Medical expenses matter most for the poor: evidence from Vietnam

Quan Hoang Vuong and Ha Nguyen

Introduction: Less developed countries, Vietnam included, face serious challenges of inefficient diagnosis, inaccessibility to healthcare facilities, and high medical expenses. Information on medical costs, technical and professional capabilities of healthcare providers and service deliveries becomes influential when it comes to patients' decision on choices of healthcare providers.

Methods: The study employs a data set containing 1,459 observations collected from a survey on Vietnamese patients in late 2015. The standard categorical data analysis is performed to provide statistical results, yielding insights from the empirical data.

Results: Patients' socio-economic status (SES) is found to be associated with the degree of significance of key factors (i.e., medical costs, professional capabilities and service deliveries), but medical expenses are the single most important factor that influence a decision by the poor, 2.28 times as critical as the non-poor. In contrary, the non-poor tend to value technical capabilities and services more, with odds ratios being 1.54 and 1.32, respectively.

Discussion: There exists a risk for the poor in decision making based on medical expenses solely. The solution may rest with: a) improved health insurance mechanism; and, b) obtaining additional revenues from value-added services, which can help defray the poor's financial burdens.

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Abstract

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Keywords

Medical expenses; Healthcare information; Healthcare policy; Patients' socio-economic status; Sociology of patients

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Introduction

It has been known that healthcare systems in less developed countries face serious challenges, most notably inefficiencies of diagnosis, lack of access to effective healthcare facilities and services, and rising costs. In general, these issues influence patients' perception of healthcare quality and satisfaction, which in turn have an impact on their future decision of choosing healthcare provider [1]. Although for low-income patients (and households) the costs of healthcare service are of primary concern, to make a good decision on the choice of healthcare provider quality information is required. To this end, poor patients also have disadvantages, which can possibly lead to associated risks of unnecessarily high costs, lower service quality, among others, in actual situations [2-3]. The risk of becoming financial distressed runs higher for the poor due to travel costs, borrowing costs. It is not uncommon that many choose to refuse hospitalization and health services, and accept the health risks due to lack of timely treatment, facing the serious problem of healthcare financing [4].

Looking at patients' perception of healthcare quality and satisfaction, nursing services play an important role [5] while inequality in providing services to patients of different socio-economic statuses (SES) is not difficult to observe [4].

This short paper provides empirical evidence on the differences in perceptions/behaviors between the poor and non-poor patients regarding their decisions on choices of healthcare providers. The result highlights and reasons why poor patients in many cases do not make a 'best-available' decision; and this leads to some suggestion on improving this situation.

Materials and Methods

The data set employed in this research has been collected by a research team at Hanoi-based Vuong & Associates in 2015, containing 1,459 observations on different aspects of demand, satisfaction and use of healthcare information reported by patients. The original data set is provided in [6]. The patients are classified into two SES categories of "nonpoor" and "poor".

The data are used to assess the degree of significance of information for such factors as: healthcare costs, professionalism and knowledge of health personnel (including doctors and nurses) and accessibility to health services and facilities. As discussed above these factors influence a patient's informed decision on whether or not to choose a healthcare provider.

The data set is categorical by the survey nature. Categories of response outcomes follows.

- For assessing significance of information on "Cost", two categories are: i) "dec.cost": decisive; and ii) "indec.cost": indecisive.

- For assessing significance of professionalism and technical capabilities of the healthcare provider ("Prof"), two categories are: i) "dec.prof": decisive; and ii) "indec.prof": indecisive.
- For assessing significance of accessibility to services ("Service"), two categories are: i) "dec.serv": decisive; and ii) "indec.serv": indecisive.

As the responses are dichotomous, three 2×2 contingency tables are constructed from the survey data and provided in Table 1.

Table 1. Distributions of patient responses regarding significance of "Cost", "Prof" and "Service"

	(1.a) "Cost"		(1.b) "Prof"		(1.c) "Service"	
"SES"	"dec.cost"	"indec.cost"	"dec.prof"	"indec.prof"	"dec.serv"	"indec.serv"
"poor"	147	160	228	79	530	622
"nonpoor"	331	821	940	212	162	145

Statistical Analysis

Apart from descriptive statistics, this article uses Chi-square (χ^2) test of independence for examining possible relations between dichotomous variables "SES" and factors in Table 1. Two variables are independent if one variable's probability distribution is not influenced by the other, and for our 2×2 tables, that means the structure of one column of data does not help explain the structure of the remaining one.

Suppose we have n observations distributed over two categorical variables **x** and **y**, the null hypothesis for a χ^2 test of independence is: H_0: **x** and **y** independent; that means, H_1: **x** and **y** associated. The test statistic is given by:

$$\chi^2 = \sum_{i,j} \frac{\left(f_{ij} - e_{ij}\right)^2}{e_{ij}}$$

where, f_{ij} is the number of observation that satisfies the condition of simultaneously being in the category i of variable **x** and in the category j of variable **y**; e_{ij} is the expected value if **x** and **y** are independent:

$$e_{ij} = \frac{n_i \times n_j}{n}$$

where n_i, n_j are the numbers of observations falling into category i (for **x**) and category j (for **y**).

If $\chi^2 < \chi^2(k)$ (with k denoting the corresponding degree of freedom), H_0 is rejected; and we cannot reject the alternative hypothesis (H_1) that **x** and **y** are associated. In this article we use the significance level of 5%.

Odds ratio

Odds ratio is another useful statistic for our 2×2 contingency tables, measuring how likely the probability of one event (π) is compared to its mutually exclusive event. Computing odds ratio involves determining "Odds":

$$\text{Odds} = \pi/(1 - \pi)$$

Then for 2×2 tables, "Odds ratio" (θ) is computed as:

$$\theta = \frac{\text{Odds}_1}{\text{Odds}_2} = \frac{n_{11}n_{12}}{n_{21}n_{22}}.$$

Technical details and practices for the examination are provided in [7-8].

Results

From Table (1.a), the poor account for more than 21% of surveyed patients, and 33% of respondents regard health costs as the decisive factor for making decision on their choice of healthcare provider (478 out of 1,459). From (1.b), more than 80% of respondents based their decisions on professional capabilities of the health personnel. Even if for lower SES group's patients, 2/3 are strongly influenced by this factor. From (1.c), roughly 47% of the patients see service as the decisive factor for their decision (category "dec.serv"). This is somewhat counterintuitive as media frequently report complaints by patients regarding unsatisfactory service as if this factor will decide patient's choices.

Next, we report χ^2 statistics, and corresponding p-values, in Table 2 for three 2×2 contingency sub-tables (1.a-c).

Table 2. Results of χ^2 statistics

	"Cost"	"Prof"	"Service"
X^2	39.49	7.704	4.178
p	3.3×10^{-10}	0.006	0.041
X^{2}is χ^2-distributed, with $(2-1)(2-1) = 1$ degree of freedom.			

All p-values reported in Table 2 are highly significant, rejecting the null hypothesis of independence. The results indicate that healthcare costs, professional capabilities and accessibility to health services all are critical in informing the decision by patients, and related to a patient's socio-economic status. In addition, Table 3 provides "Odds ratio" (θ) for different pairs of relations and corresponding confidence intervals.

Table 3. Computed "Odds ratio" (θ)

	"SES"/"Cost"	"SES"/"Prof"	"SES"/"Service"
θ	2.28	0.65	0.76
95% CI	[1.76, 2.95]	[0.48, 0.88]	[0.59, 0.98]

Taking θ between "SES" and "Cost" (2.28) as an example, it comes from (1.a) for a poor patient answering "dec.cost": $\pi = \frac{147}{147+160} = 0.479$. Thus, $\text{Odds}_1 = \frac{0.479}{1-0.479} = 0.919$. Nearly 92% that a poor patient will base their decision on the matter of healthcare costs.

Likewise, $\text{Odds}_2 = 0.403$ for a non-poor patient. So we end up with $\theta = \frac{0.919}{0.403} = 2.28$. The 95% CI of θ is [1.76, 2.95] telling the propensity of falling into this range of value for θ, 95 times out of 100 observations.

In contrary, the trend is quite different regarding the two remaining factors "Prof" and "Service". The survey data suggest that the non-poor regard technical capabilities $\frac{1}{0.65} = 1.54$ times as important as the poor do; and satisfactory service delivery $\frac{1}{0.76} = 1.32$ times.

Discussion

The above results and data indicate that although all three factors of medical costs, perceived capabilities of healthcare provider and service deliveries are important to patients, they possess different degrees of influence on patients with different SES. This reflects a primary concern about destitution risks by poorer patients, and is consistent with [9].

Although it may sound intuitive, the finding flags a warning against a possible risk of poverty caused by re-hospitalization or prolonged treatment due to a cost-based decision of choosing healthcare provider. Today's heavy reliance on medical equipment and facilities leads to higher depreciation and unit cost (service hour, medicine and visit) and many lower-cost services may signal inadequate investments in both facilities and healthcare staff. In fact, a better health insurance mechanism will be needed to address this problem [3,9].

In addition, as patients from the higher-income groups tend to value medical expenses less important and satisfactory services more, a better diversified healthcare system should take this into account for a better financing solution. When the non-poor are willing to pay more, additional revenues for premium services can help defray part of basic medical expenses for the poor, ultimately helping to reduce risks of destitution.

Last but not least, this analysis add further evidence to the significance of a search for quality information by patients [10], which can become costly for disadvantaged people. Therefore, investments into management information systems and data contribution to public health platforms, preferably centralized ones managed by the government, will more likely boost public confidence in healthcare services while reduce costs for society.

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