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Synthesis

This report summarizes the work of a two-phased research study entitled “*Health costs attributable to smoking in Vietnam*” which aimed to estimate the societal cost of tobacco use in Vietnam.

The general objective of this study was to support the promulgation of tobacco control laws and policies in Vietnam through the generation and analysis of scientific evidence on the direct and indirect health costs attributable to smoking. The specific objectives of this study were to: 1) generate knowledge about the medical costs directly attributable to active tobacco use; 2) generate knowledge about the morbidity- and mortality-related costs indirectly attributable to active tobacco use; and 3) increase awareness and knowledge among policy makers and the general public about the health costs attributable to active tobacco use in Vietnam.

The costs included in this research were (i) medical expenses related to the treatment of tobacco-related diseases and (ii) productivity losses caused by tobacco-related morbidity and mortality. The diseases included in the study were: lung cancer, cancers of upper aero-digestive organs, chronic obstructive pulmonary disease (COPD), ischemic heart diseases, and stroke.

The main activities carried out during this study included: 1) conducting a literature review of existing methodologies used in health cost analyses to inform the development and implementation of a similar study in Vietnam; 2) investigating the availability, accessibility, and appropriateness of secondary data sources that would be used to assess direct and indirect costs of tobacco-related diseases; 3) developing data collection tools; 4) implementing a pilot survey in two central hospitals (one general hospital and one specialized cancer hospital) in northern Vietnam to test the data collection tools and to inform the development of data collection procedures and guidelines; 5) obtaining ethics approval from the Institutional Review Board (IRB) of the Hanoi School of Public Health; and 6) implementing a hospital-based study in thirteen hospitals in Vietnam. A research report was prepared based on the findings of the study and will be sent separately.

The Research Problem

Vietnam's active and passive smoking rates remain among the highest in the world. According to the 2010 Global Adult Tobacco Use Survey (GATS) conducted by the Ministry of Health (MOH) and General Statistics Office (GSO), the prevalence of smoking among adult men was 47.4% and among adult women 1.4%; this is equivalent to 15.3 million tobacco users. The prevalence of exposure to home-based second-hand smoke was 67.6% and at work it was 49%.

The continued high level of active and passive tobacco use has had serious negative health impacts on the Vietnamese population. In 2003, according to the Regional COPD Working Group, COPD prevalence in Vietnam – at 6.7% – was the highest among 12 Asia-Pacific countries.¹ Likewise, in 2002 the International Agency for Research in Cancer estimated that Vietnam has 10,300 new lung cancer cases annually in addition to 8,240 new cases of upper aero-digestive cancers (mouth, pharynx, larynx, oesophagus, sinuses).² A significant proportion of these patients are expected to seek medical care.³

The Vietnamese Government's readiness to address the tobacco epidemic has been reflected in both the Prime Minister's Decision No 77/2002/QD-TTg (Ratification of the Programme for the Prevention and Control of Certain Non-Communicable Diseases 2002–2010) and Government Resolution No 12/2000/NQ-CP (National Tobacco Control Policy 2000–2010). Vietnam signed the Framework Convention on Tobacco Control on 8 August 2003 and ratified it on 17 November 2004. A plan to implement the FCTC was approved by the Prime Minister through Decision QD-TTG 1315 of 30 August 2009. A national tobacco control law is currently being drafted by Ministry of Health and is expected to be passed by the National Assembly in May 2012. The tobacco tax policy has been improved; to date this has included a homogenous excise tax schema applied to all types of cigarette in 2006 followed by a tax increase from 55% to 65% of the manufactured price in 2008. A ban on tobacco advertising in the mass media has been enforced. Improvements have been made to health warnings. A smoke-free policy has been issued by the government and enforcement efforts have been made by some ministries and provincial governments.

While the country has thus made some significant progress, it still faces many challenges and limitations. The tax level remains low compared to World Health Organization (WHO) and World Bank (WB) recommendations. Cigarette affordability has actually increased due to inflation and income increases over the past few decades. The ban on cigarette advertising/promotion is poorly enforced at points-of-sale (POS). There is no effective mechanism for enforcing the smoke-free policy in work and public places, resulting in low compliance. Health warnings still do not meet international best practices. At the same time,

¹ Regional COPD Working Group, COPD prevalence in 12 Asia-Pacific countries and regions: Projections based on the COPD prevalence estimation model. *Respirology* 2003; 8:192–198

² International Agency for Research on Cancer, GLOBOCAN 2002 database

³ Some cancer patients initially refuse treatment after being diagnosed with cancer. However, at some stage, due to many physical discomforts (pain, bleeding, etc) and hoping for survival, many do ultimately seek medical help. They may not actually be hospitalized due to the advanced stage of their cancer, but are still recorded by the hospitals.

some provisions of the draft tobacco control law remain weak.

These policy limitations reflect on one side the result of the tobacco industry's interference, and on another side the continued low level of awareness among policy makers of the negative health and economic impacts of tobacco use. This lack of awareness – based in part on the inadequacy of national documentation and evidence – has limited the ability of policy makers to appropriately consider “gains” versus “losses” related to the tobacco industry's contribution to the country's economy against the potential benefits and contributions of tobacco control.

At the international level, tobacco use is known to impose considerable costs on household, national, and global economies. Each year, global economic losses due to tobacco use are about USD 400 billion, including health care expenses, lost foreign exchange, diversion of agriculture land that could be otherwise used to grow food, the cost of fires, increases in insurance premiums, decreases in workers' productivity, and the cost of cleaning the environment.

To support the development and implementation of stronger tobacco control policies in Vietnam, scientific evidence about the health hazards and economic burden associated with tobacco use is urgently needed.

One way to document and assess the adverse health effects of tobacco use on a society is to translate smoking-caused illnesses, premature mortality, and productivity losses into economic terms. To date in Vietnam, only a few studies have addressed the costs of tobacco use. Most of these studies have addressed the opportunity cost of tobacco use at the household level. A unique study recently conducted by the Hanoi School of Public Health (HSPH)⁴ measured the health care cost of three major tobacco-related diseases; it is considered to be the first study that measured the health care cost burden of smoking in Vietnam. However, this study had several limitations which needed to be addressed in a more comprehensive study. The limitations included: 1) the study addressed only three diseases, although the list of smoking-related diseases is much longer; 2) the study only estimated the costs of smoking-attributable hospitalization, but was not able to address other cost factors such as the cost of premature deaths, the cost of outpatient care, lost labour time while seeking treatment etc.; and 3) the study was based on a small sample size (390 patients). These limitations led to insignificant cost estimate differentials between smokers and non-smokers.

To address these shortcomings, and to fill the knowledge gap which still existed about the real costs of tobacco use in Vietnam, HealthBridge and its partners implemented a two-phased research project which examined the societal cost of tobacco use. This study included both medical costs for the treatment of tobacco-related diseases and productivity losses due to tobacco-related morbidity and mortality. In addition to direct health care costs, the study addressed indirect morbidity and mortality costs.

No changes were made to the stated research problem during the study's implementation.

⁴ Hana Ross, Dang Vu Trung, Vu Xuan Phu “The costs of smoking in Vietnam: the case of inpatient care,” *Tobacco Control* 2007;16:405–409.

Research Objectives

The general objective of this study was to support the promulgation of tobacco control laws and policies in Vietnam through the generation and analysis of scientific evidence on the direct and indirect health costs attributable to smoking. The specific objectives of this study were: 1) to generate knowledge about the medical costs directly attributable to active tobacco use; 2) to generate knowledge about the morbidity- and mortality-related costs indirectly attributable to active tobacco use; and 3) to increase awareness and knowledge among policy makers and the general public.

A research report based on the study's results will be used for a series of advocacy workshops, which will target policy makers, in particular members of the National Assembly and its committees (such as the Legislative Committee, the Social Affairs Committee, the Ethnic Minority Committee, etc) and the media. The purpose of these workshops will be to increase support for the passage of a strong tobacco control law, predicated upon improved understanding of the true costs of tobacco use. A suitable time for these advocacy workshops will be January to April 2012.

Methodology

This cost of illness study utilized a prevalence-based and disease-specific approach to estimate the economic costs of smoking-related diseases.

The economic costs of smoking were divided into two components: direct costs and indirect costs for outpatient, inpatient, and self-treatment care. Direct costs included both health care and non-health care costs. Direct health-care costs are those resources expended during the health-care process, such as user costs (formal user fees), provider costs (capital depreciation and recurrent costs), and other party costs (social insurance premiums and pay-outs). Direct non health-care costs include transportation, nutritious supplemental food, and care giving. Indirect costs included mortality and morbidity costs and the value of lost productivity attributable to smoking-related diseases. Furthermore, to be all-encompassing, the study incorporated the direct and indirect costs of all affected parties: the patient and his or her family (private, out-of-pocket expenses), the public (government subsidies for hospitals), and third parties (insurance-related expenses).

The study was implemented in two phases. Phase 1 focused on assessing the feasibility of conducting the study in Vietnam. It was conducted between 16 March and 16 September 2010. Phase 2 involved the hospital-based study, including the collection and analysis of data and the production of the research report. This phase was conducted between 17 September 2010 and 31 December 2011.

Selecting smoking-related diseases

During the research development phase, four disease groups were of research interest: lung

cancer, cancer of upper-aero digestive tract, chronic obstructive pulmonary disease (COPD), and ischemic heart disease. However, recommendations from the Burden of Disease team at the Hanoi School of Public Health and Prof. Theo Vos from Queensland University led to the addition of stroke to the study, as it is also positively correlated with smoking. In the end, five smoking-related diseases were included: 1) lung cancer (WHO International Statistical Classification of Diseases and Related Health Problem, 10th Revision (ICD 10) codes: C33-C34); 2) cancer of the upper aero-digestive tract (ICD 10 codes: C00-C15, C30.0, C31-C32); 3) COPD (ICD 10 codes: J40-J44); 4) ischemic heart diseases (ICD 10 codes: I20-I22, I24-I25); and 5) stroke (ICD 10 codes: I60-I64, I67-I69).

Selecting hospitals

Thirteen hospitals were selected to participate in the study. Six of these hospitals operated at the national level: the Bach Mai Hospital (with Institute of Cardiovascular diseases), the “E” Hospital (with care units dedicated to cardiovascular diseases, cancer, and respiratory illnesses), the Friendship Hospital (with care units dedicated to cardiovascular diseases, cancer, and respiratory illnesses), the ENT Hospital (with care units dedicated to upper aero-digestive cancers), the National Cancer Hospital K (with care units dedicated to various forms of cancer), and the National Hospital for Tuberculosis and Respiratory Diseases (with care units dedicated to cancer and COPD). Five of the selected hospitals operated at the provincial level: the Pham Ngoc Thach Hospital for Tuberculosis and Respiratory Diseases in Ho Chi Minh City, the Hanoi Oncology Hospital, the Ho Chi Minh Oncology Hospital, the Binh Duong General Hospital, and the Hai Duong General Hospital. The Chi Linh General Hospital and the Di An General Hospital were also selected to represent district-level hospitals. The research team excluded commune health centers from the study because all patients with one of the five diseases of interest are ultimately referred to a district or higher level hospital for diagnosis and treatment.

Study population and samplings

The study population included those patients who were hospitalized in one of the above-mentioned hospitals and who had been diagnosed with one of the five diseases of interest. To be included in the study, the patient also had to have been discharged from hospital during the period March to October 2011.

Patients were excluded if they had mental or other communication problems or were under 18 years of age. The inclusion-exclusion decisions were made during the recruitment process based on medical records and interviews with potential patients and their physicians.

The original planned sample size was 2,400 (approximately 600 cases for each disease group). The addition of stroke to the included diseases raised the total sample size to 3,129. This included 727 cases of lung cancer, 680 cases of cancer of the upper aero-digestive tract, 627 cases of COPD, 675 cases of ischemic heart disease, and 420 cases of stroke.

Data collection

The data for calculating the social costs of inpatient, outpatient, and self-treatment care were obtained from the following sources:

- Primary data was collected through patient discharge interviews.
- Secondary data, which included the direct costs of both providers and users, was collected from each participating hospital in a number of ways.
 - The providers' costs (capital and recurrent items, depreciations) were collected through the hospitals' asset registries and financial records. Information on year and cost of purchase and lifetime used for the straight-line depreciation of buildings, vehicles, equipment, and other assets were collected from the hospitals' asset registry. Annual costs for the depreciation of the capital items were collected from the hospitals' financial records. Recurrent costs – including personnel costs (salaries, allowances, social insurance contributions, professional hazard/risk payments, and incentive bonuses), drugs/supplies (drugs, chemicals, medical consumables) and operating costs (electricity, water, fuel, office supplies, and telecommunications) – were also collected from the hospitals' financial records. The provider costs of each service (cost per bed-day, cost per consultation, cost per laboratory, cost per imaging diagnostic test, etc) was estimated using the number of units of services used by each patient; this was assessed by reviewing patient records.
 - The cost of formal fees (user costs) and health insurance reimbursements was provided by hospital staff from hospital records; this included drug costs, laboratory costs, X-ray costs, money charged by the hospital to the patient, as well as the kind of insurance held by the patient. Formal fees were then divided by user fees and health insurance reimbursements. The number of each medical record was used to link the secondary data with the primary data collected directly from the patients.
 - A consent letter was developed; it was explained to and signed by each participant. Before signing, each potential participant was informed of the study's research objectives, their right to refuse to participate, and about data confidentiality. Each person was also given the contact information of HealthBridge project coordinator.

Ethical approval for this study was provided given by the Institutional Review Board (IRB) of the Hanoi School of Public Health.

Estimating the social costs of inpatient, outpatient, and self-treatment care

The research team adopted the cost of illness approach to estimate the societal cost of inpatient, outpatient, and self-treatment care. The total costs were calculated using the following formula:

$$C_t = C_i + C_f + C_o$$

Where:

1. C_t is the total cost
2. C_i is the cost borne by the patient and his/her family (private costs) in terms of travel, care giving, informal fees paid to health care providers, income loss, and other indirect costs. This included outpatient and self-treatment care costs borne by the family/individual.
3. C_f is the cost borne by the hospitals (public costs), including recurrent costs (supplies, personnel, support service, administration, etc. and capital cost depreciation.
4. C_o is the cost borne by the health insurance companies that paid for health care providers and for sick leave payments.

The Smoking Attributable Fraction for inpatient, outpatient, and self-treatment for each disease category was estimated following SAMMET method. First, the research team determined the percentage of smokers amongst those diagnosed with one of the diseases. Second, since some non-smokers had been diagnosed with the smoking-related diseases and some of the smokers would have acquired the disease regardless of their smoking status, only a percentage of smokers diagnosed with the disease could be counted for the SAF. Third, the research team assumed that smokers diagnosed with smoking-related diseases would have incurred at least average per capita health care costs over their lifetimes if they had not been diagnosed with the smoking-related disease; therefore, only the cost of the treatment in excess of the average per capita health care cost was included in cost calculations attributable to smoking.

The SAF of a particular disease was obtained by multiplying the percentages calculated during each of the three steps. The formula for calculating total smoking attributable social cost was adopted from Yang et al⁵, as noted below.

$$SAF_c = SAF_H + SAF_O + SAF_S$$

Of which:

$$SAF_H = \sum \{ [P(I)_i \times Q(I)_i] \times SAF_{I_i} \}$$

$$SAF_O = \sum \{ [P(O)_i \times Q(O)_i] \times SAF_{O_i} \}$$

$$SAF_S = \sum \{ [P(S)_i \times Q(S)_i] \times SAF_{S_i} \}$$

Where:

SAF_c is the smoking attributable fraction of social costs of smoking in Vietnam

⁵ Yang, M.C., et al. Smoking attributable medical expenditures, years of potential life lost, and the cost of premature death in Taiwan. *Tobacco Control*. 2005.14(supl 1):62-70

SAF_H is the smoking attributable fraction of social costs of smoking for inpatients

SAF_O is the smoking attributable fraction of social costs of smoking for outpatients

SAF_S is the smoking attributable fraction of social costs of smoking for self-treatments

$P(H)$ is average social costs per hospitalization for disease i

$P(O)$ is average social costs per outpatient care for disease i

$P(S)$ is average social costs per self-treatment care for disease i

$Q(H)$ is the total number of admissions for both smokers and non-smokers for disease i

$Q(O)$ is the total number of outpatient care episodes for both smokers and non-smokers for disease i

$Q(S)$ is the total number of self-treatment care episodes for both smokers and non-smokers for disease i

$SAFH$ is the smoking attributable fraction for hospitalization of disease i calculated as described above

$SAFO$ is the smoking attributable fraction for hospitalization of disease i calculated as described above

$SAFS$ is the smoking attributable fraction for hospitalization of disease i calculated as described above

Estimating smoking-attributable productivity losses due to mortality (SAPLM)

The research team estimated smoking-attributable productivity losses due to mortality (SAPLM) based on deaths and present discounted value of lifetime earnings (PVLE) method.

Two sources of per capita income were also used for estimating PVLE: average income per person per year as per the Vietnam Living Standard Survey (VLSS) 2010 and GDP per capita 2010. Relative Risks (RRs) from the studies of Liu et al.⁶ and Gu et al.⁷, smoking prevalence from GATs, and National Health Survey (NHS) 2002 were used to estimate SAPLM.

Smoking-attributable productivity losses due to disability (SAPLD)

Smoking-attributable productivity losses due to disability (SAPLD) for each disease category (by age and gender) was estimated by number of work days lost by both the patient and his/her caregivers multiplied by their average earnings per day.

⁶ Liu B-Q, Peto R, Chen Z-M, Boreham J, Wu Y-P, Li J-Y, et al. Emerging tobacco hazards in China: 1. Retrospective proportional mortality study of one million deaths. *British Medical Journal*. 1998;317:1411-22

⁷ Gu D, Kelly TN, Wu X, Chen J, Samet JN, Huang J-F, et al. Mortality Attributable to Smoking in China. *N Engl J Med*. 2009;360(2):150-9

Project Activities

The following activities were undertaken during this two-phased research study

Phase 1

1. Meetings: Three official meetings were held amongst the research team and advisors, in April, June, and August 2010. The meetings focused on the findings of the costing study review, the methodology used, input data and sources, and the detailed calculation model which would be used for the Phase 2 study.
2. Literature review: The research team initially proposed to undertake two literature reviews. The first review was to focus on the different methodologies used in health cost analysis, while the second was to explore the range of health costs attributable to smoking as reported in other national and international studies. The first review resulted in recommendations being made for the Phase 2 methodology. The second review was not carried out as the research team discovered that a similar review had already been conducted as part of research study carried out by the Vietnam Steering Committee on Smoking or Health (VINACOSH). As the main researcher of the VINACOSH study (Dr. Hoang Van Minh) was also a member of the current research team, and to avoid duplication, the research team decided that the current study would use the findings from VINACOSH's review after they were published in November 2010. The VINACOSH review revealed that nine similar Asian studies had recently been conducted in Singapore, Korea, Myanmar, Taiwan, Bangladesh, China, Hong Kong, Vietnam, and India, although each of those studies had used different methodologies. The VINACOSH study had also already made conservative estimates of the economic burden of tobacco use at the national level in Vietnam based on secondary data. In total, it estimated that the annual cost of treating three diseases (COPD, lung cancer and ISD) – including hospitalization, outpatient, and self-treatment care – was 2,300 billion dong. However, the VINCASOH report also mentioned that limitations of the study had resulted in an under-estimating of the cost. The study report argued that there was an urgent need for a more representative and comprehensive study of this issue.
3. Data collection tool design and testing: The research team designed and tested several data collection tools in two hospital settings, including:
 - 1) A structured questionnaire for interviewing patients with one of the selected diseases. The questionnaire was developed to gather the following information:
 - Socio-demographic characteristics of the patients (including household income and monthly earnings and expenditure, occupation, educational attainment, gender, age)
 - Smoking status
 - Disease diagnosed (based on medical record) for this hospitalization
 - Health insurance status
 - Inpatient direct costs (user side) other than formal hospitalization fees for this

hospitalization (i.e., pocket money spent on drugs and for obtaining medical services other than those received directly from the hospital; the costs incurred by the family to take care of the patient; transportation and other non-medical expenses related to hospitalization)

- Inpatient indirect costs (the number of unpaid sick leave days taken related to the disease during hospitalization)
- Outpatient care indirect costs (the number of unpaid sick leave days taken related to the disease before hospitalization)
- Disease-related inpatient costs (user and provider, direct and indirect) incurred during the previous 12 months
- Disease-related outpatient care costs (user side, direct and indirect) incurred during three months prior to hospitalization

A consent letter was developed and attached to the questionnaire; each patient had to read and sign in this letter in order to agree to participate in the study.

2) A form for collecting information about staff time allocated to the treatment of specific diseases by hospital department. The form was developed to collect information on:

- Number of staff members in each department in the hospital
- Time contribution of departmental personnel for inpatient treatment of each disease included in the study
- Staff members' monthly income including salary, allowance, and others

3) Four forms for collecting information about capital depreciation of hospital assets. The forms describe the resources of each participating hospital, including immobile assets, medical equipment and facilities, human resources, and other non-medical supplies/facilities (water, electricity, etc.)

4) A form to collect general hospital information about:

- Personnel working in the hospitals by department
- Total number of inpatient beds (planned and actual)
- Total annual number of admissions, total number of laboratory tests performed and imaging diagnoses made by department and by disease, etc.

The tools were tested at the National Cancer Hospital and the National General E Hospital. Comments and recommendations made during testing (such as those related to wording, inconsistencies in skip patterns, flow and sequencing of questions, etc) were taken into consideration as the tools were revised for use in Phase 2.

4. Data collection guidelines development: The guidelines for data collection were developed after pilot testing the tools in 2 hospitals. The guidelines included detailed instructions on, for example, the types of data to collect, where to collect the different types of data, and who should be met.
5. Secondary data source analysis: The project team explored various secondary data sources

that could be used to assess direct and indirect costs of tobacco-related diseases.

6. Ethical Review: The project team prepared and submitted an application to the Institutional Review Board of Hanoi School of Public Health for ethical review. The application was approved.

Phase 2

1. Meetings: (a) The project team conducted a one day meeting in June 2011 amongst the research team and the research advisors (Dr. Hana Ross and Dr. Dang Vu Trung). The main purpose of the meeting was to seek advice from the advisors on issues related to data collection and data analysis. (b) Meetings were held as needed amongst the research team members to discuss and select solutions during the data collection and analysis process. (c) The research team held meetings with representatives of the participating hospitals in March and April 2011 to present the research study objectives and to gain the hospitals' agreement to collaborate. Each hospital selected among the nurses working in each participant hospital to be an interviewer who is responsible for data collection.
2. Training: Two training workshops were offered in each hospital in April and early May 2011. The first training session was conducted for the general hospital data collectors by the HSPH researcher team. The second training session focused on using the interview questionnaires and was conducted by the HealthBridge project manager. Those trainees conducted the data collection in their hospitals. During the training workshops, participants provided suggestions to revise the questionnaire and various data collection forms. These comments were taken into consideration as revisions were made to the documents prior to the implementation of the data collection process.
3. Data collection: Data was collected from thirteen hospitals between April and October 2011.
4. Data entry and analysis: The process of entering the data, analyzing the results, and producing a final report was completed between June and December 2011. The general hospital data were entered and analysed by HSPH's team while the interview questionnaires were entered by a team of external consultant and analysed by Thac Minh. HBV project manager monitored all the data entered process and provided the support to the data analysis team. The indirect costs were analysed by HSPH's team. The final research report was developed by HBV project manager and HBV project director.

Quality control

The research team subcontracted a staff member of the Institute of Hygiene and Public Health of Ho Chi Minh City (HCMC) to coordinate the data collection process and to be responsible for quality control of data collection in four hospitals in HCMC. For nine hospitals in Hanoi, these were coordinated directly by the HBV Project Manager. All forms were checked for completeness at two levels: 1) at the hospital level by a physician in charge of data collection; and 2) by the project supervisor in HCMC and HBV project manager in Hanoi. Any missed information was sent back to hospital for rechecking. In cases where updating the information was impossible (e.g., the patient had already been discharged and the missing information was

on the questionnaire), the entire case was excluded from data analysis. Communication between the hospital data collection team, the project supervisor in HCMC, and the HBV project manager took place daily via telephone and email. Double data entry was carried out on 10% of the cases.

The original project completion date was September 2011. However a no-cost extension was granted to 31 December 2011. An extension was required given delays in completing the inpatient interviews; this was the result of i) a significant increase in the sample size (from 2,400 to 3,127) after stroke was added to the disease list.

Project Outputs and Outcomes

The main outputs of the Phase 1 study were as follows:

- ➔ A literature review report which outlines the various methodologies used in health cost analyses as well as recommendations for the design and implementation of a Phase 2 research study. The report can be found in Appendix I.
- ➔ A detailed description of available secondary data, their sources and access information, and their strengths and limitations.
- ➔ Information accessibility and management descriptions for hospital settings (specialist, central general, and provincial general hospitals) where data collection would be conducted in the phase 2 study.
- ➔ Tools for data collection, including: 1) a structured questionnaire for interviewing patients with one of the studied diseases; 2) a form for collecting staff time allocation related to the treatment of specific diseases by hospital department; 3) forms for collecting hospital capital depreciation information; and 4) a form to collect general information from each participating hospital. The tools were finalized during Phase 2.
- ➔ Data collection guidelines, which can be found in Appendix II
- ➔ Ethics approval from the Hanoi School of Public Health, which can be found in Appendix III.

The above-mentioned outputs have been included in the phase 1 scientific report.

The main outputs and outcomes of the Phase 2 study were as follows:

- ➔ Technical research report, which will be sent in a separate file.
- ➔ Final version of the data collection tools, found in Appendix IV.
- ➔ The relationship and collaboration between HBV and thirteen hospitals involved in the study was developed (details provided in the research report).
- ➔ A network of local and international researchers and advisors (details provided in the research report). The researchers and advisors represented different agencies and had a variety of backgrounds and experience in disparate fields and areas of research. By

participating in the study, they were able to share not only technical information about health cost analysis (which is not common in Vietnam), but also their experiences in conducting hospital-based studies. The creation and maintenance of this network has significantly increased the local researchers' knowledge about and experience in conducting detailed and multivariate health cost studies.

- ➔ Across thirteen hospitals, thirty-nine staff trained in general data collection and approximately seventy staff trained in conducting questionnaire-based patient interviews. This training has increased the capacity of the trained staff to participate in the data collection portion of hospital-based research studies.
- ➔ Increased capacity of the hospital focal points involved in the research study. Each focal point gained an increased understanding of the health costs attributable to smoking, while their respective hospitals have ownership of a data set which could be used for further analysis for other purposes (with due acknowledgement to the *Health Costs Attributable to Smoking in Vietnam* study).
- ➔ Research findings which will be disseminated at an upcoming National Assembly workshop. (Although planned for 2011, the dissemination workshop has been moved to 2012 to link it to a series of planned workshops with the National Assembly through another project which focuses on advocating for the development and passage of a strong national tobacco control law. The Health Policy Research Institute will co-organize the results dissemination workshop with HealthBridge, with the participation of the participating hospitals, the health institute, researchers, members of the media, and organizations working on tobacco control and poverty reduction.)

Overall Assessment and Recommendations

The project research has met its objectives: 1) to generate knowledge about the medical costs directly attributable to active tobacco use; 2) to generate knowledge about the morbidity- and mortality-related costs indirectly attributable to active tobacco use; and 3) to increase awareness and knowledge among policy makers and the general public about the health costs attributable to active tobacco use in Vietnam.

The research was carried out by a team of researchers representing different agencies, international NGOs, and the Hanoi School of Public Health. It received significant support from several international technical advisors about health cost analysis. This partnership between organizations, and between the researchers and the technical advisors, was based on the research and advocacy strength of each and contributed to an increased capacity for all involved.

The research findings highlighted the significant economic burden of tobacco usage in Vietnam, in terms of the treatment of tobacco-related diseases. As compared to previous study conducted by the Hanoi School of Public Health, this study: 1) estimated the societal costs of five diseases; 2) estimated both direct (inpatient, outpatient, and self-treatment) and indirect (morbidity and mortality) costs; and 3) used a larger sample size (3,219 interviews).

Some of the main **findings** of this study are:

- ❖ The average costs for one inpatient episode were 63,554,138 dong (~USD3,000), 77,778,023 dong (~USD3,750), 12,527,049 dong (~USD600), 36,522,567 dong (~USD1,700), and 14,718,578 dong (~USD700) for lung cancer, upper aero-digestive tract cancers, COPD, IHD, and stroke, respectively. The social costs of smoking are shared by three different entities: government, insurance companies and household. The costs borne by government and insurance counted for 38%-56%, depending on the disease.
- ❖ The total societal cost for the five smoking-related diseases in Vietnam was 11,252 billion dong (~USD550 million), of which direct costs count for 55.0% and indirect costs count for 45.0% (using Lu RRs and GATs smoking prevalence). The total social cost for hospitalization related to the five smoking related diseases in Vietnam was 6,205 billion dong (~USD320 million). The indirect mortality cost for the five smoking related diseases was 4,506 billion (~USD220 million). The indirect morbidity cost of inpatient and outpatient was 541.4 billion (~USD25 million). These costs will be higher when the direct costs of outpatient care and self treatment are added.

The research findings will be used to raise public and political awareness of the economic burden of smoking at the household and national levels. They will also be used as evidence for quit programmes and other tobacco control advocacy programmes. Perhaps most immediately, they will be used to advocate to policy makers to ensure that the Law on the Prevention and Control of Tobacco Harms contains strong public health provisions and that future tobacco control policies are evidence-based.

Several **lessons** were learned during the implementation of this study:

- The first major lesson learned was that engaging hospital leaders early in defining the parameters of how the study would be implemented was crucial to gaining their cooperation. One of challenges of hospital-based studies in Vietnam is that most hospitals are overloaded, the staff members are busy, and patient needs must be prioritized over other activities, such as research studies. Gaining agreement and commitment to collaborate was at first not easy and sometimes impossible. To meet this challenge, the research team met with hospital leaders to share the study's research objectives/methodology and give them an opportunity to comment on possible problems and solutions. This ensured that they felt empowered in setting limits to how much the study would impact on the hospitals' regular operations while also allowing their staff members an opportunity to gain research capacity.
- Another lesson learned was that linking patients' interviews with their discharge time was a necessary but insufficient factor in ensuring their participation. To collect the most complete information about hospitalization-related costs, the project team had assumed that the patient interview should be as close as possible to discharge time; this assumption included the recognition that when patients knew that they were about to be discharged, they could become impatient during the interview or even refuse to participate. Interviews were therefore set up before the doctors informed the patients of their discharge time. However, some patients still failed to be interviewed; this matter was not resolved by the study's end.

Appendix I: Literature review report on different methodologies used in health cost analysis and its recommendation for Vietnam study

REVIEW OF COSTING METHODOLOGY AND RECOMMENDATION FOR VIETNAM STUDY

For health care planning, recent trends and future disease costs are information used for setting priorities and cost containment measures (1, 2). Thus, costing plays an important role in the health care policy making process.

1. Cost classification

Drummond et al (3) proposed 3 groups of resources used in health care: health care resource use (e.g. hospital resources and community care resources), patient and family resource use (e.g. transportation, sick absence and care givers), and resource use in other sectors (e.g. social welfare). Cost classification is divided into three category costing types: **direct medical, direct non-medical and indirect costs** (4).

Direct medical costs refer to those resources whose consumption is wholly attributable to the use of the health care services (5). These include costs of diagnosis, treatment, follow-up, rehabilitation, and terminal care, and are both institutional and non institutional. For instance, costs for drugs, beds, tests, out-patient attendances, nurse visits at home are direct medical costs. One point to remember when identifying direct medical costs is that these have to include not only costs of resources directly used in providing health services, in other words directly serving the patients, such as drugs, beds, working time of doctors and nurses, etc., but also costs of other resources involved in this process, such as costs raised from supporting departments like General Administration, Housekeeping, Laundry or Maintenance. The latter costs, which are called overhead costs, need to be allocated for other departments (will be discussed later).

Direct non-medical costs are out-of-pocket expenses for goods and services outside the medical care sector (6). These include costs of transportation, meals, accommodation, facilities, services, and informal care. The categorization of informal care is flexible as sometimes it is classified as indirect cost. Similarly, overhead costs may also be classified as direct non-medical costs or direct costs.

Indirect cost refers to lost productivity (paid or unpaid) resulting from morbidity or mortality (7), i.e. cost of productivity loss due to sick leave, permanent disability or premature death. For example, from the patient's point of view, direct medical costs include both inpatient direct costs and outpatient direct costs while direct non-medical costs cover all expenses for transportation, meals, accommodation,

informal care and non-medical expenses related to hospitalization. Indirect cost for the patient is income loss due to sick leave.

Table 1: Cost classification and potential source of information for cost calculation

Cost		Resource use	Source of information for estimation of costs	
Category	Sub-category			
Tangible costs	Direct medical cost	Inpatient care	Medical services Hospitals/patients & care givers	
		Outpatient care	Medical services Other health facilities/ patients & care givers	
	Direct non-medical cost	Personal facilities	Home modification/ special devices/ social services	Patients & care givers (interview)
		Travel	Public/ own transportation	Patients & care givers (interview)
		Food	Extra food	Patients & care givers (interview)
		Accommodation	Hotel/guest house	Patients & care givers (interview)
		Time loss while receiving treatment	Time loss of patient (hours or days)	Patients & care givers (interview)
		Informal care	Time loss of care givers (hours or days)	Patients & care givers (interview)
	Personal care assistance	Paid helpers	Patients & care givers (interview)	
	Indirect	Morbidity cost	Working time loss (days of illness)	Patients & care givers (interview)
Mortality cost		Working time loss (work-absence years from death to retired)	Patients & care givers (interview)	

<i>Intangible costs</i>	<i>Indirect</i>	Quality of life	Cost for bearing pain and worry of patients and patients' families	Expert's opinion on QALYs Patients & care givers (interview)
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2. Costing procedure

In general, costing involves 3 steps: identifying, measuring and valuing all resources used for health care of a certain disease.

First step: Identification of resource use

The main point to remember when embarking on a costing study is that, to an economist, cost refers to the sacrifice (of benefits) made when a given resource is consumed for health care. Therefore, it is important not to confine one's attention to expenditures, but to consider also other resources, the consumption of which is not adequately reflected in market prices (hence the shadow price gets involved), for example, volunteer time, patients' leisure time, and donated clinic space.

Identification of resources covers two topics: types of resource use that are relevant for health care for the disease, and level of detail that has to be measured and valued (8).

Tangible versus Intangible cost

The cost types mentioned above are all tangible which analysts could attempt to measure. Analysts need to acknowledge that there are also intangible costs such as pain and worry of patients and patients' families. However, in most studies, those costs are mentioned but excluded because of difficulty in measurement.

Cost of informal care

Informal care is care provided by family members, friends, acquaintances or neighbors of patients without financial compensation (9, 10). Providing informal care entails giving up work and leisure time, investing energy and making fewer social contacts. In terms of societal perspective, the loss of time for informal care giving should be assessed in the form of opportunity cost. Regarding categorization, informal care is sometimes considered as indirect cost (9). Informal care is classified as household activities of daily living (HDL), health care activities (HCA), activities of daily living (ADL), and instrumental activities of daily living (IADL) (11). HDL includes preparing food and drinks, shopping, doing chores and taking care of children. HCA includes preparing medication, doing rehabilitation, contacting health care providers and organizing home facilities for the patient. ADL includes assistance such as toilet activities, moving around the house, eating and drinking. IADL includes management matters e.g. banking, shopping or traveling.

Indirect cost

As labor is a scarce resource in economic concepts, absence of an individual from work can be quantified in terms of the value of the lost productivity. Productivity cost is a synonym of indirect cost. Another concept is time cost. This concept includes value of both work time and leisure time. Therefore, productivity cost is defined as "the cost associated with lost or impaired ability to work or to engage in

leisure activities due to morbidity and lost economic productivity due to death (8)". Work time is divided into paid working time and non-paid working time. Productivity costs refer to loss of production due to illness and mortality. Time loss can be classified as time spent receiving treatment and time spent recovering at home. The patient's time spent receiving treatment is recommended to be classified as direct cost. This classification style can have an effect on the result in case indirect cost is not included (12). Similarly, according to Kolber, indirect costs are those costs that are not actually paid. They are defined as productivity lost due to illness. There are two forms of indirect costs: morbidity and mortality costs. Morbidity costs include the value of production losses of those who are sick, absent, unemployed or restricted from working due to an illness. Mortality costs are calculated as the present value of lost production due to premature death caused by illness (4).

Transfer payment

There are some payments, such as sickness compensation, that are a financial cost of a social security fund or government, and also a financial income of the patients. They are not social costs because this money does not reflect resources consumed due to illness. They will be exchanged with patients' utility which is not related to the illness. This money is called transfer payment, and is not included in the cost of illness. In contrast, cost of payment administration is included because the payment is a consequence of the illness (13).

Future health care cost

Future health care cost or health costs in ex-tended years of life are the costs associated with patients who live longer and consume health care resources as a result of a given treatment. We have to consider future medical care cost, both related and unrelated to the diseases. Related medical care is care given to treat that diseases in case patients re-hospitalize or need more health care after discharge. Unrelated medical care is care given to treat another disease that is necessitated by the treatment. When conducting a cost of illness study, future health care cost needs to be included.

Taxes

It was argued that direct and indirect taxes and social premiums should be excluded from cost analyses since they do not represent costs for society (14). However, in practice, in most situations it is difficult to exclude, so is included (8).

Second step: Measuring resource use

The measurement of resource use for health care of a disease depends much on the context of the study. The major source of data on health care resource use are routine statistics kept at the hospital or other agencies involving in health care, such as medical records and reports on resource consumption. Interviews with patients and patients' families are usually used for measuring patient and family resource use. For resources in other sectors, routine data systems may be available for the measurement.

Third step: Valuation of resource use

Direct medical costs

Unit costs used in the valuation process can be from primary or secondary sources. They can be from direct cost measurement, accounting data, standard unit cost, price list, expert opinion and from other studies (5).

When estimating direct medical costs from hospital as well as community, in some settings there may be charge data or average cost figures. However, even if these exist, they may be considered imprecise. For instance, the hospital charge may not reflect the real cost of a treatment due to subsidization from the government or monopolies, or the average cost or charge is not for the specific items concerned (in case there is no average daily costs for bed days for different types of wards or the average cost available for an out-patient visit may not differentiate among different clinic specialties). Therefore, it is likely that micro-costing would be required. In micro-costing the approach would be to derive the cost of a treatment from its component parts, namely consultant time, tests, drugs, equipment, buildings and departmental overheads. Some survey work may be required, plus data from the hospital finance department on staff salaries, overtime allowances and equipment prices. Costing of equipment and buildings will require assumptions to be made about useful life and resale value.

For direct measurement, in other words micro-costing, there are some aspects to be considered in the valuation of resource use. These are adjustment of cost at different time (discounting and the annuitization of capital expenditures), valuation of time loss (indirect cost), and prices (market and shadow prices).

Some allowance needs to be made for the differential timing of costs because even in a world with zero inflation and no bank interest, it would be an advantage to receive a benefit earlier or to incur a cost later, that is called time preference. Thus, when valuation of resource use in a period of more than one year, analysts have to discount future costs to present values.

A more common situation is where most costs are easily expressed on an annual recurring basis and it is only capital costs which differ from year to year. It might be more convenient to express all the costs on

an annual basis, obtaining an equivalent annual cost for the capital outlay by an amortization or annuitization procedure.

One practical point that evaluators might care to note is the choice of discount rate because it has a substantial impact on the study results. Arthorn Riewpaiboon et al (10) found out that a change of discount rate from 3% to 6% resulted in a 4.76% increase of the hospital's total annualized capital cost. The prevalence of a 5% rate in the existing literature has the advantage that different studies are comparable, at least on this methodological dimension. However, some argue that 5% may not consistently reflect societal or individual preferences and 3% would be the most appropriate real discount rate for costing as well as economic evaluations. Therefore, the best current advice would be (1) to present costs in their undiscounted form, so that others can investigate the implications of employing different discount rates; (2) to use either the announced rate in the jurisdiction concerned, or the rate of 3% and 5%; (3) to undertake a sensitivity analysis, making sure that this includes 0%, 3% and 5% and (4) to alert decision-makers to the importance of the choice of discount rate.

Mentioned above is the economic-based approaches which include combination of depreciation cost and interest on undepreciated portion over the useful life of capital items. There is another method of capital cost calculation called accounting-based approaches in which equivalent annual cost for the capital outlay is estimated by averaging the capital purchase prices throughout their useful life. These two methods result in different calculation outcomes. Results from Arthorn Riewpaiboon et al showed that the total annualized capital cost of buildings and capital items calculated by the accounting-based approach was 13.02% lower than that calculated by the economic-based approach, and recommended to use economic-based approach as a suitable method for capital cost calculation.

Direct non-medical costs

One difficult question when dealing with direct non-medical costs is how values are imputed for time spent on informal care, especially leisure time? There are two main methods of valuing time spent on informal care: revealed preference methods and stated preference methods (15). Revealed preference methods use real-life decision data to value informal care. This means that preferences of informal caregivers are deduced from informal caregivers' decisions or from decisions in the market for close substitutes of informal care. Revealed preference methods can be calculated based on opportunity costs or replacement cost. Replacement cost is valued time spent on informal care at (labor) market prices of a closed market substitute (proxy goods). Stated preference methods may be contingent valuation or conjoint analysis. Contingent valuation assesses the minimum amount of money an informal caregiver would need to receive to be willing to provide a certain or an additional amount of informal care. Conjoint analysis is a method for the analysis of respondents' preferences for a set of multi-attribute alternatives.

Indirect cost

To estimate indirect cost, frequently used methods are the human-capital cost approach, willingness to pay, and the friction cost approach (2, 16). The human capital cost approach is the most often employed. This approach is based on the concept of a potential loss of production as a result of illness. It is assumed that a vacant position will never be filled and that society will continuously lose the production of those patients until retirement. This means that the labor markets are in equilibrium without unemployment. The market wage rates are used for morbidity cost calculation. Per capita GDP is usually used in the calculation of mortality cost. Furthermore, the earnings in the future are discounted at a constant annual rate. There is a comment that the real production loss can be much smaller than the potential loss because the workers who are sick can be replaced for little payment. This is a weak point of the human capital approach.

In an attempt to measure “actual” rather than “potential” production loss, an alternative method has been developed called the friction cost method. The basic idea of this approach is that those patients on short-term leave from their work can make up for the loss of production when they return, or can be taken care of by internal labor resources, or that non-urgent work may be canceled or postponed. For long-term work absence, patients can be permanently replaced by someone who is unemployed. The actual productivity loss from the work continues only during the period of time required for worker replacement. This period is called the “friction period”. It is assumed that workers who are on sick leave will be replaced after completion of the friction period. This means that if the period of work missed by the patient is shorter than the friction period, all production loss during the absent period is valued as indirect costs. However, if patients are absent from work for longer than the friction period, production loss will be limited to only the friction period. Therefore, the friction period has the role of a cut-off point in determining indirect costs. In practice, more information is needed for this method. Such information is not available in most countries. Thus, it is not popular for estimating indirect costs.

Another alternative method is willingness to pay (WTP) or contingent valuation. This method relies on the view of individuals who are asked hypothetical questions regarding how much they would be prepared to pay to avoid their probability of death or morbidity. WTP could be helpful in indicating how individuals value health and life and in deriving social preferences regarding health policy. Furthermore, WTP might be especially helpful in assessing the burden of pain and suffering which are intangible and not amenable to be evaluated in terms of the monetary value of resources used or forgone. However, this approach is used less frequently because it is difficult to apply and it is affected by income. The lower income earners tend to be willing to pay less than higher income earners.

Factors Influencing Cost calculation

Besides implementing these steps, there are some main points that need to be considered when an evaluator embarks on a costing study in the health field.

a. Viewpoint/perspective

It is essential to specify the viewpoint because an item may be a cost from one point of view, but not a cost from another. For example, patients' income loss due to sick leave is a cost from the patient's point of view, but not a cost from the hospital's point of view. The analysis can be conducted from various viewpoints or perspectives which can be classified as patient (first party), provider (second party), purchaser or payer (third party), employer or other sponsor (fourth party), government, and societal perspective (5). Defining the objectives of the study allows researchers to select the perspective that is the most appropriate. However, when in doubt the analyst should always adopt the societal point of view, which is the broadest one and is always relevant.

b. Time horizon

Time horizon is used to define the period of time needed to observe resource use. Ideally, the time horizon should be chosen in such a way that all cost consequences of the disease can be taken into account in the analysis (17).

In the case of a cost of illness study, the study has two alternatives: prevalence-based and incidence-based approaches (4). For the prevalence-based approach, the study time should be at least one year to avoid seasonal effects on the unit cost analysis of medical services and clinical symptoms. The other approach is an incidence-based cost of illness. This approach measures the economic burden from the start to the end points of illness. It observes only new cases occurring in a given period and monitors them until the end point.

c. Economic versus accounting costs

The theoretical foundation of costing is **economic versus accounting costs**, economic and accounting assessment applies different costing methodologies. One fundamental concept in economics is opportunity cost – by choosing to use available resources in one way, we forgo other opportunities to use these same resources. So economic cost or opportunity cost of engaging in an activity or producing a product refers to the sum of all other benefits that can be generated by the same amount of resources taken away for this activity (7). On the other hand, accountants measure costs by the historical outlay of funds. So, accounting cost is the acquisition price of product.

An example of potential differences between the accounting and the economic approach in valuing resources consumed is the costing of capital assets. The accounting approach uses historical acquisition price, the economic approach uses replacement value

Economic or opportunity cost is the first priority used in costing as well as economic evaluation (7). However, in practice, market prices (charge from price list) with appropriate adjustment can be applied as a reasonable proxy of opportunity costs (5).

d. Accounting-based approach vs. economic-based approach of capital costing

Most studies on health care costing have used the accounting-based approach due to its simplicity. The practical accounting-based approach is simply a division of purchase price of a capital item by its useful years. It ignores the concept of opportunity cost and costs in time difference (18). This can distort the reality. The economic-based approach of capital costing covers both depreciation cost (the rate at which the capital is “used up”) and opportunity cost (interest) of making the investment (the funds tied up in the asset) (19). The calculation is to divide current price by annuity factor. Current price is the result of adjusting purchase price by consumer price index (20). The annuity factor is calculated based on useful life and discount rate (18). The choice of discount rate also affects the final result. The discount rate, as recommended by WHO guide (19), was 3% or 5%. Normally, capital cost of buildings and capital items calculated by accounting-based approach was less than that calculated by the economic-based approach. The bigger the hospitals are (the more capital items they own), the larger the difference is. The conclusion from some other studies confirms WHO guidelines that the economic-based approach is appropriate for calculating the capital costs (21).

e. Market prices and shadow prices

Prices in the health care market do not represent opportunity costs since it is not a free market. Health care is usually regulated by health authorities and government. Market prices may be higher than opportunity costs due to monopolies or tax systems. On the other hand, they may be lower than the opportunity costs due to government subsidies. Ideally, opportunity cost is preferred to market prices. However, the pragmatic approach to costing is to take existing market prices unless there is some particular reason to do otherwise. It is by no means clear when an analyst should attempt to adjust observed market prices to reflect true opportunity costs. Unless they are convinced that to leave prices unadjusted would introduce substantial biases into the study as well as there is a clear and objective way of making the adjustments, market prices unadjusted could be used in most costing studies.

Opportunity costs of goods with distorted market prices or without market prices are called shadow prices (13). Shadow prices are used to value non-market items.

f. Approaches for Overhead cost allocation

Overhead expenses are all costs on the income statement except for direct labor, direct materials & direct expenses. Overhead expenses include accounting fees, advertising, depreciation, insurance, interest, legal fees, rent, repairs, supplies, taxes, telephone bills, travel and utilities costs, and so on (22) used in health care facilities.

In health economics, the term ‘overhead costs’ is known for those resources that serve many different departments and programs, for example general hospital administration, central laundry, hospital

records, cleaning, porters, power, and so on. If individual programs are to be cost, these shared cost need to be attributed to programs (23).

Commonly, costs to be included depend on the study perspective but in most cases, three category costing types are included: direct medical, direct non-medical and indirect costs (24). In this instance, overhead cost is part of direct non-medical costs.

The main point to note at the outset is that there is no unambiguously right way to apportion overhead costs (23). The approach that is favored by economists is to employ marginal analysis. That is, to see which (if any) of such costs would change if a given program were added to, or subtracted from, the overall activity. Whilst this is fine up to a point, the most common situation is that the choice is not such an addition or subtraction, but one between two programs, each of which would consume the given central services (perhaps because they are competitors for the same space in the hospital). For example, suppose the question concerned space in the hospital that could be used either for anticoagulant therapy or pulmonary embolism, or for renal dialysis. If the economic evaluation concerned a choice between two program then there would be no methodological problem; the costs associated with use of the space would be common to both and could be excluded from the analysis (23). However, typically the comparison might be between the anticoagulant therapy and another program in the same field. This could be a program of more definitive diagnosis of pulmonary embolism, which would avert some hospitalization. In such an instance, it would be relevant to obtain an estimate of the value of the freed resources (for example, hospital floor space) that could be diverted to other uses.

In cost analysis, it is important to note that the effort that one would put into overhead cost allocation would depend on the likely importance of overhead costs (in quantitative terms) for the whole analysis (23).

Different approaches of overhead cost allocation

A number of methods can be used to determine a more accurate cost of a program in a hospital or other setting where shared (or overhead) costs are involved. The methods are illustrated below in terms of a hospital setting, where the direct non-medical cost comes from. The basic idea is to determine the quantities of service consumed by the patient (days of stay in ward A, B or C, number of laboratory tests of each type, number of radiological procedures, number of operations, and so on), to determine a full cost (including the proper share of overhead, capital, and so on) for a unit of each type of service, and to multiply these together and sum up the results. The allocation methods described below are different

ways to determine the cost per unit for each type of service. In these methods, the overhead costs (for example, housekeeping) are allocated to other departments (for example, radiology) on the basis of some measure, called an allocation basis, judged to be related to usage of the overhead items (for example, square feet of floor space in the radiology department might be used to allocate housekeeping cost to radiology).

In deciding which of the following approaches to use, it should be borne in mind that the more important the cost item is for the analysis, the greater the effort that should be made to estimate it accurately. There may conceivably be evaluated for which simple per diem, or average daily cost will suffice, because the result is unlikely to change irrespective of the figure assumed for the cost hospital care. However, we suspect that such situations are in the minority, given the relative order of magnitude of hospital cost compared with other elements of health care expenditures.

Alternatively, the intermediate approach suggested by Hull et al (1982) may suffice. Here the per diem cost is purged of any items relating to medical care costs, leaving just the ‘hotel’ component of hospital expenditure. It is then assumed that all patients are ‘average’ in respect of their hotel cost and that expenditure can therefore be apportioned on the basis of patient-days. Thus, the hotel cost can be calculated for the patients in the program of interest and combined with the medical care costs attributable to those patients to give the total costs of the program. (The medical care costs would be estimated separately, using data specifically relating to the patients in the program.)

If more detailed consideration of costs is required, various methods for allocating shared (or overhead) costs are available, namely the following:

i. **Direct allocation** (ignores the interaction of overhead departments). Each overhead cost (for example, central administration or housekeeping) is allocated directly to final cost centers (for example, programs like day surgery, or departments like wards or radiology). Therefore, a given ward’s share of central administration would be equal to the total cost of central administration, multiplied by the ward’s share (or proportion) of the allocation basis (say, paid hours for staff). Note that the ward’s share is its paid hours divided by total paid hours of all final cost centers, not total paid hours for the whole organization. The latter method would underestimate the costs in all final cost centers.

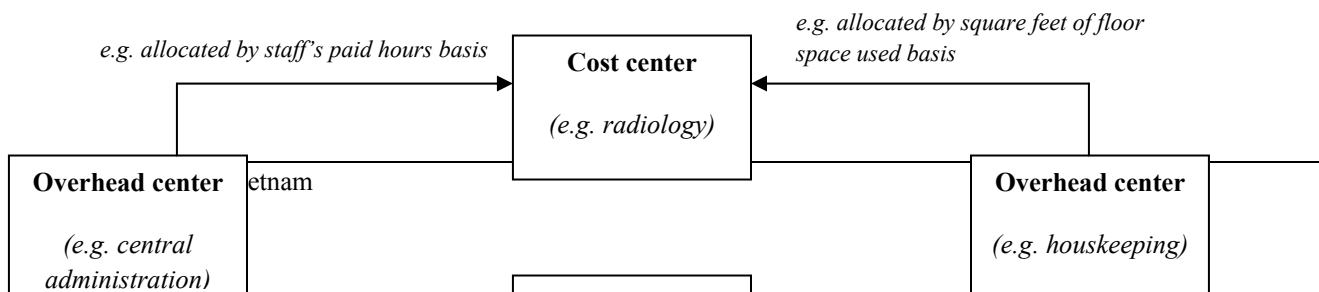


Fig. 1 Schematic illustration of direct cost allocation method

ii. **Step-down allocation** (partial adjustment for interaction of overhead departments). The overhead departments are allocated in a step-wise fashion to all of the remaining overhead departments and to the final cost centers.

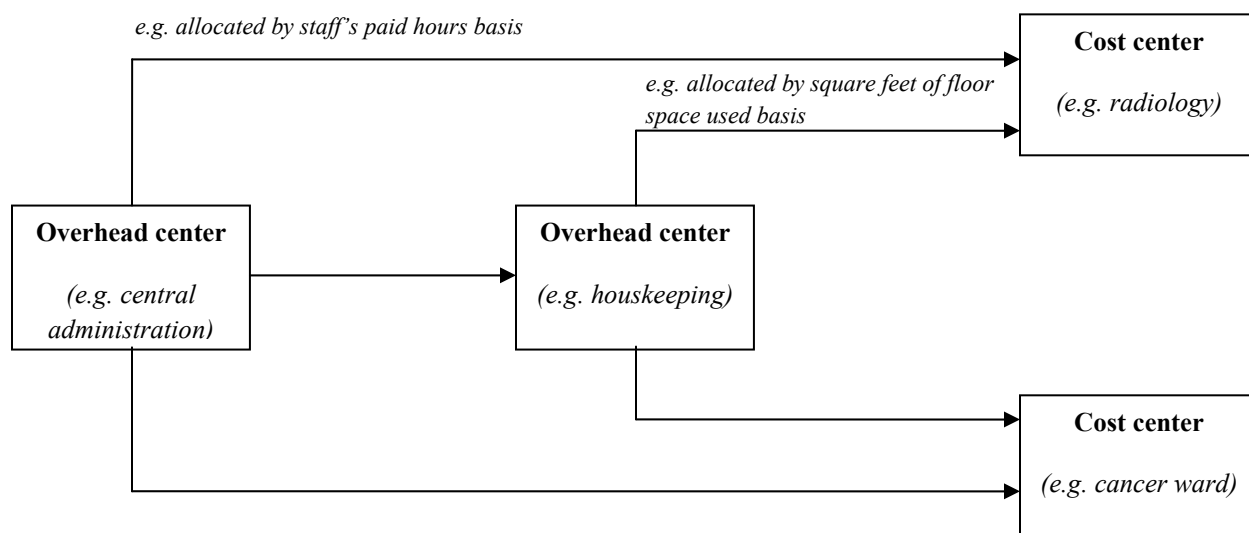


Fig. 2 Schematic illustration of Step-down allocation method

iii. **Step-down allocation with iterations** (full adjustment for interaction of overhead departments). The overhead departments are allocated in a step-wise fashion to all of the other overhead departments and

to the final cost centers. The procedure is repeated a number of times (about three) to eliminate residual unallocated amounts.

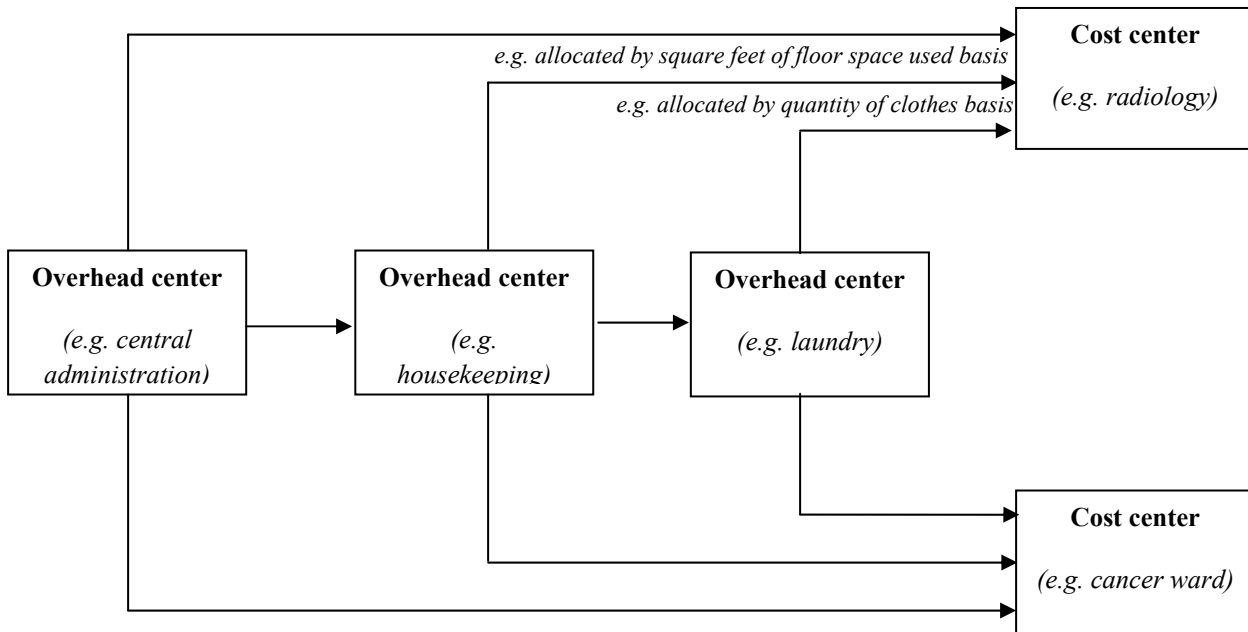


Fig. 3 Schematic illustration of Step-down allocation with interaction method

iv. **Simultaneous allocation** (full adjustment for interaction of overhead departments). This method uses the same data as (ii) or (iii) but it solves a set of simultaneous linear equations to give the allocations. It gives the same answer as method (iii) but involves less work.

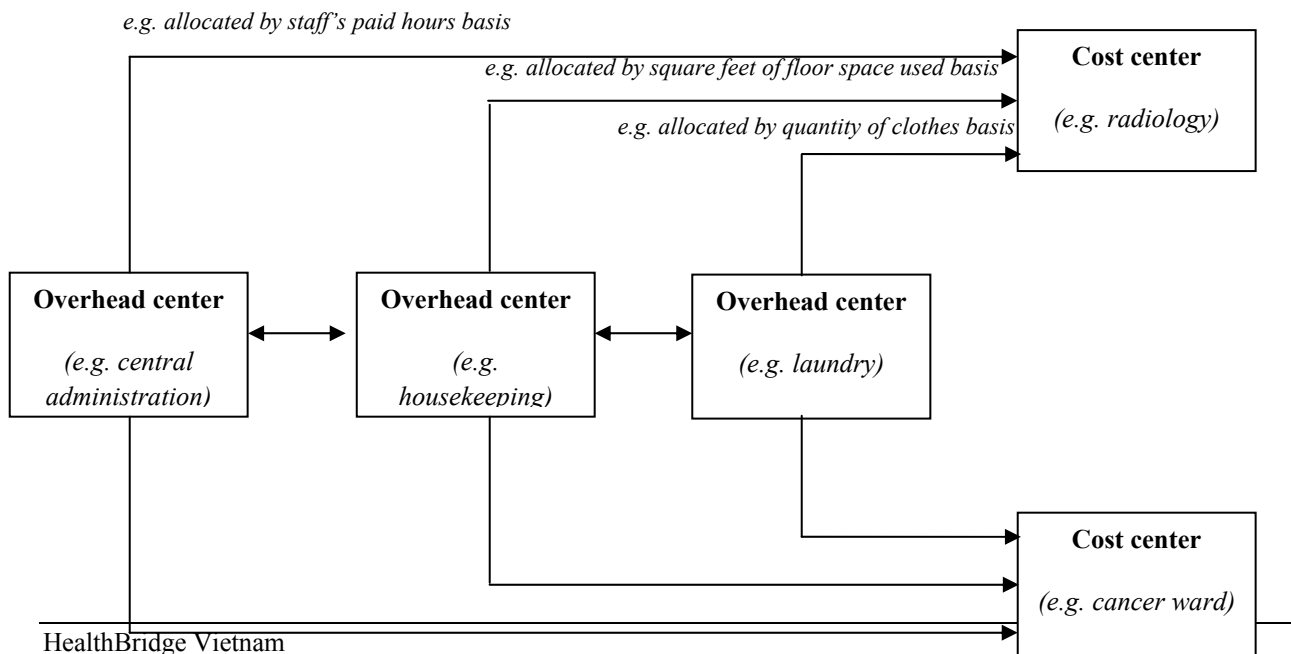


Fig. 4 Schematic illustration of Simultaneous allocation method

A much simpler, but cruder, approach is to do the following.

- i. Identify those hospital costs unambiguously attributable to the treatment or program in question (for example, physicians' fees, laboratory tests, and drugs). (These are known as the directly allocatable costs). Allocate these directly and immediately to the program.
- ii. Deduct, from total hospital operating expense, the cost of departments already allocated above and departments known not to service the program being cost.
- iii. Allocate the remainder of hospital operating expense on the basis number of patient-days, for example,

$$\text{Hospital cost of the program} = \text{Directly allocatable cost} + \frac{\text{Net hospital expendistal}}{\text{Total number of hospital patient-day}} \times \text{Hospital patient-days attributable to the programme}$$

- iv. Finally, undertake a sensitivity analysis

Another classification of overhead costing methods according to Kobelt et al, 2002 show that there are three commonly used allocation methods include a program's or unit's percentage share of the total budget or the total salary budget; per-unit costs of activity or use of space (24). All of these allocation methods may be used in a program in the appropriate context, for example, when allocating administrative costs (such as costs for senior management, accounting, and purchasing), it may be appropriate to use percentage share of the total budget or the total salary budget methods to allocate costs. When allocating shared rent and maintenance costs, a method based on the square footage used by programs is often more appropriate. Following are some additional examples:

- Personnel and consultant costs can be allocated based on employee and consultant time records that clearly identify time spent on specific activities. Employees' and consultants' individual travel and other business expenses can be allocated on the same basis.
- Fringe benefits can be allocated based on the percentage allocation of individual salaries
- Telephone expense are most efficiently documented and allocated by having separate numbers for each department or activity, which allows the organization to request separate bills from the telephone company. Additionally, larger nonprofits may benefit from purchasing a software product that will automatically monitor telephone use by cost center.
- Vehicle use should be allocated based on mileage recorded in a log that identifies the driver, round trip, mileage, purpose and specific.
- Space and facility costs, including utilities and maintenance can be allocated based on square footage or time in use. (25)

There is now a growing literature on activity-based costing for hospitals (Ramsey 1994). This does not refer to a separate allocation methodology, but instead emphasizes the importance of identifying the activities/inputs that drive the final cost of a product. In this method, the costs of overhead departments (for example, administration, housekeeping, or laundry) are allocated to service departments based on the activities/inputs that drive them (for example, paid hours for administration, square footage for housekeeping), instead of using a more generic allocation basis for all overhead departments, such as direct costs.

An example of overhead cost allocation

The following example demonstrates the various methods of handling overhead costs discussed above. Suppose we wish to determine the cost of neonatal intensive care for a specific group of patients. For each patient we have data on the length of stay in the neonatal intensive care unit (NICU) and data on the number and type of laboratory tests performed. For simplicity, let us assume that these were the only services received by the patients – that is, the patients had no operations, no radiological or nuclear medicine investigations, no social work, and so on. Furthermore, let us assume that there are only three

overhead departments that serve the laboratory and the NICU: administration, housekeeping, and laundry. (in principle it would be possible to consider other overhead department, like plant operations and maintenance, bioengineering, and materials management).

The first task is to determine a unit of those departments that directly serve patients. We will determine a cost per unit of output, and multiplying this cost by the usage of each patient to determine the cost per patient. Thus the unit of output must be as homogeneous as possible with respect to cost, and be available in the data for each patient. We have selected a patient-day as the unit of output of the NICU, and a workload measurement unit for the laboratory. Each laboratory test is assigned a pre-determined number of workload measurement units according to the amount of work needed to perform the test.

An allocation basis must be determined for each overhead department. For example, square feet of floor space has been selected for housekeeping. This means that housekeeping cost will be allocated to departments receiving housekeeping services in proportion to the square footage of floor space in the department. Similarly, a paid hour has been selected as the allocation basis for administration costs and pounds of laundry for the laundry cost.

4. Costing in Vietnam context

Taking a series of technical meetings between research team and national and international experts and consultants as well as a small pilot of data collection, we come up with the "possible best" way to do the costing in Vietnam context as following:

Table 2. List of Cost components and source of information for cost calculation

Cost		Resource use	Source of information for estimation of costs	
Category	Sub-category			
Tangible costs	Direct medical cost	Inpatient care <i>(detail will be discussed in the next part)</i>	Medical services	Hospital records (with invoice) from Accounting – General Planning division
		Outpatient care	Medical services	Exist survey (questionnaire for patients or care givers)
	Direct non-medical cost	Personal facilities	Home modification/ special devices/ social services	Exist survey (questionnaire for patients or care givers)

		Travel	Public/ own transportation	Exist survey (questionnaire for patients or care givers)
		Food	Extra food	Exist survey (questionnaire for patients or care givers)
		Accommodation	Hotel/guest house	Exist survey (questionnaire for patients or care givers)
		Time loss while receiving treatment	Time loss of patient (hours or days)	Exist survey (questionnaire for patients or care givers)
		Informal care	Time loss of care givers (hours or days)	Exist survey (questionnaire for patients or care givers)
		Personal care assistance	Paid helpers	Exist survey (questionnaire for patients or care givers)
	Indirect	Morbidity cost	Working time loss (days of illness)	Will not be included in this research due to lack of existing data in Vietnam and inaccuracy
		Mortality cost	Working time loss (work-absence years from death to retired)	Will not be included in this research due to lack of existing data in Vietnam and inaccuracy
Intangible costs	Indirect	Quality of life	Cost for bearing pain and worry of patients and patients' families	Expert's opinion on QALYs Patients & care givers (interview) Will not be included in this research due to lack of existing data in Vietnam and inaccuracy

Almost all cost components which are mentioned in the above list could be calculated based on the information collected from the exits survey. Only one item, which is "inpatient care cost" will be exacted from the hospital records (with invoice) of patients and from different types of accounting books from Accounting – General Planning division. The item "inpatient care cost" consists of a series of detailed cost as listed below:

- Group A - Bed-day cost: for this cost item, we need to collect data on the length of stay and type of bed consumed from the hospital record of each patient then

multiply with the charge (from the approved hospital charge) of each type of bed.

- Group B - Health check, paraclinical tests, other diagnoses (e.g. X-ray): for this cost group, we need to get the information on the actual number of each type of services included in this group from the hospital record of each patient multiplies with correlative charge for each type.
- Group C - Cost for drugs, blood, and other medical materials. In order to calculate this cost group, we also need to extract the data related to what type of drugs, and other medical materials consumed as well as the actual amount of drugs, blood and other medical materials required for each patient to multiply with charges for each type
- Group D – Cost for minor to major surgical operation and other special treatment method for that specific patient group. The calculation of this cost group requires data on the type of operation or other special treatment method, the actual number of each type used from the hospital record of each patient and the charge for each type of operation
- Group E1 – Overhead cost (personnel): this cost item will be calculated based on the total expense for personnel in each hospital (this number could be extracted from the total amount from item number 100 to 108 in the balance sheet of Accounting division or annual report of each hospital), the total number of personnel working for the whole hospital and each department within this hospital, and the length of stay for each disease's patient group and each patient. In other words, the overhead cost for personal allocated for each patient will be calculated by taking the total personnel expenses of this hospital divided by number of staff (including health care staff and administrative staff) then multiplied with the proportion between the actual length of stay for one specific patient and the total length of stay for that disease's patient group.
- Group E2 – Overhead cost (depreciation): it is ideal if we could collect data on depreciation of each asset used for one specific patient or one specific disease's patient group. However, it is impossible in reality due to large variation in type and price of assets or equipment used for each patient and the remaining problem of depreciation cost allocation for other indirect departments in the hospital to each patient. Hence, we choose the "most possible best" way which consists of taking the total amount of depreciation cost for each year (from the item 2141 (visible depreciation) and item 2142 (invisible depreciation) in the

balance sheet of Accounting department) in the hospital divided by the proportion of length of stay of a specific patient to the total length of stay of the whole hospital.

- Group E3 – Overhead cost (office material, electricity, water, telecommunication, etc.): this overhead cost item will be calculated based on the costing method for the above items which is allocated based on the actual length of stay of each patient.

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Appendix II: Guidelines for collecting data (in Vietnamese)

NGHIÊN CỨU “CHI PHÍ ĐIỀU TRỊ CỦA NĂM NHÓM BỆNH LIÊN QUAN ĐẾN HÚT THUỐC LÁ Ở VIỆT NAM”

Mục tiêu nghiên cứu:

1. Đo lường chi phí bệnh viện của năm nhóm bệnh liên quan đến hút thuốc.
2. Mô tả các yếu tố chi phí của năm nhóm bệnh liên quan hút thuốc.
3. Ước tính ảnh hưởng của hút thuốc đến chi phí chăm sóc y tế cho năm bệnh xác định trong nghiên cứu liên quan hút thuốc.

Quá trình thu thập số liệu tại bệnh viện như sau: (Sau khi Cán bộ HBV đã thống nhất với Bệnh viện triển khai nghiên cứu tại BV):

1. Nhóm nghiên cứu bao gồm: Quỳnh Anh, Hà (Đại học Y Tế Công cộng), Thu (HBV) sẽ phụ trách triển khai công việc thu thập số liệu.
2. Điều phối viên thu thập số liệu sẽ liên hệ với đầu môi tại bệnh viện hẹn ngày làm việc. Trong buổi làm việc sẽ trao đổi về chọn đối tượng phỏng vấn và hẹn ngày phỏng vấn. Tại mỗi bệnh viện cần sự phối hợp và hỗ trợ của 4 – 5 cán bộ, nhân viên y tế thuộc 3 phòng: Phòng Y vụ, Phòng Kế hoạch, Phòng Tài chính Kế toán và Y tá hành chính. Mỗi bệnh viện cử 4 – 5 cán bộ này tham gia tập huấn thu thập số liệu theo kế hoạch của nhóm NC.
3. Triển khai tập huấn tại bệnh viện: Chia 2 nhóm, một nhóm tập huấn thu thập số liệu chung do HSPH đảm nhiệm, một nhóm là y tá hành chính (cán bộ của khoa phòng điều trị) tập huấn phỏng vấn bảng hỏi do Thu đảm nhiệm
4. Sau khi tập huấn, cán bộ này phối hợp thành một nhóm thu thập số liệu cho nghiên cứu này tại bệnh viện của mình. Điều phối viên sẽ giữ liên lạc và giám sát thu thập số liệu ở các bệnh viện mình phụ trách.
5. Thời gian thu thập tất cả các loại số liệu: Từ khi triển khai hướng dẫn thu thập số liệu đến tháng 10 năm 2011.
6. Nghiên cứu có một phần nhỏ kinh phí hỗ trợ thu thập số liệu.

Hướng dẫn thu thập số liệu tại bệnh viện:

(1) Phỏng vấn bệnh nhân chuẩn bị ra viện:

- Cán bộ thu thập giai đoạn 2: Y tá hành chính khoa điều trị.

Cán bộ thu thập thông tin sẽ bổ sung các thông tin về chi phí chẩn đoán, điều trị cho bệnh nhân này bằng cách chụp/ phỏng từ ghi tổng hợp các chi phí do xét nghiệm, chẩn đoán và thuốc đã sử

dụng, số tiền phải thanh toán... Lưu ý: mẫu này dùng để thu thập số liệu khi bệnh nhân mắc 5 bệnh trên xuất viện trong thời gian thu thập số liệu tại bệnh viện.

Sử dụng mẫu bảng hỏi để phỏng vấn bệnh nhân khi xuất viện, tìm hiểu các chi phí của cá nhân bệnh nhân, gia đình cho điều trị bệnh của họ. Bộ câu hỏi này do nhân viên bệnh viện điền. Bao gồm các thông tin chi phí của bệnh viện cho bệnh nhân trong đợt điều trị nội trú lần này bao gồm chi cho thuốc, xét nghiệm, X – quang, và phí khác của bệnh viện đối với bệnh nhân, loại hình bảo hiểm, thời gian bị mất, đi lại, mua thuốc, chi phí không chính thức, và các chi phí cho khám ngoại trú trong 3 tháng vừa qua và tự điều trị, chi phí cho các lần điều trị nội trú khác trong 12 tháng vừa qua (nếu có) vv...Hành vi hút thuốc sẽ được tìm hiểu để loại bỏ tác động liên quan đến tần suất và mức độ hút đến chi phí.

(2) Chi phí của bệnh viện

- *Cán bộ thu thập:* Do nhân viên/ phòng ban liên quan của bệnh viện thu thập

+ Phòng Kế hoạch – Tổng hợp

+ Phòng Tài chính - Kế toán

- *Các mẫu này chỉ thu thập số liệu 1 lần đối với mỗi bệnh viện.* Mẫu phiếu đính kèm và xin copy Báo cáo tài chính và bảng cân đối tài khoản.

Công việc cụ thể thu thập số liệu tại bệnh viện:

1. Nhóm làm việc với phòng Kế hoạch-Tổng hợp: (Dùng để tính toán chi phí bệnh nhân nằm viện)

a. Số liệu thống kê của bệnh viện

- Số lượng bệnh nhân của từng loại bệnh (5 nhóm bệnh) trong nghiên cứu
- Số lượng bệnh nhân của 5 nhóm bệnh trong nghiên cứu, phân bổ theo khoa
- Tổng số ngày nằm viện của từng nhóm bệnh (cả bệnh viện và theo khoa)
- Số lượng xét nghiệm cận lâm sàng theo loại xét nghiệm và theo khoa (Mẫu phiếu đính kèm)
- Thời gian cần có để thu thập số liệu (mất bao lâu để thu thập số liệu? khi nào có thông tin?)
- Chi phí nhân công lao động, ước tính phân bổ thời gian cho điều trị nội trú, ngoại trú, cho nhóm bệnh nhân trong nghiên cứu.

2. Nhóm làm việc với cán bộ phòng Kế hoạch – Tổng hợp, Y tá hành chính và TCKT: (Dùng để tính toán chi phí bệnh nhân nằm viện, ngoại trú, tự điều trị)

Lập danh sách các bệnh nhân đã được chẩn đoán và đang điều trị bệnh liên quan trong NC này tại BV của mình, theo dõi và nắm chắc ngày xuất viện của họ. Khi họ vừa làm thủ tục xuất viện xong thì phỏng vấn theo bộ phiếu. Sau đó tra sổ lưu, sổ thuốc điều trị lấy các thông tin về các xét nghiệm, chẩn đoán hình ảnh và thuốc, hoá chất điều trị của chính bệnh nhân này bằng cách chụp/ phô tô tờ tính viện phí gắn kèm vào bộ phiếu đã phỏng vấn. Công việc này do nhân viên phòng Kế hoạch – Tổng hợp, Y tá hành chính và TCKT thực hiện. Các bệnh viện thu thập thông tin của các bệnh nhân vừa được điều trị và xuất viện trong thời gian nghiên cứu.

3. **Nhóm làm việc với cán bộ phòng Tài chính, kế toán:** *(Dùng để tính toán chi phí nằm viện)*

Đưa các mẫu phiếu đề cán bộ bệnh viện điền (trong trường hợp không điền, xin copy Báo cáo tài chính và bảng cân đối tài khoản (nếu được)

Appendix III: Ethical Approval (in Vietnamese)

BỘ Y TẾ
TRƯỜNG ĐẠI HỌC Y TẾ CÔNG CỘNG

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập – Tự do – Hạnh phúc

HỘI ĐỒNG ĐẠO ĐỨC TRONG NCYSH

Số: 040/2010/YTCC-HD3

Hà Nội, ngày 6 tháng 10 năm 2010

V/v: chấp thuận các vấn đề đạo đức NCYSH

CHẤP THUẬN (CHO PHÉP) CỦA HỘI ĐỒNG ĐẠO ĐỨC TRONG NGHIÊN CỨU Y SINH HỌC TRƯỜNG ĐẠI HỌC Y TẾ CÔNG CỘNG

- Căn cứ Quyết định số 692/QĐ-YTCC ngày 15 tháng 11 năm 2007 của Hiệu trưởng Trường Đại học Y tế công cộng về việc thành lập Hội đồng đạo đức trong nghiên cứu y sinh học nhiệm kỳ 2 (Gọi tắt là Hội đồng đạo đức - HDDD) xét duyệt các vấn đề đạo đức trong nghiên cứu y sinh học của các đề tài/ dự án;
- Căn cứ Quyết định số 491/QĐ-YTCC ngày 24 tháng 9 năm 2004 của Hiệu trưởng Trường Đại học Y tế công cộng về việc ban hành Quy chế Tổ chức và hoạt động của Hội đồng đạo đức Trường đại học Y tế công cộng;
- Trên cơ sở xem xét của HDDD ngày 04 tháng 10 năm 2010.

Nay Hội đồng đạo đức **chấp thuận (cho phép)** về các khía cạnh đạo đức trong nghiên cứu đề tài:

- Tên đề tài: **Nghiên cứu chi phí y tế của bốn bệnh liên quan đến hút thuốc ở Việt Nam**
- Mã số: 010-040/DD-YTCC
- Chủ nhiệm đề tài: **Phạm Thị Hoàng Anh**, Quỹ HealthBridge Canada tại Việt Nam
- Đơn vị chủ trì: Quỹ HealthBridge Canada tại Việt Nam
15-16, ngõ 232 Tôn Đức Thắng, Quận Đống Đa, Hà Nội
- Địa điểm triển khai nghiên cứu: Hà Nội và TP. Hồ Chí Minh, Việt Nam
- Thời gian thử nghiệm và thu thập số liệu: Từ 11/2010 đến 4/2011
- Thời gian nghiên cứu: từ 03/2010 đến 06/2011

Ngày chấp thuận (cho phép): Ngày 06 tháng 10 năm 2010

Thời gian cho phép: 06/10/2010 đến 06/10/2011

Lưu ý: HDDD có thể kiểm tra ngẫu nhiên trong thời gian tiến hành nghiên cứu!

KT. CHỦ TỊCH HỘI ĐỒNG
(Ký và ghi rõ họ tên)



Lê Cự Linh

THƯ KÝ HỘI ĐỒNG
(Ký và ghi rõ họ tên)



Lê Thị Kim Ánh

Appendix IV: Data collection tools

1. General hospital data collection tools

Checklists

Research: “Healthcost attributable to smoking in Vietnam ”

General information sheet

Hospital name:

Period: 2010

Contact person in hospital:

Tel: _____

Guideline for inputting data in the forms

Step1: Adjusting data collection forms

Data collectors work with researcher of HealthBridge or staffs from School of Public Health directly to give the most suitable forms for specific characteristic of hospital.

Basically, a General Data collection Information of healthcost (hereafter called GI) includes 5 sections:

Section 1 - Output (GI1): Collect data on the output (number of patients, number of treatment days, number of test, number of image diagnosis ... were carried out)

Section 2- Salary budget (GI2): Collect data on labour cost for all staffs of hospital

Section 3 – Amortization of fix assets (equipments, facility and infrastructure) (GI3): Collect data on all infrastructure and equipments in hospital

Section 4 – Operating cost (GI4): Collect data on general Operating cost of hospital (cost for electricity, living water, hospital management..)

Section 5 – Medical and material consumming (GI5): Collect data on cost of Medical and material consumming of hospital

Data collectors only collect information and put data after receiving the last forms.

Step 2: Data collection***GI1: Collecting data on operating result of hospital***

To complete GI1, need to complete 4 data table and provide the copy of some supplement documents.

- 1 Fill out table 1: Fill in the no. of planned beds, no. of days for inpatient treatment and no. of outpatient health check up for each inpatient department
- 2 Fill out table 2: Fill in the no. of days for inpatient treatment and no. of outpatient health check up for each outpatient department
- 3 Fill out table 3: Fill in the no. of products performed by all paraclinical departments on both inpatient and outpatient treatment
- 4 Fill out table 4: Fill in the no of patients from all the hospitals in the study in 2010
- 5 Provide a copy of Hospital Check Up form in 2010

GI2: Collect data for human resource (salary, bonus, extra salary...)

In order to complete GI2, fill in one data table and provide one copy for supplemental documents

- 1 Fill in the data table: fill in the salary, extra salary, and other fee as well as the estimated % of time providing treatment for inpatient and outpatient for each department in the hospital
- 2 Provide the copy of salary statement for June and December of 2012 of all the hospitals (detailed for each individual or each department)

GI3: Collect data on depreciation expenses for long term assets (equipments, machines, buildings...)

In order to complete GI3, fill in one data table with three parts and provide a copy of supplemental documents

- 1 Fill in the table- Part A: list out all the buildings and constructing complexes in the hospitals along with the quantity, value, year of construction and percentage of depreciation
- 2 Fill in the table- Part B: list out all the transportation vehicles of the hospitals along with the quantity, value, year of purchase and percentage of depreciation
- 3 Fill in the table- Part C: list out all the equipments of each department along with the quantity, value, year of purchase and percentage of depreciation
- 4 Provide a copy of long term assets inventory form of the hospitals for year 2012

GI4: Collect data from the Finance and Accounting Office for all the general administrative costs of the hospital

In order to complete GI4, fill in one data table and provide a copy of supplemental documents

- 1 Fill in the table: List out all the items/sub items spent and total amount spent for the whole hospital
- 2 Provide a copy of financial statement of the hospital in 2010

GI5: Collect data on expenses for medication and consumables for the hospital

In order to complete GI5, fill in one data table

- 1 Fill in the table: fill in the amount spent on medication and consumables for the hospital in 2010

Step 3: Double check all the data

Use the following check list to decide if all the tasks are completed or not:

- 1 Already filled in all paper or electronic data table
- 2 Already obtained the copies of all Checking Tables for Hospital in 2010
- 3 Already obtained the copies of expenses on human resources for January and December of 2012 of the hospital (detail for each individual or each department)
- 4 Already obtained the inventory statement for long-term assets of the hospital in 2010 (detail for each department)
- 5 Already obtained the balance sheet for hospital in 2010
- 6 Already obtained the financial report of the hospital in 2010
- 7 Already obtained income statement of the hospital in 2010 (or only for administration in 2010)

Completed	Not yet completed

Upon completion of all the content in the check list, please send the forms to HealthBridge either via email for mail/express mail service.

The staff at Hanoi School of Public Health will check the data and will request for clarification if needed.

If you have any questions, please contact our staff from School of Public Health who is in charge of your hospital:

Full name:.....

Email:.....

Tel: 04.62662336

Mobile:.....

Research: “Healthcost attributable to smoking in Vietnam ”

Form 1 (GI1): Product Outcomes

Purpose: To quantify the product outcomes (no. of hospitalization day/no. of inpatient care/no of outpatient come for health check up/....) at all the departments in the hospital in 2010

Name of hospital: _____

Period: 2010

Source of information: Planning Department

Name of staff collecting the information: _____

Contact telephone: _____

If you have any questions, please contact our research staff: _____

TABLE 1

How to fill: not the number of planned beds in column (4); no. of actual beds in column (5), and inpatient service in column (7)

No .	Department with expenses	Amount of service provided						
		Instruction to fill out the column (4)	Planned number of beds in 2010	Actual number of beds in 2010	Instruction to fill out the column (7)	No of inpatient patients	Instruction to fill out the column (7)	No of days for inpatient care in 2010
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(6)	(7)
A	Paraclinical Departments							
1	Surgical department	Note the no. of planned beds			Note the no. of patients receiving inpatient treatment at the department in 2010		Note the no. of patients receiving inpatient treatment at the department in 2010	
	Special operation	No need to fill out column D	X	X	No. of special operations		No. of special operations	

	Operation type 1	No need to fill out column D	X	X	No. of operations type 1		No. of operations type 1	
	Operation type 2	No need to fill out column D	X	X	No. of operations type 2		No. of operations type 2	
	Operation type 3	No need to fill out column D	X	X	No. of operations type 3		No. of operations type 3	
2	Intensive care unit	Note the no. of planned beds			Note the no. of patients receiving inpatient treatment at the department in 2010		Note the no. of days for inpatient treatment at the department in 2010	
3	Paediatric department	Note the no. of planned beds			Note the no. of patients receiving inpatient treatment at the department in 2010		Note the no. of days for inpatient treatment at the department in 2010	
4	Ob-gyn department	Note the no. of planned beds			Note the no. of patients receiving inpatient treatment at the department in 2010		Note the no. of days for inpatient treatment at the department in 2010	
5	Internal medicine-traditional medicine department	Note the no. of planned beds			Note the no. of patients receiving inpatient treatment at the department in 2010		Note the no. of days for inpatient treatment at the department in 2010	
	Total	Total no of planned beds in 2010			Note the total no. of patients receiving inpatient treatment at the hospital in 2010		Note the total no. of days for inpatient treatment at the hospital in 2010	

TABLE 2

How to fill out: Change column (2) to match with all the outpatient clinic of the hospital. Fill in the no. of planned beds in column (4) and the no. of outpatient health check up in column (7)

No	Department with expense	Amount of services provided				
		Instruction to fill out column (4)		No. of outpatient records	Instruction to fill out column (7)	No. of check ups
(1)	(2)	(3)	(4)	(5)	(6)	(7)
B	No. of outpatient departments (if available)					
1	Check-up department	Note the no. of planned beds			Total no. of health check up/outpatient care in 2010	

TABLE 3

How to fill in: Modify column (2) to match with paraclinical activities that are already collected from the hospital data (in the report of activity in 2010). Fill in the number of paraclinical activities for inpatient patients in column (4). Fill in the number of paraclinical activities for outpatient patients in column (6).

No	Departments with expenses	Intruction to fill out column (4)	In patient products in 2010	Instruction to fill out column (8)	Outpatient products in 2010
(1)	(2)	(3)	(4)	(5)	(6)
C	All the paraclinical departments				
1	Testing-Imaging department	Total no of tests/images of all hospitals		Total no of tests/impages for outpatient	
	(If available, list the specific types in the following rows)				

2	GI coloscopy department	Total no of tests/images of all hospitals		Total no of tests/impages for outpatient	
3	Ear-nose-throat coloscopy department	Total no of tests/images of all hospitals		Total no of tests/impages for outpatient	
	Total	Total no of paraclinical products for the hospitals		Total no of paraclinical products for outpatient	

TABLE 3

How to fill in. Total up the number of inpatients in 2010 according to each disease category in column B (use the report data of the hospital in 2010 or from the paper medical records or electronic medical records of the hospital). Detail for each ICD code. In case there is not data available, not the number of patients according to each disease category

No	List the no. of inpatients with confirmation of having the following diseases	No of inpatients treated in 2010	No of inpatients treated in Jan + Feb + Mar in 2011
(1)	(2)	(3)	(4)
1	Lung cancers: <u>C33-C34</u>	-	
	Malignant neoplasm of trachea C33		
	Malignant neoplasm of bonchus and lung C34		
2	Cancers of upper aero digestive tract: <u>C00-C15; C30-C32</u>	-	
	Malignant neoplasm of lip C00		
	Malignant neoplasm of other and unpecified part of tongue C01-02		
	Malignant neoplasm of gum, floor of mouth, palate, unspecified part of mouth C03-C06		
	Malignant neoplasm of tonsil C09		
	Malignant neoplasm oforopharynx C10		

	Malignant neoplasm of neopharynx	C11		
	Malignant neoplasm of sinus, hyropharynx, and other in lip, oral cavity, pharynx	C12-C14		
	Malignant neoplasm of oesophagus	C15		
	Malignant neoplasm of nose, nasal	C30.0		
	Malignant neoplasm of accessory sinus	C31		
	Malignant neoplasm of larynx	C32		
3	COPD:	J40-J44		
	Simple and mucopurulent chronic bronchitis	J41		
	Unspecified chronic bronchitis	J42		
	Emphysema	J43		
	Other chronic obstructive pulmonary disease	J44		
	Bronchiectasis with (acute) exacerbation	J47		
4	Ischemic heart disease:	I20-I24; I24-I25		
	Angina pectoris	I20		
	Acute myocardial infarction	I21		
	Subsequent myocardial infarction	I22		
	Other acute ischemic heart disease	I24		
	Chronic ischemic heart disease	I25		
5	Stroke:	I60-I64; I67, I69		
	Total no of inpatients treated for all disease types			

Research: "Healthcost attributable to smoking in Vietnam "**Form (GI2): Salary**

Purpose: Quantify the total expenses for human resources in 2010 at all the departments treating patients in the study, and to quantify the expenses for human resources treating inpatient and outpatient patients

Name of hospital:

Year of recording: Year 2010

Source of information: Department _____

Name of staff collecting information: _____ **Contacting telephone:** _____

Note if the expenses is not charged by the accounting department of the hospital.

How to fill in: Column B, change to match with the names of clinical, paraclinical, administrative and other departments in the hospital

If the staff work at more than one department (for example hospital director can manage and perform surgery)

Estimate the time working in clinics and admin to divide up the salary and other fees

Column C note salary information for contracted staff

Column D, if available, note the information of extra salary paid by donors to participating staff in project against TB or other projects

Column E : note the total basic salary by department

Column F-L, note total extra salary. If can not separate this part note in column L (does not include per-diem)

Column M-0 note down the total amount that the employees have to pay, do not note the amount taken away from the salary

Column P-V note the total of amount paid that is not already calculated in other columns. If there is non, leave blank to avoid duplication

Column W total of column C to V

Column X. if 100% staff only serve outpatient care, note 100%

If the staff spends time on outpatient health check up note the code for each staff and calculate their time for inpatient and outpatient care to obtain the percentage of their working time dedicating for each department providing inpatient treatment.

Code	Department name	Contracted salary (for contracted staff)	Extra salary paid by the donors	Total basic salary	Bonus according to salary rate	Expense paid by employee	Other expense	Collective welfare	Total expense for human resource in 2010	Percentage of time dedicated for inpatient care (%)
A.	Clinical departments									
1	Surgical dept.									
2	Intensive care unit									
3	Paediatric dept.									
4	Ob-gyn dept.									
5	Internal medicine-traditional medicine dept.									
B.	Outpatient health check up department									
1	Check up department									
C.	Paraclinical departments									
1	Testing-imaging department									
2	GI colonoscopy department									

3	Ear-nose-throat colonoscopy department								
D	Administrative department and other departments								
1	Pharmacy- medical equipments								
2	Planning department								
3	Administration								
TOTAL									

Research: “Healthcost attributable to smoking in Vietnam ”

Form 3 (GI3): Depreciation of long-term assets

Purpose: Quantify the amount of depreciation according to each paraclinical, clinical department and for the whole hospital

Name of hospital: _____

Time of record: year 2010

Source of information: Department _____

Name of staff collecting the information: _____

Contact telephone: _____

How to fill out: Column D the lines in blue contain the name of departments fixed to match with the hospital. If there is a difference, please change họ
For each department, list out each asset, actual value, year of purchase, percentage of depreciation according to the requirement of the Ministry of Finance.
The lines that already been filled out are examples. Please delete the information and note the data from your hospital.

If run out of lines, add more lines to the table. If not sure of depreciation percentage then leave it blank

If there is information on depreciation percentage collected for each department already obtained, note that. Clarify the percentage of depreciation

	Assets by department	Actual value	Year of purchase (for building, construction complexes it can be the year of renovation)	Quantity	Percentage of depreciation (%) – According to the requirement of the Ministry of Finance	Yearly depreciation
A	<u>Buildings and construction complexes</u>					
1						-
2						-
3						-
4						-
5						-
B	Transportation vehicles					0
1						-
2						-
3						-
4						-
5						-
C	Long-term assets					0

	Long-term asset at Paraclinical department					-
1						-
2						-
3						-
4						-
	Outpatient health check up department					-
1						-
2						-
3						-
4						-
	Administrative department and other departments					-
						-

RESEARCH: “Healthcost attributable to smoking in Vietnam”**Form No.4 (GI4): Operating cost****Objective: Identify general operating cost of hospital****Name of hospital:** _____**Period: 2010****Source of information: Department** _____ **(financial statement of 2010)****Name of person collecting the information:** _____ **Phone number:** _____**How to fill in: Change the budget line in column C if it is different from the subsection in the list. Filling the information for total cost of hospital.**

Section/ subsection budget	Detail of expenses	Total subsection budget	Total budget
6500	Payment for public services		
6501	Electricity		
6502	Water		
6503	Fuel (gas, oil v.v.)		
6504	Sanitation		
6550	Office Supplies		
6551	Stationery		
6552	Office equipments		
6599	Other office supplies		
6600	Information, Communication		
6601	Local telephone		
6602	International telephone		
6603	Postage		
6604	Fax		
6606	Communication		
6612	Books, magazines		
6649	Others		
6650	Conference		
6651	Buying and printing documents		
6652	Allowance for lecturers, reporters		
6653	Travelling cost		
6654	Room rental		
6655	Venue rental, transportation		
6699	Others		
6700	Per diem		
6701	Travelling		
6702	Allowance		
6703	Room rental		
6749	Others		
6750	Hiring cost		
6752	House rental		
6754	Equipment rental		

6756	Hiring local experts and lecturers		
6757	Hiring local labor		
6758	Training staff		
6799	Other renting costs		
6800	Meetings for the visitor to the hospital		
6850	Meetings others		
6900	Regular maintaining and repairing of fix assets		
6902	Cars, trucks		
6903	Specialized vehicle		
6904	Ship, boat		
6917	Maintaining and improving computer software		
6905	Specialized technical equipments		
6914	Computers, photocopy and fax machine		
6906	Air conditioner		
6907	Housing		
6908	Fire-protection equipments		
6949	Other fix assets and infrastructure facilities		
7000	Technical expenses		
7001	(excluding medicines and medical supplies for patients)		
7002	Specialized technical equipments (not fix assets)		
7003	Printing cost		
7004	Uniforms, clothing		
7005	Labor protection		
7012	Payment for external contracts (scientific research)		
7049	Other		
9000	Buying intangible assets		
9001	Buying patent		
	<i>(excluding assets listed in the Depreciation of fix assets)</i>		
9003	Buying computer software		
9049	Others		
9050	Buying assets for technical works		
	<i>(excluding assets listed in the Depreciation of fix assets)</i>		
7750	Other expenses		
7757	Expense for Property insurance		
7758	Other supporting costs		
7799	Others		

RESEARCH: “Healthcost attributable to smoking in Vietnam”**Form No.5 (GI5): Cost of medicines and medical supplies**

Objective: Identify the cost of medicines and medical supplies consumed in the hospital

Name of hospital:

Hospital

Period: 2010

Source of information: Department

Name of person collecting the information: _____

Phone number: _____

Unit of currency: dong

	Inpatient	Outpatient	Total
Cost of medicines (spent in technical works) in 2010			-
Cost of medical supplies (spent in technical works) in 2010			-
Total	-	-	-

Note: Based on the information in accounting reports

2. Inpatient Questionnaire

Appendix 1: Research tools

APPENDIX 5.1: PATIENT'S QUESTIONNAIRE (first version) (for patients with one disease eligible study before hospital discharge)

General guidelines:

You should read from the left to the right, from top to bottom. Read the words in normal font which are the questions for patient and **the words in bold** are the instructions to help the patient to concentrate better on the next questions.

The italic words are the instructions for interviewer, don't read out for patientt.

With each answer, please mark (X) into the blank square in the right column next to the answer or specify the quantity or note in the blank space when seeing the symbol of a writing hand (☞.....)

For the multiple choices that have the note in the right with arrow symbol (➔), please skip the next question and move to the question specified in the note column.

For example, with the question 19 below, if the patient have never smoked, after marking (X) into the square ☒ Never smoke, skip the next questions and move to question 28.

PART 1: ADMINISTRATIVE INFORMATION

Mark into the next box, if you already attached the hospital financial record

1. **Hospital/District health center:**
2. **Department:**.....
3. **Interviewer's name:**.....

Information obtained from the patient's medical record/discharge form to fill out questions 4 to 11

4. **Medical record number of the patient (don't fill the patient's name) :**.....

5. **Gender:** Male Female.

6. **Date of birth:**.....month.....year (solar calendar).....**Age:**.....

7. **Duration of hospitalization**

From date:..... to date.....

8. **Treatment activities received from the hospital**

8.1. The patient received treatment:

Stay overnight in the hospital/Overnight inpatient

Do not stay overnight in the hospital/ Day time inpatient

8.2. Number of times the patient receive outpatient check-up at "khoa kham benh":
times

- 8.3. List out all the departments that the patient has received treatment from and the number of respective treatment days at each department

Name of department 1:.....	Number of days for inpatient treatment:.....
Name of department 2:.....	Number of days for inpatient treatment:.....
Name of department 3:.....	Number of days for inpatient treatment:.....
Name of department 4:.....	Number of days for inpatient treatment:.....
Name of department 5:.....	Number of days for inpatient treatment:.....
Name of department 6:.....	Number of days for inpatient treatment:.....

- 8.4. List out all the paraclinical activities that the patient has taken part in at the paraclinical departments

8.4.1	Imaging Diagnostic Department	No.of images that patient obtained
8.4.2	Functional Diagnostic Department	No. Of services that patient received
8.4.3	Haematology Department	No. Of tests that patient received
8.4.4	Biomedical Department	No. Of tests that patient received
8.4.5	Microbial Department	No. Of tests that patient received
8.4.6	Pathology Department	No. Of tests that patient received
8.4.7	Other paraclinical department (state clearly)	Number of services that patient received
8.4.8	Other paraclinical department (state clearly)	Number of services that patient received
8.4.9	Other paraclinical department (state clearly)	Number of services that patient received
8.4.10	Other paraclinical department (state clearly)	Number of services that patient received

8.5 Expenses spent for the recent inpatient service. *(Do not fill this questionnaire out if a copy of medical financial report for inpatient service is available)*

No	Detail	Total amount spent <i>(include the amount paid by insurance and from patient's out of pocket)</i>
8.5.1	Expense for medication, blood, saline <i>(list out in detail for each category if possible)</i>	.....VND
	Medication	.....VND
	Blood	.....VND
	Saline	.....VND
8.5.2	Expense for hospital bed daily	.....VND
8.5.3	Expenses for medical tests (Please specify)	.....VND
	Haematology	.....VND
	Biomedical	.....VND
	Microbial	.....VND
	Pathology	.....VND
8.5.4	Expenses for medical imaging	.....VND
8.5.5	Expenses for functional diagnostic	.....VND
8.5.6	Expenses for major operation/ minor operation procedures (Please specify)	.....VND
	Major operation	.....VND
	Minor operation	.....VND
8.5.7	Consumables	.....VND
8.5.8	Other expenses Please specify....	.....VND
8.5.9	Total expenses	.....VND
8.5.10	Total amount paid by insurance	.....VND
8.5.11	Total amount co-paid by patient with insurance	.....VND
8.5.12	Total amount paid for services as requested	.....VND

8.5. Payment method once being discharged from the hospital *(mark the appropriate option, and you can choose multiple options)*

- Paid by insurance company (Please specify the % paid... %)
- Paid by patients/pay for services as requested
- Free

Other (please specify...)

9. Diagnosed disease when discharge (tick on the box)	ICDX code	Note
Lung cancers:		
• Malignant neoplasm of trachea	<input type="checkbox"/> C33	
• Malignant neoplasm of bronchus and lung	<input type="checkbox"/> C34	
Cancers of upper aero digestive tract:		
• Malignant neoplasm of lip	<input type="checkbox"/> C00	
• Malignant neoplasm of other and unspecified part of tongue	<input type="checkbox"/> C01-02	
• Malignant neoplasm of gum, floor of mouth, palate, unspecified part of mouth	<input type="checkbox"/> C03->06	
• Malignant neoplasm of parotid gland, salivary glands	<input type="checkbox"/> C07-08	
• Malignant neoplasm of tonsil	<input type="checkbox"/> C09	
• Malignant neoplasm of oropharynx	<input type="checkbox"/> C10	
• Malignant neoplasm of neopharynx	<input type="checkbox"/> C11	
• Malignant neoplasm of sinus, hypopharynx, and other in lip, oral cavity, pharynx	<input type="checkbox"/> C12->14	
• Malignant neoplasm of oesophagus	<input type="checkbox"/> C15	
• Malignant neoplasm of nose, nasal	<input type="checkbox"/> C30.0	
• Malignant neoplasm of accessory sinus	<input type="checkbox"/> C31	
• Malignant neoplasm of larynx	<input type="checkbox"/> C32	
9.3. COPD:		
• Bronchitis, not specified as acute or chronic	<input type="checkbox"/> J40	
• Simple and mucopurulent chronic bronchitis	<input type="checkbox"/> J41	
• Unspecified chronic bronchitis	<input type="checkbox"/> J42	
• Emphysema	<input type="checkbox"/> J43	
• Other chronic obstructive pulmonary disease	<input type="checkbox"/> J44	
9.4. Ischemic heart disease		
• Angina pectoris	<input type="checkbox"/> I20	
• Acute myocardial infarction	<input type="checkbox"/> I21	
• Subsequent myocardial infarction	<input type="checkbox"/> I22	
• Other acute ischemic heart disease	<input type="checkbox"/> I24	

• Chronic ischemic heart disease	<input type="checkbox"/> I25	
9.5. Stroke		
• Subarachnoid Haemorrhage	<input type="checkbox"/> I60	
• Intracerebral Haemorrhage	<input type="checkbox"/> I61	
• Other nontraumatic intracranial Haemorrhage	<input type="checkbox"/> I62	
• Cerebral infarction	<input type="checkbox"/> I63	
• Stroke, not specified as Haemorrhage or infarction	<input type="checkbox"/> I64	
• Other cerebrovascular diseases	<input type="checkbox"/> I67	
• Sequelae of cerebrovascular disease	<input type="checkbox"/> I69	

10. Duration of sickness:

11. Other diseases (please specify):.....

PART 2: PATIENT'S INFORMATION

No. (1)	Question (2)	Answer (3)	Note (4)
12	Can you state your highest level of education?	<input type="checkbox"/> Illiterate <input type="checkbox"/> Not graduate primary <input type="checkbox"/> Primary graduate <input type="checkbox"/> Secondary graduate <input type="checkbox"/> High school graduate <input type="checkbox"/> Vocational degree, qualification (< and =2 years) <input type="checkbox"/> Vocational high school, technical secondary school, college <input type="checkbox"/> Bachelor <input type="checkbox"/> Upper graduate (master/doctor) <input type="checkbox"/> Don't know	
13	Can you state or main occupation (in the last 12 months)	<input type="checkbox"/> Manager <input type="checkbox"/> Officer with background from college	

		<input type="checkbox"/> General officer <input type="checkbox"/> Personal service provider, security officer, saler <input type="checkbox"/> Agriculture (farming, breeding, agricultural services, hunting) <input type="checkbox"/> Forestry <input type="checkbox"/> Aquiculture/ Pisciculture <input type="checkbox"/> Mineral mining <input type="checkbox"/> Craftsman <input type="checkbox"/> Construction <input type="checkbox"/> Industry/Processing/handicraft <input type="checkbox"/> Fitter and operator (car driver) <input type="checkbox"/> Unskilled worker (people providing service in the streets, launder, unskilled workers in other industries) <input type="checkbox"/> Don't know <input type="checkbox"/> Other.....	
14	Types of effective insurance	<input type="checkbox"/> Mandatory health insurance <input type="checkbox"/> Social insurance <input type="checkbox"/> Other voluntary insurance (Bao Viet or other companies): specify the name ☞..... and the fee per year..... <input type="checkbox"/> Don't engage in any forms of insurance	
15	How many people are there in your family? (Only people who live and eat together during the past three months):	..... people	
16	What is the average expenditure of your family per	..... 000 VND/month	

	month? <i>(food, clothing, education, health...)</i>		
17	What is the average income of your family per month? (including the above people)	_____. 000 VND/month	
18	Compared to other household, how do you rate your standard of living in these categories?	<input type="checkbox"/> Most wealthy <input type="checkbox"/> Above average <input type="checkbox"/> Average <input type="checkbox"/> Under average <input type="checkbox"/> Poorest	

Now we would like to ask about your smoking situation

With each answer in column 3, please mark (X) into the blank square or specify the quantity or note into the blank space with the hand holding pen symbol (☞.....)

No (1)	Question (2)	Answer (3)	Notes (4)
19	Do you smoke?	<input type="checkbox"/> Never smoke	☞ skip to question 28
		<input type="checkbox"/> used to smoke, already give up	☞ skip to question 24
		<input type="checkbox"/> Smoke irregularly	
		<input type="checkbox"/> Smoke regularly	
	<u>For regular and irregular smokers</u>		
20	Type of cigarettes you are using	<input type="checkbox"/> Cigarettes <input type="checkbox"/> Water pipe <input type="checkbox"/> Smokeless tobacco (chew tobacco with betel leaves)	
21	How long have you smoked? <i>☞ If you have smoked for less than 1 year, please specify the number of months</i>	☞..... years ☞..... months	
22	On average, how many cigarettes do you smoke per day? <i>☞ Please specify the quantity</i>	☞.....cigarettes/day ☞.....cigarettes/week(<i>for irregular smokers</i>) water pipe usage/day	

No (1)	Question (2)	Answer (3)	Notes (4)
		<p>..... water pipe usage/week (for irregular smokers)</p> <p>..... chewing tobacco/day</p> <p>.....chewing tobacco/week (for irregular smokers)</p>	
23	Brand name of cigarette	☒.....	
For ex-smokers:			
24	How long have you quit smoking?	<p>☒.....years</p> <p>☒.....months (if less than 1 year)</p>	
25	How long had you smoked? ☒ If you smoked for less than 1 year, please specify the number of months	<p>☒..... years</p> <p>☒..... months</p>	
26	Type of tobacco you used	<p><input type="checkbox"/> Cigarettes</p> <p><input type="checkbox"/> Water pipe</p> <p><input type="checkbox"/> Smokeless tobacco (chew tobacco with betel leaves)</p>	
27	On average, how many cigarettes did you smoke per day? ☒ Please specify the quantity	<p>☒.....cigarettes/day</p> <p>☒.....cigarettes/week (for irregular smokers)</p> <p>..... water pipe usage/day</p> <p>..... water pipe usage/week (for irregular smokers)</p> <p>..... chewing tobacco/day</p> <p>.....chewing tobacco/week (for irregular smokers)</p>	

Now I would like to ask you about the costs related to your current hospitalization. Please name all your spendings, including your relatives' ones during hospitalization time.

Please suggest and write down each spending into column 2

28	Average meal cost per day of patient	⊗.....VND/day	
29	Average meal cost per day of family's member	⊗.....VND/day	
30	Transportation cost of the patient	⊗.....VND <input type="checkbox"/> Use private vehicle	Move to question 34 if the patient could provide the estimation
31	If you use private vehicle, which one do you use?	<input type="checkbox"/> Bicycle <input type="checkbox"/> Motorbike <input type="checkbox"/> Other ⊗.....	
32	How far is it from the patient's house to the hospital?	⊗.....km	
33	Total number of transportation during the treatment period	..... time	
34	Transportation cost for caretakers, family members	.....VND <input type="checkbox"/> Use private vehicle	
35	If you use your private vehicle, what is your mode of transportation	<input type="checkbox"/> Bicycle <input type="checkbox"/> Motorbike <input type="checkbox"/> Other ⊗.....	
36	Daily traveling distance for caretakers, family memners	.....km	
37	Total numer of visting times during the treatment	.....time	
38	Is there any other cost you and your family have to spend? <i>(Suggestion: fee for caretaker, tests outside of the hospital, blood, voluntary treatment fee...)</i>	And how much?	
	⊗.....	⊗.....VND	
	⊗.....	⊗.....VND	
	⊗.....	⊗.....VND	

	✂.....	✂.....VND	
39	Beside the medicine provided during the hospitalization, do you have to buy further medicine?	<input type="checkbox"/> No	➔ Skip to question 39
		<input type="checkbox"/> Yes	
40	Total amount spent on extra medication apart from that provided by the hospital <i>(Note the name of medication and its cost....)</i>	..... VND	
	✂.....	✂.....VND	
	✂.....	✂.....VND	
	✂.....	✂.....VND	
	✂.....	✂.....VND	
	✂.....	✂.....VND	
	✂.....	✂.....VND	
41	After hospitalization, how much will you have to spend for transportation?	✂..... VND	
42	In order to cover for this hospitalization, how much money have your family prepared?	✂..... VND	
43	In which, how much is your available amount of money? (not the money from borrowing, selling things)	✂..... VND	
Now I would like to ask you about the costs that your family spent before this hospitalization.			
44	In this time of treatment, before hospitalization, have you and your family taken medical examination and treatment at any other hospital?	<input type="checkbox"/> No <input type="checkbox"/> Yes	➔ skip to question 48
45	Total costs for medical examination and treatment right before hospitalization	✂..... VND	
	<i>In which:</i>	<i>Please ask in detail and check again to make sure the total money from question 45.1 to 45.5 is equal to the total money in question 45</i>	

45.1	Costs for tests before hospitalization	⊗.....VND	
45.2	Costs for medicine and medical equipments before hospitalization	⊗.....VND	
45.3	Transportation costs before hospitalization <i>(Please ask again whether this amount of money is included in the above section)</i>	⊗.....VND	
45.4	Accommodation and meal costs before hospitalization	⊗.....VND	
45.5	Other expenses spent before hospitalization	⊗.....VND	
46	Number of days off taken by the patient to take medial examination and treatment before hospitalization	⊗.....days	
47	Number of days off taken by family's members in order to take care of the patient before hospitalization	⊗.....days	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>
I would like to ask about EXAMINATION AND TREATMENT COSTS related to this disease during the past 12 months			
48	During the past 12 months, how many times have you been hospitalization for this disease?	<input type="checkbox"/> This is the first time during the past year <input type="checkbox"/> ⊗.....times	→ skip to question 59 → Ask the detailed costs for each treatment
49	The duration of each hospitalization <i>(The first time is the most recent one, right before this hospitalization)</i>	First time: from...to... Second time: from...to... Third time: from...to... Forth time: from...to...	
Please specify your detailed costs for each time being in-patient during the past year			

50	Total costs for medical examination and treatment of the first hospitalization	⊗.....VND	
	<i>In which:</i>	<i>Please ask in detail and check again to make sure the total money from question 50.1 to 50.6 is equal to total money in question 50</i>	
50.1	Cost for health check up and hospital fee for this hospitalization	⊗.....VND	
50.2	Costs for tests before and during hospitalization	⊗.....VND	
50.3	Costs for medicine and medical materials	⊗.....VND	
50.4	Transportation costs (for both patient and family's members)	⊗.....VND	
50.5	Accommodation and meal costs of family's members	⊗.....VND	
50.6	Other expenses	⊗.....VND	
51	Number of days off taken by the patient to take medical examination and treatment	⊗.....days	
52	The number of days off taken by family's members in order to take care of the patient.	⊗.....days	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>
53	Total costs for medical examination and treatment of the second hospitalization	⊗.....VND	
	<i>In which:</i>	<i>Please ask in detail and check again to make sure the total money from question 53.1 to 53.6 is equal to total money in question 53</i>	
53.1	Cost for health check up and hospital fee for this hospitalization	⊗.....VND	
53.2	Costs for tests before and during hospitalization	⊗.....VND	

53.3	Costs for medicine and medical materials	⊗.....VND	
53.4	Transportation costs (both of the patient and family's member)	⊗.....VND	
53.5	Accommodation and meal cost for family's member	⊗.....VND	
53.6	Other expenses	⊗.....VND	
54	Number of days off taken by the patient to take medical examination and treatment before hospitalization	⊗.....VND	
55	The number of days off taken by family's members in order to take care of the patient.	⊗.....VND	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>
56	Total cost for medical examination and treatment for the third hospitalization	⊗.....VND	
	In which:	<i>Please ask in detail and check again to make sure the total money from question 56.1 to 56.6 is equal to total money in question 56</i>	
56.1	Cost for health check up and hospital fee for this hospitalization	⊗.....VND	
56.2	Cost for tests before and during hospitalization	⊗.....VND	
56.3	Cost for medicine and medical materials	⊗.....VND	
56.4	Transportation costs (both of patient and family members)	⊗.....VND	
56.5	Accommodation and meal costs for family's members	⊗.....VND	
56.6	Others	⊗.....VND	
57	Number of days off taken by the patient to take medical examination and treatment	⊗.....VND	

	before hospitalization		
58	The number of days off taken by family's members in order to take care of the patient.	⊗.....VND	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>
	Please tell us in detail about other medical service which were not hospitalization during the past three months for this disease.		
59	During the past three months, beside the hospitalization, do you have to use any other medical service? (inviting medical workers to the house or coming to any drug store/ medical institution without being hospitalized)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't remember	→ End the interview → End the interview
60	The duration of each hospitalization <i>(The first time is the most recent one, right before this hospitalization)</i>	First time: from...to... Second time: from...to... Third time: from...to... Forth time: from...to...	
	Please specify about the most recent time of using medical service but not inpatient, related to this disease		
61	Which medical services below did you use?	<input type="checkbox"/> Examination and treatment at home <input type="checkbox"/> Out-patient examination and treatment <input type="checkbox"/> Buying medicine <input type="checkbox"/> Tests (blood, urine, ...) <input type="checkbox"/> Radiography <input type="checkbox"/> Other	
	Please specify the total money spent for this treatment:		
62	Total expense for this treatment	⊗.....VND	
	In which	<i>Please ask in detail and check again to make sure the total money from question 62.1 to 62.7 is equal to total money in question 62</i>	

62.1	Examination cost	⌘.....VND	
62.2	Test cost	⌘.....VND	
62.3	Radiography, ultrasonography, graphical diagnosis		
62.4	Costs for medicine and medical materials	⌘.....VND	
62.5	Transportation cost	⌘.....VND	
62.6	Accommodation and meal cost	⌘.....VND	
62.7	Other expenses (gifts...)	⌘.....VND	
63	Number of days off taken by the patient to take medical examination and treatment before hospitalization	⌘.....VND	
64	Number of days off taken by family's members in order to take care of the patient.	⌘.....VND	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>
Please specify about the second time of using medical service			
65	Which medical services below did you use?	<input type="checkbox"/> Examination and treatment at home <input type="checkbox"/> Out-patient examination and treatment <input type="checkbox"/> Buying medicine <input type="checkbox"/> Tests (blood, urine, ...) <input type="checkbox"/> Radiography <input type="checkbox"/> Other	
66	Total expense for this treatment	⌘.....VND	
	In which	<i>Please ask in detail and check again to make sure the total money from question 66.1 to 66.7 is equal to total money in question 66</i>	
66.1	Examination cost	⌘.....VND	
66.2	Cost for tests	⌘.....VND	
66.3	Radiography, ultrasonography,		

	graphical diagnosis		
66.4	Cost for medicine and medical materials	⊗.....VND	
66.5	Transportation cost	⊗.....VND	
66.6	Accommodation and meal cost	⊗.....VND	
66.7	Other expenses (presents...)	⊗.....VND	
67	Number of days off taken by the patient to take medial examination and treatment	⊗.....VND	
68	Number of days off taken by family's members in order to take care of the patient.	⊗.....VND	<i>If there are more than one person take the days off, please help the patient to calculate the total number of days off of all family's members.</i>

Add more pages if the patient has more than 3 courses of inpatient medical examination and treatment and 2 courses for outpatient and self-treatment

Thank you for your cooperation!

Note for interviewer:

After interviewing the patient discharged from hospital, please photo and attach the hospital expense report here.

Thanks you for your time!