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Socio-Economic Effects of Malaria on Households' Consumption in North-Central Nigeria

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***Abstract**: The study was an analysis of the effects of malaria on households' consumption in North-Central Nigeria. This was with the view to determine the effects of malaria shocks on household consumption and the adjustment strategies households adopt to smooth consumption when a member is down with malaria. A multistage sampling technique was used to collect data from 600 houses affected with malaria in North-Central Nigeria. Descriptive statistics and household expenditure models were used for the analysis. Households affected with malaria ate fewer meals per day compared to past days of no malaria illness. It was found that only 39.0% of the households in the study area had three meals per day during the period of malaria attack compared to 61.7% before malaria attack. Households adopted different strategies to cope with the malaria attack. These include: sale of their food reserves (18.3%) and household assets (17.0%), borrowing from money lenders (15.7%) and friends (7.0%), receipts of gifts (15.0%), reduction in household consumption of other goods (12.0%) and working for extra hours. The household expenditure models revealed a negative relationship between malaria attack and food expenditure (-0.072), education expenditure (-3.174) and housing expenditure (-0.089). The study revealed a positive relationship between health consumption of affected households and household income (0.052), borrowing (0.432), sale of assets (0.057) and de-saving (0.024). The test of hypothesis at 5% level of significance revealed that the adjustments strategies adopted by households affected with malaria in the study area significantly smooth household consumption. It was recommended that micro-credit organizations have an insurance role to play in mitigating the effects of malaria on households' consumption and production. In the short-run, micro-credit helps insure consumption. In the long-run the change in the value of livestock in response to malaria shocks is lower in households with access to micro-credit and thus insurance does not come at the cost of production efficiency.*
***Keywords:** consumption, effects, households, malaria, Nigeria, North-Central, Socio-economic.*

I. Introduction

One of the biggest shocks to economic opportunities faced by households is major illness to members of the households. Malaria illness has significant adverse effects on households' production and consumption, labour supply and income generation. It affects not only household food consumption, cropping patterns, livestock production, labour-time allocation and access to productive assets, but also children's education, access to consumption of goods and services essential for household maintenance and reproduction (Laxminarayan, 2004). Coping strategies are vitally important for poor households faced with illness shocks, since the costs associated with serious illness such as malaria can absorb a large proportion of the household budget and therefore require the mobilization of substantial additional resources (Yu and Wilkes, 1998; Russell, 2004). Ability to cope with the high costs of serious illness such as malaria is therefore essential for the health and livelihood of poor households (Worall et al., 2005). While health shocks can have adverse consequences for households in both developed and developing countries, they are likely to have a particularly severe effects on households in the latter, because these households are typically unable to access formal insurance markets to help insure consumption against such shocks (Wagstaff, 2007).

The literature on the effects of malaria shocks on household outcomes in developing countries is quite large and the results are mixed. Townsend (1994), Kochar (1995) and Skowfias and Quisumbing (2005) found that illness shocks are fairly well insured. Cochrane (1991), Dercon and Krishnan (2000), Gertler and Gruber (2002), Asfaw and Braun (2004), Wagstaff (2007), Beegle et al., (2008) however found that illness shocks have a negative and statistically significant effect on consumption or income. Udry (1990), Rosenzweig and Wolpin (1993), Besley (1995), Fafchamps et al. (1998), Jalan and Ravallion (1999) and Gertler and Gruber (2002) all reached essentially the same conclusion: wealthier households are better able to insure against shocks in general and health/illness shocks in particular. This implies that financial institutions could have an important role to play in insuring consumption against income shocks. Unfortunately commercial financial institutions in developing countries such as Nigeria are more often than not, weak and do not adequately service the poor.

In North-Central Nigeria, households have developed various strategies to cope with the adverse health-related shocks. However, these strategies have not been adequately studied. Such studies are needed to

identify interventions that complement households own strategies so that they are more effective with efficient in managing health related shocks.

This study's specific objectives are to determine the effects of malaria shocks on households' consumption and the adjustment strategies households adopt to smooth consumption when a member is down with malaria in North Central Nigeria.

II. Methodology

The study was conducted in North-Central Nigeria. It is one of the six geo-political zones of Nigeria. The zone comprises Benue State, Kogi State, Kwara State, Plateau State, Nasarawa State, Niger State and the Federal Capital Territory. The zone is known as Middle-Belt of Nigeria and has a population of 20,266,257 and spans an area of 226,411 km^2 (87,419mi^2) (NPC, 2014 estimate). Nigeria is located between latitude 4^0N and 14^0N of the Equator and longitudes 3^0E and 15^0E of the Greenwich Meridian. With a landmass of 923,678 square kilometers, Nigeria is the fourth largest country in West Africa after Niger, Mali and Mauritania in terms of landmass. With the population of 177,096,000 (2014 estimated population), Nigeria is the most populous country in Africa. The zone has a mean temperature range of 24^0C in October to about 37^0C in March while rainfall varies from 12.5mm in some places to 140mm in other places. Alluvial soils are found along the Niger and Benue troughs and their flood plains. Agriculture is the dominant economic activity in terms of employment and linkages with the rest of the economy. Roughly 75 percent of the zone's land is arable, of which about 40 percent is cultivated. Despite two major rivers: the Niger and Benue, agriculture is predominantly rain-fed. Yam, cassava, rice, maize, sorghum and millet constitute the main food crops. The export crops are sesame, groundnuts, soyabeans etc. The zone can boast of a great deal of livestock resources like goats, poultry, sheep, pigs and cattle.

The population for this study consisted of all; households affected with malaria in North-Central Nigeria. Purposive sampling technique was used to select three States namely: Benue, Kogi and Nasarawa States due to their level of malaria prevalence, proximity and accessibility, and high intensity of farming activities. Simple random sampling and stratified random sampling techniques were used in selecting a sample size of 600 respondents from the three States: Benue State having 270 respondents, Kogi Sate and Nasarawa State with 210 and 120 respondents respectively.

Data for this study were collected from both primary and secondary sources. The primary data for the study were generated from the households affected with malaria in Benue State, Kogi State and Nasarawa State using a well structured questionnaire. The questionnaire was administered with the assistance of community health workers and extension workers in the various communities of the States. The secondary data were collected from National Health Insurance Scheme, the Federal Ministry of Health, the State Ministry of Health (Benue, Kogi and Nasarawa States), National Bureau of Statistics (NBS), and published data from the World Bank and Roll Back Malaria (RBM).

The data collected for this study was analysed using both descriptive and inferential statistics. The descriptive statistics such as mean, frequency and percentages was employed to analyse the effects of malaria shocks on households' consumption and household expenditure models were used to determine the adjustment strategies households adopt to smooth consumption when a member is down with malaria in North Central Nigeria.

Household Expenditure Model

To estimate the effects of illness (malaria) shock on household consumption, five models were constructed. The dependent variables in the five models include: logarithm of total expenditure, logarithm of expenditure on food, logarithm of expenditure on education, logarithm of expenditure on housing and the logarithm of expenditure on health. The transformation of the variables into logarithms was applied for two reasons. First, to control for heteroskedasticity, and secondly to acknowledge that marginal utility of income is assumed to be non-linear. Given that the dependent variable, expenditure, is expressed in logarithmic form, the coefficients give the proportionate effects of each explanatory variable.

Using household expenditures on food, housing, education and other items as dependent variables, a test of full consumption smoothing in response to health shock was conducted. The health shock variable entered the regressions as a dummy variable. The household level variables in the model were household size, the level of education of the household head; while spending on health, food, education, housing, others were used as dependent variables in separate regressions.

Thus the following models were developed for education, food, housing, others.

Education Consumption Model

Edu = f(TY, LnHShock, LE, HS)

Where: Edu = spending on education
TY = total income of the household
LnHShock = Log of total expenditure incurred as a result of the health shock
LE = level of education of the household head
HS = Household size.

The specific form of the model becomes:

$Edu = \alpha_0 + \alpha_1 TY + \alpha_2 LnHShock + \alpha_3 LE + \alpha_4 HS + U_1$

On a priori grounds, α_1 and $\alpha_3 > 0$ while α_2 and $\alpha_4 < 0$.

Food Consumption Model

FD = f(TY, LnHShock, HS, LE, PF)

Where: FD = spending on food
TY = total income of the household
LnHShock = Log of total expenditure incurred as a result of the health shock
HS = Household size
LE = level of education of the household head
PF = Prices of food items consumed.

The specific form of the model becomes:

$FD = \beta_0 + \beta_1 TY + \beta_2 LnHShock + \beta_3 HS + \beta_4 LE + \beta_5 PF + U_2$

On a priori grounds, $\beta_1 > 0$, β_2, β_3, $\beta_5 < 0$ $\beta_4 > 0$.

Housing Consumption Model

HSG = f(TY, LnHShock, LE, HS, PB)

Where: HSG = Housing expenditure
LnHShock = Log of total expenditure incurred as a result of the health shock
LE = level of education of the household head
HS = Household size
PB = Prices of household items other than food.
The specific form of the model becomes:
HSG = Δ0 + Δ1TY + Δ2LnHShock + Δ3LE + Δ4HS + Δ5PB + U3

On a priori grounds, Δ1 and Δ3 > 0 while Δ2, Δ4 and Δ5 < 0.

Consumption Smoothing Model

The Engel's curve explored mechanisms employed by households for smoothing consumption. An Engel curve explains the relationship between expenditure on a particular good and the total income or expenditure, holding prices constant. This analysis estimated Engel curves in the general Working-Lesser form:

$W_{ih} = K_{ih} + M_{ih} \log x_h$

Where: W_{ih} is the expenditure share of good I for household h, x_h is total expenditure, and K_{ih} and M_{ih} are parameters to be estimated. The system contains four equations corresponding to expenditure share (excluding out of pocket spendings) of food, education, house and other. A typical equation can be specified as follows:

$S_{ih} = K_{ih} + M_i \log(TY_h) + C_h + X_h + U_1$

Where S_{ih} is the expenditure share of good i for household h, TY_h is the total income of household h, C is the set of coping strategy dummy variables (DESAVE, BORROW, SALE, OTHER), X is the set of socio-economic and demographic controls, and U is a random error term.

Health Consumption Model

The health consumption model was used to estimate the coping strategies of consumption smoothing:

$C_i = K_0 + K_1 TY_h + K_2 DESAV + K_3 BOR + K_4 SAL + K_5 OTHER + K_6 LE + K_7 HS + K_8 SH + K_9 AH + U_2$

A priori expectation, $K_1, K_2, K_3, \ldots K_9 > 0$

Where: C_i = log of consumption, showing change on consumption level of commodity i (in this case health) of the ith household affected by the health shock (malaria).
TY = total income
DESAV = desaving in naira
BOR = Amount borrowed in naira
SAL = sale of assets in naira

OTHER = Other strategies for consumption smoothing.
LE = level of education of household head
HS = Household size
AH = Age of household head
SH = Sex of household head
K_i = Parameters to be estimated
U_2 = Random error term.

III. Results And Discussion

Impact of malaria illness on household food consumption pattern

Malaria is alluded to affect household's food consumption patterns. This study investigated the number of meals that were consumed by households affected with malaria illness. Table 1 show that the affected households ate fewer meals per day compared to past days of no malaria illness. Only 35 percent of affected households in Kogi State had 3 meals per day compared to 44 percent of affected households in Benue State and 38 percent of affected households in Nasarawa State.

Approximately 52 percent of the affected households in Kogi State had 2 meals per day while 13.5 percent had only one meal per day. Approximately 46 percent of the affected households in Benue State had 2 meals per day while 10.5 percent had only one meal per day. In the case of Nasarawa State, 56 percent of the affected households had 2 meals per day while 6 percent had only one meal per day.

The households which indicated that they could not have the normal 3 meals per day complained of insufficient food stock. Hence reducing the number of meals per day and changing the time of the first meal of the day were coping strategies adopted by the households in the face of food shortages occasioned by malaria attack. Further probing revealed that the households that were taking 2 meals per day usually had their breakfast mid morning, skipped lunch and took dinner in the evening. This finding agrees with Yu and Wilkes (1998) that households reduced consumption level as a coping strategy to health risk (malaria attack).

The feeding expenditure model

Table 2 showed the results of the feeding expenditure model. The $\overline{R^2}$ of 0.683 suggested that about 68.3% variation in the dependent variable was explained by the independent variables. The total income (TY) of the household appeared with a positive sign, indicating a positive relationship with the feeding expenditure of the households. This implies that a 1% increase in total income of the household will lead to about 0.063% increase in the feeding expenditure of the households.

The health shock variable appeared with a negative sign, signifying an inverse relationship between the health shock and the feeding expenditure as well as feeding pattern of the households, and is statistically different from zero at 1% level of significance. This implies that once a household is infected with malaria, the feeding expenditure reduces. A reduction in feeding expenditure presupposes a reduction in the quantity and/or quality of food as well as the number of meals/day consumed by the households.

Thus, based on the estimates of the model, one percent increase in the health shock will lead to a 0.072% reduction in the quantity of food consumed in the affected household. The household size (HS) appeared with the right sign (positive sign) in line with the a priori expectation and was statistically significant at 10% level of significance. This implies that one percent increase in the size of the household will increase the feeding expenditure of the household by 0.134%. Prices of food items consumed (PF) was observed to have a negative relationship with the feeding expenditure. As the prices of food items consumed rises by one percent, the household feeding expenditure declined by 0.43%.

Coping strategies adopted by households to cope with malaria illness

Table 3 shows the percentage of households adopting particular strategies to cope with malaria illness in the study area. The most frequently used coping strategies by households affected with malaria in the study area were: selling of their reserves (18.3%), selling of household assets (17.0%), borrowing from money lenders (15.7%) and receiving gifts (15.0%).

This finding agrees with Jiang and Braun (2005) that household strategies in coping with ill-health risk (malaria attack) include: using cash and savings, selling livestock, selling other assets, changing productive activities, borrowing from friends and relatives, borrowing from money lender, receiving in-kind help from friends and relatives, delaying payment to private health care providers; being exempted from medical fees, receiving support from children, receiving reimbursement from medical schemes and receiving social relief. Variations between households could be based on differences in asset base, educational level as well as gender and age of the head of the household.

Effects of malaria illness shocks on households' health consumption (health consumption model)

The health consumption model was estimated to analyse the effect of malaria illness shocks on household health consumption. Table 4 revealed the R^2 of 0.724 which showed that 72.4% variation in the log of consumption on health was accounted for by the predictor variables. The high F-statistics of 21.382 meant that regression line made a good fit.

The total income of the households had a positive association with the health expenditure. This implied that a one percent increase in the income of the households, the expenditure on health will increase by 0.052%. Also the amount of money desaved by households when faced with health shocks was positively related with the expenditure on health. This implies that a one percent increase in the amount desaved when faced with health shock by households will bring about 0.024% increases in the households expenditure on health. The result further revealed a positive association between the amount borrowed by households from friends, relatives, self help groups, financial institutions and money lenders in the presence of health shocks and the expenditure on health. This implies that a one percent increase in the amount borrowed from such sources when faced with the health shock will lead to about 0.432% increase in the expenditure on health of such households.

Other sources such as assistance from friends and relatives in the presence of health shock which entered the model as dummies were found to have a direct relationship with the health expenditure. This suggests that a one percent change in such sources will lead to a corresponding change in the health expenditure of households by 0.026%. The estimates of the model depicted a positive association between the sale of households' assets and reserves when faced with health shock and the expenditure on health of such households. The implication is that if households increase the sale of assets and reserves in the presence of health shock by one percent, the expenditure on health of such households will correspondingly increase by 0.057%.

Other socio-economic characteristics such as the household size and the age of the households showed a positive relationship with health expenditure of households faced with health shock. The implication of such association is that an increase in household size by one percent will lead to 1.2% increase in the health expenditure of the affected households.

Thus, the older a household head is, the higher the tendency of such a house head to explore ways to finance the health expenditure of the households when beset with any form of health shock. These findings are in consonance with Holzman and Jorgensen (2000) who proposed a framework highlighting a social risk management matrix which outlined three types of strategies that households employ to cope with adverse shocks: prevention strategies, mitigation strategies and coping strategies.

Effects of malaria illness shocks on households' education (education expenditure model)

Table 5 showed the result of the education expenditure model. The R^2 of 0.708 suggested that a 70.8% variation in the dependent variable (education) was explained by the explanatory variables. Total income of the household (TY) was positively related to the households expenditure on education and was statistically different from zero. This implies that every one percent increase in the household's income will lead to about 0.066% increase in the household's expenditure on education.

The health shock variable (LnSHOCK) was observed to have a negative relationship with the expenditure on education of the households observed in the study; and the health shock variable was also statistically significant at 5% level. This implies that in event of ailment of the households, the expenditure on education of the households will decline by 3.174%.

The level of education of the household head (LE) and the household size (HS) did not meet the a priori expectations and were not statistically significant. The F-statistic value of 5.458 showed that the regression line made a good fit (F-statistic computed [5.458] > F-tabulated [2.37] at 5% level of significance).

Effects of malaria illness shocks on households' housing expenditure (housing expenditure model)

Table 6 showed the result of the housing expenditure model. The R^2 of 0.693 revealed that 69.3% of variation in housing expenditure was explained by the explanatory variables of the model. The total income (TY) of the household showed a positive relationship with the housing expenditure.

The health shock variable's negative sign implies an inverse relationship with housing expenditure and was statistically significant from zero at five percent level of significance. This suggests that a one percent increase in malaria infection will lead to about 0.089% reduction in the households' expenditure on housing items.

The household size was positively related with the housing expenditure of households. This implies that as the number of persons in the households increases the expenditure on housing items will also increase. Prices of housing items had a negative relationship with the housing expenditure but were not statistically significant.

Poorer households with small reserves had fewer choices. Relatively well-to-do households had more produce and plant materials to store, more livestock, more savings and other sources of income than poorer households. Selling off part of these goods did not drastically affect next season's farming operations. However, even though next year's cropping season was not in danger, the coping strategies reduced their capacity to invest and spend on future projects.

IV. Conclusion And Recommendation

The result of this study revealed that only 39.0% of the households in the study area had three meals per day during the period of malaria attack compared to 61.7% before malaria attack.

Households adopted different strategies to cope with the malaria attack. These include: sale of their food reserves (18.3%) and household assets (17.0%), borrowing from money lenders (15.7%) and friends (7.0%), receipts of gifts (15.0%), reduction in household consumption of their goods (12.0%) and working for extra hours. The household expenditure models revealed a negative relationship between malaria attack and food expenditure (-0.072), education expenditure (-3.174) and household expenditure (-0.089). The study revealed a positive relationship between health consumption of affected households and household income (0.052), borrowing (0.432), sale of assets (0.057) and de-saving (0.024). The test of hypothesis at 5% level of significance revealed that the adjustments strategies adopted by households affected with malaria in the study area significantly smooth household consumption. It was recommended that micro-credit organizations have an insurance role to play in mitigating the effects of malaria on households' consumption and production. In the short-run, micro-credit helps insure consumption. In the long-run the change in the value of livestock in response to malaria shocks is lower in households with access to micro-credit and thus insurance does not come at the cost of production efficiency.

Table 1: Number Of Meals Eaten Per Day By The Sampled Households Before And During Malaria Attack (In Percentage)

No. of meal/day	Benue State		Kogi State		Nasarawa State		Combined Sample	
	Before Attack	During Attack	Before Attack	During Attack	Before Attack	During Attack	Before Attack	During Attack
1	0.0	10.5	0.0	13.5	0.0	6.0	0.0	10.0
2	32.5	45.5	42.5	51.5	40.0	56.0	38.3	51.0
3	67.5	44.0	57.5	35.0	60.0	38.0	61.7	39.0

Source: Field Survey (2013).

Table 2: Results Of The Feeding Expenditure Model

Variable	Coefficient (β)	t-statistic
Constant	7867.837	1.783
TY	0.063	1.528
In SHOCK	-0.072	-7.513 ***
LE	-0.010	-1.926
HS	0.134	1.838 **
PF	-0.043	1.577

*** 1% level of significance ** significance at 10% level

$\bar{R}^2$ = 0.683 and F-Statistic = 4.824

Source: Field Survey (2013).

Table 3: Percentage Of Households That Adopted Coping Strategies To Cope With Malaria Illness

Coping strategy	Benue State	Kogi State	Nasarawa State	Combined Sample
Received gifts	13.0	18.0	14.0	15.0
Sold their reserves of food	24.0	14.0	17.0	18.3
Borrowed from money lenders	14.0	17.0	16.0	15.7
Borrowed from friends	8.0	6.0	7.0	7.0
Sold household assets	17.0	18.0	16.0	17.0
Worked for extra hours	10.0	7.0	10.0	9.0
Reduced household consumption of other goods	10.0	12.0	14.0	12.0

Source: Field Survey (2013).

Table 4: Results Of The Health Consumption Model

Variable	Coefficient	t-value
Constant	14424.255	1.885
TY	0.052	1.418
DE-SAVE	0.024	0.551
BORROW	0.432	12.038
SALE	0.057	2.023
OTHER	0.026	0.613
SH	-0.024	-0.746
LE	-0.028	-1.014
HS	0.012	0.412
AH	0.002	0.015

$\bar{R}^2$ = 0.724
F-Statistic = 21.382
Source: Field Survey (2013).

Table 5: Results Of The Education Expenditure Model

Variable	Coefficient (β)	t-statistic
Constant	5455.528	1.394
TY	0.066	5.291
LnSHOCK	-3.174	-4.336 **
LE	-0.123	-0.811
HS	0.114	0.064

Dependent variable: EDU
** 5% level of significance
$\bar{R}^2$ = 0.708 and F-Statistic = 5.458
Source: Field Survey (2013).

Table 6: The Results Of The Housing Expenditure Model

Variable	Coefficient (β)	t-statistic
Constant	9532.432	2.016
TY	0.027	0.545
LnSHOCK	-0.089	-2.760 **
LE	-0.042	-3.334
HS	0.067	0.536 **
PF	0.017	0.528

** 5% level of significance
$\bar{R}^2$ = 0.693 and F-Statistic = 3.882
Source: Field Survey (2013).

References

[1]. Asfaw, A. and Braun, J. (2004). Is consumption insured against illness? evidence on vulnerability of households to health shocks in rural Ethiopia. Economic Development and Cultural Change 53, 115-129.
[2]. Beegle, K., Weerdt, J. D. and Dercon, S. (2008). Adult mortality and consumption growth in the age of HIV/AIDS. Economic Development and Cultural Change 56, 299-326.
[3]. Besley, T. (1995). Nonmarket institutions for credit and risk sharing in low-income countries. Journal of Economic Perspectives 9 (3), 115-127.
[4]. Cochrane, J. H. (1991). A simple test for consumption insurance. Journal of Political Economy 99 (5), 957-976.
[5]. Dercon, S. and Krishnan, P. (2000). In sickness and in health: Risk sharing within households in rural Ethiopia. Journal of Political Economy 108 (4), 688-727.
[6]. Fafchamps, M., Udry, C. and Czukas, K. (1998). Drought and saving in West Africa: Are livestock a buffer stock? Journal of Development Economics 55 (2), 273-305.
[7]. Gertler, P., Levine, D. I., and Moretti, E. (2009). Do microfinance programs help families insure consumption against illness? Health Economics 18, 257-273.
[8]. Holzman, R. and Jorgensen, S. (2000): Social risk management: the new conceptual framework for social protection, and beyond, Social protection discussion paper, No. 0006, the World Bank. Pp. 1-10.
[9]. Jalan, J., and Ravallion, M. (1999). Are the poor less well insured? evidence on vulnerability to income risk in rural China. Journal of Development Economics 58 (1), 61-81.
[10]. Jiang, Y. S. and Braun, J. (2005): The economic cost of illness and household coping strategies in Western rural China, Chinese Rural Economy, 11: 3-39.
[11]. Kochar, A. (1995). Explaining household vulnerability to idiosyncratic income shocks. American Economic Review 85 (2), 159-164.
[12]. Laxminarayan, R. (2004). Does reducing malaria improve household living standards? Tropical Medicine and International Health 9(2): 267-272.
[13]. Rosenzweig, M. R. and Wolpin, K. I. (1993). Credit market constraints, consumption smoothing, and the accumulation of durable production assets in low-income countries: Investment in bullocks in India. Journal of Political Economy 101 (2), 223-244.

[14]. Russell, S. (2004). "The Economic burden of illness for households in developing countries: A Review of Studies Focusing Malaria, Tuberculosis and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome, American Journal of Tropical Medicine and Hygiene, 71(2): 147-155.
[15]. Skoufias, E. and Quisumbing, A. (2005). Consumption Insurance and Vulnerability to Poverty: A Synthesis of the Evidence from Bangladesh, Ethiopia, Mali, Mexico and Russia. The European Journal of Development Research 17 (1), 24-58.
[16]. Townsend, R. M. (1994). Risk and insurance in village India. Econometrica 62 (3), 539-591.
[17]. Udry, C. (1990). Credit markets in Northern Nigeria: Credit as insurance in a rural economy. World Bank Economic Review 4 (3), 251-269.
[18]. Wagstaff, A. (2007). The economic consequences of health shocks: Evidence from Vietnam. Journal of Health Economics 26 (1), 82-100.
[19]. Worrall, E., Basu, S. and Hanson, K. (2005). Is malaria a disease of poverty? Tropical Medicine and International Health 10(10): 1047-1059.
[20]. Yu, H. and Wilkes, A. (1998): Coping with the costs of severe illness in rural China, Chinese Health Economics, 17(10): 42-45.