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Socioeconomic differences in a rural district in Vietnam: effects on health and use of health services

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Stockholm 2004
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Published and printed by Karolinska University Press
Box 200, SE-171 77 Stockholm, Sweden
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ISBN 91-7349-984-6
ABSTRACT

Background: Differences in health status and health care utilization between socioeconomic groups are evident in low-income and high-income countries. The situation in rural Vietnam is not well known. Empirical results on health by socioeconomic group, or geographic location may provide useful information for designing equity-oriented health policy and poverty focused interventions.

Objective: To study socioeconomic differences and deviations from equality in health, health care utilization and health care expenditure in a rural district in Vietnam in relation to existing health care policy and available services.

Methods: The studies were conducted within a demographic surveillance system (FilaBavi) in the BaVi district, northern rural Vietnam. The basic study used was the FilaBavi baseline survey with 11,547 households and 49,893 persons. The results on utilization and payment for outpatient services were based on a sub-study of 4,769 individuals. Socioeconomic differentials in prolonged cough prevalence were estimated for 35,832 individuals aged 15 or more. The socioeconomic differences in mortality were estimated using the quarterly follow-ups during 1999-2002.

Main findings: Different indicators: income, expenditure, household asset, housing conditions and official classification give different descriptions of the economic situation. The indicators are not closely correlated. Sensitivity and positive predictive value for poverty are low for all indicators. Self-treatment is the most common choice and accounts for 50.7 % of the health care actions taken. It is reported more often by the better-off than the poor (56.1 % vs. 41.2 %). Private practitioners are important sources of health care. They account for 18%, and are consulted more often by the poor than by the better-off (21.0 % vs. 16.1 %). The poor choose commune health centers more often than the better-off (20.0 % vs. 15.5 %). Poor patients are more likely to deter from seeking health care in public health facilities. Twenty percent in the lowest income quintile deter from seeking health care in public health services due to financial difficulties, compared to 8.2 percent in the highest income quintile. The mean payment for treatment during a 4-week recall period is 7.4 percent of the household monthly income, a substantial share. The percentage of the household income used for treatment decreases as the income increases. The poorest quintile spends 16.9 % of their monthly household income, while the richest quintile spends only 3.7 %. There are differences in sources of payments between income groups. The richest income quintile relies on household saving more often than the poorest (37.8 % vs. 28.6 %), while the latter reports borrowing money as a main source of payment for health care to a larger extent than the richest quintile (38.1 % and 21.3 % respectively). The estimated prolonged cough prevalence is higher for persons classified as poor, regardless of indicator used. The standardized mortality rate of males in the lowest wealth quintile is much higher than that of males in the highest wealth quintile.

Conclusions and recommendations: The studies gave indications as regards socioeconomic differences in health and in access to health services especially for the poorer groups of the population in the study area. Poor persons and households are in worse situations regarding health, utilization of health care and payments for health services. The results urge for policy initiatives to reduce the burden of the poor and to satisfy the greater needs of the poorer part of the population. For egalitarian health polices, it is important to ensure not only an absolute level of health but also smaller relative differentials between socioeconomic groups. A combination of developing risk-sharing schemes; exemption, partial or full from payment; differentiation of prices; appropriate allocation of scarce public resources; supporting and regulating the private health sector; government subsidized health insurance for low income groups, and in the long-run universal coverage of health insurance may be possible solutions to improve access to health care for the poorer section of the population.

Key words: Socioeconomic status, equity, equality, socioeconomic inequality in health, socioeconomic inequality in health care, Vietnam.
List of original papers

This thesis is based on the following papers, which will be referred to by their roman numerals:


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<th>Definition</th>
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<tr>
<td>ARI</td>
<td>Acute Respiratory Infections</td>
</tr>
<tr>
<td>BHPS</td>
<td>British Household Panel Survey</td>
</tr>
<tr>
<td>CHC</td>
<td>Commune Health Center</td>
</tr>
<tr>
<td>DALY</td>
<td>Disability-adjusted Life Years</td>
</tr>
<tr>
<td>DSS</td>
<td>Demographic Surveillance Site</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Programme of Immunization</td>
</tr>
<tr>
<td>FilaBavi</td>
<td>Bavi Sociodemographic Surveillance System</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
</tr>
<tr>
<td>GSO</td>
<td>General Statistical Office</td>
</tr>
<tr>
<td>ICI</td>
<td>Illness Concentration Index</td>
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<tr>
<td>IMR</td>
<td>Infant Mortality Rate</td>
</tr>
<tr>
<td>KI</td>
<td>Karolinska Institutet</td>
</tr>
<tr>
<td>MCH/FP</td>
<td>Maternal and Child Health/Family Planning</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOLISA</td>
<td>Ministry of Labor, Invalid and Social Affairs</td>
</tr>
<tr>
<td>OPP</td>
<td>Out-Off-Pocket Payment</td>
</tr>
<tr>
<td>PAHO</td>
<td>Pan America Health Organization</td>
</tr>
<tr>
<td>PCA</td>
<td>Principal Component Analysis</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing Power Parity</td>
</tr>
<tr>
<td>SAREC</td>
<td>Department for Research Co-operation with Developing Countries</td>
</tr>
<tr>
<td>SES</td>
<td>Socioeconomic Status</td>
</tr>
<tr>
<td>Sida</td>
<td>Swedish International Development Co-operation Agency</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>U5MR</td>
<td>Under five Mortality Rate</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>VLSS</td>
<td>Vietnam Living Standard Survey</td>
</tr>
<tr>
<td>VND</td>
<td>Vietnamese Dong</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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1. BACKGROUND

1.1 The concerns for health inequalities

Gaps in health status and health care among different social groups are evident both in low-income countries and high-income countries. The disparities are apparent and can be observed irrespective of whether the population is categorized by social class, income, occupation, education or ethnicity (Beaglehole and Bonita 1997). A relation between socio-economic status (SES) and health has been widely documented in epidemiological studies (Duncan et al., 1995, Duncan 1996, Lahelma et al., 1994, Humphries and van Doorslear 2000, Kaplan and Keil 1993, Lynch et al., 1996, Wilkinson 1997, van Doorslaer et al., 1997). Regardless of which SES indicator or health outcome measure used, the link between SES and health was found (Mackenbach et al., 1997). Lower socio-economic status is associated with poorer health (Lahelma et al., 1994, Humphries and van Doorslear 2000, Kaplan and Keil 1993, Lynch et al., 1996, Wilkinson 1997, van Doorslaer et al., 1997).

The concern of the international community in health inequalities has varied greatly during the last decades. It was high from the mid-1970s to the mid-1980s with the “Health for All” movement initiated by WHO which was greatly accelerated by the 1978 International Conference on Primary Health Care held in Alma-Ata. One of the objectives of the primary health care defined in the above-mentioned conference is to improve equity in access to health and health care for all with government's supporting or encouraging the development of free health care services to cover the entire population (WHO 1978).

By the mid-1980s, however, the situation had changed due to severe economic difficulties experienced by many low and middle-income countries, which made it clear that the goal of free government health services for all was hard to realize. “Thus, the pendulum began to swing away from “Health for All” towards what became known as the “health sector reform” (HSR) (Gwatkin 2000). Two important events in 1993 provided guidance to many of the health sector reforms. The first was the publication of the World Development Report 1993 in June and the second was the International Conference on Health Sector Reform: Issues for the 1990s in September (Berman 1995). The focus then shifted from "Health for All" with heavily government subsidies towards health system efficiency and sustainability.

During the following years, there has been a growing concern that the efficiency-driven health reforms with a reduction of the direct role of the state and an increase of the use of market-like mechanisms in health care provision would lead to decreased social justice and fairness (Blas and Hearst 2002). This marked an incipient renewal of concern for poverty and equity in health and a number of activities were started to address these concerns. A number of studies examining the impact of economic transition and health sector reform on health equities in different settings indicate that the choices and access to services for those who can pay increased, while for the poor the choices and access decreased and the measures that were supposed to protect the poor and vulnerable did not

Recent “benefit-incidence” studies carried out in different countries under the auspices of the World Bank, which assess the distribution of the financial benefits from different types of government expenditures across social class also indicated that overall government health service programs usually benefit the better-off more than the disadvantaged. This is true especially for secondary and tertiary care, which usually accounts for most government health care expenditures (Gwatkin 2001).

1.2 Poverty and health

1.2.1 Poverty - definition

For those concerned with poverty and interested in reducing inequalities, their concern is not with health conditions that exist in society as a whole, but with the condition of different socioeconomic groups within the population, particularly important are those in the “lowest” and most disadvantaged groups. The “basic human needs” school of thought advocated dealing directly with the poor as the best means of producing sustainable economic growth (Gwatkin 2000).

Absolute and relative poverty-definition and measures

There is no simple, yet useful definition of poverty. The most basic definition of poverty is the concept of absolute poverty that concerns the lack of the most fundamental needs such as food, water, clothing and shelter. A definition like this requires a measure based on a “poverty line”, for example a minimum income level to purchase enough food for a minimum daily caloric intake. The current international poverty line proposed by the World Bank stands at an average per capita consumption of US$ 1.00 per day (in 1995 dollar). A second approach deals with what is referred to as “relative poverty”, which is defined in one of two ways. The first one is to determine how much income one needs to live decently according to some locally established definition of decency. The second is simply to define the national poverty line as some proportion, often arbitrarily determined, of a society’s average per capita income or expenditure. For example, the proportion of the population living at less than one-half the country’s average per capita income or median income (Gwatkin 2000).

A wide range of possible measures of poverty has been developed and used in different countries based on income, expenditure/consumption, household assets, education attainment or occupation of adults. Some researchers have proposed composite measures using several indicators simultaneously (Cortinovis et al.,1993) like Duncan's Socio-economic Index (Duncan 1996) and Hollingshead's Index of Social Position (Liberatos et al., 1988). Different methods produce different pictures of poverty (Andreß 1998) and its relation to health.

Most measures have different meanings in different settings. In practice, the choices of
measures are dependent on the available data (Berkman and Macintyre 1997, Macpherson and Silburn 1998). However, there has also been a growing interest in measures suitable for comparison between countries.

Commonly, income and/or expenditure are used to measure poverty, but it is important to consider other indicators (Macpherson and Silburn 1998). In low income countries, the interest is to examine condition to physical survival in terms of food basket (absolute poverty). In this case, poverty is defined, for instance, as incomes lying below a certain “poverty line” or by looking at living conditions and the ownership of certain goods. In industrial countries, the practice is to define and compare to accepted standard of living, that is, for example, how much income one needs to live decently according to some locally established definition of decency (relative poverty)(Andreß 1998).

**The multi-dimensional nature and the importance of non-monetary dimension of poverty**

Traditionally, poverty has been defined in economic terms and health status has not been an element in the definition, health was rather considered primarily as a service to be delivered to those who are found to be poor in terms of income/expenditure criteria (Gwatkin 2000). According to Amartya Sen, health status and education are as important as income to improve the poor's conditions and he proposed to assess poverty in terms of a Human Development Index including health, education status together with income (UNDP 1996, Sen 1999). The same multi-dimensional concept of poverty is also stated and used by the Asian Development Bank: "poverty is a definition of essential assets and opportunities to which every human is entitled. Everyone should have access to basic education and primary health services. Poor households have the right to sustain themselves by their labour and be reasonably rewarded as well as having some protection for external shocks" (Bhushan et al., 2001). So income poverty is only one component of poverty. The non-economic dimensions of poverty are e.g. lack of self-esteem, ignorance and diseases.

In Vietnam, there are, at present, many different definitions of poverty and poverty lines simultaneously used (MOH 2002). Most poverty definitions are one-dimensional as they are based on income or expenditures of households. The General Statistical Office (GSO) defined the poverty line in terms of the level of income needed to buy 2,100 calories per capita per day (VND 130,000/month) (MOH 2002). Since 1993, the Ministry of Labor, Invalid and Social Affairs (MOLISA) stated poverty thresholds based on the amount of rice consumption per capita per month. From 1st January 2001, this rice poverty line was replaced by a new poverty line based on a monetary term (MOH 2002).

**1.2.2 Poverty – some figures**

Poverty is a striking feature of the world. It has been estimated that the number of people living in extreme poverty (defined as less than $ 1 per person per day) amounts to 1,170 million (World Bank 2003). Although there have been slight reductions in the world’s poverty in percentage terms for the period from 1990 to 1999, both the share and the absolute numbers increased in some regions reflecting the widening gap between affluent and poor countries. While in East Asia and the Pacific, the share of people in extreme
poverty fell from 30.5 percent to 15.6 percent, the poverty rate in Sub-Saharan Africa rose from 47 percent in 1990 to 49 percent in 1999, and the number of people living in extreme poverty increased by 74 million. The transition economies of Europe and Central Asia experienced an even sharper drop in income, and their poverty rate increased more than double (World Bank 2003). Income inequality between countries has increased sharply over the past 40 years. In 1960 per capita GDP in the richest 20 countries was 18 times that in the poorest 20 countries. By 1995 this gap had widened to 37 times. Income inequality within countries shows less pronounced trends. However, since within-country income inequality has increased in some populous countries, overall more people have been affected by increases in inequality than by decreases (World Bank: World Development Report 2001/2002, World Bank- Poverty Net: http://www.worldbank.org/poverty/data/trends/inequal.htm).

Table 1. Poverty in poor regions of the world, 1990-1999

<table>
<thead>
<tr>
<th>Region</th>
<th>% of the population below the poverty line*</th>
<th>Number of poor (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asia</td>
<td>45</td>
<td>506</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>30.5</td>
<td>486</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>47</td>
<td>241</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>2.1</td>
<td>5</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>11</td>
<td>48</td>
</tr>
<tr>
<td>Eastern Europe &amp; Central Asia</td>
<td>1.4</td>
<td>6</td>
</tr>
</tbody>
</table>

* Defined as less than $1 per person per day as 1993 price.
Source: World Bank 2003

In Vietnam, due to high economic growth, achievement in terms of reduced poverty was remarkable. The poverty rate defined according to the rice poverty line has been reduced from 20% (1992/93) to 16% (1997/1998) and to around 11% (2000). This means that around 300,000 households have escaped from poverty each year during the second half of the 1990s. The number of hunger households has dropped from 450,000 (1995) to 150,000 (2000) and this constitutes around one percent of the households (MOH 2002, MOLISA 2000).

Comparing with neighboring Southeast Asian countries, the Vietnam incidence of relative poverty is low indicating a fairly egalitarian distribution of income across the population. Taking the Gini coefficient, which indicates the degree of inequality in income distribution as a measure of relative poverty (the Gini coefficient takes value from 0 to 1, the value 0 means perfect equality) in 1998 and 1997 for comparison, Vietnam’s figure is better than current figures of China, Philippines, Thailand and the figure of Malaysia in 1995. By contrast, the incidence of absolute poverty (including food and non-food expenditure as defined by international organizations including the World Bank) in Vietnam (35%) is quite high when compared to selected countries of the region, e.g. China (4.6%), Indonesia (11.3%), Thailand (13.1%) and Malaysia (15.5) (World Development Report 2000/2001, MOH 2002).
Table 2. Absolute and relative poverty – comparisons between some selected Asian countries

<table>
<thead>
<tr>
<th>Countries</th>
<th>Absolute poverty in % (year) (Food and non-food poverty)</th>
<th>Relative poverty as measured by Gini coefficient (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>4.6 (1998)</td>
<td>0.40 (1998)</td>
</tr>
<tr>
<td>Philippines</td>
<td>40.7 (1997)</td>
<td>0.46 (1997)</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15.5 (1989)</td>
<td>0.48 (1995)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>11.3 (1996)</td>
<td>0.36 (1996)</td>
</tr>
</tbody>
</table>


1.2.3 Poverty—the links with poor heath

It has long been understood that health status is influenced by various factors and it is difficult to disentangle the influence of low income on health from that of other factors such as poor housing and working conditions, lack of education, poor nutrition and social isolation, which all go hand in hand with low income. However, poverty is—from a global as well as a Vietnamese perspective—the main determinant of poor health and premature death. Poverty is the lack of freedom to live a healthier life. Low income can influence health through a lack of material necessities—i.e. the inability to afford adequate food, heating or shelter. It can also have an effect through social and emotional factors: an inability to take part in the life of the community, leading to social isolation and a lack of support network and self-esteem, with associated health-damaging effects (Dahlgren and Whitehead 1992).

Among poor countries, there exists a strong relationship between the absolute level of income—as measured by per capita gross national product (GNP) and life expectancy: the lower the GNP, the lower the average life expectancy (World Bank 1993). On the other hand, in more affluent countries, what seems to strongly predict life expectancy is the extent of relative deprivation, as measured by the size of income gap between the rich and the poor (Wilkinson 1992, 1996). Income inequality is linked to higher mortality (Kawachi and Kennedy 1997).

It is commonly recognized that poverty is associated with poor health, but poverty is a dynamic, not a static concept. Some people face long periods of financial hardship, a large number of others move in and out of poverty for different periods of time, so the dynamic nature of people’s experiences of income and health is an important aspect to look for. The analysis of the British Household Panel Survey (BHPS) from 1991 to 1996/97 (Benzeval and Judge 2001) supports the general findings of longitudinal studies in the international literature on income dynamics and health (Kaplan and Haan 1989, Tahlin 1989, Wolfson et al., 1993, Menchik 1993). The study shows that persistent poverty is more harmful for health than an occasional episode of poverty; long-term income is more important for health than current income; income levels are more
significant than income change; and income reductions appear to have greater effect on health than income increases (Benzeval and Judge 2001).

Poverty and ill-health are intertwined. The association between poverty and ill-health reflects causality running in both directions. Illness may have a substantial impact on the household income. In addition, ill-health is often associated with substantial health care costs (Wagstaff 2002). Rises in out-of-pocket payments for health services are driving many families into poverty, and are increasing the poverty of those who are already poor. The so called “medical poverty trap” has been shown by national household surveys and participatory poverty alleviation studies (Whitehead et al., 2001). Poor people delay health care seeking until an emergency situation arises because of financial constraints. Delay in turn forces poor people to seek health care at a higher level of health services such as hospitals, which are also more expensive. The consequences of such expenses are loans and debt. Thus poor people are caught in a vicious circle: poverty breeds ill-health, ill-health maintains poverty (figure 1).

![Figure 1. The vicious circle of poor health and poverty](Source: MOH 2002)

There is a systematic pattern in countries with a heavier burden of illness and exposure to health hazards in the socially disadvantaged groups in the population. Furthermore health services are often less accessible and of lower quality in disadvantaged areas—where they are most needed. For instance, in Canada, men in the wealthiest fifth of the population could expect to live on average six years longer than the man in the poorest fifth. The corresponding gap between the wealthiest and poorest women were three years of life expectancy (Dahlgren and Whitehead 1992). Making comparison between countries, absolute levels of mortality in low-income countries remain unacceptably high: child mortality rates are ten times higher than in established market economies. Maternal mortality ratios are on average thirty times higher in low-income countries than in high-income countries (World Bank 1993).

In Vietnam, the link between poverty and poor health is also reflected by the fact that almost all premature deaths, diseases and disabilities are far more common among the poor as compared with the non-poor. Life expectancy in the more-affluent Red River
Delta region is ten years longer (70.8 years) than the life expectancy in the poorer Central Highland; Infant mortality rates experienced by rural poor households are 40 per one thousand live births as compared with an urban average of 37.7/1,000 live births (MOH 2002). Similarly, the burden of disease as measured in terms of DALY’s lost per thousand persons is 27 times higher among rural poor children (1-4 years of age) than for children in urban areas (MOH 2002, Bhushan et al., 2001).

1.3 Equity, equality in health

1.3.1 Main concepts and principles

While a concern for lessening poverty and improving the health of the poor is widespread, many focus more on inequalities, both in general and with respect to health in particular (Gwatkin 2000). Traditionally, health inequalities have played a much more central role than the health of the poor alone in Europe than in other parts of the world (Gwatkin 2001, Black 1980, Whitehead 1992). The concepts of equity, equality and health have several dimensions and interpretations. Classic equity is not explicitly related to health.

Equity means ”fairness”, ”right judgement”, ”Principles of justice outside common law or statute law, used to correct laws when these would apply unfairly” (Oxford Advanced Learner’s Dictionary, 1980). Equity implies that equal situations be treated equally or that need rather than social advantages is considered in decisions about resource allocation (WHO 1996). According to the Greek philosopher Aristotle equity is ”treating equals equally and inequals inequally”. Thus equity has moral and normative aspects.

Equality is used to compare two or more groups with regard to size, amount, number, degree etc. Equality in terms of numbers is relatively easy to define and measure. Also, it is neutral according to values and only describes distribution and results. Equality described strictly through numbers however is only one kind of equality. Actually equality is understood in many ways and may be categorized in two types: (i) equality in outcome, for example equality in health status, (ii) equality in sharing, for example equality in health expenditures, equality in health care use. Equity and equality are by no means synonymous and need to be distinguished from one another. There are, however links between equity and equality that will be discussed later.

Health is defined by WHO as a “state of complete mental, physical and social well-being and not merely the absence of disease or infirmity” (WHO 1946). This comprehensive, holistic concept of well-being reflects the optimism that unfortunately is largely unattainable. The more realistic definition of health promoted by WHO in the 1980s emphasises the ability to function “normally” in one’s own society (Beaglehole and Bonita 1997).

Socioeconomic equality in health implies equal distribution of health status across different SES groups. Equity in health status has traditionally been linked to reduction of inequalities (Gwatkin 2000). According to WHO, equity in health status refers to the attainment by all people of the highest possible level of physical, psychological and
social well-being that biological limitations permit (WHO 1996). Also according to WHO, "equity in health" is minimizing avoidable disparities in health and its determinants-including but not limited to health care-between groups of people who have different levels of underlying social advantage or privilege.

Barnum and Kutzin defined equity as "involving interaction of the risks of illness across different social groups, the availability and use of services for the illnesses and the ability of different groups to pay" (Barnum and Kutzin 1993).

According to Whitehead, inequities are inequalities that are judged to be unfair, i.e. both unacceptable and avoidable (Whitehead 1992). The inequality-oriented definition of health equity thus refers health inequity to the inequalities that are unjust and unfair and calls for a reduction of poor-rich health differences by improving the health of the disadvantaged (Gwatkin 2000, Whitehead 1992).

When are health differences fair and acceptable? Examples are biological variations in diseases, health-damaging behavior freely chosen. Avoidable differences that seem unfair are: health-damaging behavior with restricted choice of lifestyle, exposure to unhealthy, stressful living and working conditions and inadequate access to health care and health promoting services.

Health is different from health care, which is just one but very important determinant of health status. Health care is especially related to access and provision and deals with distribution of resources. In this regard, equity in health care means that everybody with the same need should get the same share of health services. Equity in health care also implies that health care resources are allocated and used according to need, and payment for health services is made according to ability to pay.

Apart from distinguishing between equity and equality, there are also the concepts of horizontal and vertical equity in public health. Horizontal equity or “equal treatment for equals” implies equal treatment for equal needs irrespective of ability to pay. Thus, two individuals with similar health problems should receive similar treatment independent of their ability to pay. Horizontal equity also implies the allocation of equal or equivalent resources for equal needs. Vertical equity or “the unequal, but equitable, treatment of unequals” refers to the allocation of different resources for different levels of needs (Mooney and Jan 1997, PAHOWHO 1999). This means that allocation of more resources to areas or persons with higher levels of health needs. Horizontal equity is specifically related to need whereas vertical equity is rather related to priority. Vertical equity is normative and includes values and political decisions. Vertical equity takes into account health fairness, whereas horizontal equity deals with equal distribution of outcomes. Clearly, equity differs from equality- the latter requires equal shares for everybody whereas the former implies a fair distribution that might involve different shares (PAHOWHO 1999).
1.3.2 How equity and equality are to be measured

While there is a general consensus on the objective of equity in health status, there is still less clarity on how to assess progress (Money 1987). One of the major challenges is how to quantify the “size” of socioeconomic inequalities in health. Three dimensions for measuring inequalities were proposed by WHO (WHO 1997, Bogg 2002, Mackenbach and Kunst 1997):

- The measurement of “relative” or “absolute” differences: The relative measures are expressed in terms of ratios (rate ratio) for example of morbidity rates or mortality rates in the lowest to those of the highest economic groups. One can also express these differences in absolute terms as the difference between the morbidity or mortality rates of the highest and lowest socioeconomic groups (rate difference).
- The measurement of an “effect” of lower SES on health status, or of the “total impact” of socioeconomic inequalities in health upon the health status of the population as a whole: the effect measures take into account only the differences in terms of ratios or absolute values between the highest and the lowest socioeconomic groups. The impact measures include not only the effect of decreasing SES on health, but also reflect the experiences of all persons not just those in the lowest and highest socioeconomic groups. "Impact" measures also take into account the extent of SES inequalities within the population, e.g. by using information on the size of the groups with lower SES. The larger the extent of inequalities in SES, the higher these measures of total impact will be.
- Simple versus sophisticated measures: sophisticated measures are dealing with more complex statistical methods, for example regression-based measure. However, the results of sophisticated and simple methods are often similar for the first two dimensions as "comparison of extremes" and "judging the entire population".

1.3.3 What aspects of equity/equality are to be measured

Studies on equity in health are usually related to differences either in health status or utilization of and payments for health care across different socioeconomic groups in the population and comparison within or between geographical locations (Bogg 2002, Wilkinson 1997, Diderichsen 1994).

Equity/equality in health

As mentioned above, equity in health is defined by WHO as minimizing avoidable disparities in health and its determinants. "Minimizing disparities" in turn is related to equality. But equality has many dimensions. Hence, it is important to ask "equality/inequality of what" and "equality/inequality among whom". Inequality may be evaluated in terms of inequality in outcome, for example: inequality in health status and equality in sharing including equality in health expenditure and inequality in health care utilization (WHO 1996). On the "whom" question, assessing health inequalities requires
comparing health and its social determinants among more and less advantaged social

WHO’s comprehensive, holistic, “maximalistic” definition of health (WHO 1996)” the
a attainment by all of the highest possible level of physical, psychological and social well
being that biological limitations permit” is difficult to use for specific purposes, as for
measuring health status, hence a “minimalistic” medical oriented definition of health has
been proposed where health status is the same as absence of disease/illness. A number of
health variables were used as the indicators of health need required for assessing equality
in health and health care.

It is necessary to distinguish between disease and illness. Disease refers to deviation from
physiological norms identified by medical professionals, while illness signifies personal
perceived ill health and the societal reaction to ill health (Fabrega 1973, Kleinman 1986).

Blaxter distinguishes three models for classifying ill health (i) a medical, (ii) a functional
and (iii) a subjective model (Blaxter 1989). In the medical model, ill health refers to a
deviation from physiological norms and health is defined as the absence of signs,
symptoms, disease or disability identified clinically. In the functional model, ill health
refers to a reduced ability to live a "normal" life, to perform "normal" tasks or roles.
Health, in this case, is not identified as the absence of disease, but defined in functional
terms. In a subjective model, ill health refers to the individual's subjective perception of
his/her state of health, a condition of impaired well-being. Blaxter’s functional model is
equivalent to the limiting illness used in the British Household Panel Survey (BHPS)
where an interviewed person was asked whether or not she/he had an illness which limits
her/his daily activities. Subjective model is the same as subjective assessment of health
variable used in the BHPS using a five-category question about overall assessment of
health as excellent, good, fair, poor or very poor (Benzeval and Judge 2001).

When assessing and monitoring the health of a population, it is important to describe not
only classical mortality and morbidity indicators, but also perceived health, illnesses, and
symptoms. Illness refers to patients’ perspectives and refers to people’s feelings of pain,
discomfort, and disability, which play a major role in a large part of morbidity in the
community, as well as visits to health services (Giang and Allebeck 2003, Helman 1990,
Macintyre 2001). According to Lahelma, illness better represents the well-being of an
individual than disease, clinically defined by doctor's diagnosis (Lahelma et al., 1994). As
in several other comparable studies (Ensor and San 1996, Panarunothai and Mills 1997,
Segall et al., 2002, Ha et al., 2002), we used self-reported illness including symptoms as
health outcome variables instead of using self-perceived health.

Equity/equality in access/utilization of health services

Ill health usually gives rise to the need for care-either informal care (self-treatment) or
formal care (treatment provided by medical professionals). Felt need, i.e. the individual's
subjective perception of his/her state of health and what type and amount of care is
needed (Bradshaw 1972) may result in expressed need, i.e. the wish or demand for
medical care and taking steps to get treatment (Bradshaw 1972, Mäagi and Allander 1981). An assessment of need by a physician usually determines further use of health care. However, in a situation where resources are limited, the cost of treatment cannot be disregarded.

Andersen (Andersen 1995) classified three categories of important determinants of the use of medical services:

(i) Need, which refers to health status, perceived by the individual or evaluated by a health provider.

(ii) Enabling resources, which provide the patient with the means to make use of services, e.g. income, health insurance, travel distance, etc.

(iii) Predisposing characteristics, which are factors that exist prior to the onset of the ill health and need for care e.g. age, sex, ethnicity, education, occupation-those are related to attitudes, values and knowledge about health and health services.

In addition, characteristics of the health care system (for example user fees, shortage of physicians) may also affect potential access. Thus, despite felt need and a willingness to use the health services, barriers may exist that hinder access and felt need does not always result in realized utilization of health care.

Irrespective of other resources (income, education, social class, etc.) poor health is always a problem. Accordingly, it is important to protect health via health care. Insufficient medical care jeopardizes people's opportunity to live their lives in the same way as they do when in good health. In attempting to assess the contributions of medical care to health improvements, Bunker estimated that, in the United States 7 and 1/2 years of increased life expectancy since 1950 can be attributed to medical care, and with improvements in public health largely complete, medical care is now the major determinant of life expectancy and its impact is substantially greater than that of the social environment or lifestyle (Bunker 2001). The observed recent decrease in child mortality in low and middle-income countries that has occurred in spite of modest improvement of socioeconomic conditions in these countries also suggests that the improved child survival is largely due to improved access to health care, namely, to vaccines and antibiotics and to dehydration therapy for treatment of diarrhea (Beaglehole 2003).

Equity in access/utilization needs to be viewed in relation to some theories of justice in the distribution of health services: the egalitarian theory and the libertarian theory. The egalitarian viewpoint suggests that a state sector should be predominant, with health care being distributed according to “need“ and financed according to “ability to pay“. The liberal point of view, by contrast, points toward a mainly private health care sector, with health care being rationed primarily according to willingness and ability to pay. State involvement should be minimal and limited to providing minimum standard of care for the poor (Wagstaff and van Doorslear 1993).
Most studies on equity in the delivery of health care, in both Europe and the USA, start from the premise that health care ought to be distributed according to need rather than willingness and ability to pay and that health care ought to be financed according to ability to pay (Wagstaff and van Doorslear 1993).

In studies of health care utilization, self-rated health or self-reported ill health as in the present study, was often used as a proxy for medical need (Ensor and San 1996, Panarunothai and Mills 1997, Segall et al., 2002, Ha et al., 2002, Lahelma et al., 1994). Access to medical services conditioned on need has traditionally been used as a measure of a fair distribution, partly because it is easier to measure. To improve access to services has been seen as appropriate for any one sector as to achieve more ambitious goals, for example securing the well-being of the population (PAHOWHO 1999).

The approach of the study on health equity is to compare the probability of seeking health services once ill by socioeconomic groups. An equitable situation would be one where the probability of seeking health care does not differ significantly by socioeconomic groups. Regarding equity in out-of-pocket expenditure, the starting point for considering is the premise that health care ought to be financed according to ability to pay. This is based on the concept of vertical equity, that households of unequal ability to pay should pay unequally. To judge whether an expenditure is equitable or not, the expenditure should be progressive or at least proportional in relation to household income.

The importance attached to finding new models of financing health services during the last decade has been followed by a growing interest in research on the impact of alternative financing strategies. Studies have been carried out both in high-income and in low-income countries, to a lesser extent in the latter. While the relationship between socioeconomic status (SES) and health status has been well documented in international research literature (Alberts et al., 1997), findings on the relationships between SES and health care utilization are more scarce and less clear. Generally little reliable quantitative evaluation of the inequalities exists in developing countries in terms of either health status or access to and payments for health care (Makinen et al., 2000).

The impact of financing reforms depends critically on the group at which the reform is directly targeted and the distribution of costs relative to the distribution of benefits. Studies from sub-Saharan African countries indicate two central equity problems for social schemes in low-income countries. First, they are targeted at a small and economically advantaged employed population (Gilson and Mills 1995), and secondly their financing strategy appears to involve excessive government subsidization, as the majority of those benefiting are likely to be civil servants (Gilson and Mills 1995, Vogel 1996).

The impact of user fee systems depends on their utilization consequences (Donaldson and Gerard 1993). Demand studies suggest that neither price, income nor quality will substantially influence demand of low-income groups (Akin et al., 1986, Heller 1982). Later studies contradicted these results and suggested that the poor reduced their utilization relatively more than the rich in response to higher price (Getler et al., 1987,
More recent studies which incorporate quality variables (mostly structural dimension of quality, such as availability of drugs, medical equipment, probability of being seen by a doctor, physical conditions of health facilities, etc.) gave mixed and in some cases counter-intuitive results (Sepehri and Cheromas 2001, Wouters 1991). Some, but not all studies show that quality improvement introduced concurrently with user fees increases health facility utilization (Knippenberg et al., 1990, Jancloes et al., 1982). For example, a study in Cameroon reveals that while utilization declined in facilities with no fees and no quality amelioration, it rose where the fees were introduced with quality improvements (Litvack and Bodart 1993). The conclusions of the Cameroon study are also dependent on two other preconditions: the retention of at least some fee revenue at the local health facility, and the conversion of revenue into quality improvements. Fee retention at the facility level may exacerbate inequities between geographical areas. As Dahlgren commented when assessing Kenyan fee proposals "the better-off districts with more health facilities and a high proportion of the population able to pay will be the winners, while the losers are the poor districts with few health institutions and high proportions of the people unable to pay" (Dahlgren 1990).

The impact of financing mechanism depends not only on use but also on who pays. User fees are progressive if they are in favor of the low-income, more vulnerable groups through a sliding scale or exemption mechanism. While the need for exemption mechanism is commonly recognized, there is still little evidence of their effective implementation (Sepehri and Cheromas 2001), and there is increasing evidence of managerial difficulties of effective targeting (Stierle et al., 1999). Ensor and San in their study in four districts in Vietnam also conclude that "in general, people are only exempted if they are invalid or disabled, just being poor is no guarantee that the fee waiver will be given" (Ensor and San 1996).

It is important to consider the factors which underlie the impact of financing schemes (Gilson and Mills 1995). Existing experience suggests that three groups of factors underlie the efficiency and equity impact of financing innovation: the design of schemes, the presence of complementary government policies, and influences flowing from the broader context. Of the design factors, an “affordable” price or premium is clearly necessary in low-income countries, because of the limited ability to pay. Nonetheless, regular readjustment of the price is required to maintain cost-recovery levels in the presence of inflation (Gilson and Mills 1995, Lewis and Parker 1991). Within social insurance systems, it is necessary to develop a regular strategy to limit access to unnecessary referral services (e.g. by the development of a “gate-keeper” who determines referral on medical ground only). A mechanism should also be developed to encourage the use of revenue generated by curative services to subsidize preventive care (e.g. integration of services and functions within a defined geographic area) (Gilson and Mills 1995).

The potential impact of how health systems were financed on the well-being of households, particularly poor households, was analyzed by Ke Xu et al. by assessing household catastrophic expenditure (exceeding 40% of the household income remaining after subsistence needs have been met) as a result of health spending. The authors used
data from household surveys in 59 countries and found that the triad: poverty plus out-of-pocket payment and the absence of risk pooling mechanisms are the most important factors leading households to catastrophic spending. They also recommended that the most straightforward approach to protect people, particularly the poor from catastrophic health expenditures is to reduce out-of-pocket payment and provide more financial risk protection through the development of social insurance or funding through taxes (Ke Xu et al., 2003).

There is a growing interest in recent years in examining major issues confronting Vietnam’s health sector, particularly the impact of neoliberal policy measures on access to health services and the health of the population. Using the PubMed and the World Health Organization website, I found several studies done by both Vietnamese and International researchers that employed different designs and examined different health equality related issues (Ensor and San 1996, Sepehri et al., 2003, Segall et al., 2002, Jowett et al., 2003, Wagstaff 2000, Ha et al., 2002). Almost all of the studies used cross-sectional design and self-reported morbidity as a health outcome variable and either income or expenditure as an economic variable in assessing socioeconomic differences in health (see table 3, summarizing selected studies). In this thesis, I have broadened the sphere of variables to include also specific health outcome/disease namely prolonged cough and mortality and used several economic variables simultaneously. Follow-up surveys were also employed in our studies to collect data on vital events including death registration. The objective is to assess how large are the deviations from equality in health and health care among people across different socioeconomic groups.
<table>
<thead>
<tr>
<th>Authors (year of study)</th>
<th>Study design</th>
<th>Type of data</th>
<th>Health indicator</th>
<th>Economic indicator</th>
<th>Equality related issues to be investigated</th>
<th>Key findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepehri A (1988)</td>
<td>Cross-sectional HH* survey</td>
<td>Secondary (VLSS 1988)</td>
<td>Self-reported morbidity</td>
<td>Expenditure</td>
<td>General health, health care utilization, health expenditure</td>
<td>The poor reported sickness and use CHCs more often. Non-poor use public H* and private H*, Poor pay more in relative terms</td>
</tr>
<tr>
<td>Ensor T (1995)</td>
<td>Cross-sectional HH* survey</td>
<td>Primary</td>
<td>Self-reported morbidity</td>
<td>Income</td>
<td>Health care utilization, health expenditure</td>
<td>The poor use CHCs and drug stores more often. The poor pay as much as non-poor and more in relative terms</td>
</tr>
<tr>
<td>Segall M (1992-98)</td>
<td>Longitudinal HH* illness survey (HH health care acts and costs) Cross-sectional HH* survey (HH characteristics)</td>
<td>Primary</td>
<td>Self-reported morbidity</td>
<td>Income</td>
<td>General health, health care utilization, health expenditure</td>
<td>The poor reported sickness more often, make less use of health care, the poor pay more in relative terms</td>
</tr>
<tr>
<td>Jowett M (N.A)</td>
<td>Cross-sectional HH* survey</td>
<td>Primary</td>
<td>Self-reported morbidity</td>
<td>Expenditure</td>
<td>Health expenditure</td>
<td>The poor pay more in relative terms</td>
</tr>
<tr>
<td>Thuan NTB (2001-2002)</td>
<td>Longitudinal HH* illness survey (HH* health care acts and costs) Cross-sectional HH* survey (HH* economic status)</td>
<td>Primary</td>
<td>Self-reported morbidity</td>
<td>Income</td>
<td>Health expenditure</td>
<td>The poor pay more in relative terms</td>
</tr>
<tr>
<td>My present study (1999, 1999-2002: papers II-IV)</td>
<td>HH* follow-up surveys (mortality) Cross-sectional HH* survey (HH* economic status, morbidity)</td>
<td>Primary</td>
<td>Self-reported general health, prolonged cough, Mortality</td>
<td>Income, Expenditure, Official classification (morbidity) Wealth index (mortality)</td>
<td>Morbidity (general health, specific disease/illness) mortality, health care utilization, health expenditure</td>
<td>The poor use CHCs and private H* more often. The poor pay as much as non-poor and more in relative terms</td>
</tr>
</tbody>
</table>

Source: Pubmed and http://www.who.int. Note: HH*: household; H*: health facilities
1.4 Vietnam

1.4.1 General description of Vietnam

Vietnam is located in Southeast Asia, bordering with China to the north and Laos and Cambodia to the west. The land area of the country is about 331,000 km² and the sea coast stretches over three thousand kilometers along the East Coast of the Indo-Chinese Peninsula. Hills and mountains cover up to three quarters of the land area. In 2000, the population was over 78 millions, 80% of which residing in rural areas and concentrated to the two fertile deltas of the Red River in the north and the Mekong River in the South. According to statistics in 2000, Gross Domestic Product (GDP) was about 441,6000 billion VND. The GDP per capita was estimated to be 5,688,130 VND with 11.5 % of the population below the poverty line. The health budget (including government budget, hospital fees, health insurance and foreign aids) was about one percent of GDP amounting to 5,098 billion VND, and 65,600 VND per capita (MOH 2001).

Vietnam has a long history of struggle against outside powers trying to dominate the country. In 1945, Vietnam declared its independence from France. Since independence, the Vietnamese government has been implementing a consistent policy of health development that ensures provision of free and equitable basic health care services to the entire population and has made impressive achievements in the health status of the population given the relatively low level of economic development.

Health indicators in Vietnam are relatively better than those of other countries that are at a similar economic level. The infant mortality rate (IMR) has decreased considerably in the last few decades, from 160 per 1,000 live births in 1960 to 44 per 1,000 live births during 1989-1993 and then continued down to 36.7 per 1,000 live births in 1999 (MOH 2002). The under five mortality rate (U5MR) is close to that of countries with a GNP three to four times higher than Vietnam (Unicef 1993). The average life expectancy at birth is 70.1 years for women and 66.5 years for men (MOH 2002). These high levels of health indicators have been attributed to the socialist characteristic, which invested considerable resources in establishing a vast network of health services throughout the country and in developing a number of effective vertical health programs to deal with priority health problems. The other factors that contributed to the impressive achievements in health status include: a universal primary education system with a high level of literacy, and a relatively egalitarian distribution of income.

The linkage between economic development and health depends not only on the level of GDP/capita but to a great extent on the quality of the economic growth process as illustrated in the Global Health Chart below (figure 2). Vietnam has, for example, achieved a higher level of under-1 survival than Indonesia even though Vietnam’s GDP per capita is 60% of the GDP per capita in Indonesia.

Although the IMR and U5MR in Vietnam is lower compared to that of other countries at the same economic level, there are variations between and within regions: the IMR in rural areas is twice as high as that in urban areas. Similarly, among the 40% of families
with the highest expenses, the IMR is just half of that of the remaining 60% (MOH 2002). The IMR is also significantly different among ethnic groups. Compared with the IMR of the Kinh ethnic group, which accounts for 80% of the Vietnamese population, the IMR of the H’mong group is 2.7 times higher, of the Dao group 2.1 times higher and of the Kh’mer group 1.8 times higher.
Figure 2. World Health Chart 2001
Source: www.whc.ki.se
Table 4. Basic data of Vietnam

<table>
<thead>
<tr>
<th>Population</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inhabitants (1998)</td>
<td>78 millions</td>
</tr>
<tr>
<td>Average annual population growth rate (2000)</td>
<td>1.4 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GNP per capita (2001)</td>
<td>410 US$ (PPP. 2,070)*</td>
</tr>
<tr>
<td>Average growth rate (1991-2000)</td>
<td>7.5%</td>
</tr>
<tr>
<td>Poverty (population below rice poverty line) (2000)</td>
<td>11%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health status and health expenditure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy (1999)</td>
<td></td>
</tr>
<tr>
<td>Male: 6.5</td>
<td></td>
</tr>
<tr>
<td>Female: 70.1</td>
<td></td>
</tr>
<tr>
<td>Infant mortality rate (2000)</td>
<td></td>
</tr>
<tr>
<td>36.7/1,000 live births</td>
<td></td>
</tr>
<tr>
<td>Under 5 mortality rate (2000)</td>
<td></td>
</tr>
<tr>
<td>42/1,000 live births</td>
<td></td>
</tr>
<tr>
<td>Maternal mortality ratio(2000)</td>
<td></td>
</tr>
<tr>
<td>95/100,000 live births</td>
<td></td>
</tr>
<tr>
<td>Under 5 malnutrition rate (2000)</td>
<td></td>
</tr>
<tr>
<td>39%</td>
<td></td>
</tr>
<tr>
<td>Health budget (2000) billion VND</td>
<td></td>
</tr>
<tr>
<td>5,688,130</td>
<td></td>
</tr>
<tr>
<td>% Health budget in GDP (2000)</td>
<td></td>
</tr>
<tr>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td>% Health budget in state budget expenditure (2000)</td>
<td>4.68</td>
</tr>
<tr>
<td>Health budget per capita (2000) 1,000 VND</td>
<td>65,600</td>
</tr>
</tbody>
</table>


1.4.2 Renovation (Doimoi) and health sector reforms

Since 1986, facing serious economic problems, the government of Vietnam has launched an initiative for reform, which is known as Doimoi. The whole country is moving from its centrally planned economy to a market-oriented. Agricultural production has been de-collectivized, prices have been market-oriented, private sector production and foreign investment are actively encouraged, state-owned enterprises have been given budgetary autonomy, etc. This has led to dramatic economic and social changes. The economic reform of recent years appears to have revitalized a stagnant economy and upgrade the standard of living of the Vietnamese people. At the same time the previous achievements in social sectors are under threat and the reform process may challenge the government's wish to preserve equitable access to health care unless appropriate and effective measures are introduced to protect the most vulnerable groups of the population.

Concurrently, and related to economic reforms, reforms of health services, particularly related to health service financing, have taken place. Since 1989, the Ministry of Health has implemented a number of measures designed to secure new resources for the health sector. These include: (i) introduction of user fees for health care in health facilities except commune health centers with an exemption (partial or full) for handicapped, families and individuals able to present a certificate of contingence; (ii) legalization of private practice; sale of drugs in the open market; and (iii) introducing health insurance with primary focus on state employees. In the early years of reforms commune health centers (CHC), previously financed by collective production, deteriorated with the loss of cooperative finance. In 1994 the government started to pay salaries for commune health workers. This measure contributed to a large extent to the stabilization of the rural health care system.
During the transitional period of reforms the liberalization of the economy has not only contributed in economic growth, but also increased income disparities and problems with access to social and health services for those households which are less successful in the market economy. While state policy emphasizes equity and free access to services for the poor, health costs for patients have risen substantially in the form of official and unofficial payments to staff and for drugs. The public sector faces challenges in the form of dramatic decrease in utilization of public health facilities, a shift towards self-medication and to private medical practice by public employees. The role of the state as a sole provider of health services has changed and financial constraints restrict activities of the sector. There is evidence that economic reforms affected the health care system, making them less accessible and less affordable, especially for poor people (Witter 1996).

With the introduction of user fees and recent health insurance schemes, it was hoped that these cost-recovery schemes would contribute to a "large" share of the government health expenditure. In 1998, hospital fees and health insurance covered 29% of the state funding for the health sector. Furthermore, the actual amount of money that patients spent was usually more than officially established user fees. Even health services given by commune health centers, which are supposed to be offered free of charge, are not really free. In 1991, a MOH survey on users of health facility reported that, on average, 81% of the patients had to pay for treatment at commune health centers (MOH 1991). According to Vietnam Living Standard Survey (VLSS), overall utilization rates, broadly defined in terms of frequency of medical contacts with health care providers, (public or private) are lower among the poor. In addition, the poor chose self-medication or even reported no treatment more often than the better-off. Among the poorest quintile, more of the sick obtained treatment from the private sector (15%) than from the public sector (12%) (VLSS 1988).

This means that the role of the public sector is less important in providing services to the poor than to the better-off (World Bank 1995). Utilization patterns also vary considerably across income groups. The poor have much less opportunity to high quality specialist providers defined as public hospitals and private doctors than the better-off. Similarly, poor families are more likely to use paramedics, while the rich use doctors. The poor appear to pay a higher proportion of their income than the rich for each episode of illness when they visit health facilities. A significant proportion of the poor and not so poor appear to find health charges a burden, either because they are forced to reduce necessary expenditure, or take a loan or deter from obtaining treatment due to its high cost (World Bank 1995).

1.4.3 Health services and health care system

The health sector of Vietnam has been increasingly strengthened and developed with extensive rural coverage. The system was established in the north after the partition in 1954 and was extended to the south after the reunification in 1975. Since 1986, with Doi moi policy, a public-private mixed health system is in development with the public one playing key roles in the protection and care for health of the whole population. Health services in Vietnam have basically three levels: central, provincial and basic level (district, commune and village level) (Long 2000, MOH 2002) (figure 3).

At the top level, the Ministry of Health which includes 14 departments, either administrative or technical, is the main national authority in the health sector to formulate and execute health
policy and programs in the country. The Ministry manufactures and distributes drugs, sets prices in health facilities and is responsible for the provision of all preventive and a large part of the curative health services in the country. The Ministry is assisted in its activities by a number of central speciality institutes: 17 central or specialized hospitals, which function as tertiary care referral centers. Under direct control of the MOH there is also a number of research institutes, medical and pharmaceutical schools as well as pharmaceutical and medical equipment corporations.

At a provincial level, there are 61 Provincial Bureaus, each of which serves a population of 0.25-5 million (average 1.2 million). It is under the full administration of the Provincial People’s Committee but also receives professional guidance from MOH. In each province, there is at least one general hospital with 200-1,000 beds. It provides technical guidance to district hospitals and is a referral center to admit patients referred to by other hospitals, as well as self-referred patients. In addition to hospital, there are in each province a provincial preventive health center and MCH/FP center responsible for preventive health and MCH/FP activities and programs.

The basic level includes district, commune and village health care network. In each district there is a district general hospital with an average of 100 beds, serving as referral institution for all commune health centers in the district. It also provides training activities for health staff working in commune health centers in the district. Each district also has a preventive health team and a MCH/FP team which move around the district providing support to categorical health programs. These district services serve a population of 50,000-300,000 persons.

In a commune of 2,000-10,000 inhabitants there is a Commune Health Center (CHC) staffed with 3-5 health workers. CHC is responsible for providing primary health care including preventive, ambulatory and inpatient services and for referring complicated cases to upper levels of care. It also implements national health programs such as: MCH/FP, ARI, EPI program, etc. According to MOH statistics, 95.5% of the 10,396 communes in the country had a CHC by June 1999 (MOH 2002); In the rest of the communes (mainly in high mountainous areas), the health staff have to work in private homes or at the Commune People’s Committee. Most of the CHCs had drug outlets equipped with essential drugs to meet patients’ needs when they came for treatment (Chuc 2002). CHC health workers are paid by the government, however, as salaries are modest, some have other jobs or are engaged in a private practice.

Village health workers serve as a bridge between the public health system and the people. They are responsible for providing health information and education, giving guidance on hygiene and epidemic prevention and early detection of diseases. Their duties are also to provide MCH/FP and nutrition counselling, first aid and care of common diseases and participate in health programs in the village.

After the 1989 health sector reforms, the private pharmaceutical and medical services developed rapidly in terms of both quantity and quality. By the end of 1998, there are 41,033 (37,551 registered and 3,482 unregistered) private facilities including private health facilities (19,836), private pharmaceutical facilities (14,182) and private medicine practitioners (7,015) (MOH 1998). In general, the existing private facilities are small in size, mainly in the form of clinics or pharmacies/sale agents. The number of private hospitals is very small compared to the public system. There are two types of private providers: (i) full-time service providers who own private
facilities, collect fees directly from their patients, and usually have retired from public health services, and (ii) part-time service providers who are staff of the public health services, but do private practice after the working hours of public services (Toan 2001a). According to findings from MOH’s survey, in 1999, 69.4% of private health facilities, 55.5% of private pharmaceutical facilities and 61.8% of private traditional medicine practitioners are located in cities and urban areas (MOH 2002).

Figure 3. Structure of public health care system in Vietnam

1.4.4 Health financing and expenditures

The term “health financing” can be defined as a process of raising and organizing funds for the provision and consumption of health services (Dong 2000). In Vietnam, the health sector finances the bulk of its health care expenditures from the following sources (i) state fund (taxation), (ii) insurance (compulsory and voluntary) (iii) user fees and (iv) foreign aid/co-operation.
Structure of health financing in Vietnam

In Vietnam the public health budget contains four fiscal transactions by levels of government: the central and the three levels of local governments: provincial, district and commune. The health facilities of the three first levels of the government (central, provincial and district) account for 90% of the national health budget. The overall level of the recurrent spending on health is determined by projected growth rates of the total revenue and of the total expenditures and the share of health in the total expenditures.

Government funds for health are allocated by the Ministry of Finance to provinces and cities based on certain norms, such as the number of hospital beds (for curative expenditures) or on the population of the province (for preventive expenditures). In the annual budget allocated for provinces, only an aggregate recurrent budget is provided. Thus provinces allocate budget to each sector, including health, based on the norms set by the Ministry of Finance. For poor provinces, this is a minimum budget that has to be allocated for health. The provinces can also spend on health out of their own revenues, although this happens only in the better-off provinces. The financing of health expenditure out of their own revenues in the better-off provinces causes large disparities in the government health expenditure per capita across provinces, since better-off provinces are able to spend more on health than poorer provinces.

In addition to the state budget allocated to health, the provinces receive other sources of funds from various health programs directly from the Ministry of Health, such as the Expanded Program of Immunization, the Tuberculosis Control Program, etc.

Districts receive most of their supports from the provinces, although they may have their own revenue sources. Since communes are expected to be self-sufficient, they are virtually excluded from the integrated state budget. Since 1994, however, the government has taken over the payment of salaries to the staff of commune health centers. All communes supplement their scarce budgets through mark-up on sale of drugs and fee for deliveries. In better-off communes, households may contribute some small sum of the money for the operating expenses of the commune health center. This is the reason why commune health centers in better-off communes offer better quality services than those in poorer communes. Starting from 2003, the provincial governments are responsible for recurrent expenditure of their CHCs.

With the current pattern of fund allocation, the better-off tend to receive more government subsidy than the poor. Data from VLSS shows that in 1988, 36% of people using public hospitals were from the highest expenditure quintile, while only 8% came from the poorest quintile (MOH 2002). Most people using commune health centers are from the poorest quintile. Reasons for this inequity are high user fees and unbalanced fund allocation: 75% to 87% of the total funds for health go to public hospitals, which are often located in urban areas. These hospitals are more accessible for urban people, who in general are more affluent and have higher payment capacity than rural people (MOH 2002).
**Health financing schemes**

**User fees/out-of-pocket payments**

User fees were introduced into public hospitals in Vietnam in 1989 as a consequence of a shortage of government funds for hospitals during the inflation period of the late 1980s. The fee system was implemented in the three higher (central, provincial and district) levels of the health care system, requiring those patient who are able to do so to pay part of their health care. According to Decree no 95/CP issued in 1994, handicapped, children under 6, orphans, single elderly, very poor, people living in remote, mountainous areas, patients suffering from mental diseases, leprosy, and smear-positive pulmonary tuberculosis are exempted from fees. Recently (2002), Decree no 139/TTg stated that the poor are also to be treated free of charges.

Total user fee collection has grown rapidly over time from just around 10% in 1991 to 53% in 1998 as a proportion of the government budget allocated for hospitals (MOH 1998). In 1998, thirteen percent (13%) of the total government health expenditure was financed from user fees (MOH 1998). However, the actual amount of money that patient spent was usually more than the officially established user fees. A recent review of the health sector estimated that household out-of-pocket payments for health care in 1998 accounts for 80 percent of the total health expenditure (MOH 2002, World Bank 2001). In addition to official hospital fees, informal fees in terms of payment for drugs, gifts for physicians and indirect costs are sometimes higher than the official payment made to the hospitals and these constitute a factor that hinder people’s, especially the poors' access to health services.

**Health insurance**

Health insurance began in Vietnam in 1993, following a decree issued in 1992 that set up two separate insurance schemes: (i) a compulsory scheme covering current and retired civil servants and employees of state and large (having more than 10 employees) private enterprises, and (ii) a voluntary scheme aimed at the remainder of the population. The compulsory scheme provides both inpatient and outpatient care benefits. The voluntary scheme has two packages, a lower-priced package that covers inpatient care and a higher-priced package that includes outpatient as well as inpatient care. By the end of 2000, the number of health insurance enrollees reached almost 10.63 million, accounting for 13.94% of the total population. For the compulsory scheme, the figures are 6.4 millions and 8.25 % respectively. In the initial years, the health insurance revenue was only VND 70 billions, by the year 2000, the revenue climbed to VND 944 billions, accounting for almost 18% of the state budget for the health sector (MOH 2001).

**Government funding (Tax-based financing)**

Although government funding for health in absolute terms increased steadily from VND 703.3 billion in 1991 to VND 3,842 billion in 1997, given the fixed price of 1994, in fact the funds have not been increased since 1997. The share of the government budget as a proportion of the GDP has slightly decreased during 1997-2001 (1.2% GDP in 1996 compared to 0.93 % in 2001-figure 4). Also government spending on health as a percentage of the total government expenditures has fallen from 4% in 1992 to 3% in 1997 (Tuong et al., 2000). Government spending on health in
Vietnam was low as compared with its neighbouring low-income countries where their governments’ health budgets range from 1.3 to 2.5 of their GDP.

![Graph showing percentage of government funding for health as proportions of GDP, 1991-2001](image)

**Figure 4.** Percentage of government funding for health as proportions of GDP, 1991-2001  
*Source: MOH 2002*

**Public-private mix financing of health**

As mentioned above, financing for the health sector comes from the state and local revenues, private payment for medicines and services, foreign aid and from contributions by health insurance card holders.

As in most other developing countries, the share of households in the total health expenditure is high in Vietnam and there has been a reversal of the public-private expenditure mix over the last decade. In 1993, public spending (including state, donors, health insurance funding) was 2,167 VND billion, but private household spending was twice more than this amount (VND 5,051 billion). Thus, households accounted for 71% of the total health expenditures. By 1998, although aggregate public spending had more than doubled in absolute terms (to VND 5,620 billion), private spending had increased nearly four times to VND 23,153 billion. It means that the share of households in total health spending had further increased to 80.5%, with state, donors and insurance accounting for the remaining 19.5%—among the world’s smallest (World Bank 2001) (figure 5). The large private share in total health expenditures is a result of not only expensive use of private health services by individuals but also of payment of user fees and drugs at public health facilities.

Compared with other countries in the region, the total spending per capita on health care from all sources in Vietnam is among the largest (US$ 27/person/year). As a result, public hospitals in Vietnam have increasingly relied on user charges paid by individuals to finance their recurrent costs and any increase in the total spending on health will correspond to a growth of out-of-pocket payment by households and will place a heavier burden on the poor (MOH 2002).
1.5 About the thesis

This thesis comprises aspects of health-related equality: equality in health status and equality in economic access to and utilization of health services. Studies in equality in health and health care require also that people or households are divided in socioeconomic groups. Thus, the first concern of the thesis is the way of categorizing or ranking members of a population in order to examine the inequalities among them; the second deals with the question of how equally/unequally different aspects of health (health, health care utilization, health expenditure) are distributed across different socioeconomic groups in a study population. The table below (table 5) comprises concerns of my thesis among different dimensions of health inequalities.

Table 5. The dimensions of health inequality

<table>
<thead>
<tr>
<th>Different ways of categorizing/ranking population members</th>
<th>Different aspects of health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic status (income, expenditure, housing conditions, asset ownership, etc.)</td>
<td>Health status (morbidity: self-reported, self-perceived, clinically defined; disability; mortality, etc.)</td>
</tr>
<tr>
<td>Social status (education, occupation, etc.)</td>
<td>Health care utilization</td>
</tr>
<tr>
<td>Socioeconomic status (income, expenditure, education, occupation, etc.)</td>
<td>Health care expenditure</td>
</tr>
<tr>
<td>Geographical location (urban, rural, mountainous, etc.)</td>
<td></td>
</tr>
<tr>
<td>Gender and sex</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Health condition per se</td>
<td></td>
</tr>
</tbody>
</table>

Source: Modified from Gwatkin 2000.

My studies examine health inequities following the concept suggested by WHO in which health inequity is represented by inequalities in health status, health care utilization and health care expenditure (WHO 1996). Based on a conceptual framework model developed by Wagstaff describing determinants of health outcomes (Wagstaff 2002), I have modified to illustrate the
relationships between health status, health care utilization and payments for health care within a context of existing health care policy and health care system (figure 6). Health polices determine health care structure and the way the health care system is organized (public vs. private or mix, curative vs. preventive). Health polices also determine health financing schemes (free of charge, prepayment, co-payment or out-of-pocket payment). These in turn influence the use of and access to health services of households as well as household economic conditions. Household economic status affects the health care action taken and the health outcomes of household members. Health outcomes and health seeking pattern influence the formulation of appropriate health policies, completing the loop.

The concept of equality involves examining the full circle of the model at all four levels: individual, household/community, health system and policy. Judging the policy impact requires comprehensive and large scale investigations and it is not the purpose of my studies. Thus the focus of my thesis is on socioeconomic differences in health (morbidity, mortality), health care use (household members’ actions when ill) and payment for health care with the assumption that socioeconomic factors influence health status, different socioeconomic groups may have different patterns of health seeking behaviors and payment. Mode of payment for health care will differ for different socioeconomic groups.

In this thesis, the term “inequalities” is used and defined as variations from equalities. Hence, inequalities in health are defined as differences in the occurrence of health problems between individuals of higher and lower SES.

The Vietnamese health care system is based on the principle of equal access to health care for equal need and requires a financing scheme in which contributions are made according to ability to pay, and a delivery scheme in which access to services is distributed according to need and irrespective of ability to pay. Lower socioeconomic groups generally have higher rates of morbidity and mortality than higher socioeconomic groups and thus might be expected to make more use of health services. Health care utilization can also be assessed in terms of the kind of health care providers that is used by a particular socioeconomic group. If public hospitals, where the large share of state-subsidized resources was directed, are used mostly by the better-off, while the poor use lower level, lower quality health facilities, we could say that inequalities in health care use exist. The financing of a health care system may be assessed in terms of a distribution of the financial burden of out-of-pocket payments among households in the population. If poor households have to pay a larger share of their income as Out-Off-Pocket (OPP) expenses, the financing scheme is said to be regressive.
Figure 6. Model of framework for analysis of health equalities (modified from Wagstaff 2002)
2. OBJECTIVES
2.1 General Objective
The general objective was to study the socioeconomic differences and deviations from equality in health status, health care utilization and health care expenditures of people in a rural district in Vietnam and to provide an input to the policy formulation process for equity in health.

2.2 Specific objectives
- To measure and compare economic status of households in the study area using different indicators (I).
- To describe the relationship between income groups and utilization of various health services (II).
- To describe the level and distribution of household's expenditures on health care in different income groups (II).
- To assess the magnitude of socioeconomic inequalities in morbidity using prolonged cough as a health outcome indicator (III).
- To estimate and compare mortality among people across socioeconomic groups (IV).
3. METHODS
3.1 study settings

Map of Bavi district

Bavi district- FilaBavi

All studies included in the thesis were conducted within the Epidemiological Field Laboratory (hereafter called FilaBavi) in a rural district of northern Vietnam-Bavi. The field laboratory was developed within the health system research project supported by Sida- SAREC with the main objective to establish an epidemiological surveillance system to follow demographic and health changes in the population, which can help the district to improve health planning and health status in the population and provide a setting and sampling frame for sub-studies within the health system research project. The specific aims of the FilaBavi are to:

- Develop an epidemiological surveillance system among a representative sample of the population in the Bavi District, Hatay Province, Vietnam;
- Generate basic health data, e.g. on fertility and mortality, in order to supply information for health planning;
- Constitute a setting for epidemiological research training of Vietnamese and Swedish research students;
- Provide household and individual background data, a sampling frame for specific studies, in order to economize on resources and increase cost effectiveness in research and research training;
Serve as an appropriate research setting for intervention studies, based on findings generated by field laboratory, and health priority discussions with the community and relevant authorities.

Bavi is a District of the Hatay Province, 60 km west of Hanoi, the Capital of Vietnam. The district covers 410 km², including lowland, highland, and mountainous areas, and ranges in altitude from 20 to 1297 meters above the sea level. The district, consists of 32 communes, with an average of 532 m² used for agriculture per capita. The climate is typical of northern Vietnam, with hot and a wet season from June to October and a cool and a dry season from November to May.

The District has approximately 235,000 people, belonging to the Kinh ethnic group (91%), Muong (8%) and minorities of Dao, Tay, Hoa, and Kh'mer. Children under one year of age comprise 1.5% of the overall population, children under 5 years of age 7.9% and women aged 15-49 years 27.1% (Chuc and Diwan 2003). Crude mortality rate is estimated to 5.1 per 1,000 person-years for both sexes (4.7 for females and 5.6 for males) (Byass 2003). Illiteracy is low, only 0.4% of the adult population where 9% have high school and 0.5% higher education. Illiteracy varies between communes but not very much.

Agricultural production and livestock breeding are the main economic activities (81%). The major products are wet rice, cassava, corn, soybean, green beans and some fruits, such as pineapple, mandarin, and papaya. Other economic activities are forestry (8%), handicraft (6%), small trade (3%), fishing (1%), and transport (1%). The average annual income in terms of rice production is 290 kilograms/person/year (US$ 40/person/year). The conditions of life are unequally distributed between communes ranging from 459 kilograms/person/year to 190 kilograms/person/year. The transportation system is well developed with unpaved roads passing all communes and a national road connecting Bavi with other districts and provinces.

The health care system in the district is organized following the national model with one district hospital with 150 beds and 32 commune health centers (one CHC for each commune). Most health care is provided by government health facilities but there are over a hundred private practitioners (mostly assistant doctors, traditional healers, some private pharmacies and drug-sellers) (Chuc 2002).

The Bavi District was selected as the socio-demographic surveillance site since it contained a variety of geographic characteristics, had similar socioeconomic characteristics as well as health status as many other districts in Vietnam and had local authorities and health leaders strongly supporting the project (Chuc and Diwan 2003).

The general Bavi sample used for the base-line survey and for subsequent studies, comprises of the households in a 69 randomly selected clusters, villages or defined part of large villages. The size of the field laboratory was based on requirements to obtain acceptably precise estimates of infant mortality which was one of the original specific objectives.

A hypothetical infant mortality rate (IMR) of 45 per 1,000 live births and an under-five mortality rate (U5MR) of 60/1,000 during a study period of 3 years was assumed. The aim was to show differences in IMR between equally sized groups in the magnitude of 15 per 1,000 with 80%
probability. This could be achieved using approximately 20% of the total population, i.e. 50,000 people. The primary sampling units were villages. Small villages put together were regarded as one unit, and large villages were divided into several units. A stratified, random cluster sample with probabilities proportional to cluster size, number of households, was used. Stratification was done according to geographical area types. Initially, sixty-seven clusters out of the whole district with an average size of 676 individuals per cluster were selected. Two big clusters were later split. All households in the selected clusters, totally 11,547 with 49,893 persons were included in the study base (Chuc and Diwan 2003).

Data was collected in interviews using structured questionnaires. Specially employed and trained female interviewers performed the data collection for households and individuals. For each household, a household representative was chosen, in most cases the female head of the households. She was considered to be the person with the best knowledge of household conditions and the health status of the household members (Chuc and Diwan 2003). At household level, information was collected on housing conditions; housing assets; expenditures on food during the previous day and services and goods during the last month; income from different sources from the previous year, land ownership, geographical access to health services. The economic official classification of households was given by the local authorities. For each of the household members, information on demographic characteristics, education, occupation, and health status was collected.

The FilaBavi was started in January 1999 with the base-line survey including 11,457 households with 49,893 persons. After the base-line survey, the same households were visited every three months. The infrastructure of FilaBavi has been used for several sub-studies including my studies.

By the end of March 2004, 19 follow-up rounds have been made. A second household survey, re-census 1, was undertaken in 2001 and a third, re-census 2, was carried out in 2003. This thesis utilized the results of the base-line survey, the re-census 1 and the first 13 follow-up rounds from the routine FilaBavi data collection.

3.2 Study subjects

The subjects of the studies include: households and persons in different socioeconomic groups (I-IV); persons with self-reported morbidity (II); persons with cough for three weeks or more at the point of interview (III); and death cases (IV). Figure 7 illustrates subjects and sampling of the studies.
3.3 Study designs and data collection methods

The studies were based on four cross-sectional household surveys (I-IV) and the follow-up surveys (IV) using structured questionnaires to capture socioeconomic information of households.
as well as information on demographic characteristics, morbidity, mortality, health seeking behavior and health expenditures of individuals. Data collected were used to construct various economic indicators to measure and compare socioeconomic status of households. Based on information collected through the household surveys and follow-ups, equality and inequality was assessed in terms of health care utilization and expenditures as well as health status/health outcome such as tuberculosis suspects and mortality.

The sampling procedures, and data collection process were as follows (table 6):

**Study 1- General Bavi sampling (base-line survey):** The study used information collected in the base-line survey.

**Study 2- The 1075 household sample:** The above FilaBavi study base was used as a sampling frame. In the first step, thirty clusters were randomly selected among the 67 clusters already chosen for the FilaBavi. In a second step, one household in each cluster was randomly selected by using the household list of the cluster. After that, a sample of 35 households was taken by going from door to door until completion of the required sample size in the cluster. In this way, a sample of 1,075 households with 4,769 individuals were selected.

The interviewers working for FilaBavi performed the data collection. Structured interviews using questionnaires were used to collect data on reported illnesses; health care utilization and health care expenditure during four weeks prior to the interview: delay in seeking health care, type of health care providers, reasons for choosing a particular health care provider, amount of money paid out-of-pocket and sources for payments for health care. Information on reported incomes of households was extracted from the FilaBavi base-line survey.

**Study 3- The prolonged cough survey:** The general FilaBavi sample was used as the study base, restricting to the 35,832 individuals aged 15 or more. In order to identify cough cases/potential TB cases, a screening question was added to the regular follow-up interviews: “Does any one in your household suffer from cough of equal or more than three weeks’ duration at the time of interview?” The question was put to the household representative, and if she/he identified such persons, the cough cases were interviewed in persons.

A structured questionnaire was developed and administered to all identified (559) cases to collect data on background variables, smoking habits, symptoms other than prolonged cough, health seeking behavior from onset of symptoms, and knowledge about cause and transmission of tuberculosis.

Information on the socioeconomic situations of households (reported incomes, reported expenditures, official economic status) was extracted from the FilaBavi base-line survey.

**Study 4- FilaBavi follow-ups:** All households in FilaBavi were visited quarterly by the interviewers. From May 1999 to August 2002, thirteen follow-up surveys were conducted.

At each follow-up, the interviewers asked in each household if any death had occurred in the household since the last follow-up, together with questions about other vital events. If yes, a structured form for death which included basic information, cause of death, etc. was filled in.
During this period of time, 860 deaths were recorded during a total of 175,380 person-years of follow-up. Socioeconomic variables (housing conditions, sanitary conditions, housing assets, land area owned, income, expenditure, debt) of households from the FilaBavi base-line survey and the first re-census (April 2001) were used to construct the wealth index (Gwatkin et al., 2000, Houweling et al., 2003). It in turn was used to classify households into socioeconomic groups for mortality comparisons. Table 6 summarizes the subjects of the studies.

Table 6. Summary of study designs and data collection techniques (HH*: Household)

<table>
<thead>
<tr>
<th>Study</th>
<th>Study designs and data collection methods</th>
<th>Sample</th>
<th>Data collection period</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Poverty measurement</td>
<td>Cross sectional structured interviews in HH*</td>
<td>11,547 HH* with 49,893 individuals (all HH* in base-line)</td>
<td>Feb-Apr. 1999 Base-line</td>
<td>I</td>
</tr>
<tr>
<td>2. Utilization of and expenditures on health services</td>
<td>Cross sectional structured interviews in HH*</td>
<td>Sub-sample of baseline including 1,075 HH* with 4,769 individuals used to identify 942 persons with self-reported illness</td>
<td>1999 Sub-study and base-line</td>
<td>II</td>
</tr>
<tr>
<td>4. Mortality differentials</td>
<td>Cross sectional structured interviews in HH*</td>
<td>All HH* in base-line and new HH* added after base-line</td>
<td>1999-2002 Baseline, first re-census and follow-ups</td>
<td>IV</td>
</tr>
</tbody>
</table>

3.4 Main variables and definitions

- Socioeconomic status: a number of socioeconomic variables were recorded and the following socioeconomic indicators were used.
  1) Monthly income was derived from the estimated reported yearly income of the household from the different income sources. A division by the number of household members and by 12 to give an estimate of the monthly individual income was then performed.
  2) Monthly expenditure was calculated by dividing the reported average daily expenditure on food x 30 plus monthly expenditure on different items and services by the number of household members to reflect amounts per month and individual in the households.
  3) The Official Economic Status provided by the local authority based on the household’s income from rice production given the area available for the household. A poverty line has been set by the Ministry of Labour, Invalid and Social Affairs (MOLISA). The following classification was used:- very poor meant less than 13 kg of rice per capita and month, poor from 13 kg to 15 kg and 20 kg of rice for mountainous or plain area respectively.
4) Housing conditions were based on a number of favourable housing conditions such as concrete or brick/zinc roof, brick wall, ceramic/enamelled tile floor, electricity, drilled/dug well, biogas/flush toilet, and presence of bathroom. The housing score took value from 0 to 7.

5) Household assets were based on the possession of 13 durable goods such as: TV, video recorder, radio cassette, refrigerator, motorbike, etc. The asset score ranged from 0 to 13.

6) Wealth index, a composite index was calculated using the method of principal component analysis based on socioeconomic related variables of households such as: housing conditions, sanitary conditions, land area, income, expenditure, etc. (Gwatkin et al., 2000, Houweling et al., 2003).

- Health care providers and health seeking actions: a number of categories of health care providers or health care actions were recorded. Commune health centres, district, provincial, central hospitals were classified as public health service providers. The latter three health care providers were grouped as public hospitals. Private practitioners included modern, traditional healers, private pharmacies, drug vendors. Self-treatment included buying/using modern or traditional drugs without medical professional consultation or using drugs available at home or any kind of self-medication without drugs at home.
- The Illness Concentration Index for prolonged cough was calculated to provide a summary measure of the health status in relation to SES. The index was calculated from the concentration curve, which plots the cumulative percentages, going from poor to rich, of all persons against the cumulative percentages of prolonged cough cases. When prolonged cough is distributed equally, the concentration curve is a straight line. The concentration index is twice the area between the concentration curve and the straight line as percent of the total possible area (Wagstaff et al., 1991).
- Deterrence rate was defined as % of patients who did not use public health services x % of patients who had not enough money to use public health services.
- Health expenditure as percentage of household monthly income was defined as expenditure for curative outpatient care per month divided by total household incomes per month.
- Prolonged cough case was defined as a person aged 15 or more suffering from cough of equal or more than three weeks' duration.
- Mortality rates were defined as the number of deaths in a given group divided by the corresponding total person-time for that group.
- The directly standardised mortality rates were calculated using WHO standard population which gives age-standardised death rates and provides for each population a rate that reflects the number of deaths that would have been expected if the populations being compared had had an identical age distribution (WHO 2000).

3.5 Data analysis

Data were processed using Access and Epi-info 6.4. Data analysis was done using SPSS 10.0-12.0 and Epi-info 6.4. Standard statistical methods were used to summarize data. Proportions were done with 95% confidence intervals. The chi-square test was used to assess significant differences between proportions. The correlations in paper I were estimated by Spearman’s correlation coefficients to avoid undue influence of skewed distribution. The concepts of
sensitivity and specificity were used to further study relations between indicators. Multivariable analysis was done in paper II and paper III to control for potential confounding factors in the comparisons between socioeconomic groups. In paper II, multiple linear regression analysis was performed to assess association between payment for health care and the independent variables: age, sex, economic status, types of health care providers, and severity of illness. Multiple logistic regression analysis was done to identify factors influencing health seeking patterns. The following variables were included as independent variables: age, sex, economic status, and severity of illness. In paper III, association between prolonged cough and background variables were analysed using multiple logistic regression which was also run separately for cough cases with smoking and cough cases without smoking (the reason was that smoking was not recorded in the baseline survey). Table 7 contains a summary of the statistical methods used.

Table 7. Summary of data analysis of the studies

<table>
<thead>
<tr>
<th>Paper</th>
<th>Analyses conducted</th>
<th>Purpose of analyses</th>
<th>Statistical method used</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Comparing different socioeconomic indicators</td>
<td>Assess correlations between indicators</td>
<td>Frequency, mean, correlation, estimation of sensitivity and specificity</td>
</tr>
<tr>
<td>II</td>
<td>Assessing relation between socioeconomic variables and use of and payment for health care</td>
<td>Assess differences in use of and payment for health care between socioeconomic groups</td>
<td>Frequency, mean, correlation, multi-variable analysis (multiple linear regression analysis, multiple logistic regression analysis)</td>
</tr>
<tr>
<td>III</td>
<td>Assessing relation between socioeconomic variables and prolonged cough</td>
<td>Assess risk factors</td>
<td>Frequency, bivariate analysis, multi-variable analysis (multiple logistic regression analysis)</td>
</tr>
<tr>
<td>IV</td>
<td>Assessing relation between socioeconomic variables and mortality</td>
<td>Assess risk factors</td>
<td>Frequency, bivariate analysis, direct standardization</td>
</tr>
</tbody>
</table>

3.6 Ethical considerations

Permission for the FilaBavi surveillance as well as other studies conducted within it was obtained from the Ministry of Health, local authorities and head of households. The FilaBavi overall surveillance activities, including data collection on vital statistics have been ethically approved by the Research Ethics Committee at Umeå University (No 02-420).

Papers I-IV used questionnaires with questions about socioeconomic, demographic background variables as well as access to health care of households. These studies are neither experimental nor clinical trials, which means they do not bear any possible direct harm to study subjects. Contents of studies were given to household heads in advance and informed consent was obtained from all of them. They had the right to withdraw from the study at any time without any threat. Information from households and individuals was kept confidential. Paper II has been part

4. MAIN FINDINGS
In this chapter, the main findings from the four papers (I-IV) are briefly presented.

4.1 Poverty measurements (I)

4.1.1 Large discrepancy between the distributions of socioeconomic indicators
Different indicators gave different descriptions of the economic situation of households. The official classification and housing score were nearly symmetrically distributed, while asset scores, and particularly, income and expenditure were highly skewed.

The median income per month and household member was VND 61,000 while the median expenditure per month per capita was VND 213,140.

The upper limit of monthly income per capita in the first quintile and upper limit of monthly income in the fourth quintile were VND 32,400 and VND 105,216. The corresponding figures for the expenditure were VND 137, 800 and VND 354,700 respectively.

4.1.2 Low correlations between indicators
The correlations between the socioeconomic indicators ranged from 0.20 to 0.64 with the majority between 0.30 and 0.40 (table 8). All correlations were statistically significant but no correlation was close to unity. The correlations at household level had similar level and patterns as the correlations at cluster level.

Table 8. Spearman rank correlation coefficients between household economy indicators. Upper estimates are at the level of households; lower estimates are for the correlations between cluster means.

<table>
<thead>
<tr>
<th>Off. Class.*</th>
<th>Housing Score</th>
<th>Asset Score</th>
<th>Income</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off. Class.*</td>
<td>1</td>
<td>.369</td>
<td>.470</td>
<td>.408</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.305</td>
<td>.352</td>
<td>.394</td>
</tr>
<tr>
<td>Housing Score</td>
<td>1</td>
<td>.385</td>
<td>.384</td>
<td>.201</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.249</td>
<td>.418</td>
<td>.262</td>
</tr>
<tr>
<td>Asset Score</td>
<td>1</td>
<td>.573</td>
<td>.639</td>
<td>.464</td>
</tr>
<tr>
<td>Income</td>
<td>1</td>
<td>.308</td>
<td>.565</td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Off. Class.* = Official Classification
### 4.1.3 Low sensitivity and low positive predictive values between indicators

If official economic classification is assumed to define “true” poverty using income below the first quintile as a criterion had 55.3% sensitivity to detect a household in poverty. The positive predictive value, that is, the probability that a household below the first income quintile is really poor, was 8.9%. Similarly, using housing, asset score and expenditure had 28.3%,13.1% and 44.5% sensitivity respectively to "detect" a household in poverty (table 9).

<table>
<thead>
<tr>
<th>&quot;True&quot; poverty definition</th>
<th>&quot;Test&quot; poverty definition</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Positive predictive value (%)</th>
<th>Negative predictive value (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off. Class.*</td>
<td>Housing</td>
<td>28.3</td>
<td>92.8</td>
<td>11.5</td>
<td>97.5</td>
</tr>
<tr>
<td>Off. Class.*</td>
<td>Assets</td>
<td>13.1</td>
<td>99.4</td>
<td>40.7</td>
<td>97.2</td>
</tr>
<tr>
<td>Off. Class.*</td>
<td>Income</td>
<td>55.3</td>
<td>81.3</td>
<td>8.9</td>
<td>98.2</td>
</tr>
<tr>
<td>Off. Class.*</td>
<td>Expenditure</td>
<td>44.5</td>
<td>80.8</td>
<td>7.1</td>
<td>97.8</td>
</tr>
<tr>
<td>Housing score</td>
<td>Assets</td>
<td>4.1</td>
<td>99.2</td>
<td>31.4</td>
<td>92.4</td>
</tr>
<tr>
<td>Housing score</td>
<td>Income</td>
<td>60.0</td>
<td>83.6</td>
<td>23.7</td>
<td>96.1</td>
</tr>
<tr>
<td>Housing score</td>
<td>Expenditure</td>
<td>32.7</td>
<td>81.1</td>
<td>12.8</td>
<td>93.4</td>
</tr>
<tr>
<td>Assets score</td>
<td>Income</td>
<td>69.5</td>
<td>80.7</td>
<td>3.6</td>
<td>99.6</td>
</tr>
<tr>
<td>Asset score</td>
<td>Expenditure</td>
<td>50.8</td>
<td>80.3</td>
<td>2.6</td>
<td>99.4</td>
</tr>
<tr>
<td>Income</td>
<td>Expenditure</td>
<td>33.8</td>
<td>83.4</td>
<td>33.8</td>
<td>83.5</td>
</tr>
</tbody>
</table>

Note: Off. Class.* = Official Economic Classification

In summary (paper I):
- Different indicators, income, expenditure, etc, gave a different descriptions of the economic situation of households.
- The indicators were not closely correlated.
- Sensitivity and predictive value for poverty were generally low for all mutual comparisons of indicators.

It can be noted that the Spearman correlation between Income and Wealth Index is of the same order as the correlations given above (r=0.41). If “true” poverty is defined as being in the lowest Wealth Index quintile, the sensitivity for poverty defined as being in the lowest income quintile is 60%. The corresponding specificity is 90%. The Wealth Index appears to relate to income much like the Housing score.

#### 4.2 Health seeking behavior (II)

##### 4.2.1 Health seeking patterns

The first choice of health care was self-treatment which accounted for 50.7% of health care actions taken.
Private practitioners were important sources of health care and accounted for 18%, while public facilities were less used: commune health centers 17.1 %, hospitals (district and provincial combined) 8.8 % of all health care actions (figure 8).

![Health seeking patterns: place for the first consultation (%)](image)

Figure 8. Health seeking patterns: place for the first consultation (%)

4.2.2 Health care actions and utilization of curative (outpatient) health services by different income groups

Self-treatment was reported more often by the better-off than by the poor (56.1% vs. 41.6%) while private practitioners were consulted more often by the poor than by the better-off (21.0 % vs. 16.1%).

The poor also reported to choose commune health centers more often than the better-off (20.0% vs. 15.5%).

Patients in the poor group were more likely to deter from seeking health care in public health facilities. Twenty percent of ill persons in the lowest income quintile revealed they had to deter from seeking health care in public health services due to financial difficulties compared to 8.2 percent in the highest income quintile.

4.3 Expenditures for health care (II)

4.3.1 The burden of cost for health care

The costs for health care were found to be substantial for households. The mean amount spent on outpatient care during a 4-week recall period was VND 40,000 or 7.4% of the household monthly income. Likewise, self-treatment accounted for 4% of the household monthly income and the poor also paid more in relative terms. The amount paid for treatment was different in different facilities. An outpatient visit to hospital cost more than three times that to CHCs or to private practitioners (table 10).
Table 10. Expenditure (VND) for the first out-patient visit to different health services

<table>
<thead>
<tr>
<th>Type of health care</th>
<th>Mean payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHCs</td>
<td>29,284</td>
</tr>
<tr>
<td>Hospital</td>
<td>102,361</td>
</tr>
<tr>
<td>Private practitioners</td>
<td>30,729</td>
</tr>
<tr>
<td>Self-treatment</td>
<td>26,404</td>
</tr>
</tbody>
</table>

4.3.2 Health expenditures by different income groups

The total costs for utilization of health facilities did not vary in any clear directions between income groups. However, there were large differences between income groups in health expenditures as percentage of the households income, and the ratio decreased as the income increased. For users of health facilities, the poorest quintile spent 16.9% of their monthly household income, while the richest quintile spent only 3.7%. Likewise, the poorest households spent 14.8% of their monthly income for self-medication while the richest spent only 2.2% (figure 9).

![Health expenditure (% of monthly household income) by income quintiles (Quintile 1: very poor, Quintile 5: rich)](image)

4.3.3 Coping strategies to pay for health care

Thirty-two percent of the interviewed outpatients reported household saving as a source for payment for health care, while 31.0% relied on selling belongings, rice and livestock and 27.0% on borrowing money from friends, relatives or money lenders. There were differences in sources of payments between income groups. The richest income quintile relied on household savings more often than the poorest (37.7% vs. 28.6%), while the latter reported borrowing money as a main source of payment for health care to a larger extent than the richest quintile (38.1% and 21.3% respectively).
In summary (paper II):

- Self-treatment was common practice and reported more often by the better-off than by the poor.
- Private providers were an important source of health services and were consulted more often by the poor than by the better-off.
- The costs for health care were substantial for households, and lower income groups spent a significantly higher proportion of their income on health care than did the rich.
- The poor were deterred from seeking health care more often than the better-off and for financial reasons.
- The poor relied much more on borrowing money to pay for their health care needs, while those who were better-off relied mostly on household savings.

4.4 Social gaps in health (III, IV)

4.4.1 Gaps in morbidity-prolonged cough (III)

Prolonged cough prevalence

The overall prevalence of prolonged cough was 1.5% with the highest prevalence (4.1%) among persons above 65 years old (table 11).

Table 11. Absolute numbers and prevalence (in brackets) of reported prolonged cough cases by sex, age groups and income indicator.

<table>
<thead>
<tr>
<th></th>
<th>Total FilaBavi</th>
<th>Cough cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>17,344</td>
<td>250 (1.4)</td>
</tr>
<tr>
<td>Female</td>
<td>19,748</td>
<td>287 (1.5)</td>
</tr>
<tr>
<td>Total</td>
<td>37,092</td>
<td>537 (1.5)</td>
</tr>
<tr>
<td>Age 15-54</td>
<td>30,138</td>
<td>276 (0.9)</td>
</tr>
<tr>
<td>Age 55-64</td>
<td>2699</td>
<td>87 (3.2)</td>
</tr>
<tr>
<td>Age =&gt;65</td>
<td>4255</td>
<td>174 (4.1)</td>
</tr>
</tbody>
</table>

The extent of inequalities in prolonged cough

Regardless of what economic indicators used, lower economic groups reported higher prevalence of prolonged cough than higher groups. However, the picture was less clear when using the expenditure indicator than income and official classification. The bottom and top ratios of prolonged cough prevalence for expenditure, income and official classification indicators were: 1.7; 3.0 and 3.75 respectively. Prolonged cough prevalences were higher among the elderly. Females reported to have prolonged cough as often as males. The illness gaps between poor and rich were wider for men when income and official classification indicators were used. Illness Concentration Indices confirmed the results for prevalences. Inequalities in cough were found irrespective of which socioeconomic indicator was used but less evident when using expenditure (table 12 and figure 10). Multiple logistic regression analysis showed that being a man, elderly, in lower socioeconomic groups and a smoker increased the gaps in risk of having prolonged cough.
Table 12. Ratios of prevalence of prolonged cough of the lowest to the highest economic groups and Illness Concentration Indices (%) (ICI%)

<table>
<thead>
<tr>
<th></th>
<th>Sex</th>
<th>Age groups</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>15-54</td>
</tr>
<tr>
<td><strong>Ratios of prolonged cough prevalence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>4.0*</td>
<td>2.4*</td>
<td>1.3*</td>
</tr>
<tr>
<td>Expenditure</td>
<td>1.5</td>
<td>1.9</td>
<td>1.1</td>
</tr>
<tr>
<td>Official Classification</td>
<td>5.35*</td>
<td>1.5</td>
<td>7.2*</td>
</tr>
<tr>
<td><strong>Illness Concentration Indices (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-18.5</td>
<td>-15.1</td>
<td>-9.9</td>
</tr>
<tr>
<td>Expenditure</td>
<td>-5.4</td>
<td>-2.4</td>
<td>+4.0</td>
</tr>
<tr>
<td>Official Classification</td>
<td>-12.4</td>
<td>-4.1</td>
<td>-11.2</td>
</tr>
</tbody>
</table>

Note: (*) Indicate significant difference in the trend between prevalence of prolonged cough across economic groups.
ICI’s (-) indicate prolonged cough is concentrated in lower economic groups.
ICI’s (+) indicate prolonged cough is concentrated in higher economic groups.
Figure 10. Illness concentration curves of prolonged cough measured by the income, expenditure and Official Classification. The greater the distance from the diagonal, the greater the inequality.

4.4.2 Socioeconomic differentials in mortality (IV)

Mortality pattern

A total of 860 deaths were recorded over 175,380 person-years during a three and a half years follow-up period. This corresponded to an overall crude mortality rate of 4.90 per 1,000 person-years. The gender-specific rates were 5.42 per 1,000 person-years for males and 4.43 per 1,000 person-years for females.

Mortality differentials between socioeconomic groups

For the whole population, the standardized mortality rate of males in the lowest quintile was much higher than that of males in the highest quintile. For working groups (15-59 years old), there were mortality differentials between quintiles as a whole and among men but only a weak socioeconomic gradient in mortality was found for women across different quintiles (figure 11).
The mortality rate ratios of the first quintile to the fifth wealth quintile were 3.54 for the whole working group and 3.63 and 3.27 for males and females respectively.

### Figure 11. Standardized mortality rates of 15-59 years old group by wealth quintiles

![Mortality Rates by Wealth Quintiles](image)

*Wealth index quintile*

In summary (paper III, IV)
- The estimated prolonged cough prevalence was higher for persons classified as poor, regardless of what indicator was used.
- The standardized mortality rate of males in the lowest wealth quintile was much higher than that of males in the highest wealth quintile.

5. DISCUSSION

5.1 Methodological considerations

5.1.1 Study designs

Cross-sectional household surveys (paper I-IV) and 13 follow-up studies (paper IV) were used to collect the data needed to assess health status and health services utilization. A strength of the population-based design compared to facility-based is that it includes those who are ill and seek health care in health facilities as well as those who do not do so. It is also possible to link health status indicators, health care utilization and health care expenditure as well as vital events to household characteristics like household economic status obtained in the household study. Population-based information in contrast to the information about health, health services, etc.
collected at institutions like health centers and hospitals is not biased due to selection mechanisms.

In a cross-sectional study, variables are measured at one point in time or represent a short period of time. Cross-sectional studies have the advantage that they can be made over a relatively short period of time, thus reducing costs. However, they have a limitation since cause-effect relationship cannot be studied. If measurement of exposure and effect is made at one point in time, it is most often impossible to separate cause and effect because it can not be determined which came first (Kelsey et al., 1996). I examine poor-rich differences in health and health care use in a descriptive way. It was not the purpose of this thesis to empirically establish how wealth and health are related and which are the causal mechanisms.

The studies presented here are quantitative. Qualitative methods have not been used to further and comprehensively understand the effects of health sector reforms. Utilization of health care provided by different kinds of health care providers was studied, however the aspect of quality of care (availability of drugs, equipments, staff, attitude of staff toward patients, etc.) was not investigated.

In paper IV, a follow-up survey design was used to collect data about deaths. Different methods for routine death registration are used in different settings. Community registration is a traditional method for recording births and deaths as well as migration. The events are supposed to be reported to authorities at a local level. However, the validity of death registration by this system in Vietnam as well as in many low-income countries is low (Huy et al., 2003, Merli 1998, Berhane et al., 2000, Lumbiganon et al., 1990, Becker et al., 1996). The census is another way to collect demographic information including mortality, but it consumes large resources so it cannot be done frequently. In addition, this method has limitations in tending to under-report important events such as perinatal and neonatal deaths as well as elderly mortality (Merli 1998, Cleland 1996). Regular follow-up surveillance carried out through household visits is considered to be the best method to discover deaths although it has been criticized for being expensive and time-consuming (Huy et al., 2003, Delaunay et al., 2001, Ngom et al., 2001, Berhane et al., 1999). In a study on validity and completeness of death reporting in FilaBavi, Huy et al. found that quarterly follow-ups missed only one death. In comparison with the assumed “actual” number, the re-census missed 4% of total deaths and 25% of infant deaths. The community registration missed 19% of all deaths (Huy et al., 2003).

5.1.2 Sampling and statistical inference

Sampling means that a limited number of units are selected from a population. The purpose is to save resources and to obtain more accurate information. There are two main types of sampling, random and non-random. Random sampling is used when statistical inference is made to the population from where the sample is drawn. If a non-random, sometimes called strategic or purposive, sample is used there is no possibility for strict statistical inference with assessment of the random sampling error. The results from random sampling can be expressed as estimates with confidence intervals reflecting the uncertainty.

The 11,547 households in FilaBavi were selected as a stratified random cluster sample. The clusters were defined as villages or parts of large villages. All households in the selected clusters
were then included in the survey. This procedure was used since simple random sampling was not feasible. It is difficult to have complete list of households in the district. The same clusters have then been used for a number of studies with different objectives. Apart from the follow-up of vital events, studies on accidents, prolonged cough, health care seeking etc. have been conducted (Huy et al., 2003, Thanh et al., 2003, Hoa et al., 2003, Giang et al., 2003). The random error due to the original sampling is in a sense the same in all these studies. Before sampling the clusters were stratified into lowland areas, highland areas and mountainous areas. Independent random samples of clusters were selected with probabilities proportional to size (pps) in each stratum. There were 69 clusters selected out of 352 available (initially, there were 67 clusters at the time of the base-line survey).

Cluster sampling normally gives estimates with larger standard errors than in simple random sampling. The reason is that the units in clusters tend to be more similar than units in general. There is intra-cluster correlation and a certain number of units do not give as much information as the same number of independent observations. The design effect is defined as the ratio of units needed in cluster sampling to the number in simple random sampling with the same precision. It depends on how strong the intra cluster correlation is and how large and how many the clusters are.

\[
\text{Design Effect} = 1 + (m-1)\rho
\]

Where \( m \) is the average number of units per cluster and \( \rho \) is the intra-cluster correlation. For FilaBavi \( m \) is about 160 households. The size of random errors in cluster sampling is increased with a factor which is the square root out of the design effect compared to simple random sampling. For the estimates of prolonged cough prevalence and mortality in this study, the design effects are 1.8 and 1.6 respectively.

There might be two views on the analysis of the present sample of households. Either we consider the sample as a random cluster sample and analyze results taking the clustering into account, using robust estimators and getting comparatively large standard errors in each particular study as indicated above. Statistical inference is then made to the entire BaVi district. This has not been systematically done in sub-studies in FilaBavi.

It could however be seen as a disadvantage that the same error repeats itself in each application. It is in a sense no longer random but systematic across the different studies. The other view is therefore to consider the selected clusters as non-random, rather as the target population itself. The variations between clusters are then no longer seen as random but as fixed effects. All conclusions are valid for the particular clusters in the sample. Extending conclusions to the entire district is then a matter of external validity of the selected sample. A step towards this view was taken when the sample of clusters was stratified into different area types. A more detailed stratification with rather few clusters would have meant that the sample becomes strategic in nature. In fact, following this line of thinking, the clusters could have been chosen fully strategically. FilaBavi might be the only so called Demographic Surveillance Site (DSS) that operates on a sample within a given area.

The major advantages of sub-studies carried out within FilaBavi are that they can make use of the FilaBavi sample as a sampling frame for further sampling (paper II) or for the purpose of a screening cough cases (paper III) and follow-up vital events including deaths (paper IV). Data on
demographic and socioeconomic characteristics of households were already collected through census and can be linked with sub-studies.

Papers I-III in this thesis use the base-line survey of 1999 to assess the economic status in spite of the fact that more information about household economy has been made available afterwards. The reason is that, in investigating the association between socioeconomic status and health, the time dimension is important and it is appropriate to link economic levels that precede health outcomes of interest (Benzeval and Judge 2001). Using repeated surveys may improve the validity and even life-course average income may be a better marker for an individual's lifetime access to material resources than income measured at one point in time. At the time of data collection on health seeking patterns and on cough only the base-line information was available. For the mortality paper, the base-line and first re-census surveys were available.

In general, the published papers use the information that was available at the time of submission. Comments, made below are, however, also referring to information obtained later.

5.1.3 Validity, reliability and response rate

The validity of a measurement is an expression of the degree to which it is capable of measuring what it is intended to measure, while reliability refers to the extent to which the instrument produces the same result when repeatedly applied to the same subject/person (Rothman and Greenland 1998). A measurement process has a bias (systematic error) if it systematically overstates or understates the true value of the property it measures and has random error if repeated measurements on the same individual give different results, unpredictably deviating from the true.

Surveys using questionnaires are considered to be subject to several types of bias such as interview bias, information bias and recall bias. The interviewer may intentionally or unintentionally influence the interviewee by personal attitudes and perceptions and even if there is no interview bias, respondents may still have different perceptions and impressions in relation to the same phenomena. It has been also known that when interviewed, respondents may respond in the way that they think the interviewer wants to hear (Yeneneh et al., 1993, Krause et al., 1998).

A number of measures have been taken in order to ensure validity and reliability of data in FilaBavi: the measurement instruments in our household surveys are questionnaires using structured questions which were developed and field-tested before conducting the surveys to make sure that all questions were clear and understandable. Face-to-face interviews were used which are considered to be more reliable than mailed questionnaires and telephone interviews. The effect of interview bias was also moderated by selecting interviewers who were not permanent health staff of the district and then well-training them. The training of interviewers was conducted both in theory and field practice to ensure quality of data. As indicated by Kroeger (1983) and Ross and Vaughan (1986) well recruiting and training local interviewers and field supervisors are important measures to avoid systematic errors. The quality of interviews was controlled by means of daily check and re-interviews of questionnaires to check for any inconsistencies by field supervisors and by researchers (Chuc and Diwan 2003).
Recall bias is known to affect the quality of data (Freij and Wall 1997, Kupek et al., 1999). Recall bias is depending not only on the length of the recall period but also on the nature of the event (frequency, level of education and other individual characteristics of the respondents (Ross and Vaughan 1986, Fleming and Charlton 1998, Goldman et al., 1998). While some authors have suggested a two-week recall period to measure morbidity (Kroeger 1983, Tipping and Segall 1996, Fleming and Charlton 1998), a four-week recall period has commonly been used to measure health status, health care use and expenditure on health of households (Rand Corporation and John F Ware 1996, Nchinda 1997, Coppo et al., 1992, Henderson et al., 1994, Asenko-Okyere and Dzator 1997, GSO 1998, Kupek et al., 1999).

In paper II, a four-week recall period has been chosen based on study experiences (GSO 1993, Knowles et al., 1996) and a high literacy rate in Vietnam. Literacy could help interviewees to remember correctly symptoms or diseases in terms of frequency and severity, decision making process regarding health care and costs incurred with health care (Hunte and Sultana 1992, Coppo et al., 1992, Henderson et al., 1994).

For paper IV, the recall period for follow-up surveys to collect information on deaths and other vital events was only three months, which reduced to a large extent recall bias (Huy et al., 2003). However, there is a concern of some incompleteness for infant and elderly deaths, especially for women. According to Huy et al., the reasons for non-reporting or under-registration of elderly female and infant deaths may be several: (i) family members of the deceased may not be willing to report the death because there is neither any incentive for reporting nor any legal sanction for not reporting; (ii) reporting may be influenced by cultural tradition of not considering an infant as fully "human" if it dies during the first day of life; (iii) regarding elderly women deaths, elderly females often live alone, therefore efforts to report their deaths are limited. Furthermore, dying at an old age is considered as "natural" which may deter relatives of the deceased from reporting the deaths (Huy et al., 2003).

In paper III, the recall bias is assumed not to be a problem since the screening question referred to present symptom/disease (prolonged cough): “Does anyone in your household suffer from cough of equal or more than three weeks' duration at the time of interview?” The question was put to the household representative, and if he/she identified such a person, the cough case was then interviewed in person.

The possible recall bias for self-reported income and expenditure is of importance. For income the unit asked about was a year which shall be considered as rather long. The mean income in the baseline and the first and second re-census surveys increases more than what is reasonable and it is possible that the interview technique has been improved over time (Phuc and Eriksson 2004). Expenditure was asked about two intervals, major expenditure during the last months and food expenditure the day before the interview. One would expect the recall bias to be smaller. A speculation is even that there could be a tendency to over-report when the asking is about very short periods.

A recall bias potentially leading to over-estimation was seen in the “neighborhood survey” used by Huy et al. in validating mortality. A group of people were asked to have a group discussion and list persons that were recalled as having died during the last year. The initial number was
larger than the number of deaths reported in interviews. However, checking the dates of death revealed that several deaths did actually occur outside the stipulated recall period (Huy et al., 2003).

Basically there are no missing value due to the commitment to the FilaBavi project from local authorities and the good cooperation of the households. A small amount of information was lost for the cough survey analysis since the field lab is an open cohort and a few cases had entered after the baseline study.

5.2 Economic classification of households - the choice of indicators

Two key methodological issues in equity research are: (i) the choice of socioeconomic indicators and (ii) the approach to analysis and summary inequity description. For the first point the discussion has been going on for long and no consensus has been reached (Wagstaff et al., 1991, Judge 1995, Liberatos et al., 1988, Durkin et al., 1994). The most commonly used indicators are individual education, income, expenditure and occupation (Mackenbach and Kunst 1977, Duncan et al., 2002). Studies in low income countries in addition have used land ownership, household assets and housing conditions (Durkin et al., 1994, DaVanza et al., 1984, Victoria et al., 1992, Schoeman et al., 1991). It is quite possible that the indicators used in high income countries are not suitable in low income countries and the asset indicators have been suggested (Schoeman et al., 1991, Kroger 1983). For some combinations of health outcome and socio-economy, the relation between them are evident regardless of the choice of indicator. For other conditions the results have been inconsistent and depending on the choice of socioeconomic indicators (Liberatos et al., 1988). In addition, as regards relations between socioeconomic indicators, our study (paper I) indicated relatively low correlations between different indicators used such as: income, expenditure, housing condition, asset possession.

Duncan et al. examined the relationship between indicators of socioeconomic status (SES) and mortality for a representative sample of individuals and found that economic indicators (income, assets) of SES were as strongly associated with mortality as the more conventional indicators of completed schooling and occupation and recommended that the former should also be used for monitoring links between SES and health (Duncan et al., 2002). According to Houweling et al. since household income or expenditure are often unavailable or unreliable as a measure of economic status in developing countries, the assets that households own are a good indicator of their economic status and the use of some asset index is a good alternative to measure household SES. However, the choice of assets influences the observed relations to health outcomes (Houweling et al., 2003). The authors also suggested that to measure economic status in developing countries, it is advisable to include items that poor households are likely to own as indicators of economic status in rural areas, such as the ownership of land, animals and farming tools (Houweling et al., 2003).

Validity and reliability of socioeconomic data

Income and expenditure data

Income data was not easy to collect and income measure may face low reliability (Ports et al., 1997). Self-reported incomes in rural settings and in low-income countries in general are
considered to be not always reliable for a number of reasons: most households rely their income on agriculture production which is small, seasonal and irregular; while in many cases people try to hide income sources to avoid taxes or envy, some may overstate income to make a better impression (Bogg 2002). For practical reason and because in Vietnam individual taxation is limited, raw pre-tax income data was used for analysis. The question was formulated as follows: “estimate the income of your household during last year from: paddy; breading, forestry; handicraft; fishing; trading; salary/allowance; others”.

In spite of the common belief that people are reticent about providing exact income information, there was no refusal in responses and self-reported income information gave a distribution of sources of household income, which is likely to be realistic in the district. Income from paddy showed a significant share of the income of the poor and very poor households while income from trading and from salary accounted for a larger portion of the total income in richer households compared with the poorer ones.

There was an underestimation of income in the baseline survey due to recall bias or other reasons and the reported incomes may be far below the real income level. Another, more detailed study done in the same sample used a longitudinal design where households were visited monthly and the household head was asked to report incomes since the last visit showed that the mean income was twice as high as in the base-line survey (Thuan 2002). Also the mean incomes from the subsequent re-census survey were higher (Phuc and Eriksson 2004).

Compared with income data, measures of poverty using household expenditures are more convenient for respondents to reply. However, the expenditure measure is also subject to bias: information bias, recall bias (Fabricant et al.,1999). In order to be able to assess household expenditures, the surveyor has to administer lengthy interviews to collect detailed information on hundreds of purchases. Also, expenditure neither reflects access to non-cash resources nor captures the effect on family well-being of state-provided goods and services (MacPherson and Silburn 1998). Expenditure also does not capture consumption that was not directly paid for, such as food produced and eaten at home. The recall period used in our study is one day prior to survey regarding food expenditure and one month preceding the interview for other expenditures. The representative of the household was asked to recall expenditure on food from the previous day and major expenditures including valuable items (equal or more than VND 20,000- app. US$ 1.3), health care, education, fertilizer, wedding, funeral, and others (if any).

Household expenditures may have seasonal variations, for instance households may increase expenditures during special occasions such as new year holidays and if a survey took place right after this time, this might result in an overestimation of expenditures. This was the case of the base-line survey, which took place one month after the traditional lunar new year holidays.

Housing condition and asset

Information on housing conditions and assets may be valuable for assessing the socioeconomic status of households since it is rather objective. Surveyors may ask respondents and then observe reality to check the correctness of given information. However, the measure can also be biased since the items included are not the most appropriate or the index constructed does not have the appropriate weights.
Official economic classification

Poverty measured by the local authority's estimation is a simple income proxy method. The most obvious disadvantage is that it excludes non-agricultural income and barter trade, gifts, etc. It is also susceptible to potential bias due to personal judgment and not truly objective. However, a possibility that a household may be misclassified is likely to occur between two consecutive economic categories, for example: between very poor and poor but not between very poor and rich since the differences between the two categories are too obvious to notice.

Wealth index

Wealth index, the index constructed from several economic variables using the Principal Component Analysis (PCA) method is nowadays, an often-used indicator to classify the economic status of households especially in low-income countries. However, the choice of asset items does effect categorization of households and who is defined as poor and who as rich varies with the asset items included in the index (Houweling et al., 2003). In addition, it has been shown by Houweling et al., that the method of PCA for constructing composite indices may produce odd results when applied to short list of items (Houweling et al., 2003). Also according to the authors, the selection of items to be included in the index should be done carefully and for descriptive and monitoring purposes it is advisable to use a comprehensive list of asset items, whereas for explanatory studies the different sets of asset items should be analyzed separately.

The Wealth Index used in paper IV is to a large extent an index of assets and housing characteristics. The mortality inequalities estimated over quintiles of the index are more clear than those estimated using income and expenditure. Only using the mean income over the three surveys produces similar results (Phuc and Eriksson 2004).

It can be anticipated that death as a health outcome is due to long-term influences and best related to stable indicators of socio-economy. In contrast, utilization of health care could be related to economic short-term fluctuation in income and expenditure.

5.3 Socioeconomic differences in health status

Improving the health of the poor and reducing health inequalities between the poor and non-poor are central concerns of the national governments in the context of their domestic polices as well as international organizations (Wagstaff 2000).

In our study, morbidity, self-reported prolonged cough (paper III), and mortality (paper IV) were used to describe the health status of the study population. All pointed to socioeconomic inequalities.

Standardized mortality rates indicated that males in lower economic groups had higher mortality than those in higher economic groups. The general finding was that prolonged cough was more common among the poor. Regardless of which economic indicator was used, differences in
prevalence of prolonged cough could be demonstrated. Lower economic groups had higher prevalence of prolonged cough than the better-off. Prevalence of prolonged cough was higher among older persons. There were no differences in prevalence of prolonged cough between men and women but socioeconomic differentials were wider for men than for women, if defined by income or by Official Classification.

Socioeconomic differentials in morbidity and mortality have consistently been shown in literature (Alberts et al., 1997, Duncan et al., 1995, Duncan 1996, Lahelma et al., 1994, Humphries and van Doorslear 2000, Kaplan and Keil 1993, Lynch et al., 1996, Wilkinson 1997, van Doorslaer et al., 1997). Those with lower SES generally experience higher morbidity and mortality rates than those with higher SES. Knesebeck et al. suggested that there are three major important factors, that contributed to these socioeconomic health differentials: (i) an increased risk of socially patterned unhealthy life-styles in lower SES groups; (ii) Unequal access to and quality of health care received; and (iii) differential exposure to material deprivation and a stressful psychological environment over the life course (Knesebeck et al., 2003). There is evidence that smoking is more common in lower socioeconomic groups (Subramanian et al., 2004, Mckee et al., 1998) and our study showed larger risk differences in prolonged cough for smoking cases in FilaBavi (paper III). An unequal access to health services among social groups was demonstrated in FilaBavi (paper II). We were able to show inequality in health as well as socioeconomic differentials in morbidity as suggested by the prolonged cough indicator (paper III). Socioeconomic differentials in mortality were demonstrated primarily for people in working age but also for men in general (paper IV). The differences for women overall was unclear.

Some inequalities in health are determined by socioeconomic differences in lifetime exposure to various factors. This is particularly evident for mortality and the explanation of the current mortality pattern should be sought in the preceding decades (Mackenbach and Kunst 1997). Martikainen et al. also indicated that in countries where income inequalities are rather small, the relationship between current income and mortality is unlikely to be due to direct causal effects of poverty and material hardship, but that income is related to an accumulation of factors, e.g. adverse educational or occupational experience, or poverty in childhood, which increases mortality over the whole range of incomes (Martikainen et al., 2001). From a Vietnam perspective, these observations are particularly of relevance giving the fact that income and wealth inequality are still moderate in Vietnam by international standards. When analysing economic differentials in infant and under five mortality in Vietnam, the World Bank suggested that the differences in infant and child mortality across wealth groups are most likely the results of socioeconomic differences in child nutrition, utilisation of health services and environmental hygiene (such as availability of safe drinking water and sanitation) (World Bank 2001).

We could show sex differences in mortality but not in morbidity measured by prolonged cough. Other studies showed that women have a lower general health status and lower mortality (Franks et al., 2003, Verbrugge 1985, Baum and Grunberg 1991, McDonough and Walters 2001). The reasons for the discrepancy in morbidity may be due to different kinds of health indicator used. While others used subjective self-rated health, we used prolonged cough as a health indicator, which is specific and more objective. When wealth index and other health indicators, namely self-reported illness, were considered, we could find higher frequency of episodes of morbidity in females and the poor reporting to be sick more often than the better-off (Khe et al., 2004).
Female excess has been found consistently for mental distress, but was far less apparent, event reversed, for a number of physical symptoms and conditions (Macintyre et al., 1996, Matthews et al., 1999). The direction and magnitude of gender differences in health vary according to the symptom/condition and phase of the life cycle (Denton et al., 2004). Verbrugge argued that women have higher incidences of less severe acute and chronic conditions than men, while men have excess morbidity for life-threatening conditions (Verbrugge 1998). Other researchers suggested that gender patterns of illness may be more complex. Some studies suggested that women are more sensitive to symptoms, while other argued that women recall symptoms more readily than men and that they may be more willing to report their health problems (Verbrugge 1985, Gijsbers van Wijk et al., 1991). The general observation appears to be that socioeconomic mortality differentials are more pronounced among men than women (Koskinen and Martelin 1994, Valkonen 1987, 1989, Powell-Grener and Rosenberg 1991).

There is a possibility of a misclassification of the socioeconomic status of women in our study, since the economic indicators are all referred to the household. The assumption is that household resources are evenly distributed between men and women. However, previous studies from Vietnam indicated discrepancies between household members' access to resources. In qualitative studies among TB patients, it has been shown that men are the main bread-winners and also the ones to take the decisions about spending. Women have a small amount of pocket-money to be used on expenditure related to the family and lastly for themselves (Long et al., 1999). It is therefore possible that the association between socioeconomic groups, sex and health outcome is confounded.

Even indicators calculated per capita fail to describe the resources available for individuals, men and women adequately, and that misclassification can be different between the wealth quintiles. This possible misclassification is likely to be present for all economic indicators used. The wealth index is to a large extent describing assets and housing conditions and might be considered as more neutral with respect to sex. To evaluate actual access to resources further combined quantitative and qualitative studies are needed.

Differential underreporting of deaths between men and women cannot be excluded. The very low mortality rate among women in the lowest wealth quintile suggests this. It is also possible that other sociodemographic factors, related with both mortality and socioeconomic status, but in a different way among women and men, are responsible for gender difference in the degree of inequality, masking women’s inequalities or accentuating them among men. Koskinen and Martelin could demonstrate that women’s smaller socioeconomic mortality differences, in comparison with men, resulted partly from gender differences in the distributions of causes of death, and partly from the influence of marital status (Koskinen and Martelin 1994).

As discussed earlier, the quality of data collected from the household follow-up visits within FilaBavi is on the whole satisfactory in terms of reliability and validity of data. According to Huy et al. (2003), this may be due to several factors: (i) surveyors knew a household's members well, actively noticing any one missing, and therefore relying not only on the respondent's information, (ii) recording pregnancy (included as a question in the quarterly follow-ups) can help surveyors to follow its outcome, hence minimizing birth and early new born deaths (iii) the quality of data also was guaranteed by means of daily check and re-interviews of questionnaires done by field
supervisors and research students (iv) the follow-up surveys were done quarterly, which reduced recall bias to a large extent.

Although all the registered deaths had been carefully validated, there was still a concern about some underestimation among female infants and females in general because the number of male infant deaths exceeded more than expected that of females while the number of males and females born was not so different (Huy et al., 2003).

Using the estimated prevalences in each socioeconomic group we can judge the full pattern of symptom occurrence. As long as the numbers of individuals in the groups are not too different, the prevalence also gives the full picture of inequality in the population. When the numbers of persons are different in the groups, like for the Official Classification, the impression of the extent of inequality just looking at the prevalences can be misleading. The upper and lower extreme groups might have high and low prevalence but they also represent small groups of persons compared to the middle groups.

Because the rate/ratio between the highest and lowest groups does not take into account the sizes of groups being compared, this can give misleading results when comparisons are performed over time or across countries and if the various groups are not all of the same size. The rate/ratio or “range” between the extreme groups measured also ignores the experience of the in-between social groups.

A summary measure of inequality for the whole population is the Illness Concentration Index (ICI) (Wagstaff et al., 1991). Following a tradition from econometry, there has been an ambition to synthesize the estimates into Gini-coefficient-like indices to describe the total inequality for the entire population or sample. The Illness Concentration Indices confirmed that in rural Vietnam, the lower economic group suffered more from prolonged cough than the better-off (paper III). The ICI is a function of the prevalence and the group sizes and gives a summary measure of inequality in the whole population.

The Concentration Index avoids the defects of the range measure. The former reflects the experiences of the entire population and not just the extreme groups. Since it ranks individuals by socioeconomic status, the Concentration Index also ensures that the socioeconomic dimension of inequalities in health is taken into account (Wagstaff et al., 1991). The disadvantage of the ICI is that several quite different patterns of prevalence, and group sizes can give the same index value. As with all indices, information is lost, which is the usual price to pay for a one-dimensional simple description.

5.4 Equality of utilization for equal need

Equity in health may have several definitions, of which, equity of utilization and equity of access apart from equity in health status are important ones (Culyer and Wagstaff 1993). Utilization of health services has been used as a proxy measure for access to health care in the context of a household survey (Gao et al., 2001, Andersen 1968, Makinen et al., 2000, Waters 2000).

In my study (paper II), reported income was used as a proxy measure of the socioeconomic status to assess the relationship between income and use of health care and payment out-of-pocket for
health care in the study population. The sample was divided into five equal-sized groups (quintiles-Q) of persons, ranked from lowest (Q1) to highest (Q5). I aimed particularly at highlighting differentials in the use of and access to health services between the richest 20% and the poorest 20% of the population. The reason for using income is that it is rather straightforward and it allows for comparison with other studies carried out within the country or elsewhere that employed the same method (Ensor and San 1996, Fabricant et al., 1999, Pannarunothai and Mills 1997).

To measure the need for health care, self-reported illness was used and the first choice of health care was analyzed. Subjective measure of morbidity like self-reported illness of all kinds is sensitive to socioeconomic and cultural factors (Gao et al., 2001, Duggal and Amin 1989). The inherent value attributed to health varies from one person to another (Culyer 1976), which may influence health behavior. If people have little concerns about health, they are less likely to report or interpret a symptom as being an illness and the poorer tend to have “less time” to be sick and ignore illness if they possibly can (Gao et al., 2001, Duggal and Amin 1989, Segall et al., 2002, Sauerborn et al., 1996). To compensate this weakness, hospital referrals by a doctor could be used as a measure of need of health care. However, this indicator is also criticized for: (i) excluding those with low access to a doctor, who would not receive a referral, despite of need for in-patient care; (ii) introducing a bias because of possible financial incentive for doctors to refer patients for hospitalization (Gao et al., 2001).

Many factors influence the health seeking decisions of households. While Ward et al. (1997) highlighted that a potential consumer had to consider benefits and incurred costs of consulting, including monetary and time costs, Stierle et al., (Stierle et al., 1999) emphasised the importance of factors such as price and accessibility to services, in particular for the indigent. However, these are not the only factors. Variables such as quality of care or perception of services may sometimes be even more important (Stierle et al., 1999). Our study did not investigate quality of care, hence we can not comment whether households perceived care of low quality.

Our results showed that utilization of public health service was relatively low: roughly nine percent of self-reported illness was consulted at public hospitals and if CHC consultations were also added, the public providers accounted for just 26% of the services used. We could not see differences in using hospitals between socioeconomic groups, but the poor made more use of what is considered to be of lower quality health providers: CHCs and private practitioners compared to the better-off. Surprising is also that the better-off practiced self-medication more often than the poor (paper II). These results are not in line with the conventional view that wealthier households are more likely to use hospitals and private health sector. The reasons for this seem to be complex and should be viewed in relation to the specific context. First, most of the private practitioners in the Bavi district are retired health staff and nurses or assistant doctors which are supposed to be of lower quality compared to doctors. In our definition, private practitioners include also traditional healers, private pharmacies and drug vendors. Second, only outpatient care is considered in our study. The recent National-wide Health Survey conducted during 2001-2002 could demonstrate with regards to inpatient care that the better-off mostly use hospitals while the poor use CHCs (MOH- unpublished). Third, for the high proportion of mild illness that does not require hospital admission-the cost of inpatient care would be substantial especially for the poor. As many as fifty-one percent of the non-poor and thirty-seven percent of the poor stated that the reason for not seeking health providers is the mildness of the illness.
However, when Acute Respiratory Infection was used as a measure of “need” for health care and official classification made by the local authority based on rice production was used as a proxy measure of income, Toan et al. could see that among ARI patients, hospital consultations were 6 times more frequent in the non-poor group than in the poor group while self-treatment in the poor group was twice as high as in the non-poor group (Toan et al., 2001b).

Analysis of utilization of health care may be sensitive to how morbidity is observed. Self-reported morbidity may introduce biases. It is well-known that self-reported morbidity does not coincide with medical records (Sutton et al., 1999, Blaxter 1985). Errors in the measurement of these variables can lead to potentially misleading estimates of morbidity and other factors on health care utilization (Burström 2002, Sutton et al., 1999). A study in Africa also showed that a patient’s first visits across providers were influenced not only by socioeconomic characteristics of patients and type of providers but also by the type of illness (Mwabu et al., 1995).

Studies elsewhere showed different and varied gender patterns of health care use: in some studies, women made more use of medical services, but in other, less than men (Green and Pope 1999, Verbrugge 1985, 1988, Macintyre et al., 1996, Rangan and Uplekar 1998). In our study, the inequality in utilization of health services between men and women was not large enough to be conclusive. Concurrently, other studies in Vietnam (GSO 1993, GSO 1998) showed a similar pattern to ours despite the fact that Vietnamese women normally have lower socioeconomic status than men and are financially dependent on their husbands and in-laws. As regard prolonged cough patients, Long et al. have shown that more women than men chose less-qualified providers (self-medication, pharmacists, or private practitioners) as the first health care action (Long et al., 2000). In another study on TB patients, the authors found that women did not start seeking care later than men, nor did they have different health seeking patterns (Long et al., 1999).

It is well known that access to health care depends on the distance to the health services. A negative relationship between distance to the health services and health care utilization is frequently found in many countries (Toan 2001a, Nemet and Bailay 2000, Mooney et al., 2000). In our study there were no significant differences regarding distance from residence to nearest CHCs and district hospital between poor and non-poor but there were differences in terms of time required to travel from residence to nearest health facilities (CHCs and district hospital) and means of transportation. The non-poor used faster means of transportation than the poor.

### 5.5 Health care expenditures and burden on household income

User charges have come to play a significant role in financing and delivery of health in publicly provided health services in low-income countries. As a response to financing constraints, user charges are often promoted as a way of rationalizing the use of care, raising revenue, and improving coverage and quality of care. However, due to limited financial ability to pay, user charges may restrict access to or deter household’s utilization of necessary services.

Our data showed that the costs for health care were substantial (paper II) and lower income groups spent a significantly higher proportion of income for health care than the rich. While 5% of the household income has become regarded in some policy discussions as an “affordable” level of expenditure on health care (Fabricant et al., 1999, Russell and Gilson 1995, Russell 1996) health expenditure in our study averaged 7.4%, ranging from 3.7% for rich households to
13.2% for the poor and 16.9% for the very poor. Moreover, patients in poorer quintiles paid as much as the rich at different levels of public health services and in some cases the poor even paid more than the rich.

A similar payment pattern where the poor paid more in relative terms and paid as much as the non-poor in absolute terms was shown in some studies done in Vietnam and also in Thailand (Ensor and San 1996, Knowles et al., 1996, Pannarunothai and Mills 1997). Makinen et al., when studying health care expenditures in eight developing countries and countries in transition demonstrated that in absolute terms, the richer groups spent more on health care than the poorer groups and that there was no clear pattern among the countries concerning health spending as a percentage of the total household spending. The authors could find only three out of five countries (where data were available) with regressive pattern (that is poor households have to pay a larger share of their income as out-of-pocket payment for health care) of health spending (Makinen et al., 2000).

The reasons for charging the poor more for the same services than the rich seem to be complex. One explanation might be that the poor tend to use facilities less than the rich do, but when they do so, the illness may be more severe than average and therefore require more expensive treatment (Knowles et al., 1996). One other explanation for higher prices paid by the poor is that, those in hardship exaggerate the amount that they have to pay- perhaps to influence policy (Ensor and San 1996). Although the explanation is unlikely to provide full explanation, it is hard to refute. In addition, the results with poorer households paying more than or at least as much as the richer ones should be interpreted cautiously in the light of the earlier discussion concerning measurement of income. The estimates of household income are reliable for ranking households, but not necessary for drawing conclusions about absolute level of income within the study area.

When asking about sources for payment for health care, as many as two-thirds (II) of those interviewed said that they had to borrow or sell assets, rice or livestock to pay for treatments. While the poorest households relied much more on borrowing money to pay for their health care needs, the richer ones tended to use household savings more often.

To our knowledge, the study was one of very few attempting to measure deterrent effects of health care costs in the Vietnamese setting. Concurrently with other studies done in Vietnam and elsewhere (Ensor and San 1996, Fabricant et al., 1999) our results indicated that the poor tended to deter from seeking formal health services more than the rich because of financial constraints.

The main purpose of government financing is to pay for health care and at the same time provide financial protection of people against the cost of ill health. Health care can be financed from a mixture of sources such as various taxes, collective group insurance premiums, local community contributions and user fees. These sources are likely to be different in terms of the degree of progressiveness. Direct taxes are typically progressive and indirect taxes (e.g. sale taxes) and social insurance are more regressive. However, different kinds of social insurance and some times also private insurance are found to be less regressive than out-of-pocket payments (Wagstaff and van Doorslaer 1993). It is therefore likely that a shift from a system with mainly user fees (out-of-pocket payments) to a system based on collective insurance would be less regressive. WHO is unequivocal in its advocacy of tax and prepayment as a means of protecting
the poor, who otherwise might not be able to purchase health care when they actually need it (WHO 1996).

In 1998, the Vietnamese public health care system was financed from four main sources (Hung et al., 2000):
- Taxes (government budget): 58%
- Compulsory health insurance: 16%
- Hospital fees: 13%
- Foreign aid: 13%

A key policy issue is how to finance the health care system in the future. Present trends indicate a relatively reduced proportion of government funds, a stagnant proportion being financed via compulsory health insurance, increased direct payments via different types of user fees and a foreign aid component at the same level but with an increased share of loan as compared with grants (Hung et al., 2000). In Vietnam, the GDP growth has been substantial e.g. 31% between 1995-1997, while the government budget for health was increased at a much slower rate by 16%. Given the fixed price of 1994, in fact the total state budget allocated to health has not increased since 1997 (MOH 2002). In the transition to market economy, with all the changes in health funding, there is a great emphasis on individual payment. It is no doubt that any additional funding for the health sector is of great importance but the danger is that many people who are unable to pay even small charges could be excluded from obtaining health care.

Until now, the full scope of efficiency and impact of cost-recovery schemes as well as interrelated factors remain under-investigated in Vietnam. Experience of charging for health care in many countries and not only in Vietnam shows that people are often deterred from seeking care, while frivolous treatment demanded by the rich continues. In addition, even the revenue generating potential is often overestimated. On the other hand, even insurance is not as good a solution in health systems as expected if there is no effective measure to limit access to unnecessary services. It has been shown, for example, that a fee-for-services system, in which patients pay the provider for each visit and service rendered, encourages provision of unnecessary services, leading to an increase in medical cost and health expenditure and a shift in emphasis away from prevention in favor of curative care (Bogg et al., 1996). From an equity point of view, insurance in low income countries is often targeted at the small and economically advantaged formally-employed population (usually less than 10 percent of the population). Potential benefits of community-based risk-sharing schemes are that they remove financial barriers to obtaining health care at the time of illness for vulnerable groups within the society and payment can be adapted to the needs and context of the local level. Experiences from China showed that community financing of a basic health care is feasible for rural China if adequate political, financial and social support are in place (Liu et al., 1996).

Over the past two decades, Vietnam’s health care system has undergone major structural changes, which transformed Vietnam’s near universal, publicly funded and provided health services into a highly unregulated private-public mix. The transition from a centrally controlled public health system to a market-oriented system has transferred the cost of health care from public budgets to private budgets, with the burden of such transfers falling disproportionately on the sicker and poorer section of the population.
Historical evidence suggests that equitable and efficient health care requires a strong publicly funded health care system, with the state playing a leading role. Considering that out-of-pocket payment in Vietnam is at the level of 80% of the total health care expenditure, it is undoubtedly of critical importance, as endorsed by the 9th Communist Party Congress in 2001, that efforts should be made to gradually reduce the share financed via user charges as revenue increases from public funds; to implement subsidized voluntary health insurance for poor people and toward to a universal coverage of health insurance for the whole population.

5.6 Equality and equity in the Vietnamese context: equitable inequalities or fair inequalities

Human health has probably improved more over the past century than over the previous three millennia. However, almost everywhere the poor have poorer health indicators and the very poor suffer even more. In addition, the gaps in health between rich and poor remain and are getting wider. A major focus on the health of the poor is now evident in the strategies of a number of governments as well as international and bilateral development agencies. This is appropriate and important since poor health is a common consequence of poverty and poverty can be a consequence of poor health. Recent thinking has also brought health inequities and inequalities to the center of concern. In simple terms, inequity is unfair inequality. Inequities and inequalities refer to the relative health status between rich and poor, men and women, ethnic groups, regions, etc. In order to place health inequality at the center of the policy debate, the need to measure and monitor it is of great importance (WHO 1996, Feachem 2000).

Equity as a concept refers to fairness and social justice as opposed to equality, which refers to "sameness" among individuals or groups. Equity is difficult to define within the health sector and cannot be directly measured. However, in operational terms, and for the purposes of measurement, equity in health can be defined as the absence of systematic disparities in health or in the major determinants of health between social groups who have different levels of underlying social advantage/disadvantage. While equity and equality are distinct, the concept of equality is indispensable in operationalising and measuring health equity. Equality can be assessed with respect to specified measurable outcomes, whereas judging whether a process is equitable or not is more open to interpretation. For assessing how equitably services should be delivered, two principles could be used: (i) equal treatment for equal need, meaning people with similar health need should receive similar treatment, regardless of their ability to pay, and (ii) equality of access, i.e. everyone should face similar costs of accessing health services. For assessing how health services are financed, two other principles are often used: (i) the benefit principle means that those who benefit from the services should pay for them and (ii) whereas the ability to pay principle argues that individuals should pay for services according to their ability to pay.

To assess whether observed inequalities may be considered inequitable from a Vietnamese perspective, the principles of ability to pay and equal treatment for equal need may be utilized. The reason for using these principles is that equity-oriented health care for people is a central goal of the Vietnamese government. Provision of health care must be based on health care needs. If more vulnerable groups with greater needs for care have to refrain from seeking health care, then the aim of the health care system, namely good care should be available for everyone and more care for those with greater need, is at risk.
Pursuing equity in health and in health care means trying to reduce unnecessary social gaps in health and health care. For Vietnam and some other settings, during the foreseeable future, reducing inequity may involve achieving minimum basic services for more and more people, but this should be an intermediate target. A final objective should be achieving the greatest improvements for all by "levelling up" rather than "levelling down", meaning moving towards high standards for all, bringing everyone to the greatest common denominator, rather than trying to lower the previously privileged to the least common denominator as Whitehead commended (Whitehead 1994).

Economic changes usually have a direct impact on the health care system, higher levels of economic development are associated with longer life expectancy and lower child mortality. However, the positive causal relationships are determined by the extent to which economic resources generated increase income of the poor and are used for the public investments in health and education. The health sector is ultimately a microcosm of society, therefore, it is not surprising that the overall increase in interpersonal and inter-regional income inequality in Vietnam associated with economic reforms has manifested in the health sector in the form of some widening disparities in access to health services and in health outcomes. Equity is the major concern in health care and it cannot be achieved by market competition. The implementation of equity in health care is closely linked to many objective factors such as geographic, socioeconomic characteristics, ethnicity and gender background of different population groups. However, equity in health is also very much dependent on health policies, especially health economic policies. Equity in health and health care requires strong government actions in financing health care and regulating prices. Fair financing in the health system should be expressed and a fairly financed health system should ensure financial security for everyone, which means that the risks associated with health costs are distributed according to ability to pay rather than to disease burden. An unfair situation, in which individuals or households are sometimes forced into poverty due to payments for care or forced to refrain from using health services because of the costs incurred should be avoided. Thus, it is of great importance to increase tax-based funds for health, and expand health insurance schemes gradually to develop a universal health insurance coverage for the whole population. Equity is not only a matter of equal treatment of equal needs but also fair allocation of resources for health promotion, prevention and protection. Given the limited government budget for health and the current pattern in Vietnam: the poorer the household, the less benefit it tends to receive from the government health funding (MOH 2002, World Bank 2001), there is a need of a better targeting of public subsidies to the poor. Priority should be given to increase the share of the public fund for the basic health care services which the poor are most likely to use and for remote, mountainous areas as well as for ethnic minority groups.
6. CONCLUSIONS AND RECOMMENDATIONS

The general conclusion is that the poor persons and poor households are in a worse situation than the well-off regarding health status, utilisation of health care and payments for health services. The studies provided some specific indications of socioeconomic differences in health and in access to health services especially for poorer groups of the population in the study area.

1. Lower economic groups reported higher prevalence of illness. Men in lower socio-economic groups had higher mortality rates than men in higher socioeconomic groups.
2. The overall use of public health services was relatively low compared with that of private providers and self-medication.
3. The poorer section of the population made more use of commune health centres and private providers than the better-off.
4. Self-medication was common and used more often by the better-off than the poor.
5. The costs for health care were found to be substantial and were a heavy burden for households.
6. The lower economic groups paid a much larger proportion of their incomes on health care and were more likely to deter from public health services due to financial difficulties compared to those in the higher economic groups.

Although the Bavi district has similar characteristics as many other districts in Vietnam, the findings from this research may not be formally generalized to the whole country. Nevertheless different findings are applicable and have implications for equity-oriented health polices and suggestions for policy initiatives also in other regions. The policy and actions needed to reduce the burden of the poor and to satisfy the greater needs of the poorer part of the population are likely to be similar. For egalitarian health polices, it is important not only to ensure absolute level of health but also smaller relative differentials between socioeconomic groups. A combination of developing risk-sharing schemes; exemption, partial or full from payment; differentiation of prices; appropriate allocation of scarce public resources; supporting and regulating the private health sector; government subsidized health insurance for low income groups; and in the long-run, universal coverage of health insurance may be possible solutions to improve access to health care for the poorer section of the population.
ACKNOWLEDGEMENTS

The research work reported in this thesis is part of ongoing Vietnamese-Swedish co-operation program "Health System Research" and is a results of great, cooperative efforts of many individuals and institutions both in Vietnam and in Sweden: MCH/FP- now Reproductive Health Department; Health Policy Unit, Department of Planning and Financing, the Ministry of Health; Health Strategy and Policy Institute; Hanoi Medical University, Bavi District, Hatay Province, Vietnam; Division of International Health (IHCAR), Department of Public Health Sciences, Karolinska Institutet; Department of Public Health and Clinical Medicine, University of Umeå; Nordic School of Public Health, Sweden. I would like to thank everyone, who contributed in one way or another and for helping me with my research.

I would like to express my sincere thanks to Professor Tran Thi Trung Chien, the Health Minister, her Deputies, the Director of Reproductive Health Department, Dr Nguyen Dinh Loan and his Deputy, Professor Tran Thi Phuong Mai, my colleagues in the RH Department, my friends and all related organizations within the MOH for supporting my study and accepting my long leave from work, especially during these final months for the completion of the thesis. Without whose support my study would not has been completed.

I would like to thank management of IHCAR: Professor Hans Rosling, Professor Staffan Bergström for accepting me as a research student at IHCAR and for taking care and giving me all needed supports.

In particular, I would like to express my sincere gratitude to:

Associate Professor Bo Eriksson, my main supervisor for encouragement, invaluable guidance and strong spirit of mutual assistance for this academic work through various studies and write-up of this thesis. He was a wonderful supervisor and a caring and supportive friend. The time and responsiveness, that Bo has put into producing the articles and this thesis have been far from the call of duty. I also would like to thank him for arranging me a visits to a city of Göteborg and his beautiful home town Vänersborg and introducing me into Swedish culture and history.

Professor Vinod K. Diwan, my supervisor- Vinod was actually my initial and first supervisor until the time Bo Eriksson could take over- for intellectual and critical supervision, for broadening my knowledge in public health and health system research. His broad knowledge and experience has taught me a great deal about the art of writing a scientific papers and about critical thinking, guiding my administrative life as a researcher.

Professor Do Nguyen Phuong, Chairman of Party Committee for Science and Education and former Minister of Health, my supervisor for providing me both professional and moral support, for guidance and never-ending encouragement, for making my training and my dream possible.

Professor Pham Huy Dung, Associate Professor Nguyen Thi Kim Chuc, Dr Anna Thorson, PhD, HRS project's coordinators for continuous encouragement and support.
Dr Ngo Van Toan, Dr Le Thi Thanh Xuan, Dr Anna Thorson, Dr Nguyen Phuong Hoa, Dr Ho Dang Phuc, Dr Nguyen Thi Kim Chuc: co-researchers, co-authors for close collaboration, for sharing knowledge and experience and for hardworking.

Associate Professor Bengt Höjer for valuable comments, discussions, support and inputs, for his kindness and friendliness.

Dr Nguyen Hoang Long, PhD for critical comments on my papers and for teaching me about computer during my very first training in Sweden.

Dr Kim Bao Giang and Dr Nguyen Phuong Hoa for kind advice and practical help while I was preparing this manuscript and for sharing the hard and unforgettable times during the thesis writing process.

Dr Lennart Bogg, Dr Anna-Berit Ransjö-Arvidson, Dr Max Petzold for commenting on the thesis. Valborg Bystedt-Mellberg for English editing.

Anna-Berit Ransjö-Arvidson and her family for sharing her beautiful house in Stocksund during most of the times I stayed in Sweden, for taking care of my life and my study, especially during my hard times with writing papers including the thesis and whenever I felt down or felt homesick.

Gunmaria Löfberg from Social Medicine, Birgitta Linnanheimo, Grethe Fochsen, Lars Hedlund, Ana-Stinna Ullrich, Bo Planstedt and Kerstin Rådmark from IHCAR for taking care and help. All other staff of IHCAR whose names I can not mention for providing excellent working conditions as well as for making my stay comfortable.

I would also like to thank the following individuals for their valuable contributions: Dr Dao Lan Huong, MPH Hoang Minh Hang, MPH Hoang Phuong, MPH Nguyen Quynh Hoa, MPH Nguyen Thi Bich Thuan, Dr Hoang Van Minh, Dr Nguyen Xuan Thanh, Dr Tran Van Phuong, MPH Tran Quang Huy, Dr Nguyen Dang Vung, Dr Pham Thi lan, Phar Nguyen Binh Minh, Dr Hoang Duc Hanh MPH Tran Thanh Do, Dr. Tran Mai Oanh, Dr Phan Hong Van, Dr Hoang Thi Hiep, Dr Nguyen Duc Kiet, Dr Annika Johansson, Dr Eva Johansson, Dr Mattias Larsson, Mrs Marina Clarke, Dr Anders Norman, Dr Karin Källander, Ms Anastasia Pharris-Ciurej.

Many people and local officials in Vietnam, especially in Bavi district help me during the field work. Their support is highly appreciated. My special thanks to Dr Nguyen Van Lam, Director of Bavi district hospital for helping with my field work.

I dedicate the thesis and offer my warm thanks to my family, my wife Kim Oanh and my children: Thu Ha and Duy Son for their love, understanding, encouragement and for patience and tolerance. As I have joined the HSR project since 1996, and have began my MPH and PhD training since then, my wife and my children must have felt some times that this project has taken me too much time from them. I am grateful that they have allowed me the time and I am sure that they will find it valuable.
I wish to thank all others, who through their support, encouragement and good wishes have made my work possible.

I would like to express my thanks to Sida/SAREC for funding my training program in Sweden.
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