

CHAPTER IV



ANALISIS AND RESULTS

This chapter provides the result as well as discussion. The result follows the conceptual framework of the study and are presented in three parts:

- 1) descriptive analysis of data
- 2) results of estimation
- 3) compare the results

4.1 Descriptive analyses of data

Table 4-1 and Table 4-2 show descriptive statistics of variables which will be used for regression analysis in the latter of this chapter.

Table 4-1 Descriptive Statistics of variables in 1998

	Mean	Median	Maximum	Minimum	Std. Dev.
HE	259.961	240.5	733	68	138.7354
INC	11039.4	10308	26054	5934	3911.666
Child	182251	140983	1121542	39530	151788.6
Elder	66950.9	53317	425975	11509	54915.22
Fe	406244	313167	2885547	75020	365745.4
Acc	17.4211	14	163	5	18.59123
Phy	236.25	97	7386	31	841.8398
Bed	1765.97	1056	28319	280	3288.486
Urban	150125	47685	5647799	7454	644136.4

Table 4-2 Descriptive Statistics of variables in 2000

	Mean	Median	Maximum	Minimum	Std. Dev.
HE	246.816	206.5	936	66	144.7678
INC	10627.3	9758	26909	4826	4035.31
Child	182793	142814	1103960	38527	152626.8
Elder	71252.8	56464.5	453567	12387	58572.65
Fe	409918	315181	2919368	78005	369120.3
Acc	17.0132	14	141	5	16.31073
Phy	237.171	95	7155	29	814.9598
Bed	1792.12	1092.5	28094	296	3243.902
Urban	150692	48073	5680380	6866	647896.8

HE

From Table 4-1 and 4-2, average monthly household health care expenditure at provincial level decreases to 246.81 Baht in 2000 from 259.96 Baht in 1998 at mean value. While Maximum number increases from 733 Baht to 936 Baht, Minimum number is stayed at similar level between the 2 years. In addition, standard deviation also increase for this 2 years. It means that the difference of health care expenditure expands among provinces.

INC

Table 4-2 shows that income also tends to have bigger difference among provinces compared with Table 4-1. Mean of income is 11039.41 in 1998 and 10627.3 in 2000. Median and Minimum decrease while Maximum increase between 1998 and 2000. As a result, standard deviation also increase.

Child

Mean of population under 14 years old increase slightly from 182251.4 in 1998 to 182793 in 2000. Both Maximum number and Minimum number decrease in the 2 years.

Elder

All of Mean, Median, Maximum and Minimum increase for the two years. It means that total number of the elderly increase and shows that Thailand has started to step into ageing society.

Fe

As a whole, we can say number of female increase in that period. Mean is 406244.4 in 1998 and 409917.5 in 2000.

Acc

We found the impact of 1997 economic crisis on health provider from these tables. The crisis influenced, especially, private hospital. As a result in it, number of hospital decrease after many private hospitals were closed down.

Phy

Physician has also been affected by economic crisis through close down of hospitals. Mean of number of physician 237.17 in 2000, increased from 236.25 in 1998 and standard deviation lower to 814.95 in 2000 from 841.83 in 1998. This means that uneven distribution of physician through country is improved.

Bed

Mean of Bed increase from 1765.97 to 1792.11, even though many private hospitals closed down after economic crisis. This is largely because public hospitals increased their beds.

Urban

We didn't find significant effects of economic crisis on urban population. In 2000, Mean of urban population is 150691.8 similar to 150124.8 in 1998.

4.2 Estimation results

Modell

The year of 1998

Table4-3 Estimation results for modell in 1998

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	101.6483	61.45036	1.654152	0.1028
INC	1.287813	0.343863	3.745139	0.0004 ^{***}
CHILD	0.031005	0.535994	0.057845	0.954
ELDER	0.678983	0.302744	2.242762	0.0283 ^{**}
FE	-10.37838	5.823773	-1.782072	0.0793 [*]
ACC	0.373228	0.124943	2.987174	0.0039 ^{***}
PHY	-0.088847	0.180257	-0.492889	0.6237
BED	0.022517	0.235616	0.095566	0.9242
URBAN	-0.275202	0.161537	-1.703654	0.0932 [*]
BKK	-0.33001	0.145223	-2.272443	0.0263 ^{**}

N= 76

*** = significant level of 1%

** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.423

Standard error of regression = 0.409

F-statistic = 7.110

Prob (F-statistic) = 0.000

Inc, Elder, Fe, Acc, Urban and BKK are significant. Adjusted R-squared is 0.423. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. F-statistic is 7.110 and this is larger than the 95 percent value. Then, we can reject the hypothesis that all coefficients of independent variable in the equation are zero.

INC

According to the estimation, we found that income and health care expenditure have positive relationship as expected. The coefficient is 1.287 and means that health care expenditure increase by 1.287% when income increases 1%. More importantly, we can state health care is “luxury goods” because the coefficient

can be interpreted as income elasticity of health care when we take log for estimation.

Child

The coefficient is 0.031 but t-statistic is too low to be reliable for result. Sign of coefficient is same as the one expected, even this is not significant statistically.

Elder

From the regression, we found positive effect of ageing on health care expenditure and significant at 5% level ($p=0.028$). The coefficient is 0.678 and it means that health care expenditure increase by 0.678% when population over 60 years old increases by 1%.

Fe

The result is significant at 10% level and coefficient is -10.378 ($p=0.079$). This shows that 1% of increment in female population leads to decrease health care expenditure by 10.378%.

Acc

The coefficient of accessibility is 0.373 and significant at 1% level ($p=0.373$). Sign of coefficient is positive as expected and it means improvement of accessibility to health facility make people spend more on health care.

Phy

Even though the result is not significant, the sign of coefficient is negative and the result is not same as expected. That shows physician does not have any incentive to increase to offer health care services. In contrast, this is expected that physician, especially at public hospital, might try to reduce their services for patients because of lack of fund at hospital or other reasons.

Bed

The result of Bed is also not significant statistically. The sign of coefficient is positive same as we expect.

Urban

The coefficient of Urban is -0.275 and significant at 10% level($p=0.093$). Sign of coefficient is negative and this is consistent with Gerdtam et al.(1992).

BKK

The coefficient of BKK is -0.330 and significant at 5% level(0.026). Sign of coefficient is negative.

*The year of 2000***Table4-4 Estimation result2 for model1 in 2000**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	40.32886	71.80965	0.561608	0.5763
INC	1.13204	0.323013	3.504627	0.0008 ^{***}
CHILD	-0.66129	0.437115	-1.512855	0.1351
ELDER	0.159582	0.510199	0.312784	0.7554
FE	-3.61833	6.689055	-0.540933	0.5904
ACC	0.036167	0.111088	0.325575	0.7458
PHY	-0.168	0.147234	-1.14104	0.258
BED	-0.37579	0.232473	-1.616502	0.1108
URBAN	0.148807	0.175139	0.849652	0.3986
BKK	0.111307	0.34659	0.32115	0.7491

N= 76

*** = significant level of 1% ** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.335

Standard error of regression = 0.439

F-statistic = 5.206

Prob (F-statistic) = 0.000

Only income is identified as having significant effect on health care expenditure. Adjusted R-squared is 0.335. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. F-statistic is 5.206 and this is larger than the 95 percent value. Then, we can reject the hypothesis that all coefficients of independent variable in the equation are zero.

INC

The coefficient of income is 1.132 and this means that health care is luxury goods same as the result of model1 for 1998. P-value is 0.000 and , therefore, we can say the estimate is significant statistically.

Child

The sign of estimate is negative, even it is not significant (p=0.135). This is not consistent with the one we expected and changed from positive in the regression result of 1998. This is maybe because people changed their health care seeking behavior after economic crisis in 1997. As mentioned in Chapter1, people tend to go

to public hospital increased dramatically (see Figure5). Moreover, children under 12 years old are offered health care services at free of charge there.

Elder

The coefficient of Age2 is 0.159 but we did not confirmed statistical significance ($p=0.755$).

Fe

Even it is not significant statistically, we got that the coefficient is -3.618, much smaller than that of year 1998 which is just after economic crisis.

Acc

The coefficient of accessibility is 0.036 and sign is positive same as our expectation. But this is not significant ($p=0.745$).

Phy

The coefficient of phy is -0.168 . Even we expected the sign is positive, the estimate has negative sign. However, t-statistic is too low and the estimate is insignificant.

Bed

The sign of coefficient is negative different from our expectation. coefficient is -0.375 but insignificant ($p=0.110$).

Urban

The coefficient of Urban is 0.148 and sign of coefficient is positive, even though the estimate is not significant.

BKK

The coefficient of BKK is 0.111 but insignificant .

*Model2**The year of 1998***Table4-5 Estimation results for model2 in 1998**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	160.0181	87.29205	1.833135	0.0771*
INC	1.171747	0.44202	2.650889	0.0129**
CHILD	-0.363493	0.903539	-0.402299	0.6904
ELDER	0.293055	0.436709	0.671053	0.5075
FE	-14.71578	8.256357	-1.782358	0.0852*
ACC	0.507394	0.17322	2.929191	0.0066***
PHY	-0.007927	0.16802	-0.047177	0.9627
BED	0.103246	0.350755	0.294353	0.7706
URBAN	-0.677984	0.238353	-2.844454	0.0081***
BKK	160.0181	87.29205	1.833135	0.0771*

N= 76

*** = significant level of 1% ** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.351

Standard error of regression = 0.382

F-statistic = 3.504

Prob (F-statistic) = 0.005

4 independent variables, Inc, Fe, Acc and Urban are significant. Adjusted R-squared is 0.351. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. F-statistic is 3.504 and this is larger than the 95 percent value. Then, we can reject the hypothesis that all coefficients of independent variable in the equation are zero.

INC

Income is a factor to effect on health care expenditure in this regression and significant at 5% level(P=0.012). Income elasticity is 1.171, similar value to modell, that is to say, health care is luxury goods

Child

Even this is not significant statistically, sign of coefficient is negative. It means that the provinces with more children has less health care expenditure.

Elder

The sign of coefficient is positive as we expected but it is insignificant.

Fe

The estimate of Gen is significant at 10% level($p=0.085$). The coefficient is -14.715 more than that of model 1. This difference tell that health care seeking behavior of women in higher income group was influenced by economic crisis than that of women in lower income group.

Acc

In model 2 for the year of 1998, accessibility to hospital is significant($p=0.006$). When accessibility is improved by 1%, that is, the number of hospital in 100,000 square km increase 1%, health care expenditure also increase 0.50%. The magnitude of coefficient is larger than that of model 1. It shows that improvement of accessibility in higher income group cause higher increment of health care expenditure than lower income group, maybe because improvement of accessibility often means establishment of private hospital, especially in higher income provinces, and push health care expenditure up more than that of public hospital.

Phy

The estimate of Phy is not significant and sign is negative. The reason why sign is negative which is not expected, is most physician work at public hospital(around 75% of total physician) and therefore, physician doesn't have incentive to increase their services or expensive treatments, which usually make health care expenditure force up. The coefficient is very small, -0.007 , much smaller than that of model 1 for 1998, even it is insignificant. It means that the magnitude of effects by physician on health care expenditure is smaller in higher income group.

Bed

The coefficient is 0.103 and sign is positive same as we expected. But we couldn't not find significant effects on health care expenditure statistically.

Urban

We got the result that urbanization has significant effect on health care expenditure among higher income group ($p=0.008$). The coefficient is -0.677 which is larger than that of model 1, -0.275 . This shows that rise in urban population put health care expenditure down, partly due to better social infrastructure.

*The year of 2000***Table4-6 Estimation results for model2 in 2000**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	75.89363	109.8644	0.690794	0.4952
INC	1.383869	0.480149	2.882164	0.0074 ^{***}
CHILD	0.00365	0.488451	0.007473	0.9941
ELDER	0.532942	0.702469	0.75867	0.4542
FE	-8.18923	10.40741	-0.786866	0.4377
ACC	0.005502	0.193085	0.028494	0.9775
PHY	-0.233825	0.196245	-1.191495	0.2431
BED	-0.259764	0.347607	-0.747292	0.4609
URBAN	0.269861	0.383363	0.703933	0.4871
BKK	75.89363	109.8644	0.690794	0.4952

N= 76

*** = significant level of 1% ** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.241

Standard error of regression = 0.534

F-statistic = 2.474

Prob (F-statistic) = 0.035

Only income is identified as having significant effect on health care expenditure. Adjusted R-squared is 0.241. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. F-statistic is 2.474 and this is larger than the 95 percent value. Then, we can reject the hypothesis that all coefficients of independent variable in the equation are zero.

INC

The coefficient of income is 1.383 and we found significant effect on health care expenditure (p=0.007).

Child

The sign of estimate is positive same as our expectation but it is insignificant statistically.

Elder

We didn't confirm significant effect of ageing on health care expenditure. Even the result of estimation was insignificant, the coefficient shows positive sign and ageing is the factor to raise health expenditure.

Fe

Coefficient is relatively high, -8.189 but it is not significant.

Acc

The coefficient of accessibility is 0.005. Although the sign of coefficient is positive as we expect, the estimate is not significant.

Phy

The coefficient of Phy is -0.233 but it is not significant.

Bed

The coefficient of Bed is -0.259 but it is not significant.

Urban

The coefficient of Urban is 0.269 but it is not significant.

Model3**The year of 1998****Table4-7 Estimation results for model3 in 1998**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.47442	99.83316	0.124953	0.9014
INC	1.765829	0.652171	2.707615	0.0112**
CHILD	1.305722	1.387392	0.941134	0.3544
ELDER	1.209388	0.612716	1.973814	0.0580*
FE	-4.2326	8.708263	-0.48604	0.6306
ACC	0.154855	0.236726	0.654153	0.5182
PHY	-0.41123	0.524233	-0.78443	0.4391
BED	0.188264	0.523704	0.359485	0.7218
URBAN	-0.16728	0.237576	-0.7041	0.487
BKK	12.47442	99.83316	0.124953	0.9014

N= 76

*** = significant level of 1% ** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.095

Standard error of regression = 0.435

F-statistic = 1.488

Prob (F-statistic) = 0.204

Inc and Elder are significant. Adjusted R-squared is 0.351. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. But F-statistic is 1.488 and this is smaller than the 95 percent value of 2.28. Then, we can't reject the hypothesis that all coefficients of independent variable in the equation are zero. This means the result is not reliable any longer.

INC

Income is a factor to effect on health care expenditure in this regression and significant at 5% level(P=0.012). Income elasticity is 1.171, similar value to model1, that is to say, health care is luxury goods

Child

Even this is not significant statistically, sign of coefficient is positive. The coefficient is 1.305.

Elder

The sign of coefficient is positive as we expected and it is significant ($p=0.058$). The coefficient is 1.209.

Fe

Although the estimate of Gen is insignificant, the coefficient is -4.232 .

Acc

The sign of coefficient is positive as we expect, but it is insignificant statistically.

Phy

The estimate of Phy is not significant and sign is negative. The coefficient is -0.411 .

Bed

The coefficient is 0.188 and sign is positive same as we expected. But we couldn't find significant effects on health care expenditure statistically.

Urban

Even it is not significant, the coefficient is -0.167 .

*The year of 2000***Table4-8 Estimation results for model3 in 2000**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	88.59717	96.53313	0.91779	0.3663
INC	1.003386	0.296662	3.382252	0.0021 ^{***}
CHILD	-2.126907	1.09051	-1.950378	0.0609 [*]
ELDER	0.070036	0.519866	0.13472	0.8938
FE	-6.530909	8.364501	-0.780789	0.4413
ACC	0.19543	0.161527	1.209891	0.2361
PHY	-0.119178	0.24649	-0.483499	0.6324
BED	-0.45591	0.245926	-1.853855	0.0740 [*]
URBAN	0.162906	0.135231	1.204645	0.2381
BKK	88.59717	96.53313	0.91779	0.3663

N= 76

*** = significant level of 1% ** = significant level of 5%

* = significant level of 10%

Adjusted R-square = 0.360

Standard error of regression = 0.327

F-statistic = 3.609

Prob (F-statistic) = 0.005

Inc, Child and Bed have significant effect on health care expenditure. Adjusted R-squared is 0.360. This estimates is robust by using White heteroskedasticity-consistent standard errors and covariance. F-statistic is 3.609 and this is larger than the 95 percent value. Then, we can reject the hypothesis that all coefficients of independent variable in the equation are zero.

INC

The coefficient of income is 1.003 and we found significant effect on health care expenditure.

Child

Although we expect positive relationship between Age and HE, we got negative sign of coefficient. The coefficient is -2.126 and it is significant statistically. This means health care expenditure decrease by 2.126% when children increase by 1%.

Elder

The coefficient shows positive sign but it is not significant statistically. The coefficient is 0.460.

Fe

Coefficient is relatively high, -8.071 but it is not significant.

Acc

The coefficient of accessibility is 0.049. The sign is positive as expected but the estimate is not significant.

Phy

The coefficient of Phy is -0.330 but insignificant ($p=0.1277$).

Bed

The coefficient of Bed is -0.547 and significant at 5% level ($p=0.035$). Sign of coefficient is negative as we didn't expect. The negative sign means people in the provinces with larger number of bed spend less for health care. This might show that utilization of health facility is not efficient as government or private health provider planned. Moreover, this is partly because people use public hospital more and utilization of private hospital lower after economic crisis.

Urban

The coefficient of Urban is 0.432 and significant at 5% level ($p=0.017$). The estimate means that health care expenditure is pushed up when urban population increases.

4.3 Analysis of estimation results

Table 4-16 indicates all coefficients of results in previous section This section considers the result of each variable based on this table.

Table 4-9 The coefficients of estimation

	Model1		Model2		Model3	
	1998	2000	1998	2000	1998	2000
INC	1.287 ^{***}	1.132 ^{***}	1.171 ^{**}	1.383 ^{***}	1.765 ^{**}	1.003 ^{***}
CHILD	0.031	-0.661	-0.363	0.003	1.305	-2.126 [*]
ELDER	0.678 ^{**}	0.159	0.293	0.532	1.209 [*]	0.070
FE	-10.378 [*]	-3.618	-14.715 [*]	-8.189	-4.232	-6.530
ACC	0.373 ^{***}	0.036	0.507 ^{***}	0.005	0.154	0.195
PHY	-0.088	-0.168	-0.007	-0.233	-0.411	-0.119
BED	0.022	-0.375	0.103	-0.259	0.188	-0.455 [*]
URBAN	-0.275 [*]	0.148	-0.677 ^{***}	0.269	-0.167	0.162
BKK	-0.330 ^{**}	0.111	-	-	-	-

^{***} = significant level of 1% ^{**} = significant level of 5%

^{*} = significant level of 10%

According to the estimation results, we obtained that income elasticity excess 1 from the results in all model of 1998 and 2000, which are consistent with previous studies by using OECD data. This states health care is a luxury good. With taking account that international comparison analysis got income elasticity excess the unity and within country analysis got less than the unity from literature reviews, these results are same as international comparison's one and not within country's one. Maybe because these results are led by big difference of income and out-of-pocket of health care expenditure. This cause the problem of accessibility to health facility related to income level.

ABAC Research Institute-KSC Internet polls reported that 30% was not covered by any health insurance schemes among the households have income more than 15,000 Baht. While 21% did not have any health insurances among the households have income less than 15,000 Baht doesn't have any health insurance (Wibulpolprasert 2002). This shows low income group is imposed double burden that is not only lack of ability to pay for health care services but also no benefit from health insurance. However, the estimates of income elasticity, which are also interpreted as the differences of health care expenditure

among provinces related to income level, suggest that the differences get narrow in 2000, judged from the elasticity in 1998 is 1.287 and 1.132 in 2000.

From the viewpoint of income level, income elasticity of higher income group is smaller than that of lower income group in 1998, even though the estimates of regression for lower income group is not significant. However, higher income group has larger elasticity than lower income group in 2000. The difference of health care expenditure among higher income group expand and the one among lower income group became narrow in the 2 years.

As for the relationship between children and health care expenditure, we didn't find any significant effects in model 1. But it is likely to have negative relationship between the 2 variables from the result in 2000, which shows coefficient is -0.661 and p-value is 0.135 , even it is not significant. Actually we found significant effect of children on health care expenditure in model3 in 2000. This might show that children became to have tendency to use public facility more and private facility less between 1998 and 2000. Generally speaking, children is needed more health care than other age groups other than the elderly. According to The health and welfare survey 2001 by NSO, 22.9% of children had sick and this is much higher than age of 10 to 49 years old. However children under 12 years old can access to have medical treatment at public hospital without any charge and children became a factor to reduce out-of-pocket of household. In addition, the 2000 year's result in model2 and model3 suggest that children in lower income household tend to get free health care treatment at public hospital more than that in higher income household. Moreover, Coefficient of model3 in 2000 is -2.126 changed from 1.305 in 1998. This means lower income group changed their health care seeking behavior for children drastically.

Next is whether Ageing is a factor to push health care expenditure up or not. The results are significant in model1 and model3 of 1998. The coefficients of estimates are 0.678 in model1 and 1.209 in model3. This might explain that the demand of the elderly for health care is not sensitive, while younger generation relatively reduced their out-of-pocket after economic crisis. This is consistent with NSO's survey. The health and welfare survey 2001 found that 35.5% of respondents answered got sick during 2 weeks before the interviews. The elderly is the highest risk group for chronic diseases and the number of admission to hospital during the past 12 months before the interviews is larger than any other age groups. Due to be having chronic diseases, the frequency to go to hospital also increases and this becomes a factor to push health care expenditure up. Coefficient is relatively

higher in model3, that is, among lower income group. It could indicate that the elderly need a certain health care regardless of other factors, such as income and etc. , partly , because the probability of suffering from chronic illness is higher. More importantly, even the elderly is covered by Medical Welfare Scheme and supposed to be offered free care at public hospitals, it is likely that the elderly prefer to have health care with out-of-pocket. This is because Medical Welfare Scheme has a problem that public hospital is under strict budget constraint of scheme. As a result, public hospitals don't try to provide "prompt and decent care" gladly (Tancharoensathien et al. 2002).

In the view of gender, we found that female has much less health care expenditure than male. Even only the estimates of model1 and model2 in 1998 are significant statistically, all estimates have negative sign and considerably large coefficient. In 1998, which is just after economic crisis, health care expenditure decrease by 10.387% when number of female increase by 1%. This tendency is more remarkable among higher income group, the coefficient is -14.715.

According to the survey on health care seeking behavior in Bangkok by Thai Farmers Research Center (called Kasikorn Research Center at present), people use public hospital more for both general illnesses and chronic illnesses and less chose clinics after economic crisis. In terms of gender, using public hospital increase, after the crisis, to 41.0% from 25.6% in male and 26.6% from 16.5% in female when they have general illnesses. While using private hospital decrease both in male and female, 22.0% from 24.2% in male and 17.6% from 23.1% This shows that people tend to go to hospital in having general illnesses but women less chose private hospital to have treatment. As for chronic illnesses, people prefer hospital, especially public hospital, to clinics. Even though men didn't change their demand for private hospital, women reduced to go there (Wibulpolprasert 2002).

Similar assertion is reached from NSO's survey. The health and welfare survey 2001 shows that 17.1% of female reports "ill", while 13.2% of male reports "ill". Moreover, female has risk to have "diseases of female genital organ" and need health care related to delivery. More importantly, the number of female who report ill is larger than that of male but more female chose "No treatment", "Used herb medicine", "Traditional healer", "Self-treatment".

However the coefficients get lower in the estimates of 2000. These show that the effect of economic crisis on health care seeking behavior of female was softened.

On concerning accessibility to hospitals, our finding is that the improvement of accessibility leads more health care expenditure as we expect. The estimates of model1 and model2 in 1998 are significant and this means accessibility has positive effect on health care expenditure, especially in higher income group. We, however, can't distinguish whether greater accessibility push health care expenditure up or high health care expenditure bring many hospital establishments. While the estimates of 2000 turned into insignificant and accessibility is not a factor to explain the difference of health expenditure any longer.

We found that the factors in supply side, such as the number of physician and bed, don't explain the difference of health care expenditure from household. The estimates of number of physician have negative sign and coefficients are relatively small. With regard of interpretation of results, it could be more precise that the provinces with more physicians have less out-of-pocket, rather than that health care expenditure decreases if the number of physician per population increases. Because we use aggregate data at provincial level and still have identification problem whether physician is independent variable or not. That is to say, we can't identify health care expenditure is lower because of more physician, or the number of physician is plenty because health care expenditure is low. Considering the agency the physician belongs to, around 20% of total physician works at private facility and the rest of 80% works at public hospital in 2000. This means physician is controlled freedom to choose workplace by themselves to a certain extent.

Another possible reason why the result shows negative sign is there is more people with health insurance in provinces where more physicians are distributed. Furthermore, Thai health system has incentive for physician to curb health care demand, as McPake (2002) refers for England system. As mentioned above, 80% of physician works at public facility and it is possible the system give an incentive to physician to reduce their services when public hospital has budget problem.

As for Bed, only result of model3 in 2000 shows significant effect on health care expenditure. Even the other results are not significant, our finding is the sign of coefficient is changed from positive in 1998 to negative in 2000. This is not consistent with our expectation in advance that Bed has positive sign. One possible reason is public share of beds. The proportion of public hospital bed is 76.8% in 1998 and 78.4% in 2000, while those of private hospital beds are 23.2% in 1998 and 21.6% in 2000. Because some public health insurance schemes (Civil Servant Medical Benefit Scheme, Medical Welfare and Health Card) restrict the beneficiary

to utilize only public facility. As a result, out-of-pocket would be lower if the more population is covered by those insurances. According to Health and Welfare Survey by NSO, it reported the uninsured dropped during 1996 and 2001. People covered by Health Card Scheme increase after economic crisis (Wibulpolprasert 2002).

In addition, improvement of coverage of Social Security Scheme is also considered as negative factor on out-of-pocket. Once the economic crisis hit on private hospitals management, 80 private hospitals were collapsed during 1998 to 2000. But this lead private hospital takes part in Social Security Scheme to obtain some patients and get revenue. As a result, out-of-pocket in urban area get lower because the insured doesn't need to pay cash at health facility which take part in the scheme. The number of insured person in SSS has been increased since the scheme has started in 1991, but it has turned into decrease in 1998 at first time. The number of insured person in 1997 is 6,084,822 and decrease to 5,418,182 in 1998, while the number of establishment which is covered by the scheme is increased from 90,656 in 1997 to 93,093 in 1998. After economic crisis in 1997, private hospital accelerate to take part in the SSS. There are 197 contractor hospitals in 1997 and increase to 205 hospitals in 1998, which are consisted by 127 public hospitals (61.96% of total) and 78 private hospitals (38.04%). In 2000, the number of hospitals reach 244 hospitals, 130 public hospitals (53.28%) and 114 private hospitals (46.70%). At the same time, the network of service provider also expanded between 1998 and 2000. The number of sub-contractor hospitals was 2,257 in 1998 and 4,014 in 2000. In particular, private hospitals were increased and the number was 2,393 (59.62% of total sub-contractor hospitals). Regarding the insured's choice of hospital, more than half of the insured choose private hospitals. Of the total of 5,575,575 in 1998, 3,041,163 selected private hospitals and 2,534,412 selected public hospitals. In 2000, the insured choose private hospitals increased to 3,368,005 and public hospitals decrease to 2,430,704. This suggests that utilization of private hospital which often causes enlarge health care expenditure, on the contrary become a push it down.

In our analysis, urbanization is a factor to decrease health care expenditure and this is consistent with the estimates of Gerdtham et al.(1992). This result is supported by the reasons as follows. The first is that people decreased to spend on health care because income fell due to the economic crisis. Economic crisis hit on urban living more severely than rural. This can explain the sign changed to positive in 2000 as macro economy has started to recover. The second reason is some health problems, such as traffic accident and occupational diseases decrease. Ministry of

Science and Technology reported that peak and average dust particles in roadside decrease in 1998 and 2000 compared with other years. These are likely to make health care expenditure get lower. But we didn't find significant effect in 2000. The last is problem of data collection for urbanization as Gerdtham et al.(1992) points out. The study states the possibility to have negative sign in the case of rough "measure of urbanization".

Additionally, urbanization includes the impact of expansion in Social Security Scheme coverage. In terms of industrial structure, more people belong to manufacturing sector and service sector in urban area and they are covered by Social Security Scheme. The expansion of coverage might have negative impact on health care expenditure.

In 2000, the signs of coefficient are turned to positive and not decreasing factor any more, even it is not significant statistically. According to ABAC Research Institute-KSC Internet polls, percentage of the uninsured in urban area is 35.3% more than 25.4% in rural area in 2000. This is thought as a reason why the sign of urbanization is positive in 2000.

We also found that the negative impact of Bangkok and the vicinity dummy variable on health care expenditure in 1998 but sign is changed to positive in 2000. One possible explanation is the impact of economic crisis. Bangkok and the vicinity is the area where monetary economy developed the most in Thailand. The economic crisis influenced Thai social and economic condition, and caused rise of unemployment rate and followed loss of income. As a result of falling of income, people reduced to spend on health care. As Chayovan et al (2000) is an example for support for this, they concluded that the crisis affected people in Bangkok more strongly than in rural and provinces.