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CONJOINT ANALYSIS FOR THE DEMAND OF HEALTH CARE RELATED TO COMMON COLD

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This article examines by means of Conjoint Analysis(CA) the health care choice in Japanese people suffering from the common cold. CA is a stated preference technique that uses a survey and involves the hypothetical scenarios. Estimates obtained from CA might be biased because it is difficult to keep the questionnaire accurate under hypothetical scenarios. This article is the first attempt to evaluate the magnitude of the bias in CA, by comparison with actual behavior. Using information about people who have actually no health insurance, our empirical result show that CA biases are around 12%.

Keyword: Conjoint Analysis, CA bias, Demand elasticity for medical care, Minor illness

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1.Introduction

Because of the rapid aging societies such as Japan, the control of medical expenditure has been among the most prominent issues in the policy debate. In discussing medical cost-control policy, information about the price elasticity of demand for medical services is of paramount importance. Unfortunately, very few research has been undertaken on this topics in Japan (Ogura(1990),Nishimura(1987)). Because of the difficulty in accessing data at the hospital or household level in Japan, these researches consist of estimates derived from cross-sectional data aggregated in the prefecture level, or time series data aggregated at the national level. These researches have, therefore, suffered from various statistical problems associated with aggregate data, such as cross-section bias and spurious regression. Moreover, the data on health care expenditure comprises expenditure related to both minor and serious illnesses. Minor illnesses are defined as illness such as common cold and diarrhea, which are curable by standard treatment at reasonable cost, and by alternative treatment such as OTC medicine, natural recovery, and remedies based on folklore. Research using aggregate measures of health care expenditure cannot really contribute to policy formation, because the luck of substitution for non-minor illnesses such as cancer or heart attacks makes it impossible to determine price elasticity.

In the United States, despite extensive research in health economics, only a few studies focus on demand for medical care for minor illnesses or the substitution between prescribed and OTC medicine(Stuart and James, 1995; Fillenbaum et al.,1995). The significant exception to this is Newhouse(1993), who uses data from RAND Health Insurance Experiment. This data set avoids the various problems associated with aggregate data. Moreover, as it consists of household rather than hospital data, it may clarify the decisions that patients make before visiting a doctor. Leibowits(1989) undertakes important research that focuses on minor illnesses and studies the substitution between prescribed and OTC medicine.

Ii and Ohkusa(1999a) and Ii and Ohkusa(1999b) are the first attempts to estimate the price elasticity of the demand for health care for minor illnesses in

Japan. Their analyses explicitly take into account the substitution between formal medicine and OTC or natural recovery. Using micro data from the Living Standard Survey in Japan, Ii and Ohkusa (1999a) find that elasticity is distributed in the range 0.0123 - 0.149. On the other hand, Ii and Ohkusa (1999b) use original data when specializing in the common cold. This research reveals price elasticity in the range 0.23 - 0.36. However, these studies, which control as much as possible for individual properties, may not be immune from the contamination of cross-sectional bias because, unless panel data is used, they cannot completely eliminate the individual effect. If the questionnaire asks the patient's choice under several hypothetical situations over cross-sectional data collection, it can be regarded as a kind of panel data. In this sense, the research would supplement that which uses micro data, as do Ii and Ohkusa(1999b).

In this research, Conjoint Analysis(CA) is one of the most reliable techniques for dealing with the individual effect by using a questionnaire survey. The CA questionnaire services hypothetical choice. Thus, the researchers can analyse choice by reference to the scenarios, and individual properties in statistical models fully control out the individual effect.

To evaluate the benefit of a new medicine or a new technology in the field of health economics, researchers have conventionally employed the Willingness to Pay (Tolley et al (1994)) or Standard gamble, Time trade-off and Rating Scale methods. However, these methods suffer from various theoretical problems. For instance, the price obtained by Willingness to Pay obviously differs from utility. The other three methods also display this shortcoming, which is not utility. Under the theoretical concept of ordinal utility, utility cannot be compared or aggregated among individuals. Compared with Willingness to Pay, CA has the advantage that respondents react as the price is given and make no prior assumptions about their choices. Furthermore, the statistical model using CA can experiment with policy simulations by changing the explanatory variables.

First, CA has conventionally been widely used in the field of environment economics and traffic economics. In health economics, CA has recently been frequently applied to the evaluation of new medical treatment technology(Ryan, 1999a; Ryan, 1999b; Bryan, 1999; Telser and Zweifel, 1999; Ratcliffe, 1999; San Miguel and Ryan, 1999; Johnson et al, 1999; Ryan and Farrar; 1994; Ryan and Hughes, 1997;, Van der Pol and Cairns, 1997; Van der Pol and Cairns, 1999; Bryan et al., 1998). For example, it has been applied to examinant fertilization(Ryan , 1999a), dentistry correction technology(Ryan and Farrar, 1994), suspension technology(Ryan and Hughes, 1997), blood transfusion technology(Van der Pol and Cairns, 1997) and the application of magnetic resonance imaging(MRI) to damage caused by knee injuries(Bryan et al., 1998).

Although CA may be more excellent method than conventional ones, it potentially suffers from bias arising from two sources: hypothetical choice and hypothetical scenarios. The purpose of this research is to distinguish and evaluate each kind of bias. If CA is applied more frequently to other fields, the magnitude of bias should be evaluated [1)]. Especially with regard to the latter, we estimate the impact of bias by using the information about people who have no health insurance.

This paper is organized as follows. Section 2 describes the data obtained from an original survey. Section 3 presents demand for health care using CA. The biases arising from hypothetical choice and scenario are evaluated in section 4 and 5, respectively. Section 6 summarizes the result and discusses further research.

2.Data

The data used here were obtained from research conducted by the authors. The respondents were 20-60 years who live in western Japan. The sample was chosen randomly from a telephone book. The survey was conducted in January and February 1998. We sent the questionnaire to respondents after they had confirmed by telephone that they would cooperate. Some 544 respondents replied to the questionnaire.

The question mainly used in this research is: “When you have the symptom of a cold, such as a temperature of 38 degrees, mucus, and a sore throat, and you think that you have caught a cold, what action do you decide to take? ”. The respondents have three choices: “visit to a doctor right away”, “take OTC medicine”, and “do nothing”. They make this hypothetical choice under the hypothetical scenario of coinsurance rate such as 30%, 40%, 50%, 70%, 100% and under that of actual rate [2)].

While conventional researches (Ii and Ohkusa, 1999b) analyses the demand for medical services under the actual coinsurance rate alone, by using CA, we analyse the demand under hypothetical coinsurance rates as well as the actual one.

Since the Japanese public health insurance system is compulsory, it is illegal in Japan to be uninsured. However, some people do not change their insurance when they move from employed-based insurance scheme to a regional one. Moreover, people who fail to pay the insurance premium is suspended their insurance or utilize it only by visiting the regional insurance office and paying the amount in arrears. We refer to such people as the ‘actually uninsured’, since they act as if they are not covered by health insurance. The actually uninsured consists of people who are without health insurance at present and those who were without it in the past. A sample number of 19 people belonged to at least one category.

The questionnaire includes additional questions, relating to dependents, household income, household assets, household debt, labor income in the last year, age, gender, education level, working status and so on. Summary statistics of these data are shown in Table1.

3.Estimates of the Demand for Health Care using Conjoint Analysis

In this section, the demand by people with the common cold for medical services and that for OTC medicine are estimated under several hypothetical coinsurance rates using CA.

Table2 indicate a sample distribution around the actual coinsurance rate. In this paper, the term “actual” means “not hypothetical”.

While the actual coinsurance rates for most persons are 20% and 30%, as legally required, between 1% and 2% of the population have an actual coinsurance rate of 0%, 10%, 15% and 100%. Of these rates, the first three imply insurer subsidies above the legal level, while the 100% rate implies the absence of insurance.

First of all in this section, the methodology of estimation is described and the estimated results given of the demand for medical services of people with the common cold. Second, the bias arising from hypothetical choice is discussed by the way of comparison with the estimates of Ii and Ohkusa(1999b). Third, the bias arising from hypothetical scenario is evaluated by comparison with the actually uninsured and the hypothetical scenario of the uninsured.

The dependent variables are trinominal: $T_{i,k}$ =1 if a patients go to visit a doctor, $T_{i,k}$ =2 if a patient takes OTC medicine, and $T_{i,k}$ =0 in other cases. The explanatory variables are age A_i, gender (G_i =1 if female, G_i =0 if male), education E_i (E_i =1 if graduated from a university or college, F_i =0 if not), working status in the last year (W_i =1 if working, W_i =0 if not), labor income in the last year L_i, household income in the last year other than own labor income I_i , household assets S_i and real coinsurance rate $R_{i,k}$. A subscript k in $T_{i,k}$ and $R_{i,k}$ corresponds to the real coinsurance rate that consists of actual coinsurance rate and hypothetical coinsurance rate(30%, 40%, 50%, 70% and 100%). Needless to say, where the actual rate is 30%, the 30% hypothetical scenario is omitted.

Following Ii and Ohkusa(1999b), the estimation equation is

$$T_{i,k}^{j*} = \alpha_0^j + \alpha_A^j A_i + \alpha_G^j G_i + \alpha_E^j E_i + \alpha_W^j W_i + \alpha_L^j \log L_i + \alpha_I^j \log I_i + \alpha_S^j S_i + \alpha_R^j R_{i,k}$$
$$+ v_{i,k}^j \ (j = 0,1,2)$$

$$T_{i,k} = \begin{cases} 1 & if \quad T_{i,k}^{1*} > T_{i,k}^{2*} and T_{i,k}^{1*} > T_{i,k}^{0*} \\ 2 & if \quad T_{i,k}^{1*} < T_{i,k}^{2*} and T_{i,k}^{2*} > T_{i,k}^{0*} \\ 0 & otherwise \end{cases} \qquad (1)$$

$$v_{i,k}^j = \varepsilon_{i,k}^j + u_i^j$$

by using a multinomial probit estimation method with random effect [2)]. Because the probability of choice j sum to 1, we can estimate the differences among alternative choices. Here, we set j=0, the choice of “do nothing” as the basis of our comparison. The error term $v_{i,k}^{j}(j=0,1,2)$ consists of $\varepsilon_{i,k}^{j}$ and u_i^j. The error term $\varepsilon_{i,k}^{j}(j=0,1,2)$ is a random variable and Ω follows a three-dimensional normal distribution over alternatives. Since the error terms in the estimation also redefined by the difference from $\varepsilon_{i,k}^{0}$ and $\varepsilon_{i,k}^{j}(j=1,2)$, and normarizing the (1,1) element of Ω should be 1, its transformed variance-covariance matrix should be

$$\begin{bmatrix} -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix} \Omega \begin{bmatrix} -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}' = \begin{bmatrix} 1 & \rho\sigma \\ \rho\sigma & \sigma^2 \end{bmatrix}$$

The error term u_i^j implies the i-th individual random effect. This specified model is known as a probit model with random effect (Butler and Moffitt, 1982). The error term u_i^j is normally distributed, so that

$$u_i^j \sim N(0, \sigma_{u^j}^2)$$

Overall, the variance-covariance matrix of $v_{i,k}^{j}$ should be

$$\begin{bmatrix} \sigma_{u^1}^2 J_K \otimes I_N + I_{KN} & \rho\sigma I_{KN} \\ \rho\sigma I_{KN} & \sigma_{u^2}^2 J_K \otimes I_N + I_{KN} \end{bmatrix}$$

where K represents the maximum number of the actual coinsurance ratio, N is also the maximum number [4)] of individual number i, I_m is $m \times m$ identity matrix, J_m is the $m \times m$ matrix that all elements are one.

The estimation procedure is the BHHH method with grid search over $\rho, \sigma, \sigma_{u^1}^2, \sigma_{u^2}^2$ [5)].

Table3 shows estimation results. The upper table is the estimation result of the demand for medical services, while the lower table is that of the demand for OTC medicine. The coefficient of the real coinsurance rate in the upper table is significantly negative. The marginal effect of this coefficient indicates that a 10% increase in the real coinsurance rate, for example from 30% to 40%, decreases the demand for medical service by 6.27 percentage points. This results is much higher than the 3.61 percentage points estimated by Ii and Ohkusa(1999b). Age has a significantly positive effect on the demand for medical services, and its marginal effect implies that 10 additional years of age increases demand by 3.07 percentage points.

The coefficient of the real coinsurance rate in the lower table is significantly positive. Its marginal effect shows that a 10% increase in the actual coinsurance rate increases the demand for OTC medicine by 4.08 percentage points. This results is barely lower than the 2.95 percentage points estimated by Ii and Ohkusa(1999b). The coefficient of age also has a significant effect: its marginal effect indicate that 10 additional years of age decreases demand by 4.08 percentage points.

4.Bias arising from Hypothetical Choice

Certain factors might be thought to account for the difference between the estimation results of Table3 and those of Ii and Ohkusa(1999b). First, the estimation model used by Ii and Ohkusa(1999b) controls more individual properties than that used in this paper, such as seriousness of illness and knowledge of medication. Another factor is the difference between the samples. Moreover, Ii and Ohkusa(1999b) do not include random effects, as they do not use CA. In addition, the methodology may be thought to make a difference. While the data used in Ii and Ohkusa(1999b) are based on actual choice, the data used in this paper are based on hypothetical choice. Since hypothetical choice need not be consistent with actual choice, there is a bias arising from hypothetical choice in Table3.

To confirm the impact of this bias, we estimate the model 1 with the sample excluded from the hypothetical scenario. Since this estimation is based on the actual coinsurance rate, it is possible to compare with Ii and Ohkusa(1999b). If there is little difference in the sample property and the estimation model of the two research projects, the difference in the results can be regarded as the bias arising from hypothetical choice. Needless to say, this estimation has no random effect, since there is only one sample for one individual.

Table 4 reports the results of estimation. First, the actual coinsurance rate has a significantly positive effect on the demand for medical services, and its marginal effect is 8.41 percentage points. This results is similar to Table3 and is also much higher than the 3.61 percentage points estimated by Ii and Ohkusa(1999b).

Second, the actual coinsurance rate has a significantly negative effect on the demand for medical services, and its marginal effect is 3.27 percentage point. This result is almost the same as(or a little bigger than) the 2.95 percentage points estimated by Ii and Ohkusa(1999b). These results suggest that the estimation result of the demand for medical services may be more contaminated by bias than that for OTC medicine, because of the difficulty of imaginating the demand for medical services.

5.Bias arising from Hypothetical Scenario

We try to evaluate the bias arising from hypothetical scenarios. Generally speaking, it is more difficult to imagine choices under the highly hypothetical coinsurance rates such as 70% and 100%, which are far from the actual rates, than those under rates such as 30% and 40%, which are near the actual rate, as higher rates are more distant from reality than lower ones. This bias arising from hypothetical scenarios is a problem, not only for this research project, but also for every research project using CA or Willing to Pay.

To measure the magnitude of this bias, we estimate the following model:

$$T_i^{j*} = \beta_0^j + \beta_A^j A_i + \beta_G^j G_i + \beta_E^j E_i + \beta_W^j W_i + \beta_L^j \log L_i + \beta_I^j \log I_i + \beta_S^j S_i + \beta_N^j N_i + \beta_M^j M_i + \varepsilon_i^j \ (j = 0,1,2)$$

$$T_i = \begin{cases} 1 & if \quad T_i^{1*} > T_i^{2*} and T_i^{1*} > T_i^{0*} \\ 2 & if \quad T_i^{1*} < T_i^{2*} and T_i^{2*} > T_i^{0*} \\ 0 & otherwise \end{cases} \qquad (2)$$

using the limited sample where the hypothetical scenario is a 100% coinsurance rate for the actually insured and the actual coinsurance rate for the actually uninsured. The actually insured, who face a 20% or 30% coinsurance rate, have great difficulty imagining choice under this scenario, whereas the actually uninsured can easily imagine it.

The explanatory variable N_i is the present actually uninsured dummy and M_i is the all uninsured dummy. If these dummies are significant, this should be interpreted as evidence of bias arising from hypothetical scenarios. Other explanatory variables and the estimation method are the same, as in the previous subsection.

Table5 shows the estimation results. The all uninsured dummy has a significantly positive effect on demand for medical services, but a significantly negative effect on demand for OTC medicine. The marginal effect of these coefficients indicates that the bias is about 12.6 percentage points for the demand for medical service and 12.7 percentage points for the demand for OTC medicine. We therefore conclude that this bias is very large and cannot be ignored.

6.Concluding Remarks

This paper examines by means of Conjoint Analysis the choice of treatment by people suffering from the common cold in Japan. A 10% increase in the real coinsurance rate decrease by 6.27 percentage points the demand for medical services, and increases 4.08 percentage points the demand for OTC medicine. Both these estimated results are higher than those of Ii and Ohkusa(1999b). To account for the differences between the two research projects, we have analysed the bias arising from hypothetical choice and the bias arising from hypothetical scenarios. Our empirical results show that the former bias in the demand for medical services is bigger than that for the demand for OTC medicine, and that the later grew by up to 12 percentage points.

The problems arising from these biases are common to all research projects using CA. We believe that the analysis of these biases and the method of controlling them is an important issue in future research.

Footnote:

*)We would like to acknowledge the cooperation of Prof. Shigeno in Osaka City University with respect to the overall design of the questionnaire. Needless to say, any remaining errors are ours.

1) Bryan et al(1998) also focused on the biases arising from the design of CA. They checked the robustness of results by comparing two estimators from different samples. However, they don't investigate the biases arising from hypothetical choice and hypothetical scenarios.

2)In Japan, there are two types of health insurance: regional and employment-based. In the employment-based health insurance, the coinsurance rate of the insured is 20% for all services, while their dependents' rete are 20% for inpatient service, and 30% for their outpatient services. However their actual coinsurance rates may be lower than the legal rate, since employees of large companies are subsided. In the regional health insurance, a coinsurance rate of all subscribers is 30% for all service.

3)Multinominal Probit model with random effect was used for estimates in Daganzo(1979) and Hauseman and McFadden(1984).

4)For example, because the coinsurance rate of regional health insurance does not become 30% or less, the number of k differs between an individuals.

5)This procedure is as accurate as Keane(1992)has shown.

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Table1: Descriptive Statistics

	Mean	Standard Deviatior	Minimum	Maximum
Age	47.53631	11.9013	20	78
Gender	0.42463	0.49474	0	1
Education status	0.56801	0.49581	0	1
Presence of dependents	0.83824	0.36857	0	1
Working status in this year	0.76326	0.42549	0	1
Working status in the last year	0.7114	0.45353	0	1
Health status	0.95327	0.21126	0	1
Labor income in the last year	510.6329	387.02904	0	2250
Household income in the last year	718.0985	450.1444	0	2250
Household income-Labor income	339.1892	400.93148	0	1950
Household assets	2619.39	2284.96782	0	7500
Attendance of life insurance	0.88603	0.31807	0	1
Attendance of private health insurance	0.56985	0.49555	0	1
The actually uninsured in this year	0.007353	0.085512	0	1
The actually uninsured	0.034926	0.18376	0	1
Actual coinsurance ratio	0.234465	0.0891138	0	1

Notes:
“ Gender ” takes 1 if female and 0 if male. “ Education ” takes 1 if graduated from a university or collage and takes 0 if not. “ Presence of dependents ” takes 1 if they have dependents and 0 if not. “ Working status in the last year ” and “ Working status in this year ” take 1 if working and 0 if not. “ Attendance of private insurance ” and “ Attendance of life insurance ” take 1 if they attend the insurance and 0 if not. “ The actually uninsured ” takes 1 if they were the actually uninsured in last year or are the one in this year and takes 0 if otherwise. “ Health status ” takes 1 if they reports “ fine ” , “ usually ” and “ not fine much ” and takes 0 if otherwise. “ Labor income ” and “ Household income ” are showed at 10,000 yen.

Table2: Distribution of Coinsurance Rates

Actual Coinsurance Rate	Number of Samples	Percentage	Cumulative Percentage
0	5	1.03	1.03
0.1	9	1.85	2.88
0.15	7	1.44	4.32
0.2	303	62.35	66.67
0.3	158	32.51	99.18
1	4	0.82	100
total	486	100	

Note: 0.1 of Actual coinsurance rate means 10%.

Table3: Estimation Result of Demand for Health Care using Conjoint Analysis

	Coefficient	Marginal Effect	*t* -values	*p* -values
[Demand for medical service]				
Age	0.0096816	0.00307657	1.816	0.069
Gender	0.1699789	0.05401531	1.202	0.229
Education	0.0067574	0.00214733	0.165	0.869
Working status in this year	-0.1447855	-0.04600944	-0.498	0.619
log(Labor income in the last year)	0.0153518	0.00487843	0.286	0.775
log(Household income in the last year)	0.0259869	0.00825803	0.567	0.571
Household assets	0.0000282	8.97E-06	1.296	0.195
Real coinsurance rate	-1.974177	-0.62734708	-11.001	0.000
constant	-0.54303		-1.23800	0.216
[Demand for OTC medicine]				
Age	-0.0111743	-0.0041939	-2.327	0.020
Gender	-0.0918302	-0.03446525	-0.734	0.463
Education	0.0197817	0.00742438	0.521	0.603
Working status in this year	-0.0626257	-0.02350436	-0.204	0.838
log(Labor income in the last year)	-0.0082176	-0.00308418	-0.147	0.883
log(Household income in the last year)	0.0808351	0.03033863	1.443	0.149
Household assets	-0.0000185	-6.94E-06	-0.883	0.377
Real coinsurance rate	1.087356	0.40810122	9.781	0.000
constant	-0.02978		-0.06500	0.948

Note:
(1)Estimation method is Trinominal Probit Model with random effect. The number of the samples is 2733(486 house), log likelihood is -2198.3691 and Pseudo R^2 is 0.0273.
The differnce of an error term of medical service and that of doing nothing is correlated with the differnce of an error term of medical service and that of OTC medicine. Their correlation coefficient(*t* -value) is 0.77(3.17). Variance of the difference of an error term of medical service and that of doing nothing is 1.21(6.96) while variance of the difference of an error term of medical service and that of OTC medicine is normalized as one. Variance of random effect in demand for medical service is 1.17(5.32) and that in demand for OTC medicine is 1.01(9.78).

(2)Explanatory variables are same as Table1.

Table4: Estimation Result of Demand for Health Care using Actual Coinsurance Rate Sample

	Coefficient	Marginal Effect	*t* -values	*p* -values
[Demand for medical service]				
Age	0.0069413	0.00274025	0.865	0.387
Gender	0.3119696	0.12315743	1.381	0.167
Education	-0.0152059	-0.00600288	-0.27	0.787
Working status in this year	0.8396021	0.3314529	1.409	0.159
log(Labor income in the last year)	-0.1343639	-0.05304337	-1.226	0.220
log(Household income in the last year)	-0.0327162	-0.01291549	-0.38	0.704
Household assets	0.0000441	1.74E-05	1.371	0.170
Real(Actual) coinsurance rate	-2.129579	-0.84070182	-2.326	0.020
constant	-0.01410		-0.01800	0.985
[Demand for OTC medicine]				
Age	-0.0074089	-0.00295558	-0.928	0.353
Gender	-0.2363165	-0.09427255	-1.074	0.283
Education	0.0288409	0.01150537	0.516	0.606
Working status in this year	-0.8171296	-0.32597338	-1.385	0.166
log(Labor income in the last year)	0.1153775	0.04602696	1.068	0.285
log(Household income in the last year)	0.0542368	0.0216364	0.619	0.536
Household assets	-0.0000384	-1.53E-05	-1.201	0.230
Real(Actual) coinsurance rate	0.8194532	0.32690035	0.954	0.340
constant	0.10432		0.13600	0.891

Note:
(1)Estimation method is Trinominal Probit Model and the number of the samples is 486, log likelihood is -405.81051 and Pseudo R^2 is 0.0252.
The differnce of an error term of medical service and that of doing nothing is correlated with the differnce of an error term of OTC medicine and that of doing nothing. Their correlation coefficient(*t* -value) is 0.64(2.47). Variance of the difference of an error term of OTC medicine and that of doing nothing is 1.12(4.19) while variance of the difference of an error term of medical service and that of doing nothing is normalized as one.

(2)Explanatory variables are same as Table1.

Table5: Estimation Result of Demand for Health Care When Coinsurance Rate is 100%

	Coefficient	Marginal Effect	t-values	p-values
[Demand for medical service]				
Age	0.0165033	0.00275376	2.169	0.030
Gender	0.0320384	0.00534584	0.151	0.880
Education	0.0311655	0.00520021	0.516	0.606
Working status in this year	0.0337776	0.00563604	0.051	0.959
log(Labor income in the last year)	-0.0221069	-0.0036887	-0.183	0.855
log(Household income in the last year)	0.0686464	0.01145416	0.546	0.585
Household assets	0.0000117	1.95E-06	0.345	0.730
The actually uninsured in this year	-0.3908659	-6.52E-02	-0.608	0.543
The actually uninsured	0.7555946	0.12607664	2.908	0.004
constant	-2.70012		-2.98400	0.003
[Demand for OTC medicine]				
Age	-0.0131898	-0.00417133	-1.98	0.048
Gender	0.0060884	0.00192549	0.036	0.971
Education	0.0602944	0.01906841	1.197	0.231
Working status in this year	-0.164274	-0.05195247	-0.391	0.696
log(Labor income in the last year)	0.0144182	0.00455982	0.188	0.851
log(Household income in the last year)	0.0842966	0.02665921	1.24	0.215
Household assets	1.06E-06	3.37E-07	0.038	0.970
The actually uninsured in this year	-0.0203321	-6.43E-03	-0.038	0.970
The actually uninsured	-0.4015091	-0.12697924	-1.687	0.092
constant	0.74397		1.27500	0.202

Note:
(1)Estimation method is Trinominal Probit Model. The number of the samples is 486, log likelihood is -418.93874 and PseudoR^2 is 0.0328.
The differnce of an error term of medical service and that of doing nothing is correlated with the differnce of an error term of OTC medicine and that of doing nothing. Their correlation coeffient(t-value) is 0.56(4.40). Variance of the difference of an error term of OTC medicine and that of doing nothing is 1.45(5.17) while variance of the difference of an error term of medical service and that of doing nothing is normalized as one.

(2)Explanatory variables are same as Table1.