

Underlying Factors of Healer Shopping Behaviour of Visceral Leishmaniasis Patients in Nepal

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Abstract

Background: The existing literature on demand for health care primarily deals with first consultation of health care providers; however, in reality, the consumers may make several visits to find the standard health care.

Objective: The objective of the study is to identify the pattern of utilization of health care of visceral leishmaniasis (VL) through the use of sequential visits to different health care providers and to examine factors determining the healer shopping behavior of the patients.

Methods: The data for this study were collected from the six public hospitals where diagnosis and treatment services for VL are available located in VL endemic districts. Poisson regression model was used in pragmatic approach of demand function to investigate the utilization pattern of health care services.

Results: Among the total patients, 16 percent visited to public hospital, 19 percent visited to public clinic, 22 percent visited to private hospitals of clinics and 23 percent subjects used home treatment. One to more than five sequential visits to the providers was found in this study. The forward looking provider's price is significantly responsible to increase the event of healer shopping; however income has no effect on multiple visits. Information but not education has a greater role to reduce the number of healer shopping events. Information, service obtaining costs and forward looking provider's prices have robustly determined the healer shopping behaviour of the patients.

Conclusion: The demand analysis which captures the multiple care seeking events is appropriate for producing the better information for policy maker.

Keywords: Visceral leishmaniasis; Utilization; Price; Multiple visits; Nepal

Introduction

A considerable amount of researches in developing countries have been carried out in the area of utilization of health services, for example, [1-8] few of them to address the determining factors of demand for health care. Indeed, the existing literatures on demand for health care primarily deal with first consultation of health care providers, however; in reality, the consumers may make several visits to find the standard health care [9]. The demand analysis based on first consultation of health care providers does not capture path of decision making process and underestimates the total cost of health care and its consequences. The decision making process for health care utilization; however, is complex that requires several steps [10,11]. The multiple visits to the providers develop the path of multiple decision making process. The multiple visits to the providers without referral from the previous providers are common in developing countries [12-15]. The literature termed 'healer shopping' or 'sequential visits' to capture the concept of the path of multiple decisions making process. The healer shopping means use of second provider without referral from the first for a single episode of illness to improve the health status of the patient. On the other hand, the public health care services in developing countries are underutilized and the poor people than the better off are less likely to utilize the services even though the public health services are targeted to them [16]. The demand analysis with capturing the events of healer shopping may be an appropriate policy tool; however, the economic analysis of several steps of decision-making process is rare in the literature.

The paper seeks to provide new insights into the pattern of health seeking behavior, to capture the healer shopping events with example

of visceral leishmaniasis (VL), also known as Kala azar. The objective of the paper is to identify the effective health care of VL through the use of sequential visits to different health care providers and to examine factors determining the healer shopping events. The paper exploited Poisson regression model to identify the factors that determine the multiple visits. The theoretical approach of demand analysis does not capture the sequential visits through utility maximization concept. The paper, therefore, uses pragmatic approach to demand analysis to capture the price of forward looking provider (public hospital), where VL care is available and the result suggested that this is an important determinant of healer shopping; however, income has no role in determining healer shopping.

Visceral Leishmaniasis Care and Healer Shopping in Nepal

Nepal's public health care system is hierarchically structured could be compared to five -layer pyramid: self care at family level, primary care at below district level, primary care at district level, secondary care and tertiary care, from bottom level to top level respectively. Self care is the practice of activities that individuals initiate and perform

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Received November 02, 2011; Accepted December 13, 2011; Published December 17, 2011

Citation: Shiva Raj (2011) Underlying Factors of Healer Shopping Behaviour of Visceral Leishmaniasis Patients in Nepal. J Bioterr Biodef S5:004. doi:10.4172/2157-2526.S5-004

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on their own behalf in maintaining health and make decisions about their health. Public health care providers dominate health care market however private health care providers are in increasing trends. People are receiving various degrees of services from private health providers including private clinic run by the doctors and private hospital and nursing homes among others. Traditional providers, drug stores among others are also playing the role of health care provider in Nepal.

In the event of an illness, the individuals seek some type of treatment. The consultation of health care services among the alternatives depends upon the type of illness, access to service provider, time and money prices of health services, economic status of the individual/household, among others. Personal preference is shopping around the best available choice which refers to the people looking for treatment that acts quickly and will cure their illness rapidly. Therefore, there are higher possibilities of multiple visits to find the effective care.

In Nepal, VL is presently confined to the twelve south-eastern Districts bordering the Bihar State of India. These identified VL districts share similar climate and geography and account for approximately 8 million population - this later figure suggest that one quarter of the nation's citizens are at risk [17]. The Government of Nepal has continued to implement VL control programmes: curative as well as preventive almost since last three decades. Passive case detection is popular than the active case detection and VL care is only available in public hospitals. K39 antigens are used to diagnose for VL in the public hospitals; Direct Agglutination Test (DAT) is also used for further diagnosis. The major drugs for treatment miltefocine, paromomycin are available only in the public hospitals although supplementary drugs for VL treatment can be found in private drug stores and private hospitals. New oral drug-Miltefocine is a teratogenic drug and thus cannot be used in pregnant females, and females of child bearing age group must practice contraception for the duration of therapy and for two months after therapy. It is used as the drug of choice for the management of VL cases. KA is only human reservoir in South Asian counties. The evidence suggests that the presence of chronic cases of kala-azar and post kala-azar dermal leishmaniasis (PKDL) provides the reservoir for infection [18]. Untreated VL and PKDL patients constitute the major reservoir for ongoing transmission of anthroponotic visceral leishmaniasis [19]. Untreated VL and PKDL patients thus are major bottleneck for the elimination of the disease in the countries. Therefore, timely, effective diagnosis and drug treatment are essential not only to cure individual patients, but also to decrease the leishmaniasis infection reservoir [19].

Diagnosis and treatment services and major drugs are provided free of cost in the public hospitals. As the result of this, VL patients have limited choices of care providers. Public hospitals are generally located urban area but VL disproportionately falls in the rural areas. Due to high access cost of care including travel cost and time, food and accommodation expenses, the access of public hospital for VL care is limited for the poor people although the treatment and diagnosis services for VL in Nepal are available at free of cost in the public hospitals [20]. Based on available information, poor people (VL is disease of poor) generally choose the local health care providers to minimize the total cost of care. Unfortunately, they might not get proper treatment from the local providers where appropriate VL care is not available, as a result of this; they started to find out the standard care VL. The sequential visits or healer shopping for VL care may depend

upon the type of providers, access price of public hospital (where VL care is available), education, information, economic status, belief and characteristics of household and the individual.

The primary issue is how to understand the complete picture of decision-making behavior of the consumers. In the process of getting treatment of VL, there simply is no single decision to make, but several sequential decisions. Following decision tree (Figure 1) demonstrates the real situation of decision-making behaviour of the people to find the treatment of VL.

Suppose that a female has got illness of VL, she takes a decision whether she visits to health care provider or not. If she decides to visit to the health provider, there are two possible outcomes: reaching to the standard care for VL treatment or other type of care. If she finds other than standard care for VL, treatment failure occurs because VL treatment is only available in public hospitals (standard care). Then she makes another decision whether to consult to the another provider. If she decides to visit another provider, similar process will be repeated. This shows clearly that she has a number of sequential visits to the different providers without referral from the previous providers.

VL remains a significant public health problem of Nepal. In Nepal, reported incidence rates have varied from about four to five cases per ten thousand populations since 2000 [21]. Since the VL adversely affects the economic situation of households, it makes the relatively poor households even poorer. VL has catastrophic and impoverishment impact on the household among the other tropical diseases such as malaria [21].

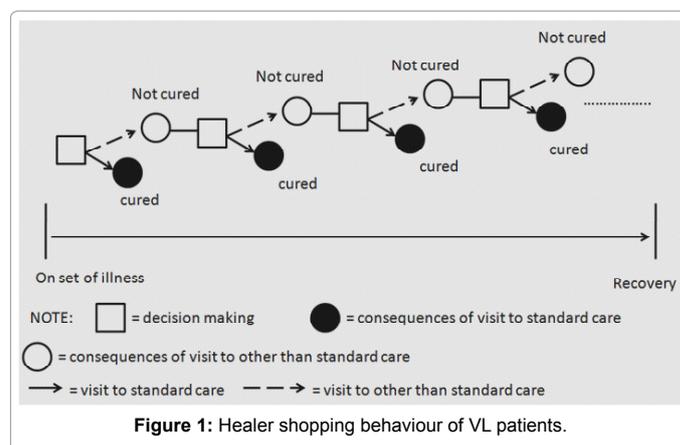
Material and Methods

Model specification

Conditional on treatment seeking, the utility is derived from the improved health status (H) for the individual after receiving medical treatment from various health care providers and consumption of goods and services other than health care (C). Therefore, the utility function will be

$$u_i = \alpha_k u (H_i, C_i) \tag{1}$$

Where, $0 < \alpha_k \leq 1$. If value of α_k is closed zero the severity of illness will be high and it is closed to one, the health is getting improvement. When $\alpha_k = 1$, utility will be maximum. We suppose



that the health status of a consumer with VL depends on the quality of treatment services (M) received as well as individual consumer and provider related characteristics (X).

$$H_i = H(M_1, M_2, \dots, M_j, X_i) \quad (2)$$

The consumer has already allocated the budget for health care and consumption of goods and services other than health care to maintain given level of health status. The consumer receives income from total working time multiplied by given wage rate and other sources, assets, transfer payment etc. Thus total income of the consumer can be expressed as:

$$Y_i = \delta A_i + \omega T_i \quad (2)$$

Where, δ is flow of income from other sources such as assets or home production (A) of an individual consumer; ω is wage rate; T is total working time for an individual consumer. The consumer allocates his total budget for health care services and consumption of goods and services; however, there is uncertainty of outcome of treatment. KA care is only available in public hospital, visits to other than public hospital leads to treatment failure. Again, if they choose other than public hospital, again there may be treatment failure. People make sequential visits to the providers; however, the individual cannot maximize his utility because his health has not been improved; in contrast, he has allocated from his fixed budget for different providers. In addition to this, there is time lag for consultation services. Conventional utility theory thus does not capture this complex situation. A descriptive analysis can give some information on what people do, however, it does not give us full information about what factors affected the behavior of individuals to behave the way they do. Kroeger [22] has described two primary models that are popular in health care utilization namely the pathway and determinants models. The pathway analysis, which is primarily of qualitative nature, describes the different steps in decision-making process of illness behavior. The determinant model focuses on a set of explanatory variables to identify the determinants of health care choice. Determinant model is more popular than the pathway model in economics. Therefore, we use pragmatic approach of demand analysis to capture some parts of complex situation. The paper focuses on determinants of multiple visits to the providers. All VL patients should visit to the public hospital to get standard care; therefore, price of public hospital is treated as forward looking price for VL care that can determine the healer shopping behavior of the patient. Thus the estimating equation based on pragmatic fashion is

$$Q_k = \gamma_0 + \gamma_1 F_p + \gamma_2 Y + \gamma_3 X + \varepsilon_i \quad (4)$$

Where Q_k = number of healer shopping; F_p = forward looking provider prices (actual price of public hospital) Y = household income; X = vector of house and individual characteristics.

Count variables indicate how many time visits has happened to find the standard care of VL. The linear regression model has been often applied to count outcomes; this can result in inefficient, inconsistent and biased estimates although expected results can be found. There are a number of models designed to count outcomes. The basic model is Poisson regression model that extends the Poisson distribution by allowing each observation to have a different value of mean. Equi-dispersion of the data is the pre-condition for Poisson regression model. Sometimes, in count data the variance exceeds mean, this is called overdispersion. Overdispersion is a problem in count data model that

is almost similar to heteroskedasticity problem in the linear regression model. This problem can be solved through computation of robust standard errors. One alternative to solve this problem is application of a full maximum likelihood analysis of the NegBin I model [23-24]. We exploited Poisson regression model with robust standard error to estimate the determinants of healer shopping to find the standard care of VL. We have used STATA command to test whether the presence of overdispersion or not.

We estimated elasticity similar to other demand equation by exploiting the following formula. Elasticity = marginal change \times (mean (or median) of independent variable/mean (median) of dependent variable), where, marginal change = change in dependent variable/change in independent variable. If independent variable is dummy variable, the marginal change is called average change. Sometimes, mean values of dependent or independent variables are highly fluctuated with sample size or outlier values. Median values of dependent and independent variable can produce robust coefficients of elasticity.

Sample size and data collection

For this paper, data were collected from clinically confirmed VL patients seeking care from six hospitals located in five high prevalence VL districts of Nepal. Consumers who sought care for any reason from outpatient facilities of the hospitals during the period October 2008 to December 2008 constituted the sampling frame for the paper. When a VL case was clinically confirmed, the field researchers contacted the patient immediately to start collecting data on the disease, its progression, and the history of healthcare service use. Only the patients who tested positive for VL in the hospital were interviewed. During the three months of data collection, the paper successfully collected information from 367 VL subjects out of 379 VL cases seeking care from these six hospitals. Note that the survey collected information from more than 25 percent of all VL cases in the country for the year 2007-8 (1371 cases were reported for 2007/2008) [18].

The required data including number of visits to the different providers cost of care, travel cost, travel time, income, household and patient characteristics were collected using a structured questionnaire. To ensure quality of data collected, rigorous mechanisms were in place at all stages of the survey and data collection. Questionnaires were designed in a way so that all the questions are in a logical order, easy to understand and phrased in local language. The ethical clearance for this paper was obtained from WHO/TDR, Geneva and Nepal Health Research Council, Kathmandu, Nepal. Survey data were double-checked before and after being entered on daily basis into the Census and Survey Processing System (CSPro.3) software package onto the computer. SPSS version 11.5 and STATA 11.2 were used for data management and analysis.

Variable definitions and priori expectations

The dependent variable is events of healer shopping 1, 2, 3, 4 and 5. We found that the individuals who have made more than five attempt other than public hospitals in one episode of KA; however, we used data up to five events of multiple visits to make adequate sample size for analysis. The results suggested that only 16 percent VL patients were consulted to standard care (public hospitals) at first consultation. At the second consultation, 51 percent out of 84 percent VL patients were consulted to the public hospitals. The following consultation tree clearly shows the number of consultations made by the percentage of VL patients.

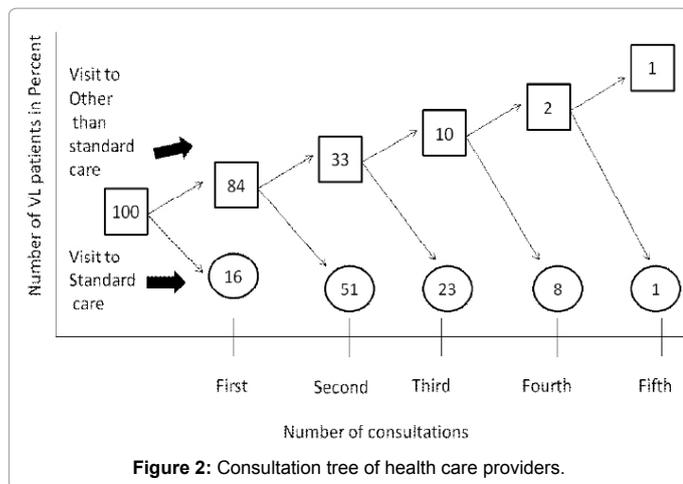


Figure 2: Consultation tree of health care providers.

Based on economic theory, we hypothesized that healer shopping for health care of VL depends upon the household income, information about VL, price of forward looking provider and household and individual characteristics. Access to health information is an important factor that allows him or her to make better decisions about medical care [25]. Information index, therefore, has been developed that reflects signs and symptoms of disease, access of information, transmission and preventive knowledge on VL, among others. The index reflects to thirty eight questions, and the value ranging from 38 for complete information and -38 for complete misinformation. The range of information can be ± 38 however we found -20 to +36 in the real situation. We used highest education in term of completed years of schooling of family members because education has spillover effects to make better decision for health care utilization and most of the patients were illiterate. We hypothesized that education and information will have positive impact on demand for health and they have negative association with healer shopping. HH size affects the production and consumption of HH. Similarly HH size may have effects on demand for health care. Literature suggested that poor people have higher number of HH size resulting the effect may be positive. Caste has been grouped into two categories: dalit and non dalit. Dalit means lower occupational caste. Dalits have limited access of development opportunities due

to the structural factors of the society. We expected Dalits are doing more events of healer shopping. Health status of the individual is measured in terms of number of healthy days in the year after having VL. We expect that there will be negative relationship between events of healer shopping and health status because the individual who is in better health status has time to get more information and can make better decision for health care. Beliefs on modern health care and risk perception about VL are dummy variables. The individual who has beliefs on modern health care and feels risk of VL is more likely to visit public hospital. Therefore these variables will have negative relations with events of healer shopping. Theoretically, there exists a u-shaped relationship between health care use and age [26]. Age reflects experiences as well as the values and norms of the society. Age may be one of the factors to determine the choice of the providers. Other individual characteristics such as gender and marital status may have effects on demand for health because society or cultures practices show gender discrimination in developing countries. There, however, is no theoretical background about the direction effects of these variables. The channels of the effect are not clear, thus we cannot predict the effects.

In the public hospital, diagnostic and treatment services are provided at free of cost; however, individuals have to pay associated cost of treatment and medicine and travel cost. At the first consultation to the health care providers, the direct payments included treatment cost, medicine cost, consultation fee and travel for each provider: average cost for public hospital was NRs 527, average cost for public clinic was NRs 238, average cost for private provider was NRs 663 and average cost for drug store was NRs 288. There is no direct payment for self care. Non monetary cost, opportunity cost of travel time and waiting time for all providers have to be paid. However, people have to scarify more opportunity cost for public hospitals. We used both direct payment and opportunity cost for estimation of cost of services.

Empirical Results

We produced results of maximum likelihood estimation and marginal effects. The interpretation of the results from maximum likelihood estimation is difficult; however, results of marginal change facilitate to interpret the results. Wald χ^2 statistic shows that the

Variable	Category	Mean	Std. Dev.	Min	Max
Number of visits	Count	2.29	0.89	1.00	5.00
Log of forward looking price	Continuous	6.33	0.41	5.18	7.53
Log of HH income	Continuous	9.91	0.79	8.61	12.23
HH size	Continuous	6.58	2.42	2.00	20.00
Disadvantaged group	Dummy	0.49	0.50	0.00	1.00
Married	Dummy	0.53	0.50	0.00	1.00
Beliefs	Dummy	0.34	0.47	0.00	1.00
Information index	Continuous	9.17	12.03	-20.00	36.00
Age	Continuous	23.68	16.51	2.00	80.00
Age squared	Continuous	832.52	1026.65	4.00	6400.00
Male	Dummy	0.58	0.49	0.00	1.00
Literate	Dummy	0.39	0.49	0.00	1.00
healthy days	Continuous	336.00	9.65	285.00	352.00

Source: Estimated using survey data

Table 1: Summary results of the explanatory variables.

independent variables are jointly statistically significant at 1 percent level. At the same time, much of the variation is unexplained with Pseudo R² being equal to 7 percent. In count data models, the R-square values are usually quite low compared to other models in cross sectional data [23-24]. All variables which are statistically significant provide expected results. We estimated robust standard errors because this is the preferred empirical method for cross sectional data for robust regression analysis. The cross sectional data are characterized by substantial by overdispersion. Although we don't have zero visits to providers, we performed overdispersion test. The results allow utilizing Poisson model to analyze the healer shopping behaviour.

The events of healer shopping are robustly determined by the forward looking provider prices. The probability of multiple visits for health care of KA increases as increased in forward looking prices. The result confirms that the prices of public hospitals are responsible to increase the multiple visits. The income has no effects of multiple visits to the providers. Similarly, gender, disadvantaged groups, beliefs, and married variables don't have any effects on increasing or decreasing of multiple visits. HH size and age encourage in increasing the events of multiple visits however higher age can reduce the multiple visits to the providers. Education, information and healthy days have greater power to reduce the healer shopping. The individuals who have information about VL from different sources for example, mass media, health professional, are more likely to visit directly to the public hospitals. The good health status can reduce the multiple visits. The individuals who have better health status, means they have better time to get the information or second opinion about treatment from other sources, that make better decision making for diagnosis and treatment of VL.

Elasticity

The elasticity measures the sensitivity analysis of demand for health care of VL that provides percentage change in price that leads to change in demand for multiple visits; however, marginal effects are independent of percentage interpretation. If the price increased in one

percent in the public hospital, it leads to less than one percent increase in healer shopping. If the price of forward looking provider, public hospital is reduced in one percent, there is probability of reducing healer shopping at a half percent point.

Discussion and Policy Implications

Better understanding the underlying process of demand for health care is quite important for producing desired outcomes from the public intervention in the health sector. When the individuals have got sick due to VL, they have to decide whether to seek medical care. The medical care is one of the inputs to improve the health status, while the cost of medical care reduces the consumption of other goods and services. The most important issue is that the individual not only have to decide whether to seek care but also what type of care they wish to demand. But there is no certain of expected health outcome from the choices [27]. There are possibilities of visiting different health providers to find the effective care subject to cost constraint. It is important to analyze decision-making process in several steps to look at the utilization patterns of health care services. Healer shopping events and switching between the types of providers are common in the developing countries [2,14], not only due to the uncertainty of health outcomes but also supply constraints.

It is assumed in the first consultation of demand analysis that utilization is satisfied demand, it is independent with supply. Indeed, the reality is different, due to the supply constraints; utilization is not equal to demand. There are many factors that make supply constraints, for example, limited opening time for outpatient services, limited services available in the rural health care providers, or essential health services concentrated to one provider located to urban area. The public hospitals have provided services at free of cost because the patients are willing to travel to more distance hospital to receive earlier treatment. But, travel time is quite high to come in the public hospital from the remote village. They have indented to consult to the public hospitals but due to limited opening time for outpatient care, eventually they

Variable	Coeff.	Robust Std. Err.	dy/dx	Std. Err.
LN forward looking price	*0.0829	0.0357	*0.1821	0.0783
LN HH income	0.0086	0.0171	0.0189	0.0375
HH size	*0.0154	0.0049	*0.0339	0.0107
Disadvantaged group	-0.0180	0.0255	-0.0395	0.0561
Married	0.0036	0.0506	0.0080	0.1112
Beliefs	-0.0202	0.0348	-0.0442	0.0758
Information index	*-0.0036	0.0012	*-0.0079	0.0026
Age	**0.0065	0.0035	*0.0143	0.0077
Age squared	*-0.0001	0	*-0.0003	0.0001
Male	-0.0093	0.0256	-0.0205	0.0564
Literate	*-0.0740	0.0319	*-0.1612	0.0687
healthy days	*-0.0244	0.002	*-0.0537	0.0044
Constant	*8.3211	0.7612		
Number of obs	=	367.00	No problem of over dispersion	
Wald chi ² (12)	=	356.32		
Prob > chi ²	=	0.00		
Pseudo R ²	=	0.07		
Log pseudolikelihood	=	-513.59		

*P<0.01 **P<0.10

Source: Estimated using survey data

Table 2: Results of maximum likelihood estimation and marginal change.

Variables	Elasticity	Standard error
Price	*0.53	0.23
Income	0.08	0.17

*P<0.01

Source: Estimated using survey data

Table 3: Elasticity of forward looking price.

have consulted other providers. In this case, demand is not equal to utilization of services and if we analyze the demand for health care based on first visit to the health care provider that will produce partial information and health care cost will be under estimated. But due to third party payment, the situation is different in developed countries; people have a propensity to bypass rural hospitals in favor of larger urban hospitals to consume additional services [28].

The paper has empirically examined the pattern of utilization of health care. The main findings of the paper are: the prices of forward looking provider has significant positive effects on events of healer shopping, and the events of healer shopping have directly positive relation with the total cost of medical care. Although public hospital provides free services due to the limited access and choices of effective health care of VL, in terms of total medical care people are paying more. The out of pocket payment for VL is, therefore, higher than other tropical diseases and it has greater catastrophic and impoverishing impacts on household [20].

We find that information has greater power to make the better decision to utilize the health services. We find the result similar to [25] that health information increases the utilization of health care facilities. Sufficient health information has greater role in decision making process and may help to increase the individual welfare [31].

Conclusion

The paper extended the conventional empirical method of analyzing the demand for health care in developing countries. This approach covers the multistage decision making behavior to utilize the health care services for VL. This approach explored an interesting story on the services provided at free of cost in the public hospital but how the people are doing healer shopping to find the standard health care provider. This analysis has produced the pieces of information on the factors determining the demand for health care but also how the out of pocket payment has been increasing in the developing countries although government is still investing huge amount of money in the health sector. Limited choices of health care services and lack of information are the primary factors to increase the events of healer shopping and out of pocket payments. Expansion of the services for VL or introducing demand side financing for the neglected tropical diseases, like VL are the appropriate policy options for reducing the events of healer shopping.

Acknowledgement

Financial support for training of Shiva Raj Adhikari is provided by UNICEF/UNDP/World Bank/WHO Special Program for Research and Training in Tropical Diseases (TDR), Geneva. I would like to thank Mahmud Khan and Siripen Supakankunti for providing valuable comments on an earlier draft, with the errors being the sole responsibility of the author. This paper was presented at the Conference of International Health Economics Association (iHEA), held in Beijing on 12-15 July 2009.

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This article was originally published in a special issue, **Bioterrorism: Disaster preparedness education and public health** handled by Editor(s). Dr. George Avery, Purdue University, USA; Dr. Deborah J Persell, State University (Jonesboro), USA, Dr. Shiva Raj Adhikari, Tribhuvan University, Nepal.