CHAPTER 5

ANALYSIS AND RESULTS

5.1 Analysis of the Descriptive Statistics

The correlation matrix is in Table 5.1. The number of beds and number of hospitals are seriously correlated to each other because their coefficient is higher than 0.9. Therefore, these variables have the possibility of being multicollinearity. Hence, the variable for either the number of hospitals or the number of general beds, which has a lower correlation with dependent variables, must be removed. In this study, the variable for hospitals was removed because its influence on the dependent variables was relatively lower than that of beds.

Table 5.1 Correlation Matrix

Correlations

|		THEE	IP	OP	TLTCE	NC	HC	DOC	CLINIC	HOSP	BED	SANATO	HSF	SNH	HMHELP	ELDALON	HMOWN	FLOOR	INCOME	LIFEMALE	LIFEFEM	UPEL70	UPEL65
THEE	Cor	.000	.910*	.610*	.563*	.548*	.321*	.640*	.407*	.578*	.652*	.673*	.140	.289*	.441*	.558*	-.520*	-.264	-.151	-.066	.177	.089	-.072
	Sig		.000	.000	.000	.000	.028	.000	.005	.000	.000	.000	.347	.049	.002	.000	.000	.073	.311	.658	.233	.550	.630
IP	Cor	.910*	.000	.329*	.744*	.753*	.330*	.601*	.231	.685*	.791*	.794*	.332*	.483*	.283	.566*	-.358*	-.096	-.353*	.103	.427*	.192	.125
	Sig	.000		.024	.000	.000	.024	.000	.119	.000	.000	.000	.023	.001	.053	.000	.013	.522	.015	.491	.003	.195	.404
OP	Cor	.610*	.329*	1.000	.042	-.006	.181	.482*	.548*	.140	.113	.201	-.179	-.138	.443*	.255	-.317*	-.225	.201	-.200	-.247	.110	-.138
	Sig	.000	.024		.781	.971	.224	.001	.000	.348	.450	.175	.228	.354	.002	.084	.030	.128	.174	.177	.094	.463	.354
TLTCE	Cor	.563*	.744*	.042	1.000	.971*	.579*	.606*	.303*	.713*	.801*	.788*	.639*	.792*	.128	.627*	-.008	.168	-.623*	.156	.625*	.338*	.418*
	Sig	.000	.000	.781		.000	.000	.000	.038	.000	.000	.000	.000	.000	.392	.000	.958	.260	.000	.296	.000	.020	.003
NC	Cor	.548*	.753*	-.006	.971*	1.000	.367*	.550*	.206	.735*	.834*	.835*	.685*	.767*	.016	.573*	.051	.227	-.616*	.140	.609*	.298*	.404*
	Sig	.000	.000	.971	.000		.011	.000	.165	.000	.000	.000	.000	.000	.915	.000	.736	.126	.000	.348	.000	.042	.005
HC	Cor	.321*	.330*	.181	.579*	.367*	1.000	.481*	.476*	.265	.276	.221	.152	.463*	.441*	.486*	-.203	-.120	-.319*	.128	.357*	.301*	.246
	Sig	.028	.024	.224	.000	.011		.001	.001	.072	.060	.136	.306	.001	.002	.001	.171	.421	.029	.391	.014	.040	.096
DOC	Cor	.640*	.601*	.482*	.606*	.550*	.481*	1.000	.801*	.585*	.675*	.585*	.133	.431*	.550*	.672*	-.213	.083	-.195	.066	.290*	.416*	.431*
	Sig	.000	.000	.001	.000	.000	.001		.000	.000	.000	.000	.374	.002	.000	.000	.151	.580	.188	.660	.048	.004	.003
CLINIC	Cor	.407*	.231	.548*	.303*	.206	.476*	.801*	1.000	.296*	.356*	.240	-.082	.234	.604*	.622*	-.147	.027	-.075	-.138	-.009	.217	.238
	Sig	.005	.119	.000	.038	.165	.001	.000		.044	.014	.105	.584	.113	.000	.000	.325	.854	.617	.356	.954	.143	.107
HOSP	Cor	.578*	.685*	.140	.713*	.735*	.265	.585*	.296*	1.000	.921*	.762*	.431*	.456*	.130	.765*	.067	.188	-.561*	.019	.325*	.309*	.436*
	Sig	.000	.000	.348	.000	.000	.072	.000	.044		.000	.000	.003	.001	.384	.000	.657	.206	.000	.899	.026	.035	.002
BED	Cor	.652*	.791*	.113	.801*	.834*	.276	.675*	.356*	.921*	1.000	.825*	.450*	.576*	.144	.782*	.028	.236	-.624*	-.022	.397*	.285	.447*
	Sig	.000	.000	.450	.000	.000	.060	.000	.014	.000		.000	.002	.000	.333	.000	.853	.110	.000	.884	.006	.052	.002
SANATO	Cor	.673*	.794*	.201	.788*	.835*	.221	.585*	.240	.762*	.825*	1.000	.322*	.415*	.103	.598*	-.130	.038	-.399*	.168	.491*	.326*	.295*
	Sig	.000	.000	.175	.000	.000	.136	.000	.105	.000	.000		.027	.004	.492	.000	.382	.799	.006	.259	.000	.026	.044
HSF	Cor	.140	.332*	-.179	.639*	.685*	.152	.133	-.082	.431*	.450*	.322*	1.000	.483*	-.349*	.132	.338*	.340*	-.553*	-.058	.333*	.121	.300*
	Sig	.347	.023	.228	.000	.000	.306	.374	.584	.003	.002	.027		.001	.016	.377	.020	.020	.000	.699	.022	.416	.040
SNH	Cor	.289*	.483*	-.138	.792*	.767*	.463*	.431*	.234	.456*	.576*	.415*	.483*	1.000	.109	.499*	.119	.268	-.615*	.180	.572*	.219	.396*
	Sig	.049	.001	.354	.000	.000	.001	.002	.113	.001	.000	.004	.001		.466	.000	.426	.068	.000	.227	.000	.139	.006
HMHELP	Cor	.441*	.283	.443*	.128	.016	.441*	.550*	.604*	.130	.144	.103	-.349*	.109	1.000	.372*	-.480*	-.232	.266	.036	-.021	-.039	-.143
	Sig	.002	.053	.002	.392	.915	.002	.000	.000	.384	.333	.492	.016	.466		.010	.001	.116	.071	.812	.889	.797	.339
ELDALON	Cor	.558*	.566*	.255	.627*	.573*	.486*	.672*	.622*	.765*	.782*	.598*	.132	.499*	.372*	1.000	-.102	.030	-.546*	-.068	.201	.237	.340*
	Sig	.000	.000	.084	.000	.000	.001	.000	.000	.000	.000	.000	.377	.000	.010		.497	.843	.000	.649	.176	.108	.019
HMOWN	Cor	-.520*	-.358*	-.317*	-.008	.051	-.203	-.213	-.147	.067	.028	-.130	.338*	.119	-.480*	-.102	1.000	.818*	-.398*	-.132	-.010	.145	.525*
	Sig	.000	.013	.030	.958	.736	.171	.151	.325	.657	.853	.382	.020	.426	.001	.497		.000	.006	.378	.945	.330	.000
FLOOR	Cor	-.264	-.096	-.225	.168	.227	-.120	.083	.027	.188	.236	.038	.340*	.268	-.232	.030	.818*	1.000	-.341*	-.106	.105	.179	.572*
	Sig	.073	.522	.128	.260	.126	.421	.580	.854	.206	.110	.799	.020	.068	.116	.843	.000		.019	.477	.481	.228	.000
INCOME	Cor	-.151	-.353*	.201	-.623*	-.616*	-.319*	-.195	-.075	-.561*	-.624*	-.399*	-.553*	-.615*	.266	-.546*	-.398*	-.341*	1.000	.019	-.406*	-.165	-.459*
	Sig	.311	.015	.174	.000	.000	.029	.188	.617	.000	.000	.008	.000	.000	.071	.000	.006	.019		.901	.005	.269	.001
LIFEMALE	Cor	-.066	.103	-.200	.156	.140	.128	.066	-.138	.019	-.022	.168	-.058	.180	.036	-.068	-.132	-.106	.019	1.000	.710*	.245	.247
	Sig	.658	.491	.177	.296	.348	.391	.660	.356	.899	.884	.259	.699	.227	.812	.649	.378	.477	.901		.000	.098	.095
LIFEFEM	Cor	.177	.427*	-.247	.625*	.609*	.357*	.290*	-.009	.325*	.397*	.491*	.333*	.572*	-.021	.201	-.010	.105	-.406*	.710*	1.000	.356*	.444*
	Sig	.233	.003	.094	.000	.000	.014	.048	.954	.026	.006	.000	.022	.000	.889	.176	.945	.481	.005	.000		.014	.002
UPEL70	Cor	.089	.192	.110	.338*	.298*	.301*	.416*	.217	.309*	.285	.326*	.121	.219	-.039	.237	.145	.179	-.165	.245	.356*	1.000	.778*
	Sig	.550	.195	.463	.020	.042	.040	.000	.035	.052	.026	.139	.797	.108	.330	.228	.269	.014	.000	.000	.014		.000
UPEL65	Cor	-.072	.125	-.138	.418*	.404*	.246	.431*	.238	.436*	.447*	.295*	.300*	.396*	-.143	.340*	.525*	.572*	-.459*	.247	.444*	.778*	1.000
	Sig	.630	.404	.354	.003	.005	.096	.003	.107	.002	.002	.044	.040	.006	.339	.019	.000	.000	.001	.095	.002	.000	

**Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

5.2 The Rationlale to Classify the Prefectural Data into Two Groups

To find the difference of the determinants between the higher health status group (N=23) and the lower health status group (N=24), data in the study were classified into two groups by the mean of life expectancy at 70 years of age for both genders (20.60year)[35]. Life expectancy at birth was used sometimes in previous studies concerning the elderly. However, life expectancy at birth is affected by the Infant Mortality Rate. Therefore, the life expectancy at 70 years of age for both genders was used in this study as the health status of elderly. If the health status in one prefecture is higher, this life expectancy would be higher. Currently, the life expectancy at 70 years of age is calculated for both males and females separately. Therefore, the average number of this data for both males and females is not available. Hence, the weighted average using the ratio of males and females who are 70 years or over in each prefecture was used to compute the life expectancy at 70 years of age for both genders. The reason why the data were classified into two groups was that if the prefectures are classified into three groups, it reduces the degree of freedom and makes OLS estimation impossible or unreliable. The reason why the mean was used as this cutting point was that when all prefectures are plotted in a histogram, the point of mean is between the two peaks of distribution of life expectancy at 70 years of age amongst the 47 prefectures (Figure 5.1). The mean of life expectancy at 70 years of age is 20.60 years and lies between the two peaks of the distribution. In addition, the prefectures were classified in 23 prefectures for the higher group and 24 prefectures for the lower group. Therefore, the number of prefectures in each group is nearly equal. Mean of the life expectancy at 70 year of age for both gender was 20.91 years, whereas that in the lower group was 20.11 years (Appendix 3).

Figure 5.1 Distribution of Life Expectancy at 70 Years of Age (for both genders)

LIFEEX

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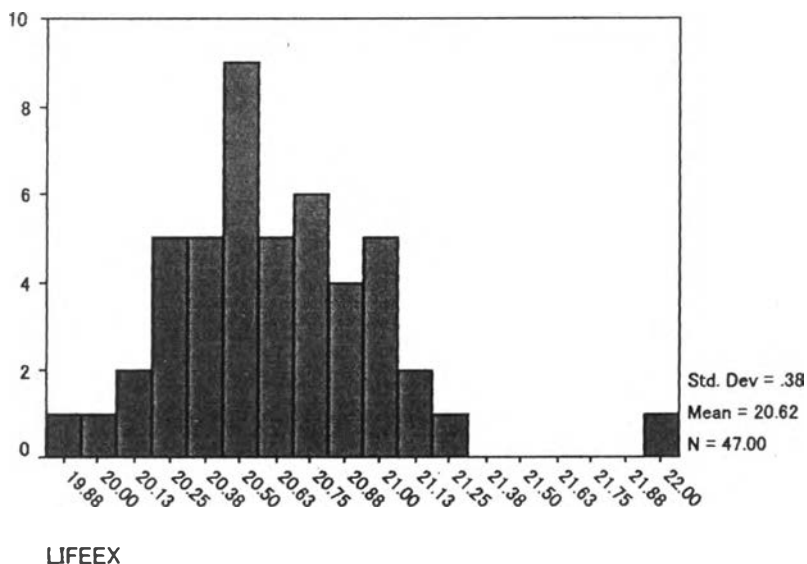
[35] This number was calculated by the weighted average by national male/female ratio using the data of national average life expectancy for both genders at 70 years of age. The average written in Figure 5.1 was calculated by the arithmetic average of the life expectancy for both genders in each prefecture.

To identify the significance of difference of THEE and LTCE between the higher life expectancy group and lower group, independent samples tests were implemented. The results are written in Table 4.1 in Appendix 4 (Raw data of two groups are in Appendix 3). The procedure is separated into two steps. Firstly, examine the Leven's Test for homoscedasticity. If the it's significance is equal or higher than 0.05, variance of two groups are not significantly different. Therefore, read the upper columns of the t-test results. If the significance is lower than 0.05, read the bottom columns of the t-test results. Secondly, examine the significance of the t-test for equality of means. If the significance of the t-test results are higher than 0.05, means of two groups are not significantly different. Table 4.1 shows only outpatient expenditure was no significantly different, whereas other expenditures (THEE, inpatient care expenditure, TLTCE and expenditure for care at nursing facilities and at homes) in higher life expectancy group were significantly higher than those in the lower group This implies that the higher health outcomes (life expectancy) is the results of the higher utilization of health and LTC services.

5.3 Results of OLS Estimation by Stepwise Method

OLS estimates have been conducted to identify the determinants of THEE and TLTCE. Inpatient care expenditure and outpatient care, which are component of THEE were also used as dependent variables. Long-term care expenditure at nursing facilities and long term care expenditure at home were also used as the dependent variables for the TLTCE. Complying with the results of the correlation matrix analysis, one of the seriously correlated variables must be removed. The number of beds was selected for this study, because the number of beds explains dependent variables better than the number of hospitals. In this study, the variable for hospitals was removed.

5.3.1 Results of the Model for Total Health Expenditure for Elderly

(Equation(1): all prefectures, Equation(7): higher group, Equation(8): lower group)[36]

Table 5.2.1 shows the results of the OLS estimations. The number of sanatorium type beds (0.480)[37] and the number of general beds (0.425) were selected as the variables that positively influence the Total Health Expenditure for Elderly in the model of all prefectural data. On the other hand, the rate of home ownership and life expectancy at 70 years of age for females were selected for the variables which negatively influence the Total Health Expenditure for Elderly. When the model for THEE was examined with the two-grouped data classified by health status (Table 5.2.2, and Table 5.2.3), the number of sanatorium type beds was selected as the major determinant of the THEE in the higher life expectancy group, while the number of sanatorium type beds and the number of home helpers were the positive determinants for THEE in the lower life expectancy group. The per capita number of

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[36] All equations are written in page 34.
[37] Number in parenthesis means the coefficient of the variable.

sanatorium type beds differs significantly: the gap between the highest prefecture in terms of the per capita number of sanatorium type beds and the lowest number prefecture is about eighteen times (Appendix 1). Life expectancy at 70 years of age for males was a negative determinant in the higher life expectancy group. This means that if a male lives longer, it reduces the time for females to live alone. Therefore, the expenditure for Social Hospitalization would be decreased. In contrast, life expectancy at 70 years of age for female was a negative determinant of THEE in the lower life expectancy group. The health status in the lower life expectancy group is worse than that of the higher life-expectancy group.

(1.) Results of OLS Estimation
Table 5.2.1 OLS Results for THEE (All Prefectures)

Model Summary [e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.716[a]	.512	.501	7.922E-02
2	.834[b]	.696	.682	6.326E-02
3	.876[c]	.768	.752	5.592E-02
4	.901[d]	.813	.795	5.081E-02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNHMOWN

c. Predictors: (Constant), LNSANATO, LNHMOWN, LNBED

d. Predictors: (Constant), LNSANATO, LNHMOWN, LNBED, LNLIFEFE

e. Dependent Variable: LNTHEE

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.845	.112		52.414	.000
	LNSANATO	.124	.018	.716	6.873	.000
2	(Constant)	7.635	.358		21.300	.000
	LNSANATO	.116	.014	.671	8.026	.000
	LNHMOWN	-.415	.081	-.431	-5.155	.000
3	(Constant)	6.889	.377		18.270	.000
	LNSANATO	6.286E-02	.019	.364	3.247	.002
	LNHMOWN	-.471	.073	-.489	-6.470	.000
	LNBED	.181	.050	.407	3.649	.001
4	(Constant)	11.406	1.464		7.792	.000
	LNSANATO	8.292E-02	.019	.480	4.436	.000
	LNHMOWN	-.461	.066	-.478	-6.954	.000
	LNBED	.188	.045	.425	4.183	.000
	LNLIFEFE	-1.521	.479	-.248	-3.174	.003

a. Dependent Variable: LNTHEE

Table 5.2.2 OLS Results for THEE (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	.592	.572	8.152E−02
2	.840[b]	.705	.676	7.101E−02
3	.902[c]	.813	.783	5.801E−02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNHMOWN

c. Predictors: (Constant), LNSANATO, LNHMOWN, LNLIFEMA

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.340	.237		22.543	.000
	LNSANATO	.199	.036	.769	5.518	.000
2	(Constant)	7.447	.788		9.453	.000
	LNSANATO	.167	.033	.646	4.992	.000
	LNHMOWN	−.452	.163	−.358	−2.771	.012
3	(Constant)	15.049	2.384		6.312	.000
	LNSANATO	.152	.028	.586	5.469	.000
	LNHMOWN	−.513	.134	−.407	−3.816	.001
	LNLIFEMA	−2.519	.761	−.334	−3.311	.004

a. Dependent Variable: LNTHEE

Table 5.2.3 OLS Results for THEE (Lower Life Expectancy Group)

Model Summary [d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.720[a]	.519	.497	6.189E−02
2	.890[b]	.792	.772	4.164E−02
3	.917[c]	.841	.817	3.735E−02

a. Predictors: (Constant), LNHMHELP

b. Predictors: (Constant), LNHMHELP, LNSANATO

c. Predictors: (Constant), LNHMHELP, LNSANATO, LNLIFEFE

d. Dependent Variable: LNTHEE

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.950	.128		46.423	.000
	LNHMHELP	.136	.028	.720	4.871	.000
2	(Constant)	5.562	.114		48.969	.000
	LNHMHELP	.118	.019	.628	6.216	.000
	LNSANATO	8.075E−02	.015	.531	5.253	.000
3	(Constant)	12.871	2.959		4.349	.000
	LNHMHELP	.121	.017	.643	7.082	.000
	LNSANATO	8.444E−02	.014	.555	6.089	.000
	LNLIFEFE	−2.367	.958	−.223	−2.471	.023

a. Dependent Variable: LNTHEE

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5.3.2 Result of the Model for Inpatient Care Expenditure for Elderly

(Equation(2): all prefectures, Equation(9): higher group, Equation(10): lower group)

Table 5.3.1 shows the results of OLS estimates for inpatient care expenditure of all prefectural data. The number of general beds (0.728) as well as sanatorium type beds (0.373) were selected as the variables that positively influence the inpatient care expenditure using the data for all prefectures. On the other hand, the rate of home ownership (-0.370) and the rate of elderly living alone were selected as the variables that negatively influence the inpatient care expenditure. Both variables are related to home care availability. Inpatient care expenditure is mainly determined by the number of beds per capita in each prefecture as was done in previous studies. The number of sanatorium type beds also affects the inpatient care expenditure positively. The adjusted R square of this model was as high as 0.846.

From the result of the model for the higher life expectancy group, the coefficient of general bed is more than one (1.026) (Table 5.3.2). Therefore, a reduction in the number of general beds is more effective for cost containment in the higher life expectancy group. For the negative determinants, home ownership (-0.428) and the rate of elderly living alone were selected. Table 5.3.3 shows the result of the OLS estimates for the model of lower life expectancy group. General beds (0.549), sanatorium type beds (0.481) and the rate of upper elderly in Roken eligible citizens (0.182) were selected as the positive determinants for inpatient care expenditure in this model. The number of clinic was selected as the negative determinant of the inpatient care expenditure. The prefectures which have an abundant in the number of clinics may reduce the utilization of inpatient care services, because elderly can receive appropriate preventive and curative care at clinics in the early stages of diseases.

Table 5.3.1 OLS Results for IP (All Prefectures)

Model Summary [e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808[a]	.652	.645	9.791E-02
2	.857[b]	.735	.723	8.642E-02
3	.916[c]	.840	.829	6.798E-02
4	.927[d]	.859	.846	6.449E-02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNBED

c. Predictors: (Constant), LNSANATO, LNBED, LNHMOWN

d. Predictors: (Constant), LNSANATO, LNBED, LNHMOWN, LNELDALO

e. Dependent Variable: LNIP

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.526	.138		32.836	.000
	LNSANATO	.204	.022	.808	9.187	.000
2	(Constant)	3.009	.427		7.053	.000
	LNSANATO	.124	.029	.492	4.267	.000
	LNBED	.278	.075	.427	3.711	.001
3	(Constant)	4.664	.458		10.174	.000
	LNSANATO	9.626E-02	.024	.380	4.090	.000
	LNBED	.345	.060	.531	5.728	.000
	LNHMOWN	-.469	.089	-.333	-5.300	.000
4	(Constant)	4.247	.468		9.075	.000
	LNSANATO	9.437E-02	.022	.373	4.224	.000
	LNBED	.473	.078	.728	6.059	.000
	LNHMOWN	-.522	.087	-.370	-6.014	.000
	LNELDALO	-.148	.061	-.238	-2.406	.021

a. Dependent Variable: LNIP

Table 5.3.2 OLS Results for IP (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839[a]	.704	.690	.1003
2	.882[b]	.779	.757	8.880E-02
3	.920[c]	.847	.823	7.575E-02
4	.946[d]	.895	.872	6.446E-02
5	.943[e]	.889	.871	6.459E-02

a. Predictors: (Constant), LNSANATO
b. Predictors: (Constant), LNSANATO, LNHMOWN
c. Predictors: (Constant), LNSANATO, LNHMOWN, LNBED
d. Predictors: (Constant), LNSANATO, LNHMOWN, LNBED, LNELDALO
e. Predictors: (Constant), LNHMOWN, LNBED, LNELDALO

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.810	.291		13.078	.000
	LNSANATO	.313	.044	.839	7.064	.000
2	(Constant)	6.284	.985		6.378	.000
	LNSANATO	.276	.042	.738	6.590	.000
	LNHMOWN	-.531	.204	-.292	-2.602	.017
3	(Constant)	4.588	1.023		4.487	.000
	LNSANATO	.131	.061	.350	2.137	.046
	LNHMOWN	-.606	.176	-.333	-3.446	.003
	LNBED	.402	.138	.458	2.912	.009
4	(Constant)	3.454	.955		3.616	.002
	LNSANATO	5.993E-02	.058	.160	1.039	.313
	LNHMOWN	-.717	.155	-.394	-4.641	.000
	LNBED	.756	.170	.862	4.440	.000
	LNELDALO	-.276	.096	-.357	-2.871	.010
5	(Constant)	3.127	.904		3.460	.003
	LNHMOWN	-.779	.143	-.428	-5.455	.000
	LNBED	.900	.099	1.026	9.137	.000
	LNELDALO	-.319	.087	-.413	-3.663	.002

a. Dependent Variable: LNIP

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Table 5.3.3 OLS Results for IP (Lower Life Expectancy Group)

Model Summary [f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.725[a]	.525	.504	7.419E-02
2	.852[b]	.726	.700	5.768E-02
3	.917[c]	.840	.816	4.512E-02
4	.939[d]	.881	.856	3.994E-02
5	.954[e]	.911	.886	3.555E-02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNHMHELP

c. Predictors: (Constant), LNSANATO, LNHMHELP, LNBED

d. Predictors: (Constant), LNSANATO, LNHMHELP, LNBED, LNCLINIC

e. Predictors: (Constant), LNSANATO, LNHMHELP, LNBED, LNCLINIC, LNUPEL70

f. Dependent Variable: LNIP

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.939	.157		31.460	.000
	LNSANATO	.133	.027	.725	4.935	.000
2	(Constant)	4.550	.157		28.916	.000
	LNSANATO	.119	.021	.646	5.568	.000
	LNHMHELP	.103	.026	.455	3.923	.001
3	(Constant)	3.508	.302		11.630	.000
	LNSANATO	8.488E-02	.019	.462	4.495	.000
	LNHMHELP	9.514E-02	.021	.418	4.588	.000
	LNBED	.179	.047	.389	3.785	.001
4	(Constant)	3.636	.272		13.382	.000
	LNSANATO	9.013E-02	.017	.491	5.351	.000
	LNHMHELP	.141	.026	.620	5.488	.000
	LNBED	.243	.049	.527	4.979	.000
	LNCLINIC	-.194	.076	-.342	-2.553	.019
5	(Constant)	1.530	.894		1.711	.104
	LNSANATO	8.831E-02	.015	.481	5.884	.000
	LNHMHELP	.156	.024	.687	6.592	.000
	LNBED	.253	.044	.549	5.805	.000
	LNCLINIC	-.244	.071	-.431	-3.456	.003
	LNUPEL70	.529	.216	.182	2.447	.025

a. Dependent Variable: LNIP

5.3.3 Result of the Model for Outpatient Care Expenditure for Elderly

(Equation(3): all prefectures, Equation(11): higher group, Equation(12): lower group)

Table 5.4.1 shows the result of the OLS estimation of the model for outpatient care expenditure with all prefectural data. The number of clinics (0.506) and sanatorium type beds (0.423) were selected as the variables that positively influence the outpatient care expenditure from this model. Special Nursing Homes and life expectancy at 70 years of age for females were selected as the variables that negatively influence the outpatient care expenditure. The adjusted R square (0.463) was not as high as the model for inpatient care expenditure. The number of clinics influences the outpatient care expenditure positively. However, the number of sanatorium type beds, which functions to take care of convalescent patients, was not considered as a positive factor for outpatient care expenditure. Life expectancy at 70 years of age for females means the health status in each prefecture. Therefore, the healthier the elderly in each prefecture, the less medical services tend to be utilized.

When the data for prefectures were classified into two groups by the life expectancy (Table 5.4.2), the number of doctors (0.909) and the average disposable income per capita (0.454) were positive determinants of the outpatient care for the higher life expectancy group. The rate of upper elderly in the population of Roken insured (-0.489) was a negative determinant in the higher life expectancy group. In regards to the lower life expectancy group, the number of clinics (0.819) was a positive determinant and the capacity of Special Nursing Homes (-0.492) was a negative determinant (Table 5.4.3).

Table 5.4.1 OLS Results for OP (All Prefectures)

Model Summary [e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.555[a]	.308	.293	9.160E-02
2	.619[b]	.384	.355	8.744E-02
3	.673[c]	.453	.415	8.328E-02
4	.714[d]	.509	.463	7.983E-02

a. Predictors: (Constant), LNCLINIC

b. Predictors: (Constant), LNCLINIC, LNSNH

c. Predictors: (Constant), LNCLINIC, LNSNH, LNSANATO

d. Predictors: (Constant), LNCLINIC, LNSNH, LNSANATO, LNLIFEFE

e. Dependent Variable: LNOP

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.137	.332		12.481	.000
	LNCLINIC	.348	.078	.555	4.476	.000
2	(Constant)	5.191	.553		9.380	.000
	LNCLINIC	.399	.077	.636	5.155	.000
	LNSNH	−.175	.076	−.286	−2.320	.025
3	(Constant)	5.509	.544		10.122	.000
	LNCLINIC	.366	.075	.585	4.887	.000
	LNSNH	−.242	.077	−.396	−3.130	.003
	LNSANATO	4.974E−02	.021	.296	2.346	.024
4	(Constant)	10.876	2.506		4.341	.000
	LNCLINIC	.317	.075	.506	4.204	.000
	LNSNH	−.155	.084	−.253	−1.838	.073
	LNSANATO	7.101E−02	.023	.423	3.152	.003
	LNLIFEFE	−1.900	.868	−.319	−2.190	.034

a. Dependent Variable: LNOP

Table 5.4.2 OLS Results for OP (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.612[a]	.375	.345	8.452E−02
2	.746[b]	.556	.512	7.300E−02
3	.864[c]	.746	.706	5.660E−02

a. Predictors: (Constant), LNDOC

b. Predictors: (Constant), LNDOC, LNUPEL70

c. Predictors: (Constant), LNDOC, LNUPEL70, LNINCOME

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.140	.698		4.498	.000
	LNDOC	.459	.129	.612	3.550	.002
2	(Constant)	8.040	1.819		4.421	.000
	LNDOC	.583	.120	.777	4.865	.000
	LNUPEL70	−1.336	.468	−.456	−2.856	.010
3	(Constant)	3.990	1.772		2.252	.036
	LNDOC	.682	.097	.909	7.064	.000
	LNUPEL70	−1.433	.364	−.489	−3.940	.001
	LNINCOME	.496	.131	.454	3.777	.001

a. Dependent Variable: LNOP

Table 5.4.3 OLS Results for OP (Lower Life Expectancy Group)

Model Summary [c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.568[a]	.323	.292	9.694E−02
2	.709[b]	.503	.455	8.507E−02

a. Predictors: (Constant), LNCLINIC

b. Predictors: (Constant), LNCLINIC, LNSNH

c. Dependent Variable: LNOP

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.130	.461		8.966	.000
	LNCLINIC	.352	.109	.568	3.241	.004
2	(Constant)	5.856	.746		7.849	.000
	LNCLINIC	.507	.111	.819	4.580	.000
	LNSNH	−.332	.121	−.492	−2.751	.012

a. Dependent Variable: LNOP

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5.3.4 Result of the Model for Total Long-term Care Expenditure

(Equation(4): all prefectures, Equation(13): higher group, Equation(14): lower group)

Table 5.5.1 shows the result of the OLS estimation of the model for Total Long-term Care Expenditure with all prefectural data. Special Nursing Homes (0.448), sanatorium type beds (0.422) and Health Services Facilities for the Aged (0.213) were selected as the positive determinants of TLTCE using the data for all prefectures. The number of doctors (0.182) also slightly affect the TLTCE in a positive direction.

When the data was classified by the life expectancy (Table 5.5.2 and Table 5.5.3), the major positive determinants were sanatorium type beds (0.569) and Special Nursing Homes (0.421) for both the higher life expectancy group and the lower group. However, the third determinant was different between the two groups. In the higher life expectancy group, Health Services Facilities for the Aged (0.248) was the positive determinant of TLTCE, whereas the number of general beds (0.083) was the determinants of TLTCE.

Table 5.5.1 OLS Results for TLTCE (All Prefectures)

Model Summary [g]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839[a]	.704	.698	.1064
2	.907[b]	.823	.815	8.323E-02
3	.954[c]	.910	.904	6.009E-02
4	.962[d]	.926	.919	5.517E-02
5	.960[e]	.921	.916	5.626E-02
6	.969[f]	.939	.933	4.994E-02

a. Predictors: (Constant), LNBED

b. Predictors: (Constant), LNBED, LNSNH

c. Predictors: (Constant), LNBED, LNSNH, LNSANATO

d. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF

e. Predictors: (Constant), LNSNH, LNSANATO, LNHSF

f. Predictors: (Constant), LNSNH, LNSANATO, LNHSF, LNDOC

g. Dependent Variable: LNTLTCE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.476	.449		1.058	.296
	LNBED	.642	.062	.839	10.356	.000
2	(Constant)	−1.466	.501		−2.926	.005
	LNBED	.415	.064	.542	6.475	.000
	LNSNH	.495	.091	.455	5.439	.000
3	(Constant)	−.677	.382		−1.774	.083
	LNBED	.141	.063	.185	2.249	.030
	LNSNH	.548	.066	.504	8.271	.000
	LNSANATO	.131	.020	.441	6.436	.000
4	(Constant)	−.859	.356		−2.413	.020
	LNBED	9.816E−02	.059	.128	1.651	.106
	LNSNH	.518	.062	.476	8.402	.000
	LNSANATO	.131	.019	.440	7.004	.000
	LNHSF	.101	.034	.148	3.001	.005
5	(Constant)	−.735	.355		−2.072	.044
	LNSNH	.568	.054	.523	10.428	.000
	LNSANATO	.152	.014	.508	10.508	.000
	LNHSF	.114	.033	.168	3.436	.001
6	(Constant)	−1.219	.343		−3.552	.001
	LNSNH	.487	.054	.448	9.083	.000
	LNSANATO	.126	.015	.422	8.555	.000
	LNHSF	.145	.031	.213	4.712	.000
	LNDOC	.192	.054	.182	3.546	.001

a. Dependent Variable: LNTLTCE

Table 5.5.2 OLS Results for TLTCE (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786^a	.618	.600	9.791E−02
2	.936^b	.875	.863	5.735E−02
3	.959^c	.920	.907	4.720E−02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNSNH

c. Predictors: (Constant), LNSANATO, LNSNH, LNHSF

Coefficients ^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.584	.285		12.596	.000
	LNSANATO	.253	.043	.786	5.831	.000
2	(Constant)	−2.451E−02	.586		−.042	.967
	LNSANATO	.181	.028	.564	6.540	.000
	LNSNH	.556	.087	.554	6.420	.000
3	(Constant)	−.229	.487		−.470	.644
	LNSANATO	.183	.023	.569	8.023	.000
	LNSNH	.423	.082	.421	5.135	.000
	LNHSF	.165	.051	.248	3.245	.004

a. Dependent Variable: LNTLTCE

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Table 5.5.3 OLS Results for TLTCE (Lower Life Expectancy Group)

Model Summary [d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839[a]	.704	.691	9.304E-02
2	.886[b]	.785	.764	8.122E-02
3	.943[c]	.890	.873	5.953E-02

a. Predictors: (Constant), LNBED

b. Predictors: (Constant), LNBED, LNSNH

c. Predictors: (Constant), LNBED, LNSNH, LNSANATO

d. Dependent Variable: LNTLTCE

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.656	.604		1.086	.289
	LNBED	.614	.085	.839	7.236	.000
2	(Constant)	-.718	.719		-.998	.330
	LNBED	.447	.095	.611	4.701	.000
	LNSNH	.357	.127	.364	2.806	.011
3	(Constant)	-.865	.528		-1.637	.117
	LNBED	.251	.083	.343	3.025	.007
	LNSNH	.480	.097	.490	4.930	.000
	LNSANATO	.113	.026	.388	4.369	.000

a. Dependent Variable: LNTLTCE

5.3.5 Result of the Model for Expenditure for Care at Nursing Facilities

(Equation(5): all prefectures, Equation(15): higher group, Equation(16): lower group)

Table 5.6.1 shows the results of the OLS estimation for the model of Expenditure at Nursing Facilities. Sanatorium type beds, Special Nursing Homes, Health service facilities for the aged and doctors were selected as the variables that positively influence the long-term care expenditure at nursing facilities in this model. The adjusted R square was as high as 0.966. This means that nursing care expenditures are largely determined by these variables only.

In the higher life expectancy group(Table 5.6.2), the determinants are almost the same as the result of the estimates using the data for all prefectures: sanatorium type beds, Special Nursing Homes and Health Services Facilities for the aged were positive determinants. However, for the lower life expectancy group (Table 5.6.3), various factors such as average disposable income, average floor space of the house, the number of beds, the number of clinics as well as long-term care facilities like Special Nursing Homes, sanatorium type beds and Health Services System for the Aged influenced the Expenditure at nursing facilities.

Table 5.6.1 OLS Results for NC (All Prefectures)

Model Summary [e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.869[a]	.755	.750	.1240
2	.919[b]	.845	.838	9.975E-02
3	.960[c]	.921	.916	7.204E-02
4	.983[d]	.966	.962	4.806E-02

a. Predictors: (Constant), LNBED

b. Predictors: (Constant), LNBED, LNSNH

c. Predictors: (Constant), LNBED, LNSNH, LNSANATO

d. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF

e. Dependent Variable: LNNC

Coefficients [a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	−1.437	.524		−2.745	.009
	LNBED	.852	.072	.869	11.790	.000
2	(Constant)	−3.599	.600		−5.993	.000
	LNBED	.599	.077	.611	7.797	.000
	LNSNH	.551	.109	.396	5.051	.000
3	(Constant)	−2.654	.458		−5.795	.000
	LNBED	.271	.075	.276	3.598	.001
	LNSNH	.614	.079	.441	7.735	.000
	LNSANATO	.157	.024	.412	6.430	.000
4	(Constant)	−3.042	.310		−9.813	.000
	LNBED	.178	.052	.182	3.446	.001
	LNSNH	.550	.054	.395	10.240	.000
	LNSANATO	.157	.016	.412	9.625	.000
	LNHSF	.217	.029	.248	7.390	.000

a. Dependent Variable: LNNC

Table 5.6.2 OLS Results for NC (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.682	.667	.1181
2	.948[b]	.899	.889	6.820E-02
3	.985[c]	.970	.965	3.822E-02

a. Predictors: (Constant), LNSANATO

b. Predictors: (Constant), LNSANATO, LNSNH

c. Predictors: (Constant), LNSANATO, LNSNH, LNHSF

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.568	.343		7.482	.000
	LNSANATO	.351	.052	.826	6.717	.000
2	(Constant)	−1.815	.697		−2.603	.017
	LNSANATO	.264	.033	.622	8.023	.000
	LNSNH	.675	.103	.508	6.557	.000
3	(Constant)	−2.155	.394		−5.470	.000
	LNSANATO	.267	.018	.629	14.468	.000
	LNSNH	.453	.067	.341	6.793	.000
	LNHSF	.274	.041	.313	6.683	.000

a. Dependent Variable: LNNC

Table 5.6.3 OLS Results for NC (Lower Life Expectancy Group)

Model Summary [i]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880[a]	.774	.764	.1054
2	.909[b]	.826	.809	9.485E-02
3	.959[c]	.919	.907	6.631E-02
4	.983[d]	.966	.959	4.393E-02
5	.988[e]	.975	.969	3.844E-02
6	.991[f]	.981	.974	3.471E-02
7	.993[g]	.986	.980	3.069E-02
8	.995[h]	.991	.986	2.570E-02

a. Predictors: (Constant), LNBED

b. Predictors: (Constant), LNBED, LNSNH

c. Predictors: (Constant), LNBED, LNSNH, LNSANATO

d. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF

e. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF, LNINCOME

f. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF, LNINCOME, LNFLOOR

g. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF, LNINCOME, LNFLOOR, LNHMOWN

h. Predictors: (Constant), LNBED, LNSNH, LNSANATO, LNHSF, LNINCOME, LNFLOOR, LNHMOWN, LNCLINIC

i. Dependent Variable: LNNC

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	−1.337	.684		−1.955	.063
	LNBED	.835	.096	.880	8.688	.000
2	(Constant)	−2.759	.840		−3.285	.004
	LNBED	.662	.111	.698	5.967	.000
	LNSNH	.369	.149	.291	2.487	.021
3	(Constant)	−2.939	.588		−4.994	.000
	LNBED	.423	.092	.445	4.579	.000
	LNSNH	.520	.109	.409	4.794	.000
	LNSANATO	.138	.029	.365	4.792	.000
4	(Constant)	−3.329	.397		−8.383	.000
	LNBED	.242	.071	.255	3.427	.003
	LNSNH	.570	.073	.449	7.861	.000
	LNSANATO	.136	.019	.361	7.140	.000
	LNHSF	.190	.037	.277	5.154	.000
5	(Constant)	−7.109	1.488		−4.776	.000
	LNBED	.237	.062	.250	3.848	.001
	LNSNH	.663	.073	.522	9.110	.000
	LNSANATO	.123	.017	.326	7.051	.000
	LNHSF	.278	.047	.405	5.961	.000
	LNINCOME	.326	.125	.183	2.611	.018
6	(Constant)	−7.940	1.394		−5.696	.000
	LNBED	.243	.056	.256	4.348	.000
	LNSNH	.605	.071	.476	8.566	.000
	LNSANATO	.135	.017	.357	8.120	.000
	LNHSF	.227	.048	.331	4.746	.000
	LNINCOME	.398	.117	.223	3.400	.003
	LNFLOOR	.259	.115	.147	2.253	.038
7	(Constant)	−6.103	1.451		−4.205	.001
	LNBED	.164	.059	.173	2.773	.014
	LNSNH	.582	.063	.458	9.203	.000
	LNSANATO	.141	.015	.371	9.445	.000
	LNHSF	.259	.044	.377	5.839	.000
	LNINCOME	.288	.113	.161	2.538	.022
	LNFLOOR	.476	.136	.270	3.496	.003
	LNHMOWN	−.300	.125	−.184	−2.397	.029
8	(Constant)	−5.937	1.217		−4.878	.000
	LNBED	.104	.054	.109	1.922	.074
	LNSNH	.522	.057	.411	9.119	.000
	LNSANATO	.134	.013	.353	10.527	.000
	LNHSF	.281	.038	.410	7.405	.000
	LNINCOME	.267	.095	.150	2.804	.013
	LNFLOOR	.523	.115	.297	4.544	.000
	LNHMOWN	−.294	.105	−.180	−2.807	.013
	LNCLINIC	.130	.046	.111	2.795	.014

a. Dependent Variable: LNNC

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5.3.6 Results of the Model for Expenditure for Home Care

(Equation(6): all prefectures, Equation(17): higher group, Equation(18): lower group)

Table 5.7.1 shows the results of the OLS estimation of the model of expenditure for home care. The number of home helpers (0.569) was selected as the variable that increases home care expenditure from the result of this model. For negative determinants, average disposal income was selected. However, the adjusted R square was relatively low (0.414). This might be the result of omitted variables. Compared to the services at facilities such as inpatient care and long-term care at nursing facilities, it is more difficult to find the variables which affect home care services.

In the higher life expectancy group, the rate of upper elderly (0.589) as well as the number of home helpers (0.421) was selected as the positive determinants (Table 5.7.2). Average floor space of the house (-0.804) was selected as the negative determinant. In the lower life expectancy group, the number of home-helpers was selected as the positive determinant and the average disposable income was selected as the negative determinants (Table 5.7.3).

5.7.1 OLS Results for HC (All Prefectures)

Model Summary [c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.547[a]	.299	.284	.1355
2	.663[b]	.439	.414	.1226

a. Predictors: (Constant), LNHMHELP

b. Predictors: (Constant), LNHMHELP, LNINCOME

c. Dependent Variable: LNHC

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.996	.228		13.168	.000
	LNHMHELP	.214	.049	.547	4.386	.000
2	(Constant)	6.975	1.218		5.728	.000
	LNHMHELP	.222	.044	.569	5.036	.000
	LNINCOME	-.506	.153	-.375	-3.316	.002

a. Dependent Variable: LNHC

Table 5.7.2 OLS Results for HC (Higher Life Expectancy Group)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.413[a]	.171	.131	.1362
2	.617[b]	.380	.318	.1207
3	.744[c]	.554	.483	.1050

a. Predictors: (Constant), LNFLOOR

b. Predictors: (Constant), LNFLOOR, LNUPEL65

c. Predictors: (Constant), LNFLOOR, LNUPEL65, LNHMHELP

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.802	.843		6.887	.000
	LNFLOOR	−.485	.233	−.413	−2.081	.050
2	(Constant)	.940	2.015		.467	.646
	LNFLOOR	−.862	.252	−.735	−3.416	.003
	LNUPEL65	1.644	.633	.559	2.598	.017
3	(Constant)	3.978E−02	1.784		.022	.982
	LNFLOOR	−.943	.222	−.804	−4.253	.000
	LNUPEL65	1.732	.552	.589	3.141	.005
	LNHMHELP	.181	.067	.421	2.720	.014

a. Dependent Variable: LNHC

Table 5.7.3 OLS Results for HC (Lower Life Expectancy Group)

Model Summary [c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.656[a]	.430	.404	.1188
2	.733[b]	.537	.493	.1096

a. Predictors: (Constant), LNHMHELP

b. Predictors: (Constant), LNHMHELP, LNINCOME

c. Dependent Variable: LNHC

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.934	.246		11.925	.000
	LNHMHELP	.218	.053	.656	4.072	.001
2	(Constant)	6.263	1.526		4.104	.001
	LNHMHELP	.255	.052	.769	4.893	.000
	LNINCOME	−.438	.199	−.346	−2.206	.039

a. Dependent Variable: LNHC