

Study on Effectiveness of Different Types of Supervision for Primary Health Care in Rural Korea (I)

I. INTRODUCTION

1. Objectives

The objectives of this study are twofold. First, this study proposes to analyze what determines the effectiveness of supervision in providing primary health care in a rural setting in Korea. Second, it proposes to investigate the relationship between the type and content of supervision and the performance in the provision of primary health care. The effectiveness of supervision is to be estimated by some predetermined scale in several areas such as motivating, training, assigning work to, and organizing work for, health workers. Health workers include CHP,¹⁾ CHA²⁾ and VHA.³⁾ The performance will be estimated by the degree of community participation, the volume of primary care offered per population, and the cost-effectiveness of services offered. In examining the determinants of effective supervision, the model of supervision as that of the first-line management will be used. The principal hypothesis to be tested is that effective supervision leads to a better performance in the provision of primary care in a rural setting in Korea.

2. Major Hypotheses of the Study and Conceptual Model of Analysis

The major hypotheses of the study are as follows:

- a. Among others, the effectiveness of supervision is determined by the model of supervision in providing primary health care as well as in other areas.

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1) Community Health Practitioner.

2) Community Health Aide.

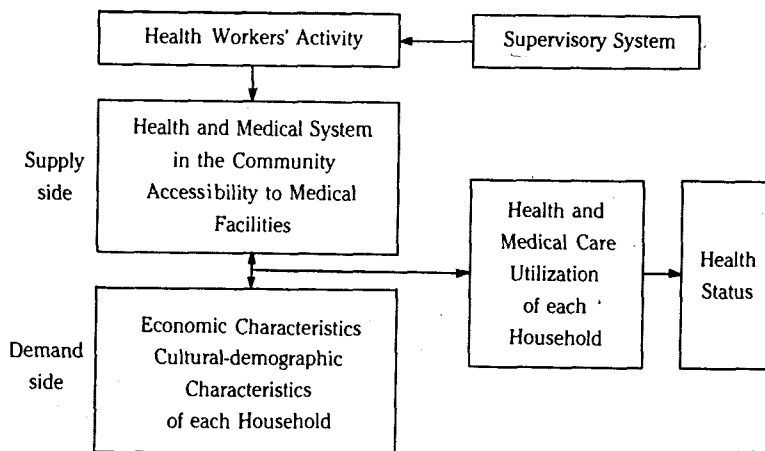
3) Village Health Agent.

- b. There is a positive relationship between the effectiveness of supervision and the performance in providing primary health care, however, the performance is measured.
- c. The types of supervision as the first-line management may be classified into two model in the broadest term—model A where supervision mainly consists of monitoring activities and model B where supervision mainly consists of monitoring and controlling activities.
- d. In providing primary health care in a rural setting, model B leads to a better performance than model A.

The above hypotheses are advanced on the basis of the conceptual model of analysis presented in Figure 1.

As shown in the figure, supervisory system is theorized to influence the supply side of health and medical care. Then, it is reasoned that interactions between providers and consumers of health services determine the utilization of the services by each household. Finally, it is theorized that the level of utilization of each household influences the health status of each member of the household. In this study, no hypotheses are advanced about the effects of supervisory system on health status because it is thought that one year is not long enough time interval to observe any discernible difference in health status which may have been caused by the difference in supervisory system.

Figure 1. Conceptual Model of Analysis



II. METHODOLOGY

1. Selection of the Experimental Site and the Sample

Chunseong *Gun* (county) has been chosen as the experimental sites for our study. Two *Myons* (township) out of eight *Myons* of Chunseong *Gun* have been chosen as the treatment and control area. At present, health workers are providing one kind or another of primary health care in Chunseong *Gun* under the sponsorship of provincial government and Seoul National University. The selection criterion is the compatibility in several key variables such as population size, age composition, per capita income as reflected in per capita tax revenue, population density, transportation, and pupil-teacher ratio.

Shindong *Myon* has been designated as the Treatment Area and Seo *Myon* as the Control Area. The supervisor who is trained in model B supervision is assigned to supervise health workers in the provision of primary health care in the Treatment Area. The other supervisor who is trained in model A is assigned to the Control Area.

In addition, one "observer" is assigned to each supervisor to monitor their supervisory activities and refine the effectiveness of their supervision. The observers accompany the supervisors once a month to record and monitor the supervisors' activity. The supervisors, then, record and submit their daily activities for review. The review of supervisors' activities record is conducted by the observers. Frequent reviews are conducted in order to gain insight on what constitute effective supervision in the provision of primary health care and, at the same time, to improve the current supervisory activities. The supervisors' recording of their activities has been done on a form made in accordance with job analysis technique and the form is up-dated and improved during the initial phase of the study period.

The study is designed to concentrate on examining the differential impacts of different kinds of supervision on the selective indices of performance in the provision of primary health care. The indices examined are: (1) the degree of community participation as measured by the attendance to Mothers' Club meeting;(2) the volume of services received as measured by the number of visits to the health center or visits of the residents by a health worker per 1,000 population.

In order to collect data on the above indices, household surveyes have been conducted at the start and at the end of this study, at a one year interval. Sampling method adopted is a 100 percent sampling of one Enumeration District (ED) from each *Myon*. The ED is a geographical unit containing about 300 households. Therefore, about 300 households in each of two *Myons* are selected for the survey. Table 1 shows the universe, sample size and response rate. As indicated in the table, response rate was very high, ranging from 93 to 99 percent.

Table 1. Sample Households and Universe

<i>Myon</i>	Total (Universe)		Sample Selected		Response Rate and No. of HDs. Surveyed (%)		
	Pop.	No. of EDs	No. of HDs	No. of EDs	No. of HDs	1981	1982
Shindong	10,989	28	2,134	4	300	297 (99.0)	280 (93.3)
Seo	8,297	20	1,535	4	300	284 (94.7)	295 (98.3)
Total	19,286	48	3,669	8	600	581 (96.8)	575 (95.8)

2. Dependent and Independent and Control Variables Selected for the Study

The household survey data have been collected for the following variables

Dependent Variables

- the number of times a member of the family had a contact with a health worker.
- the number of times a member of the family received medical treatment of any kind.
- the number of times a member of the family visited the health center for any reason.
- the quality of care or consumer satisfaction indices.
- community participation indices such as the number of times a housewife attended Mothers' Club meeting.
- cost per service contact.

Independent Variables

- dummy variables indicating whether the household is located in the Treatment Area or Control Area, i.e., subject to supervisor Type B or Type A.

Control Variables

- household income as represented by per household tax.
- the number of children in the family.
- a dummy variable indicating the sex of the head of the household.
- a dummy variable indicating whether the occupation of the head of household is farming or others.
- educational level of the head of the household.
- a dummy variable indicating whether there was a pregnancy in the family.
- the number of the times a member of family was ill.

As shown above, the dependent variables are "impact" variables which are selected to represent the effects of different types of supervision in the provision of primary health care. Control variables are

demographic and socioeconomic variables of respondents. These variables are selected on the basis of preliminary analyses of national data, theories, previous studies, and a priori reasoning as those likely to influence the dependent variables significantly.

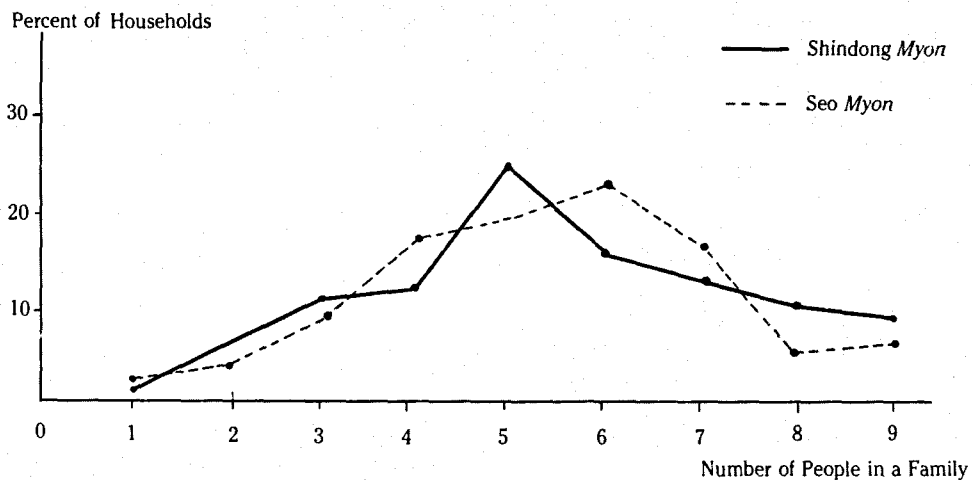
III. RESULT OF THE SURVEY

1. Descriptive Analysis of Control Variables

Inter-Myon differences in socioeconomic variables are examined through frequency distributions. Figures 2 through 7 present the frequency distribution of households of each Myon by family size, the age of head of household, schooling, occupation and income based on the 1982 survey data. The 1981 survey data on socioeconomic variables are not presented here because they are not significantly different from the 1982 data on these variables.

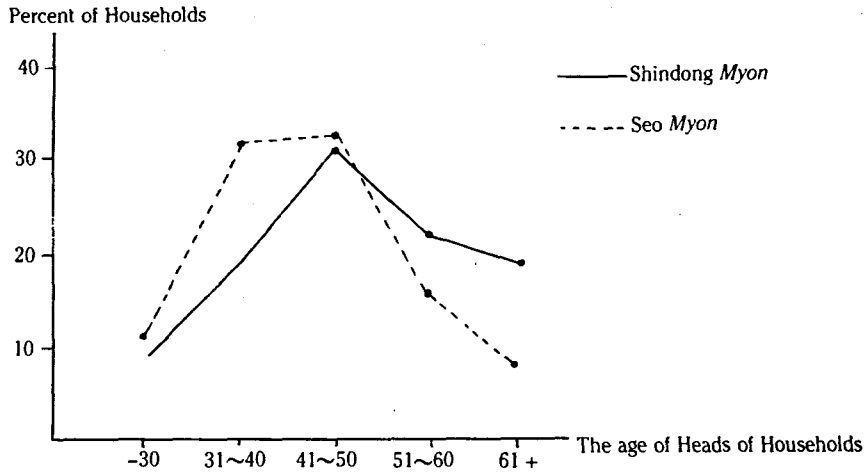
Figure 2 shows that there appears to be no significant difference in the size of family between Shindong and Seo Myon. However, the heads of households in Shindong Myon are on the average about five years older than those in Seo Myon (See Figure 3).

Figure 2. Distribution of Households by Family Size in 1982



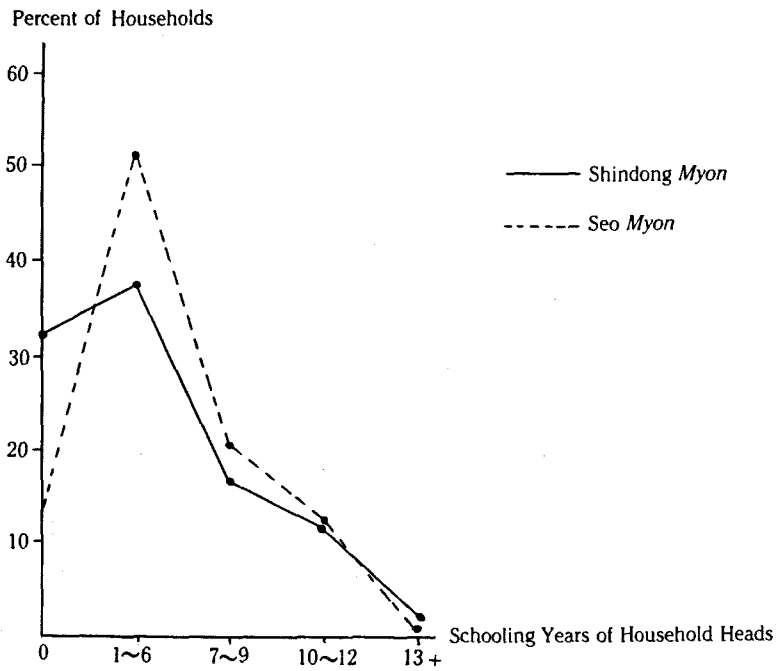
Myon	Mean	S.D.
Shindong	5.561	1.969
Seo	5.488	1.763

Figure 3. Distribution of Households by the Age of Heads of Households in 1982



<i>Myon</i>	Mean	S.D.
Shindong	48.2	12.983
Seo	43.5	11.226

Figure 4. Distribution of Households by the Years of Schooling in 1982



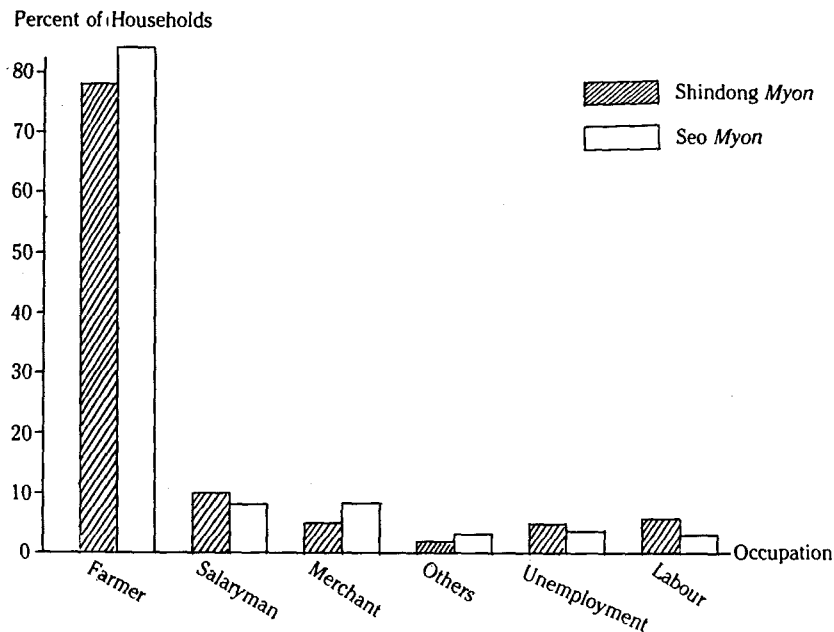
As for the years of schooling, more than a half of the heads of households in Seo Myon have primary school education and about 20 percent middle school education, whereas the figures for Shindong Myon are about 37 and 15 percent (See Figure 4). This may be due to the fact Shindong Myon residents are older than Seo Myon's.

Figure 5 shows the most of the residents of Shindong and Seo Myons are farmers. There are, however, more people engaged in other occupations or unemployed in Shindong Myon (about 22% than in Seo Myon (about 16%).

When household incomes of Shindong Myon are compared with those of Seo Myon, Seo Myon has more households in 30 to 50 million Won annual income bracket (about 22%) than Shindong Myon (about 13%). (See Figure 6.) However, Seo Myon also has more households in lower income bracket of 10 to 15 million Won (about 15%) than Shindong Myon (about 5%). When mean incomes are compared, Seo Myon's exceeds that of Shindong Myon's by slightly less than one quarter.

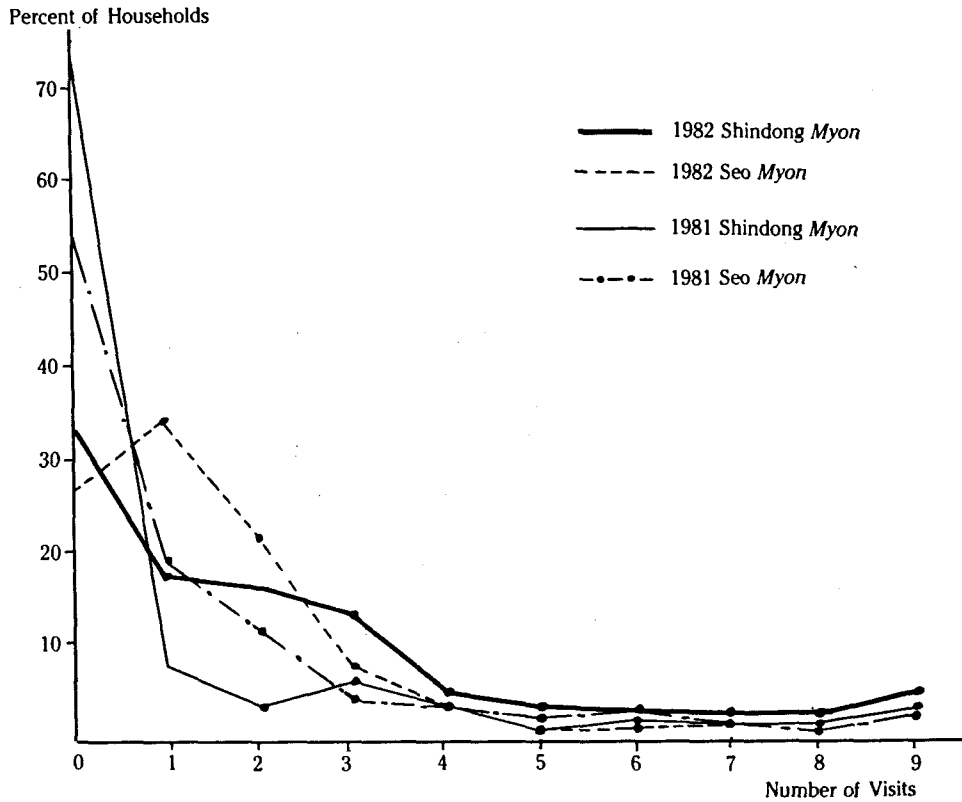
In summary, the demographic and socio-economic pictures of emerging from the above analyses show no clear patterns. Shindong Myon may be said to be more urbanized in that it has a more people on salary, a more convenient transportation, and a proportionately less farmers than Seo Myon. On the other hand, Seo Myon has a younger population, a greater average years of schooling and a higher average income than Shindong Myon. How these inter-Myon differences may influence the impact variables are difficult to

Figure 5. Distribution of Households by Occupation and Myon in 1982



a health facility of any kind for curative service during the month of interview, increased a great deal between 1981 and 1982 both for Shindong and Seo Myon. However, those who visited once or twice also increased for the residents of both Myons.

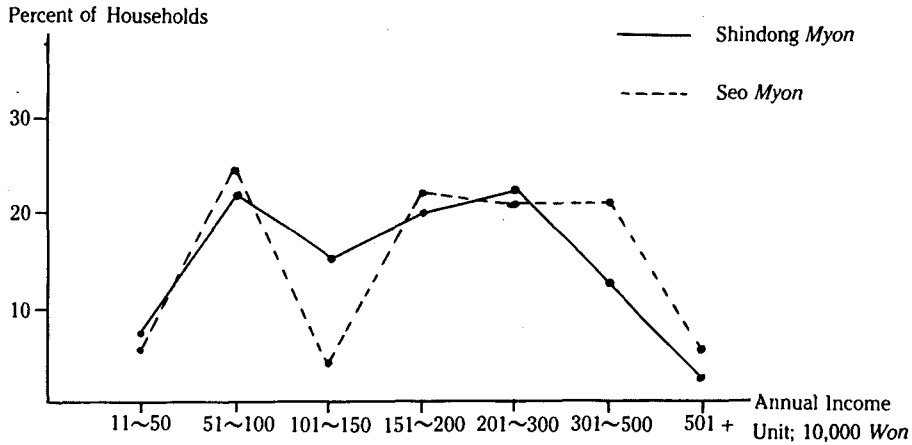
Figure 7. Number of Visits to any Health Facility for Curative Service during the Month of Interview



<i>Myon</i>	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	2.054	2.383	1982-1981 of Shindong	.000
1982 Seo	1.529	1.706	1982-1981 of Seo	.007
1981 Shindong	1.051	2.159	Shindong-Seo in 1981	.617
1981 Seo	1.134	1.829	Shindong-Seo in 1982	.002

ascertain from the above preliminary analyses. It is hoped that multiple regression analyses to follow would estimate the effects of these difference on the impact variables more activately and, therefore, succeed in holding their effects constant so that the pure impacts of supervisory models may be estimated.

Figure 6. Distribution of Households by Annual Income in 1982



<i>Myon</i>	Mean	S.D.
Shindong	20.3 million	12.7 million
Seo	24.9 million	16.2 million

2. Comparative Analyses of Inter-Year (1981~1982) Changes in Impact Variables

Frequency Distribution and Differences Between Two Means

Inter-Myon differences in the impact variables are compared between those based on the 1981 baseline survey data and those from the 1982 "post-treatment" data. The 1982 data are so called because the different models of supervision is introduced in 1981 at the time of base-line survey and the two different types of supervision are practiced until the summer of 1982 when the second survey was conducted.

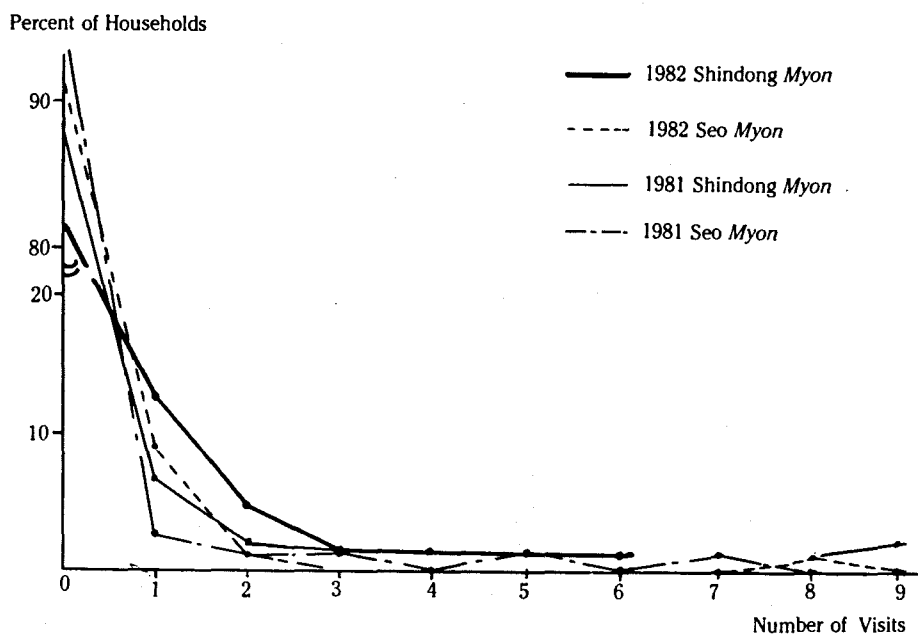
The impact variables studied in this preliminary analysis are various variables representing the utilization rate of health service and a variable representing the degree of community participation.

The first variable to be examined is the number of visits to any health facility for curative service.

A visual inspection of Figure 7 indicates that the households any of whose members have never visited

When the average numbers of visits are examined, the mean values increased (statistically) significantly between 1981 and 1982 for both Shindong *Myon* and Seo *Myon* residents. However, the increase was greater for Shindong *Myon* than for Seo *Myon* residents. Thus, the t-tests of difference of two means show that whereas the difference in the average number of visits between Shindong and Seo *Myon* was statistically insignificant (significance level = .617) in 1981, the inter-*Myon* difference became significant in 1982 (sig. level = .002). Whether the widening inter-*Myon* difference in visits for curative service is due to difference in the supervisory model is to be examined by multivariate analyses later.

Figure 8. Number of Visits to any Health Facility for Preventive Service during the Month of Interview

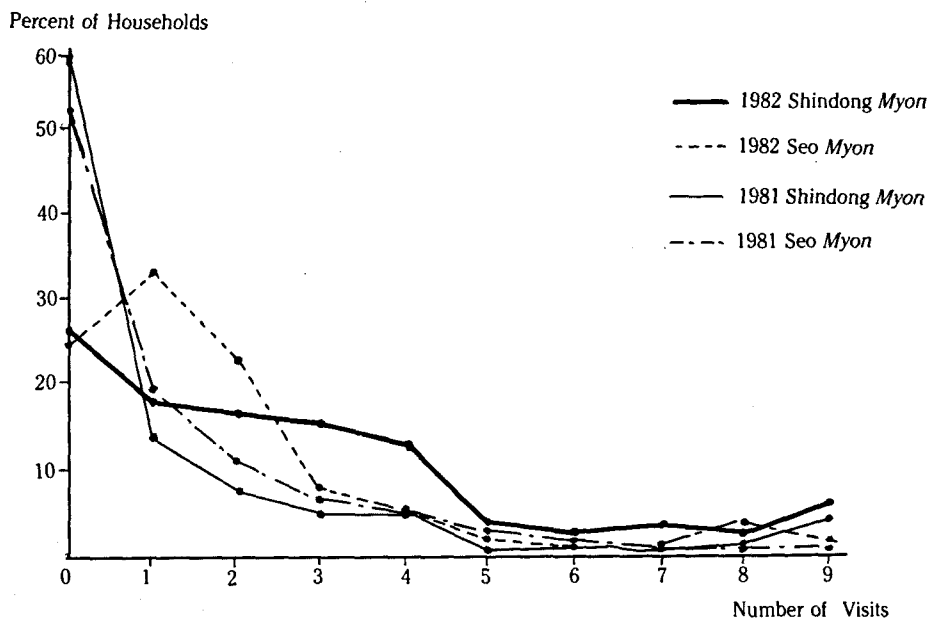


<i>Myon</i>	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	0.325	0.854	1982-1981 of Shindong	.474
1982 Seo	0.125	0.554	1982-1981 of Seo	.629
1981 Shindong	0.266	1.100	Shindong-Seo in 1981	.027
1981 Seo	0.102	0.606	Shindong-Seo in 1982	.001

When frequency distribution diagram of visits to any health facility for preventive service is examined one can discern no visible pattern according to *Myon*. (See Figure 8) This is because by far majorities 81 to 93 percent of households never visits a health facility for preventive service during the month when the interview was conducted.

The t-tests of difference of two means reveal that although the mean numbers of visits for preventive service increased between 1981 and 1982 for both Shindong and Seo *Myon*, the inter-year increase was statistically insignificant. Thus, the inter-*Myon* difference in the mean number of visits have not changed significantly, i.e., in both years, the difference remained significant.

Figure 9. Number of Visits to any Health Facility for Curative or Preventive Service during the Month of Interview

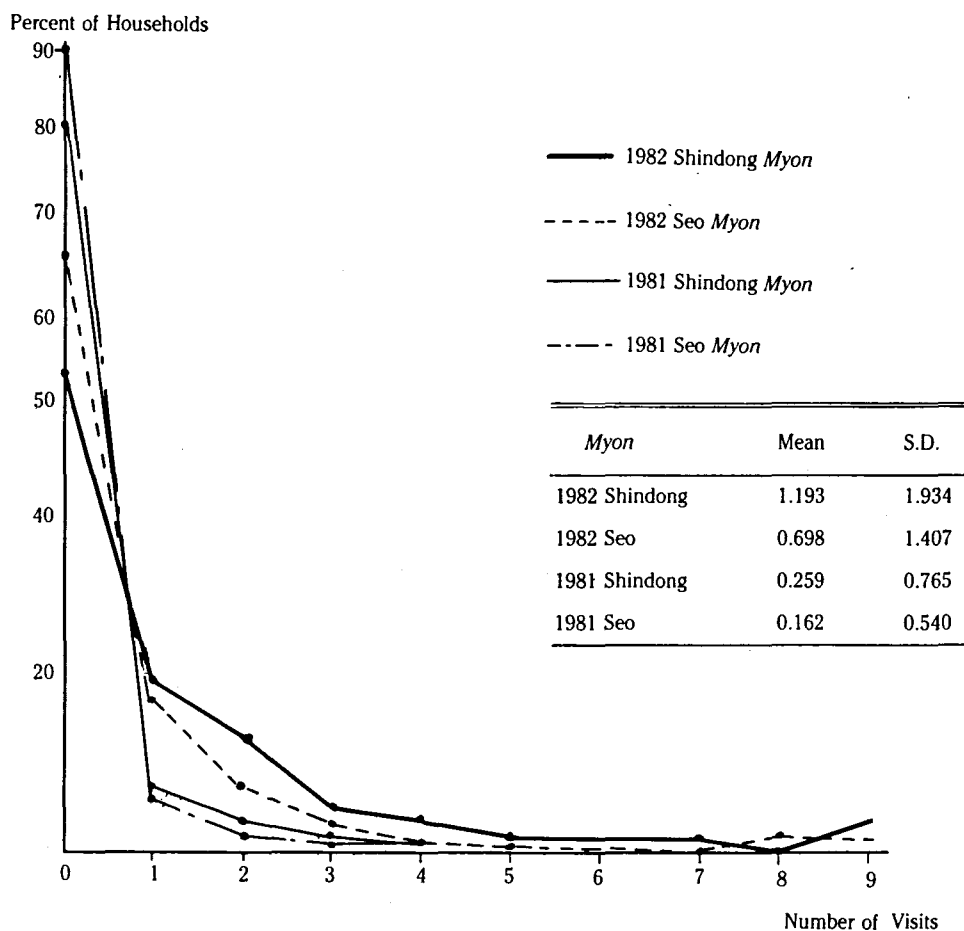


<i>Myon</i>	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	2.379	2.523	1982-1981 Shindong	.000
1982 Seo	1.654	1.823	1982-1981 Seo	.007
1981 Shindong	1.317	2.434	Shindong-Seo in 1981	.657
1981 Seo	1.236	1.887	Shindong-Seo in 1982	.000

Figure 9 shows that, when curative visits are combined with preventive visits, the total number of visits to a health facility has increased more for Shindong *Myon* than for Seo *Myon* residents between 1981 and 1982. The inter-year difference and inter-*Myon* difference in the average number of visits are similar to those observed for the visits for curative service only. This is to be expected from the fact visits for preventive service have had little impact on the number of visits for curative and preventive service. Recall that 82 to 93 percent of people never visited a health facility for preventive service.

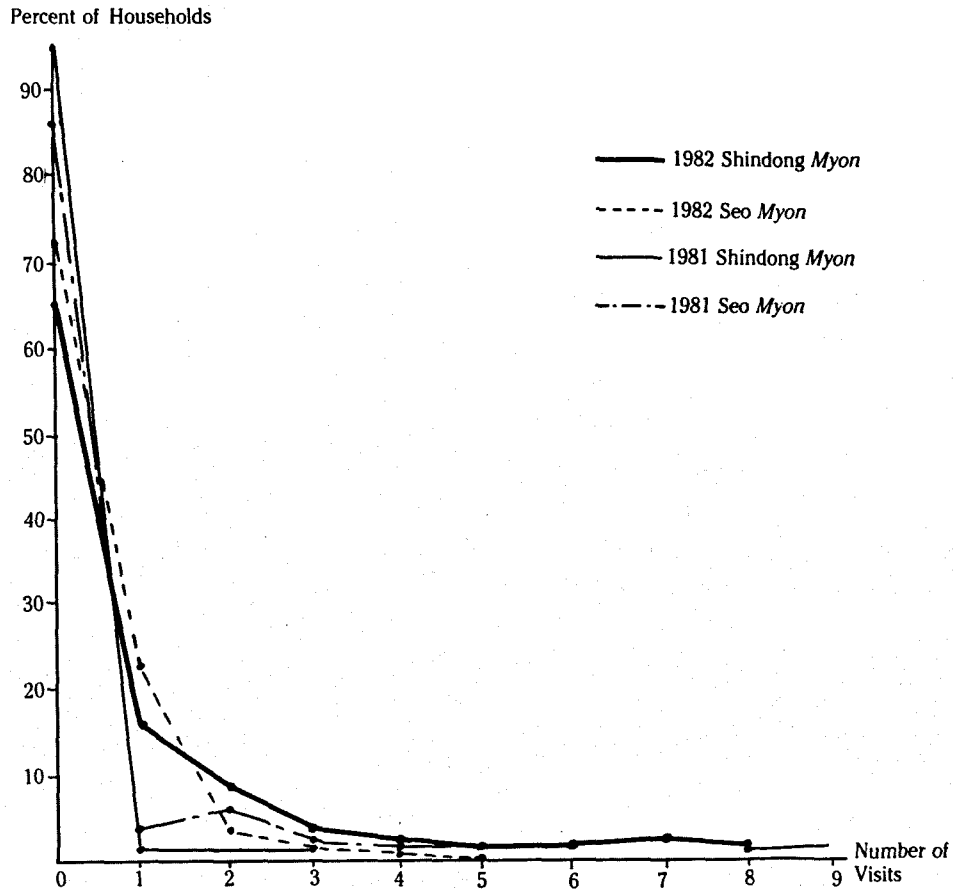
When the inter-year change in the utilization of health services by the two *Myons'* residents are examined in terms of the number of visits to local health centers, there are no discernable difference from those observed for the visits to any health facility for curative or preventive service (See Figure 10). For both Shindong and Seo *Myon* residents, "no-visits" households decreased significantly between 1981 and

Figure 10. Number of Visits to Health Centers during the Month of Interview



1982. This is translated into an increase in the mean number of visits to health centers. Thus, between 1981 and 1982, the average number of visits to health centers increased significantly for both Shindong and Seo Myon residents. However, the increase was greater for Shindong Myon than for Seo Myon

Figure 11. Number of Visits to Pharmacies during the Month of Interview



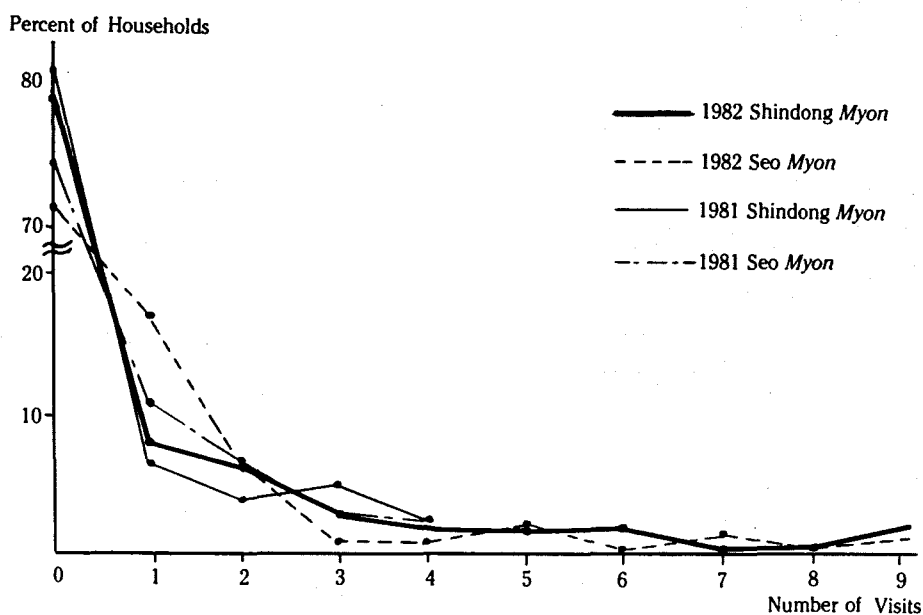
<i>Myon</i>	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	0.725	1.320	1982-1981 of Shindong	.000
1982 Seo	0.366	0.681	1982-1981 of Seo	0.738
1981 Shindong	0.128	0.820	Shindong-Seo in 1981	.006
1981 Seo	0.342	1.050	Shindong-Seo in 1982	.000

residents. Thus, whereas the inter-Myon difference in the mean number of visits was statistically insignificant (at .05 level) in 1981, it became significant (at .000 level) in 1982.

When the rate of utilization of health care is measured by the number of visits to pharmacies, it follows the same pattern set by the visits to any health facility or health center. (See Figure 11) Namely, the average number increased between 1981 and 1982 for both Shindong and Seo Myon and the magnitude of increase was greater for Shindong Myon than for Seo Myon. However, the difference in inter-year change between Shindong and Seo Myon is statistically not significant.

When the data on the visits to private hospitals or dental clinics are examined, there were no statistically significant changes between 1981 and 1982 for either Shindong or Seo Myon (See Figure 12). Since there had been no significant difference between Myon in the average number of visits in 1981, inter-year

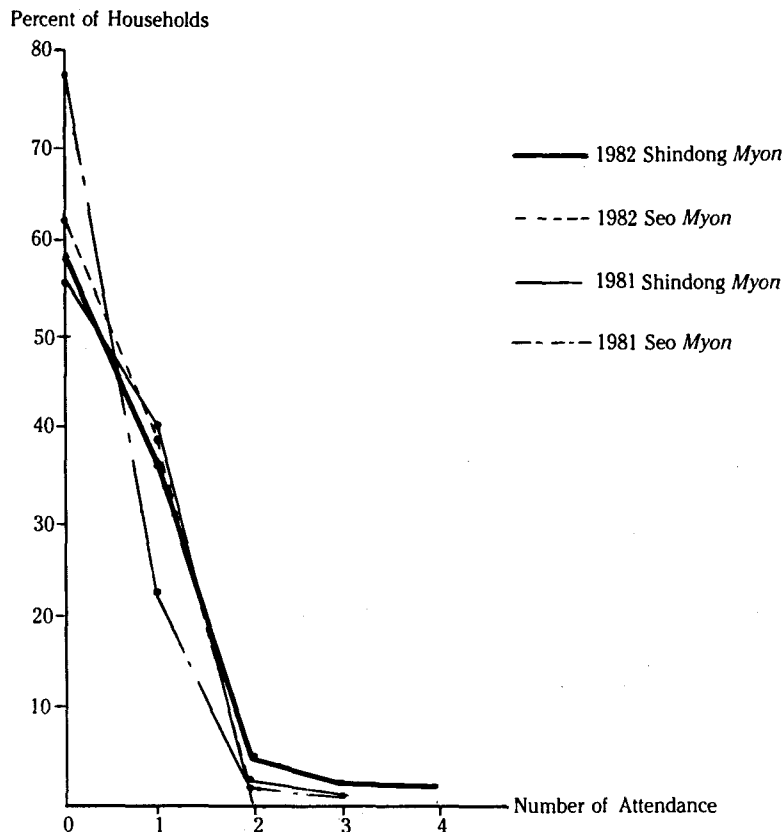
Figure 12. Number of Visits to Private Hospital or Dental Clinic



Myon	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	0.489	0.301	1982-1981 of Shindong	.236
1981 Seo	0.525	1.197	1982-1981 of Seo	.249
1982 Shindong	0.640	1.703	Shindong-Seo in 1981	.909
1981 Seo	0.655	1.492	Shindong-Seo in 1982	.729

difference remain insignificant in 1982 also. Therefore, unless there were unknown factors which operated to centralize the impacts, the difference in supervisory model apparently has had no significant impacts on the number of visits to private hospitals or dental clinics. Therefore, this is the only exception in that there were no significant changes between years and no significant difference in inter-year changes between *Myons*.

Figure 13. Number of Attendance at Mothers' Club during the Month of Interview



<i>Myon</i>	Mean	S.D.	Difference of Two Means	t-test Significance Level
1982 Shindong	0.479	0.655	1982-1981 of Shindong	.321
1982 Seo	0.383	0.487	1982-1981 of Seo	.000
1981 Shindong	0.455	0.574	Shindong-Seo in 1981	.000
1981 Seo	0.251	0.473	Shindong-Seo in 1982	.024

As mentioned before, the degree of community participation is represented by attendance rate at Mothers' Club due to the lack of data. Figure 13 shows that there have been no observable changes in the attendance rate between 1981 and 1982, except that the no-show households decreased significantly for Seo Myon mothers. This is reflected in a greater increase between 1981 and 1982 in the average attendance rate for Seo Myon residents than for Shindong Myon residents. This resulted in the inter-year change in the average number being significant for Seo Myon (significant level = .000) but being insignificant for Shindong Myon (significant level = .321).

It is interesting to note that between 1981 and 1982, the utilization rate of health services generally increased more for Shindong Myon (Type B Model) than for Seo Myon (Type A Model) as hypothesized.

IV. CONCLUSION

Of the four hypotheses listed on page 128, the most important one is the second hypothesis about the positive relationship between the effectiveness of supervision and the performance in providing primary health care. The result of testing this hypothesis leads to supporting or refuting the remaining three hypotheses. Therefore, in summarizing major findings of this study, only the result of testing the second hypothesis will be presented here.

In analyzing the effects of different types of supervision on the "performance" in providing primary health care, the performance will be measured by (1) the utilization of health care, (2) community participation, and (3) program efficiency. Accordingly, the relationship between the type of supervision and "performance" is examined by testing the following three sub-hypotheses. They are:

- a. Compared with Type A supervisory system (mainly monitoring system of supervision), Type B supervisory system (monitoring, evaluation and control system of supervision) leads to a better utilization of health care.
- b. Compared with Type A supervision, Type B supervision leads to a more active community participation.
- c. Compared with Type A supervision, Type B supervision leads to a more efficient program performance.

Hypothesis "a" is supported with a varying degree of statistical confidence level where the variation depends on the variables chosen to represent health care utilization and also on the type of regressions (will be presented later) used. Hypothesis "b" is refuted without statistically satisfactory test of the level of confidence. Hypothesis "c" has not been tested because the data are not available.

Due to the shortness of the period during which different supervisory systems are expected to exert influence on the performance variables, the utilization of health services is used instead of health status as a performance variable.

Note that whereas Shindong *Myon* (the Type B area) had less curative and pharmacy visits than Seo *Myon* (Type A area) in 1981, in 1982, the reverse was the case (see Table 3). When the utilization rate of health services is measured by the number of visits for preventive care, although Shindong *Myon* residents had more visits than Seo *Myon* residents in 1981 and the difference increased slightly in 1982, the increase is statistically not significant by t-test). All in all, the results of regression analyses show that compared with Type A supervision (passive, mainly monitoring type of supervision), Type B supervision (active type of supervision including evaluation and control) leads to a greater utilization of health care. To repeat, therefore, to the extent to which the control variables did their job of holding the effects of other factors on dependent variables constant, hypothesis "a" is supported.

As for the effect of supervision on community participation, hypothesis "b" is not supported by the data available. When community participation is measured by the number of attendance at the Mothers' Club, the attendance rate increased more for Seo *Myon* (Type A supervision area) than for Shindong *Myon* (Type B) between 1981 and 1982. The difference in the magnitude of increase is, however, not significant.

Testing of hypothesis "c" has not been carried out satisfactory because of the lack of data on costs.

In conclusion, there are many models of supervision as the first-time of management in primary health care as in other areas. Among many possible models, this study has chosen two types. Model A emphasizes a loose and hand-off approach. It mainly relies on monitoring as the best method of supervision. Model B, on the other hand, believes in a more tight supervision. It not only monitors each health worker's activities but also evaluates his performance and exercise a greater control.

The results of various analyses undertaken show that supervisory model does affect the effectiveness of supervision in improving the performance of health workers, if the performance is measured by the utilization rate of health services. The utilization rate of most categories of health services is higher for the residents of the area where model B supervision has been practiced than for those in the area where model A supervision has been practiced for one year. If the performance is measured by other indices, however, the result is inconclusive mainly due to the paucity of the data.

It can be argued rightly that the performance of health workers should ultimately be judged by the changes in the health status of the residents whom they serve. Since the project period is too short to notice any changes in health status, the utilization rate of health services is used instead as a performance index. It is reasoned that a better use of health care would improve the health of the users.

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