博士論文

Out-of-pocket health payments and coping strategies in urban Nepal

（ネパール都市部における医療費自己負担と対処戦略に
関する研究）

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研究

Abstract

Objective: Disease-specific public subsidies are increasingly being introduced in low-income countries to prevent healthcare payment-related financial catastrophe. Assessing the incidence and intensity of catastrophic out-of-pocket spending by disease type may reveal how far existing public subsidies that target specific diseases are protecting the population from the out-of-pocket (OOP) spending. This thesis describes and analyzes the level of household OOP spending in urban Nepal, and the risk factors for catastrophic expenditure by disease type and for distress financing.

Methods: I conducted a cross-sectional multi-stage probability-sampled population survey in five municipalities of Kathmandu Valley from November 2011 to January 2012. A total of 1997 households were interviewed. I assessed the levels and distribution of catastrophic spending associated with treatment of the 10 most commonly-reported diseases. I also assessed the risk factors for distress financing due to chronic illnesses in the last 12 months using a random-effects Poisson regression model. I used classification and regression trees (CART) to illustrate

decision-making processes leading to distress financing.

Results: This study shows that 13.8% of Kathmandu households experienced catastrophic expenditure, which was concentrated among the poor. After confounder adjustment, increased risk of catastrophic spending was observed in households with at least one episode of diabetes, asthma, gastritis/peptic ulcer, injury, arthritis and heart diseases. Hospitalization, lack of home ownership, total treatment costs above the median (NRs. 6,000), education level of the household head and injury were risk factors for distress financing. CART analysis predicted that the most important factor for distress financing was treatment cost exceeding NRs. 5,424 per year. For people above 52 years old, poorer economics status and treatment cost above NRs. 9,734 increased the chance of distress financing.

Conclusion: The high incidence of catastrophic OOP spending and distress financing suggest that existing financial protection mechanisms in Nepal fall short both in depth and in coverage in the context of growing non-communicable disease burden. The Government of Nepal should introduce pre-payment for healthcare services and risk-pooling systems in a sustainable manner, which goes beyond the current subsidiary scheme that is heavily concentrated in public, primary healthcare services.

Keywords: Cost of illness, out-of-pocket health expenditure, catastrophic payment, coping strategies, distress financing, classification trees, multilevel analysis

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"Reading for a PhD is just like crisis management", said a friend of mine some years ago. I am not sure how many times I recounted this phrase, and certainly, I have agreed with my friend more than a hundred times. And yet, I was very fortunate to have endless support from important people.

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List of Abbreviations

AUC	Area Under the Curve
CART	Classification and Regression Tree
CBHI	Community-Based Health Insurance
CCTs	Conditional Cash Transfers
CI	Concentration Index
DHS	Demographic and Health Survey
EA	Enumeration Area
GDP	Gross Domestic Product
GGHE	General Government Health Expenditure
GNI	Gross National Income
IMMPACT	Initiative for Maternal Mortality Programme Assessment
JSPS	Japan Society for Promotion of Science
LR	Likelihood Ratio
LSMS	Living Standard Measurement Survey
MAE	Mean Absolute Error
MHO	Mutual Health Organization
MoHP	Ministry of Health and Population
NCDs	Non-Communicable Diseases
NHRC	Nepal Health Research Council
NRs	Nepalese Rupees
OOP	Out-of-pocket
PPP	Purchasing Power Parity
PPS	Probability Proportional to Size
PSU	Primary Sampling Unit
RMSE	Root Mean Squared Error
ROC	Receiver Operating Characteristic
SHI	Social Health Insurance
SOLID	Society for Local Integrated Development
THE	Total Health Expenditure
UHC	Universal Health Coverage

WHO   World Health Organization

1. INTRODUCTION

1.1. Background

In 2005, the World Health Assembly endorsed Resolution WHO 58.33 and committed its members to ensure that their populations have access to necessary healthcare services for prevention, promotion, treatment and rehabilitation at an affordable cost.(1) Universal health coverage aims to ensure an equitable access to healthcare services without causing financial risks for those who use health services.(2, 3) Enhancing pre-payment for health services, introducing risk pooling systems and prevention of catastrophic health spending and impoverishment are major guiding principles of such efforts.(4) Yet, only 58 countries had achieved universal health coverage as of 2008,(5) while the poorest countries still suffer from a heavy burden of healthcare costs.

Out-of-pocket (OOP) payment is a source of health financing paid directly by households. Low-income countries with annual per capita Gross National Income (GNI) of less than US$1,005 financed more than 50% of total health expenditures from out-of-pocket (OOP) payments, while OOP payments constituted only 13% of total health expenditures in high-income countries with US$12,616 per capita GNI or more.(6, 7) In consequence, more than 150 million people suffer from catastrophic health payments every year, and more than 100 million people are impoverished due to medical costs, 90% of whom are living in low-income countries.(8)

1.2. Progress toward universal health coverage

The transition to universal coverage can follow different patterns. Initially, the coverage of financial protection is limited, and the majority of countries rely on OOP spending for healthcare. This is the period when catastrophic health expenditure and impoverishment are witnessed in many resource-poor settings. Countries begin to move away from OOP payments when health insurance schemes or other forms of pre-payment are employed, including community-based health insurance (CBHI), private insurance, social health insurance for formal sector workers (SHI) and tax-based financing. As countries approach universal coverage, such risk-pooling schemes are consolidated by the central government and form the foundation of the universal healthcare package.(2, 9)

Attempts to move away from OOP health payments to an improved financial protection mechanism have been increasing recently, and some alternative financing schemes constitute a large share of national health expenditure in some low- and middle-income countries. The Philippines, Thailand and Vietnam implemented social health insurance based on individual mandatory contributions, which finance 7.7%, 7.1% and 12.7% of total health expenditure, and serving 76%, 98% and 55% of the population, respectively.(10) Private health insurance with voluntary membership has been implemented in South Africa with a share of 45% of total health expenditure.(11) Examples of community-based health insurance schemes that have been scaled up and are showing positive effects can be found in some African countries. Rwanda's Mutual Health Insurance (*Mutuelle de Santé*) has increased access to healthcare and achieved greater financial protection,(12) now covering around 90% of the population.(13) Senegal's Mutual Health Organizations (MHO)

reported increased utilization of hospitalization services and maternal care for members, although the poorest group was excluded from membership.(14-16) However, the population coverage of most CBHIs is limited to around 10% on average across countries, and their effectiveness at risk protection is weak.(17)

1.3. Challenges for universal coverage

Many low- and middle-income countries face challenges in their progress to achieve universal coverage. Strong social solidarity is needed to establish an effective financing system for the entire population where a large gap exists between the rich and the poor. Political commitment is also required to allocate a significant proportion of tax revenues to insurance schemes in the long run.(18) In low-income countries, resource mobilization for health financing becomes even more difficult given the limited resources for health.

Even if a country has launched health insurance schemes, such schemes should ensure financial sustainability, with the revenues balancing the expenditures. This requires that the enrolment rate be high enough for the insurance schemes to be maintained long-term, with realistic rates for benefit packages and co-payments.(19) However, financial sustainability of an insurance scheme can conflict with the goal of sustainability of a national health system. Kutzin warned that individual insurance schemes may reduce service coverage and exclude more severe, complicated illnesses to improve their own sustainability, which may in turn exclude high-risk groups,(20) and overburden the limited resources of publicly-funded health services.(21) This is becoming more important in low-income countries where

governments can finance national health systems only partially from tax-based revenues. Introduction of health insurance schemes in low-income countries requires a compromise between the financial feasibility of the schemes and the coverage of financial protection at the initial phase. Therefore, this thesis sets out to identify appropriate packages for financial protection that are feasible even in resource-limited settings.

1.4. Catastrophic health spending

Catastrophic health spending is a health payment that exceeds a significant, pre-defined proportion of household consumption, commonly fixed at 10%-30% of total household consumption or 40% of household capacity to pay.(22-24) Those who experience catastrophic spending are forced to sacrifice their daily consumption, or sometimes to sell assets and/or take loans.(25) This thesis employs a 10% threshold for catastrophic spending, which has been used in previous studies comparing the incidence of catastrophic spending across Asian countries.(24, 26)

To protect households from the catastrophic consequences of out-of-pocket healthcare payments, low-income countries increasingly implement essential health packages for certain types of treatment free of charge, or provide conditional or unconditional cash transfers for selected services to eligible people. Such targeted interventions constitute a large share of public health subsidies in low-income countries.(27, 28)

Despite the proliferation of subsidies and pilot insurance programs, no rigorous

assessment of financial protection has been undertaken linking specific diseases with catastrophic payments. Only a few studies have investigated the effect of disease-specific medical costs on household economic status to date,(29-31) and very few have assessed the catastrophic impact of OOP payment focusing on specific diseases.(32-35) However, understanding disease-specific costs is becoming more urgent in the context of the non-communicable disease epidemic (36) and the new WHO agenda of universal health coverage.(4) Thus assessing the incidence and intensity of catastrophic out-of-pocket spending by disease types may reveal how well the existing public subsidies that target specific diseases are protecting the general population. This thesis provides the first and most comprehensive evidence on catastrophic payments, to highlight the financial burden of major illnesses at the household level.

1.5. Household coping strategies for healthcare costs and distress financing

In the absence of effective financial protection mechanisms, households are forced to cope with healthcare costs in diverse ways. There is a growing body of literature that identifies major household coping strategies against high OOP spending, covering Africa,(37) Bangladesh,(38, 39) Afghanistan (40) and Vietnam.(41) In coping with healthcare payments, distress financing such as selling assets, borrowing money from relatives or friends, taking loans and reducing consumption play an important role in addition to non-distress financing from regular income and savings. Households often seek additional work or remove children from school to pay for healthcare as a part of their coping strategy.(42)

Distress financing leads to chronic insecurity. Previous studies have highlighted that indebtedness for healthcare imposes severe economic burden on households, and continuing to pay for high interest rates was one of the main reasons for impoverishment in north Indian villages (43) and in rural Cambodia.(44) Selling assets or removing children from schools also implies loss of productive means in the future, rendering a household chronically poor.(45)

Despite the existing body of literature on the incidence and consequences of distress financing, pathways and determinants for distress financing have not been studied rigorously partly due to methodological difficulties. The determinants of distress financing are inextricably embedded in the episode, individual and household levels, and the determinants at one level are likely to influence those at another. This means that a single-level regression analysis of household level risk factors for distress financing may obscure the true effects at household, individual or episode levels. Thus, the proper analysis of distress financing risks demands data and analysis methods that are suitable for multi-level models.(46) Interaction between the determinants also means that distress financing may occur under specific conditions within certain households or individuals, but such hierarchical analyses have never been considered despite the practical importance of such analyses. Thus, there is an urgent need to understand the mechanisms underlying the incidence of distress financing, and to suggest an effective financial protection mechanism.

1.6. Overview of the health financing system in Nepal

In this thesis, I present a case study of the catastrophic health payments, distress

financing and household coping strategies from Nepal, a country still in the early stage of transition to universal health coverage. The Government of Nepal endorsed access to free primary healthcare in the Interim Constitution of Nepal 2007.(47) To date, the Government of Nepal has adopted some financial protection schemes, but the majority of national health expenditure derives from OOP payments. Lack of financial protection in the country is likely to cause chronic impoverishment among the population, but the economic burden of and coping mechanisms for medical costs are not well known. There is an urgent need to understand the prevalence and factors associated with health spending, and to suggest an effective financial protection mechanism in Nepal.

Nepal is categorized by the WHO as one of the 26 resource-poor, low-income countries (hereinafter L-26 countries) that experience low GNI, poor health outcomes, poverty, insufficient health expenditures, and high OOP spending.(48) GDP per capita for Nepal is about US$620 as of 2011.(7) Basic health indicators have shown rapid progress over the last decade, with life expectancy at birth improved from 64 years in 2003 to 69 years in 2011,(7) the infant mortality rate decreasing from 64 to 46 per 1,000 live births , and the under-five mortality rate falling from 91 to 54 per 1,000 live births.(49) However, large socioeconomic inequality persists in the country; for instance, the under-five mortality rate for the poorest strata was 75 deaths per 1,000 live births while the richest households saw only 36 deaths per 1,000 live births in 2011.(49) It has been reported that 25% of the population in Nepal is still living under the poverty line as of 2011.(7)

An important measure for assessing a country's health financing system is the fiscal space, which is the government's capacity to collect tax to allocate additional funds for a necessary purpose without threatening its financial resources.(50) Consistent with other L-26 countries, Nepal has greater needs for health resources due to poor health outcomes, but suffers from a limited fiscal space. Table 1 presents the health financing resources in the country. Per capita total health expenditure (THE) amounts to 24 US$ in 2011,(51) falling far below US$50, the level required to accommodate a minimum set of health interventions including prevention, health promotion and curative care.(48) The percentage of THE against GDP remained 5% in Nepal in 2011 (7) while the global average was 9.7% in 2007.(48) On the other hand, the proportion of OOP spending in total health expenditure remains high (48%), suggesting that the government largely expects household OOP expenditures to finance healthcare costs.

Table 1: Health financing resources in Nepal

Expenditure measure	2011
GDP per capita (current US dollars)	619
Total health expenditure (per capita US dollars) (2009)	24
Total health expenditure (per capita PPP international dollars)	61
Total health expenditure (% of GDP)	5
General government health expenditure (% of total health expenditure)	39
Private health expenditure (% of total health expenditure)	61
External source (% of total health expenditure)	15
Out-of-pocket (% of total health expenditure)	48

(Source: World Bank 2013, Shrestha, Gauchan et al. 2012)

Fund flows for public health expenditures are maintained by the Government of Nepal. The government pools funds from tax, non-tax revenues and external aid. The Ministry of Health and Population (MoHP) manages health sector budgets and makes payments to providers including hospitals, health posts, sub-health posts, and primary health care facilities. Non-pooled funds mainly derive from OOP payments.(52) The details of provider payment systems are described in Table 2.(53)

Table 2: Provider payment mechanisms in Nepal

Type	Coverage	Allocation (% of total MoHP budget)
Fee-for-services	Users pay directly for health services. CBHI covers the cost within an annual ceiling, and the member directly pays medical costs that exceed the threshold.	N/A CBHI: 0.25%
Line-item budgeting	Prospective resource allocation; health facilities receive advance resources including operational costs. Line-item budgeting constitutes more than 80% of total public health spending in Nepal.	>80%
Disease-specific case payment (output-based budgeting)	A retrospective payment based on the health facility's performance in specific pre-defined interventions. These interventions include the Safe Motherhood Program, Screening and Treatment of Uterine Prolapses Program and cash incentives for permanent sterilization in the Family Planning Program.	3%
Population-specific case payment (output-based budgeting)	A retrospective payment for services provided to specific pre-defined groups to reduce the financial risk for specific groups such as the poor, senior citizens, people below 15 years old and designated ethnic groups	<1.1%
Capitation	A prospective budget allocation assigned according to population in a catchment area. Every district receives a fixed amount multiplied by the number of its inhabitants.	Free health services: 0.5%, Medicines: 5.5%
Cash transfer to patients	A retrospective payment made to users to (a) subsidize transportation costs incurred for healthcare, (b) provide cash incentive for nutritional support for tuberculosis patients, or (c) cash incentive for the use of health services such as the Safe Motherhood Programme.	<0.5%

(Source: Torres, Gautam et al. 2011)

Nepal has adopted a mixture of financial protection schemes, which are shown in

detail in Table 3.(52, 53) Community-based health insurance schemes are being

piloted in six districts of Nepal, and funds from tax-based subsidies are pooled and

used to supplement contributions raised from community members.(52)

Table 3: Examples of major financial protection schemes in Nepal

Program	Benefits	Coverage and target population	Limitations
Free Health Services Program	All services including listed essential drugs at sub-health posts, health posts, primary healthcare centers and district hospitals are provided free of charge	Nationwide: all citizens	Administrative inefficiency at health facilities
	Free health services at district hospitals for targeted groups	Nationwide: poor, disabled, senior citizens and female community health volunteers	Administrative complexity for eligibility screening
Safe Motherhood Program	Free delivery services at public and designated private facilities, cash incentives and transportation allowances	Nationwide: all women	Heavy administrative burden
Community-based Health Insurance Program	CBHI covers the treatment costs beyond the free health services program	Primary healthcare centers in 6 districts	High administrative cost
Uterine Prolapse Treatment Program	Free diagnosis, primary healthcare treatment, operation and transportation allowance	Nationwide: all women	Weak program monitoring
Financial support for specified diseases	Free services up to NRs. 50,000 for cancer, heart, kidney and other catastrophic diseases at public health facilities	Nationwide: poor	Administrative complexity and slow reimbursement
Valve replacement for the poor	Replacement of valve for free at public health facilities	Nationwide: poor	Administrative complexity and slow reimbursement

Program	Benefits	Coverage and target population	Limitations
Nutrition support for TB patients	Provision of cash equivalent to NRs. 1,400 per patient	Nationwide: all TB patients	Administrative complexity and slow reimbursement

(Source: Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ) GmbH and Ministry of Health and Population 2010; Torres, Gautam et al. 2011)

Although limited, the Government of Nepal subsidizes healthcare costs in several areas. Since 2006, healthcare services including listed essential drugs (54) are provided free at publicly-funded district hospitals, health posts, sub-health posts and primary health care centers. Targeted groups (the poor, people with disabilities, senior citizens and female community health volunteers) also receive all healthcare services for free at district hospitals.(53) In addition, the Safe Delivery Incentive Program, which has been implemented nationwide since 2005, provides Conditional Cash Transfers (CCTs) for institutional delivery, plus free deliveries at government and some private facilities since 2009.(55) Treatments for severe chronic illnesses including cancers, heart diseases, kidney and other severe diseases are subsidized up to 50,000 Nepali Rupees.(53) The budget allocated to such financial protection schemes derives from a pooled fund provided by the MoHP and 11 external donors through a sector-wide Approach, which has been implemented in the country since 2004.(53) In 2013, the National Health Insurance Policy was proposed by the Government under the framework of the Nepal Health Sector Programme II (2010-2015). The policy aims to ensure universal access to healthcare services through pre-payment and risk-pooling mechanisms, initially starting from the poor in selected districts.(47) Despite this complexity in provider payment systems, and numerous financial protection schemes, no rigorous assessment of the effectiveness

of financial protection has been conducted at the population level.

1.7. Objectives and organization of the thesis

The objective of this study is to analyze the current financial protection landscape in Nepal using a cross-sectional, population-based survey data. Specifically, the thesis will:

a)   provide the first and most comprehensive evidence on catastrophic payments, to highlight the financial burden of major illnesses at the household level, and

b)   provide an in-depth understanding of the determinants of distress financing using a combination of parametric and non-parametric approaches

The thesis is organized as follows. Chapter 2 will describe the methods for data collection, and present the empirical strategy required for the subsequent chapters. Chapter 3 will present the incidence and intensity of catastrophic health payments along with the risk factors for incurring catastrophic payments, using the concentration index for measuring the income-related inequality and a Poisson regression model for analysis of risk factors. Chapter 4 will analyze the risk factors associated with distress financing for healthcare, such as selling assets, borrowing money from relatives or friends, taking loans and reducing consumption, using decision tree methods and a multilevel Poisson regression model. Both Chapters 3 and 4 use data from a population-based cross-sectional survey conducted in five municipalities of Kathmandu Valley in 2011 and 2012. Chapter 5 will provide a summary and future recommendations for health financing policy and research in

Nepal.

2. METHODOLOGY: AN OVERVIEW

2.1. Introduction

This section will provide an overview of the data collection methods and procedures used in this study, including sample design, study questionnaires, fieldwork organization, data collection teams, data collection staff and training, supervision and data entry. This section will also summarize the methods for the analyses required for the subsequent chapters, namely: a) estimation of household consumption from the survey data; b) calculation of out-of-pocket health expenditures; c) redistribution of comorbidity costs; and d) data consistency and quality findings. Details of the specific analytical methods used for the investigation of risk factors for catastrophic expenditure and distress financing are not presented in this chapter, but will be given in detail in each chapter.

2.2. Organization of the study

I carried out data collection in collaboration with the Tribhuvan University Teaching Hospital and the Society for Local Integrated Development (SOLID) Nepal, which is a Kathmandu-based non-governmental organization working in the area of health and youth development. While the Tribhuvan University Teaching Hospital provided technical input to training and preparation of survey tools, SOLID Nepal was responsible for translation of the survey tools and logistical arrangements including the recruitment of staff and administrative matters.

2.3. Sample design

I conducted a cross-sectional population-based household survey in an urban area of Nepal. The study was conducted in all five municipalities (Kathmandu, Kirtipur, Lalitpur, Madhyapur-Thimi and Bhaktapur) in Kathmandu Valley between November 2011 and January 2012. The sampling frame for this study drew upon the census Enumeration Areas (EAs) used for the Nepal Population and Housing Census 2011. The list of 1,480 EAs containing around 1,467,000 people from five municipalities was obtained from the Nepal Central Bureau of Statistics. The data included the number of households and the population size per EA, along with the location map of the dwellings and major landmarks in each EA.

The target sample size for the study was calculated as 1,910 households, which was rounded to 2,000 households for logistical simplicity. For the calculation of the sample size, the key indicator used was the prevalence of hypertension among the adult population. Although previous studies assessed the prevalence of catastrophic expenditures aggregated at the household level in Nepal, the information cannot be used for sample size determination, since this study is a disease-specific assessment of the catastrophic payments which would need larger sample size. However, no study has investigated disease-specific catastrophic expenditures at the population level. Thus I used the prevalence of major diseases as a base indicator, assuming that hypertension in those over 20 years of age will comprise a major economic burden to the households. This assumption is supported by previous studies that indicated hypertension is a major risk factor for adult mortality globally and in low-income countries.(56, 57) The DHS sampling manual also recommends to use an indicator

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that is key to the overall study purpose, and which should not be too rare to easily measure.(58) The following formula suggested for the cluster sampling method in the Demographic and Health Surveys (58) was used to estimate the required sample size for these indicators:

$$ n \quad = \quad \frac{(1.96)^2 \, (r) \, (1\text{-}r) \, (f) \, (1.1)}{(0.12r)^2 \, (p) \, (n_h)} $$

where: n is the required sample size, expressed as number of households, 1.96 is a factor to achieve the 95 per cent level of confidence, r is the predicted or anticipated prevalence of hypertension, 1.1 is a factor necessary to raise the sample size by 10 per cent for non-response, f is the design effect due to probability sampling, 0.12r is the margin of error to be tolerated at the 95 per cent level of confidence, defined as 12 per cent of r (relative sampling error of r), p is the proportion of the population upon which the indicator, r, is based, and n_h is the average household size.

For the calculation, r (proportion of people with hypertension) was anticipated conservatively to be eight percent from a previous nationwide survey.(59) The value of f (design effect) was set at 1.5 in the absence of any available estimate from previous surveys, p (percentage aged 20 years and above in the total population) was set at 52 percent, and n_h (average household size) was set at 5.1 people per household.

This study adopted multi-stage cluster sampling as shown in Figure 2.

Figure 1: Sampling framework

Study Area	1,480 EAs with 312,136 households in 5 municipalities

First stage sampling	100 EAs
	  73 EAs in Kathmandu
	  5 EAs in Kirtipur
	  12 EAs in Lalitpur
	  5 EAs in Madhyapur-Thimi
	  5 EAs in Bhaktapur

Second stage sampling	20 dwellings per EA
Third stage sampling	2,000 households
Fourth stage sampling	All household members in the sampled households
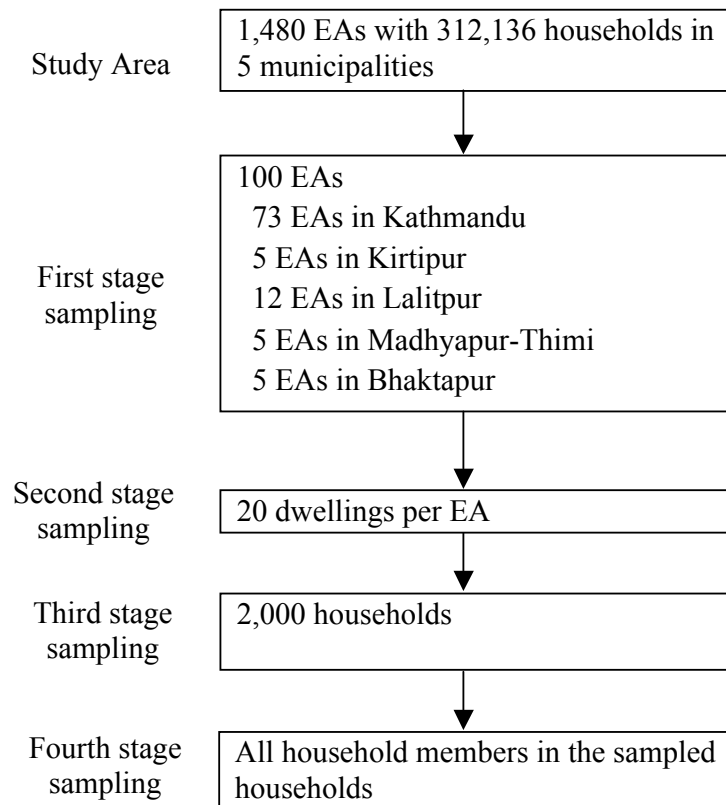
Census EAs were considered as a primary sampling unit (PSU). At the first stage of sampling, 100 PSUs /EAs were selected using systematic random sampling with probability proportional to size (58) out of 1,480 PSUs/EAs containing 312,136 households. At the second stage of sampling, a cluster of 20 dwellings per PSU was chosen based on the detailed housing and establishment maps for each EA. If a dwelling had multiple households (e.g. an apartment building), one household was randomly selected per dwelling. The target respondents for the study were the head of the household, or the most knowledgeable person about the household

expenditures and the health status of the household members. If a single respondent could not provide all the information, the household was allowed to recommend other members of the household to the interviewer.

2.4. Study questionnaires

The questionnaire was developed specifically for this study with reference to those used by the Initiative for Maternal Mortality Programme Assessment (IMMPACT), the Nepal Living Standard Measurement Survey (LSMS) and the Nepal Demographic & Household Survey (DHS). The questionnaire was originally drafted in English, which was then translated into Nepali, and validated by back-translation to English. The questionnaire was finalized after a pilot study conducted with 100 households in Lalitpur Municipality in 2011.

The questionnaire included questions about household demographic information, education, consumption and durable goods, self-reported disease episodes, care-seeking behavior, health-related expenditure, inpatient health expenditures and coping strategies (see Appendix 1 for a complete questionnaire). Interviewed households were able to report their consumption expenditures and treatment costs both in the pilot study and in the full-scale data collection, as has been confirmed in other household surveys in Nepal.(60)

The illness episodes in this study refer to all morbidities in the past 30 days and chronic conditions that continued for more than three of the past 12 months. All illnesses were coded according to a disease list that I developed based on previous

studies (29, 61) and a focus group discussion conducted with health workers in Kathmandu during March 2011. Categorization of disease codes into non-communicable disease (NCDs), communicable diseases (CDs) and injury followed the Global Burden of Disease classifications.(62) Disease codes contained both the diagnosis given by allopathic, ayurvedic and homeopathic doctors and the symptoms if the illnesses had not been medically confirmed. Interviewers cross-validated the disease diagnosis with outpatient cards and hospital discharge reports if these reports were available. Any ambiguities in responses were clarified by follow-up phone calls and/or re-interviews. To maximize the response rate, interviewers visited the sampled clusters one day prior to the interview, and made an appointment with the sampled households. If the household members were absent on the day of the interview, the interviewers made additional appointment by mobile phone, and the visits were repeated three times if the interviewers were not able to meet the participants.

2.5. Training and field operation

In undertaking the study, 16 interviewers and 4 supervisors were recruited for the data collection. All of the data collection staff had a background in public health or social work, and the majority of them had engaged in similar social surveys previously. The main training took place in Kathmandu in November 2011 for 7 days. Training consisted of overall fieldwork procedures, how to identify sampled households, confidentiality, how to administer questionnaires and practical field sessions. Supervisors received additional sessions on sampling and quality control (see Appendix 2 for a complete training agenda). Training was organized according

to the Interviewer's Manual (see Appendix 3 for a complete manual) and the Supervisor's Manual (see Appendix 4 for a complete manual), both of which were adapted from the Demographic and Health Surveys manuals (63, 64) and the Living Standard Measurement Surveys guideline.(65)

Data collection was carried out by four field teams, each containing four interviewers and a supervisor. Teams were initially deployed to the clusters in Lalitpur Municipality in the first week of December 2011 where the central office was located to ensure close supervision and monitoring. This is because the initial two weeks of data collection are a critical period for detecting systematic errors and providing feedback. A review session was held two weeks after the fieldwork had started to share the problems encountered and clarify ambiguities in operation. Data collection was completed in January 2012. Throughout the fieldwork, I maintained daily communication with supervisors and monitored the interviews of as many subjects as possible.

2.6. Data entry and processing

Completed questionnaires were sent to the SOLID office once the field supervisors had checked the accuracy and consistency of each form, and I had validated the same questionnaires. Minor errors were corrected by the interviewers who conducted the interview, and more systematic errors were sent for re-interview immediately. All the data were entered twice using CSPro version 4.1, which allows automated validation of the first entry and the second entry. I provided four data entry clerks with training on data editing and data entry using CSPro for five days in January 2012. Data

consistency check and cleaning was performed using STATA version 11.0.

2.7. Estimating household consumption

Income or consumption can be used to measure household living standards in household surveys, depending on the regional and national context: income is commonly used to measure living standards in industrialized countries where the majority of income comes in wages, while consumption provides a better estimate of wealth in developing countries where self-employment and agriculture constitute a large share of the national economy.(66) Income denotes the total earning of the household including remittances and payments and home-produced materials and foods, and is commonly used in developed countries.(66) However, income presents a large bias in household surveys as the income level may fluctuate during a recall period.(23) In addition, long-term assets and informal transactions including home production of foods are not accounted for by measures of income,(23) which leads to underestimates of household economic status in an agrarian economy like Nepal. I also identified a tendency to underreport income in the pilot study for this study.(66) Therefore, I used consumption throughout the thesis to measure household economic status.

Consumption is estimated by aggregating both purchased and home-produced goods consumed by the household, including:

- Foods purchased outside the home, the market value of home-produced foods consumed, and market value of foods received in-kind,
- Non-food items purchased outside the home and those received in-kind,

excluding large irregular expenditures, such as major home renovation, purchase
of house/land, funerals and weddings,

- Housing, measured by a rental equivalent for housing. Monthly rental-equivalent
  value was imputed if a household owned the residence,
- Durable goods owned by the household, measured by 13 items adapted from the
  Nepal Living Standard Survey 2011.(60)

Although durable goods had been purchased years prior to the survey and the costs
were not accounted during a recall period, households do benefit from the use of the
goods that determine their level of living standards. The rental equivalent value for
these durable goods was estimated following the guideline proposed by Deaton and
Zaidi, taking into account the price at the time of purchase, the current value of the
durable goods, the real rate of interest and the rate of depreciation.(66)

Household consumption is a crude measure of household economic status. A
household with many adults typically consumes more compared to a household with
parents and small children. Consumption measures also need to take into account
economies of scale, because some goods and services are shared among the
household members.(67) Consumption was adjusted for household size and
composition by dividing the household consumption by an adult equivalent scale in
the form:

$$AE = (A + \alpha K)^{\theta}$$

where A is the number of adults in the household, K is the number of children, α is
an adjusting factor for children set at 0.5 following Cutler et al.,(68) and θ is the

degree of efficiency in the economy of scale, defined as 0.75 as suggested by Xu et al..(22, 23)

2.8. Calculation of out-of-pocket health expenditure

In this study, information on healthcare costs was obtained by asking how much a household had spent on consultation/diagnosis fees including laboratory tests, X-rays and blood tests, drugs and supplies, and transportation for each illness episode. I also included hospitalization costs such as medical costs, living costs during hospitalization and expenses for those who accompanied the patients (food, lodging and transportation) in the questionnaire. Separate questions on the cost of traditional healers, homeopathic treatment, ayurvedic treatment and home remedies were also administered to the respondents. Payments to traditional healers in kind (e.g. goats, fruits and rice) were converted to a current market value similarly to consumption estimation. Of these items, I summed the direct medical costs including consultation/diagnosis fees, drugs and medical supplies and hospital bills. Spending on traditional healers, ayurveda, homeopathy and home remedy was also seen as direct costs and thus included in the OOP health expenditure. However, indirect costs such as transport, lodging and food not accounted in the hospital bills were excluded following WHO guidelines.(69)

2.9. Redistribution of comorbidity costs

Comorbidity presents a challenge in the analysis of cost of illness, when the medical costs for one disease episode cannot be singled out. In this study, around 13% of the outpatient costs were jointly reported with other illnesses, which also means that 13% of the disease-specific outpatient costs were missing. Several analytical

methods exist that separate out such jointly-reported costs. The principal diagnosis method assigns all the costs in multiple morbidities to the first disease diagnosis,(70) but it ignores the rest of an individual's disease episodes. The proportional distribution method imputes the cost ratios for a different combination of diseases using single disease costs, and applies the same ratios to allocate the jointly-reported costs into single disease costs.(71) A shortcoming of the method is that it overlooks the treatment durations or the types of health service providers a person had consulted. To avoid these shortcomings I used a regression-based approach, similar to that used by Trogdon et al.,(72) to allocate the jointly-reported costs.

First, I constructed an ordinary least squares regression model with multiple imputation to predict episode-specific outpatient costs,(73) using disease types, duration of diseases, number of comorbid diseases per person, use of private facilities and the natural log of summed outpatient cost per person. The multiple imputation method is known to yield unbiased estimates for missing data in which the data contains more than 5% of missing cases,(74) and data is missing at random (i.e. a cause for missing data is observed). In this case the data is missing due to presence of comorbidity with other diseases.(73)

Second, I applied the model to jointly-defined cases where single episode costs were missing, and estimated a predicted cost for each disease episode. In order to ensure that the single episode costs summed to the total outpatient cost for a person, the predicted disease costs were then converted into a fraction of the total predicted costs for a person. The cost fractions were then applied to the true outpatient cost per

person to arrive at the final outpatient costs by disease episode.

2.10. Data consistency and quality findings

Previous studies have pointed out the framing effects of aggregated and disaggregated questionnaire items on out-of-pocket health spending, which reported that aggregate expenditure questions tend to yield considerably lower estimates than the sum of disaggregated questions.(75, 76) For this study, I introduced both reported total and disaggregated item expenditures in the study questionnaire as exemplified in the World Health Survey,(76) and interviewers cross-checked the consistency of both expenditures at the time of the interview. Reported total and disaggregate item expenditures were compared using a Wilcoxon rank sum test to see if there was any significant difference between the two. The result showed that there is no difference between the two measures (p-value: 0.95).

I assessed the accuracy of redistribution of comorbidity costs using five out-of-sample cross-validation runs, in which each run used 80% of the randomly-selected training data to predict the remaining 20% of the test data. The result of cross-validation is shown in Table 4.

Table 4: Out-of-sample cross-validation of cost prediction

	Root Mean Squared Errors	Mean Absolute Errors
Test 1	0.340	0.210
Test 2	0.418	0.200
Test 3	0.447	0.215
Test 4	0.464	0.208
Test 5	0.383	0.210

The cross-validation of redistribution of the comorbidity cases reported consistently small root mean squared error (RMSE) and mean absolute error (MAE) ranging from 0.34 to 0.46 of RMSE in the five-fold cross-validation, similar to another study that tested prediction models for cost of illnesses.(77)

2.11. Ethical considerations

Ethical approval was obtained from the Research Ethics Committee at the University of Tokyo and the Nepal Health Research Council in August 2011 (NHRC registration number 49/2011). Interviewers read out the informed consent sheet to the study participants, informing them that participation in the study is absolutely voluntary and that the respondent can discontinue the interview whenever they would like to. The interviewers commenced the interviews only after obtaining written consent from the respondent by signature or by thumbprint.

2.12. Funding

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3. CATASTROPHIC HEALTH SPENDING AND COST OF ILLNESS IN NEPAL UNDER HEALTH TRANSITION

3.1. Objective

This chapter aims to provide the first and most comprehensive evidence on catastrophic payments, to highlight the financial burden of major illnesses at the household level, using data from urban areas of Nepal.

3.2. Methods

3.2.1. Measuring catastrophic payments by disease types

This thesis employs a commonly-used threshold value for catastrophic spending, which is 10% of the total household consumption.(24, 26) Since catastrophic spending can occur in any household regardless of their economic status,(78) this analysis addresses which of the major diseases constitute the largest burden to the household economy across all households. The impact of disease-specific out-of-pocket spending on household welfare was measured by two methods. First, we assessed the incidence and intensity of catastrophic spending by costs associated with the treatment of the 10 most commonly-reported diseases. For this, we summed the treatment cost per episode to the total costs at the household level by types of diseases, and then analyzed this household-level figure using a catastrophic threshold set at 10% of total household consumption, which is commonly used in Asia.(24) To measure the incidence of catastrophic spending we used catastrophic headcount, which is the crude percentage of households that experienced catastrophic health spending.(26) We used a concentration index to assess whether the catastrophic

headcount is unequally distributed across the income groups. CI ranges between -1 and 1; if there is no socioeconomic inequality in catastrophic headcount, the CI scores around zero with no statistical significance.(23) If the CI lies significantly below zero, catastrophic spending occurs more among the poorer households, and if the CI is significantly above zero, wealthier households have greater incidence of catastrophic spending. Statistical significance and confidence intervals for the concentration index were obtained using bootstrapping with 100 iterations, and the delta method following Rao (1965) and Kakwani et al. (1997).(79-81)

We also measured intensity of the burden of OOP spending using catastrophic overshoot, which is the average of OOP payments surpassing the catastrophic threshold, expressed as a percentage of total household consumption. A value of the CI that is significantly below zero means that the overshoot is larger among the poor. We also report the mean positive overshoot, which is the mean catastrophic overshoot only among those who experienced catastrophic spending.(82)

3.2.2. Analysis of risk factors for catastrophic health spending

In addition to measuring the crude incidence and intensity of catastrophic spending, we adopted a regression approach to assess the effect of disease types and other risk factors on catastrophic expenditures. A Poisson regression model was chosen for the analysis as catastrophic health spending is a relatively rare event. Variables used for the regression model included history of hospitalization in the past 30 days, household size, whether the household member sought care with any healthcare provider in the past 30 days, age of the household head, education of the household

head, type of healthcare provider used by the household in the past 30 days, household consumption quintile, and presence in the household of any of the top 10 commonly-reported illnesses. In this study, the top 10 commonly-reported illnesses were hypertension, cold/cough/fever, diabetes, asthma, gastritis/peptic ulcer, injury, arthritis, heart diseases, migraine/headache, and hyperuricemia in the past 30 days. The full list of variables included in the regression model is listed in Table 5. To improve precision of estimates in the final model, variables to be retained in the final model were selected by backward stepwise model-building ($p < 0.05$). Collinearity between variables was tested using the Pearson product-moment correlation coefficient, and none found. We adjusted all analyses for the sampling structure of the probability sample survey. All the analyses for this chapter were performed using STATA version 12.1.

Table 5: Variables used in Poisson regression model for catastrophic health spending

Explanatory variables	Definition
Household had hospitalization in the past 30 days	0=No, 1=Yes
Household size	Continuous
Age of household head	Continuous
Education level of household head	0=Primary or lower (below Class 5), 1=Secondary or higher (Class 6 and above)
Type of healthcare provider used by the household in the past 30 days	1=Public only, 2=Private only, 3=Public and private, 4=Other/none
Hypertension (≥1 episode) in the past 30 days	0=No, 1=Yes
Cold/cough/fever (≥1 episode) in the past 30 days	0=No, 1=Yes
Diabetes (≥1 episode) in the past 30 days	0=No, 1=Yes
Asthma (≥1 episode) in the past 30 days	0=No, 1=Yes
Gastritis/peptic ulcer (≥1 episode) in the past 30 days	0=No, 1=Yes
Injury (≥1 episode) in the past 30 days	0=No, 1=Yes
Arthritis (≥1 episode) in the past 30 days	0=No, 1=Yes
Heart diseases (≥1 episode) in the past 30 days	0=No, 1=Yes
Migraine/headache (≥1 episode) in the past 30 days	0=No, 1=Yes
Hyperuricemia (≥1 episode) in the past 30 days	0=No, 1=Yes

3.3. Results

3.3.1. Self-reported morbidity, provider choices and costs of treatment

A total of 1,997 households (9,177 individuals) were interviewed with a response rate of 99.8%. Such high response rate is common in household surveys that used a cluster-sampling method. In the cluster sampling procedure, vacant dwellings are excluded prior to the interviews, and similar rates have been reported in previous surveys of Nepal with the same design.(49, 83) Characteristics of the sampled households are shown in Table 6.

Table 6: Sample characteristics of the households

Household characteristic	Value	95% CI
Mean household size	4.4	(4.3 - 4.5)
Ratio of infants (0-4) to household members	0.09	(0.07 - 0.10)
Ratio elderly (65 and over) to household members	0.05	(0.04 - 0.06)
Age of household head	47.9	(46.4 - 49.4)
		% of total
Gender of household head		
Male		82.3
Female		17.1
Educational level of household head		
No education (Never)		24.0
Primary (Class 1 to Class 5)		13.4
Secondary (Class 6 to Class 10)		31.6
Higher (College or above)		31.0
Ownership of residence		
Own home		46.0
Rent		50.0
Provided free of charge		0.6
Squatting		3.4
Other		0.1

Of the 9,177 individuals, 32.4% of people became sick in the 30 days prior to the interview. On average, an ill person had 1.2 episodes of disease. Table 7 presents the prevalence of the 10 most commonly reported diseases in the past 30 days prior to the interview. 12.8% reported having cold/cough/fever in the past 30 days. Of people aged above 20 years, 10.5% were previously diagnosed with hypertension while 3.7% had a diabetes diagnosis.

Table 7: Prevalence of 10 most commonly reported diseases in the past 30 days

	Disease type	N	Percent	95% CI
1.	Cold/cough/fever	1,131	12.8	(11.2 - 14.4)
2.	Hypertension (>20 years)	653	10.5	(9.2 - 11.7)
3.	Diabetes (>20 years)	248	3.7	(3.1 - 4.3)
4.	Gastritis/peptic ulcer	291	3.6	(2.8 - 4.3)
5.	Arthritis	245	2.9	(2.3 - 3.5)
6.	Asthma	130	1.1	(0.9 - 1.4)
7.	Migraine/Headache	70	0.9	(0.6 - 1.2)
8.	Injury	69	0.7	(0.5 - 1.0)
9.	Hyperuricemia	49	0.7	(0.3 - 1.1)
10.	Heart diseases	71	0.6	(0.4 - 0.8)

Note: The denominator is the total number of individuals in the sampled households (N=9,177). Sample weights applied.

Table 8 presents the types of healthcare providers used in the past 30 days. A majority of study subjects used private providers or combined private providers with other types of facilities (65% of disease episodes). A further 22% of episodes used public service providers only or public providers mixed with traditional service providers, and around 4% used traditional medicine only.

Table 8: Types of health service providers used in the past 30 days

Provider type	Number of episodes	Percent	95% CI
Private providers only	2,054	58.7	(54.2 - 63.2)
Private and public providers	157	3.8	(2.7 - 4.9)
Private and traditional providers	52	1.5	(0.7 - 2.3)
Private, public and traditional providers	14	0.4	(0.1 - 0.6)
Public providers only	629	16.7	(13.2 - 20.1)
Public and traditional providers	19	4.7	(1.4 - 8.0)
Traditional providers only	60	1.6	(1.1 - 2.1)
Nowhere/other	570	16.9	(14.0 - 19.8)

Note: The denominator is the total number of disease episodes (N=3,555). Sample weights applied.

Table 9 shows the average distribution of health expenditures by consumption quintile in the past 30 days, disaggregated by the types of services the households used. Around 13% of the outpatient costs were jointly reported with other illnesses, for which illness-specific costs were assigned using the regression approach. The average outpatient costs generally increased as the consumption quintile increased. The wealthiest households tended to spend more on ayurvedic healthcare (1,268 NRs, approximately 15 US dollars at the current exchange rate). The share of OOP payments in household consumption fluctuated between the quintiles, but the richest households spent a considerably smaller share of their consumption on health (6.9%) than others.

Table 9: Average household OOP spending among those who paid for care by consumption quintile

Quintile	1 (Poorest)	2	3	4	5 (Richest)	Total
Outpatient (SE)	1,564 (266)	2,123 (664)	1,559 (149)	2,037 (242)	2,722 (514)	1,999 (202)
Inpatient costs (SE)	25,200 (12,437)	51,147 (20,377)	26,059 (8,153)	34,578 (7,170)	50,044 (8,104)	39,657 (6,310)
Ayurvedic (SE)	301 (55)	907 (251)	828 (131)	759 (460)	1,268 (340)	861 (138)
Other traditional medicine/healers (SE)	263 (117)	239 (80)	346 (130)	512 (336)	319 (117)	335 (100)
Transportation and other costs (SE)	31 (8)	143 (53)	98 (28)	90 (36)	69 (26)	471 (74)
% OOP payment against household consumption (SE)	10.7% (1.55)	14.8% (3.80)	8.3% (1.81)	10.3% (3.24)	6.9% (1.48)	10.1% (1.26)

Note: The denominator is the households reporting any positive expenditure for medical care in the past 30 days prior to the interview (N=1,517). Cost of traditional healers includes payments in cash and in kind. One US dollar is approximately 86 Nepalese rupees.

3.3.2. Incidence and intensity of catastrophic health spending

Table 10 shows the incidence of catastrophic health spending in the past 30 days prior to the survey, by total OOP spending and by disease-specific OOP payments aggregated at the household level. Overall, 13.8% of households experienced catastrophic health spending at the 10% threshold in the past 30 days. A negative concentration index and an increase in rank-weighted headcount imply that the catastrophic spending is regressive. Of all the disease types surveyed, expenses for a household due to hypertension caused the largest catastrophic headcount (1.3% at 10% threshold), followed by cold/cough/fever (1.2%), diabetes (1.1%) and asthma (1.0%). The concentration index for cold/cough/fever (-0.262) and migraine/headache (-0.879) were below zero and statistically significant, indicating that the catastrophic spending due to these diseases is distributed most heavily in the poorer households.

Table 10: Distribution of catastrophic health expenditure by major diseases

	Catastrophic headcount	Concentration index (headcount)	95% CI (headcount)	Catastrophic health payment at 10% threshold			Mean positive overshoot
				Catastrophic overshoot	Concentration index (overshoot)	95% CI (overshoot)	
Total household health expenditure	13.8%	-0.126	(-0.184 : -0.069)***	4.6%	-0.045	(-0.195 : 0.105)	33.2%
By disease-specific health expenditure							
Hypertension	1.3%	-0.206	(-0.417 : 0.004)	0.1%	-0.224	(-0.462 : 0.116)	10.7%
Cold/cough/fever	1.2%	-0.262	(-0.459 : -0.066)*	0.1%	-0.392	(-0.539 : -0.245)***	6.8%
Diabetes	1.1%	-0.099	(-0.304 : 0.107)	0.1%	-0.250	(-0.617 : 0.118)	10.2%
Asthma	1.0%	-0.185	(-0.389 : 0.018)	0.1%	0.008	(-0.536 : 0.552)	12.3%
Gastritis/peptic ulcer	0.9%	-0.111	(-0.447 : 0.225)	0.2%	0.364	(-0.111 : 0.839)	17.9%
Injury	0.8%	-0.033	(-0.328 : 0.261)	0.4%	0.011	(-0.479 : 0.501)	49.3%
Arthritis	0.7%	-0.233	(-0.467 : 0.014)	0.3%	-0.395	(-0.830 : 0.041)	41.2%
Heart diseases	0.5%	-0.247	(-0.497 : 0.002)	0.0%	-0.194	(-0.511 : 0.122)	8.3%
Migraine/headache	0.2%	-0.879	(-0.957 : -0.801)***	0.0%	-0.901	(-0.981 : -0.821)***	4.8%
Hyperuricemia	0.2%	0.426	(0.379 : 0.473)***	0.0%	0.426	(0.379 : 0.473)***	5.0%

***p<0.001; ***p<0.01; *p<0.05

Note: The denominator is the number of households (N=1,997). Sample weights applied.

Table 10 also shows the intensity of catastrophic payments by total OOP spending and by disease-specific treatment cost at the household level. The biggest financial burden to households was due to injury, which surpassed the catastrophic threshold by 49.3% in mean positive overshoot at the 10% threshold, but this overshoot was not significantly below zero. The concentration index for migraine/headache (-0.901) was the most regressive in its intensity, with statistical significance, which means that the economic burden of migraine/headache is heavier for poorer households.

3.3.3. Determinants of catastrophic health spending

Table 11 presents the results of the Poisson regression model predicting the risk of catastrophic health spending in the past 30 days. The event of hospitalization increases the risk of catastrophic spending by a factor of 6.8. Households in the second and higher consumption quintile had a significantly lower risk of catastrophic spending than the poorest households. Increased risk of catastrophic spending was observed in households with at least one episode of diabetes (RR: 2.0, $p<0.001$), asthma (RR: 2.0, $p<0.001$), gastritis/peptic ulcer (RR: 1.6, $p<0.01$), injury (RR: 1.8, $p<0.05$), arthritis (RR: 1.7, $p<0.01$) and heart diseases (RR: 1.6, $p<0.01$) even after controlling for the household size and consumption quintile. However, having had cold/cough/fever, hypertension, migraine/headache and hyperuricemia did not show any significant association with catastrophic payments, and thus those variables were removed in the initial backward stepwise regression ($p>0.05$).

Table 11: Multiple Poisson regression model predicting the risk of catastrophic health spending in the past 30 days

Risk factors		Adjusted Rate Ratio	95% CI	P-value
Hospitalization in the past 30 days	No	1.00		
	Yes	6.76	(5.13 - 8.90)	<0.001
Household size		0.91	(0.85 – 0.97)	0.005
Type of healthcare provider	Public only	1.00		
	Private only	0.92	(0.67 - 1.26)	0.595
	Public and private	1.17	(0.80– 1.72)	0.420
	Other/none	0.17	(0.10 - 0.29)	<0.001
Household consumption quintile	Q1 (poorest)	1.00		
	Q2	0.59	(0.40 - 0.87)	0.008
	Q3	0.55	(0.39 - 0.77)	<0.001
	Q4	0.58	(0.41 - 0.81)	<0.001
	Q5 (richest)	0.34	(0.24 - 0.49)	<0.001
Diabetes	No	1.00		
	Yes	2.00	(1.48 - 2.71)	<0.001
Asthma	No	1.00		
	Yes	1.95	(1.36 - 2.78)	<0.001
Gastritis/peptic ulcer	No	1.00		
	Yes	1.64	(1.21 - 2.23)	0.002
Injury	No	1.00		
	Yes	1.82	(1.13 - 2.91)	0.014
Arthritis	No	1.00		
	Yes	1.71	(1.24 - 2.37)	0.001
Heart diseases	No	1.00		
	Yes	1.61	(1.13 - 2.29)	0.009
Constant		0.35	(0.24 - 0.50)	<0.001

Note: The denominator is the number of households (N=1,997). Sample weights applied. Age of the household head, education of the household head, having had migraine/headache, hypertension, cold/cough/fever, hyperuricemia were removed in the initial backward stepwise regression (p>0.05).

3.4. Discussion

This study provides the first evidence relating major illnesses to OOP-related catastrophic spending in urban Nepal. Our analysis shows that 13.8% of households in Kathmandu experienced catastrophic expenditure, and the incidence of catastrophic spending was concentrated among the poor. The incidence of catastrophic spending is higher than a previous nationwide study which showed that 5.9% of households had catastrophic spending,(24) since our study focused on urban areas of Nepal where utilization of health facilities occurs more frequently than in rural areas. The disease-specific incidence of catastrophic headcount suggests that hypertension, cold/cough/fever and diabetes are the major three diseases that lead to catastrophic spending. After adjusting for household consumption quintile and other factors, diabetes, asthma, gastritis/peptic ulcer, injury, arthritis and heart diseases were found to increase the risk of catastrophic expenditure. Some previous studies corroborate these findings. The relationship between catastrophic expenditure and diabetes is consistent with a diabetes-related catastrophic spending review in 35 low- and middle- income countries, which showed that people with diabetes are more likely to incur catastrophic expenditures than people without diabetes.(32) A study on injury in Vietnam confirms that catastrophic expenditures occurred in 27.5% of the households that had injured and hospitalized members.(84)

This study shows the need for immediate attention to protect households from catastrophic expenditure. Due to the high prevalence of catastrophic spending from chronic non-communicable diseases such as diabetes, policy-makers should urgently introduce life-style related interventions to prevent the future costs of disease

treatment in the urban areas of the country. Policies to increase coverage and depth

of financial protection are also required. However, designing an appropriate financial

protection mechanism may be difficult in extremely resource-poor settings such as

Nepal. Currently the Government of Nepal allocates 6% of its GDP to health.(85)

Although the annual economic growth rate is around 4.6%,(7) the total expenditure

on health is likely to gain only an additional 0.3% of GDP by 2015.(86) This means

that government expenditure on health is not likely to expand in the immediate future,

leaving little prospect for tax-based health financing. Social health insurance has

gained attention from policymakers recently as an alternative to tax-based health

financing, but it will not expand in the short-term given the small formal sector in the

country.(86)

One way to increase the fiscal space for financial protection is to use available

resources more efficiently,(52, 87) by reviewing existing provider payment

mechanisms. Currently free medical services including essential drugs are provided

at a district hospital and Primary Health Care centers located in the study site.(54,

88) However, our data suggest that in 60% of the illness episodes respondents in the

poorest quintile opted for private service providers or used both private and public

facilities. A systematic review in low- and middle-income countries reported that

public providers experience longer waiting time and lack of medical equipment and

drugs,(89) which could restrict access to public facilities. Such a discrepancy

suggests that a gap exists between the current financing system and health care

demand in the general population. Improving the management of public service

providers may provide a relatively low-cost mechanism for improving financial

protection amongst the poorest members of urban Nepalese society, by encouraging the use of public facilities.

These efforts will provide some opportunities to reduce the risk of healthcare-related financial catastrophe amongst the poorest members of Nepalese society, but the only effective means to prevent financial catastrophe is to move towards a broad-based risk-pooling mechanism and, ultimately, universal health coverage (UHC).(2, 3) The path to UHC differs for every society,(90) but our results give some indication of the first steps that Nepal can take along this path. Initial steps could include a phased introduction of risk-sharing systems: the government should expand the formal risk-pooling system in urban areas by introducing social health insurance that covers hospitalization and injury.(9, 91)

This study also found that the single preventable illness most strongly associated with catastrophic expenditure was injury. Currently drink-driving is banned nationwide, and the traffic police conduct regular breath tests among drivers in cities.(92) The Government of Nepal should consider intensifying injury-prevention programs in urban areas, through road safety measures that have been shown to be effective in other countries.(93) In the absence of a strong risk-pooling mechanism, injury is always likely to be associated with unexpected, very high costs, and the best alternative to broad-based risk-pooling is prevention. Further research is needed on the major causes of injury and effective interventions to reduce the risk of injury.

This study has several limitations. First, it was conducted between November 2011

and January 2012, which was in the middle of the winter season. We interviewed

households on disease episodes in the past 30 days, and a history of chronic illnesses

in the past 12 months. The seasonality of the survey time may have influenced the

disease prevalence of acute illnesses in the past 30 days. The self-reported prevalence

of chronic illnesses was verified by comparing 30 days' recall with 12 months' recall

results, and the prevalence was found to be consistent for common illnesses

including diabetes and hypertension. Other studies have also reported a consistent

prevalence of diabetes and hypertension in urban Nepal.(94, 95)

The second limitation is that our results are based on self-reported health spending.

In undertaking this study, we assumed that poor households might use coping

strategies to minimize medical costs, such as avoiding consultation with physicians,

skipping dosages or selecting cheaper medicines. Previous studies show that in the

case of chronic illnesses, non-adherence to prescribed medications is common.(96,

97) For this reason, we asked household members whether they have ever skipped a

dosage, delayed refilling their medicines, or reduced doses to minimize costs. Since

we were not able to quantify how much they have saved from such cost aversion, and

we may not have captured the economic burden precisely based on a proper

medication and treatment schedule.

Despite these limitations, this study shows the first comprehensive evidence that

catastrophic health payments are caused by several major NCDs and injury based on

a population-based survey. Identifying the economic burden of diseases, as

illustrated in this study, can help to prioritize the future health interventions that can

effectively protect households from impoverishment even in resource-limited settings.

3.5.Conclusion

Catastrophic spending is associated with the major NCDs such as diabetes and heart diseases, which indicates an urgent need to initiate life-style interventions to prevent future cost burden. Nepal's current health financing system needs further efficiency gain to achieve greater risk protection. This can be partly achieved by improvements in the management of public service providers. Nepal should expand risk-sharing mechanisms in the country through a phased introduction of social health insurance. Through combining efforts to prevent the growth of the major NCDs and injury, to improve the quality of public services, and to expand the risk-pooling mechanism, the Government of Nepal can begin the first steps to protecting the poorest in its population from financial catastrophe.

4. RISK FACTORS FOR DISTRESS FINANCING DUE TO OUT-OF-POCKET PAYMENTS IN URBAN NEPAL

4.1. Objective

This chapter aims to provide an in-depth understanding of the determinants for distress financing using a combination of parametric and non-parametric approaches. The determinants of distress financing are embedded in the episode, individual and household levels, and the determinants at one level are likely to influence those at another. This means that a single-level regression is not sufficient to measure the true effects on distress financing. A proper analysis of distress financing risks demands data and analysis methods that are suitable for multi-level models.(46) Thus, I will assess the factors associated with distress financing for healthcare using a multilevel Poisson regression model that controls for clustering effects at different levels.(98) Second, distress financing may occur under specific conditions within certain households or individuals, and for such hierarchical analyses, non-parametric approaches such as decision trees are better suited to understand the relationship between the determinants since it allows us to assess conditional dependence between those variables. I will investigate the hierarchy of the determinants using a decision tree model called Classification and Regression Tree (CART), which is a non-parametric method to illustrate the process of decision-making under specified conditions.

4.2. Methods

4.2.1. Analysis

Distress financing denotes any form of coping strategies that have a long-term impact on household welfare, including borrowing, taking loans, selling household assets, removing children from school, reducing food intake and seeking additional work to pay for healthcare treatment.(37, 40) This paper focuses on the incidence of distress financing due to chronic illnesses, defined as any medical conditions that lasted for more than 3 months during the past 12 months. Chronic episodes in the past 12 months were used in the analysis because the incidence of distress financing for the past 30 days including all morbidity was only 0.3%, which is too rare for the analysis. I adjusted the multilevel analysis for the sampling structure of the probability sample survey. STATA version 12.1 and R version 2.15.3 were used for the data analyses in this Chapter.

4.2.2. Poisson multilevel regression

I used a three-level Poisson random-effects regression model for the analysis of risk factors for distress financing. The event of distress financing due to high OOP payments may be clustered in households or individuals with certain characteristics, and it may bias the results since the predictors in one level are also nested in other levels. Multilevel models are suited for identifying the relevant predictors while controlling for such clustering effects.(46, 99) This analysis incorporated three levels: at the episode, at the individual, and at the household level. Variables used for the regression model included history of hospitalization in the past 12 months, disease type, age of the ill person, whether the illness afflicted the household head, sex of the ill person following Rahman et al..(100) I included treatment cost for the illness episode, as a study in

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Vietnam suggested that treatment cost was found to be an important predictor for distress financing.(41) Socioeconomic variables of the household such as education of the household head, ownership of the current residence, and household economic status were also included similar to previous studies.(37, 100) For household economic status, I used the natural log of the adult-equivalent consumption per month to adjust for the household size and the skewed distribution of consumption. I tested for collinearity in these variables and dropped one of the variables where collinearity was identified. The variables assessed as significant in the initial backward stepwise Poisson regression were included in the final three-level random-effects Poisson regression.

4.2.3. Classification tree analysis

Classification and Regression Tree (CART) analysis makes no assumptions about the probability distributions of the predictor variables. In conducting CART analysis, I chose a classification tree with binary recursive partitioning to predict distress financing.(101) CART, also known as binary recursive partitioning, is a non-parametric method that can assess predictors influencing an outcome without being biased by multi-collinearity and interactions between variables, and that does not assume any probability distribution of the covariates.(101, 102) CART is suited to assess the conditional probabilities of an event given different scenarios displayed in a decision tree structure.(103) In addition to its desirable distribution-free properties and robustness against collinearity, CART also provides a simple and intuitive output that is easy to understand in terms of a decision-making process. This makes it ideal for studying complex multi-variable problems in which conditional dependence between variables means that some factors only predict the outcome of interest when triggered

by events in other variables. A main shortcoming of CART is that the CART model is highly sensitive to small changes in the dataset, and for this reason, bootstrapping of samples is required.(102) CART analysis typically follows three steps: building of classification trees; tree pruning; and selection of optimal trees. Figure 3 describes the detailed flow chart of CART analysis.

Figure 2: Flow chart of CART analysis
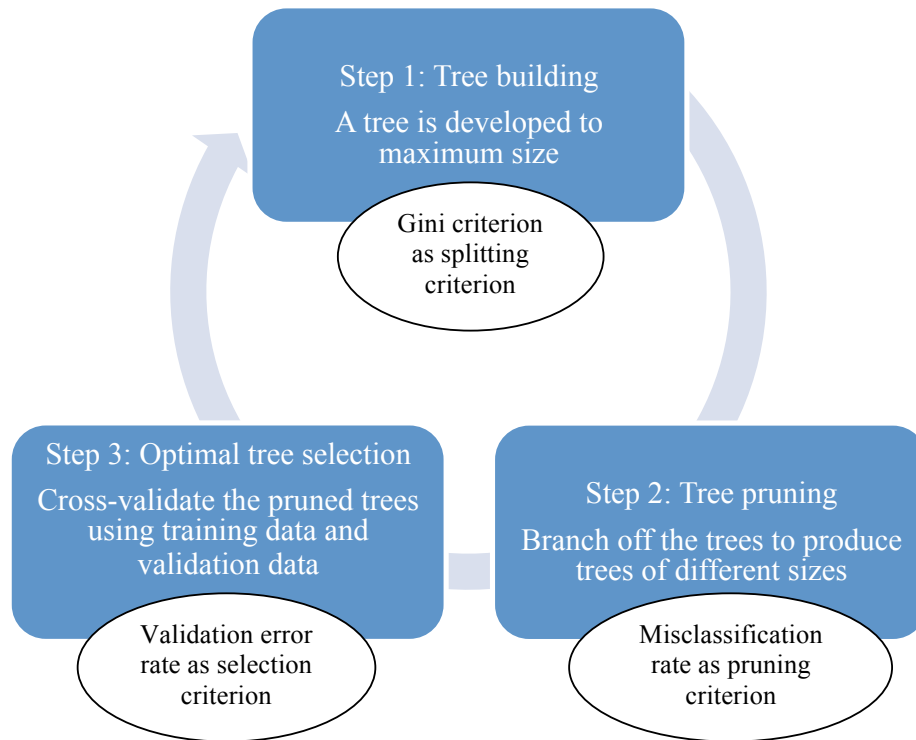
(Source: Merkle and Schaffer 2011)

First, trees are developed by identifying the 'best' splits of a predictor variable that distinguish different response categories of the outcome variable. A node in a tree denotes a sub-group of the data after being partitioned in the tree building process. A Gini criterion (101) is used to split different classes of the outcome variable in nodes, expressed as

$$i(t) = 1 - \sum_j p^2(j|t),$$

where $i(t)$ is the Gini criterion and $p(j|t)$ is the probability that an observation in node t is categorized in class j. The Gini criterion takes a minimum value of 0 when a node includes only j observations, or there is no class j in a node (perfect purity in a node). The criterion reaches its maximum of 0.5 when the proportion of the class j observations in node t is 50%.

For continuous response variables, the following objective function is used to measure the node impurity based on the sum of squared errors in a node (103):

$$i(t) = \sum_{i=1}^{n_t} \left(y_{i-} \overline{y}_t \right)^2$$

where n_t is the total number of observations in node t, and $\overline{y}_t$ is the mean of the observations in node t. The splitting point that best reduces the within-node sums of squares are selected for a continuous response variable.

At each node, CART splits the data into two nodes in a way that minimizes the Gini criterion, and continues to split the subsequent nodes in the same manner. Tree building stops when the classes in terminal nodes are all the same in a node (Gini criterion

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reaches zero), i.e. when the node contains only observations corresponding to a single outcome; or when the nodes reach the minimum number of cases allowed for splitting,(101, 103) i.e. division into further nodes becomes impossible. At this point the CART method will have produced a cascading series of decisions that either end in a set of observations that all have the same outcome, or in a set of observations that is too small to support further splitting.

The full-sized trees developed in the first step may be over-fitted, and they may not predict outcomes if applied to new datasets. In the second step, tree pruning produces trees of different sizes by repeatedly removing the branches that least improve the predictive capacity of a tree. Tree pruning cuts off the branches using a measure of misclassification rate, which denotes the proportion of non-j cases misclassified in class j (102) with the expression:

$$G(t) = \frac{R(T_{-t}) - R(T)}{d}$$

where T_{-t} denotes a tree after removing the branches stemming from node t that were originally included in the complete tree T. $R(T_{-t})$ is the misclassification rate for T_{-t}, $R(T)$ gives the misclassification rate of the tree T, and d is the difference in the number of terminal nodes (i.e. end nodes of a tree) in T_{-t} and T. $G(t)$ denotes the change in misclassification rate per additional terminal node. $G(t)$ is calculated for all non-terminal nodes in tree T, and the non-terminal node that has smallest change in misclassification rate is pruned along with sub-trees that branch off from the node. The same procedure is repeated for a new tree every time a sub-tree is pruned until no splits are left in the tree.(101, 103) This process yields a set of trees with different numbers of

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terminal nodes.

Since tree pruning yields multiple trees of different sizes with varying rates of classification accuracy, the optimal tree that best predicts the outcomes in a new dataset should be selected. In the third step, cross-validation selects the optimal tree out of the trees yielded from the pruning. In this step, the dataset is split into two groups; one consisting of k subsets of the data used for building k number of trees, each with different number of splits and terminal nodes (the training data); and another with k subsets of the data for testing how accurately the tree made using the training data classifies a new subset of data (the validation data).(103) In the data, k was set at 100 to ensure accuracy.(104) The tree that classifies the validation sets most accurately is chosen. A common rule is to select the tree with smallest number of sub-trees whose misclassification rate for validation data (validation error) lies within one standard error of the smallest validation error, which was also used in this paper.(101, 103, 105)

Since only a small fraction of episodes experienced distress financing, our data had a large class of non-distress financing and a small class of distress financing. Such imbalanced data considerably reduces prediction accuracy in classification trees.(106) For this reason, I applied random over-sampling of the small class and random under-sampling of the large class, which generates balanced samples of the majority and minority classes in a bootstrap-based sampling method.(107) Predictive validity of the classification tree was assessed using the ROC curves and the corresponding areas under the curve (AUC), which compares the prediction accuracy of the CART model using unbalanced data and the CART model constructed using random over-sampling of

the minority class (balanced data).(107) R version 2.15.3 with packages "rpart",

"rpart.plot" and "ROSE" were used for the CART analysis.

4.2.4. Variables

Table 12 shows the list of variables used in the random-effects Poisson regression

models and CART to predict the incidence of distress financing. Total medical costs

were calculated as the sum of hospitalization and outpatient costs, but 16% of the illness

episodes reported outpatient costs jointly for all episodes of care. Such jointly-reported

costs occurred when a person had more than one disease episode at a time and the

payment covered all morbidity treatment altogether. For this, I employed an OLS

regression model as suggested by Trogdon et al. (72) to estimate disease-specific costs,

the details of which are explained in section 2.9. CART analysis used a continuous

treatment cost to predict a monetary threshold for distress financing. For the

random-effects Poisson regression, treatment cost was grouped into three categories

(less than NRs. 6,000, NRs. 6,001 to NRs. 12,000, above NRs. 12,000). NRs. 6,000 was

the median and NRs. 12,000 was the mean of positive treatment cost respectively. One

US dollar is equivalent to 86 Nepalese rupees approximately.

Table 12: Variables used in the random-effects Poisson regression models and in CART

Variable	Note
Disease episode caused any distress financing to cover the treatment in the past 12 months including borrowing, loans, selling assets, seeking additional work, reducing food expenditures, or removing children from schools	1 = yes, 0 = no
Hospitalization in the past 12 months for the disease episode	1 = yes, 0 = no
Total treatment cost for the illness episode including hospitalization	0 = less than NRs. 6,000, 1 = NRs. 6,001 to 12,000, 2 = above NRs. 12,000; (CART: Continuous in Nepalese Rupees)
Disease type	0= NCDs, 1 = Communicable diseases, 2 = injury
Age of the ill person	Continuous
Disease episode occurred to household head	1 = yes, 0 = no
Sex of the ill person	1 = female, 0 = male
Education level of the household head	1 = secondary or higher (Class 6 and above), 0 = primary or lower (below Class 5)
Household own their current residence	1 = own home, 0 = rent/squatting/other
Household economic status by natural log of the monthly consumption per adult equivalent (CART used the crude monthly consumption per adult equivalent)	Continuous

4.3. Results

4.3.1. Self-reported chronic morbidity, healthcare costs and coping strategies

Overall, 1,977 chronic illness episodes were reported 12 months prior to the study, which resulted in 1.3 episodes of chronic illness on average per person. Table 13 and Figure 3 summarize the average and median OOP spending by chronic episode. Each

episode with positive expenditures cost NRs. 9,708 for outpatient care on average, NRs.

85,065 for inpatient care, and NRs. 7,387 for ayurvedic treatment. Other traditional

medicine cost NRs. 3,680 on average.

Table 13: Average and median OOP spending per episode of chronic illness with positive expenditure

Health services	Mean	Median
Outpatient (SE)	9,708 (686)	5,850
Inpatient costs (SE)	85,065 (16,436)	40,000
Ayurvedic (SE)	7,387 (2,531)	2,280
Other traditional medicine/healers (SE)	3,680 (1,441)	500
Transportation and other costs (SE)	1,611 (219)	500

Note: The denominator is the number of episodes reporting any positive expenditures for each type of health service in the past 12 months. Cost of traditional healers includes payments in cash and in kind. One US dollar is approximately 86 Nepalese rupees.

Figure 3: Distribution of OOP spending for chronic illness with positive expenditure, by type of health service
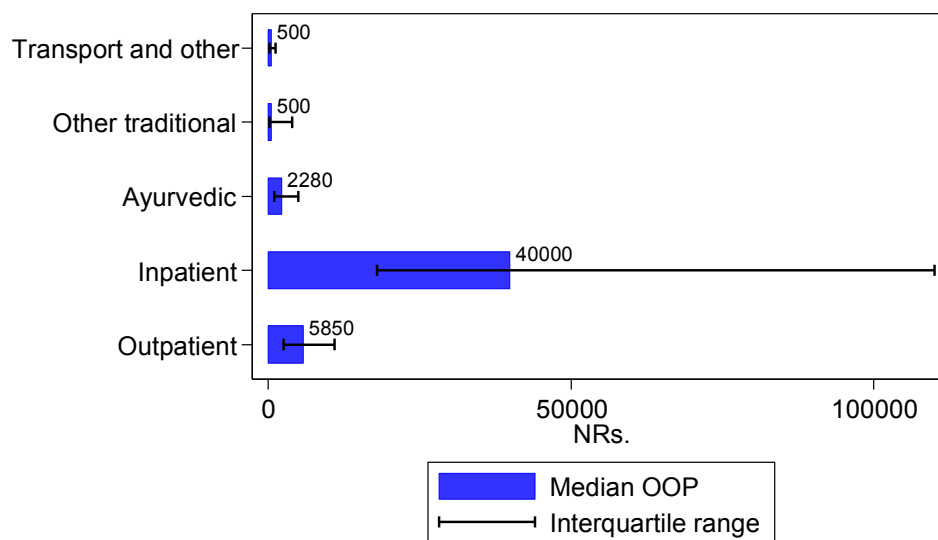
Note: The median and interquartile ranges illustrate the OOP expenditures by illness episode with none-zero, positive expenditure in the past 12 months. Cost of traditional healers includes payments in cash and in kind. One US dollar is approximately 86 Nepalese rupees.

Figure 4 shows the coping strategies that the households employed in the past 12 months. Of 1,997 households, 46.6% used income and 10.7% used savings to finance the OOP payments. Distress financing occurred in around 1.8% of the surveyed households (2.5% of the illness episodes), with 1.3% of households paying for healthcare costs from borrowing/loans and 0.5% of households from other means including selling assets, removing children from schools, reducing consumption and seeking additional work.

Figure 4: Coping strategies for treatment of chronic illnesses in the past 12 months
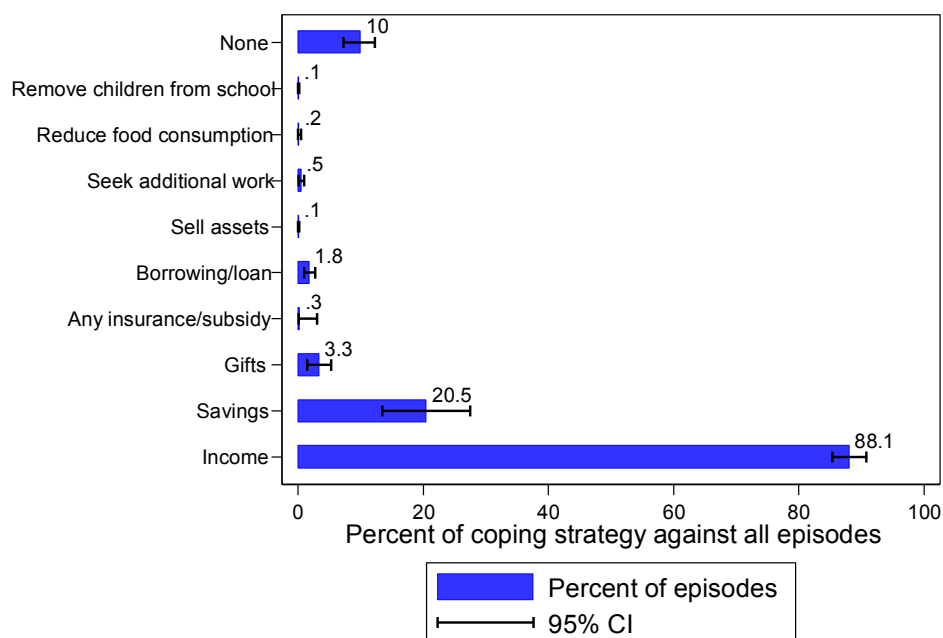
Note: The denominator is the total number of chronic illness episodes (N=1,977). Sample weights applied.

4.3.2. Risk factors for distress financing

Table 14 presents the results of three-level Poisson random-effects regression models. A likelihood-ratio (LR) test between the multilevel model and a single level Poisson regression model without random effects was statistically significant (LR chi-squared (2) = 264.7, p<0.001), indicating that controlling for random effects is required.

Table 14: Risk factors for distress financing due to chronic conditions in the past 12 months using multilevel Poisson regression

Risk factors	Weighted incidence of distress financing (%)	Adjusted Rate Ratio (95% CI)	P-value
Episode-level variables			
Hospitalization in the past 12 months			
No	1.5	1.0	
Yes	28.7	8.2 (4.7 - 14.5)	<0.001
Treatment cost			
Less than NRs. 6,000	0.5	1.0	
NRs. 6,001 - 12,000	2.4	5.7 (2.3 - 14.2)	<0.001
Above NRs. 12,000	8.5	9.2 (3.4 - 24.4)	<0.001
Disease type			
NCDs	2.2	1.0	
Communicable diseases	5.0	2.2 (0.5 - 9.0)	0.291
Injury	18.6	4.7 (1.8 - 12.1)	0.001
Household-level variables			
Ownership of residence			
Renter/squatting/provided free	3.9	1.0	
Own home	1.7	0.3 (0.1 - 0.5)	<0.001
Education of household head			
Primary or lower (Below Class 5)	4.1	1.0	
Secondary or higher (Class 6 and above)	1.1	0.2 (0.1 - 0.4)	<0.001
Constant		0.0 (0.0 - 0.0)	<0.001
No. of observations		1977	
Individual-level variance (covariance)		0.0	(0.0)
Household-level variance (covariance)		1.5	(-0.9)

Note: Three-level structure include episode (level 1), individual (level 2), and household (level 3). Sample weights applied. Sex, age, household head and household economic status were removed in the initial backward stepwise regression (p>0.05).

The event of hospitalization was found to be the strongest risk factor for distress financing (RR: 8.2, 95%CI: 4.7 – 14.5, p<0.001). Episodes with treatment costs above NRs. 6,000 showed higher risk of distress financing (RR: 5.7, 95%CI: 2.3 - 14.2, p<0.001), and even higher risk if the treatment cost exceeded NRs. 12,000 (RR: 9.2, 95%CI: 3.4 – 24.4, p<0.001). Injury also showed a higher risk of distress financing compared to NCDs (RR: 4.7, 95%CI: 1.8 – 12.1, p<0.01). At the household level, owner-resident households were at a lower risk of distress financing (RR: 0.3, 95%CI: 0.1-0.5, p<0.01). Also, the education of the household head was found to be an important predictor, with heads above secondary or higher education showing significantly lower risk of distress financing (RR: 0.2, 95%CI: 0.1 – 0.4, p<0.001). Individual effects such as age and sex, and household economic status were not significant risk factors for distress financing.

4.3.3. Predictors for distress financing from CART analysis

Figure 5 shows the results of the classification tree with predictors for distress financing selected by the model using the balanced data. The classification tree initially split at treatment cost, with chronic annual illnesses costing under NRs. 5,424 having considerably smaller chance of distress financing. CART further classified the probability of distress financing by age, and showed that if the person is aged under 52 years old, the chance of distress financing is predicted to be 0.83. For those above 52 years old, if the monthly household consumption per adult equivalent was below NRs. 9,817 illness episodes with treatment costs above NRs. 9,734 a year will have a higher chance of falling into distress financing (0.76). In CART analysis, total treatment cost had more weight in determining the probability of distress financing in the classification

tree than any other factors.

Figure 5: Classification tree predicting distress financing due to chronic conditions in the past 12 months on balanced data (N=1,977)
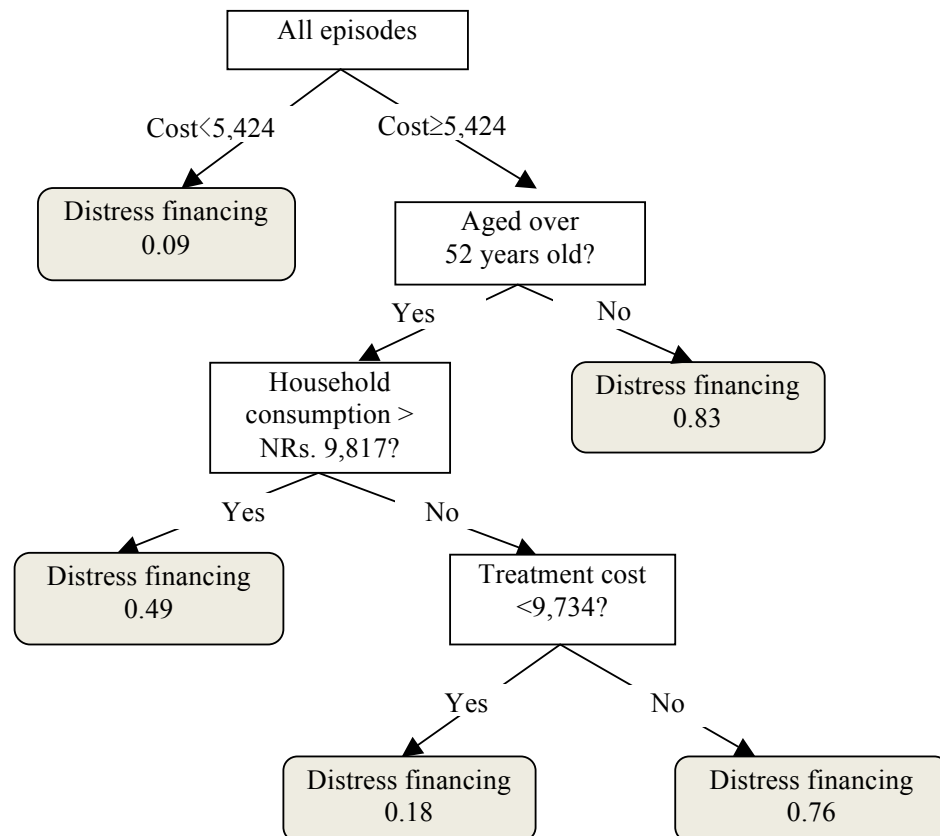
Table 15 provides the overall fit of the model based on the classification error of the tree. The table describes the smallest tree with no splits and the largest tree with 11 splits.

Table 15: Classification errors based on the balanced data

G(t)	Number of splits	Training error	Validation error	SE(validation error)
0.502	0	1.000	1.024	0.023
0.079	1	0.498	0.498	0.020
0.049	3	0.340	0.340	0.017
0.015	4*	0.291	0.291	0.016
0.011	7	0.239	0.277	0.016
0.010	8	0.228	0.280	0.016

The first column is the change in misclassification rate per additional terminal node, and the second column is the number of splits in each tree. The third column denotes the classification error rate of each tree's prediction on the training data compared to the tree with zero splits. The fourth column shows the error rate of each tree's predictions on the validation data compared to the tree with zero splits. The fifth column displays the standard error of the classification error rate on the validation data. The optimal tree size on the balanced data is four splits (denoted by an asterisk in Table 14), with cross-validation error lying within one standard error of the smallest cross-validation error (0.277).

Figure 6 presents ROC curves comparing the predictive accuracy of the classification tree for the unbalanced data and the balanced data. Since the decision tree is classified at one point (yes or no), and does not involve thresholds at different values, only a single ROC point appears in the ROC area.(108)

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Figure 6: ROC curves for predictive validity of classification tree using imbalanced and balanced data
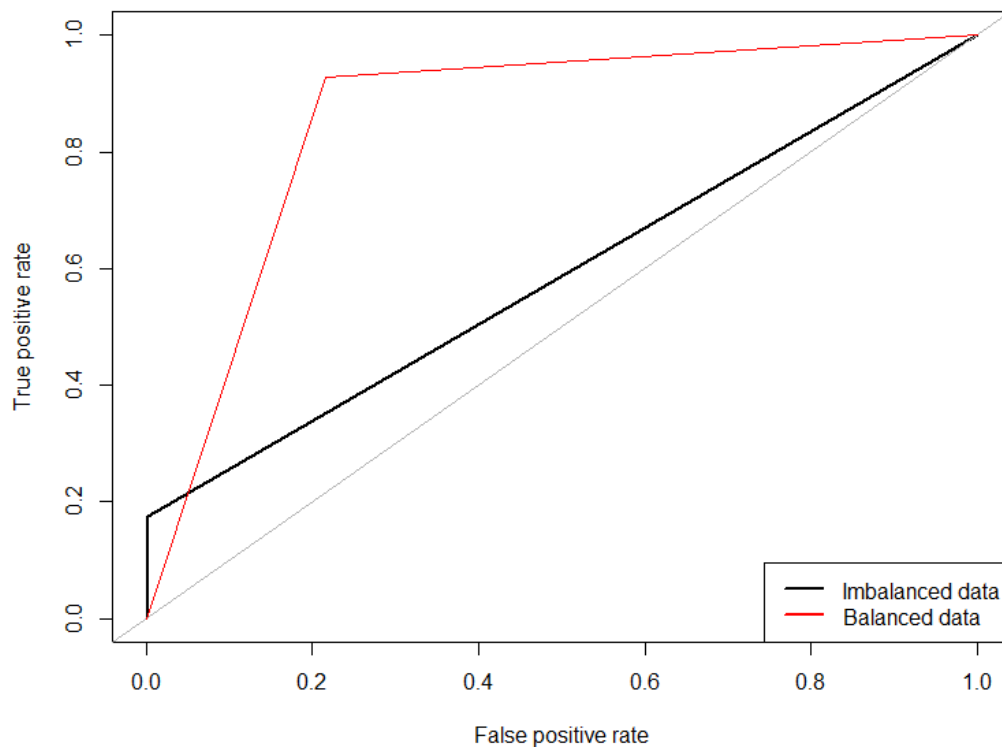
The ROC analysis based on the predicted probabilities yielded by the classification tree resulted in AUC 0.59 for the imbalanced data without over-sampling or under-sampling, and the balanced data after random over-sampling showed considerable improvement in the predictive accuracy with AUC 0.86.

4.4. Discussion

The three-level Poisson random effects model suggests that hospitalization, total treatment costs, having injury/communicable diseases, ownership of the residence and the education level of the household head are found to be the factors associated

with the incidence of distress financing. CART predicts the pathways in which the distress financing occurs among the study population otherwise. The factor that predicts high probability of distress financing is whether the illness episode involved treatment costs higher than NRs. 5,424. Among those who are older than 52 years, monthly household consumption below NRs. 9,817 per adult equivalent, combined with the annual treatment cost above NRs. 9,734 is likely to incur borrowing, taking loans or other severe form of financing. The results derived from the three-level Poisson random effects model and CART analysis complement each other. The Poisson random effects model was used to identify the risk factors for distress financing with statistical significance. Monthly household consumption may have appeared as an important predictor in CART but not in the Poisson random effects model because CART can produce hierarchical relationships by showing complex interaction terms between variables, which is not possible with standard regression modeling procedures. On the other hand, such a hierarchical structure cannot be illustrated in regression models. Of all the risk factors identified, CART shows that the total treatment cost is the major predictor for distress financing, and that for people aged over 52 years old, household economic status may play a major role.

The multilevel Poisson regression analysis suggests that episodes that cost above NRs. 6,000 tend to have higher risk of borrowing, taking loans, selling assets etc. after adjusting for other covariates. CART further confirmed that the episodes with treatment cost above NRs. 5,424 are at higher risk, including the episodes with outpatient and inpatient care. A study in rural Vietnam concurs with the results, finding that financing from loans, borrowing and reducing consumption increases if

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the total treatment costs fall in the upper 50% of the cost distribution.(84) Due to a lack of any public health insurance scheme in Nepal, households have no mechanism for mitigating the risk from high OOP spending other than their own income or savings. A household experiencing high healthcare costs exceeding the threshold, therefore, has a high risk of falling into chronic insecurity.

This study also demonstrates that hospitalization is strongly associated with the incidence of distress financing. Hospitalization often occurs unexpectedly and imposes a heavy cost burden, whereas households with regular outpatient treatment for chronic illnesses may be able to contain treatment costs within their regular income and savings, and/or to control the timing of hospitalization to fit household budget strategies. A study in 15 African countries on OOP spending agrees with the results, finding that families with inpatient care tended to experience more distress financing than outpatient treatment.(37) Second, chronic illness episodes with injury are more likely to cause distress financing than chronic non-communicable diseases. This could be because predicting treatment costs for injury is not usually possible, while non-communicable disease may have more predictable and manageable costs.

At a household level, the analyses show that insecure home ownership is significantly associated with risk of distress financing. Households that do not possess their residence (i.e. renter, squatting and other types) are at a higher risk of borrowing, taking loans or other means of extreme financing. Home-renters are not rare in urban Nepal; according to the national population census in 2011, 40% of households in urban areas live in rented houses, while around 59% of households are

renting their residence in Kathmandu District where Kathmandu and Kirtipur municipalities are located.(109) The importance of home ownership is that it indicates a part of the asset wealth in households.(110, 111) Moser (2006; 2008) argues that households with physical capital (i.e. housing) are better equipped with the capacity for asset accumulation over time, and they tend to have stronger resilience to sudden financial shocks.(111, 112) As previous studies suggest, means-testing for health subsidies for the poor is not effective and administratively complex in developing nations,(113) and a simple criteria such as home ownership may offer a better alternative for fee-exemption schemes.

Better education of the household head was found to be protective against distress financing after adjusting for other covariates. The results suggest that if the household heads had received secondary or higher education, the risk of distress financing reduces by 80%. Previous studies in 15 African countries (37) corroborate the finding that better-educated household heads are less likely to borrow money to pay for the cost of medical care. Also, a study in India has shown that households with educated heads tend to finance the hospitalization costs only from income.(114) The effects of education could be explained in a way that the educated heads tend to have better social capital to draw on for health payments,(37) or they are able to cope with sudden contingencies.(112) This reinforces the importance of promoting post-primary education of the general population, and shows the indirect benefits of post-primary education through reduction of the catastrophic consequences of health costs.

This study shows an urgent need for action for effective financial protection mechanisms in urban Nepal. Although the current public health subsidy in Nepal aims to safeguard people from catastrophic consequences of health costs, its protective effects are invisible. Presently, the Government of Nepal supports major selected diseases to a value of up to NRs. 50,000, but the subsidy is limited to severe NCDs such as heart diseases, cancers, kidney and other diseases, and no subsidiary schemes exist to cover injury or hospitalization. This is inconsistent with my findings that injury and hospitalization are most likely to induce distress financing and long-term economic insecurity. Insurance for accidental injury has been offered by a few private insurance companies only for the wealthier strata of the urban population. To ensure protection from extreme spending, the government should consider a social health insurance scheme for injury and hospitalization cases in urban areas, starting from employees of the public sector. If such insurance were to be implemented, the copayment by households should ideally remain below NRs. 5,500 for chronic illnesses per year. However, a longer-term strategy for financial protection should aim to move towards a broader risk-pooling system, and universal health coverage. Sustainability of SHI and of the national health system depends on how far the medical scheme can expand enrollment rates while providing a sufficient benefit package. The government should establish a regulatory framework to ensure that health insurance schemes cover a minimum set of service benefits for all members, thereby allowing effective risk-pooling.(20) Concurrently the Government of Nepal should intensify injury-prevention programs in urban areas, such as road safety measures that have been shown to be effective in other countries.(93)

This study has several limitations. Due to the limited sample size for specific disease types, I was not able to quantify thresholds for distress financing for each single disease. A similar exercise using a nationally-representative study with larger sample size will be useful to identify the thresholds for major illness episodes, which will help establish more effective financial protection schemes in the country. To date, no such attempt has been made in any country. The second limitation is that the results are based on self-reported OOP spending. Poor households may minimize treatment costs by avoiding consultation with physicians, skipping dosages or taking cheaper medicines. In the case of chronic illnesses, non-adherence to prescribed medications is common.(96, 97) For this reason, I asked household members whether they have ever skipped a dosage, delayed refilling their medicines, or reduced doses to minimize the costs in the interview. The results obtained from these questions were not reliable since the interview respondents were often not the sick person themselves.

4.5. Conclusion

Using a combination of multilevel Poisson regression and classification and regression trees, the results of the analyses show that the event of hospitalization, ownership of the residence, total treatment costs, the education level of the household head and having injury are risk factors for distress financing. High incidence of distress financing leading to chronic impoverishment suggests that the financial protection mechanism in the country falls short both in depth and in coverage. The Government of Nepal should consider introducing social health insurance, starting with hospitalization and injuries, with the government

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underwriting a minimum benefit package, including a copayment rate that effectively

prevents impoverishment. Future research should aim to identify the copayment

threshold for distress financing separately for major illnesses. By doing so

policy-makers can design an insurance scheme that effectively provides financial

protection, while ensuring sustainability of the health financing system.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Summary

First, this thesis shows that 13.8% of the households in urban areas of Nepal face catastrophic OOP spending, and that the incidence and intensity of catastrophic spending is concentrated among the poor. The prevalence of catastrophic OOP spending is higher than most south Asian countries, such as Bangladesh (13.0%), India (8.4%) or Sri Lanka (8.9%),(24) and higher than urban areas of Bangaldesh (9%).(115) Descriptive analysis of disease-specific OOP expenditure suggests that hypertension, cold/cough/fever and diabetes were the three common diseases that amount to catastrophic spending. After adjusting for household consumption quintile and other factors, hypertension and cold/cough/fever were no longer significantly associated with catastrophic spending. Importantly, this thesis demonstrates that the more serious diseases are independently associated with catastrophic spending even after adjusting for household consumption, indicating that their impoverishing effects span all social strata in urban Nepal. Major chronic non-communicable diseases such as diabetes, asthma, gastritis/peptic ulcer, arthritis and heart diseases were found to increase the risk of catastrophic expenditure in addition to injury.

The relationship between catastrophic expenditure and diabetes was found in a diabetes-related catastrophic spending review in 35 low- and middle- income countries, which showed that people with diabetes are more likely to incur catastrophic expenditures than people without diabetes.(32) A study on injury in

Vietnam also corroborates our finding that catastrophic expenditures occurred in 27.5% of the households that had injured and hospitalized members.(84)

Second, this thesis illustrated that 2.5% of chronic illness episodes caused distress financing, the most severe form of coping strategy for financing healthcare costs. The incidence of distress financing is lower compared to 15 African countries (37) and urban Bangladesh.(100) The event of hospitalization, home ownership, total treatment costs above the median cost (NRs. 6,000, approximately 70 US dollars at the current exchange rate), the education level of the household head and having injury were the risk factors for distress financing. Among these factors, CART analysis predicts that the most important factor for distress financing is whether the treatment cost exceeded NRs. 5,424 (approximately 63 US dollars at the current exchange rate). Further, among the illnesses that cost above NRs. 9,734 (approximately 113 US dollars at the current exchange rate) for people below 52 years old, the risk of distress financing increases in poor households. A study from rural Vietnam agrees the finding that financing from loans, borrowing and reducing consumption increases if the total treatment costs fall in the upper 50% of the cost distribution.(84)

The major findings from the present study—high incidence of catastrophic OOP spending and distress financing—suggest that existing financial protection mechanisms in urban Nepal fall considerably short both in depth and in coverage, as demonstrated in a study on catastrophic payments from 14 Asian countries.(24)

Despite current public health subsidies in the country that aim to safeguard people from poverty and destitution due to medical costs, too few cases benefit from such subsidies. The subsequent sections will discuss policy recommendations for health financing in urban Nepal.

5.2. Expanding financial risk protection: social health insurance and voluntary insurance plans

As a policy priority for the urban population of Nepal, effort should be directed to moving towards a broad-based risk-pooling mechanism and, ultimately, universal health coverage (UHC). Introduction of a financial protection mechanism in extremely resource-poor settings such as Nepal may be challenging due to a lack of available resources. Given the limited fiscal space for the health sector, a rapid increase in health expenditure is not likely to occur in the short term. As a politically feasible alternative to the sudden introduction of UHC within this limited fiscal space, initial steps could include a phased introduction of social health insurance as an alternative to tax-based health financing, starting from hospitalization and injuries among the formal sector employees in urban areas. Introducing SHI can follow initial steps as follows:

- Agree on mandatory contributions by formal sector, including civil servants and private sector employees in urban areas,
- Establish benefit package and provider payment mechanisms under SHI, which cover hospitalization and injuries, with sufficient depth of insurance coverage to reduce the major financial implications,

- Expand the coverage of SHI to major NCDs and other illnesses in the long term,

- Establish a regulatory framework in ways which the health insurance schemes – either SHI, voluntary or CBHIs- cover a minimum set of service benefits for all members, thereby ensuring effective risk-pooling.(20)

Although the number of formal sector employees is limited in Nepal, the SHI can expand gradually from this base to cover family members and dependents in future, and then be extended to all private sector staff as the system matures.

5.3. Strengthening public sector management

This thesis illustrated heavy utilization of private healthcare providers in urban Nepal (64% of all disease episodes in the past 30 days), and the same propensity is manifested among the households in the poorest quintile (60% of all disease episodes). Heavy preference of private providers even among the poorest households suggests that free primary healthcare services at public providers are underutilized. A systematic review in low- and middle-income countries attributes this to failure in public service provision, that public providers experience longer waiting time and lack of medical equipment and drugs.(89) Improving the management of public service providers may provide a relatively low-cost mechanism for improving financial protection amongst the poorest members of the urban Nepalese society, by encouraging the use of public facilities. Improved and cost-effective management of public facilities will enable existing healthcare funds to be better targeted to those most in need of financial protection.

5.4. Disease prevention and management

My study found that catastrophic spending was more likely to occur among people with chronic non-communicable diseases such as diabetes and heart diseases in urban settings. An important aspect of reducing the economic burden due to disease is life-style related interventions to prevent the onset of the diseases and further complications associated with them. Such interventions should include population-wide education for healthy diet, importance of regular exercise, reduction of smoking and alcohol consumption and regular health check-ups at primary healthcare facilities. Currently the Government of Nepal bans tobacco and alcohol advertisements in the media since 1996, combined with a tax levy on tobacco and alcohol products. Physical exercise including yoga and sports has been promoted by NGOs and the mass media.(116) Prevention of NCDs through such life-style interventions may also reduce disease burden especially among the poor and socially disadvantaged groups, for those who have less access to timely diagnosis and treatment of non-communicable diseases.(117) Despite few evaluations of socioeconomic inequality and preventive interventions, a systematic review of population-level tobacco control showed that raising tobacco prices was more effective at reducing consumption in low-income groups and people in manual labour.(118)

While NCDs constitute the major economic burden on households in urban Nepal, management of NCDs with equitable access to effective treatment should be a

primary goal for policy-makers. As drug purchases are primarily financed by out-of-pocket payments in low-income countries, pricing policy reform in the pharmaceutical industry should be established. Such reform should set different prices depending on the insurance plans or socioeconomic status of the patients; for instance, charging higher prices for wealthier patients receiving treatment in private clinics or those who are covered by private insurance, while offering a discounted rate at public facilities and for low-income households.(119) Such pricing policy will benefit both the urban and the rural population.

This study also found that the preventable illness most strongly associated with catastrophic expenditure and distress financing was injury in urban areas. Drink-driving is banned nationwide, and the traffic police conduct regular breath tests among drivers in cities.(92) The Government of Nepal should consider intensifying injury-prevention programs in urban municipalities, through road and workplace safety measures such as speed limits (93) and effective implementation of traffic signals in main roads. Without a risk-protection mechanism, injury is always likely to be associated with unexpected and lumpy expenditure, and the best alternative to broad-based risk-pooling is prevention.

5.5. Recommendations for future research

This thesis assessed the economic burden of common illnesses in urban Nepal and the risk factors for catastrophic spending and distress financing. In this study I identified gaps in knowledge about health financing and health systems in Nepal, and on the

basis of these findings I am able to make recommendations to improve the assessment of financial protection nationally and globally.

First, future studies should aim to assess how far the population is benefiting from government health expenditure directed to both the public sector and the private sector. Such assessment should compare the public budget allocation with actual utilization rates and the benefits incurred by using healthcare among the general population by sector and by types of diseases, to illustrate major efficiency gaps and areas for further investment.

Second, better methods for measurement of indirect costs should be explored in developing country settings. Estimation of income lost due to illnesses and/or care-giving for ill people sometimes leads to a fall in household consumption levels. This study attempted to incorporate questions on the indirect costs of illness, but the pilot test in Lalitpur found that the majority of individuals were not on a regular payroll, and thus unable to report lost salaries. Indirect costs are indispensably important for chronic conditions that induce long-term income depletion, and they should be considered in the cost analysis. Incorporating transportation costs and time spent on travel may be useful in future studies, as they constitute major cost burdens in rural areas.

Third, measurement of cost-related medication non-adherence should be tailored for developing countries. Non-adherence to prescribed medication is common for

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reducing treatment costs, which considerably underestimates the level of OOP spending, in addition to its detrimental effects on health outcome. However, it was extremely difficult to collect information on the precise dosage and the types of drugs being taken. A better estimation technique for such cost aversion should be established that is suitable for population-based surveys in developing countries, such as adopting diary methods for recording medication and intake, similar to the ones used for keeping food consumption records.

Health financing with adequate risk protection is a universal goal in all countries. This study has shown the limitations of the current health system in Nepal, and potential for future reform. By incorporating the recommendations and steps suggested here, combined with a strong commitment by policy–makers to build a strong regulatory framework in health sector, the people of Nepal can move toward enjoying the benefits of financial protection and improved health.

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APPENDIX 1: Study Questionnaire (English)

Disease-specific out-of-pocket expenditure on health care and coping strategies for health care costs in Kathmandu Valley, Nepal

Questionnaire

Identification	
HH0. NAME AND CODE OF DISTRICT_____	☐☐
HH1. NAME AND CODE OF VILLAGE/MUNICIPALITY _____	☐☐☐
HH2. WARD NUMBER...…………………………………………………………..	☐☐
HH3. CLUSTER NUMBER.………………………………………………………...	☐☐☐
HH4. HOUSEHOLD NUMBER.…………………………………………………....	☐☐
HH5. URBAN/RURAL.……………………………………………………………... (URBAN=1, RURAL=2)	☐
HH6. RESPONDENT'S NAME AND LINE NUMBER (Copy from HL1)	
1. _____ ☐☐	
2. _____ ☐☐	
3. _____ ☐☐	
4. _____ ☐☐	
5. _____ ☐☐	

INTERVIEWER VISITS				
	1	2	3	FINAL VISIT
HH7. DATE OF INVERVIEW				
HH8. NAME & CODE OF INTERVIEWERS				
HH9. RESULT CODE*				
HH10. NEXT VISIT: DATE				TOTAL NO. OF VISITS
HH11. TIME				☐

*RESULT CODES:
>   1   COMPLETED
>   2   NOT AT HOME
>   3   POSTPONED
>   4   REFUSED
>   5   DWELLING NOT FOUND
>   6   OTHER_____
>   (SPECIFY)

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME_____ ☐☐ DATE _____	NAME_____ ☐☐ DATE _____	NAME_____ ☐☐ DATE _____

Informed consent

(Please read to respondent before asking any questions for the interview)

Research Title: Disease-specific out-of-pocket expenditure on health care and coping strategies for health care costs in Kathmandu Valley, Nepal

My name is ....…….. I am representing the University of Tokyo in Japan and the Tribhuvan University Teaching Hospital.

The purpose of this study is to understand the most common diseases that are associated with high treatment costs so that a solution can be found for the problem. The information from this survey will help the Government of Nepal to formulate health policies to tackle the problem by implementing disease prevention programs or improving the health system. Although there might not be an immediate benefit in participating in this survey, the information you provide is very helpful for health policy planning and has the potential to provide ideas to improve the current situation of health care in Nepal. In this regard I would like to ask you some questions about your experiences.

There is no possible risk if you agree to participate in this interview, although some of the questions are personal and may make you feel uncomfortable. However, all the information that you give to me will be kept strictly confidential; Your name will not be used and you will not be identified in any way. This study has been approved by the ethical review committee at The University of Tokyo and the Nepal Health Research Council. This research is funded by "Organized Overseas Program for Young Researchers" Grant at the University of Tokyo. As a gratitude, we will give you soap at the end of the interview. This interview may take approximately 15 to 60 minutes to complete. Your participation is absolutely voluntary and there is no penalty for refusing to take part. You are free to ask any questions. You may refuse to be in this interview process, refuse to answer any question in the interview; and stop the interview at any point.

You may ask any question about the study at this time and if you have further questions about this study, please do not hesitate to contact.

Professor

Internal Medicine Department

Faculty of Medicine

Tribhuvan University Teaching Hospital

Assistant Professor

Department of Global Health Policy

Graduate School of Medicine, The University of Tokyo

If you agree to participate in this study, please write the date and your name below.

Signature:_____   Date: _____

RECORD THE TIME INTERVIEW STARTED: ☐☐ Hour   ☐☐ Minute

SECTION 1: HOUSEHOLD ROSTER

HL1 Line No.	HL2 Usual residents	HL3 Relationship to head of household	HL4 Sex	HL5 Age	HL6 Education		HL7 Religion	HL8 Marital status	HL9 Occupation
CODE	Please give me the names of the people with whom you usually sleep and eat **starting with the head of the household.**	What is the relationship of (NAME) to the head of the household? *REFER TO CODE BELOW*	Is (NAME) male or female? 1=Male 2=Female	How old is (NAME)? *WRITE IN YEARS IF AGE LESS THAN 1 YEAR WRITE 00*	What is the highest Class in education that (NAME) completed at current age? CLASS 01=Never attended school 02=Less than 1 year completed 03=Class 1 04=Class 2 05=Class 3 06=Class 4 07=Class 5 08=Class 6 09=Class 7 10=Class 8	11=Class 9 12=Class 10 13=Not completed college 14=Completed college 15=Bachelor's/degree not completed 16=Bachelor's /degree completed/higher 17=DK	*IF AGE IS 10 YEARS OR OLDER* What is (NAME's) religion? 1=Hinduism 2=Buddhism 3=Islam 4=Kirat 5=Christianity 6=Other	What is (NAME's) marital status? 1=Never-married 2=Currently married 3=Divorced 4=Separated 5=Widowed	What is NAME's main occupation? What kind of work does NAME mainly do? **REFER TO CODE BELOW**
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									

*Relationship to head of household

01=Head 02=Wife or husband 03=Son or daughter 04=son-in-law or daughter-in-law 05=Grandchild 06=Parent 07=Parent-in-law 08=Brother or sister 09=Other relative 10=Adopted/fostered/stepchild 11=Not related 12=DK

**What is NAME's main occupation? What kind of work does NAME mainly do?

01=Household work 02=Govt. job 03=NGO job 04=Business 05=Teacher 06=Professional (Doctor/Engineer/Advocate) 07=Agriculture works 08=Garments Worker 09=Handicrafts 10=Poultry/cattle raising 11=Skilled Laborer 12=Unskilled Laborer 13=Driver 14=Student 15=Beggar 16=Old/Disabled 17=Military service 18=Rickshaw/van puller 19=Fisherman 20=Retired 21=House help/ Maid 22=Unemployed 23= Other (Specify)

SECTION 2: HOUSEHOLD EXPENDITURE INFORMATION

Code	Questions	Answers	
	Now, we would like ask you about household expenditure. For past 30 days, please refer to a normal one month period without any special expenditure for festivals, weddings, or funerals. ***WRITE IN RUPEES. IF NONE WRITE ZERO. WRITE DK IF DOES NOT KNOW. DO NOT LEAVE ANY PART BLANK.***		
HE1	**Food Expenditure**	**Past 30 days**	**Past 12 months**
	A. How much money did your household spend on food bought from outside? (e.g. rice, beans, cooking oil. vegetable, meat etc.)		
	B. Did your household consume food that was grown or produced by your household? If so, how much would your household have spent in the market to buy this quantity of food?		
	C. What is the total value of food consumed that your household received in-kind (gift, donation or wages for work, etc.)?		
HE2	**How much money did your household spend on:**	**Past 30 days**	**Past 12 months**
	A. Education		
	B. Clothes and footwear		
	C. Personal care items (soap, shampoo, toothpaste, cosmetics, haircuts and the like)		
	D. Household items (laundry soap, cleaning items, anti-mosquitoes and the like)		
	E. Water and sewage		
	F. Electricity		
	G. Fuels		
	H. Transport		
	I. Telecommunication fees		
	J. Garbage disposal		
	K. Health care and treatment costs		
	L. Socializing and recreation (except funerals, dowries and weddings)		
	M. Loan repayment		
	N. Other (Specify)		
HE3	What is the money value of the amount received in-kind (gift, donation or wages for work, etc.) by your household for:	**Past 30 days**	**Past 12 months**
	A. Clothes and footwear		
	B. Personal care items (soap, shampoo, toothpaste, cosmetics, haircuts and the like)		
	C. Household items (laundry soap, cleaning items, anti-mosquitoes and the like)		
HE4	Is this dwelling yours?	Yes ....1 >> ***GO TO HE7*** No 2	
HE5	What is your present occupancy status?	Renter .... 1 Provided free of charge by relatives or landlord or employer......................2 >> ***GO TO HE7*** Squatting ....3>>***GO TO HE7*** Other ....4>>***GO TO HE7***	
HE6	What is the rent per month? (cash plus value of in-kind payments) ***RECORD IN RUPEES***	NRs. >> ***GO TO NEXT PAGE (SECTION 3)***	
HE7	If someone wanted to rent this dwelling (only the unit occupied by the household) today, how much money would they have to	NRs.	

	pay each month? *RECORD IN RUPEES*	

SECTION 3: HOUSEHOLD EPISODES OF ILLNESSES

Now we will ask you about illness episodes among household members. Please consider multiple medical treatments for the same disease as one episode. For example, if a child went to a clinic for asthma and then again after two days for a follow up visit, those two clinic visits will be considered as one episode of illness.

USE SEPARATE LINES FOR EACH DISEASE EPISODE (DIAGNOSIS) IF SAME PERSON HAD MORE THAN ONE DISEASE EPISODE. YOU MAY USE DITTO FOR NAME AND HOUSEHOLD LINE NIMBER.

HD1. Has anybody (including children) in the household suffered from any illnesses or injuries or delivered a baby in the **past 30 days?**   **1. YES**   **2. NO >> GO TO HD7**

Who became become sick, had delivered or was injured in the **PAST 30 DAYS**? If sick or injured, or had complications associated with delivery, what was the diagnosis?
WRITE "NORMAL DELIVERY" IN HD5 FOR DELIVERY WITHOUT COMPLICATION AND LEAVE HD6 BLANK.

HD2	HD3	HD4	HD5	HD6		
Code	Name	Household Line Number	Diagnosis (if available) or main symptom *SEE CODE 1*	Duration of illness		
				Years	Months	Days
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						

HD7. Has anybody (including children) in the household suffered any chronic diseases (including those due to injury) in the **past 12 months**? Chronic disease refers to a disease that lasts for **more than 3 months**.
1. YES   2.   NO >>*GO TO NEXT PAGE (SECTION 4)*
Who and what chronic diseases did they suffer from in the **PAST 12 MONTHS**?

HD8	HD9	HD10	HD11	HD12		
Code	Name	Household Line Number	Diagnosis (if available) or main symptom *SEE CODE 1*	Duration of illness		
				Years	Months	Days
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						

SECTION 4: HEALTH PROBLEMS AND CARE SEEKING BEHAVIOUR (PAST 30 DAYS ALL MORBIDITY)

INTERVIEWERS: CHECK HD1 AND IF THE ANSWER IS "YES", COMPLETE THE SECTIONS 4, 5, 6, AND 7. IF THE ANSWER IS "NO", GO TO SECTION 8.

HA1	HA2	HA3	HA4	HA5				HA6	HA7	HA8		
Episode of illness	Name **COPY FROM HD3**	Household Line Number **COPY FROM HD4**	Diagnosis **COPY FROM HD5**	Where did NAME seek care for this illness in the past 30 days? Please answer in the order that NAME visited. If illness had started more than 30 days ago, then start from where NAME went 30 days ago. Please include allopathic medicine, ayurveda, homeopathy, traditional healers and home remedy. *FOR NORMAL DELIVERY, RECORD PLACE OF DELIVERY* 01=Nowhere/home 02=Govt. Hospital/clinic 03= PHC center 04= Health post 05= Sub-HTH post 06=PHC outreach clinic 07 =FCHV 08 =Other govt. (Specify) 09=UMN/Red Cross NGO 10=Other (Specify) 11=Private hospital 12=Clinic/Nursing home 13=Pharmacy 14=Other private medical sector (Specify) 15=Shop 16=Traditional healer 17=Ayurvedic clinic 18=Homeopathic practitioners 19=Other (Specify) 20=DK				(If NAME visited *nowhere to seek care in the past 30 days*) Why did NAME not go? 01=Problem was not serious 02=Treatment costs too much 03=Distance is long 04=Afraid to find having a serious case 05=Afraid to take action 06=Nobody at home to take care of kids/elderly 07=No one was there to accompany 08=It is a hassle to go outside 09=Did not know where to go 10=Received home remedy 11=Had enough medicine at home 12=Other (Specify) 13=DK *MULTIPLE ANSWERS ALLOWED*	Which type of doctor made this diagnosis? *NO NEED TO FILL IF NORMAL DELIVERY* 1=Allopathic 2=Ayurvedic 3=Homeopathic 4=DK	When did the illness start? *RECORD DATE OF ONSET OF ILLNESS* *FOR NORMAL DELIVERY, RECORD DATE OF DELIVERY*		
				1st Code	2nd Code	3rd Code	4th Code			Day	Month	Year
01												
02												
03												
04												
05												
06												
07												
08												

30 days

SECTION 5: HEALTH EXPENDITURES (PAST 30 DAYS ALL MORBIDITY)

Episode of illness	EX1	EX2					EX3	EX3a	EX3b
	Was there any cost incurred due to this illness (or delivery) in the past 30 days? 1=Yes 2=No>>*SKIP THIS LINE UNTIL END OF SECTION 7, AND GO ON TO THE NEXT LINE* 3=DK>>*SKIP THIS LINE UNTIL END OF SECTION 7, AND GO ON TO THE NEXT LINE*	How much did this household pay for treatment of this illness (or delivery) in the past 30 days? Please do not include hospitalization which is defined as having spent at least one night in hospital. Please include all costs for modern medicine, traditional medicine, ayurveda and home remedy etc. ***RECORD IN RUPEES. IF NOTHING WAS SPENT WRITE 0.*** ***IN CASE OF COMORBIDITY (2 OR MORE DISEASES FOR WHICH THE TREATMENT COST CANNOT BE SEPARETED) USE 1, 2 AS INSTRUCTED IN TRAINING***					How much did this HH pay in cash for traditional healer for this illness in the past 30 days? ***RECORD IN RUPEES*** ***IF NOTHING WAS SPENT WRITE 0*** ***NO NEED TO FILL IF NORMAL DELIVERY***	Did this HH pay in kind for traditional healer for this illness in the past 30 days? If so, how much would your household have spent in the market to buy the item? ***RECORD IN RUPEES*** ***IF NOTHING WAS SPENT WRITE 0*** ***NO NEED TO FILL IF NORMAL DELIVERY***	(If went to the traditional healer) What kind of treatment did NAME receive for this illness in the past 30 days? 1=Blow breath 2=Use broom 3=Use ash powder 4=Chant mantras 5=Use herbs 6=Other (specify)
		A. Total medical cost (A=**B**+**C**)	Medical cost		Other costs				
			B. Fees including consultation/ investigation fee, diagnosis & test (e.g. X ray, blood test etc)	C. Cost of drugs and medical supply	D. Transport cost for NAME and accompanying family members	E. Other costs (specify)			
01									
02									
03									
04									
05									
06									
07									
08									

Episode of illness	EX4 How much did this HH pay for homeo-medicine for the treatment of this illness in the past 30 days? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0* *NO NEED TO FILL IF NORMAL DELIVERY*		EX5 How much did this HH pay for ayurvedic treatment for this illness in the past 30 days? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0* *NO NEED TO FILL IF NORMAL DELIVERY*		EX6 How much did this HH pay for home remedy for this illness in the past 30 days? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0* *NO NEED TO FILL IF NORMAL DELIVERY*	
01						
02						
03						
04						
05						
06						
07						
08						

SECTION 6: INPATIENT HEALTH EXPENDITURES (PAST 30 DAYS ALL MORBIDITY)

Episode of illness	HS1 Did NAME receive inpatient treatment for this illness (or delivery) in the past 30 days? 1=Yes 2=No >> *NEXT LINE* 3=DK >>*NEXT LINE*	HS2 How many times was NAME hospitalized for this illness (or delivery) in the past 30 days?	HS3 How many days did NAME spend in the hospital for this illness (or delivery) during the past 30 days (days)?	HS4 How much did this household pay for hospitalization due to this illness (or delivery) in the past 30 days? Hospitalization refers to having spent at least one night in hospital. *RECORD IN RUPEES. IF NOTHING WAS SPENT WRITE 0. IN CASE OF COMORBIDITY (2 OR MORE DISEASES FOR WHICH THE TREATMENT COST CANNOT BE SEPARETED) USE 1, 2 AS INSTRUCTED IN TRAINING*						
				A. Medical cost for NAME during hospitalization			B. Living cost for NAME during hospitalization		C. Expenses for accompanying		D. Other charges (specify)
				1. **Total medical cost (1=2+3)**	2. Fees including consultation/ investigation fee , bed fee, diagnosis & test	3. Cost of drugs and medical supply	1. Food	2. Others (Specify)	1. Food and lodging	2. Transport (including transport cost for NAME)	
01											
02											
03											
04											
05											
06											
07											
08											
09											
10											

SECTION 7: COPING STRATEGIES AND INSURANCE (PAST 30 DAYS ALL MORBIDITY)

Episode of illness	CS1	CS2	CS3	CS4		CS5		CS6		CS7
	Did this household use household income to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK	Did this household use household savings to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK	Did this household obtain ex-gratia from family not living with you, relatives, friends or neighbors to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK	Did this household borrow money from family not living with you, relatives, friends or neighbors to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK If Yes, how much was paid from this source? *RECORD IN RUPEES* *IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*		Did this household borrow money from a bank or commercial money lender to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK If Yes, how much was paid from this source? *RECORD IN RUPEES* *IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*		Did this household sell assets to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No>>*GO TO CS8* 3=DK>>*GO TO CS8* If Yes, how much was paid from this source? *RECORD IN RUPEES* *IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*		*(If sold assets)* What kind of assets did this household sell to pay for this illness (or delivery) in the past 30 days? 1=Stored foods/agricultural products 2=Household goods 3=Car/motorcycle 4=Production tools 5=Agricultural products/trees 6=Livestock 7=Land 8=Jewelry/gold 9=Other (specify)
				Code	NRs	Code	NRs	Code	NRs	
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										

Episode of illness	CS8	CS9	CS10	CS11	CS12	CS13	CS14	CS15
	Did this household seek additional paid work to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK	Did this household reduce expenditures on food to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=DK	Did this household remove children from school to pay for this illness (or delivery) in the past 30 days? 1=Yes 2=No 3=No children going to school in this HH 4=DK	Was NAME covered by any health insurance program during the past 30 days? I mean, was NAME enrolled in an Organization/scheme that pays for health care costs if NAME becomes sick? 1=Yes 2=No 3=DK	What is the health insurance/subsidy program or scheme that NAME was enrolled in during the past 30 days? 1= None 2= Government employees' benefits 3= Government subsidy 4= Private insurance 5= NGO subsidy 6= Other (specify)	Has NAME received or is to receive any payment from the health insurance/subsidy to fully or partially cover the health care expenditure that was incurred in the past30 days due to this illness (or delivery)? 1=Yes 2=NO>> *NEXT LINE* 3=DK>> *NEXT LINE*	How much total money has NAME already received from the health insurance/subsidy to fully or partially cover the health care expenditure that was incurred in the past 30 days due to this illness (or delivery)? *RECORD IN RUPEES* *WRITE 0 IF NONE*	(If not yet received) How much total money is NAME to receive from the health insurance/subsidy to fully or partially cover the health care expenditure that was incurred in the past 30 days due to this illness (or delivery)? *RECORD IN RUPEES* *WRITE 0 IF NONE*
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								

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SECTION 8: HEALTH PROBLEMS AND CARE SEEKING BEHAVIOUR (PAST 12 MONTHS CHRONIC DISEASES)

INTERVIEWERS: CHECK HD7 AND IF THE ANSWER IS "YES", COMPLETE THE SECTIONS 8,9,10, 11 AND 12. IF THE ANSWER IS "NO", GO TO SECTION 12

HB1	HB2	HB3	HB4	HB5	HB6				HB7
Episode of illness	Name **COPY FROM HD9** ☆	Household Line Number **COPY FROM HD10**	Diagnosis **COPY FROM HD11**	(For diabetes patients only) Is NAME receiving injectable insulin treatment? 1=Yes 2=No 3=DK	Where did NAME seek care for this illness in the past 12 months? Answer in the order that NAME visited. If illness had started more than 12 months ago, then start from where NAME went 12 months ago. Please include allopathic medicine, ayurveda, homeopathy, traditional healers and home remedy. 01=Nowhere 11=Private hospital 02=Govt. Hospital/clinic 12=Clinic/Nursing home 03= PHC center 13=Pharmacy 04= Health post 14=Other private medical sector 05= Sub-HTH post (Specify) 06 =PHC outreach clinic 15=Shop 07 =FCHV 16=Traditional practitioner 08 =Other govt. (Specify) 17=Ayurvedic clinic 09=UMN/Red Cross 18=Homeopathic practitioners 10=Other NGO (Specify) 19=Other (Specify) 20=DK				(*If NAME visited nowhere to seek care in the past 12 months*) Why did NAME not go? 01=Problem was not serious 02=Treatment costs too much 03=Distance is long 04=Afraid to find having a serious case 05=Afraid to take action 06=Nobody at home to take care of kids/elderly 07=No one was there to accompany 08=It is a hassle to go outside 09=Did not know where to go 10=Received home remedy 11=Had enough medicine at home 12=Other (Specify) 13=DK *MULTIPLE ANSWERS ALLOWED*
					1st	2nd	3rd	4th	
					Code	Code	Code	Code	
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									

12 months

.

Episode of illness	HB8 Which type of doctor made this diagnosis? *NO NEED TO FILL IF NORMAL DELIVERY* 1=Allopathic 2=Ayurvedic 3=Homeopathic 4=DK	HB9 When did this illness start? *RECORD DATE OF ONSET OF ILLNESS* — Day	Month	Year	HB10 Was NAME prescribed drugs for treatment for this illness by a doctor or any health personnel in the past 12 months? 1=Yes 2=No >>*NEXT LINE* 3=DK >>*NEXT LINE*	HB11 During the past 12 months, did NAME ever not fill or refill a prescription for this illness because the medicine costs too much? 1=Yes 2=No 3=Medicine was free 4=DK	HB12 During the past 12 months, did NAME ever delay getting the prescription for this illness filled or refilled because the medicine costs too much? 1=Yes 2=No 3=Medicine was free 4=DK	HB13 During the past 12 months, did NAME ever skip doses to make the medicine for this illness last longer? 1=Yes 2=No 3=Medicine was free 4=DK	HB14 During the past 12 months, did NAME ever take smaller doses to make the medicine for this illness last longer? 1=Yes 2=No 3=Medicine was free 4=DK
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									

SECTION 9: HEALTH EXPENDITURES (PAST 12 MONTHS CHRONIC DISEASES)

Episode of illness	EY1	EY2					EY3	EY3a	EY3b
	Was there any cost incurred due to this illness (or delivery) in the past 12 months? 1=Yes 2=No>>**SKIP THIS LINE UNTIL END OF SECTION 11, AND GO ON TO THE NEXT LINE** 3=DK>>**SKIP THIS LINE UNTIL END OF SECTION 11, AND GO ON TO THE NEXT LINE**	How much did this household pay for treatment of this illness in the past 12 months? Please do not include hospitalization which is defined as having spent at least one night in hospital. Please include all costs for allopathic medicine, traditional healers, homeopathy, ayurveda and home remedy etc. ***RECORD IN RUPEES. IF NOTHING WAS SPENT WRITE 0.*** ***IN CASE OF COMORBIDITY (2 OR MORE DISEASES FOR WHICH THE TREATMENT COST CANNOT BE SEPARETED) USE 1, 2 AS INSTRUCTED IN TRAINING***					How much did this HH pay in cash for traditional healer/medicine for this illness in the past 12 months? ***RECORD IN RUPEES*** ***IF NOTHING WAS SPENT WRITE 0***	Did this HH pay in kind for traditional healer for this illness in the past 12 months? If so, how much would your household have spent in the market to buy the item? ***RECORD IN RUPEES*** ***IF NOTHING WAS SPENT WRITE 0***	(If went to the traditional healer) What kind of treatment did NAME receive for this illness in the past 12 months? 1=Blow breath 2=Use broom 3=Use ash powder 4=Chant mantras 5=Use herbs 6=Other (specify)
		Medical cost			Other costs				
		A. **Total medical cost** (A=B+C)	B. Fees including consultation/ investigation fee, diagnosis & test (e.g. X ray, blood test etc)	C. Cost of drugs and medical supply	D. Transport cost for NAME and accompanying family members	E. Other costs (specify)			
01									
02									
03									
04									
05									
06									
07									
08									
09									

111

Episode of illness	EY4 How much did this HH pay for homeo-medicine for the treatment of this illness in the past 12 months? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0*	EY5 How much did this HH pay for ayurvedic treatment for this illness in the past 12 months? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0*	EY6 How much did this HH pay for home remedy for this illness in the past 12 months? *RECORD IN RUPEES* *IF NOTHING WAS SPENT WRITE 0*
01			
02			
03			
04			
05			
06			
07			
08			
09			

SECTION 10: INPATIENT HEALTH EXPENDITURES (PAST 12 MONTHS CHRONIC DISEASES)

Episode of illness	HT1	HT2	HT3	HT4						
	Did NAME receive inpatient treatment for this illness in the past 12 months? 1=Yes 2=No >> *NEXT LINE* 3=DK >>*NEXT LINE*	How many times was NAME hospitalized for this illness in the past 12 months?	How many days did NAME spend in the hospital for this illness during past 12 months (days)?	How much did this household pay for hospitalization due to this illness in the past 12 months? Hospitalization refers to having spent at least one night in hospital. *RECORD IN RUPEES. IF NOTHING WAS SPENT WRITE 0. IN CASE OF COMORBIDITY (2 OR MORE DISEASES FOR WHICH THE TREATMENT COST CANNOT BE SEPARETED) USE 1, 2 AS INSTRUCTED IN TRAINING*						
				A. Medical cost for NAME during hospitalization			B. Living cost for NAME during hospitalization		C. Expenses for accompanying	D. Other charges (specify)
				1. **Total medical cost (1=2+3)**	2. Fees including consultation/ investigation fee , bed fee, diagnosis & test	3. Cost of drugs and medical supply	1. Food	2. Others (Specify)	1. Food and lodging	2. Transport (including transport cost for NAME)	
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										

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SECTION 11: COPING STRATEGIES AND INSURANCE (PAST 12 MONTHS CHRONIC DISEASES)

Episode of illness	CT1	CT2	CT3	CT4			CT5			CT6			CT7
	Did this household use household income to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK	Did this household use household savings to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK	Did this household obtain ex-gratia from family not living with you, relatives, friends or neighbors to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK	Did this household borrow money from family not living with you, relatives, friends or neighbors to pay for this illness in the past12 months? 1=Yes 2=No 3=DK If Yes, how much was paid from this source? *RECORD IN RUPEES IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*			Did this household borrow money from a bank or commercial money lender to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK If Yes, how much was paid from this source? *RECORD IN RUPEES IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*			Did this household sell assets to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK If Yes, how much was paid from this source? *RECORD IN RUPEES IN CASE OF COMORBIDITY USE 1, 2 AS INSTRUCTED IN TRAINING*			*(If sold assets)* What kind of assets did this household sell to pay for this illness in the past 12 months? 1=Stored foods/agricultural products 2=Household goods 3=Car/motorcycle 4=Production tools 5=Agricultural products/trees 6=Livestock 7=Land 8=Jewelry/gold 9=Other (specify)
				Code	NRs		Code	NRs		Code	NRs		
01													
02													
03													
04													
05													
06													
07													
08													
09													
10													

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Episode of illness	CT8	CT9	CT10	CT11	CT12	CT13	CT14	CT15
	Did this household seek additional paid work to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK	Did this household reduce expenditures on food to pay for this illness in the past 12 months? 1=Yes 2=No 3=DK	Did this household remove children from school to pay for this illness in the past 12 months? 1=Yes 2=No 3=No children going to school in this HH 4=DK	Was NAME covered by any health insurance/subsidy program or scheme during the past 12 months? I mean, was NAME enrolled in an Organization/scheme that pays for health care costs if NAME becomes sick? 1=Yes 2=No 3=DK	What is the health insurance/subsidy program or scheme that NAME was enrolled in during the past 12 months? 1= None 2= Government employees' benefits 3= Government subsidy 4= Private insurance 5= NGO subsidy 6= Other (specify)	Has NAME received or is to receive any payment from the health insurance/subsidy to fully or partially cover the health care expenditure in the past 12 months due to this illness? 1=Yes 2=NO>>*NEXT LINE* 3=DK>> *NEXT LINE*	How much total money has NAME already received from the health insurance/subsidy to fully or partially cover the health care expenditure that was incurred in the past 12 months due to this illness? *RECORD IN RUPEES* *WRITE 0 IF NONE*	(If not yet received) How much total money is NAME to receive from the health insurance/subsidy to fully or partially cover the health care expenditure that was incurred in the past 12 months due to this illness? *RECORD IN RUPEES* *WRITE 0 IF NONE*
01								
02								
03								
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SECTION 12: DURABLE GOODS

In the following questions, I would like to ask about the ownership of durable goods in your household, regardless of which person owns them. Please **exclude** from your answer any item owned mainly for a **household enterprise**.

DG1			DG2	DG3	DG4	DG5	DG6
Does your household own any of the following items? ***CIRCLE YES OR NO FOR EACH ITEM.*** ***IF THE ANSWER IS YES, ASK DG2-DG6*** ***IF THE ANSWER IS NO, GO TO NEXT ITEM***			How many [ITEM] (s) does your household own?	How many years ago did your household acquire this [ITEM]? If your household has more than one item, please refer to the most recently acquired item.	Did you purchase it or receive it as a gift or payment in-kind?]? If your household has more than one item, please refer to the most recently acquired item.	How much was it worth when your household obtained it?]? If your household has more than one item, please refer to the most recently acquired item.	If you wanted to sell this [ITEM] (s) today, how much would you receive? If your household has more than one item, please mention total value of all items.
CODE	ITEM	**Y**es / **N**o	Number	Years (0 if less than a year)	1=Purchase 2=Gift	NRs	NRs
01	Radio/Tape/CD player	Y N			1 2		
02	Camera (still/movie)	Y N			1 2		
03	Bicycle	Y N			1 2		
04	Motorcycle/scooter	Y N			1 2		
05	Motor car/Jeep	Y N			1 2		
06	Refrigerator or freezer	Y N			1 2		
07	Washing machine	Y N			1 2		
08	Fans	Y N			1 2		
09	Heaters	Y N			1 2		
10	Television	Y N			1 2		
11	Telephone sets/Mobile phone	Y N			1 2		
12	Sewing machine	Y N			1 2		
13	Computer/Printer	Y N			1 2		

INTERVIEWERS: CHECK YOUR FILLED IN QUESTIONNAIRE CAREFULLY BEFORE LEAVING THE RESPONDENTS AND END YOUR INTERVIEW BY GIVING THANKS TO THE RESPONDENT
RECORD THE TIME FINISHED: HOURS [|]   MINUTES [|]

Interviewer: In future, we may need to contact you again for follow-up. Can you tell us your (mobile) phone number for that purpose?

If permission is given, record the phone number. Phone No. _____

APPENDIX 2: Training Agenda

Date	Topic
Day 1 AM	Workshop opening speeches
	Introduction of participants and trainers
	Objective of the survey
	Survey organization
	--Administration and logistics
	--Responsibilities of interviewers
	--Responsibilities of supervisors
	Overview of the survey questionnaire
	Sampling Overview
Day 1 PM	Fieldwork Procedures
	■ Interviewer assignment sheets
	■ Making callbacks
	■ Keeping the questionnaires confidential
	■ Supplies and documents needed for fieldwork
	■ Locating sample households
	■ Problems in contacting a household
	■ Identifying eligible respondents
	■ How to handle an interview
	■ Other general points
	■ Q&A
Day 2 AM	How to fill in the household questionnaire
	■ How to fill in the questionnaire – general
	■ Household Identification Sheet
	■ Informed Consent Sheet
	■ Section 1: Household Roster
Day 2 PM	■ Section 2: Household Expenditure Information
	■ Disease codes
	■ Section 3: Household Episodes of Illnesses
	■ Q&A
Day 3 AM	■ Standard costing for medical treatment and medicine
	■ Section 4: Health Problems and Care Seeking Behaviour (30 days)
	■ Section 5: Health Expenditures (30 days)

Date	Topic
	■ Section 6: Inpatient Health Expenditures (30 days)
Day 3 PM	■ Health subsidy in Nepal
	■ Section 7: Coping Strategies and Insurance (30 days)
	■ Health Problems and Care Seeking Behaviour (12 months)
	■ Health Expenditures (12 months)
	■ Inpatient Health Expenditures (12 months)
	■ Coping Strategies and Insurance (12 months)
	■ Q&A
Day 4 all day	Practice session in the own neighbourhood
Day 5 AM	Review of practice session
	■ Discussion on findings, problems encountered, solutions
	■ Individual feedbacks
Day 5 PM	Supervisors' session
	■ Survey sample
	■ Survey quality control, such as the role of good supervision and team interaction in the field
Day 6 AM	Logistic arrangements
	Timetable and budget
	After field interviews what happens next?
Day 6 PM	Field practice (2) at TUTH
	By end of the day, participants will return to the training hall and submit the completed questionnaires.
Day 7 AM	Review of Field practice
	■ Discussion on findings, problems encountered, solutions
	Individual feedbacks
Day 7 PM	Any other issues
	Closing of the training

APPENDIX 3: Interviewer's Manual (English)

（This manual has been adapted from ICF Macro (2011). Demographic and Health Survey Interviewer's Manual. <u>MEASURE DHS Basic Documentation Number 2</u>. Calverton, Maryland, ICF Macro.）

Disease-specific out-of-pocket expenditure on health care & coping
strategies for health care costs in Kathmandu Valley, Nepal

INSTRUCTIONS FOR INTERVIEWERS

PREPARED BY

THE UNIVERSITY OF TOKYO

TRIBHUVAN UNIVERSITY TEACHING HOSPITAL

SOLID NEPAL

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Section 11: Coping Strategies and Insurance (Past 12 months chronic diseases)
Annex: Interviewer's Cluster Control Sheet

PART I. INTRODUCTION

1. Objectives of the Survey

The study on the health care expenditure and coping strategies for major illnesses in Nepal is a joint effort between the University of Tokyo and the Tribhuvan University Teaching Hospital. The survey has the following objectives:

- To assess the disease-specific out-of-pocket health expenditure
- To assess the proportion of households which made catastrophic health payment for health care
- Identify the characteristics of the households which are more likely to have made catastrophic payment
- To assess the household coping strategies for health expenditure

The information gathered from the survey would generally aid decision makers to formulate national health policies to:

- Identify the target groups or target diseases for government subsidy
- Analyze the impact of existing health policies in support of the health payments
- Identify the diseases that are associated with high costs and to formulate treatment options which are cheaper
- Identify the diseases which are preventive and associated with high costs to enhance preventive programs

2. Organization of the survey

2.1. The survey team

The SOLID Nepal will serve as the implementing agency for the survey. The SOLID Nepal will take responsibility for operational matters including planning and conducting fieldwork, and processing of collected data. During the fieldwork, you will work in a team consisting of 4 interviewers and a supervisor. Each team will be accompanied by a local guide. Each supervisor will be responsible for a team of 4 interviewers. The specific duties of the supervisor are described in detail in the supervisor's manual.

2.2. Responsibilities of interviewers

The interviewer occupies the central position in the survey because he/she collects information from respondents. Therefore, the success of the survey depends on the quality of each interviewer's work. In general, the responsibilities of an interviewer include the following:

- Locating the structures and households in the sample, and completing the household questionnaire

- Checking completed interviews to be sure that all questions were asked and the responses neatly and legibly recorded
- Returning to households or call back by phone to interview respondents who could not be interviewed during the initial visit

These tasks will be described in detail throughout this manual.

2.3. Responsibilities of supervisors

Your team supervisor will play very important roles in ensuring the quality of the survey. They will;

- Spot-check some of the addresses selected for interviewing to be sure that you interviewed the correct households and the correct respondents
- Review each questionnaire to be sure it is complete and consistent
- Observe some of your interviews to ensure that you are asking the questions in the right manner and recording the answers correctly
- Meet with you on a daily basis to discuss performance and give out future work assignments
- Help you resolve any problems that you might have with funding the assigned households, understanding the questionnaire, or dealing with difficult respondents.

PART II. GETTING STARTED

1. Interviewer's Cluster Control Sheet

Each morning, your supervisor will brief you on your day's work and explain how to locate the households assigned to you. When they assign the households to you, you should write the identification information on the Interviewer's Cluster Control Sheet (Annex). The identifying information such as the household number, address, HH serial number in the structure, name of the head of the household will be written in the sheet. At the end of the day, you will be responsible for recording in these sheets the final outcome for all household visits and the interviews you conducted.

2. When interviewee cannot be reached

If no one is at home when you go to interview the household, ask the neighbours whether the house is inhabited. If it is occupied, ask the neighbours when the household members will return. Arrange with your supervisor to go back to the dwelling when it will be occupied or at the end of the day. Note those plans on your cluster control sheet and note the time you are to return on the first page of the questionnaire (Household Information Panel). Do not substitute

another household.

If no adult is at home, arrange to come back at another time. Do not interview anyone who does not usually live in the household. Each household in the sample has to be visited at least three times before you can mark the household as 'Not at home', unless otherwise instructed by your supervisor. There may be cases when you learn that the household will be away for an extended period, and will definitely not return within the fieldwork period. In such cases, three visits to the household may not be necessary. However, even in such cases, the ultimate decision will have to be taken by your supervisor.

If the person will not be available or will not return home at a time later that day when it is feasible to interview her/him, follow the instructions of your supervisor about the number of times you should attempt the interview.

3. Keeping the questionnaires confidential

You are responsible for seeing that the questionnaires are kept confidential. Do not share the results with other interviewers. You should never interview a household in which you know one or more of the members, even if they are only casual acquaintances. If you are assigned to a household in which you know a person even if that person is not eligible for an interview, you should notify your supervisor so that he can assign that household to another interviewer.

4. Supplies and documents needed for fieldwork

Before starting fieldwork each morning, verify that you have everything you need for the day's work. Necessary supplies include;
- Interviewer's Cluster Control Sheet
- A sufficient number of questionnaires
- Interviewer manual
- Your personnel identification
- Clip board
- Black ink pens
- A bag to carry questionnaires and materials
- A calculator (cellphone may have this application)

5. Locating sample households

A structure is a freestanding building, for a residential or commercial purpose. It may have one or more rooms in which people live; it may be an apartment building, or a house, for instance. Specific households have been selected to be interviewed, and you should not have any trouble in locating the households assigned to you if you use the structure number and the name of the head of the household to guide you.

6. Problems in contacting a household

In some cases you will have problems locating the household that were selected because the people may have moved or the listing teams made an error. Here are the examples of some problems you may find and how to solve them;

a) The household has moved away and a new one is now living in the same building. In this case, interview the new household.

b) The structure number and the name of the household head do not match with what you find in the field. If you have located the correct dwelling, you should interview the household in that dwelling.

c) The head of the household has changed. In some cases, the person listed as the household head may have moved away or died since the listing. Interview the household that is living there.

d) The house is all closed up and the neighbours say the people are away, and will be back in several days or weeks. Enter code 2 'not at home'. The house should be revisited at least two more times to make sure that the household members have not returned.

e) The house is all closed up and the neighbours say that no one lives there; the household has moved away permanently. Enter code 5 'dwelling not found'.

f) A household is supposed to live in a structure that when visited is found to be a shop and no one lives there. Check carefully to see whether anyone lives there. If not, enter code 5 'dwelling not found'.

g) No one is at home and neighbours tell you the family has gone to the market. Enter code 2'not at home' and return to the household at a time when the family will be back.

Discuss with your supervisor any problems you have in locating the households that you are assigned to interview.

7. Identifying eligible respondents

In each home you visit, you should begin by interviewing a knowledgeable adult member of the household to fill in the Household Questionnaire. Note that in the Household Questionnaire there are a number of modules that you will need to administer to the mother or primary adult caretaker of children living in the household. This means that you may complete

the household interview with more than one respondent answering questions to different modules. Your supervisor will give you a list or tell you how to find the households to visit. You must visit all these households.

8. How to handle an interview

Conduct yourself in a relaxed informal way, but be thorough. Use the questionnaires carefully.

✓ Ensure that you understand the exact purpose of each question. This will help you to know if the responses you are receiving are adequate.
✓ Ask the questions exactly as they are written. Even small changes in wording can alter the meaning of a question.
✓ Ask the questions in the same order as they are given on the questionnaire.
✓ Ask all the questions, even if the respondent answers two questions at once. You can explain that you must ask each question individually, or say "Just so that I am sure…" or "Just to refresh my memory…," and then ask the question.
✓ Help your respondents to feel comfortable, but make sure you do not suggest answers to your questions. For example, do not 'help' a woman to remember various health care providers.

Do not leave a question unanswered unless you have been instructed to skip the question. Questions left blank are difficult to deal with later. In the office it may look as though you forgot to ask the question. Always write in 0 when a zero answer is given. For some questions, the code 'Doesn't know' will already be provided, and after you are sure that the respondent is unable to provide you with an answer, you will be able to circle this response. In questions where a 'Doesn't know' response is not printed on the questionnaire, you must make sure that the respondent comes up with an answer. In exceptional cases where this may not be possible, indicate this on the questionnaire with a note.

Record answers immediately. Write down any pertinent remarks made by other people present, and mention who the other people are. Check the whole questionnaire before you leave the household to be sure it is completed correctly.

Thank the respondent for her (or his) cooperation. Remember the survey schedule, and remember that you are part of a team. Do not stay and talk for too long, but do not rush the interview either.

9. Other general points

Dress neatly

The first impression a respondent has of you is formed through your appearance. The way you dress may affect whether your interview is successful or not. Dress neatly and simply.

Gain rapport with the respondent

Try not to arrive at a respondent's house at an inconvenient time of day, such as mealtimes. Try to arrive when the respondent will not be too busy to answer questions. Introduce yourself by name and show your identification. Explain the survey and why you want to interview the women in the household, exactly as your introduction tells you to. Be prepared to explain what is meant by confidentiality and to convince respondents to participate if they are reluctant. If the respondent refuses to be interviewed, note the reasons on the questionnaire, if possible. Remain calm and polite at all times.

Probe for adequate responses

Pause and wait if the respondent is trying to remember difficult items. Ask the respondent to clarify her/his answer if necessary. You may have misunderstood the response. Check for consistency between the answers a respondent gives. Treat the questionnaires as tools that you are using to converse with the respondent. Try to understand and remember the responses, and if there is an inconsistency, ask the questions again.

PART III. GENERAL PROCEDURES FO COMPLETING THE QUESTIONNAIRE

1. Asking questions

It is very important that you ask each question exactly as it is written in the questionnaire. When you are asking a question, speak slowly and clearly so that the respondent will have no difficulty hearing or understanding the question. In some cases, you may have to ask additional questions to obtain a complete answer from a respondent (we call this 'probing'). If you do this, you must be careful that your probes are neutral and that they do not suggest an answer to the respondent.

2. Recording responses

In this survey, all interviewers will use pens with black ink to complete all questionnaires. Supervisors will do all their work using pens with red ink. Never use a pencil to complete the survey questionnaire.

2.1.   Questions with pre-coded responses

For some questions, we can predict the types of answers a respondent will give. The responses to these questions are listed in the questionnaire. To record a respondent's answer, simply fill in the number (code) that corresponds to the reply.

Example:

NAME	Is (NAME) male or female? 1=Male 2=Female
Maya	2
Anil	1

For some questions, you will need to circle the number (code) that corresponds to the reply.

Question	Answer
Is this dwelling yours?	Yes ....① No 2

2.2.　Recording responses that are not pre-coded

The answers to many questions are not pre-coded but require that you write the respondent's answer in the space provided.

Example:

Question	Answer
How much money did your household spend on food bought from outside during the past 30 days? **RECORD IN RUPEES**	8,000

2.3.　Following instructions

Throughout the questionnaire, instructions for the interviewer are printed in all CAPITAL LETTERS, whereas questions to be asked of the respondent are printed in small letters.

SECTION 3: HOUSEHOLD EPISODES OF ILLNESSES

Now we will ask you about illness episodes among household members. Please consider multiple medical treatments for the same disease as one episode. For example, if a child went to a clinic for asthma and then again after two days for a follow up visit, those two clinic visits will be considered as one episode of illness.

USE SEPARATE LINES FOR EACH DISEASE EPISODE (DIAGNOSIS) IF SAME PERSON HAD MORE THAN ONE DISEASE EPISODE. YOU MAY USE DITTO FOR NAME AND HOUSEHOLD LINE NIMBER.

HD1. Has anybody (including children) in the household suffered from any illnesses or injuries or delivered a baby in the **past 30 days**?　1. YES　2. NO >> GO TO HD7

Who became become sick, had delivered or was injured in the **PAST 30 DAYS**? If sick or injured, or had complications associated with delivery, what was the diagnosis?
WRITE "NORMAL DELIVERY" IN HD5 FOR DELIVERY WITHOUT COMPLICATIONS AND LEAVE HD6 BLANK

HD2	HD3		HD4	HD5	HD6			
Code		Name	Household Line Number	Diagnosis (if available) or main symptom *SEE CODE 1*	Duration of illness			
					Year	Months	Days	
01								
02								

IV HOUSEHOLD QUESTIONNAIRES

HOUSEHOLD INFORMATION PANEL

The Household Information Panel consists of an upper (HH1 to HH7) and a lower (HH8 to HH12) panel. The upper panel should normally be filled in before you approach the household. Your supervisor will have provided the necessary information to you when you are assigned the household.

HH1. Name and code of the district
Enter the name and the code number of the district as instructed by your supervisor.

HH2. Name and code of the village/municipality
Enter the name and code number of the village/municipality as instructed by your supervisor.

HH3. Ward number
Enter the ward number as instructed by your supervisor.

HH4. Cluster number
Enter the cluster number as instructed by your supervisor.

HH5. Household number
Enter the household number as instructed by your supervisor.

HH6. Urban/Rural
Enter the urban/rural number as instructed by your supervisor.

HH7. Respondent's name and line number
Enter the name and line number (from the Household Listing, columns HL1 and HL2) of the respondent to the Household Questionnaire.

HH8. Date of interview
Enter the date of the interview as day, month and year. If you visited the same household more than once, record each date of the visit as day, month and year.

HH9. Interviewer's name and code
Enter your name and identification number. You will be provided with your identification

number during the training.

HH10. Result of household interview

If the Household Questionnaire is completed, circle '1' for 'Completed'. If you have not been able to contact the household after repeated visits, circle '2' for 'Not at home'. If the household postpones to be interviewed, circle '3' for 'Postponed'. If the household refuses to be interviewed, circle '4' for 'Refused'. If you are unable to locate the household or if the dwelling is destroyed, circle '5' for 'HH not found'. If you have not been able to complete the Household Questionnaire for another reason, you should circle '6' for 'Other' and specify the reason in the space provided. Some examples of 'Other' codes might be: the household respondent is incapacitated; the questionnaire is partly completed; adult household members were not found at home after repeated visits.

HH11. Next visit: date

If the household agrees on a date for the next visit, enter the date of the appointment as day, month and year.

HH12. Next visit: time

If the household agrees on a date for the next visit, enter the time of the appointment.

INFORMED CONSENT

The purpose of the Household Questionnaire is to provide information on general characteristics of the population and the households. You will use it to collect important information on health status of people in Nepal.
.
Begin by saying the following to the respondent:

My name is ....…….. I am representing the University of Tokyo in Japan and the Tribhuvan University Teaching Hospital.

We are conducting a study to understand the economic consequences of major illnesses in Nepal. In this regard I would like to ask you some questions about your experiences.

(Read out the Informed Consent Form)

If permission is given, begin the interview. If the respondent does not agree to continue, thank him/her and leave the household to go the next household. Later, discuss the refusal with your supervisor; you or another person from the team may attempt to interview the household for a second time. This will depend on your description of the refusal. However, remember that a household's participation in the survey must be on a voluntary basis, and potential

respondents must never be forced to participate.

SECTION 1: HOUSEHOLD ROSTER

A household is a person or group of persons who usually live and eat together. The head of the household or the most knowledgable member of the household can serve as the respondent for this section.

Note that the Household Listing Form includes HL1. Line No. This is the number used to identify each person listed. You must obtain a complete list of all persons who usually live in the household, but you do not need to fill in or do anything in this column since the numbers are already provided. This is a very important number, since once household members are assigned these line numbers as the Household Listing is being completed, they are identified with these line numbers throughout the questionnaires administered in this household.

You should begin by saying:
FIRST, PLEASE TELL ME THE NAME OF EACH PERSON WHO USUALLY LIVES HERE, STARTING WITH THE HEAD OF THE HOUSEHOLD.
List the head of the household in line 01. List all household members (HL2), their relationship to the household head (HL3), and their sex (HL4).

Note that the household head is determined solely on the basis of what the respondent tells you. You are not required to assess who the household head is most likely to be, or whether the person stated as the household head has the necessary characteristics to be the household head. Also note that if there are more than 15 household members, you will need to use a continuation sheet to record the additional household members. Please remember to change the line numbers of household members on the continuation sheet to read '16', '17', '18', etc. and note both on the primary and the new questionnaire.

The Household Listing will be completed in two stages: first, names (HL2), relationship codes (HL3) and sex (HL4) of all household members are recorded until all household members are included in the list. When the respondent is asked to provide the names of persons living in the household, their relationship to the head of the household and their sex is naturally mentioned during the course of listing the names. For this reason, the list is completed vertically for HL2, HL3 and HL4 during the first stage. Then, questions from HL5 to HL10 are asked for each person before moving to the next person.

HL2. NAME

Fill in the name of each household member, starting with the head of household (the person who is considered to be responsible for the household). It is up to the respondent to define who the head of the household is. The head of the household should always be on the first row of the list. Never contest the respondent's answer. Also note that the names of household members will never be used for analysis purposes. However, recording the names of all household members is important since you will be using these names to address the questions.

HL3. WHAT IS THE RELATIONSHIP OF *(name)* TO THE HEAD OF THE HOUSEHOLD?
Enter the code corresponding to how the person listed is related to the head of the household. Use the codes at the bottom of the Household Listing. Be particularly careful in doing this if the respondent is not the head of the household. Make sure that you record the relationship of each person to the household head, not the relationship to the respondent. For example, if the respondent is the wife of the head of the household and she says that Sola is her brother, then Sola should be coded as '09' ('Other relative'), not as '08' ('Brother or sister'), because Sola is a brother-in-law of the head of the household. Be very careful in obtaining this information correctly, since respondents tend to provide the relationship of the person to themselves, rather than to the head of the household. If the head of the household is married to a woman who has a child from a previous marriage, that child's relationship to the head of the household should be coded as '10' ('Adopted/foster/stepchild'). If a household member is not related to the head of household, such as a friend who lives with the household, enter '11' ('Not related'). Enter '98' if the respondent doesn't know the relationship of a household member to the head of household.

HL4. IS *(name)* MALE OR FEMALE?
Circle '1' for 'Male' and '2' for 'Female'. Do not guess the sex of the household member from the name provided to you. When the respondent is listing everyone in the household, he/she may indicate the sex of the person at the same time, by saying "My sister Mary," for instance. In this case, you do not need to ask the sex of the household member again, since it is already obvious that the person is a female. However, when a name is mentioned that can be used for both males and females, never use your judgement. Even in cases when you think that the name would most likely be a male's (or a female's) name, have the respondent confirm the sex. This column should never be left blank.

HL5. HOW OLD IS *(name)*?
Enter each person's age in completed years, that is, his/her age at his/her last birthday. Completed age is also defined as 'the number of completed solar years since birth'. With this definition, since a 6-month-old baby has not completed a full solar year, his/her age will be

entered as '00'. This column should never be left blank.

HL6. WHAT IS THE HIGHEST LEVEL OF EDUCATION (NAME) HAS COMPLETED?

If the person has been to school, record the highest level of schooling attended by entering the code for the response. You may need to probe for the type of school attended.

HL7. WHAT IS (NAME'S) CURRENT MARITAL STATUS?

The options here are never married, currently married, divorced, separated, or widowed. Circle the code corresponding to the respondent's status at the time of the interview. Ask this question only if the person's age is 10 years or older.

HL8. WHAT IS (NAME'S) RELIGION?

The options here are Hindu, Buddhist, Muslim, Kirat, Christian, or Other. Circle the code corresponding to the respondent's answer at the time of the interview. Ask this question only if the person's age is 10 years or older.

HL9. WHAT IS NAME'S MAIN OCCUPATION? WHAT KIND OF WORK DOES NAME MAINLY DO?

Refer to the right bottom of the page to see the occupation code. There is no minimum salary or number of hours that a respondent must work in order to qualify for having an occupation. Ask this question to household members aged 10 or above.

SECTION 2: HOUSEHOLD EXPENDITURE INFORMATION

The primary objective of this section is to find out how much people spend on health care services, and how large a share of total household spending goes to the purchase of health care services. Ask all the questions referring to both past 30 days and past 12 months.

The reason why we need information on both 30 days and 12 months is because many times, the annual expenditure cannot be obtained by just multiplying the 30 days expenditure by 12. For example, health care and treatment expenditure could have been very high in a household in the past 30 days because someone needed an urgent heart operation. But they could have been spending nothing during the remaining 11 months of the year because nobody was sick. Then multiplying the past 30 days expenditure by 12 to obtain annual expenditure will overinflate the actual expenditure.

Thus, please try to obtain information on both past 30 days and past 12 months. If a respondent cannot by any means remember or reply the cost of either past 30 days or 12 months, fill in either one (i.e. 30 days or 12 months) but never leave a blank for both 30 days

and 12 months.

If a respondent replies an interval, say "I spent between 400-500 rupees on clothing in the past 30 days" then please take the mean which is 450 rupees.

Because of the Tihar festival that ended recently, the past 30 days expenditure may not be a good reflection of what is usually spent during a normal one month period. Thus, please emphasize that the respondent must refer to a normal one month period without any special expenditure on festivals, weddings or funerals. This does not apply to the case of past 12 months.

HE1A: Ask the respondent approximately how much the household spent on purchasing food items from outside in the past 30 days and in the last 12 months.
HE1B: Ask the respondent whether they have consumed any home-produced foods. If yes, ask approximately how much the household would have had to spend in the market if they were to buy the same amount of foods.
HE1C: Ask the respondent whether they have consumed any foods that were gifts, donation or wages for work. If yes, ask approximately how much the household would have had to spend in the market if they were to buy the same amount of foods.

HE2. Ask the respondent approximately how much the household spent on each item (education, clothes and footwear, household items, water and sewage, electricity, fuels, transport, telecommunication fees, garbage disposal, health care and treatment costs, socializing and recreation, and other (specify)) in the past 30 days and in the last 12 months. Note that socialization and recreation for past 30 days refer to normal social activities such as picnic, puja and other activities that the household normally spend EXCEPT the Tihar festival. Instead, include expenditure on Dasain, Tihar, sraddha and other annual festival and ceremonies in the past 12 months expenditure.

HE3. Ask the respondent approximately how much the household would have had to spend on the items that were actually received in-kind (gift, donation or wages for work, etc.) for each item (clothes and footwear, personal care items, and household items).

HE4. Ask the respondent whether the household owns the dwelling that the household lives in. A dwelling is a room or group of rooms occupied by the household. It may be distinguished from the next dwelling unit by a separate entrance.
HE5. Ask the household's present occupancy status.
HE6. If the household is renting the dwelling, ask the household their monthly rent including

both the payment in cash and payment in-kind.

HE7. If the household owns the dwelling, provided for free by relatives/landlord/employer or squatting, ask the respondent how much the household would have had to pay per month if they were to rent the same type of dwelling. Note that we are referring to the entire dwelling or apartment that the household is occupying, not only a room that would be rented out.

SECTION 3: HOUSEHOLD EPISODES OF ILLNESSES

The purpose of this section is to identify the episodes of all diseases and delivery in the past 30 days AND the episodes of chronic diseases in the past 12 months. One episode of illness means that if a child went to a clinic for asthma treatment and then again after 2 weeks visited the clinic for follow-up visit, these two clinic visits will be considered as one episode of illness.

HD1. HAS ANYBODY (INCLUDING CHILDREN) IN THE HOUSEHOLD SUFFERED FROM ANY ILLNESSES OR INJURIES OR DELIVERED A BABY IN THE PAST 30 DAYS?
Ask if anyone in the household had any disease, delivery or injury in the past 30 days. If anyone experienced a disease, injury or delivery, circle 1 and proceed to HD3 through HD6. If no one had any chronic diseases, circle 2 and skip to HD7.

HD3. NAME
Ask the name of the household member who suffered from any kind of diseases, injury or had delivery in the past 30 days. Use separate lines for each disease episode (diagnosis) if the same person had more than one disease episode.

HD4. HOUSEHOLD LINE NUMBER
Check HL1 and HL2 in the Household Listing Form and fill in the corresponding Household Line Number of the person.

HD5. DIAGNOSIS (IF AVAILABLE) OR MAIN SYMPTOM
In HD3 through HD4, you have already listed down the names of the household members who experienced any kind of diseases, injury or delivery in the past 30 days. In HD5, record the diagnosis for each episode of illnesses. For example, if a person went to a clinic twice in total and he was diagnosed first as common cold and second as hypertension, those are two episodes of illnesses. Use the disease code sheet and write in diseases or symptoms that are not in the disease code sheet. Write "normal delivery" in HD5 for delivery without complications. Ask the respondent if the household keeps the hospital discharge records and/or OPD reports. You will find the diagnosis by medical doctors in these reports.

HD6. DURATION OF ILLNESS

Record the overall duration of the illness or injury. If HD5 is "normal delivery", then there is no need to fill in HD6. Note that diseases which have a duration of more than 3 months in HD6 must also appear in the list of chronic diseases (this will be explained in more detail later).

Example:

HD2	HD3	HD4	HD5	HD6		
Code	Name	Household Line Number	Diagnosis (if available) or main symptom *SEE CODE 1*	Duration of illness		
				Year	Months	Days
01	Maya	01	2			10
02	Maya	01	6		5	

2=Common cold/fever

6=Hypertension

Is the same as:

HD2	HD3	HD4	HD5	HD6		
Code	Name	Household Line Number	Diagnosis (if available) or main symptom *SEE CODE 1*	Duration of illness		
				Year	Months	Days
01	Maya	01	2			10
02	,,	,,	6		5	

2=Common cold/fever

6=Hypertension

HD7. HAS ANYBODY (INCLUDING CHILDREN) IN THE HOUSEHOLD SUFFERED FROM ANY CHRONIC DISEASES (INCLUDING THOSE DUE TO INJURY) IN THE PAST 12 MONTHS? Note that chronic diseases here mean that if a person had suffered from any illnesses for <u>more than 3 months</u>, it is regarded as chronic disease.

Ask if anyone in the household had any chronic disease that lasted for more than 3 months in the past one year. If anyone experienced a disease, injury or delivery, circle 1 and proceed to HD9 through HD12. If no one had any chronic diseases, circle 2 and skip to Section 4.

HD9. NAME

Ask the name of the household member who suffered from chronic diseases in the past 12 months. <u>Use separate lines for each disease episode (diagnosis) if the same person had more than one chronic disease.</u>

HD10. HOUSEHOLD LINE NUMBER

Check HL1 and HL2 in the Household Roster and fill in the corresponding Household Line Number of the person.

HD11. DIAGNOSIS (IF AVAILABLE) OR MAIN SYMPTOM

In HD9 through HD10, you have already listed down the names of the household members who experienced chronic diseases in the past 12 months. In HD11, record the diagnosis for each episode of illness. For example, if a person had experienced diabetes and hypertension that lasted for more than 3 months, those are two episodes of chronic illnesses. Use the disease code sheet and write in diseases or symptoms that are not in the disease code sheet. Ask the respondent if the household keeps the hospital discharge records and/or OPD reports. You will find the diagnosis by medical doctors in these reports.

HD12. DURATION OF ILLNESS

Record the overall duration of the illness/injury.

SECTION 5: HEALTH PROBLEMS AND CARE SEEKING BEHAVIOUR (PAST 30 DAYS ALL MORBIDITY)

The main purpose of this section is to identify the episode of all illnesses, injury and delivery in the past 30 days and how the household members sought care from the health care providers.

Check HD1 and if the answer is "yes", complete the sections 4, 5, 6 and 7. If the answer is "no", go to section 8.

HA2. NAME: copy HD3
HA3. Household Line Number: copy HD4
HA4. Diagnosis: copy HD5

HA5. WHERE DID NAME SEEK CARE FOR THIS ILLNESS IN THE PAST 30 DAYS?

Ask the respondent where the person went to seek care for the illness in the past 30 days, and record the appropriate codes as given in the answer category. Probe if the respondent

has a problem recalling the type of health service provider. Multiple answers are allowed for this question. Record in chronological order. If the person visited the same place more than once then record the corresponding code only once.

Example: Maya first had dizziness and thought that she does not need to go to a hospital but can be cured by just purchasing a drug at the pharmacy. But since the condition did not get better after self-medication, Maya visited a nearby NGO clinic. Then she was referred to the district hospital for further check-up. She was prescribed a medicine for hypertension, so she went to a pharmacy next to the hospital to buy the prescribed drug.

NAME	Where did NAME seek care for this illness in the past 30 days? How far is the place from home? Please answer in the order that NAME visited. If illness had started more than 30 days ago, then start from where NAME went 30 days ago.						
	FOR NORMAL DELIVERY, RECORD PLACE OF DELIVERY						
	01=Nowhere/home 11=Private hospital						
	02=Govt. Hospital/clinic 12=Clinic/Nursing home						
	03= PHC center 13=Pharmacy						
	04= Health post 14=Other private medical sector (Specify)						
	05= Sub-HTH post 15=Shop						
	06 =PHC outreach clinic 16=Traditional practitioner						
	07 =FCHV 17=Ayurvedic clinic						
	08 =Other govt. (Specify) 18=Other (Specify)						
	09=UMN/Red Cross 19=DK						
	10=Other NGO (Specify)						
	1st		2nd		3rd		4th
	code	km	code	km	code	km	code	km
Maya	13	0.1	10	1	02	2		

HA6. (IF NAME VISITED NOWHERE TO SEEK CARE IN THE PAST 30 DAYS) WHY DID NAME NOT GO?

If the sick person (NAME) did not visit anywhere for treatment in the past 30 days, ask the respondent why NAME did not go anywhere. Record the appropriate code as given in the answer category. Note that multiple answers are allowed up to 4.

HA7. Which type of doctor made this diagnosis?

Ask the respondent if the diagnosis for the disease was made by allopathic doctor, an ayurvedic doctor, or homeopathic doctor. Circle appropriate code as given in the answer category.

HA8. WHEN DID THE ILLNESS START?

Ask the respondent when the illness started, by date, month and year. If date is unknown, record 99. For normal delivery, record date of delivery.

SECTION 5: HEALTH EXPENDITURES (PAST 30 DAYS ALL MORBIDITY)

The purpose of this section is to assess the outpatient cost of health expenditures incurred to the household from all diseases, injury and delivery in the past 30 days.

Always refer to the HD2, HD3, HD4 and HD5 to make sure that the line numbers for the episodes of illnesses align with EX, HT and CS modules.

EX1. WAS THERE ANY COST INCURRED DUE TO THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Ask the respondent if the household spent any money on the treatment of the illness, injury or delivery in the past 30 days. If there was no cost associated with the treatment or transportation, or the respondent does not know, skip this line until the end of Section 7. Go to the next line and start from EX1 again.

EX2. HOW MUCH DID THIS HOUSEHOLD PAY FOR TREATMENT OF THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS? PLEASE DO NOT INCLUDE HOSPITALIZATION WHICH IS DEFINED AS HAVING SPENT AT LEAST ONE NIGHT IN HOSPITAL. PLEASE INCLUDE ALL COSTS FOR ALLOPATHIC MEDICINE, TRADITIONAL HEALER, HOMEO-MEDICINE, AYURVEDA AND HOME REMEDY ETC.

Record in rupees the cost of treatment for each illness, starting by total medical cost. Then ask about fees including consultation/investigation fee, diagnosis & test (e.g. X-ray, blood test etc) and the cost of drugs and medical supply. Private clinics/hospitals may charge total fees inclusive of both the consultation fees/diagnosis/tests and drugs, and the household may not know the breakdown costs. In such cases record only the total medical costs (A) and leave B and C blank. Ask the respondent transport cost for (name) and accompanying family members for both ways, and any other costs incurred. If nothing was spent, write 0. Never leave the cells blank (except B and C, when the household can report only the total medical costs).

EX3. HOW MUCH DID THIS HOUSEHOLD PAY IN CASH FOR TRADITIONAL HEALER/MEDICINE FOR THIS ILLNESS IN THE PAST 30 DAYS?

Record in rupees the cost of treatment that was provided by a traditional healer/medicine for each illness. Record 0 if nothing was spent. You do not need to fill in this question if it was a normal delivery.

EX4. HOW MUCH DID THIS HH PAY FOR HOMEO-MEDICINE FOR THE TREATMENT OF THIS ILLNESS IN THE PAST 30 DAYS?

Record in rupees the cost of treatment for homeopathy for each illness. Record 0 if nothing was spent. You do not need to fill in this question if it was a normal delivery.

EX5. HOW MUCH DID THIS HOUSEHOLD PAY FOR AYURVEDIC TREATMENT FOR THIS ILLNESS IN THE PAST 30 DAYS?

Ask the respondent how much the household spent for ayurvedic treatment for the illness in the past 30 days. Record 0 if nothing was spent. You do not need to fill in this question if it was a normal delivery.

EX6. HOW MUCH DID THIS HOUSEHLD PAY FOR HOME REMEDY FOR THIS ILLNESS IN THE PAST 30 DAYS?

Ask the respondent how much the household spent for home treatment of the illness in the past 30 days. Home treatment refers to preparing herbal medicine at home, using drugs stored at home etc. Record 0 if nothing was spent. You do not need to fill in this question if it was a normal delivery.

SECTION 6: INPATIENT HEALTH EXPENDITURES (PAST 30 DAYS ALL MORBIDITY)

HT1. DID NAME RECEIVE INPATIENT TREATMENT FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Ask the respondent if the household spent any money for hospitalization of the illness, that is, if the person paid any money to stay in a hospital for a medical treatment at least one night in the past 30 days. If there was no inpatient treatment or the respondent does not know the answer, record the corresponding code and go to the next line.

HT2. HOW MANY TIMES WAS NAME HOSPITALIZED FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

If the answer for HT1 was 1 ('Yes'), ask the respondent how many times the person was hospitalized for the illness and record the number of times.

HT3. HOW MANY DAYS DID NAME SPEND IN THE HOSPITAL FOR THIS ILLNESS (OR DELIVERY) DURING THE PAST 30 DAYS?

Ask the respondent how many days the person stayed in the hospital for treatment of the illness. Remember that you are always referring to the specific episode of illness as recorded in HD5. Record in days.

HT4. HOW MUCH DID THIS HOUSEHOLD PAY FOR HOSPITALIZATION DUE TO THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS? HOSPITALIZATION REFERS TO HAVING SPENT AT LEAST ONE NIGHT IN HOSPITAL.

Record in rupees the cost of hospitalization for each illness, starting by total medical cost. Then ask about fees including consultation/investigation fee, bed fee, diagnosis & test and the cost of drugs and medical supply. Private clinics/hospitals may charge total fees inclusive of both the consultation fees/bed fee/diagnosis/tests and drugs, and the household may not know the breakdown costs. In such cases record only the total medical costs A.1 and leave A.2 and A.3 blank. Ask the respondent transport cost for (name), living cost for (name) during hospitalization, and expenses for accompanying family members for both ways, and any other costs incurred. If nothing was spent, write 0. Never leave the cells blank (except A.2 and A.3, when the household can report only the total medical costs).

SECTIN 7: COPING STRATEGIES AND INSURANCE (PAST 30 DAYS ALL MORBIDITY)
The purpose of this question is to assess the coping strategies of the household when they face large amount of the expenditure for health.

CS1. DID THIS HOUSEHOLD USE HOUSEHOLD INCOME TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?
In many instances, a household finances the treatment cost from their regular income.
Ask the respondent whether the household paid for treatment of the illness (or delivery) from the usual household income.

CS2. DID THIS HOUSEHOLD USE HOUSEHOLD SAVINGS TO PAY FOR THIS ILLNESS IN THE PAST 30 DAYS?
Sometimes a household's regular income is not enough to cover the entire medical costs, and the household may choose to use their savings to pay. Ask the respondent whether the household used household savings to pay for the illness (or delivery) in the past 30 days.

CS3. DID THIS HOUSEHOLD OBTAIN EX-GRATIA FROM FAMILY NOT LIVING WITH YOU, RELATIVES, FRIENDS OR NEIGHBOURS TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?
Sometimes a household receives money as gift from a family member living away from the household, relatives, friends or neighbors. IF the answer is 1 ("Yes"), ask the respondent how much was paid from the money the household had borrowed. If the amount is unknown write DK. Never leave the amount blank.

CS4. DID THIS HOUSEHOLD BORROW MONEY FROM FAMILY NOT LIVING WITH YOU, RELATIVES, FRIENDS OR NEIGHBORS TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Ask the respondent if the household borrowed money from family not living together, relatives, friends or neighbors to pay for the illness (or delivery) in the past 30 days. If the answer is 1 ('Yes'), ask the respondent how much was paid from the money the household had borrowed. If the amount is unknown write DK. Never leave the amount blank.

CS5. DID THIS HOUSEHOLD BORROW MONEY FROM A BANK OR COMMERCIAL MONEY LENDER TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Sometimes a household borrows money from a money lender to cover the cost of illnesses, which accrues interest rates and causes financial difficulties. Ask the respondent if the household borrowed money from a bank or commercial money lender to pay for the illness (or delivery) in the past 30 days. If the answer is 1 ('Yes'), ask the respondent how much was paid from the money the household had borrowed. If the amount is unknown write DK. Never leave the amount blank.

CS6. DID THIS HOUSEHOLD SELL ASSETS TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Ask the respondent if the household sold assets (e.g. furniture, gold, a house, land etc) to pay for this illness or delivery in the past 30 days. If the answer is 1 ('Yes'), ask the respondent how much was paid from the money obtained by selling assets. If the amount is unknown write DK. Never leave the amount blank. If the answer is 2 ('No') or 3('DK'), skip until CS8.

CS7. (IF SOLD ASSETS) WHAT KIND OF ASSETS DID THIS HOUSHEOLD SELL TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Ask the respondent what kind of assets the household sold to pay for the illness or delivery. Record the corresponding code.

CS8. DID THIS HOUSEHOLD SEEK ADDITIONAL PAID WORK TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

Sometimes a household may find another work, be it manual labor or more formal job, to finance the treatment cost. Ask the respondent whether the household sought additional paid work to pay for the illness or delivery in the past 30 days.

CS9. DID THIS HOUSEHOLD REDUCE EXPENDITURES ON FOOD TO PAY FOR THIS ILLNESS OR DELIVERY) IN THE PAST 30 DAYS?

Sometimes a household may save their expenditure on foods by buying cheaper kind of

foods or reducing the food intake to pay for the treatment. Ask the respondent whether the household reduced expenditures on food to pay for this illness in the past 30 days.

CS10. DID THIS HOUSEHOLD REMOVE CHILDREN FROM SCHOOL TO PAY FOR THIS ILLNESS (OR DELIVERY) IN THE PAST 30 DAYS?

In some instances a household may stop sending children to school to save the cost of schooling, and use the money for the treatment instead. Ask the respondent whether the household removed children from school to pay for the illness or delivery in the past 30 days.

CS11. WAS NAME COVERED BY ANY HEALTH INSURANCE PROGRAM DURING THE PAST 30 DAYS? I MEAN, WAS NAME ENROLLED IN AN ORGANIZATION/SCHEME THAT PAYS FOR HEALTH CARE COSTS IF NAME BECOMES SICK OR DELIVERS?

CS11 through CS15 pertain to the coverage of health insurance and the government subsidy scheme to compensate for the health care costs. Ask the respondent whether name was covered by any health insurance or subsidy scheme in the past 30 days. If the answer is 2 ('No') or 3('DK'), skip until CS15 and go to the next line. For instance, Maya was a civil servant and she received a treatment at the Civil Servant's Hospital for free. In this case, circle 1 ("Yes"). Another example is delivery at government hospitals. All delivery are free of charge in public hospitals in Nepal. If name has delivered in a public hospital at no cost, then circle 1 ("Yes").

CS12. WHAT IS THE HEALTH INSURANCE/SUBSIDY PROGRAM OR SCHEME THAT NAME WAS ENROLLED IN DURING THE PAST 30 DAYS?

Ask the respondent the type of the health insurance or the subsidy program name was enrolled in during the past 30 days. For instance, if Maya, a civil servant, went to the Civil Servants' Hospital to receive free medical treatment, circle 1 ("Government employee's benefits") because she is eligible for a free treatment offered to civil servants. Another example is delivery at government hospitals; if name delivered at a public hospital free of charge, circle 2 ("Government subsidy").

CS13. HAS NAME RECEIVED OR IS TO RECEIVE ANY PAYMENT FROM THE HEALTH INSURANCE/SUBSIDY TO FULLY OR PARTIALLY COVER THE HEALTH CARE EXPENDITURE THAT WAS INCURRED IN THE PAST 30 DAYS DUE TO THIS ILLNESS (OR DELIVERY)?

Sometimes a health insurance program or a health subsidy scheme reimburses the treatment cost to the subscribers. Ask the respondent whether name has received or is going to receive any payment from the health insurance/subsidy to cover all of, or part of the health care expenditure that the household paid in the past 30 days due to the illness. If the answer is 2

('No') or 3('DK'), skip until CS15 and go to the next line.

CS14. HOW MUCH TOTAL MONEY HAS NAME ALREADY RECEIVED FROM THE HEALTH INSURANCE/SUBSIDY TO FULLY OR PARTIALLY COVER THE HEALTH CARE EXPENDITURE THAT WAS INCURRED IN THE PAST 30 DAYS DUE TO THIS ILLNESS (OR DELIVERY)?

Ask the respondent how much in total name has already received from the health insurance/subsidy to cover the health care cost that was incurred in the past 30 days due to the illness, either fully or partially. Record 0 if nothing has been paid by the insurance/subsidy.

CS15. (IF NOT YET RECEIVED) HOW MUCH TOTAL MONEY IS NAME TO RECEIVE FROM THE HEALTH INSURANCE/SUBSIDY TO FULLY OR PARTIALLY COVER THE HEALTH CARE EXPENDITURE THAT WAS INCURRED IN THE PAST 30 DAYS DUE TO THIS ILLNESS (OR DELIVERY)?

Sometimes the insurance subscribers receive partial or full reimbursements much later than the time the disease occurred. Ask the respondent how much total money name is going to receive from the health insurance/subsidy to fully or partially cover the health care costs that was incurred in the past 30 days due to the illness. Record 0 if nothing is to be paid by the insurance/subsidy.

SECTION 8: HEALTH PROBLEMS AND CARE SEEKING BEHAVIOUR (PAST 12 MONTHS CHRONIC DISEASES)

The main purpose of this section is to identify the episode of chronic diseases in the past 12 months and how the household members sought care from the health care provider. Note that Section 8 through Section 11 refer only to the chronic diseases that lasted for more than 3 months during the past 12 months.

Check HD7 and if the answer is "yes", complete the sections 8, 9, 10 and 11. If the answer is "no", go to Section 12.

Normal delivery without complications should not be included in chronic diseases because it is not a condition that can last for 3 months. Thus all instructions on "normal delivery" in the 30 days morbidity section do not apply in this section.

HB2. NAME: copy HD9
HB3. Household Line Number: copy HD10

HB4. Diagnosis: copy HD11

HB5. (FOR DIABETES PATIENTS ONLY) IS NAME RECEIVING INJECTABLE INSULIN TREATMENT?

Ask the respondent if NAME is receiving injection for treatment of diabetes.

HB6 through HB9 are the same as Section 5.

HB10 through HB14 are additional questions for chronic diseases. The questions aim to assess the non-adherence of medication, that is, a person saves drug costs by skipping the medication or reduces the dose.

HB10. WAS NAME PRESCRIBED DRUGS FOR TREATMENT BY A MODERN HEALTH SERVICE PROVIDER FOR THIS ILLNESS IN THE PAST 12 MONTHS?

Ask the respondent if NAME was prescribed drugs by a modern health service provider for the illness in the past 12 months. If the answer is 2('No') or 3 ('DK'), skip HB11 through HB14 and go on to the next line.

HB11. DURING THE PAST 12 MONTHS, DID NAME EVER NOT FILL OR REFILL A PRESCRIPTION FOR THIS ILLNESS BECAUSE THE MEDICINE COSTS TOO MUCH?

Ask the respondent if NAME deliberately did not fill or refill a prescription for the illness in the past 12 months due to economic reasons. Record 2 ('No') if NAME did not fill or refill prescription simply because he/she forgot, was too busy or feared the side-effects. Record 3 ("Not applicable as the medicine was free") if the medicine was provided free of charge.

HB12. DURING THE PAST 12 MONTHS, DID NAME EVER DELAY GETTING THE PRESCRIPTION FOR THIS ILLNESS FILLED OR REFILLED BECAUSE THE MEDICINE COSTS TOO MUCH?

Ask the respondent if NAME deliberately delayed getting the prescription for the illness filled or refilled due to economic reasons. Record 2 ('No') if NAME delayed to fill or refill prescription simply because he/she forgot, was too busy or feared the side-effects. Record 3 ("Not applicable as the medicine was free") if the medicine was provided free of charge.

HB13. DURING THE PAST 12 MONTHS, DID NAME EVER SKIP DOSES TO MAKE THE MEDICINE FOR THIS ILLNESS LAST LONGER?

Ask the respondent if NAME deliberately skipped doses to make the medicine for this illness last longer due to economic reasons. Record 2 ('No') if NAME skipped doses simply because he/she forgot medication, was too busy or feared the side-effects. Record 3 ("Not applicable

as the medicine was free") if the medicine was provided free of charge.

HB14. DURING THE PAST 12 MONTHS, DID NAME EVER TAKE SMALLER DOSES TO MAKE THE MEDICINE FOR THIS ILLNESS LAST LONGER?

Ask the respondent if NAME deliberately reduced the quantity of doses to make the medicine for this illness last longer due to economic reasons. Record 2 ('No') if NAME reduced doses simply because he/she was careless, did not like the taste or feared the side-effects. Record 3 ("Not applicable as the medicine was free") if the medicine was provided free of charge.

SECTION 9: HEALTH EXPENDITURES (PAST 12 MONTHS CHRONIC DISEASES)
Always refer to the HD8, HD9, HD10 and HD11 to make sure that the line numbers for the episodes of illnesses align with the sections 8, 9, 10 and 11.
Refer to Section 5 as the questions are the same except that we are only referring to chronic illnesses that lasted for more than 3 months in the past 12 months. .

SECTION 10: INPATIENT HEALTH EXPENDITUES (PAST 12 MONTHS CHRONIC DISEASES)
Refer to Section 6.

SECTION 11: COPING STRATEGIES (PAST 12 MONTHS CHRONIC DISEASES)
Refer to Section 7.

SECTION 12: DURABLE GOODS

For each of the durable goods ask if the household currently owns the good and circle 'Y' for those items that the household owns, and 'N' for the items that household does not own. Ask about all of the items in DG1 before moving on to DG2 through DG6. Do not include any items owned for a household enterprise (e.g. a store owned by the household, a factory, etc.)

For those household item that are owned, ask questions DG2 through DG6.
DG2. Ask how many of the item the household owns.
DG3. Ask how many years ago the newest item was purchased.
DG4. Ask whether the household purchased the item or received it as a gift/payment in-kind. If the household owns more than one item, refer to the newest item only.
DG5. Ask how much the item was worth at the time the household purchased it. If the household owns more than one item, refer to the newest item only.
DG6. Ask how much the item could be sold for today. If the household owns more than one item, calculate total value of all items. The interviewee may respond that he or she does not

want to sell the item. Explain that you are trying to determine the value of the item and that you do not want the household to sell the item.

END OF THE INTERVIEW

INTERVIEWERS: Check the completed questionnaire carefully before you leave the household. Thank the respondents and ask the mobile number or the phone number in case you require further follow-up.

Annex: Interviewer's Cluster Control Sheet

Cluster number: _____

Interviewer number: _____ Date: _____

HH No.	Address of Structure	HH serial no. in structure	Name of head of HH	Final Result	Notes

Standard costing for medical treatment in major hospitals of Kathmandu

Type	Institution	Consultation Fee	Diagnosis Fee	Bed fee	Drugs	Note
OPD	TUTH	0	0	70-2000	n/a	Once
OPD	TUTH				12000	Monthly, Dialysis
OPD	Bir Hospital	0	0		n/a	Once
OPD	Pharmacy				300	Monthly (metformin)
OPD	Pharmacy				500	Monthly (metformin and antihypertensive)
OPD	Pharmacy				300	Day (Insulin)
Inpatient	Ayurveda Hospital	0	0	50-500	n/a	Once
OPD	Ayurveda Hospital	0	0		150	Per 15 days, Jeaundice
OPD	Ayurveda Hospital				120	Per 30 pieces, Common cold
OPD	Ayurveda Hospital				200	Per 15 days, hypercholesterolemia
OPD	Ayurveda Hospital				77	Per month, hypertension
OPD	Ayurveda Hospital				285	Per month, DM
Inpatient	Norvic Hospital					
OPD	Norvic Hospital					
Inpatient	Maternity Hospital	0	0	0	0	Under the government subsidy
OPD	Materniy Hospital	0	0	0	0	Under the government subsidy
OPD	Homeopathic hospital	0	0	n/a	0	Pashpati hospital serves medicines for free

150

Drug price list for major illnesses

Name of medicine	Range	Unit price
Amlodipine	2.5mg	2.5 to 5
	5 mg	4 to 6
	10 mg	5 to 8
losartan	25mg	5-6
	50mg	8-10
telmisartan	20 mg	6.5-8
	40mg	11-14
	80mg	18-20
Atnelol	25mg	3-5
	50mg	5-8
	100mg	6-10
Losartan50mg+hydrochlorothaizide12.5		12-15
Amlodipine+Atenolol	5/50	4-6
Atrovastatin	5mg	6-8
	10mg	9-12
	20mg	17-22
Enarapril	2.5mg	3-4
	5mg	5-7
	10mg	7-10
Ramipril	2.5mg	5-9
	5mg	9-15
	10mg	18-21
Rusovastatin	5mg	9-18
	10mg	17-32
	20mg	32-45
Metformin	500mg	2-3
	850mg	3-5
	1000mg	5-7
glimipride	1mg	4-11
	2mg	7-15
	3mg	10-18
	4mg	12-21
Glicazide	40mg	3-4
	80mg	5-6
Pioglitazone	15mg	7-9
	30mg	13-16

Name of medicine	Range	Unit price
Acarbose	25mg	11-12
	50mg	16-18
Glipride	5mg	1-2

APPENDIX 4: Supervisor's Manual

(This manual has been adapted from ICF Macro (2011). Demographic and Health Survey
Supervisor's and Editor's Manual. <u>MEASURE DHS Basic Documentation Number 4</u>.
Calverton, Maryland, ICF Macro.)

STUDY ON THE HEALTH CARE EXPENDITURE AND COPING STRATEGIES FOR MAJOR ILLNESSES IN NEPAL

INSTRUCTIONS FOR SUPERVISORS

PREPARED BY

THE UNIVERSITY OF TOKYO

TRIBHUVAN UNIVERSITY TEACHING HOSPITAL

SOLID NEPAL

Content

PART I. INTRODUCTION

1. Objectives of the Survey

The study on the health care expenditure and coping strategies for major illnesses in Nepal is a joint effort between the University of Tokyo and the Tribhuvan University Teaching Hospital.

The survey has the following objectives:

- To assess the disease-specific out-of-pocket health expenditure
- To assess the proportion of households which made catastrophic health payment, and the individual/household characteristics that are likely to incur such catastrophic payment
- To assess the household coping strategies for health expenditure

The information gathered from the survey would generally aid decision makers to formulate national health policies to:

- Identify the target groups or target diseases for government subsidy
- Analyze the impact of existing health policies in support of the health payments

2. Organization of the survey

2.1. The survey team

The SOLID Nepal will serve as the implementing agency for the survey. The SOLID Nepal will take responsibility for operational matters including planning and conducting fieldwork, and processing of collected data. During the fieldwork, you will work in a team consisting of 4 interviewers and a supervisor. Each team will be accompanied by a local guide. Each supervisor will be responsible for a team of 4 interviewers. The specific duties of the supervisor are described in detail in the supervisor's manual.

2.2. Responsibilities of supervisors

The field supervisor is the senior member of the field team. He/she is responsible for the well-being and safety of team members, as well as the completion of the assigned workload and the maintenance of data quality. The supervisor receives his/her assignments from and reports to the principal investigators. The specific responsibilities of the supervisor are to make the necessary preparations for the fieldwork, to organize and direct the fieldwork, and to conduct periodic spot-check.

To prepare for fieldwork, the supervisor must:

Obtain sample household lists and/or maps for each area in which his/her team will be working.

Become familiar with the area where the team will be working and determine the best arrangements for travel and accommodations.

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Contact local authorities to inform them about the survey and gain their cooperation.

Obtain all monetary advances, supplies, and equipment necessary for the team to complete its assigned interviews.

Careful preparation by the supervisor is important for facilitating the work of the team in the field, for maintaining interviewer morale, and for ensuring contact with the central office throughout the fieldwork.

During the fieldwork, the supervisor will:

- Assign work to interviewers, taking into account the linguistic competence of individual interviewers and ensuring that there is an equitable distribution of the workload.
- Maintain fieldwork control sheets and make sure that assignments are carried out.
- Regularly send completed questionnaires and progress reports to the central office and keep headquarters informed of the team's location.
- Edit all completed questionnaires in the field. All editing must be completed prior to leaving the sample area.
- Communicate any problems to the principal investigator.
- Arrange for lodging and food for the team.
- Make an effort to develop a positive team spirit. A congenial work atmosphere, along with careful planning of field activities, contributes to the overall quality of the survey.

PART II. PREPARING FOR FIELDWORK

1. Collecting materials for fieldwork

Before leaving for the field, the supervisor is responsible for collecting adequate supplies of the materials the team will need in the field. These items are listed below:

Fieldwork documents

- Supervisor's manual
- Interviewer's manual
- Maps and household listing forms for all clusters in the assigned area
- Letters of introduction to local authorities
- Household questionnaires
- Supervisor's cluster control sheets
- Interviewer's cluster control sheets

Supplies

- Black pens for interviewers
- Red pens for the supervisor

- Clipboards

- Staplers and staples

- Envelopes to store completed questionnaires

- First aid kit

- Funds for field expenses

- Sufficient funds to cover expenses for the team

- Funds for the local guides

2. Contacting local authorities

It is the supervisor's responsibility to contact the ward officials before starting work in an area. Letters of introduction will be provided, but tact and sensitivity in explaining the purpose of the survey will help win the cooperation needed to carry out the interviews.

3. Contacting the central office

Each supervisor should arrange for a system to maintain regular contact with the central office staff before leaving for field. Regular contact is needed for supervision of the team by central office staff, payment of team members, and the return of completed questionnaires for timely data processing.

PART III. ORGANIZING AND SUPERVISING FIELDWORK

1. Assigning work to interviewers

The following tips may be helpful to the supervisor in assigning work:

- Make daily work assignments. Be sure each interviewer has enough work to do for the day.

- Assign more households to interview than an interviewer can actually do in one day. This is necessary because some households may not be available for interview at the time of the visit.

- Distribute work fairly among the interviewers.

- Ensure that each interviewer has all the required information and materials for completing the work assignment.

- Maintain complete records each day using Supervisor's cluster control sheet (Annex). All assignments and work should be carefully monitored for completeness and accuracy.

- Make sure that all selected households for the cluster have been interviewed before leaving an area.

- Reassign a household to a different interviewer if it turns out that the interviewer knows the respondent. Interviewers are not allowed to interview anyone they know.

- Finally, it is the responsibility of the supervisor to make sure that the interviewers fully understand the instructions given to them and that they adhere to the work schedule.

2. Reducing nonresponse

One of the most serious problems in a sample survey of this type is nonresponse, that is, failure to obtain information for selected households. A serious bias could result if the level of nonresponse is high. One of the most important duties of the supervisor is to try to minimize this problem and to obtain the most complete information possible. In many cases, interviewers will need to make return visits to households in the evening or on the weekends to reduce nonresponse. It is a time-consuming task and requires strict monitoring by means of the control sheets.

Various ways of dealing with nonresponse are discussed below.

Type 1: The interviewer is unable to locate the selected household

a) Structure not found. The supervisor should make sure the interviewer has tried several times to locate the structure using the household listing form, maps, etc. If the interviewer is still unsuccessful, the supervisor should attempt to locate the structure and ask neighbours.

b) Structure nonresidential, vacant, or demolished. If the interviewer indicates that a structure is not a dwelling unit or that it is vacant or demolished, the supervisor or editor should verify that this is the case. If the interviewer is correct, there is no need for further callbacks.

Type 2: The interviewer is unable to locate the respondent eligible for the interview

a) No one home at time of call. The interviewer should make every effort to contact neighbours to find out when the members of the household will be at home or where they might be contacted. At least three visits should be made to locate the household members. Sometimes it may be necessary to call at mealtime, in the early morning, in the evening, or on the weekend. UNDER NO CIRCUMSTANCES IS IT ACCEPTABLE TO MAKE ALL THREE VISITS ON THE SAME DAY.

b) Respondent temporarily absent. The respondent may not be at home or may be unable to complete the interview at the time of the first call. The interviewer should find out from other household members or neighbours when the respondent can best be contacted, and a return visit should be made by then. If possible, an appointment should be made with the respondent.

Type 3: The respondent refuses to be interviewed

The number of refusals reported by each interviewer should be closely monitored. If an interviewer reports an unusually high number of refusals, it may indicate that he or she gives up too early or explains the survey inadequately. If this appears to be the case, the supervisor should observe the interviewer promptly. Try to postpone interview to another day if the interviewers sense that they have arrived at an awkward time. If there is a linguistic or ethnic barrier between

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the respondent and the interviewer, the supervisor should, if possible, send a different interviewer to complete the questionnaire.

3. Handling pending interviews

Supervisors should keep track of all assignments including pending interviews of the Supervisor's cluster control sheet (Annex). Completing callbacks for pending interviews is time consuming and should be carefully planned. If a few interviews remain pending as interviewing in a cluster nears completion, one or two interviewer should be assigned to remain in the area and complete the interviews while the rest of the team proceeds to the next assignment area.

4. Maintaining motivation and morale

The supervisor plays a vital role in creating and maintaining motivation and morale among the interviewers. To achieve this, it is necessary to make sure that interviewers:

- Understand clearly what is expected of them
- Are properly guided and supervised in their work
- Receive recognition for good work
- Are stimulated to improve their work
- Work in tranquil and secure conditions.

PART IV. MAINTAINING FIELDWORK CONTROL SHEETS

Control of fieldwork within sample clusters is maintained by keeping control sheets for interviewer assignments. Two forms are used to maintain control of questionnaires and measure progress.

- Supervisor's cluster control sheet
- Interviewer's cluster control sheet

1. Supervisor's cluster control sheet

One Supervisor's cluster control sheet should be completed for each cluster by the supervisor and returned to the head office with the questionnaires from that cluster. An example of the Supervisor's cluster control sheet is shown in Annex.

The first step in completing the Supervisor's cluster control sheet is to copy the cluster identification information (cluster number and name of the locality) from the household listing form. The cluster number is a three-digit number and will be written on the top of each page of the household listing.

The next step is to record the information for all selected households from the household listing forms. They should be written on the Supervisor's cluster control sheet in the same order in which

they are written on the household listing forms. When the households are written in a different order, it causes unnecessary confusion during the data processing operation, especially since the questionnaires will be put in order by household number.

The supervisor should assign each interviewer a number of households to interview. When making interview assignments, HH No., Address of the structure, HH serial number in structure, name of the head of the household should be copied on the Interviewer's cluster assignment sheet from the Supervisor's cluster control sheet.

At the end of each day, the interviewers will return the questionnaires in which all interviews have been completed to the supervisor for checking. The supervisor should review the household questionnaires to check that:
- All eligible respondents have been correctly identified on the household questionnaire
- The identification information on the cover pages of the household questionnaire is correct.

Next, copy the information from the questionnaires about the results of the interview into Final result of the Supervisor's cluster control sheet. Remarks and comments about the interview assignment, results, or interviews may be recorded in Notes.

Always start a new cluster on a separate Supervisor's cluster control sheet. This sheet would be included in the package of questionnaires going back to the central office.

2. For Interviewer's cluster control sheet, refer to Interviewer's manual.

V. MONITORING INTERVIEWER PERFORMANCE

Controlling the quality of the data collection is the most important function of the supervisor. Throughout the fieldwork, he/she will be responsible for observing interviews and carrying out field editing. By checking the interviewer's work regularly the supervisor can ensure that the quality of the data collection remains high throughout the survey. It may be necessary to observe the interviewers more frequently at the beginning of the survey and again toward the end. In the beginning, the interviewers may make errors due to lack of experience or lack of familiarity with the questionnaire; these can be corrected with additional training as the survey progresses. Toward the end of the survey interviewers may become bored or lazy in anticipation of the end of fieldwork; lack of attention to detail may result in carelessness with the data. To maintain the quality of data, the supervisor should check the performance of interviewers thoroughly at these times.

A powerful tool in checking the quality of the data is to systematically spot-check the information for particular households. This is done by conducting a short reinterview in some households and checking the results with what was collected by the interviewer. Reinterviews help reduce three types of problems that affect the accuracy of the survey data.

Reinterviews are used to check that the interviewer actually interviewed the selected household. Sometimes interviewers either inadvertently locate the wrong household or they may deliberately interview a household that had no episode of illnesses, thus making it easier to finish their work quickly. Occasionally, an interviewer may not interview any household and just fill in a questionnaire on her own. Reinterviews are a means of detecting these problems.

Another problem that may arise is that some interviewers may deliberately omit the history of diseases and report that there was no case of illnesses, injury or delivery in the reference period. In these ways, they can finish their work quickly. If this happens frequently, it can have a substantial impact on the quality of the data.

To conduct the reinterview, the supervisor should take a blank household questionnaire, fill in the identification information on the cover sheet with a red pen, and write clearly 'REINTERVIEW' on the top of the cover page. The supervisor should then visit the selected household with only the reinterview questionnaire and interview the household, filling in the HL and HD modules only. After completing the reinterview, the supervisor should obtain the original questionnaire and compare the information. If the supervisor discovers that some episodes of illnesses were not identified in the original interview, the interviewer should return to gather the missing information on the original questionnaire.

PART VI. EDITING QUESTIONNAIRES

Ensuring that questionnaires are edited for completeness, legibility and consistency is one of the most important task of the supervisor. Every questionnaire must be completely checked in the field. This is necessary because a small error can create much bigger problems after the information has been entered into the computer and tabulations have been run. Often small errors can be corrected just by asking the interviewer. In other cases, the interviewer may have to go back to the respondent to get the correct information. Timely checking permits correction of questionnaires in the field.

1. General instructions
- Always use a red pen to make corrections.
- If the problems are major, such as discrepancies in the expenditures are largely missing, it will

be necessary to go back to interview the respondent again. If a return visit is not possible, try to call the respondent on the phone.

- Under no circumstances should you make up an answer. Do not try to fill in the questionnaire by yourself.

- In checking each questionnaire, make sure that the respondent was asked all questions appropriate for him/her (check that the interviewer followed the skip instructions). You will need to look for:

  ➢ Questions for which a response is recorded when it appears there should be no response (in this case, cross out the response by drawing two lines through the codes with your red pen).

  ➢ Questions for which no response is recorded when it appears there should be a response (in this case, try to find the correct response as described above).

- Check the ranges for all variables that are not precoded (e.g. A. total medical costs in EX2 should be the same as the total of B. Fees including consultation/investigation fee, diagnosis etc. and C. cost of drugs.). Mark any inconsistencies with a red pen.

2. Organizing questionnaires for return to the office

   a) Organize all the household questionnaires in numerical order by household number within the cluster. Also, any continuation questionnaires (e.g. if there are more than 12 household members) should be inside the primary questionnaires and should have 'CONTINUATION' written across the top of the cover sheet. The primary questionnaire for that set should say 'SEE CONTINUATION' across the top of the cover sheet.

   b) Check the questionnaires against the Supervisor's cluster control sheet to be sure that:

   ➢ The correct number of Household questionnaires are present

   ➢ The household final result codes are correct.

   c) After all the checking described above have been completed, the supervisor should put all the questionnaires along with the Supervisor's cluster control sheet into the envelopes provided. On the outside of the envelope, she/he should write the cluster number, the name of the locality, and the number of household questionnaires for that cluster. The packets should be kept securely until they can be transported to the central office.

Annex: Supervisor's Cluster Control Sheet

Cluster number: _____
Supervisor's name: _____   Date: _____

HH No.	Address of Structure	HH serial no. in structure	Name of head of HH	Interviewer and date assigned	Final Result	Notes