

# Impact of Regional Health Insurance on the Utilization of Medical Care by the Rural Population of Korea

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*This study was conducted to determine how the regional health insurance program, put into effect nationwide, might affect patterns and extent of medical care utilization in rural areas. The study employed a "one-group, before-after design" and the data were collected from two sampling surveys conducted in Kangwha County, based on "multi-stage, stratified cluster sampling." Changes in ambulatory care utilization, as measured in terms of the number of visits per 100 persons during the two-week survey period, varied with the type of facility. Out-of-pocket expenses for medical care connected with all forms of facilities were found to have decreased during the time interval due to insurance coverage. Before insurance, when a person sought medical help at a drugstore, it was more often because it was conveniently close and he or she was old and believed himself or herself to not be seriously ill; when a person sought medical help at a clinic or hospital, it was because he or she believed himself or herself to be seriously ill (i.e. only morbidity condition was a significant factor). After insurance, when a person sought help at a drugstore, it was mainly because he or she was old and the drugstore was conveniently located; when a person sought help at a clinic or hospital, it was because he or she believed himself or herself to be seriously ill and, in addition, because the facility was conveniently located (i.e. geographical accessibility became an added factor of significance). Furthermore, knowledge of benefit coverage increased as residents gained more experience with the program during the interval between surveys.*

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**Key Words:** Health insurance, medical care utilization

During the latter part of the 1970s, the provision of health services to the general public in Korea has (remarkably) improved as a result of rapid economic growth and active government intervention through public health services and primary health care. In 1977 the government launched a compulsory health insurance program which covers the employees of various firms and institution. The medical aid program for the indigent segment of the population was also adopted.

In addition, the government selected 1 city and 5 rural counties as areas where a carefully conducted pilot study and demonstration of the regional health insurance designed to provide health care benefits for the self-employed, such as farmers and small shop owners, would be carried out in 1981 and 1982. This

program is of particular importance to the Korean situation for two reasons. First, over half of the entire population are potential enrollees of the program. Secondly, most of these potential users have no regular income, and many of them live in medically underserved areas. However, the progress made toward implementing this program has been much slower than that of the employee health insurance program due to a lack of sufficient government financial support for it and uncertainty regarding the effects of the program on medical care utilization.

The purpose of this present study is to gain an understanding of how the regional health insurance program might affect the patterns and extent of medical care utilization. The specific objectives of the study are:

1. To identify the changes in medical care utilization patterns in terms of the number of visits to various health institutions, such as drugstores, private clinics, government health centers, hospitals, and herb clinics.

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2. To measure the changes in the relation of medical care need to effective demand in terms of visits to physicians.

3. To identify the major determinants of those changes in patterns and extent of medical care utilization.

4. To identify the changes in the knowledge level of the patients concerning the program, which is important to the success of the program.

There are available reports of several studies regarding factors influencing medical care utilization. Anderson (1968) has reported that the following factors are important to health care utilization: health need, predisposing factors, and enabling factors. Aday and Eichhorn (1972), Bice and White (1969), and other researchers have suggested that a health insurance program acts as an enabling factor to increase health care utilization. There are several empirical studies supporting this, based on experience in England (Stewart and Enterline 1961), Canada (Enterline et al. 1973), and Korea (Kim et al. 1980, Yu et al. 1981). Based on the findings of these researchers and others, the following hypotheses were formulated.

1. *Overall medical care utilization will increase as a result of the introduction of health insurance.*

In another study, Klarman (1965) has suggested that health insurance increases medical care utilization by reducing a financial burden. However, it may be possible that in some circumstances in which the characteristics of health care are in some way unique, like those in the introduction of health insurance, might result in a different utilization pattern. For example, unlike those in some other countries, drugstores in Korea can sell almost any kind of medicine without a doctor's prescription, and therefore, to that extent they have been playing an important role as providers of health care. Furthermore, many Koreans still believe that herb medicine is sometimes more effective than modern medicine in the treatment of chronic illnesses. However, the practice of buying medicine without a doctor's prescription and of using herb medicine was expected to change after the health insurance program went into full effect because expenses for medicines purchased at drugstores without a doctor's prescription and for visits to herb clinics are not covered by the program.

Therefore, the second hypothesis was stated:

2. *There will be a shift in the use of drugstores or traditional herb clinics for medical care to the use of professional health care facilities such as*

*hospitals, government health centers, and private clinics.*

The last hypothesis concerns the predisposing factor, suggested by Anderson (1968). There are many foreign studies on this issue. Aday and Anderson (1974) studied the relationship between income level and utilization of medical services. They reported that income level became a less important factor after the introduction of health insurance because health insurance tends to remove the financial barrier to medical care for the low income group increasing their utilization of medical services. It was to test whether this is also true in Korea and to determine whether there are any other barriers to receiving medical care in Korea, that this third hypothesis was stated:

3. *After the introduction of the program, income level will become a less important factor affecting utilization of medical services, and geographical accessibility will become a more important factor.*

This hypothesis is of particular importance to the Korean situation since one of the primary goals of the regional health insurance program is to make medical care available to everyone.

## METHODS

### 1. Study design

The "one-group, before-after design" was used to measure changes in patterns and extent of medical care utilization and in attitudes toward health insurance by conducting surveys 2 weeks before and one year after the pilot health insurance program was put into effect, (Figure 1). To avoid the effects of unnecessary environmental variations and to focus on changes within the same group, the utilization patterns of the same households have been measured in each of the two surveys. The same month (June)

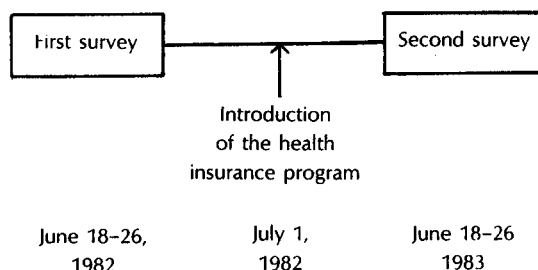


Fig. 1. Framework of the research design

**Table 1. Summary of sampling frame**

Stratum	Population	Sample	Proportion (%)
1. High accessibility	1 Eup (4,970)	1 Eup (324)	6.5
2. Medium accessibility	4 Myuns (5,099)	2 Myuns (357)	7.0
3. Low accessibility	5 Myuns (6,490)	2 Myuns (390)	6.0
	1 Eup and 9 Myuns (16,559)	1 Eup and 4 Myuns (1,071)	6.5

was chosen to avoid the influence of any seasonal variation in medical care utilization patterns. For both surveys, all data were collected from interview surveys with structured questionnaires used as guidelines by interviewers. This study employed "multi-stage stratified cluster sampling," and about 6.5 percent of the population were included in the sample based on the following steps:

**(1) Stratified sampling:** The households of the main island of Kangwha County were divided into three strata according to the distance from the Eup, which is the most heavily populated area, under the assumption that medical care utilization patterns are quite different from stratum (or area) to stratum, according to geographical accessibility to health care facilities, which are concentrated in the Eup. Since all strata are similar in size, an equal number of units (two Myuns) were randomly selected from each stratum. Table 1 provides a summary of sample size for each stratum.

**(2) Cluster sampling:** In this study, a village was chosen as a cluster (or sampling unit) to reduce costs while maintaining a reasonable representativeness for each stratum. All villages located within the previously selected two Myuns were arranged in sequential order, and then a total of 52 villages (or clusters) were systematically selected.

In the first survey questionnaires were completed by 1,103 out of 1,071 households, a response rate of 94.6 percent. In the second survey questionnaires were completed by 959 out of 1,010 households, a response rate of 94.9 percent. However, 36 of the households which completed questionnaires were new households who had moved into the sampled villages (or clusters) during the one-year period between surveys. These households were later excluded from the analysis, and, therefore, the remaining ongoing panel samples were 923 households.

## 2. Data analysis

Although the data were gathered on the basis of household units, the individual was chosen as a unit of analysis for the measurement of changes in medical care utilization, since medical care utilization markedly differs from individual to individual.

In this study, the dependent variables under consideration for outpatient care were divided into extent and patterns of medical care utilization. First, the extent was analyzed based on the number of visits and medical care expenditures, as proxy measures, for each type of health care facility (e.g., drugstore, health center, clinic, hospital, and herb clinic). Second, patterns were analyzed based on the ratio of the number of visits to each health care facility to the total number of visits.

The independent variables were divided into three categories: demographic, socio-economic, and health care need variables. Demographic independent variables included age, sex, and geographical accessibility. Socio-economic variables included income and education. Since most respondents were farmers, it was difficult to measure the exact amount of their income; the health insurance premium was used as a proxy measure of their income since the premium is proportional to the income of the household, although the measurements used for determining them could not have been exact.

Health care needs were also divided into acute conditions and chronic conditions for the purpose of this study. An acute condition was defined as a condition having a relatively short course (less than two weeks), and one that was diagnosed and treated by a physician. A chronic condition, on the other hand, was defined as one having symptoms persisting over two weeks.

The data were analyzed based on the following methods: "independent (or pooled) t-test" was used to evaluate differences in extent and patterns of

medical care utilization between the two surveys. And the chi-square test was used to test whether the change in medical care utilization patterns was related to the difference in time between the surveys (before and after). Furthermore, a series of multiple regressions was used to explain the changes in medical care utilization patterns in terms of the aforementioned independent variables.

## RESULTS AND DISCUSSION

### 1. Changes in medical care utilization

The degree of change in medical care utilization, as measured in terms of the number of visits per 100 persons during the two-week period, varied significantly according to the type of facility except for that related to herb clinics. As seen in Table 2., the number of visits to drugstores decreased from 16.3 to 10.6; the number of visits to government health centers and clinics and hospitals increased from 1.6

and 4.5 to 2.5 and 7.7, respectively. The t-test indicates statistical significance in all of the above changes. This is consistent with the earlier findings from the study of utilization patterns after the introduction of the Type I (Industrial Establishment) health insurance program of Korea. Kim *et al.* (1980) found that the number of ambulatory care visits (person per year) increased from 2.9 to 5.5 after the introduction of the Type I program.

### 2. Changes in out-of-pocket expenses

In order to clarify the reasons for changes in utilization, out-of-pocket expenses for the two-week period were measured before and after the introduction of the program. As seen in Table 3, the amount of out-of-pocket expenses for the use of drugstores decreased from 1,015 won to 623 won during the time interval.

Since the medical care benefits have been available, the utilization of drugstores has decreased. The t-test indicates statistical significance in the

Table 2. Changes in utilization of services by facility as measured during the two-week period

Facility	Health insurance program					
	Before		After		Difference	
	mean	s.d.	mean	s.d.	mean	s.d.
Outpatient visits per 100 persons						
Drugstore	16.3	56.7	10.6	46.9	5.8**	69.5
Health center and sub-center	1.6	20.4	2.5	20.3	0.9*	28.6
Clinic & hospital	4.5	43.1	7.7	57.7	3.2**	70.3
Herb clinic	1.2	15.6	1.0	13.0	-0.2	20.9
Inpatient care per 100 persons						
Admission rate	13.8	2.6	16.7	0.7	20.7*	
Inpatient days	24.1	318.6	40.1	418.5	16.1*	

\*  $p < .05$  \*\*  $p < .01$

Table 3. Changes took place between the two surveys in out-of-pocket expenses by facility

(Unit: won)

Facility	Health insurance program					
	Before		After		Difference	
	mean	s.d.	mean	s.d.	mean	
Outpatient						
Drugstore	1,015	4,918	623	3,919	-838**	
Health center and sub-center	57	645	44	170	-13	
Clinic and hospital	2,430	35,051	803	9,916	-1,637	
Herb clinic	847	16,040	430	8,328	-417	
Inpatient clinic and hospital	10,100	155,550	8,843	109,860	-1,257	

\*\*  $p < .01$

decrease. Despite the increase in utilization of clinics and hospitals, out-of-pocket expense has markedly decreased from 2,430 Won to 803 Won because the program covered the large proportion. Out-of-pocket expenses for inpatients has also decreased although it was not statistically significant.

### 3. Changes in pattern of medical care utilization

For the purpose of this study, a medical care need was defined as the state of a patient having clinical symptoms or signs during the two-week period; and an effective medical care demand was defined as the medical care need that received treatment.

As seen in Table 4, the effective demand for all facilities has slightly increased from 85.9 percent to 86.9 percent, but the effective demand for visits to physician only has significantly increased from 22.3 percent to 47.7 percent. As noted earlier, the changes are not the result of an increase in new effective demand, but rather, the result of the aforementioned shifts in utilization patterns.

The amount of unmet need can, of course, be obtained by subtracting the number of effective demands from the number of medical care needs. There are some changes in reasons for not receiving treatment (i.e., unmet need). Of these, economic reasons show the most marked change during the time interval, that is, the proportion of economic reasons to the total has decreased from 26.5 percent to 16.9 percent. This supports the claim that the program, to an extent, has removed the financial barrier to receiving medical care.

The annual hospital admission rate increased from 1.9 percent to 2.6 percent, and annual inpatient days

increased from 24.1 days to 40.1 days per 100 persons. While changes in annual admission rates and inpatient days were statistical significant, the decrease in out-of-pocket expenses was insignificant during the time interval.

Again, this result is consistent with the findings from the study of the Type I health insurance program. Annual admission rate for the Type I health insurance showed 1.8 percent before the insurance and 4.2 percent one year after the health insurance (Kim *et al.* 1980).

### 4. Variables affecting the magnitude of medical care utilization

Table 5 provides a summary of factors affecting utilization of drugstores. The two-way analysis of variance (ANOVA) indicates that the effects of age, geographical accessibility, and education level were statistically significant at the 5% level. Among three age groups, the adult group (15-54) showed the lowest utilization, perhaps due to its low morbidity rate, and the elderly (55 and over) showed the highest utilization. Accordingly, the utilization pattern for the age groups was "J" shaped. As expected, residents of the eup who reside closest to health care facilities showed the highest utilization of drugstores, but the overall rates decreased due to the shifts in utilization patterns from drugstores to hospitals and clinics. Finally, while college graduates showed the lowest utilization, their utilization rates did not significantly change during the time interval, when all other rates were decreased. Perhaps this can be explained by the more selective use of health care facilities by the better educated.

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Table 4. Changes in ambulatory medical care need and effective demand

	Health insurance program		
	Before	After	Difference
Medical care need (A)	618	459	(159)
Utilization			
All types of facilities (B)	531	399	(139)
Physician visits only (C)	138	219	81
Effective demand			
All types of facilities (B/A × 100)	85.9	86.9	1.2
Physician visits only (C/A × 100)	22.3	47.7	25.4 **
Unmet need			
All types of facilities (A - B)	87	60	(27)
Physician visits only (A - C)	480	240	(240)

\*\* p < .01

Note: Units for A, B and C are the number of cases

**Table 5. The number of visits by facilities during the two-week before and after the program according to demographic and socio-economic characteristics**

Unit: per 100 persons

Characteristics	Drugstores			Health centers			Clinics & hospitals		
	Before	After	Ratio	Before	After	Ratio	Before	After	Ratio
Age**									
Under 15	0.17	0.12	0.7	0.02	0.05	2.6	0.08	0.15	1.9
15 - 54	0.14	0.08	0.6	0.01	0.01	1.0	0.03	0.06	2.0
55 and over	0.22	0.13	0.6	0.01	0.04	4.0	0.05	0.05	1.0
Sex									
Male	0.16	0.10	0.6	0.01	0.03	3.0	0.06	0.10	1.7
Female	0.15	0.10	0.7	0.01	0.02	2.0	0.03	0.08	2.7
Geographical accessibility**									
Low	0.12	0.09	0.8	0.02	0.05	2.5	0.03	0.05	1.7
Medium	0.16	0.10	0.6	0.01	0.02	2.0	0.04	0.07	1.8
High	0.20	0.12	0.6	0.01	0.01	1.0	0.07	0.17	2.4
Income level									
Low	0.17	0.09	0.5	0.01	0.03	3.0	0.06	0.10	1.7
Medium	0.13	0.09	0.7	0.02	0.03	1.5	0.03	0.09	3.0
High	0.17	0.11	0.7	0.01	0.02	2.0	0.04	0.09	2.3
Education level of the head of household									
Elementary	0.14	0.09	0.6	0.01	0.03	3.0	0.05	0.08	1.6
Junior high	0.18	0.11	0.6	0.01	0.02	2.0	0.04	0.09	2.3
Senior high	0.20	0.13	0.7	0.01	0.02	2.0	0.05	0.11	2.2
College	0.12	0.12	1.0	0.00	0.02	—	0.01	0.12	12.0
Total	0.16	0.10	0.6	0.01	0.03	3.0	0.05	0.09	1.8

\*\*  $p < .01$ 

of age and geographical accessibility were found to be statistically significant. While the members of each age group exhibited utilization patterns similar to those related to their use of drugstores, the patterns according to geographical accessibility were somewhat different. That is, utilization of health centers (including health subcenters) increased as the geographical accessibility to clinics and hospitals decreased. This may be explained by the fact that health centers are the only professional health care facilities in most of the remote areas.

Furthermore, the factors influencing clinics and hospitals were age, sex, and geographical accessibility. While each age group showed similar patterns as in the case of other facilities, the utilization patterns for the group of 55 and over did not change during the time interval. Possible reasons for this include: economic reasons, lack of medical knowledge, and lack of (physical) assistance. Sex was also found to be

a significant factor affecting utilization patterns. As suggested by other related studies, the frequency of visits by males, especially males under 14, was higher than those for females. In addition, those who lived the closest to clinics or hospitals (i.e., high accessibility) showed the highest utilization after the initiation of the program. The results also showed that the frequency of visits to clinics or hospitals markedly varied according to geographical accessibility. This supports the third hypothesis that geographical accessibility is the one important factor influencing utilization of clinics and hospitals after the introduction of the program.

##### 5. Comparison of factors influencing utilization before and after the introduction of the program

According to the multiple regression analysis, age, geographical accessibility, and morbidity conditions (both acute and chronic) were the statistically signifi-

**Table 6. Factors affecting utilization of each facility before and after the program**

Variable	Drugstores		Health centers		Clinics and hospitals	
	Before	After	Before	After	Before	After
Age	0.058*	0.028	-0.013	0.017	-0.023	-0.029
Geographical accessibility	0.034*	0.006	-0.033**	-0.057*	0.027	0.039
Sex	0.013	-0.001	-0.004	0.027	0.028	-0.006
Acute condition	0.480*	0.319*	0.192*	0.294*	0.177*	0.276
Chronic condition	0.237*	0.156*	0.135*	0.049*	0.055*	0.126
Education level of the head of household	0.012	0.085	-0.023	-0.048*	-0.009	0.021
Income level	0.013	0.007	-0.0169	0.018	-0.023	0.002
	R <sup>2</sup> : 0.28	R <sup>2</sup> : 0.12	R <sup>2</sup> : 0.05	R <sup>2</sup> : 0.09	R <sup>2</sup> : 0.04	R <sup>2</sup> : 0.09
	F: 140.3	F: 51.6	F: 20.4	F: 37.3	F: 13.6	F: 37.3

\*  $p < .05$  \*\*  $p < .01$

(Note: The numbers in the table represent beta coefficients)

cant factors influencing utilization of drugstores before the program, but age and geographical accessibility became insignificant after the program (Table 6). The changes in factors during the time interval may be explained as follows. For both time periods, illnesses were the most important factors influencing utilization of drugstores, perhaps due to the obvious reason, that is, people use drugstores only when they have certain illness (disease conditions). However, the degree of importance, as indicated by beta coefficients, for the morbid conditions decreased during the time interval because many of those who have probably started using clinics and hospitals rather than drugstores. In summary, the regression analysis shows changes in factors during the time interval, and both regression models (before and after) seemed to be reasonable in terms of R-square (0.28, 0.12), significant F-statistics (140.3, 51.6); and signs of beta coefficients.

Furthermore, geographical accessibility and degree of morbidity, the significant factors affecting utilization of health centers before the program, and education level of the head of household were added to the equation, with negative beta coefficient, after the program. This may confirm the tendency to avoid a low cost public health care facility, in favor of private facilities, by the more educated. As mentioned earlier, geographical accessibility was significant with a negative beta coefficient because health centers were the only professional health care facilities available in most remote areas.

In addition, only the morbid conditions were significant factors affecting utilization of clinic and hospital

before the program, but geographical accessibility also became significant after the program. This may be explained by the rapid increase in the use of clinics and hospitals by residents in Eup (i.e., high accessibility area), after the introduction of the program. Income level was not a significant factor in both periods because the amount of premium probably was not a good estimator of income level. This result supports the third hypothesis, that is, apart from morbidity conditions, geographical accessibility was the most important factor influencing utilization of clinics and hospitals.

## 6. Changes in knowledge and attitude toward the program

Knowledge of the benefit coverage has increased as residents gained more experience with the program during the time interval. Especially, the proportion of those who clearly understood well has increased from 11.9 percent to 17.8 percent during this period. However, even after the respondents had one year experience with the program, only about a half (55 percent) of them correctly understood how the premium rating was derived.

While 57.8 percent felt a degree of burden from the premium, only 2.5 percent felt that the insured person's portion was relatively high. This result is consistent with the response that as an alternative to improving the financial status of the program, 56 percent of the interviewed preferred a reduction in benefit coverage, whereas only 19.6 percent preferred an increase in the premium.

Table 7. Summary of knowledge of benefit coverage

Unit: number (%)

Level of understanding	Before	After	Total
Not well understood	5 ( 0.9)	4 ( 0.7)	9 ( 0.5)
*Relatively well understood	500 ( 89.9)	459 ( 79.4)	959 ( 84.6)
**Clearly well understood	51 ( 11.9)	115 ( 19.8)	166 ( 14.6)
Total	556 (100.0)	578 (100.0)	1134 (100.0)

Chi-square: 26.1 (p&lt; 0.01)

Table 8. Alternatives to improving the financial status of the program

Alternatives	Number (%)
Increase in the premium	123 ( 19.6)
Decrease in benefit coverage	352 ( 56.0)
Don't know	147 ( 23.3)
No response	7 ( 1.1)
Total	629 (100.0)

## CONCLUSION

The three research hypotheses proposed by this study have been confirmed. That is, in this study the following changes in medical care utilization have taken place following the introduction of the program: overall medical care utilization has increased; the use of drugstores and herb clinics has decreased; and geographical accessibility has become a more important factor affecting utilization.

While the program seems to have succeeded in increasing medical care utilization, especially in the rural area, it has created another problem. That is, it has resulted in a severe financial burden for the government due to the excessive utilization of health services. As we prepare for the full expansion of the regional health insurance program throughout the country, financing mechanism of the program should be restructured. Since more than half of the respondents were financially burdened by the premium, a reduction in benefit coverage might be more desirable than an increase in the premium. In the long run, however, the government should strengthen the primary health care service capability through the health centers as a low cost alternative to the more expensive hospitals or private clinics. The findings from this study will provide useful information to help develop plans for medical facilities,

medical manpower, financing mechanism, and insurance benefit structure as we prepare for the full expansion of the regional health insurance program throughout the country.

In order to provide direction for the further study on this issue, the following suggestions are made: (1) a greater number of factors, especially health status and environmental status of residents, could be included in the analysis to provide more data to explain the reasons for the increase in medical care utilization and (2) another area, one similar to Kangwha in all aspects except health insurance status could be selected to make possible a comparison of utilization patterns (i.e. a control for confounding factors).

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