

III health in Viet Nam and its outcomes

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Introduction and overview

Vietnam has an impressive history of economic and social development over the past two decades. Transformation from a command to a market economy since the early 1990s (a process called *doi moi*) has been accompanied by consistent high levels of growth, around six per cent per annum. Poverty rates halved from 58 per cent to 29 of the population between 1993 and 2002 and latest figures for 2006 show further dramatic decrease to 16 per cent. Vietnam has a population of over 82 million people of whom xx% are aged xxx or under. The country is diverse, with boom urban areas of Ho Chi Minh City (Saigon) and Hanoi contrasting with the mountainous and remote highlands that are home to some of the 17 ethnic minority groups, the intensively farmed lowland paddy areas of the Mekong Delta and long coastal settlements of fishing communities.

The one-party communist government of Vietnam has a commitment to economic growth being accompanied by protection for the poorest and is concerned at neighbouring Chinese levels of inequality between urban and rural populations. An important element in Vietnamese social and economic development has been a continued commitment to social protection. The pre-market universal provision of free healthcare has been replaced by a mixed system of compulsory and voluntary health insurance, free access to the poorest and the imposition of user-charges in an increasingly privatised health sector. For those who pay compulsory health insurance, those with formal waged jobs (where employers comply with social insurance) then access to healthcare is accompanied with maternity and sickness benefits. Of course, coverage through this mechanism is limited – only 25 per cent of the population were covered during the period of our analysis in 2004. Subsequent expansion of voluntary health insurance places has led to 40 per cent of the population being covered for health-care but adverse selection is common and many of these new enrollees are disproportionately those with the highest costs- often elderly and often paid for by their working children.

Before we move to analysis of the incidence and costs of ill-health a closer look at the nature of ill-health in Vietnam is worthwhile. In recent times, parallel to *doi moi*, there has been a fundamental transformation in morbidity and mortality with traditional infectious diseases receding and non-communicable diseases, especially cancer, cardiovascular accidents, diabetes and mental illness all rising. Accidents have risen to account for two thirds of all deaths. Public health provision through vaccination campaigns and other forms of prevention at local levels have been very successful but two emerging risks to public health

from HIV/AIDS and from avian influenza have emerged. Vietnam was one of the original countries to experience avian influenza but the public health response has meant that it is one of the leaders in South-East Asia and now has zero incidence. Traffic accidents are responsible for almost half all accidental deaths, and resulted in 19 dead per 100,000 people, a rate which is higher than the East Asia average, worse than in any European transition country and four to five times worse than in the best performing countries (VDR 2008). To counter the problem Vietnam has introduced compulsory wearing of helmets for motorcyclists was introduced in December 2007 but the impact of this is yet to be determined.

The potential disruption of ill-health and disability to living standards is well-known across both developing and industrialised countries. The outcomes from ill-health are also potentially long-lasting – affecting economic production of the household today but also potentially “scarring” the next generation. For instance, parental ill-health, particularly of the main household earner, is the most common cause of long-term child poverty in developing countries (Chronic Poverty Research Centre 2005). The evidence of the risk of ill-health to poverty in Viet Nam is also of long-standing. Studies from the early 2000s into qualitative experience of poverty illustrated how far the poor felt at risk of ill-health and the potential effects of periods of ill-health on their income, assets and well-being (World Bank and DfID 1999). Previous analysis in the 1990s has looked at pre-determinants of child health, nutrition and low birth weight (Ha and Huong 1999, Glewwe, Koch and Nguyen 2004 and Bales 1999, respectively). Many studies have looked at the uptake of health insurance and the use of health care facilities. These have pointed to the growing diminution in importance of commune level health facilities and the rise in both self-treatment through private pharmaceutical sector and hospital usage (Nga 1999, Trivedi 2004, Wagstaff 2007).

This paper looks at the impact of ill-health and disability as a “dual shock” on individuals and households: the first shock is the reduction of income that results from ill-health, the second is the expenditure shock that results from paying for healthcare. The research stems from the United Nations Development Programme in Vietnam and their involvement with the Policy Advisory Group in the Ministry of Finance which is providing analytical and advisory services on the implementation and reform of social protection. Our brief is a descriptive one: to firstly profile the risk and incidence of ill-health and then to estimate the impact on household income and spending of ill-health. The research is a benchmarking exercise rather than a finished and rounded piece of analysis for many reasons. First, the data at our disposal was the Vietnam Household Living Standards Survey (VHLSS) for 2004 and this data will be imminently updated by release of the 2006 VHLSS survey that will enable a panel element between 2004 and 2006 to be analysed for a clearer analysis of relationships between ill-health as an “event” rather than observed over the whole cross-sectional sample of households. Second, 2006 VHLSS contains specific modules on health and disability that will enable a more detailed and better specified analysis to follow the 2004 baseline.

Our paper proceeds as follows, we begin by outlining the recorded incidence of ill-health and disability in VHLSS 2004, we then estimate the impact of a variety of measures of ill-health on income, finally, we show how household expenditure is affected by healthcare spending

and how this is linked to the issues of both health insurance and healthcare provision and user-charges.

Data and Methodology

The VHLSS surveys are the primary source of data on incomes and living standards in Vietnam. Their sampling methodology leads to under-counting of migrants (especially rural-urban migrants) and over-weighting at the commune level which forms the basic sampling unit. These sampling problems however are secondary to more specific measurement problems in recording ill-health which relies on self-reported general questions on ill-health over the preceding 12 month period. Reported ill-health is well-known in health economics to have measurement problems in that it is potentially different from actual ill-health and that there are potential biases in the difference between reporting and actual ill-health. *“For a given true but unobserved health state, individuals will report health differently depending upon conceptions of health in general, expectations for own health, financial incentives to report ill health and comprehension of the survey questions.”* (Bago d’Uva et al 2006 page 1). We know that up-take of healthcare is higher by higher income/educated groups (Trivedi 2004) and Evans et al (2007a) suggest that bias of reporting to higher income households will occur quite strongly given the link between health insurance, pensions and waged work, especially employment by the state. The problem is an international one and not unique to Vietnam (Thomas and Frankenberg 2002).

The second data problem is that the best measure of ill-health available to us is recorded over 12 months and thus subject to recall error but also more crucially, allows for adaptation and substitution to occur by household members faced with ill-health leading to many short-term effects of ill-health being smoothed out over the year. Households may undertake coping strategies that may not be observable. Such strategies documented in the literature include selling assets or drawing on formal or informal savings, taking on credit or loans from moneylenders, include family members or acquaintances, increasing hours of work of other household members, or simply reducing the food intake of all household members (see Dercon (2004) or Fafchamps(2003) for a review). On the other hand, consistent, chronic ill-health and disability are likely to have no observable behavioural change over the year as households will have already adapted to its presence.

Turning to the measures used for ill-health in greater detail, the 2004 VHLSS identifies any household member who has suffered from any illness or injury in the past 4 weeks and then secondly asks similar question about illness or injury in the past 12 months for those where no recent illness is recorded. The combination of the two measures allow us to capture all ill-health over the past year and to align this with income and expenditure data. The term “ill-health” refers to illness or injury. There is no comprehensive measure of disability – only those household members who are aged over six years and who are unable to work are allowed to identify themselves as disabled, only 0.8 per cent of the population, when health surveys clearly show nearer three per cent of the population suffering from some form of disability (MOH 2003)

Using only the data on ill-health we are able to derive different indicators of severity of ill-health from the reported number of days that firstly give rise to days off from work (or school or inability to carry out regular activities) and secondly give rise to a stay in bed that requires care from another person. The combination of ill-health indicators and these two measures of days off and days in bed mean that we derive five measures of ill-health. In ascending order of severity these are:

- Any reported ill-health over the past 52 weeks (abbreviated as **ILL52**)
- Reported ill-health that results in *any* days off from work, school or other normal activities (abbreviated to **DAYSOFF**)
- Reported ill-health measure that results in any days in bed that require care from another person(abbreviated to **DAYSBED**)
- Reported ill-health that leads to more than 14 days off - representing the highest 15 per cent of days off from work (abbreviated to **SEVERE DAYS**)
- Reported ill-health that leads to more than 7 days in bed requiring care- representing the highest 15 per cent of days in bed (abbreviated to **SEVERE BED**)

Our approach is to use these measures and focus on the strengths of the descriptive power of cross-sectional survey data. We provide diagnostic profiles of household experience of income constraint and of expenditure change. This means that, even with econometric and other forms of analysis that can identify statistically significant associations between ill-health and other factors, we are rarely if at all able to make strong findings about causation.

The Incidence of Ill-Health in Vietnam

Over 12 months on average 40 per cent of the population report ill-health or injury over 12 months. Simple profiles that we report elsewhere (Evans, Harkness and Porter 2008) confirm a clear u-shaped incidence of ill-health with age – higher for infants declining for older children and prime-age adults and then rising consistently from the age of 40 onwards. Income gradients on reported ill-health are negative (higher with higher income) but flatter and then more aligned with low income with the more severe measures of ill-health. However, such bi-variate profiles are obviously the result of several underlying and potentially confounding factors and are difficult to interpret because the underlying direction of the causal relationship with income can be two-way. There are also many potential drivers of ill-health, many of which, like underlying epidemiological factors will be unobserved in VHLSS data.

What are the main drivers of ill-health? We report a series of descriptive regression models that show the association between our five measures of ill-health and a range of individual, household and geographical factors. To avoid direct measurement of income, which can be

considered as endogenous, we have specified the models to replicate the set of characteristics that are known to be determinants of poverty from earlier work (Evans et al 2007). Table 1 reports the summary results from a series of fifteen regression models that estimate the coefficients for each of the five ill-health measures across the whole population and by gender. Table 1 gives the change in probability of reporting ill-health in percentage terms for each characteristics and then shows when significant associations were only found for one gender (in brackets).

Table 1 shows that at the individual level women are more likely to report ill-health, but only for the least severe measures, being single compared to married reduces risk and that increasing age is clearly linked to increased risk across all the measures. Severe ill health in younger age population is not common and thus significance is lost. At the household level there are clear indications that the presence of a functioning toilet and of tap water reduces risk of ill health as one would expect. Household size and composition appears to have protective effects against ill-health –with the presence of young children and elderly people and large households all reducing risk. However, the presence of someone else ill in the household is associated with a very substantial increase in risk. This is an important finding that we will return to later when estimating impacts. Geographical factors appear to be associated through lower risk in urban areas and higher risk in the southern regions (where climate is more tropical) but only for low level severity ill-health.

The most important finding from these regressions is the clear indication that ill-health is associated with household composition – both in reducing risks by living in larger and multi-generational households but also in the significant clustering of ill-health once it occurs within the household. This latter factor is not explained by a selection effect the elderly who have higher incidence of ill-health who tend to live in households on their own or with other elderly people rather than with their adult children.

This finding has potentially important ramifications for the impact of ill-health on household income and spending and on the design of social protection in response.

The Impact of Ill-health on Income

Vietnam is a developing country and while formal employment with wages is a growing it is still a minority share of economic activity that remains dominated by agriculture and fishing and to a lesser extent by household business trade. However, many Vietnamese adults “multi-task” and have more than one kind of employment mixing waged work with household agricultural or business activity. This approach helps to smooth income flows – especially where there are season fluctuations from agricultural harvests- but also presents us with potential measurement problems when we come to estimate behavioural responses to ill-health and consequential income losses.

Figure 1 shows the proportions of multiple employment activity present in working age Vietnamese and shows that overall around a third of individuals are in waged employment,

and that household level activity makes up the majority of economic activity with one half of all activity in agricultural production and one fifth in trade and business.

When we turn to look at the overlapping activity we see that under a half of waged workers have solely waged employment, around one half of agricultural workers have that as a sole employment and only 42 per cent of those engaged in trade rely on that solely as employment. The informal economy is thus dominant and inextricably mixed with formal waged employment and even where formal employment can be recognised in survey data there is no ability to see if the employer is one of the widespread evaders or avoiders of social insurance – by either paying no contributions or through partial compliance (See World Bank 2008).

Our approach to estimating employment interruption and income loss is to begin at the individual level and look solely at “prime age” workers to see what relationships are apparent between reported ill-health and days and hours of work. For individual waged income we can then estimate a gross income loss from employment associated with ill-health but for household level employment in agriculture and ill health we can only identify hours and days lost and have to move to the household level to establish overall effects on income. We thus look at household level impacts last and given the likelihood of substitution and smoothing behaviour over a year we look across all forms of employment and prioritise estimation of impacts associated with instances of cumulative household ill-health and at the presence of severe ill-health.

How does ill-health affect the likelihood of being employed? Overall employment rates in Vietnam are very high and people with ill-health are likely to continue to be employed, especially in shared household level economic activity. Figure 2 shows the employment rates (single type employment) by our five measures of ill-health for working age people aged 16 to 59. There are clear gradients of employment that decline as ill-health increases in severity across all types of employment but household agricultural employment clearly

is associated with the majority of workers having days off for illness, higher rates even for those that report any ill-health. Selection effects are more likely to affect access to waged employment but *raw* probabilities of being so employed show little observable evidence of this. Our regression analysis of the probability of waged employment due to ill-health and other controls however clearly shows lower probability associated with ill-health and a summary of findings is given in Table 2.

Table 2 shows that ill-health overall has little significant impact on the probability of being in waged employment, with significant associations for women where they have a small increased probability of employment (around 2 per cent) if they suffer any ill-health and a 3.6 per cent reduced probability of being employed if they have a level of ill-health that leads to days in bed requiring care from another person. Our earlier finding of household clustering of ill-health however appears to have no significant impact on the probability of being in waged employment- this may arise from underlying small sample size, but overall the signs of the insignificant variables are positive, suggesting that any effect is a positive one.

Does ill-health have an effect on days and hours of work for those that are in waged employment. We find small effects on days of work, but only for those that report severe ill-health both SEVERE DAY and SEVERE BED measure. However, ill-health has a far more consistent association on hours of work, with all five measures being associated with fewer hours per month. The underlying reasons for this require further consideration and research but it is likely that waged employment is a resource that individuals try to maintain by attendance with lower effort when ill-health strikes. Put simply, turning up to work when suffering from ill-health and working fewer hours is a more rational response than not turning up for a day. However, we are unable to separate the original and adjusted hours and days of employment over the period to establish causality and leave this question for future work.

Does ill-health lead to a wage penalty? Table 3 suggests clear evidence that it does in a summary of regression models estimating such penalties. For those in waged employment there is a clear consistent negative relationship between ill-health at individual and household level and across all levels of ill-health. However, only measures of individual ill-health are statistically significant. Men's wage penalties appear more consistent than women's, but overall wage penalties range from 10 per cent for the low levels of ill-health to 12 and 16 per cent for the more severe measures of ill-health. If male wage penalties are taken separately then they range from 11 to 20 per cent. Once again, we are unable to separate how much of this effect is in selection into employment and thus lower overall wages for those who suffer ill-health verses how much the penalty comes from interruptions from employment.

We repeated our analysis on reductions in individual days and hours of employment for individuals engaged in household level economic activity in agricultural and business activity. Our analysis showed that days work in agriculture rose when there was low level of ill-health, clearly indicating compensatory work to make up lost time, but that more severe levels of ill health led to reductions in days. There was a clear loss of hours across all measures of ill-health in agricultural work. Measurement of days and hours lost in household business and trade were hampered by small sample sizes for incidence of severe-ill health but showed clear losses in both days and hours.

This clear set of results at the individual level however did not necessarily mean that households would necessarily be worse off over the whole year. Other members of the household could substitute for lost days of those that had ill-health. Household structure in Vietnam includes much cross-generational co-residence with elderly parents often living with adult children (and with their children). Migration and economic development are having some impact on these patterns of living together but migrants are often short-term absences from households during which remittances are sent back. However, with such a range of household composition and the prevalence of household level and informal economic activity the ability of households to adapt to the shocks of ill-health are potentially considerable. Figure 3 shows the *proportion* of household members who report ill-health according to the five measure of ill-health. One quarter of households report no single member having any ill-health over the previous 52 weeks. One half, 48 per cent, report having some but less than half of household members reporting ill-health. This means that

28 per cent of households have more than half or all of their members reporting ill-health. Looking across the other measures of ill-health we see that the more severe the measure the less the incidence of majority ill-health. This is perfectly understandable as households would not be viable economic and social entities if the opposite was the case and sample sizes for such few cases are too small to model.

This overview however gives us theoretical parameters with which to estimate household level effects of ill health. The first likely effect of ill-health comes from *cumulative ill-health* where more than one member of the household has ill-health and this affects the productive capacity of the whole household. The second likely effect is through severity of one or more members because this will lead to others in the household having to substitute economic activity for caring.

Cumulative ill-health returns us to the core finding shown in Table 1 that individual incidence of ill-health is significantly raised by others being ill. What potential effect does this have on household income? For our analysis we ignore households that are comprised only of elderly people and concentrate again on the impact on incomes from working age people. To ensure a consistent and comprehensive approach we define income restrictively to “market income” to distinguish the loss from sources of income that may respond to such losses – from state or informal transfers. We test for cumulative effects using an additive approach to working age household members being ill and compare one member being ill to two being ill and more being ill. Each household in VHLSS ascribes a head of household who is most likely to be chosen according to their economic status as chief earner, we thus additionally test cumulative effects on whether it is this head of household who is one of the members reporting ill-health.

Once again, a range of regression models were used to estimate impacts across these parameters using our three most common measures of ill-health (ILL52, DAYSOFF and DAYSBED). Table 4 gives a summary of results that show the percentage change in household income that is associated with the measures of ill-health. If we consider the results for the simplest of specification, cumulating working age members’ ill-health without regard to whether they include the nominated head of household, we see that having more than one member ill on any measure has a significant effect on household income. All household income is reduced by around four per cent for the lowest level of reported ill-health (ILL52) but this rises to over five per cent for the higher levels (DAYSOFF and DAYSBED). Work income is affected to a greater extent, eight per cent loss ILL52 and DAYSOFF and almost ten per cent where more than one member has days in bed requiring care (DAYSBED). There is not a clear set of significant results for the remaining results from this form of specification when we move to comparing ill-health free (no reported ill-health) to the position where two or where three or more report ill-health. Ill-health for two members appears more consistently associated with reductions in work income: of five per cent for ILL52, six per cent for DAYSOFF and ten per cent for DAYSBED. Controlling for the ill-health of the head of household reduces the associated outcome for ILL52 across all specifications and is only seen to reduce work income by five per cent where the head alone reports this level of ill-health. The remaining set of results that employ the head of household control show consistent monotonic rises in penalties in both dimensions of

cumulative ill health of household members and of rising measures of ill-health. Additionally there is a consistent higher loss of income recorded for work income compared to all income. Specifically, this means that when the head of household only reports ill health the effect on work income rises from five per cent (ILL52) to eight per cent (DAYSOFF) to ten per cent (DAYSBED) and all income is associated with a reduction of six per cent (DAYSOFF) rising to nine per cent (DAYSBED).

The effect of others being ill alongside the head of household is associated with higher reductions in income (reading down the columns in Table 4) so that for ILL52 the five per cent reduction in work income increases to six per cent when another person is ill alongside them and increases to nine per cent when a further person is also reported as having this level of ill-health. For the DAYSOFF measure, the associated reduction in work income rises from eight per cent when the head alone reports this level of ill-health to ten per cent when another member and 13 per cent when another two persons report this level of ill-health. For the DAYSBED measure, the associated reduction in work income when the head alone reports ill-health is 10 per cent, rising to 11 per cent when another person also reports and 12.5 per cent when a further one or more persons additionally report. The results for all income mirror these results for work income but with lower reductions.

These results are important evidence in support of cumulative ill-health affecting the whole household and take forward the earlier evidence of clustering of individual ill-health in households in terms of outcome.

However, the results of ill-health at the household level cannot solely be limited to working age people. We were concerned that ill-health of adult members could also lead to decreased enrolment in post-primary education for 11-16 year olds (primary education is compulsory in Vietnam) as evidenced in other developing countries (see Jacoby and Skoufias 1997). Rates of enrolment for older children fall off as they grow older and disproportionately so for poorer families (Evans et al 2007a). We will not report the results from our regression models on probability of post-primary enrolment other than to report that, subject to a full set of controls, we found significant decreases in enrolment where three or more adults suffered from ill-health that led to days off work and/or days in bed requiring care.

We now turn to our second theoretical basis for a household effect – the presence of severe ill health. We limit the analysis to the most “severe” measure of ill-health (SEVERE BED) but do so over the whole sample of households to ensure we maximise incidence and sample size. However, we expand our analysis to look at the effect on three potential effects: income, household work and children’s enrolment in post-primary schooling.

Our substantial efforts to find statistically significant effects were poorly rewarded due to both small numbers but also due to unobserved substitution and adaptation by households to the presence of severe ill-health. However, we do find a small set of results. The first is that hours of waged employment are reduced – but the net effect on hours is very small, one eighth of an hour significant at 99% and this effect is only for women. The second effect is on employment in household trade and business. Here there is a reduction in employment rate for both men and women of between two to three per cent. Turning to look at

potential outcomes on behaviour other than employment we see a statistically significant but very small reduction in the hours of household work for women only, a 0.6 per cent of an hour reduction significant at 95 per cent

But the result of most interest is the effect of severe ill-health on children's post-primary school enrolment. Enrolment rates fall from 85 to 83 per cent overall and fall more for girls, from 84 to 81 per cent and these falls are statistically significant at 95 per cent. However, there is no accompanying statistically significant increase in these children's employment or housework.

All in all our analysis shows clear and fairly consistent evidence of an income shock following on from ill-health in Vietnamese households and that there are both first order impacts in employment and income and also second order effects on school enrolment. We now turn to look briefly at the second form of shock – on household spending

Expenditure Shocks from Ill-health

Our analysis aims at a baseline study to look at shocks and responses separately and in the earlier analysis of income we can separate primary income from “responsive” income from transfers. However, we are unable to do this for expenditure as the costs of healthcare to the household are a direct outcome of both the very small set of state transfers that are awarded to assist in payment of healthcare costs, the provision of “free” healthcare to the poorest households identified by their communes as warranting free access to healthcare and the health care system in general. All healthcare in Vietnam results from a mix of subsidies to providers, user-charges and personal informal and market provision. The outcome of this mixture of provision, charging and personal decisions based on explicit and hidden costs is that spending on healthcare is incredibly skewed. While it is internationally known that demand for health care rises more than proportionately as income rises (McPake, Kumaranayake and Normand 2002) it is also clear that those who have the highest budget constraint, the poor, who are additionally most likely to be deterred by user-charges and other costs of health care (James et al 2006).

Figure 4 shows inequality in Vietnamese health spending in the form of a Lorenz curve, with proportion of population and proportion of all spending as x and y axes respectively. Sixty per cent of the population spend little and account for around 10 per cent of spending, while the top 10 per cent account for 60 per cent of spending. Previous analysis by the authors has shown increased health spending are linked significantly to original income, higher education and overseas remittances (Evans et al 2007a).

Health expenditure however is ubiquitous: only three per cent of households avoid any expenditure on health at all (excluding insurance payments) and the share of spending on health has risen to around 6 per cent overall since 2002 (Glewwe 2005). This means that over one third of households in Vietnam have a health spending shock that is termed as “catastrophic” in the development literature (reference here), at or above 10 per cent of all household spending.

Only a minority of the 97 per cent who spend on health care receive subsidies towards the costs (37 per cent). It is clear that the poor spend relatively small amounts on healthcare and there is reason to believe that the poorest will have different composition of spend to the remainder of the population. We know from Trivedi's analysis (2004) that the poor in 1998 took up self-medication using private pharmacies to avoid the costs (both financial and transaction costs) of formal medical referral. This means that constraints on spending on healthcare are still severe in Vietnam and that the poor are disproportionately disadvantaged. One quarter of the poorest income quintile report being unable to meet the direct out of pocket costs of healthcare and 17 per cent of the second poorest quintile. Only nine per cent of the richest quintile report similarly. It should be remembered that costs are not consistent across the income quintiles in this comparison as the poorest income quintiles are more likely to under-report health costs and to defer and discount such costs.

Our analysis of the relationship between healthcare spending and overall poverty measures through expenditure will be reported in a later paper. Our final analysis of expenditure shock is to test how far the income shocks we have previously identified are associated with spending change. The evidence to date clearly suggest that there may be substitution effects for expenditure. If households have to spend money on healthcare, it may potentially cause them to reduce spending on other important goods, such as food, or education. Thus ill health of one household member may reduce the available budget to the household for other expenditures, if the budget constraint is binding. We test this theory by examining the share of expenditure devoted to health, education, food (and within food, rice), and non-food expenditure (excluding health) drawing on Deaton's earlier analysis (1997). As we only have a single set of cross-sectional data we adopt a reduced-form approach, and examine each expenditure share including only exogenous regressors¹.

Table 5 shows the results from this regression and is expressed solely in positive or negative signs as underlying coefficients are hard to interpret. We find that having controlled for income, it is not significant in the health expenditure equation, but is so for all the other categories of expenditures. Food and rice shares decrease with income (and rice more than proportionately) as one would expect from basic Engels curve assumptions about food expenditure decreasing as income rises. Education and non-food shares increase with income. The effect of having ill-health in the household, shown by the proportion of ill household members, increases the proportion of spending on healthcare significantly as expected. However, most interestingly and relevant to our concerns about substitution effects, it decreases the proportion of spending on all other categories, and it appears to have the strongest effect on education.

¹ The econometric specification of this analysis is complex. Income is instrumented simply with the income quintile that each household falls into in 2004. Household composition and region are used as controls. The estimation approach is a generalized linear model to show the weight of proportion of expenditures allocated to each expenditure category. We use a series of variables to proxy for ill health for each expenditure category to evaluate the effect on the balance of expenditure. We include the proportion of household members who reported that they had been ill in the last 52 weeks as a household level variable that can weight expenditure against other

We can thus tentatively conclude, within the limitations of the data, that there is likely substitution between health spending and other spending. Further exploration of this and related questions would be worthwhile for future research, especially if policy inputs into the household (such as health insurance) are assessed in their relation to potential substitution effects.

Discussion and Conclusions

Our analysis in this paper has sought to draw a range of baseline results to show that ill-health in Vietnam can be clearly associated with both income and expenditure shocks. Our approach has been to set the agenda for a continuing set of analysis that will take forward and more rigorously test both the incidence, consequences of and responses to ill-health using better specified data from 2006 VHLSS and the panel data between this and the 2004 survey.

We must also, late in the paper, draw in some of the motivations for our analysis – the expansion and reform of social protection in Vietnam. The latest changes to social protection law have hugely expanded access to healthcare, mostly from new voluntary health insurance. Our future analysis will therefore be able to compare our findings before and after this introduction. Evidence clearly shows that selective uptake of voluntary health insurance is leading to problems of funding and coverage. Healthcare funding mechanisms in Vietnam have not adapted sufficiently to ensure sufficient referral from primary healthcare gatekeepers and providers have incentives to over-provide, especially in access to diagnostic tests. In the meantime, those subsidies that are targeted at the poor have been found to give them no greater protection against high levels of out of pocket expenses (Wagstaff 2007). Our early and tentative findings are thus the start of an important analysis and re-think of how the response to ill-health in Vietnam will develop.

Recent changes to health insurance are opening up individual cover to household cover and access and our findings on the clustering of ill-health in the household suggest that this response is well-founded.

At the individual level we identified clear evidence that ill-health was associated with reduced activity in primary economic production. There were clear significant associations between lower days, and more consistently, lower hours of work for those suffering from ill-health. There was also a clear associated reduction in waged income from employment for those who reported ill-health and had waged employment that is currently covered by compulsory social insurance for income replacement through sickness benefits those in formal waged employment. However, we additionally show that activity is lost in household level economic activity where no formal social security is available to provide income replacement. Voluntary insurance for healthcare costs will not provide income replacement benefits for this group. But how far should social protection step in to potentially nullify the adaptation and substitution of labour within household enterprises?

We have found clear evidence of cumulative effects of ill-health in households where more than one person was affected by ill-health. There was a clear association between

increasing numbers of members being ill and between levels of cumulative ill-health according to severity and lower income from economic activity. Additionally, we found evidence of an effect on school enrolment where high numbers of potential household earners reported ill-health. This means that responding to health by Vietnamese social protection has to ensure that education subsidies can be triggered to neutralise the effect of adult ill-health on children's education. The threat to education was confirmed through our analysis of expenditure where strong evidence was found that that spending on health did substitute for spending on education.

There is still much to do both in terms of analysis and in development and review of social protection in Vietnam. Our next steps are to take forward these findings to 2006 data that has been released in Sprint of 2008. The Vietnamese Government is trying several new financial models for healthcare provision and future health insurance and sickness benefits will be remodelled to ensure that responses reflect the nature of the double shock of ill-health on income and expenditure. In fifteen years Vietnam wants to join the "middle income" countries of the world and to do so with a comprehensive system of social protection.

Table 1: Individual Probability of Reporting Ill-Health: Summary of Regression Models

| % marginal probability | <u>Measure A</u> | <u>Measure B</u> | <u>Measure C</u> | <u>Measure D</u> | <u>Measure E</u> |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <i>For population aged 13 and over.</i> | <i>ILL52</i> | <i>DAYSOFF</i> | <i>DAYSBED</i> | <i>SEVERE DAYS</i> | <i>SEVERE BED</i> |
| Individual Level Factors | | | | | |
| Gender – being Female | +8.6 | +6.1 | +2.2 | <i>n.s.</i> | <i>n.s.</i> |
| Single (verses married) | -11.5 | -7.6 | -5.3 | -1.6 | -1.6 |
| Divorced (verses married) | -7.2** | <i>n.s.</i> | -3.4** | <i>n.s.</i> | <i>n.s.</i> |
| Age compared to 21-30 year olds (younger ages 13- 20 consistently non significantly different and are omitted from table) | | | | | |
| 31-40 | +4.0 | +4.8 | (+4.8M) | (+2.3 M) | (+2.3 M) |
| 41-50 | +10.8 | +8.9 | — | +0.9** | +0.9** |
| 51-60 | +21.6 | +17.9 | +3.3 | +2.5 | +2.5 |
| 61-70 | +35.7 | +30.9 | +10.3 | +4.8 | +4.8 |
| 71-80 | +37.5 | +30.3 | +15.2 | +8.7 | +8.7 |
| 81and over | +38.1 | +24.8 | +21.6 | +13.1 | +13.1 |
| Household Factors | | | | | |
| Ethnic Minority | -2.6 ** | (+1.0 ** W) | <i>n.s.</i> | -0.7** | -1.0** |
| Tap water present. | (-3.5** W) | -1.7** | -1.1** men | (-0.7** M) | (-1.2 W) |
| W.C. or Earth Closet Toilet in House | -2.8 | -2.8 | -1.3 | -0.7 | -0.9 |
| Presence of Elderly over 60 | -4.7 | -4.2 | -1.2** | <i>n.s.</i> | <i>n.s.</i> |
| Presence of children under 5 | -2.8 | <i>n.s.</i> | <i>n.s.</i> | -0.7*** | -0.8** |
| Large household | -9.1 | -6.8 | -1.1** | <i>n.s.</i> | <i>n.s.</i> |
| Three generations present | -4.4 | -3.7 | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| Waged employment present In Household | +1.8 | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| Others ill in household | +35.9 | +36.4 | +19.3 | +22.2 | +16.7 |
| Locational Factors | | | | | |

| | | | | | |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Urban | -2.8** | -2.7 | -1.3 | n.s. | n.s. |
| Region – compared to Red River Delta | | | | | |
| <i>North Eastern Mountain</i> | -2.8** | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| <i>North Western Mountain</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| <i>North Central Coast</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | +0.9** | +1.2** |
| <i>South Central Coast</i> | +4.5 | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| <i>Central Highlands</i> | +14.3 | +9.4 | +2.9 | <i>n.s.</i> | <i>n.s.</i> |
| <i>South East</i> | +14.4 | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> |
| <i>Mekong Delta</i> | +11.5 | <i>n.s.</i> | <i>n.s.</i> | <i>n.s.</i> | +3.7 |

Source: Authors' calculations from VHLSS 2004.

Notes: All Significance at 99%, except where ** shown at 95%

"M" denotes men, "W " denotes women

() association only found for gender given in brackets

n.s. non significant control

Full sets of controls can be found in Evans, Harkness and Porter 2008

Table 2
The Net Outcome of Ill-health on Probability of Waged Employment
(summary of regression results)

| Marginal Probability | Men | Women |
|--|--------|----------|
| ILL52 | | |
| <i>Individual Ill-health</i> | -1.08% | 1.98%** |
| <i>Others Ill in Household</i> | 2.33% | 1.86% |
| ANYDAYS | | |
| <i>Individual Ill-health</i> | -0.46% | 1.73% |
| <i>Others Ill in Household</i> | 2.28% | 1.87% |
| ANYBED | | |
| <i>Individual Ill-health</i> | -0.50% | -3.62%** |
| <i>Others Ill in Household</i> | 2.35% | 2.11% |
| SEVERE DAYS | | |
| <i>Individual Ill-health</i> | -3.02% | -2.46% |
| <i>Others Ill in Household</i> | 2.39% | 2.05% |
| SEVERE BED | | |
| <i>Individual Ill-health</i> | -2.27% | -4.05% |
| <i>Others Ill in Household</i> | 2.38% | 2.22% |
| Other Control variables: <i>Marital status, age, post secondary education, literacy, ethnic minority status, urban/rural location, region, presence of children in household, presence of children under 5 in household, presence of elderly in household, household size.</i> | | |

Source: Authors' calculations from VHLSS 2004

Note: *** significant at 99%, ** significant at 95%

Full models reported in Evans, Harkness and Porter 2008..

Table 3
Annual Waged Earnings Lost by Measures of Ill-health
(Summary of regression models)

| % of earnings lost | All | Men | Women |
|--|-----------|-----------|------------|
| ILL52 | | | |
| <i>Individual Ill-health</i> | -9.7%*** | -10.9%*** | -7.96% |
| <i>Others Ill in Household</i> | -5.04% | -5.10% | -5.22% |
| ANYDAYS | | | |
| <i>Individual Ill-health</i> | -10.0%*** | -8.3%*** | -12.05%*** |
| <i>Others Ill in Household</i> | -5.10% | -5.53% | -5.03% |
| ANYBED | | | |
| <i>Individual Ill-health</i> | -12.6%*** | -13.8%*** | -9.87% |
| <i>Others Ill in Household</i> | -4.51% | -4.98% | -4.22% |
| SEVERE DAYS | | | |
| <i>Individual Ill-health</i> | -15.8%*** | -20.1%*** | -7.91% |
| <i>Others Ill in Household</i> | -4.76% | -5.35% | -4.52% |
| SEVERE BED | | | |
| <i>Individual Ill-health</i> | -11.9%*** | -14.2%** | -8.44% |
| <i>Others Ill in Household</i> | -4.83% | -5.45% | -4.41% |
| Other Control variables: <i>Marital status, age, occupation, post secondary education, literacy, ethnic minority status, urban/rural location, region, presence of children in household, presence of children under 5 in household, presence of elderly in household, household size.</i> | | | |

Source: Authors' calculations from VHLSS

Note: *** significant at 99%, ** significant at 95%

Full models reported in Evans, Harkness and Porter 2008

Table 4
The Outcome of Ill-health of Working Age Members on Household Income
(Summary of Models)

| % reduction in annual per-capita income | ILL52 | | DAYSOFF | | DAYSBED | |
|---|------------|-------------|------------|-------------|------------|-------------|
| | All Income | Work Income | All Income | Work Income | All Income | Work Income |
| Models with no Head of Household Specified | | | | | | |
| >1 working age member | -3.8*** | -7.9*** | -5.4*** | -8.4*** | -5.5*** | -9.8*** |
| 2 ill compared to none | n.s. | -5.3*** | -4.0** | -5.7** | n.s. | -10*** |
| >=3 ill compared to none | n.s. | n.s. | -0.1** | n.s. | n.s. | n.s. |
| Models with Head of Household Specified | | | | | | |
| Hoh only | n.s. | -5.0*** | -5.1*** | -7.7*** | -7.4*** | -10.0*** |
| Hoh and 1 | n.s. | n.s. | -6.3*** | -9.7*** | -8.8*** | -11.0*** |
| Hoh and 2 or more | n.s. | n.s. | -8.7*** | -12.6*** | -9.6*** | -12.5*** |
| Controls | | | | | | |
| Head of household: <i>gender, post secondary education, literacy, employment activity, aged over 60, marital status</i> | | | | | | |
| Household: <i>presence of other aged over 60, number of children, presence of children aged less than 5, overall size, ethnicity, urban-rural, region</i> | | | | | | |

Source: Authors' calculations from VHLSS 2004 -

Notes: n.s. = not significant; ** significant at 95%, *** significant at 99%

All Households with Working Age members

Full specification and diagnostics given in Evans, Harkness and Porter 2008.

Table 5
Determinants of expenditure shares

| | Health | Food | Non-Food | Education | Rice |
|--|--------|-------|----------|-----------|-------|
| Income- compared to Poorest Quintile | | | | | |
| Quintile 2 | n.s. | -ve** | +ve** | +ve** | -ve** |
| Quintile 3 | n.s. | -ve** | +ve** | +ve** | -ve** |
| Quintile 4 | n.s. | -ve** | +ve** | +ve** | -ve** |
| Quintile 5 | n.s. | -ve** | +ve** | +ve** | -ve** |
| Proportion of household members reporting ill-health | +ve** | -ve** | -ve** | -ve** | -ve** |
| Ethnic minority | -ve** | +ve** | -ve** | -ve** | +ve** |
| Urban | +ve** | +ve** | -ve** | -ve** | +ve** |

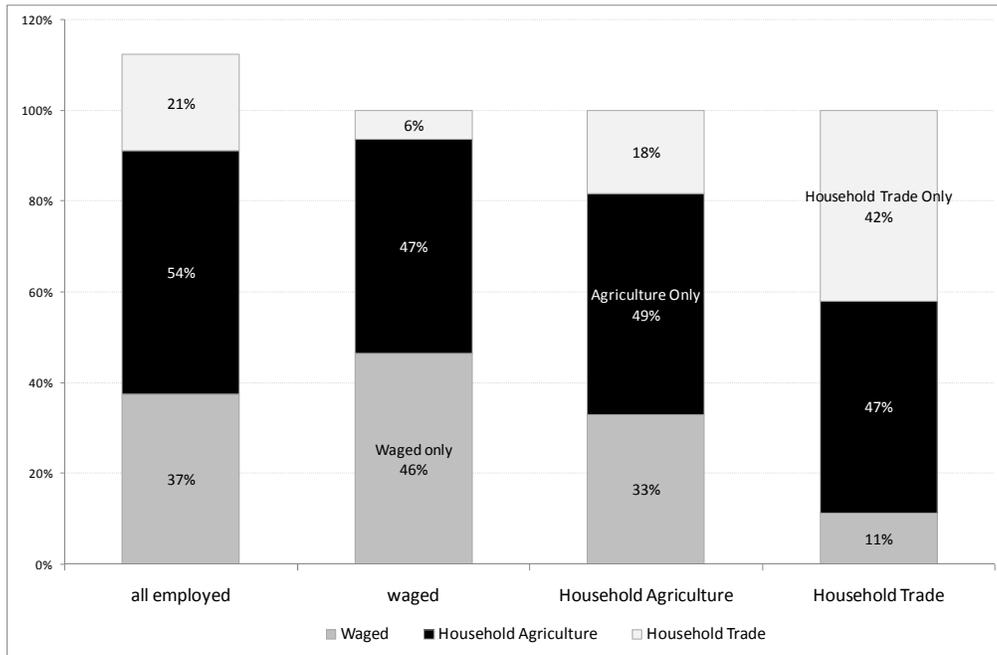
Source: Authors' calculations from VHLSS 2004

Notes: GLM estimates, robust standard errors.

Models all included controls for household composition and regional variation,
 **significant at >95%.

Figure 1

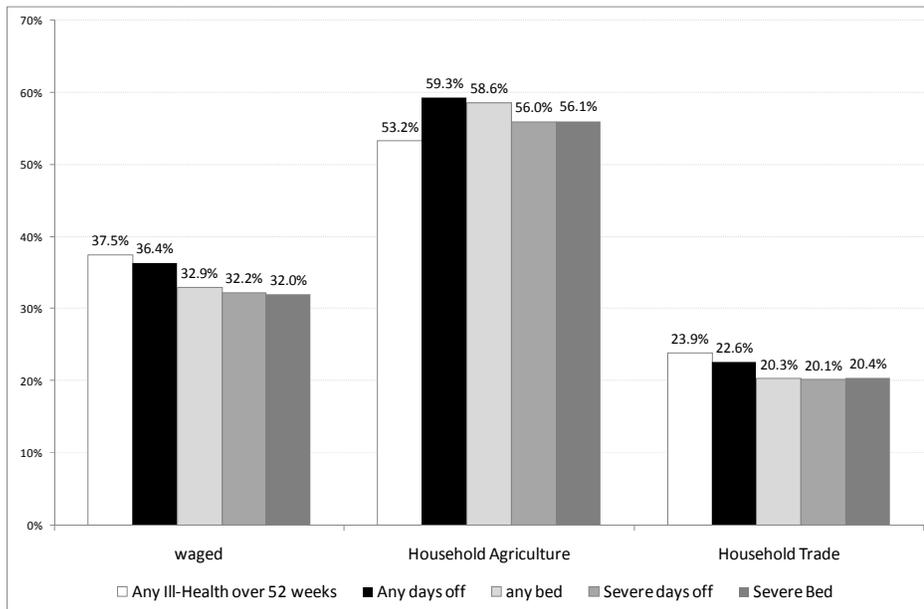
Employment and Multiple Employment in Vietnamese Working Age Individuals



Source: Authors' calculations from VHLSS 2004.

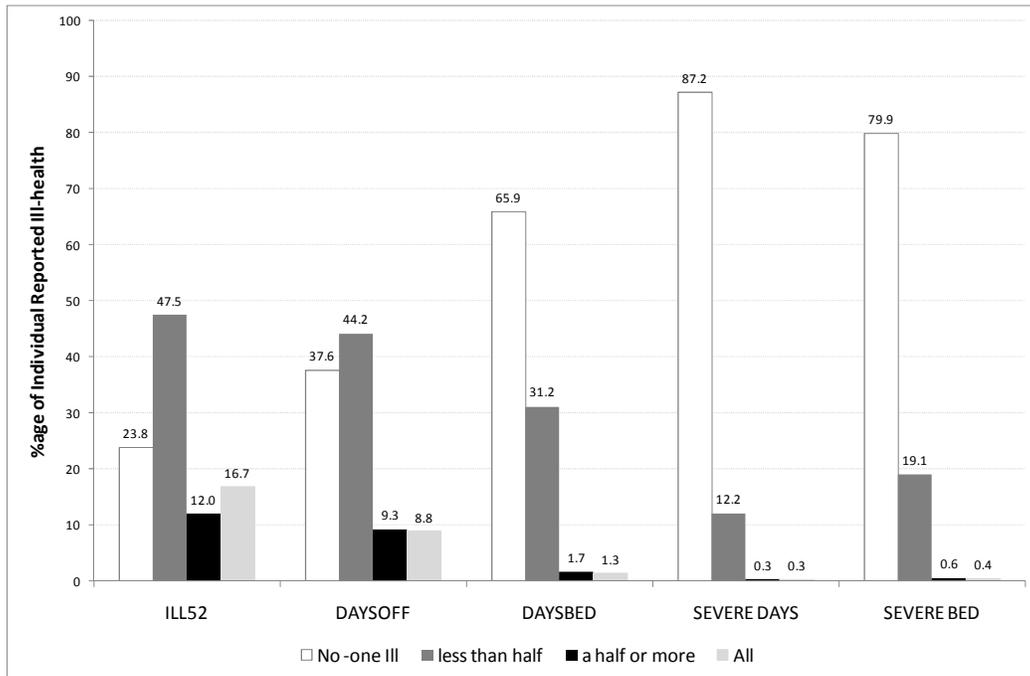
Figure 2

Rates of Employment by Incidence of Ill-health



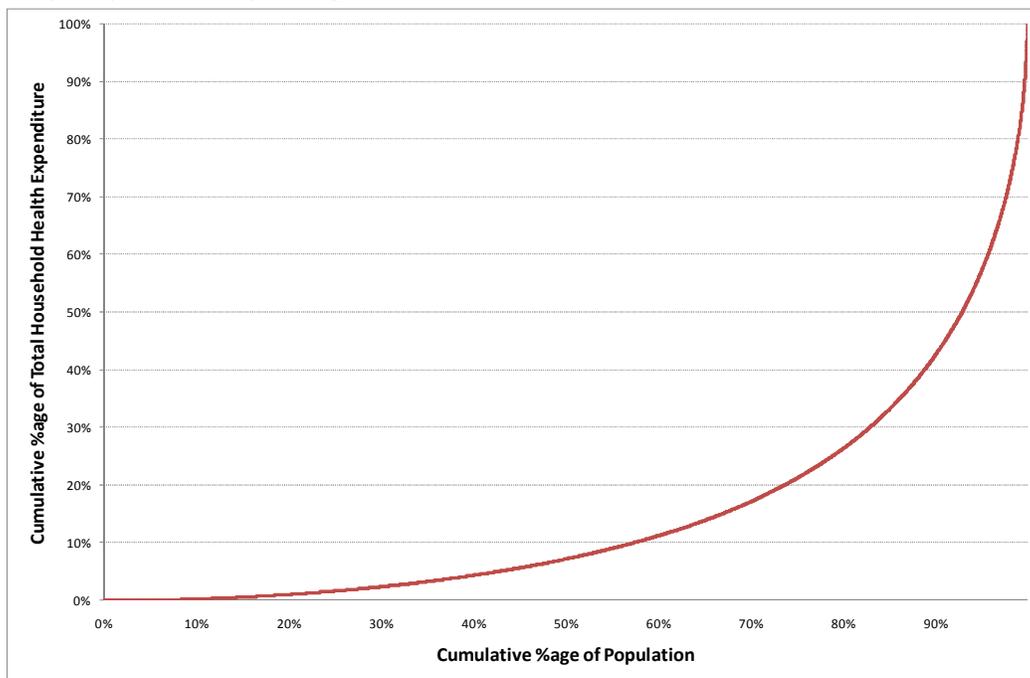
Source: Authors' calculations from VHLSS

Figure 3
Proportion of Household Members Reporting Ill-health



Source: Authors' calculations from VHLSS

Figure 4
Inequality in Health Spending



Source: Authors' calculations from VHLSS 2004

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