Data Article

Data on Vietnamese patients’ financial burdens and risk of destitution

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ABSTRACT

The research process started in the first week of August 10, 2014 and ended early February 2015, obtaining qualified data for 330 patients from many hospitals in northern Vietnam. Its expansion was performed for an enlarged dataset through May 2015, containing 900 records. This article exemplifies the attempt to examine the likelihood of destitution among Vietnamese patients due to insufficient insurance coverage, cost of treatment and patient’s status of residency during a curative hospital stay. The result suggests that the patients, who are poor and come from rural areas, face serious obstacles in accessing health care services. This data article presents attributes and values of the data set used in the article provided at DOI: http://dx.doi.org/10.1186/s40064-015-1279-x Vuong (2015) [4].

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Specifications Table

| Subject area                  | Medical                                                                 |
|-------------------------------|------------------------------------------------------------------------|
| More specific subject area    | Patient's financial burdens occurring during a curative hospital stay |
| Type of data                  | Table, graph, figure                                                   |

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### Value of the data

- The data potentially offer a specific insight on financial destitution due to costs of treatment.
- The data can help reveal the likelihood of a patient’s recovery after treatment.
- The data help to understand the effect of health insurance on reducing the likelihood of falling into destitution.
- The data shed light on the risk of “extra thank-you money” becoming an obligatory part of treatment costs for patients, low-income patients in particular.
- The data set structure can be enriched for deeper analysis providing insights and implications for bettering policy making in health insurance and poverty reduction.

### 1. Data

The first data set, which will be used for computation examples provided in this article, contains 900 records obtained from a survey on Vietnamese inpatients concerning family status, patient’s income level, patient’s extra expenses to doctors and hospital’s staff, and their loans to finance treatment. Fig. 1 shows the distribution of patients hospitalization lengths.

Continuous (numerical) and discrete (categorical) variables are measured and reported in the survey data set. Table 1 presents numerical variables of the data set. Fig. 1a and b present medical expenditures and average daily costs in relation to health status of patients when hospitalized. They are not significantly different from those provided in [4] (Table 2).

### 2. Experimental design, materials and methods

The dataset was constructed using information from questionnaires in order to enable the modeling of baseline-category logits (BCL). In addition, the computing of empirical probabilities upon events of hypothetical influence is performed. The logic for designing the experiment and thus data sets are similar to what is described in [1], for data groups in \( J \) categories of \( Y \) as multinomial with corresponding sets of probabilities \( \{\pi_1(x), \ldots, \pi_J(x)\} \), and with the multinomial probability mass function: \( p(n_1, n_2, \ldots, n_J) = \binom{n}{n_1, n_2, \ldots, n_J} \pi_1^{n_1} \pi_2^{n_2} \ldots \pi_J^{n_J} \). The data set has been created to enable an BCL analysis to simultaneously model effects of \( x \) on \( (J - 1) \) logits such that the estimating of \( (J - 1) \) equations enables the computing of the remaining logits. Therefore, Pearson-type likelihood ratio test statistics \( X^2, G^2 \) or goodness-of-fit, following a multivariate GLM estimations \( g(\mu_i) = X_i\beta \) become appropriate for hypothesis testing. For practically estimating multinomial logistic models, consult with Refs. [2,3]. Practicality of survey data uses is also provided in Ref. [4].

Some possible questions and hypotheses worth testing of using the data set analyzed by [4], is in Table 3.
The following short R commands help create the data set provided in the file named “table1.csv”

```r
> med = read.csv("E:/.../Med2015/Data/P330.csv", header = T)
> attach(med)
> table1 = xtabs(~Res+Insured+Burden)
> ftable(table1)
```

The data set in file name “table1.csv” presents a distribution of patients following by residency status, insurance participation, and extent to which patients fall into destitution due to financial status.

**Table 1**

| Coded name | Explanation                                                                 | Unit          |
|------------|------------------------------------------------------------------------------|---------------|
| Spent      | Total money spent during his/her stay in hospital in millions of Vietnamese Dong. According to official exchange rates at the time of survey, VND 1 million was equivalent to $472. | Million of VND |
| Dcost      | Average daily cost the patient had to pay during the entire treatment period | Million of VND |
| Income     | Annual income                                                               | Million of VND |
| Days       | Number of days the patient spent in the hospital                            | Day           |
| Pins; Pinc; Pchar; Ploan | Portions of finance from sources: insurance reimbursement, income, charity funds from civil organizations or employers, or borrowings | Percent        |
| Streat, Srel, Senv | Percentage of funds used for the purpose of main treatments, for covering costs of relatives coming to help the patient, or paying “extra thank-you money” or bribing doctors/staff | Percent        |

**Note** – Treatment outcomes A - full recovery; B - partial recovery; C - stopped in middle; D - unsuccessful treatment, including mortality.

**Fig. 1.** Status of health in relation to expenditure and average daily cost. (a) Range of expenses for patients with treatment outcome categories (A, B, C or D). (b) Range of daily cost for patients falling into different treatment outcome groups (A, B, C or D).
burden1 = read.csv("E:/.../Med2015/Data/table1.csv",header = T)
attach(burden1)
contrasts(burden1$Res) = contr.treatment(levels(burden1$Res),base = 2)
contrasts(burden1$Insured) = contr.treatment(levels(burden1$Insured),base = 2)
fit.burden1 = vglm(cbind(C,B,A) ~ Res + Insured,family = multinomial,data = burden1)
summary(fit.burden1)
The above estimation yields coefficients and associated statistics that are used in [4] for estimating empirical probabilities, using the 330-observation dataset. In addition, Fig. 2 is drawn for the 900-observation dataset.

The probabilistic trends for patient’s financial burdens are in line with [5]. Examples of R commands for creating a specific dataset and corresponding BCL estimations are provided in Appendixes A and B. In the same vein, Fig. 3 shows declining trends for becoming destitute if a patient is either resident or insured, or both.

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**Appendix A.**

R commands help create the data set provided in the file named “table2.csv”
> med = read.csv("E:/.../P330.csv,header = T)
> attach(med)
> table2 = xtabs(~ AvgCost + Insured + Burden)
> ftable(table2)

Appendix B.

R commands using data in “table2.csv” estimated model follow as:

> burden2 = read.csv("E:/.../table2.csv,header = T)
> attach(burden2)
> contrasts(burden2$AvgCost) = contr.treatment(levels(burden2$AvgCost), base = 2)
> contrasts(burden2$Insured) = contr.treatment(levels(burden2$Insured), base = 2)
> fit.burden2 = vglm(cbind(C, B, A) ~ AvgCost + Insured, family = multinomial, data = burden2)
> summary(fit.burden2)

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2016.09.040.

Appendix C. Supplementary material

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2016.09.040.

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