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Kim, I. S.; Sich, Dorothea; Kim, H. J.; Kim, Y. K.; Kim, M. S.

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DEVELOPMENT AND ORGANIZATION OF
MYUN LEVEL HEALTH CARE SERVICES
IN KOREA

농촌 보건의료조직의 개발
— 면 보건지소를 중심으로 —

Il Soon Kim, M.D., M.P.H., Dorothea Sich, M.D., M.P.H.,
Han Joong Kim, M.D., M.P.H., Young Key Kim, M.S.,
Moon Shik Kim, M.D., M.P.H.

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Department of Preventive Medicine and Public Health,
Yonsei University College of Medicine

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SUMMARY

Active discussions on the organization of national health care services are now under way in the health sector in accordance with the content of the 4th Five Year Economic Plan in which social development aspects are reflected for the first time. Among others health care for the rural residents and urban low-income groups is being given high priority. Particularly establishment of a more effective new health care delivery system is a major task because both the present urban and rural health care delivery systems in Korea are still inadequate. Thus, it is necessary to study, and to collect various kinds of data relating to this field, so that adequate, feasible plans can be made for the future.

Some observer feel that the present *gun* (county) health center, which forms the core of the public rural health care delivery network, should be strengthened to establish a basic organization for delivery of comprehensive health care services, but the unanimous opinion of specialists who have operated rural health demonstration projects is that a primary organization for comprehensive health care service in rural area should be established at the *myun* (township) level.

Through this study, the development and organization of a *myun* health care service has been tested by utilizing experiences gained in a demonstration project in Kang Wha *Gun* during the past two years. Also, various scientific methods have been utilized to organize the service so that it would fit the Korean rural situation. The most basic concept applied to this study is 'community health' which has been developed and proved to be the key concept in the solution of health problems in developing countries.

In this study, concepts and principles which are required for the various aspects of health care service organization were defined first, referral system models that are practically feasible in rural Korea were established, functions of the *myun* health subcenter (MHS) were defined, the types, number and role of the manpower required to fulfill the functions of MHS were identified, and finally the size of the subcenter building, facilities and equipment, drugs and materials as well as budget were studied in detail.

1. The 'community health concepts and approaches' applied to this study are summarized as follows: (1) The whole community population rather than the individual, is the target of health care service, (2) a referral system is set up for effective utilization of health care resources, (3) both curative and preventive services are integrated into one system in order to provide a comprehensive health care service, (4) a voluntary and positive participation by the community resident is induced, and (5) health resources are developed based on the community health needs.

Such community health approaches were applied and adjusted to the present rural situation in Korea. Three basic principles were also established and applied for the purpose of developing and organizing *myun* health care services. Firstly, development of the basic health resources needed to deliver health care and a financial plan should be done simultaneously in integrated fashion. Secondly, the health care organization should begin at the grass roots or village level where the people are living and then move upward to the *myun*, *gun* and province. Thirdly, the health care

delivery system should be organized so that both private and public health institutions located within the community can support or complement each other.

2. The *myun* health care organization should fulfill a role as the lowest and most basic unit of the rural health care system, and should serve the several villages in the *myun* in which it is located. The *myun* health care organization does not exist by itself as an independent structure but is an integral part of the entire health care delivery system, and it must relate to other parts, such as the village voluntary health worker, the *gun* health center and the regional hospital that delivers secondary level health care. Such a referral or linkage system is necessary to insure maximal utilization of the limited health resources available to the area.

Three models of a referral system which are applicable to the current rural community situation in Korea were designed; these are outlined below.

First model: A health post is placed in each village in the *myun* and MHS is established at a convenient location in the *myun* and these organization are responsible for providing comprehensive primary health care to the *myun* in which they are located. The next step in health care delivery is establishment of a hospital-sized medical care facility at the *gun* level which would be integrated with the presently existing *gun* health center and would provide secondary health care. In this case, each *gun* will have an integrated health organization which will provide comprehensive health care service. However, at the Province level, the general hospital assuming tertiary care and the Provincial Health Department managing public health service are separated. This proposed plan is most ideal and convenient for the community resident as comprehensive health care services can be provided. However, the feasibility of implement-

ing such a model is questioned because of the larger number of new hospital buildings, specialized health personnel and other medical resources which would be required in the county. Because of this defect, perhaps this model is not the most effective to utilize health resources.

Second model: In this model, the public health organization and the secondary curative service organization are also integrated. For economic reasons, a new larger health region is formed with 2 or 3 *guns* to establish a new comprehensive health care service organization area. In the implementation of this model some difficult problems would be expected because the proposed health service region does not accord with other administrative organizations and the span of administrative control for the public health services would be too widely expanded.

Third model: The public health organization and the primary curative organization are integrated up to the *myun* level but are separated from each other at the *gun* level, and the present *gun* health center will take charge of public health service only as it is at present. In addition to the above health care delivery organizations, a regional hospital is placed in each health care service region.

This design would be inconvenient for community residents because of the division of public health and curative services at the *gun* level, however, the economic and administrative feasibility of this model is very high.

3. The function of the MHS was determined next. To identify the function of the MHS the magnitude of the total health needs of the *myun* area was measured because the function of MHS should depend on health needs and demand of the community. For this study, a health interview survey, with the samples drawn from the whole Kang Wha

Gru population, was conducted to determine the magnitude of health needs of community. The need for preventive health care was determined by a group of public health specialists.

The magnitude of identified health needs was so enormous that it became apparent that organizing *myun* health care service to completely meet the entire needs is almost impossible. Therefore a method of setting priorities was adopted which would give more attention to the more urgent and important problems. The criteria used in setting priorities were those of Dr. Bryant, and included: i) prevalence, ii) seriousness, iii) community concern, and iv) vulnerability to management.

Applying criteria of the priorities outlined above and reviewing the current rural situation in Korea, eleven functions were determined and proposed for the MHS. The functions are as follow:

- 1) Curative care
- 2) Child health care
- 3) Maternity health care
- 4) Family planning
- 5) Tuberculosis control
- 6) Environmental sanitation
- 7) Health education
- 8) Community and government relations
- 9) Health planning and internal management
- 10) Training of health personnel and supervision
- 11) Miscellaneous

Of these, from 1) through 6) can be said to be major functions, and the remaining five, auxiliary functions. In order to implement the above functions, a structural organization with three major divisions, curative, public health and maternal health, was developed. The overall operations and management of the MHS would be led by a subcenter director.

4. The above functions only describe the

types of services or programs to be undertaken by the MHS. Detailed content of the service and the quantities required must be identified. In order to determine the magnitude and contents of programs and services which must be delivered through the MHS a concept of the 'basic health requirement' has been developed for this study. The 'basic health requirement' is the minimal health service package which is absolutely necessary to maintain the health of the people living in the community or area. This concept enabled the researchers to determine the basic target for each program. This requirement was compiled and developed through the consensus of opinions of eleven specialists, using the Delphi-technique. When the basic target of each program is quantified, it is possible to estimate the required manpower, facilities, equipment and budget. Quantification of the basic target of each health program for implementing the functions of MHS to a standard population of 10,000 persons is done below.

1) The target of the curative service is to provide primary health care to every patient visiting the MHS. According to the result of a health interview survey, the total number of patients visits expected during a year was estimated to be 5,300. Implementation of a health insurance organization in a rural community would increase the number of patient visits to 11,200 per year.

2) In the area of child health care, the target is the provision of basic preventive vaccinations to all eligible children. Fulfillment of this target would require administration of 1937 vaccinations per year.

3) The target of the maternal health program is the provision of prenatal care at least twice to each pregnant mother, and post natal care once or more. In addition, the delivery of every baby under hygienic conditions is also a target. In order to provide these services, a total of 573 prenatal cares,

240 deliveries and 240 postnatal care would have to be performed each year.

4) The targets which were established for the family planning program were: (i) giving family planning education to every woman in the child-bearing age, and (ii) achieving the Government-established target for utilization of contraceptive methods. The government target for family planning methods is about 347 persons in 10,000 population per year which can be broken down into 36 persons condoms, 163 oral pill, 126 IUD (loop) insertions, and 32 sterilizations (vasectomy or tubal ligations) annually.

5) In the tuberculosis control programs, the target was to take chest X-rays or do sputum examinations on all persons in the "high-risk" group in the community, and to treat all the sputum positive cases in the *myan*. The total annual case finding target which was adopted was achievement of the Government's target. To achieve this basic target, 12 new cases must be found through sputum tests, and 37 persons by X-ray annually. Each year 78 registered patients should receive treatment.

The basic health requirement and targets for the remaining program could be determined, but quantification of the service necessary to fulfill the goal was impossible to calculate.

5. After determination of the basic functions and the quantity to services to be done, it is possible to determine the types of manpower needed and job allocation of each type of manpower.

Three principles were established for selecting health personnel: (i) the full utilization of the existing health manpower as much as possible, (ii) delegation of non-technical work to lower-level health workers if possible, and (iii) high priority was given to accomplishment of the subcenter's function even though it may not be presently feasible of obtain the

required manpower. The result of study showed that the subcenter should have a physician, a public health nurse, a midwife, multi-purpose health workers (nurse aids), a multi-purpose technician aid and curative care aid.

In order to identify detail program component, activities of the individual programs at the health subcenters of Kang Wha Community Health Demonstration Project area were drawn in a flow chart. A job description was developed by each type of health personnel and by detailed program component based on the central principle of the 'team concept'.

6. In order to cover the previously determined amount of health care service at the MHS, it is necessary to calculate the number of each type of health personnel required. Consequently, a 'time-activity study' was undertaken on the 35 *myan* health workers, 2 physicians, 2 public health nurses and 2 midwives in the Kang Wha Community Health Demonstration Project. On the basis of this study the amount of working time required to fulfill each unit activity was computed, and by comparing this with the total annual number of working hours available per worker, the required number of each type of personnel was possible to calculate. For each MHS, 1 physician, 1 public health nurse, 1 midwife and 5 multipurpose workers (MPW), a multipurpose technician aid and a curative care aid are required. However, if each village has a voluntary health worker as envisioned in the community health care concept, the number of MPW's could be reduced to 3.

7. In organizing the curative services, which is one of the most important function of the MHS, it is necessary to know what types of disease are to be dealt with at the primary medical care level in the MHS.

Data was collected on the demographic characteristics of the patients, most commonly encountered disease entities, and the diagnostic

and therapeutic techniques most commonly utilized by analyzing the out-patient records of the two MHS in the Kang Wha demonstration project area in 1975-76. The above survey disclosed that:

1) Among the outpatients visiting to the MHS, female patients predominated over males in a ratio of 1.35 to 1, and the age group from 0 to 4 years of age comprised 30% of the total number of patients.

2) Those who live near the MHS are more likely to frequently utilize its services.

3) The most common diseases encountered at the MHS, listed in decreasing order of occurrence are: acute respiratory infections (25.5%) skin diseases (6.9%), and gastrointestinal diseases (6.3%). The ten most common diseases comprised 67.7% of all patients and the twenty most common diseases encompassed 90%. On the basis of the above survey, it was concluded that the majority of the diseases which will be dealt with by the MHS are relatively minor diseases which are easily cured.

4) For diagnosis of diseases, laboratory studies were required by 9.2% of the patients and radiological study was required by 6.5% of the cases. A total of 13.6% of the patients required either radiological studies or laboratory studies or both for adequate diagnosis or confirmation of their diseases.

5) In the treatment methods, 42% required simple drug prescriptions; 12.8% special drugs such as antibiotics; 12.5% needed low-cost injections and special injections; and about 10% required dressing. Approximately 5% of the patients received minor surgery or were referral cases.

6) The average medical fee per visit with three days of drugs for the out-patients at the MHS, in 1976, was calculated to be 370 won.

8. For implementation of the programs of the MHS determined above, an estimation of facilities, equipment, tools, drugs and re-

plenishment of other necessary supplies was made.

As far as possible, methods of quantification were used to estimate these quantities, but in instances where this was impossible, figures obtained from the experience of the Kang Wha health demonstration project were used.

1) After careful analysis of the curative activities of the two MHS in the Kang Wha community health demonstration project area, a list of the minimum number of required drugs was compiled. It showed that 27 kinds of oral medicines, 15 kinds of injections, 8 kinds of drugs of external use, 2 kinds of intravenous fluids and 6 kinds of antiseptics and disinfectants were necessary.

The quantities of each of these drugs needed annually, as well as the required amounts of tuberculosis medication, were calculated.

2) In preparation of a list of necessary facilities and equipment, those items already supplied to MHS were also listed separately and X-ray setups and laboratory facilities were included in order to strengthen curative function as well as preventive services.

In light of the current health care patterns, it was estimated that 532 X-ray examinations and 1,399 simple laboratory tests would be required annually. After a broad-based insurance program is implemented, it is estimated that the annual utilization of X-ray and laboratory services will increase to 933 and 2,395 respectively.

3) The size of the present health subcenter is about 20-pyones which is too small to permit even the conduct of curative services. To enable the proposed function of MHS to adequately carry out its curative and preventive functions, it was necessary to assess the floor-space requirements. The new design calls for a total floor area of 149m² (12.1 pyongs), and was designed in consultation with a hospital architect, taking into consideration the proposed functions and programs and the

estimated patient utilization. A sample design of an efficient MHS floor plan is included.

9. For implementing the new function of the reorganized MHS, its budget and financial management were also studied. A plan without an adequate budget is meaningless. Itemized budgets and program budgets were prepared to cover the annual operating expenses; the capital investment necessary for reorganizing and developing the new MHS was also calculated. The classification system of the Institute of Municipal Treasurers and Accountants (I.M.T.A.) was used. A management plan for these budgets was also prepared.

These calculations project an estimated

operating budget of about W11,710,000 per year. An estimated 50% of the budget will be used for provision of curative services, 45% for public health services, and the remaining 5% will be used for administration. The expenditure necessary for reorganization of the MHS was calculated to be some W5,000,000 including building renovation, X-ray facilities, and a light motorcycle for transportation.

The cost of the curative service will be underwritten by medical fees from the patients, and the public health service and facilities expenditures will be subsidized by the Government.

CHAPTER 1 INTRODUCTION AND OBJECTIVES OF THE STUDY

At present, the rural health care delivery system in Korea is dual. One system is the public and preventive health program administered by the Government, and the other is the curative service rendered mainly by the private sector.

It is admitted that the private medical sector, whose growth and progress are controlled by free market functions, has been providing good medical care service for urban people who can afford the medical fees. But, the medical benefits have reached rural communities in insufficient quality and quantity because the rural economic and social situation is not motivating the private sector to provide them there.

There are four or five private medical practitioners¹⁾, on the average, in the *cup* area (a town with population of 20,000-25,000) where the *gun* (county) administration office is located and, as of 1975, some 30 percent of *myuns* (township), where most farmers make a living, remain without doctors. Moreover, about 50 percent of the doctors in the *myun* areas are young physicians in residency training who are compulsory dispatched by the Government to rural areas for a 6-month mandatory period. Most of the remainder are what are called "limited area doctors", who are not fully qualified, but are allowed to practice in specified rural "doctorless" areas only.

The rural public health program conducted by the Government includes the operation of *gun* health centers, each covering a population of 100,000 to 150,000 persons. However, these centers do not function satisfactorily due to a lack of qualified doctors, nurses and technicians, as well as inadequate equipment and facilities.

In the *myun* area where the majority of

the rural population lives, the public health care services available are very minimal provided by three *myun* health workers dispatched from the *gun* health center. Each of these health workers is responsible for one of the three services: maternal and child health (MCH), family planning and tuberculosis control. These health workers, however, are mostly nurse aides with insufficient training, therefore they do not have sufficient skills and knowledge to carry out such health programs by themselves. Moreover, due to the lack of motivation, their performance of their assigned duties is usually poor.

Most of these health workers are often administratively supervised by their *myun* office while technical supervision from the *gun* health center is inadequate. They are more often identified as *myun* office personnel than as health workers carrying out the health center's program.

In short the current health care delivery system in rural Korea can be described as being in an "undeveloped" state.

The basic and most important reason for this is that in the national development process little priority was given to health programs. Even though such a stage may be unavoidable in the developing countries, in Korea it is due to too little investment in social welfare and the health sector compared with other fields. Since the founding of the Republic of Korea, an average of a mere one percent of the whole national budget was allotted for health activities annually. This lack of support for health programs is clearly demonstrated by the fact that a full-scale national health plan was never established in the past three Five Year Economic Plans.

Fortunately, the past Five Year Economic Plans have been successful and living condi-

tions have greatly improved. Now the Government has become to be able to pay interests in social welfare and health field, and has announced that it would establish a national health plan and a low-cost health care delivery system for rural people in the Fourth Five Year Economic Plan beginning in 1977. Consequently, the Ministry of Health and Social Affairs has published a summary plan of proposed health programs during the period of the Fourth Five Year Economic Plan.

In the process of the development of the national health plan, one of the areas which had least study and experience was the organization of *myun* health care services. According to the Health Center Law enacted in 1953 and amended in 1962, health subcenters can be set up in each city and *myun* when necessary, but the law did not mention the role or the functions of the subcenters. The Government has built a total of 1310 health subcenters in *myuns* throughout the country, with the assistance of the local administration, the *gun*, and the Farmer Cooperative Association.⁵⁹ The size of these health subcenter buildings is about 20-pyungs (1 pyung equals 333m²). It is reported that 391 offices are not in use as of 1975. What is worse, health workers who are dispatched by the *gun* health center mostly do not utilize the building as their offices, but they go instead to the *myun* office and work there under the supervision and direction of the *myun* chief. In such a situation it is very difficult for these health workers to carry out their health work effectively.

The weakness of the *myun* health care organization has caused the rural health care programs to be fragile. As a result, all the Government programs such as the T.B. control program, MCH program, and Family Planning program have been ineffective. Because of the weakness of the system the Government has hardly even tried to improve environment health, venereal disease control and other health programs. Consequently, there is now

a keen need for efficient and effective rural health care organization, but the big problem is, how it should be organized.

So far, there have been various concepts and methods for effective solutions to the health care problems of rural communities in the developing countries, and these concepts and methods have been tested in various demonstration projects in and outside of Korea. These concepts and methods can be summarized by the term "community health approach".⁶⁰ Its goal is the realization of the right of all people to receive medical care. Therefore, it demands the establishment of the most effective health care delivery system possible through the joint efforts of community volunteers, the Government and the health professionals, in order to provide comprehensive health care to all the people in a defined community. For the effective and efficient solution of rural health care problems, the following three elements must be present: first, the voluntary participation of the community people, in solving their own health problems; second, a multi-level organization that furnishes comprehensive health care; third, the establishment of a referral system between these levels.⁶¹

Many health professionals in Korea also agree to this approach, but there are two different opinions as to where the terminal organization that provides comprehensive health care in the rural community should be located. One opinion is that the present health center located in the *gun* should be strengthened so that it will become the basic organization that could provide comprehensive health care services.⁶⁰ In addition to this, if necessary, mobile medical teams could be organized to work out of the *gun* health center.

However, a majority of the experts directly involved in rural health care demonstration projects state that an organization which is designed to provide a comprehensive health care services at the community level must be established at the *myun* level.⁶² The reasons

for such a viewpoint are summarized as follows: First, in the average *myun*, with a population of 10,000 the quantity of the health needs is so great that without a health care organization, it is almost impossible to meet even basic health needs. Second, accessibility is very serious factor owing to poor transportation facilities and road conditions in most rural areas. It improves the accessibility greatly if the primary care organization are located in the *myun* area. Third, most direct health services are performed in villages by means of home-visiting, and cannot be centralized in buildings like the health centers or clinics. Health problems can occur at any time, not necessarily just at the time of a mobile team's arrival at the spot. Fourth, active participation and close cooperation and with the community people is as important as the cooperation and close relations with the local government. Both of these are more efficiently carried out through an organization based at the *myun* level. Fifth, the facility in which the services can be provided does already exist in the MHS.

In establishing health care services in a community, the health care should be organized based on the health needs of the community. The functions, services, manpower, facilities, equipment and budget of the health care organization should be determined by application of a scientific method to meet the community needs. At this time, when a national health plan is being widely discussed, it is imperative that a rational and reasonable organizational health care network should be developed.

The specific objectives of the study on the organization of *myun* level health care services are:

- 1) to formulate all the basic concepts necessary for development of comprehensive health care service for the Korean rural population,
- 2) to establish feasible referral system models for rural Korea,

- 3) to define the functions of the *myun* health subcenter (MHS),
- 4) to identify the type, number and role of the personnel necessary to implement the programs of the MHS,
- 5) to determine the size of building, furniture and equipment, drugs, materials and budget necessary for the performance of the above functions.

The most direct motive for conducting of this research is to provide reasonable and valid data on the organization of *myun*-level health care services. It is felt that this will provide valuable input for the preparation and implementation of the new National Health Plan, one of the parts of the Fourth Five Year Economic Plan, which will be implemented in 1977-1981 by the Government.

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CHAPTER 2 GENERAL FRAMEWORK OF THE STUDY AND STUDY METHODS

The study of a *myun*-level health care organization requires a series of investigations which have different characteristics, but proceeded integrally in a manner which the flow chart (Figure 2-1) summarizes.

The basic concepts and principles for the development and organization of the MHS are discussed in Chapter 3. There are no established rules on the process, criteria or methods of development and organization of health care in a community. The cultural and socio-economic aspects of the community should be considered initially, and primary attention should also be focused on the concept and philosophy of health care at that time.

For this study, community health concepts and approaches which have already been developed for the solution of rural health care

problems in the developing countries, were closely examined and readjusted so that they could be applied to current rural conditions in Korea; they are also used as the basic guidelines for this study.

The *myun*-level primary health care organization or MHS cannot exist alone in the community, but rather must be integrated into a referral system (see Chapter 4). However, even though it cannot function totally without backup support, it is the basic unit upon which the whole rural health care organization is built. The health subcenters which presently exist are located in an administrative district called a *myun* which corresponds roughly to a township, and has administrative jurisdiction over about 10 villages. A *gun* health center is situated in each *gun*, an administrative district composed of several *myuns* and corresponding roughly to a county. At the provincial level, a hospital provides secondary or tertiary medical care services. Therefore, the proposed MHS is to be part of a large health care service organization with referrals.

A model of a referral system, which can be duplicated in other rural areas, has been developed in the course of this study.

In Chapter 5, the functions of the MHS are identified. The health care service organization in a community should be based on the health needs of that community. Therefore, total health needs should be measured before designing the health care organization. For this study, health interview surveys were conducted to measure the total health needs of the population of Kang Wha *Gun*.

However, it becomes readily apparent that the total health needs of a *myun* are so enormous that the MHS can not practically be organized in a way that can meet all the health need because of the strict limitations

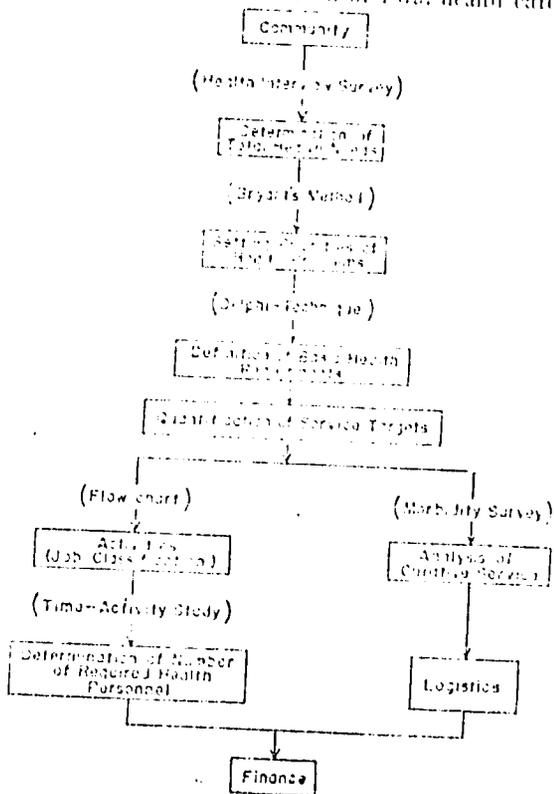


Figure 2-1. General Framework of the Study and Study Methods

on available manpower, facilities and financial resources. Accordingly, priorities must be established among the rural health care needs, taking into account the present rural situation in Korea. The solution of the most important health care problems would then be considered to be the priorities in a program of community health care. There are many methods of setting priorities; however for this study Dr. John Bryant's method was applied to the situation of Kang Wha *Gum*.

The MHS was selected and organized as the most basic comprehensive health care unit, and eleven functions or programs were designed taking into account the determined priorities and current rural conditions.

In Chapter 6, quantitative service targets are calculated for each of the programs (functions) identified in Chapter 5. However some of the programs could not be accurately quantified. Nevertheless quantification is necessary in order to measure the amount of manpower, facilities, equipment and budget which will fulfill the target. The basic health requirements which are essential to maintain an acceptable level of human health were defined and these were utilized to quantify service targets. Specific methods were needed to identify the various basic service components necessary to fulfill the basic health requirements for each program.

Even though the basic health requirements for each program could be determined, it was not possible to measure the quantitative service target in some cases. In such cases quantitative targets set by the Government, or the targets set for the Fourth Five Year Economic Plan were adopted and applied.

In Chapter 7 and 8, the health manpower needed to assume the newly assigned functions of the MHS are discussed. In Chapter 7, the types of health personnel required at the MHS are determined. Although it is recognized that the manpower currently available in the rural health care system is poorly distributed and not sufficiently trained, the principle followed in the manpower development discussion is that existing personnel

should be retained and placed first before other new types of health personnel are developed.

Activities of each program of the MHS in the Kang Wha Community Health Demonstration Project area are shown in a flow chart in order to help determine detail program contents. The job descriptions for health care personnel by type of job were developed with a 'teamwork' concept in mind.

In Chapter 8, the number & types of health personnel necessary to perform the determined service targets for each program are calculated. To determine the number of required personnel, a time-activity study was conducted covering all personnel at the health subcenters in Kang Wha *Gum*. From this study, the time necessary for performing individual service units was calculated and also the number of health personnel required was calculated by comparing the figures for the number of hours required to complete the service target and the annual working hours per employee.

In Chapter 9, curative services at the MHS are analyzed. In the organization of curative services, which is one of the most important functions of the MHS information based on types of patients and diseases and methods utilized for the diagnosis and treatment of these diseases had to be obtained. For this purpose, all the outpatient registration records for the period from May 1975 to April, 1976 in the two MHSs in the Kang Wha Community Health Demonstration Project were examined and analyzed.

With the result of the analysis, it was possible to determine the quality of medical care personnel, the estimated size of medical care space, and requirements for facilities and equipment.

In Chapter 10, the logistics for overall functions at the MHS such as facilities, equipment, medicine and other consumable goods necessary for the performance of programs and services are calculated.

In Chapter 11, the last chapter, a financial management plan is proposed for the newly established MHS. Expenditures are categorized into two parts: capital costs and operational expenses. A budget management plan is also discussed.

CHAPTER 3 BASIC CONCEPTS AND PRINCIPLES IN THE ORGANIZATION OF HEALTH CARE SERVICES

There are no prescriptions of how a health care system in a community should be organized. However, it should correspond to the situation in which it is implemented, and the concept and philosophy of health care at the time, the cultural, socioeconomic conditions, resources available for health care and the expectations of the community should be considered.

The ultimate goal of health care in the current society is to provide 'good quality' health care for all the people when it is needed. This goal has been accepted by most of the countries and societies in the world particularly after the World Declaration of Human Rights in 1948. However, the resources available to attain this goal are extremely limited and in fact, insufficient. Many studies on health care delivery systems and organization of health care services have recently been conducted, and health planning has received special concern in recent years. This is because of the effort to find efficient and effective methods to try to attain the ultimate goal of health care for all, using the limited health resources. Recently, in order to meet this goal better, there has been a movement to reorganize the traditional medical educational system and health care delivery systems so that they are more responsive to the needs of individuals living in communities. This movement has been termed the "community movement" (1979:300).

The basic concepts of organization for the *myun* health subcenter (MHS) proposed in this study are based on the concepts and approaches of the community health. The important differences of these concepts and approaches from traditional medical care are explained below.

The first is in the definition of population

or area to be covered by medical personnel and medical institutions. Traditionally only those who could afford medical fees and or those who visited a physician or a medical institution were able to receive medical care. The extent of responsibility of the physician was not well defined in the past because a clear cut ultimate goal had not been established. Accordingly, the needs for establishing over-all health plan was not particularly felt among health professionals in the past. If the ultimate goal of modern health care, 'health care for all', is to be attained, the extent of responsibility of physicians will have to be expanded until it covers all the people residing in a defined area. When physicians realize their expanded responsibility, the needs for health planning is recognized. The first step in development of a health plan is definition of the target population or the area which a particular physician or medical institution is responsible for covering. The health care service should be organized to cover the medical needs of the entire population defined. Therefore, the goal for the organization of *myun*-level health care should be provision of health care for all members of the *myun* community.

The second is the establishment of a referral system. Once the population and area of responsibility are defined, as explained above, a system should be established so that all health care problems in a community can be solved. However, the health needs of, for example, the *myun* community, are so enormous that they cannot be solved by utilizing only the existing health resources in the defined area. One method that effectively meets the health needs with limited resources is a structured health care system with division of function and varying levels of manpower and facilities.

It is almost impossible to organize a health care system which can solve the entire health problems of the community and even if it were possible it would cause a waste of resources. Thus the primary health care unit usually matched with a government administrative unit, is assigned a defined population area to cover and then a referral system which connects each health care unit to the next higher level of medical manpower and facilities is established. This enables solution of health problems of varying degree more effectively and efficiently with limited resources.

The third is the provision of comprehensive health care services. The health care delivery system in Korea has developed a dual system. The two parts of the dual system are curative services and preventive or public health services. This dual system developed because of the specialization of medical personnel and of other characteristics of the provider in terms of the public or private. It has caused great inconvenience to community people. For example, a mother takes a child to a health center for vaccination but she must go to another private hospital or clinic to be treated for her own common cold. From standpoint of people living in the community, health care service whether curative or preventive is all part of one integrated service not two separate programs. Therefore, under the proposed new health care delivery system preventive and curative health care service should be integrated into one system.

The fourth is the active participation of community people in the health care service organization. In the past, it was thought that the disease and health problems were an individual matter and not a community affair. The only person responsible for medical care was the medical doctor because he had the requisite special knowledge. The community health approach shifts the responsibility for health care from the individual to the community. Thus a new concept that maintaining

and promoting the health is a community affair has evolved. In solving health problems in the community, medical doctors no longer have the leading role, but are considered a resources to be utilized for maintaining the health of the community population. For this reason modern welfare states have moved positively towards provision of health care. Health maintenance is one of the community goals. If any health program is not matched with the community goal then the program will not be accepted by the community people and be bound to failure. For example, at the *myun* level, the problem of whether to have more medical doctors or expand medical facilities will depend on a decision of the whole *myun* population rather than the medical profession. The responsibility for providing the financial support necessary for operation of the system will also rest on them. It is apparent that many health problems cannot be solved by medical doctors alone without the direct participation and cooperation of the community people.

The last difference between traditional and community health is that the health care delivery system should be organized and developed on the basis of health needs of that community. Determination of necessary types and number of health personnel and facilities in a certain community should be based on the health needs and expectations of the community. It is undeniable that the present health care delivery system in Korea has been ineffective. Maldistribution of health manpower and facilities, excessive production of medical specialists and, at the same time, a lack of needed health personnel are the most apparent signs of this ineffectiveness. This is due to the fact that the development of health resources has not been based on the health needs of the community or of the nation.

For development of the *myun* level health care organization in this study, a few additional principles were established in addition to the concept outlined above. These principles

are largely aimed at compensating for the erroneous approaches that have been taken by the Government in its attempts to solve rural health care problems.

The first principle is that in the organization of health care services, the development of health care manpower, facilities and a method for provision of adequate financial support must be undertaken in a simultaneous and integrated manner. The manpower, facilities, equipment and finances which are the basic factors in the organization of health care service, should not be planned separately.

In the past Government efforts to solve rural health problems, each of these three factors has been approached independently from the others. For example, a health subcenter building was built to upgrade health care, but the money was wasted because adequate manpower and monetary support for the proper functioning of the health subcenter were not supplied. Resident physicians have been currently sent for 6 months to doctorless *myuns* compulsory to supplement health subcenter manpower. However the expected effect of this program was not achieved because the facilities, equipment and financial support for these physicians needed to deliver health care was not adequately supplied. To provide financial support for health care, a large scale health insurance system has been planned and developed, however without improving the effectiveness of the present health care delivery system, adequate financial support will do little to improve health care.

The second principle is to attempt to develop and organize health care services from the grass roots upward. Up to the present, the establishment of the health care delivery system has been initiated from the central administration (Government) and was directed downward through the province, *gun* and *myun*. The health care service in the *myun* areas where the majority of rural population resides, has received low priority and has not been well researched or developed because it

is too far from the Central Government. In other words, the health care system was not rooted in the people it was meant to serve, but rather it floated above them. Since health care is essentially a service oriented program, it is important that the services should be accessible and acceptable to the people in order to be effective. The best way to achieve this accessibility is to organize health care service upward from the village to the *myun* and *gun*. The focus must be on needs, expectations and priorities for health care among village inhabitants. Health care service is organized by these people and with these people, and then linked to the organization above.

The third principle is to consider both the public and private health sectors, even though their basis of operation is different, as components of one system, supplementing each other so that together they can work toward a common goal. More than 30% of the medical care presently is rendered by the private medical sector.⁵⁾ The private sector should also be viewed as a national resource in that it serves the people of the nation. However, in national health planning in the past, the private medical institutions, because of a difference in goals, have not been included in the official health care delivery system. This has led to an attitude of competition rather than cooperation between the public and private sectors, and resulted in inefficient delivery of services.

If a private medical institution exists in a *myun* or *gun* area where there is no public medical institution then the Government should invest resources in the private medical institution and utilize it for the community instead of establishing a new public medical institution. This will reduce the national expenditure required to render effective service. For instance, if a private physician is available in a *myun* community then the doctor should be utilized at the health subcenter by contract, instead of appointing another physician from outside.

The last principle to be considered is whether the MHS proposed in this study is replicable in other rural areas across the nation. This type of health care delivery system must be closely matched to the economic and social conditions of the community in which it is to be implemented, however it does not need to be too bound by the present reality. There is some room for latitude because the Korean economy is currently expanding very rapidly, and also the Government is increasingly able and willing to invest funds in the health field. Therefore, this study aims towards the capabilities of rural communities 3 to 5 years in the future. Even if implementation is begun before the expected economic growth and support are available, the program proposed in this study may be introduced in by phases until the goal is reached.

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CHAPTER 4 REFERRAL SYSTEM MODELS

The health care system should be one integrated organization but for the sake of practicality, the system is composed of several suborganizations each covering a defined, limited area and population. In considering the rural administrative structure there should also be various health organizations suitable for each level. An appropriate health care delivery organization should exist in each *myun, gun*, and province and these can then be systematically formed into a rural health care delivery system adapted to the area. For the integration of those various organizations into one system, a systematic vertical as well as horizontal relationships should be established between organization and suborganizations. The vertical relations among the health care organizations is called as the referral system. This referral system is necessary to employ the limited health resources most efficiently, and also effectively attain the

goals within the system.

A rural health care delivery system is a referral system which connects a number of lower and higher suborganizations in the rural community. The definition of hierarchical relationships in the referral system is based upon the function of each unit rather than its administrative niche, and the function of each unit in the system is determined by the health needs of the population which it serves.

To illustrate this relationship, physician manpower may be taken as an example. At the *myun* level, a general practitioner-physician will deliver primary health care to the community for which he has responsibility. However, some patients may be beyond the range of his ability or facilities, and these will be referred to a regional hospital where care by specialist physicians is available. Naturally, a referral hospital will cover, on a referral basis, a much larger population and

area than the primary health care physician.

In this study, three possible models of referral systems, which are considered applicable in the current rural community in Korea, were designed in order to supplement and connect the organizations and suborganizations for more efficient care. At present, the public health service has a functional system connecting the *myun* health subcenter, *gun* health center, provincial health department, and the Ministry of Health and Social Affairs. However, the curative service does not have any such system because the majority of the curative services are supplied by independent, private medical institutions.

Neither rural nor urban curative medical care institutions have developed a referral system in Korea. Therefore, one patient who suffers from a cold, may visit a general hospital in a city, and another patient who is from Cheju Island, at the southern tip of Korea, may receive curative care at a Seoul hospital. Both of these are examples of the serious waste of money, manpower and medical institution. Which can occur without a referral system.

The ideal is to develop an integrated health care delivery system combining both curative and preventive services and having a built-in referral system. The initial task to be solved in the establishment of the referral system is how to integrate the public health service and the curative service within the same area.

Before discussing each of the referral system models, the components or functional units common to the referral systems, and also the principles of organization will be briefly explained.

First, a health post is to be established through the voluntary efforts of the village people in each *ri* or village as a terminal unit in the health care delivery system. The concept of the health post has been well developed and is described elsewhere.¹⁾ It is based on the community health approach, already described in Chapter 3, which emphasizes

community participation in the health care system. The main function of this health post, which will be staffed by a part-time family health worker, is to deliver public health service in cooperation with the government health worker from the local *myun* health subcenter (MHS). It will also handle minor injuries and play a role in case finding and referral to the MHS.

Second, the functions of each suborganization in the health care delivery system are as follows. In the public health system the major function of the *gun* health center, which is the official terminal organization, is to provide direct service to the population. However, the major function of public health service organization above the *gun* health center (GHIC) (i.e. the province and central government) is administrative work such as planning, managing, supervising and evaluating. However, for curative service, the major function of each organization is to provide direct service to the population and is regardless to the level of system. Primary, secondary and tertiary care is classified by only the severity and types of disease and level of care for the disease. Each of the three levels of care is assigned to a particular organizational unit in the health care referral system. The MHS will be responsible for primary care, the regional hospitals for secondary care and general hospitals for tertiary care.

Third, the preventive health service and the curative service will be integrated up to the *gun* level since the major function of both services is direct service to community people, up to this level. Above the *gun* level the public health service organization and the curative service organization may be operated separately since the type of service is too specialized to be integrated.

Applying the above principles, three referral models were developed. In each of the three alternate plans, the structural organization is the same at the *ri* and *myun* level and also at the level of provision of tertiary care.

The health post and the MHS will provide integrated direct health care services in the *ri* and *aegeu* area; at the provincial level, general hospitals will provide tertiary care on a referral basis. The difference between the models is in the area of secondary care and focuses on whether the hospital which provides the secondary care should be placed in each *gun*, or in a new region made up of several *guns*, and whether preventive and curative services should be integrated at the *gun* or regional level (see Figure 4-1).

In the first model a hospital is placed in each *gun* to handle secondary care for all the *gun* residents. This hospital will be integrated with the GHC. This integrated new organization will be responsible for providing comprehensive health care to the entire *gun* population. This model is convenient for community people because each *gun* has a secondary level health care service organization, and comprehensive health care service can be provided to all the community people within a

gun. Although this model is ideal for delivery of services to the community population, each county must build and staff a new hospital. Building and operating such a hospital for each *gun* may not be economically feasible, and even if it were, may not be the most effective way to utilize resources.

The second model integrates the preventive health service and the curative service at the secondary care level to form a new comprehensive health care organization in a region which is composed of 2 or 3 *guns*. This model is economically more feasible than the first model, but may be administratively unfeasible because the proposed regions does not correspond to other administrative units. Since there are no such administrative regions in the local government, it would be very difficult to obtain cooperation from local government, which is extremely important in providing the public health care service under the present health care system. It also increases the span of control of health care sub-organizations in

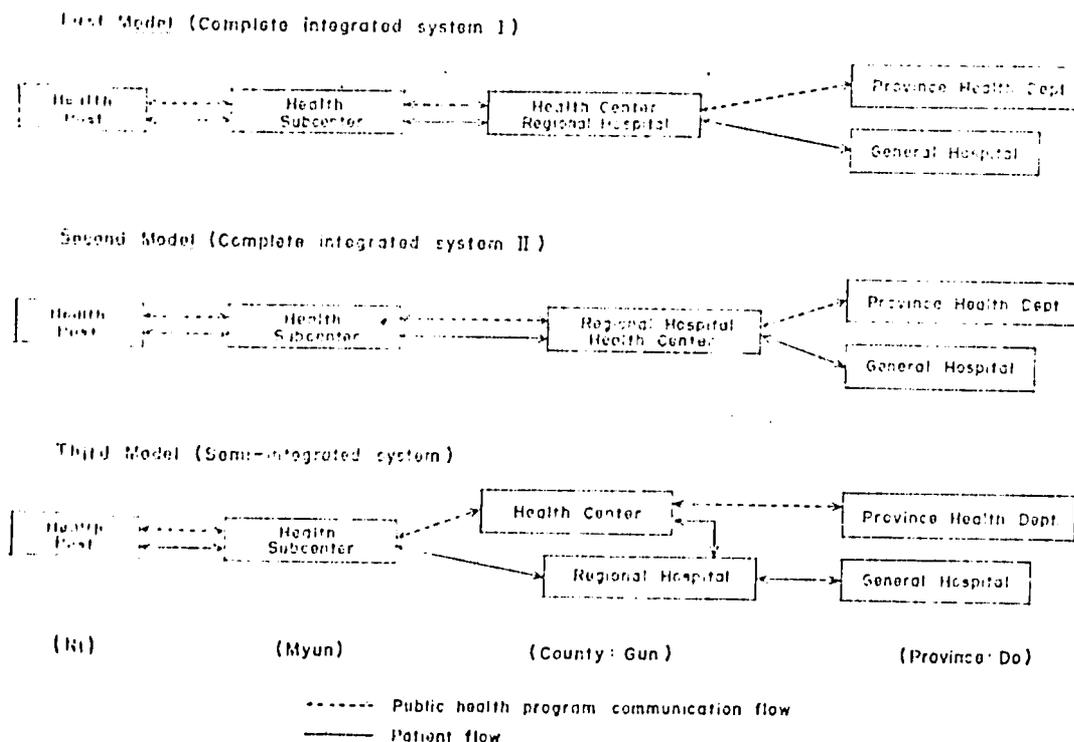


Figure 4-1. Models of Health Care Referral System in Rural Korea

the regions and may cause ineffectiveness.

The third model is designed so that the organization which provides preventive health services and the organization which provides curative services will be separate from the *gun* level upward. The GHC will handle only preventive health service and the regional hospitals, covering 2-3 *guns*, will provide only secondary medical care. This model may cause some inconvenience to a few clients who need preventive and secondary curative services simultaneously and they must visit two separate organizations. However, the economic and administrative feasibilities of this model are very high, because the health center is utilized for only the preventive health services, largely as it is at present without much modification. It exactly corresponds to the administrative system. It also utilizes the existing provincial hospitals which usually cover 2 or 3 *guns*.

A detailed illustration of the third model is shown in Figure 4-2. In the figure, the two large circles denote individual *guns*. Patients who need medical care or preventive service (public health service) are referred to the MHS through the health post. The MHS provides most of the preventive health services and primary medical care. Those who need preventive health services which can not be provided by the MHS are referred to GHS. Any patient who requires secondary curative care is directly referred to a regional hospital from a private clinic, from a GHC, or from a MHS. The curative function of the GHC is limited to provision of primary health care for the residents of the *cup* in which it is located. It renders preventive health service to the entire *gun*. The private clinics in the *gun* provide only primary care.

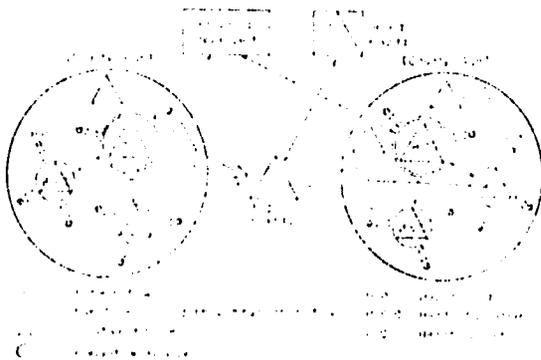


Figure 4-2. Diagram for Health Care Referral Model 3

The regional hospital, which is equipped and staffed to render secondary hospital care, accepts patients referred from the MHS, GHC and private clinics. If a patient requires more specialized service, the patient is referred to a general hospital located in one of the major cities. The provincial health department controls and supervises the public health service and the regional hospital within its province.

In Figure 4-3 the administrative units, size of the target population, and the manpower required for the third model is shown.

A health post is placed in each village (average population: 500~1,000) and simple health service is handled by the family health worker at the health post. The family health worker concept in Korea has been developed and implemented at the Kang Wha Community Health Demonstration Project.²⁾ A MHS is placed in each *myun* and serves a population of 10,000 to 15,000. The MHS forms the center of the comprehensive rural health care service, and is staffed with a general practitioner-physician and other personnel needed for provision of primary health care. A GHC is set up in each *gun* and serves a population of 100,000 to 150,000. The GHC controls public health services for the entire *gun* and also provides primary care for the *cup* in which it is located. Regional hospitals staffed and equipped to render secondary (specialist) medical care are provided for service areas covering 300,000 to 500,000 persons. If more advanced treatment is required patients may be transferred to tertiary general hospitals where the most advanced and specialized types of care are available.

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CHAPTER 5 FUNCTIONS AND ADMINISTRATIVE STRUCTURE OF THE MYUN HEALTH SUBCENTER

The basic health care organization which delivers comprehensive health care for a rural area should be located in the area which it serves. The services delivered by such an organization should be designed to meet the community's health needs. Although there are existing *myun* health subcenters (MHS) in rural Korea, the kind of basic health care organization referred to above has quite different functions and requires new roles for health care personnel, and should be distinguished by a new title such as "*myun* comprehensive health care center." Such a name would connote the difference of organizational basis of this new health care organization and give community members a fresh concept of the health subcenter. However because of the cumbersome nature of such a title in English, the simpler term "*myun* health subcenter" is used in this paper.

The concept of the MHS includes the building, facilities as well as all the various activities and health care roles to deliver comprehensive health care services for the *myun* population. The first step in organization of this type of center is to define its fundamental function. The required manpower, equipment and facilities may then be discussed in relationship to the defined function.

If there had been an organization such as we are planning to establish in rural communities in the past, some supplementary plans could have been made to help the organization function better. Since there were no similar organizations existing, it was necessary to develop a new type of organization with new functions.

The functions and roles of the MHS were developed in accordance with the basic concepts and principles of the organization mentioned previously in Chapter 3. In summary,

those concepts and principles of the organization are:

- 1) The organization should assume primary responsibility for the entire health care of the community (*myun*) population.
- 2) The functions should be determined based on the health needs of the population.
- 3) Comprehensive health care should be provided which includes integration of both prevention and treatment.
- 4) In so far as possible, the majority of health care services should be rendered locally without the help of higher level medical care institutions outside of the *myun*.

The administrative structure of MHS can be discussed only after the functions have been determined. The numbers and types of manpower required and the role of each of the health care personnel should be determined on the basis of the functions of the MHS. The problems of equipment, facilities and budget will be covered in the later chapters on the basis of the above determination.

This chapter will deal with defining the function of the comprehensive health care center, and will suggest the type of administrative structure necessary to perform these functions.

A. Determination of the Function of the *Myun* Health Subcenter

The first item to be considered in determining the function of the MHS is the quantity of health needs of the target population. The average *myun* has a population of 10,000-15,000 persons, and according to a study done in the United States, the same size of population would require thirteen physicians just to provide primary medical care coverage.¹⁾ So

it can be said that the quantity of medical care required in a *myun* is enormous.

It is easily recognized that covering the entire health needs of a *myun* population is impossible, considering present economic and other conditions in Korea. Therefore, the next task is to set priorities among the health problems which have been identified in rural Korea. After the priorities of the problems have been determined, the functions of a MHS can be defined.

In this study the total health needs and demands were measured and then priorities for the health problems were set afterward.

1. Measurement of Health Need and Demand

(1) Concept of Health Need and Demand

Determination of health need and demand is mainly based on health concepts of individual living in the community and is very difficult to quantify.²⁾ The total health need or sociobiological need is defined as the health needs related to the maintenance of physical health, mental health and social well-being. Since health itself is not a measurable entity it is almost impossible to measure the total health needs.

The sociobiological needs need not be completely measured since adequate health plan can be done even without measuring the health care needs. The demand is expressed as an actual utilization of health service to meet the need.

Total health needs may be divided into two identifiable needs. The first is the personal health care need³⁾ or the "felt need"⁴⁾ of the individual in the community and the second is the need for preventive health care service. Each individual of the population may not feel the need for preventive health care, but from the preventive or public health viewpoint, provision of public health care services are extremely important for the maintenance of the health of the whole population and must be an important part of the health plan. The per-

sonal health care needs can be ascertained by directly interviewing individuals in the community through a health interview survey. The preventive health care needs can more accurately be identified by professionals. The concept of health needs is shown in Figure 5-1.

A death and morbidity survey can be used as an indirect indicator of health needs and a measurement of demands, but these methods were not used for this study, because they are not specifically useful in determining the function of a health subcenter.

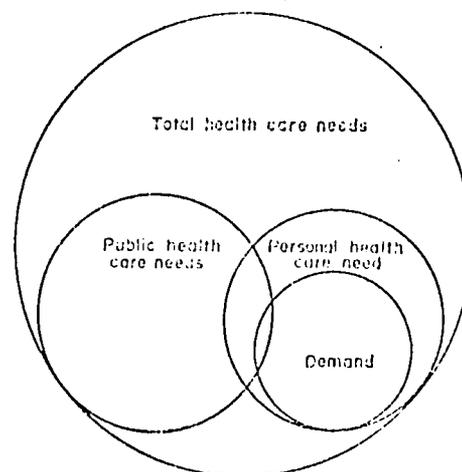


Figure 5-1. Concept of Health Needs and Demands

(2) Measurement of Personal Health Care Need and Demand

The personal health care needs and demand can be equated mainly with the need and demand for curative services. By asking questions which probe the ways in which health care needs are met and finding out how persons in the target population maintain their health, a direct interview survey with the community residents can be a means of measuring the need and demand for personal health care. The data obtained from a health interview survey largely depends on the individual's knowledge, attitudes and concepts of health and health care and is also related to the sociocultural environment of the individual.

a. Health interview survey

For this study a health interview survey was conducted covering 4 *myuns* in Kangwha *gun*

during the period of October 27-November 17, 1975. For the survey, a multi-stage probability sampling method was used, based on a cluster sample of the villages representing the entire population. The sampling rate was 13%. An interview survey of each sample household was conducted by trained interviewers using structured questionnaire which was constructed after two pretests.

A total of 3,037 persons (response rate 97.6%) residing in 536 households responded to the health interview survey. The major items included in the questionnaire were socio-economic factors, morbidity, utilization of medical care services, and other demographic characteristics. The need and demand for personal health care was taken as being expressed by the morbidity and utilization rates found in the survey.

After determination of the need for personal health care, an attempt was made to identify the level of sophistication of medical care organization and the type of medical personnel necessary to adequately provide curative services to meet the needs. To identify this level detailed information concerning the individual's health problems including the diagnosis or symptoms of the disease, the patient's own evaluation of the seriousness of the disease, the duration of sickness and the medical care organization where the patient received treatment was obtained from the survey. With this information a group of medical professionals set criteria to objectively determine the level of adequate medical care needed. The diseases were divided into two classes: those that required treatment from a qualified physician-specialist (or a general hospital), and those that could be adequately treated by a general practitioner or someone with less training.

b. Results

The incidence rate of acute diseases was 11.6% during the two weeks and the point prevalence of chronic diseases (defined as those sick more than one month) was 21.4% at the time of the survey. The survey also

showed that 1.35% of those surveyed had some impairment and 1% either received an operation or were hospitalized. The average rate of persons who had experienced some restriction of activity due to illness was 3.1%. These data disclose the personal health care needs which are the felt needs (see Table 5-1).

The utilization of health care services is an indicator of health demands. According to the survey, approximately 70% of those who had either symptoms or disease, whether it was chronic or acute, received some kinds of health care services.

Table 5-1. Basic Information on Felt Curative Need and Demanded Need

Acute condition	
Incidence rate within the last 2 weeks	11.6%
Period prevalence rate within the last weeks	13.4%
Chronic condition	
Prevalence rate (person)	21.4%
Prevalence rate of impairment	1.35%
Incidence of Delivery within the last 12 months	2.31%
Incidence of Abortion within the last 12 months	0.76%
Admission rate within the last 12 months	0.39%
Operation rate within the last 12 months	0.66%
Disability days	3.1 days/person
Physician visit within the last 12 months	0.58 times/person

In summary, it can be seen that approximately 1/3 out of the total community population had diseases and 2/3 out of the 1/3 who were ill utilized medical services of various types. Therefore, some 21% of the whole community population was confirmed to have utilized medical care services during the month while the survey was being conducted (see Table 5-2).

The average number of visits to the medical institutions was 0.58 times per person per year.

Approximately about 1/4 of the population (about 2,500 persons out of the *ayun* population of 10,000) was shown to have personal health care needs during the 4 weeks, which was considered a great deal of need.

Table 5-2. Health Needs and Utilization of Health Care Services (Acute and Chronic Conditions)

1. Acute condition				
Persons	Acute condition		Health care utilization	
	Total	No	Yes	No
3,637	2,620	497	287	120
%	100.0	85.6	13.4	9.5
%			100.0	70.5
				29.5

2. Chronic condition				
Persons	Chronic condition		Health care utilization	
	Total	No	Yes	No
3,637	2,297	719	534	206
%	100.0	75.6	21.4	17.6
%			100.0	72.2
				27.8

In the case of acute diseases, nearly 1.2% were diseases requiring professional doctors, and about 3.2% of those with chronic diseases required a specialist for management (see Figure 5-2).

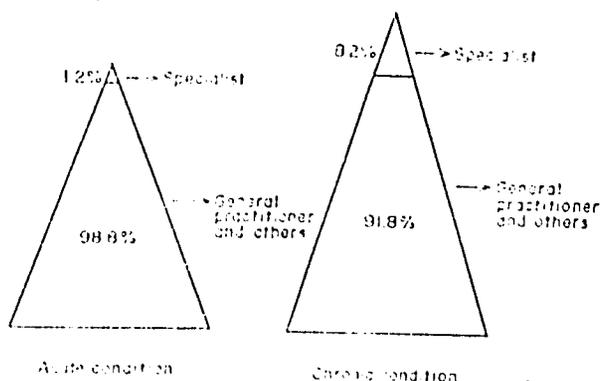


Figure 5-2. Models for Levels of Personal Health Care Services Disclosed by Health Interview Survey

Therefore, the majority of personal health care needs can be met by general practitioners without resort to specialists, and only 5 to 10% of medical problems require referral to secondary medical care institutions.

(3) The Preventive and Public Health Care Needs

The need for preventive and public health services is hard to clarify as a need because in general, most individuals have very little interest in the preventive aspect of health because their felt needs are focused more on their own individual health.

a. Measurement of the need for preventive and public health care

The confirmation of preventive and public health care needs can not be done through a direct health interview survey of the community population because, in general, the individuals in the community do not recognize the necessity for the preventive and public health care. The identification of preventive and public health care need requires the consideration of socioeconomic and cultural factors as well as a process of judgement.

In this study the preventive health care problems were identified with the assistance of a number of expert professionals and a text book in the public and preventive health field.⁵⁰ The results were classified in several categories. All of the important items identified by the preventive and public health professionals were included in the classification, although the repeated items were omitted. The classification was based on the consensus of the professional specialists.

b. Results

The need for preventive and public health care services, as judged by the specialists were classified into categories as follows: i) by disease (eg. infections and non-infectious diseases), and ii) by health care program (eg. maternal-child health, family planning, mental health, dental health, nutrition, environmental sanitation, industrial health, and occupational health). Detailed items of each health program were placed under their respective category in the classification as shown in Table 5-3.

The amount of preventive public health services needed in a certain community is also estimated to be very large, and meeting all the needs is simply not possible.

2. Health Problem Priority Setting

(1) The Concept of Priorities

The amount of health care as demonstrated by the measurement of health care demands and needs is extremely large while the manpower and material resources available to meet

Table 5-3. Preventive and Public Health Care Needs
 (Professionally Identified Preventive Health Needs)

1. Infectious disease control
 - a) Schistosomiasis
 - b) Tuberculosis
 - c) Venereal disease
 - d) Parasitic infection
 - e) Others
2. Non-infectious disease control
 - a) Hypertension
 - b) Cancer
 - c) Accident
 - d) Others
3. Maternal and child health
 - a) Maternal health
 - b) Child health
4. Family planning
5. Industrial health (occupational health)
6. Nutrition and deficiency disease
7. Mental health
8. Dental health
9. Environmental sanitation
 - a) Clean water distribution
 - b) Sewage treatment
 - c) Night soil treatment
 - d) Refuse disposal
 - e) Pollution control
 - f) Insect & mouse control
 - g) Zoonosis
 - h) Health related programs, etc.

these needs is relatively small. Consequently, a concept of priority must be utilized so that the most urgent and essential problem in the current Korean situation, receive the amount of attention they deserve.

After setting the priority of a particular problem a decision should also be made as to the extent of coverage to be given to the priority problem. This requires consideration of such factors as size of the target population and the qualitative aspects of the problem solving measures. The priority of health problems can directly be shifted to health programs. Therefore, the decision of priorities is usually based on health problems, while the specific methods of solution are health programs.

(2) Methods of Setting Priorities

There are several methods of deciding which

problem should receive the highest priority for early solution among the health problems in a certain community, but none of the methods seem to be absolutely perfect. For this study, John Bryant's method of priority setting was adopted.⁶⁹ Bryant has developed four criteria for priority setting. The first criteria is prevalence. The prevalence indicates the magnitude of a particular health problem, and if the magnitude increases the priority is correspondingly increased. The second criteria is the seriousness of the health problem. This criteria focuses on how much or how seriously a certain health problem affects the individual and or the society. The third criteria is the concern of the community. Concern for a particular problem is manifested by a demand from the community members for its solution. Since health problems are closely related to the culture, socioeconomic conditions and attitudes of the community, it is natural that health problems about which the community is concerned should receive high priority because these are the problems about which there is a high felt need by the population. However, it is difficult to accurately gauge the degree of concern of a community. The fourth criteria is vulnerability to management. Even if a health problem is considered large scaled and very serious, if it is not amenable to solution because of financial or technical difficulties, it should be given low priority to avoid wasting valuable resources on an insoluble problem.

If accurate quantitative data are available for each of the above criteria, priorities can be built based on the data. Such data, however, are not usually available. And even though the correct data may be available the use of heterogeneous standards in data collection makes comparison of the criteria difficult or impossible.

For that reason, each criterion is given a score ranging, from 1+ to 4+ depending on the degree of severity. A total priority score for each problem is then calculated by multi-

plying together the scores on each of the four criteria. Those problems with highest total scores are assigned highest priority for solution.

The method is easy to use, and an approximate estimation of the value of each of the criteria can be made even though the available data are not appropriate and accurate. However, a defect of the Bryant's method is that the four different criteria are each afforded the same degree of importance when in actuality they may have quite different degrees of priority and does not necessarily indicate the degree of importance. Even if the score of one problem is two times higher than that of another problems, this does not necessarily mean the former problem should receive a budget two times greater than the latter.

In this study, the priorities were determined by eleven health professionals using Bryant's method. They were encouraged to be as objective as possible in their judgement and to attempt to avoid prejudiced opinions based on personal concerns and attitudes, because such subjective judgments reduce the validity of the priorities. Finally the total priority scores of each evaluation for each problem were averaged, to eliminate, in as far as possible, individual prejudice.

Table 5-4. Priorities of Health Problems in Rural Korea Determined by Health Professionals Applying Dr. Bryant's Method Applied to Kang Wha Con

Order	Health problems	Average score
1.	Curative care	127.7
2.	Child health care	74.0
3.	Tuberculosis control	58.3
4.	Maternity care	57.1
5.	Clean water	50.7
6.	Family planning	50.4
7.	Environmental health	39.8
8.	Parasitic diseases control	30.0
9.	Communicable diseases control	26.1
10.	Dental health	25.1
11.	Mental health	12.2
12.	Malnutrition	10.1
13.	Others	--

(3) Results of Priority Setting

The priorities which were calculated by the method outlined above are shown in Table 5-4. As the Table shows, curative services have the highest priority and are followed in order by child health care, tuberculosis, maternity care, clean water, family planning, and environmental health. Parasitic diseases, communicable diseases, dental health, mental health, and malnutrition all received low priority ratings.

3. Functions of the MHS

The functions of the MHS were finally designed based on the results of the determined survey and the current rural health situation.

The MHS serves as a bridge between the community's health needs and the resources required for solution of those health problems. The functions of the MHS were divided into eleven categories taking into consideration the current rural situation, existing health activities and assuming independent management of the MHS. (see Table 5-5).

Table 5-5. Functions of Health Subcenter

Main functions	1. Medical care
	2. Child health care
	3. Maternity care
	4. Family planning
	5. Tuberculosis control
	6. Environmental sanitation
Supporting functions	7. General health education
	8. Community and government relations
	9. Internal management and planning
	10. Training and supervision
	11. Others

The eleventh function (others) was purposely left open for possible activities which may develop in the future as part of the expanding health activities. As Table 5-6 shows, functions one through six are main function and supporting functions are included in categories seven to ten. Curative services and preventive health services are the main functions of the MHS. The function of the first section are curative and the other five main functions deal

with preventive and public health services.

B. Administrative Structure of the *Myun* Health Subcenter

The administrative structure of the *myun* health subcenter should be organized to enable it to perform the functions for which it was established. The performance of function means the work of bridging the gap between the needs of the population and the services of the MHS which are designed to meet those needs. For this purpose, an administrative organization is needed. An organization scheme was developed for this purpose consisting of the following structure.

A curative unit should be established to assume the delivery of curative services to patients. For this function, activities should be centered on primary health care delivery. Some of the other functions which should also be included in the unit are assisting in giving prenatal, delivery and postnatal care for the high-risk mother, and assistance in preventive and public health activities, such as family planning operations, preventive vaccination and physical check-ups.

A MCH unit is necessary for the health of mothers and children. Maternal child health management is partly included under the preventive health activities, but was organized independently in view of the size and nature of the activities required. This unit would mainly conduct the management of maternal child health, but would also be able to render assistance to other sections. To be ideal the family planning program should also be included in this section for the integrated approach.

The preventive health program unit, covering the entire field of preventive health activities, must be arranged to include programs for family planning, tuberculosis control, sanitation and other programs. Part of the important problems related to family planning or tuberculosis control could be handled with

the support of the curative and MCH unit.

Finally, it is necessary to have a director for the *myun* health subcenter, who assumes responsibility for planning, managing, supervising and evaluating all the activities of the health subcenter including community relations.

In actual situation the clear cut division of work is not desirable. The functions should be performed in a team (see Chapter 7).

Figure 5-3 is a diagrammatic illustration of the relationship between organization and structure.

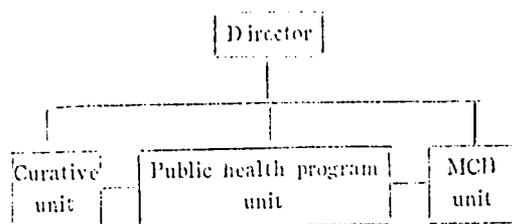


Figure 5-3. Administrative Structure of the MHS

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CHAPTER 6 BASIC HEALTH REQUIREMENTS AND CALCULATION OF SERVICE QUANTITIES

The basic functions defined in the preceding chapter are expressed as tasks or programs of the *myun* health subcenter. Thus far, the functions have been defined qualitatively rather than quantitatively. The functions or programs, however, should be quantified so that services can be organized. For example, for the organization of the curative services at the *myun* health subcenter (MHS) certain specific targets should be determined because it is not possible for the MHS to take responsibility for every single disease or minor symptom of the *myun* population. Also, the amount of prenatal care that should be given by the MHS should be determined prior to organization of maternity health service. The World Health Organization recommends 15 prenatal care visits per pregnancy for each pregnant woman.¹⁾ If such criteria are accepted for our situation more than one midwife per MHS are needed just to undertake the prenatal care in the *myun*. This is definitely not feasible in consideration of the current rural situation in Korea. However, quantification of the program can not be done easily without any specific concept and approach.

For this purpose the concept of basic health requirements was developed to determine the basic quantitative target of each function of the subcenter. With such basic targets the quantities of service can also be measured.

A. Basic Health Requirement

The concept of basic health requirements is derived from a consideration of the minimum quantity of health care that will maintain the health of a human being. This concept implies that at least this amount of health care must be delivered to each member of the

population of the community either by the Government or by society. This concept, therefore, depends upon the situation and value system of a society. In other words, the basic health requirement is determined with professional knowledge based on medical ethics and philosophy derived to a particular society.

1. Methods

The "Delphi technique" was used to collect the widely varying opinions of eleven health professionals about the basic health requirements in rural Korea. These professionals were the health care specialists engaged at the Kang Wha community health demonstration project, the Kang Wha county health center director, and a team of professors from Yonsei University College of Medicine. The final determination of basic health requirements was then made by the study team based on the collected information.

The following question is an example from this study. "In light of the current situation in rural Korea, how many times do you think an average pregnant woman should receive prenatal care?" It was possible, through these kinds of question, to determine the basic health requirement for programs such as curative care, maternity care, child care, and environmental hygiene. The determination of basic health requirements for the family planning and tuberculosis control programs was also possible, however, it was very difficult to quantify them. Therefore the government established yearly targets were adopted for these two programs. These Government targets were set in the process of formulating the national health plan, which is a part of the 4th Five Year Economic Plan.²⁾

Table 6-1. Basic Health Requirements of Each Program

1. Curative services
 - All demanded curative service should be managed.
2. Child care services
 - All children should receive basic vaccinations.
 - All mothers and families of young children should receive information on good child raising and especially on balanced diet.
3. Maternity care services
 - All pregnant women should receive prenatal care at least twice (once in the first trimester and again in the third trimester).
 - All pregnant women in the 'high risk' category should receive special care.
 - All deliveries should be conducted under standardized hygienic conditions.
 - All pregnant women should receive postnatal care at least once.
4. Family planning program
 - All the women in the reproductive age group should receive information on family planning.
 - The government target should be accomplished.
5. Tuberculosis control program
 - The government target should be accomplished.
 - All people in the 'at risk' group should receive either a chest X-ray or a sputum examination.
 - All detected sputum positive cases should be treated.
6. Environmental health program
 - All drinking water should be chlorinated
 - All community people should receive information about construction of a hygienic privy, kitchen and garbage disposal.
7. General health education program
 - All community people should receive information about dental health, personal hygiene, parasitic diseases and other health problems as necessary.

2. Results

The basic health requirements as determined by the above methods are shown in Table 6-1.

B. Calculation of Service Quantities by Target

The quantity of services required to fulfill the basic health requirements established for the determination of the basic targets was then calculated. Calculation of the quantities of service is necessary for the following reasons: first, the calculation of quantities of service can be used as a program evaluation indicator; second, it can also be used to calculate the required number of health care personnel¹⁰; third, training programs can be designed to equip health care workers with skills appropriate to their job; and last, it is a prerequisite of job descriptions of each health worker.

1. Methods of Calculation

(1) Standard population

For the quantification of health services, the population or number of clients should first be defined. The figure of 10,000 persons was used as the standard population of a *myun* area for the convenience, and the structure of

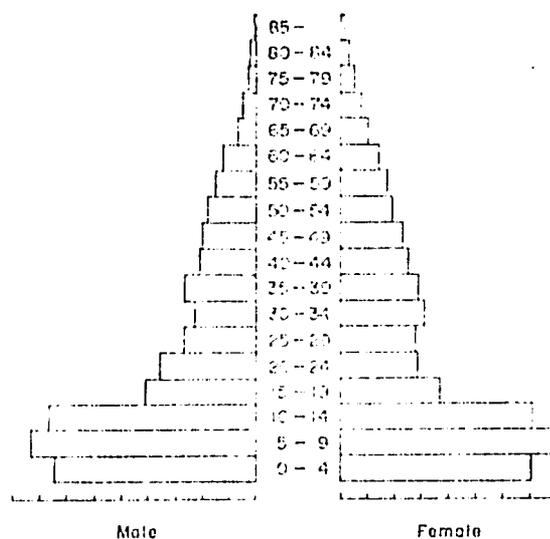


Figure 6-1. Population Structure of Rural Korea (1970 Population Census)

the standard population was derived from the rural population which was obtained from 1970 national population census (see Figure 6-1 and Table 6-2).

Table 6-2. Population Structure of Rural Korea (1970 Population Census)

Age	Male	Female	Total
0	2.61	2.49	2.55
1	2.73	2.61	2.70
2	3.11	2.97	3.04
3	2.91	2.77	2.84
4	3.41	3.29	3.31
5-9	16.68	15.69	16.19
10-14	15.23	14.23	14.73
15-19	8.17	7.57	7.87
20-24	7.19	5.76	6.48
25-29	5.52	5.59	5.55
30-34	5.99	6.31	6.15
35-39	5.49	5.93	5.67
40-44	4.24	5.07	4.65
45-49	4.11	4.56	4.33
50-54	3.60	3.82	3.71
55-59	3.11	3.39	3.25
60-64	2.43	2.82	2.63
65-69	1.51	2.00	1.77
70-74	1.07	1.57	1.32
75-79	0.56	0.96	0.76
80-84	0.25	0.49	0.37
85-	0.08	0.19	0.14

(2) Data and information used

The health interview survey (see Chapter 5) conducted in Kang Wha Gun in 1975 was the source of basic data and necessary information was supplemented with additional data from sources which will be referred to later.

2. Service Quantities by Each Function or Program

(1) Curative care

The basic health requirement for the curative care was defined as "All demanded medical care should be managed". In order to provide this quantity of care it is necessary to calculate the amount of curative care demanded.

Curative care for patients at the *myun* health subcenter (MHS) should be limited to primary medical care for out-patients only. All other needs should be referred to the upper level medical care institution (see Chapter 4).

Three different criteria were used for the calculation of medical care demand in a *myun*. These criteria were the number of physician visits per year, drugstore visits per year and outpatient visit rate per year among health insurance enrolled in rural areas.

The number of physician visits, which was 0.53 times per person per year, was obtained from the results of the health interview survey (see Chapter 5). The number of drugstore visits was 3.35 times per person per year, and the number of physician visits, 0.53 times, was added to it to obtain a combined calculation. The outpatient visit rate of the members who have enrolled in the various insurance programs in rural Korea was 1.12 times per person per year, in 1975.⁵¹ The reason why the two other criteria besides that of physician visits were used was that in the future when the MHS begins to function fully with an organized medical insurance program, more utilization of the MHS is expected.

If the current rate of physician visits as shown above remains constant, approximately 5,800 patients out of 10,000 population can be expected to visit a MHS during each year. However other studies such as that of Dr. Moon,⁶⁾ show an outpatient visiting rate of 0.355 per person per year which would yield a smaller number of patients that our study predicts. Utilizing the second criterion, drug store visits a total of 33,500 persons would be expected to utilize drugstores in a year in a *myun* population of 10,000. If the 5,800 physician visits were added to the above figure, a total of 39,270 visits could be expected per year. Such estimation suggest the maximum number of visits at the MHS in the future, but the possibility of this many visits in the near future is low. The third criterion used was the number of outpatient visits among

those who had health insurance. This is considered to be most possible in the near future. The OPD visit rate per person was 1.12 per year among insurance enrollees and in a *myeon* with a population of 10,000 a total of 11,200 patients are estimated to be the most likely number to visit the center during one year.

Number of patients expected to visit the MHS for curative care during one year are:

- a. Based on physician visit
 - 0.53 times per person per year in the Kang Wha study
 - 0.355 times per person per year in Dr. Moon's study
 - Therefore, number of physician visit per year
 - $= 10,000 \text{ (population)} \times 0.53 = 5,300$
 - $= 10,000 \text{ (population)} \times 0.355 = 3,550$
- b. Based on physician visit and drug store visit
 - 3.317 times per person per year
 - total of annual number of drug store visit
 - $10,000 \times 3.317 = 33,170$
 - annual number of physician and drug store visit is
 - $5,800 + 33,170 = 39,270$
- c. Based on health insurance data in rural Korea
 - total enrollment 27,335
 - number of O.P.D. visits per year 30,601
 - O.P.D. utilization rate per month 9.33%
 - annual number of O.P.D. visit
 - $= 10,000 \text{ (pop.)} \times 0.0933 \times 12 = 11,196$
 - $= 11,200$

(2) Child health care

The two basic health requirements of child care were defined as 'all children should receive basic vaccinations' and 'all mothers and families of children should receive information on good child raising and especially on balanced diet'.

For this particular study, only the first requirement was quantified. The second requirement is part of the general health education program and can be solved as part of that

program. The vaccination plan for this study was based on the immunization schedule recommended by the Korea Pediatric Society in 1975.⁷⁾ As Table 6-3 shows, BCG, DPT, poliomyelitis and small pox were included for the children less than 24 months old.

Table 6-3. Four Basic Immunization Schedule Recommended by the Korea Pediatric Society (June 1, 1975)

Age	Type of vaccination
Within 4 weeks	BCG
2 months	Poliomyelitis (oral) DPT
4 months	Poliomyelitis (oral) DPT
6 months	Poliomyelitis (oral) DPT
18 months	Poliomyelitis (oral) DPT
12-24 months	Small pox

According to the above vaccination plan, each child will receive five DPTs and polio shots simultaneously during the period between birth and 12 months, and will also get two more shots before becoming two years old.

It is recommended that a cohort approach be introduced for an accurate estimation of the size of the target population who are to receive vaccinations. The Lexis Diagram⁸⁾ in Figure 6-2 can be used to calculate the target population for vaccination for the year 1975, based on the cohort observation.

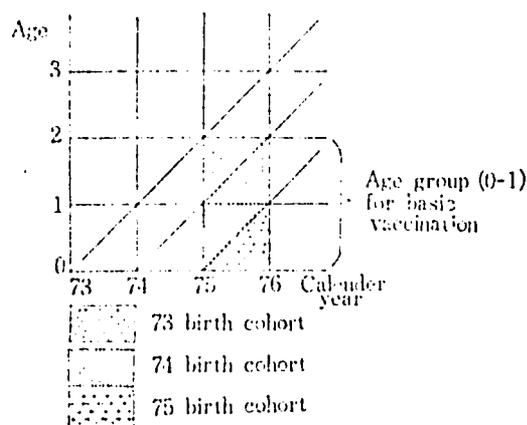


Figure 6-2. Lexis Diagram to Determine Number of Vaccination to be Given

The group of children 0-24 months old would consist of 75 birth cohort, 74 birth cohort and 73 birth cohort. The first group of children (0-12 months) requiring five vaccinations includes one half of the 75 birth cohort and one half of the 74 birth cohort. The group of children (13-24 months) requiring two shots includes one half of the 74 birth cohort and one half of 73 birth cohort. The total number of vaccination for 1975, therefore, totaled 1,987 as shown below. Figures for the birth cohort for each year are obtained from the 1970 national population census of the Government and calculated for the average *myun* population of 10,000 (see Table 6-2).

Total number of vaccinations to be done in 1975

$$= \frac{1}{2} (\text{number of 75 birth cohort} + \text{number of 74 birth cohort}) \times 5$$

$$= \frac{1}{2} (\text{number of 74 birth cohort} + \text{number of 73 birth cohort}) \times 2$$

$$= \frac{1}{2} (255 + 270) \times 5 + \frac{1}{2} (270 + 304) \times 2$$

$$= \frac{1}{2} (2,825 + 1,118) = 1,987$$

(3) Maternity care

The four basic health requirements defined for maternity care are as follow:

- All pregnant women should receive prenatal care at least twice (once in the first trimester and again in the third trimester).
- All pregnant women in the 'high risk' category should receive adequate attention and care.
- All deliveries should be conducted under hygienic condition.
- All pregnant women should receive post-natal care at least once.

The amount of service required to meet the basic targets for i) hygienic delivery, ii) antenatal care including high risk pregnancies and iii) postpartum care have been calculated.

The crude birth rate, 24 persons per 1,000 population which is the target set for 1973 in a National Health Plan as part of 4th Five Year Economic Plan,⁹⁾ was applied, and the pregnancy loss rate was based on the result

of prospective cohort study done by Ko and others in 1973 and 1974.¹⁰⁾

The conceptual frame developed for setting the targets in maternity health is illustrated in Figure 6-3.

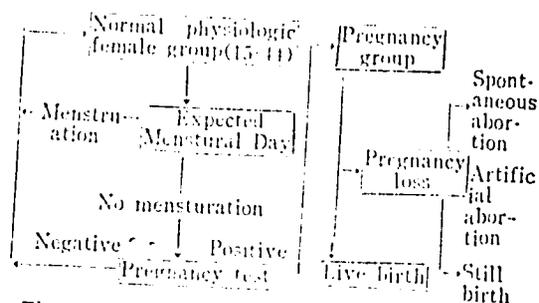


Figure 6-3. Conceptual Frame for the Outcome of Pregnancy

The crude birth rate is an accurate figure for calculation of the amount of service necessary for third trimester prenatal care and delivery care but will not be applicable for calculation of first trimester prenatal care due to the pregnancy wastage such as still-birth and abortions. The number of first trimester pregnancies was calculated by adding the pregnancy loss to the crude birth rate and these figures were used as the basis for calculation of the prenatal care required.

The total number of pregnant women was calculated as follow.

Total Number of Pregnancies

$$= \text{live birth} + \text{loss during pregnancy}$$

$$= \text{live birth} + \text{spontaneous abortion} + \text{artificial abortion} + \text{still-birth}$$

A total of 333 mothers would require prenatal care in the first trimester in an average *myun* with a population of 10,000 according to Dr. Ko's study,¹⁰⁾ the results of which are

Table 6-4. Rate for Pregnancy Outcome Calculated with Drs. Ko and Kim's Model 1973-1974.

Spontaneous abortion rate	0.07
Artificial abortion rate	0.19
Still birth rate	0.02
Live birth rate	0.72
Number of live birth	240
Total number of pregnancy	$240 \times \frac{1.00}{0.72} = 333$

shown in Table 6-4. In the third trimester 210 additional prenatal care visits would be required, bringing the total number of prenatal care visits to 573.

About five percent of the total number of pregnancies were estimated to be 'high risk' pregnancies.¹⁰ This would be about 12 cases per year in a average *myam* with 10,000 population. Exact specification of the amount and type of care for these special cases was avoided because some of these would be referred to specialists and this is beyond the scope of activities of the MHS.

The number of women who need postnatal care was assumed to be the same as the number of live births or 240 per year.

The quantity of services required for the maternity care program each year is summarized in Table 6-5.

Table 6-5. Service Quantities Required for Maternity Care Program

Number of expected deliveries per year	240
Total number of prenatal care required	573
At the first trimester	333
At the third trimester	240
Number of high risk pregnancies	12
Number of postnatal care required	240

(4) Family planning

The two basic health requirements which were established previously for family planning are: i) All women in the reproductive age group should receive information on family planning. ii) The Government target should be accomplished.

The target for family planning service was adopted from the Government as stated previously. The number of couples in the ages between 15 and 44 who are eligible for family planning, was calculated from the age structure of the standard population shown in Figure 6-1.

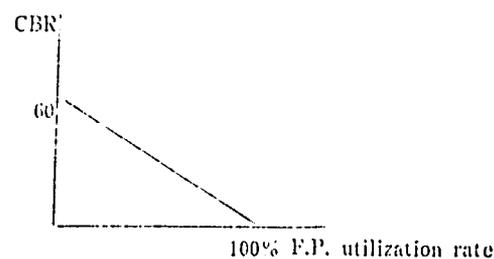
The goals for the family planning program were adopted from the population policy program planned by the office of the Maternal and Child Health, Ministry of Health and

Social Affairs for the 4th Five Year Plan.¹⁰

The quantity of services required for the family planning program was calculated by two methods. Dr. Donald J. Bogue's Pregnancy Model¹²⁾ was used to calculate the utilization rate of family planning services which would be necessary to reduce the birth rate each year and additionally, the amount of services necessary to achieve the government family planning target for 1979 which is included in the 4th Five Year Economic Development Plan, was calculated. This second calculation was divided by contraceptive methods and based on a rural population of 10,000.

Dr. Bogue has hypothesized that there is a linear relation between rates of family planning utilization and crud birth rate. His formula, based on data from the developing countries, proposes that if every eligible couple practices family planning, the birth rate would be zero, and if no couple practice family planning, the crude birth rate would be 60.

Dr. Bogue's basic model is illustrated in Figure 6-4.



$$C = 100 - \frac{100}{60} \times \text{CBR}$$

(C: Family planning utilization rate in married women)

Figure 6-4. Pregnancy Model Proposed by Dr. Donald J. Bogue

The following calculations were based on a crude birth rate of 23 per 1,000 when the Government set the goal of 1.5% population increase by 1979.

$$C = 100 - 100/60 \times \text{CBR} = 100 - 100/60 \times 23$$

$$C = 61.6\%$$

Therefore, the target crude birth rate can

be maintained when the rate of family planning utilization is 61.1 per cent.

In a typical rural community of 10,000 with a population structure like that of the 1970 national census, a total of 1,218 couples would be in the age group eligible for family planning, and of these, 750 must utilize some form of contraception to meet the government target of 1.5% population increase ($1,218 \times 61.6 / 100 = 750$).

Originally it had been planned that 15% of the total eligible couples¹³⁾ should finance their own contraceptives, but this was later lowered to 10 percent in consideration of rural economic conditions that leaves 51.6 percent of the number necessary to meet the target when contraceptives is financed by the government. This is shown graphically in Figure 6-5.

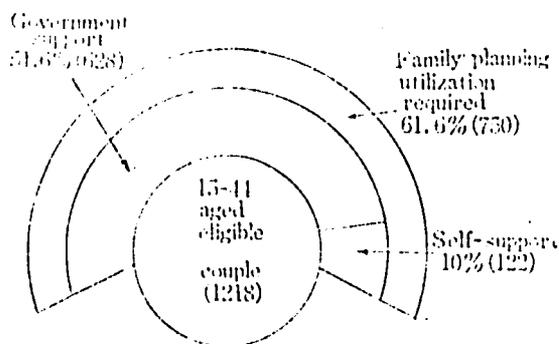


Figure 6-5. Family Planning Target in a Rural Community of 10,000

Under the government program,¹⁴⁾ the percentages of contraception to be accomplished by various methods could be broken down as follows: i) Intrauterine device—50% ii) Vasectomy and tubal ligation—13% iii) Condom 9% iv) Oral pill—23%. Table 6-6 shows the number of persons in each category when this breakdown is applied to the total of 628 clients in a *myun* (see Table 6-6).

However, such estimation will lead to incorrect estimations when applied to the above target because of the following reasons: i) in case of using temporary contraceptive method, such as condom or oral pill, the method must

Table 6-6. Contraceptive Methods to Be Applied

Intrauterine device	314
Vasectomy & tubal ligation	113
Condom	57
Oral pill	111
Total	628

be repeated, so an estimation can be made without problems, ii) but when vasectomy, tubal ligation or IUD are inserted, the number of users cannot be accurately confirmed. This is because the number of clients who are utilizing either semi-permanent or permanent contraceptive methods would accumulate over the years. In order to obtain more easily quantifiable figures the family planning target set by the Maternal and Child Health Section of the Ministry of Health and Social Affairs was used¹⁵⁾ (see Table 6-7).

The above target was based on the whole Korean population of 35,099,000. The respective figures for a rural community of 10,000 for 1979 are shown in Table 6-8.

Table 6-7. Family Planning Target Set by Government for the 4th 5 Year Economic Planning Period

	1977	1978	1979	1980	1981
Condom	250,000	275,000	300,000	325,000	350,000
Oral pill	320,000	310,000	350,000	380,000	400,000
Loop insertion	420,000	430,000	440,000	450,000	460,000
Sterilization	80,000	90,000	110,000	115,000	125,000

In the government target the rural and the urban populations were dealt with together and consequently could not be separated. Therefore, this may make the figures somewhat less applicable to a purely rural population.

(5) Tuberculosis control program

The three basic health requirements in the tuberculosis (TB) control program are: i) all persons in high risk groups should receive either a chest X-ray or a sputum examination.

Table 6-8. Estimation of Number of Each Contraceptive Methods to Be Applied Based on Government Target for the 4th Economic Planning Period (Average Annual Number from 1977 to 1981) for a rural population of 10,000

Condom	86 per month
Pill	103 per month
Loop insertion	126 per year
Sterilization (Vasectomy + tubal ligation)	32 per year

ii) all detected sputum positive cases should be treated, iii) the Government target should be achieved.

The TB control program is divided into three parts: i) detecting patients ii) registration and treatment of the detected patients iii) preventive activity through BCG vaccination and education.

There are two methods to detect TB patients: chest X-ray examination and sputum test. The risk group must receive the above two examinations and this was determined in the basic health requirement. The 'at-risk' group is the group that must receive first consideration in detection programs. The following groups of people are at special risk according to the WHO Expert Committee on Tuberculosis¹⁵⁾:

- i) older adolescents and adults with respiratory symptoms.
- ii) persons who have been in close contact with a sputum positive index case.
- iii) health staff exposed to infection in wards and laboratories particularly if they have not been protected by BCG vaccination.
- iv) patients who have had TB but have had either no chemotherapy previously or inadequate chemotherapy.
- v) persons known to have radiographic abnormalities in the lung of the type termed "fibrotic lesions", especially if there are large and recently detected.
- vi) patients with certain concomitant

diseases, for example, diabetes, pulmonary dust diseases, and gastrointestinal malabsorption syndromes, alcoholics, and patients on steroids.

However, there is no data reporting exactly how many risk patients there are in a community. The quantification of this, therefore, would be very difficult.

The patients who are detected should be registered with the MHS and, according to the Government provision, be classified into three groups: i) sputum positive patients requiring treatment ii) sputum negative patient requiring treatment, and iii) sputum negative case requiring observation. Patients in the third category do not need any treatment but rather a thorough going examination and close observation. Patients in the first and second group should receive appropriate treatment.

The preventive vaccination with BCG is included in the child health program and will not be discussed in this section.

In calculation of the amount of services necessary to cover and achieve the target effectively the prevalence rate, incidence rate, death rate, registration rate and recovery rate for tuberculosis should be known.

The TB prevalence rate was officially reported to be 3.3 per cent after the third national tuberculosis survey which was undertaken by the Korean Tuberculosis Association and the Ministry of Health and Social Affairs in 1975.¹⁶⁾ However, the incidence rate and death rate had to be estimated by health professionals since accurate data are not available. A national survey on the TB incidence rate was conducted in Korea during 1970 and 1971, and the rate was 0.31 per cent.¹⁷⁾ However this rate is not applicable at present because it is out dated. So, for this study Japanese data was adopted.¹⁸⁾ In Japan, when the prevalence rate was 3.3 per cent, the incidence rate was 0.3 per cent. By 1981, it was estimated that the incidence rate in Korea would be 0.2 percent according to the same

data.

The TB death rate was estimated to be 70 per 100,000 in 1977 and projected to drop to 50 per 100,000 in 1981, though the accurate data were unavailable.

In 1975, only 13% of all TB cases were registered according to a guideline to TB activities published by the Ministry of Health and Social Affairs.¹⁹ Of the detected cases, 6.25% had been detected by chest X-rays and 7.5% by sputum examination for acid-fast staining.²⁰

The cure rate among patients registered to the *gaa* health centers (GHC) was figured to be about 40 per cent each year based on the Kim's report in 1971.²¹ It is estimated that the cure rate would be about 50 per cent in 1976.

Calculation of size of the target is needed in order to determine the number of case to be detected and treated. In order to treat all patients detected, the number of new cases to be found per year should be determined.

According to the Government target, 30 new cases of TB should be detected in rural population of 10,000 each year.¹⁹ However such a goal will not be sufficient to decrease the prevalence rate from 3.3 percent to 1.5 percent, which is the goal of TB control program set by the Government for the 5 year period ending in 1981.²¹ Therefore, it is necessary to set a new target as shown below.

a. The data on prevalence rate, incidence rate, mortality rate, registration rate, and recovery rate for 1976 were used as a benchmark.

b. A long-term yearly plan of case registration rate and the cure rate was arbitrary defined based on the best professional judgement and this plan can be used as an indicator in evaluating the effectiveness of introducing new organization, personnel, equipment and financial resources, during the years between 1977 and 1981.

A target cure rate of 50 per cent was set for the starting year, 1976, with increases to

75 per cent in 1981 based on the assumptions that the MHS will be strengthened. And, when the TB control program is conducted by the strengthened subcenter, the rate of default in treatment would be reduced because patients are more easily followed by the subcenter. The subcenters are also more accessible to patients and more effective treatment can be delivered by the MHSs because they are expected to be supplied with secondary TB drugs.

A gradually increasing registration rate ranging from 20% in 1976 to 10% in 1981 was set on the assumption that i) an X-ray machine would be installed at each MHS, ii) health care personnel would be increased, and case-finding will be more active than now.

c. The target of incidence and mortality rates was also projected and determined arbitrary on a long-term yearly plan as shown in Table 6-9.

d. The number of cases to be found and the number of patients to be registered were calculated by the following methods:

Table 6-9. Annual Target of Registration and Recovery Rate and Estimated Incidence and Death Rates for Tuberculosis Based on Prevalence Rate (3.1%) in 1976.

Year	Incidence rates	Death rates	Registration rates	Recovery rates
1976	0.30%	70/100,000	20%	50%
1977	0.30%	70/100,000	25%	55%
1978	0.28%	60/100,000	30%	60%
1979	0.25%	60/100,000	33%	65%
1980	0.22%	50/100,000	35%	70%
1981	0.20%	50/100,000	40%	75%
1982	0.20%	50/100,000	40%	75%

- i) total number of patients = patients of previous year + new patients (expected recovered cases)
 ii) number of cases to be detected = number of patients to be registered in next year - (registered case - (recovery cases - death in registered cases)).

The result shows in Table 6-10

Table 10. Estimated Target for Case-finding and Treatment by Year

Year	Total patient	New cure	Death	Re-treat case	Re-cure case	Newly registering case
1976	319	30	7	61	33	--
1977	399	30	7	75	41	53
1978	282	28	6	85	51	44
1979	253	25	6	76	49	53
1980	223	22	5	78	55	53
1981	185	20	5	74	56	42
1982	141	20	5	58	44	--

e. The average number of patient to be detected and registered in a year were figured out with the average number 1977 through 1981.

Therefore,

Annual target for case finding ($=215/5=43$), and

Annual target for treatment ($=339/5=68$)
Therefore, an average of 49 patients have to be discovered annually, and 78 patients were the target number of treatment including sputum negative follow-ups.

f. 75 percent out of the 49 new cases are to be detected by chest X-ray examination and 25 percent through sputum testing.²⁰⁰ Therefore, 37 persons should be found through X-ray examination, and 12 persons through sputum tests.

g. 450 sputums per year should be collected since the detection rate by sputum test is 2.5 percent, and 592 persons should receive the indirect X-ray examination since the detection rate by indirect chest X-ray is 6.25 percent.

h. Each patient who is registered with the MHS should receive a direct chest X-ray examination twice a year and a sputum test 4 times a year for follow up. Thus the total number of direct X-ray examinations to be taken for follow up will be 156, and the number of sputum test will be 312. The total number of direct X-ray examination need to be taken will increase to 205 a year as the detected cases either by sputum or indirect

chest X-ray need direct chest X-ray examination for the confirmation.

The activity targets for the TB control program at the MHS during a year are summarized as follows:

d) case finding	
a) total target 49 cases	
discovery through sputum test	12 cases
detected through X ray	37 cases
b) target of X-ray examination	
indirect	592
direct	49
c) target of sputum collection	450
ii) management of patient	
a) number of patient to be treated	78
b) X-ray, direct	156
c) sputum examinations	312

(6) Other Health Programs

Even though basic health requirements for environmental sanitation and health education were included in the function of the MHS the quantification of program targets in detail was not possible due to the characteristics and the limited data for each program. The basic health requirement for environmental sanitation was that "all drinking water should be chlorinated." However, the installation of a water supply cannot be controlled by the MHS, and chlorination of well water and piped water can not be quantified for there is no data to generalize.

In the field of health education, quantification of the amount of education needed by each individual patient neither is possible nor necessary, since it will have to be included into the activities of the respective programs. The amount of group education necessary to meet basic health requirements is also difficult to quantify and programs should be developed according to the situation at each MHS.

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CHAPTER 7 TYPES, ROLES AND JOB DESCRIPTIONS OF HEALTH PERSONNEL IN THE MYUN HEALTH SUBCENTER

In the preceding Chapters, the functions, basic targets and quantities of service needed at the myun health subcenter (MHS) to de-

liver comprehensive health care service were calculated. In this Chapter, types, qualities and job description of health personnel who will

work at the MHS will be defined.

A. Principles for Selecting Health Personnel

Principle for selection of health personnel appropriate for current rural conditions in Korea were predetermined and are outlined below.

The first principle was to utilize fully the existing health personnel, and as far as possible, avoid developing new types of health manpower.

In order to accomplish this goal, the existing health personnel will receive supplementary education and training to enable them to undertake new assignments if their present level of training is inadequate for the proposed new health roles required in the MHS. The above principle was based on the following rationale. When an entirely new type of health personnel is developed for a specific function in a health care delivery organization, a number of problems will occur such as: i) role conflicts with the existing personnel ii) problem of acceptability to the community and the existing health personnel iii) legal problem iv) job security of career employees, and v) expenses necessary for education and training. The development of new health personnel, therefore, was avoided as far as possible.

The second principle was to delegate job responsibility to health personnel on the basis of their qualifications and background. Thus, easily managed work was given to the lower echelon health workers. In particular, many of the activities at a MHS do not require personnel who have obtained technical or university qualification. In cases not requiring specific qualifications, on-the-job training for people would be sufficient. Such recruitment was not particularly mentioned in this study, but semi-voluntary health workers selected from the community (for example, family health workers in Kang Wha gun) have so far proven to be able to cover a substantial

amount of the health services at the village level.

The third principle was that function must be given priority over securing the manpower. The availability of needed health personnel and economic matter were considered secondary because in a long term plan the basic requirements must be achieved. If the basic requirements in the suggested are accepted as valid base for health planning, they must be fulfilled. And they must be given the support they require. Physician, public health nurse and midwife are among the health personnel who must be included in this consideration.

B. Types and Roles of Health Personnel for the Myun Health Subcenter

The types of manpower selected were based on the aforementioned three principles. The role of each type of personnel will be mentioned only briefly in this section because the tasks have not yet been clearly defined. Detailed job descriptions for each type of health personnel will be given in the next section. The plan for securing manpower was not discussed in detail in this study.

1. Physician

The physician's roles at the MHS are:

- a. provision of curative services
- b. planning and operation of the public health programs
- c. serving as a liaison between higher administrative agencies and the community
- d. supervision of health personnel and activities at the center
- e. continuous education of the MHS staff.

It seems that the present curriculum at medical colleges does not produce physicians who are able to fulfill such roles. Some Korean medical colleges have been conducting a community health education program, and physicians from these medical institutions would be perhaps better prepared for such positions. If

a physician who is assigned to direct a MHS has not received any course work in community health at college, it is recommended that he be given a one or two month training course before being assigned to his post. Another area of concern is the terms of employment of the MHS physician. At present, the physicians assigned to the MHS are responsible for administration of an extensive public health program as well as delivery of curative services.

It seems desirable to allow the physician to be given a certain incentive for his services in the public health program, while at the same time remaining a free practitioner in the delivery of curative services. This would avoid making the physician-MHS director a full-time Government employee, thus saving on salary, and also give incentive and impetus to the development of better curative services since this will increase the physician's income.

2. Public Health Nurse

A public health nurse must become available at the MHS, too, so that the basic service requirements can be fulfilled. This will especially enhance the public health work and facilitate management of MHS services.

The public health nurse's role in the MHS are considered to be;

- a. administration and management of the public health services
- b. supervision, continuous education and guidance of all staff engaged in public health work
- c. cooperation with the physician in planning and in evaluation of the public health programs
- d. liaison between the MHS and the community leaders, agencies and interested groups on health related programs in the community
- e. liaison between the MHS and higher administrative agencies, the MHS and public health services in the community.

There are few official programs for training public health nurse in Korea at present.

However, if the present curriculum of nursing schools and colleges could be revised to meet the needs of public health nurses or if additional training could be given to those who finish nursing school, it would certainly be possible to meet the requirement for public health nurses.

3. The Midwife

For the fulfillment of basic requirements in maternity and newborn care in the community an appropriately trained midwife, knowledgeable in obstetrics as well as in the community health care approach, must become available at the MHS. Within the MHS team she will have to take on the tremendous responsibility of implementing and managing almost all aspects of maternity care, which includes prenatal care, delivery care, post partum and newborn care, spacing care and all related education to all concerned in the community. Since no other person in the MHS team has the education and skill to develop and manage this program adequately and her activities will be constantly disrupted by delivery calls, close cooperation with and support by the other members of the MHS team is essential. Details of this cooperation, especially in staff management concerning the peripheral village programs, and in adequate care for high risk patients at the MHS, and referral to appropriate institutes must be worked out.

The existing programs for midwifery training do not prepare a midwife to manage a *myun* program which covers the basic maternity care requirements as determined above.

The training of a midwife qualified to practice maternity care in a *myun* must be oriented at the basic requirements for maternity care in the *myun*. It must include the community health approach and the proper preparation and management of home deliveries under rural Korean conditions. It must also include the requirements to do this as a member of the MHS team. Many problems will have to be solved before a maternity care service for

the rural *myun* can function satisfactorily. Status, training, reimbursement schemes and career opportunities for the rural midwife are not the least of the problems that need consideration. But these are many more. It is too early, to have a definite understanding of how such midwives can be produced in sufficient numbers. There, too, planning must occur in an integrated manner and must consider the entire MHS functions and integrated services as well as rural attitudes towards procreation. More than any other service maternity care must be oriented at the grass roots.

The existing training programs for midwives can hardly meet the basic requirement and the system is not suited for rural maternity health care which is still mainly based on home-delivery. Therefore, home-delivery should be included in the training course. Midwife qualification should also be granted to students graduating from nursing colleges.

4. Myun Health Workers (Multipurpose Health Workers)

Multipurpose health workers (MPW) refer to nurse-aids presently dispatched to the *myun* area from the *gun* health center (GHC) or other health workers with similar educational background and functional roles. These workers mainly carry out their given assignment through home-visits under the supervision of the physician, public health nurse and midwife. A joint research project on the roles and functions of *myun* health personnel is now under study by the Government and WHO at Yong In *Gun*.¹⁾ The necessity of rearrangement of roles has already been recognized. The necessity for rearranging roles and functions of *myun* health workers has also been confirmed at the Kang Wha Community Health Demonstration Project areas.²⁾ The basic idea for rearrangement of the role was to shift from the present single role of health workers to a multipurpose role for the reasons discussed below.

In the past, the family planning program, tuberculosis control program and maternal-

child health program have been separately conducted with a single *myun* health worker assigned responsibility for each program. The new idea is that the whole *myun* community would be divided into a number of smaller areas equal to the number of *myun* health workers, and each health worker would then assume responsibility for the three public health programs in her own smaller area. This role shift has several advantages.

First, the present duplication of activities of each health worker may be avoided if such MPWs are utilized at the *myun* level. The most important work of *myun* health workers is to go home-visiting. At present each of the three *myun* health workers must cover the entire area (about 40 Km² in average) of the *myun* and the entire community population, a total of 10,000 persons in 2,000 households on the average. When the plan for multipurpose activities of the three health workers is adopted the whole *myun* will be divided into three areas and each MPW will cover only one of these *myun* areas. The number of home-visits by each *myun* health worker will increase. Therefore, more services can be provided.

Second, the frequency of home-visiting will increase as the time needed to do the home-visiting is reduced. The time required for home-visiting is divided into the transportation time and the counseling time. When a home-visit is made by the proposed MPW, more hours can be allotted for counseling and education time at each home because farming houses are closely located in every one area, and thus the time needed for transportation will decrease.

Third, the counseling time needed for each home-visit can be reduced. The time utilized for a home visit may be divided into that used to establish rapport and actual counseling time. When a home-visit is made by the MPW, because she is working in a smaller area where she can work intensively and become well

known, the time needed to establish rapport can also be reduced.

Fourth, more extensive health problems can be managed if the present health worker is trained to be a MPW. The existing health worker is not allowed to carry out other functions. There are various health problems in the *myun* e.g., dental health, mental health or environmental health problems which may require high priority to solve. Such problems cannot be handled by the present health workers. Accordingly, it is necessary for the proposed MPW's be trained to work toward the overall solution of health problems in the *myun*.

Fifth, a single supervision system for MPW's can be established, reducing the administrative difficulty. The present health workers are under the supervision of two different sections at the GHC. Family planning workers and maternal child health workers belong to the Center's administrative section while tuberculosis control workers belong to the preventive-epidemic section. Thus each receive orders and instructions from different channels. If a single supervision system is formed, each of the MPW's will be given the same instruction and supervision, reducing the administrative complexity and increasing efficiency and co-operation.

5. Multipurpose Technician-Aid

One of the proposed functions of MHS involves operation of X-ray and laboratory facilities. For the proper operation of these facilities, some technical expertise is required, but the technicians employed do not have to be highly qualified and it is not feasible to induce such qualified persons to work in rural area.

It is known that high-school graduates from the community can be suitably trained for this position with an on-the-job training program. On-the-job training should be conducted jointly by qualified technicians at the GHC and *myun* physicians. After placement these "Technician Aids" should receive close techni-

cal supervision. The technician aids can also assume, besides their given duties, general administrative work at the MHS. This will avoid the necessity of employing of regular administrative workers.

It is believed that one technician aid will be also to satisfactorily handle, at least for the present, both the laboratory work and X-ray work, and even have spare time to help with the administrative work at the MHS.

6. Medical Aid

One medical aid will be used to help the physician deliver curative services and make optimum utilization of his time. Such aids are presently hired by most of the private practitioners and public physicians in *myun* areas.

The functions that could be done by the medical aid are as follows:

- a. receiving patients
- b. keeping patient records
- c. assisting the physician when he sees patients
- d. guiding patients to the X-ray and laboratory
- e. sterilizing various equipment
- f. other miscellaneous work including wrapping and measuring the prescribed medicine, etc.

This job can be filled by any community girl with a junior-high-school level education after on-the-job training at the MHS.

C. Detailed Service Contents by Program (Function)

The roles of the health personnel have been described in general, in the previous section. The next step is to make job descriptions for each of the health personnel.

Before assigning job responsibilities, the details of the programs and the service components of each must be defined. One of the best method to ascertain service components is through the use of a "flow diagram" of the activity process of each program at the

MHS which finds exactly where each component is being performed. Such flow diagrams were drawn based on two demonstration MHS at the Kang A-ba Community Health Demonstration Project, which are considered to be functionally similar to the MHS which is proposed in this study.

Detailed service components of each program were outlined in flow diagrams.

1. Service Components of the Curative Program

Figure 7-1 shows a flow diagram for the patient referral system from *ri* level (village) at the bottom to the *myun* level (township), *gun*-level (county) and to secondary medical care institutions. Detailed service components of the curative level may be identified on the flow diagram. This components are broken down as follows:

Village Level (*ri*)

- Case finding by home visit
- Simple care, first aid and curative care to bedridden patients
- Patient referral to MHS

Health Subcenter Level (*myun*)

- Receiving patient
- History taking and physical examination
- Laboratory tests
- Interpretation of the tests
- Taking X-ray
- Reading X-ray
- Final diagnosis
- Prescribing drugs
- Dispensing drugs
- Giving injections
- Applying dressings
- Performing minor surgery
- Educating the patient
- Receiving fee for medical care
- Hospital referral
- Follow-up
- Recording
- Receiving home calls
- Receiving night calls
- Overall
 - Planning and evaluation

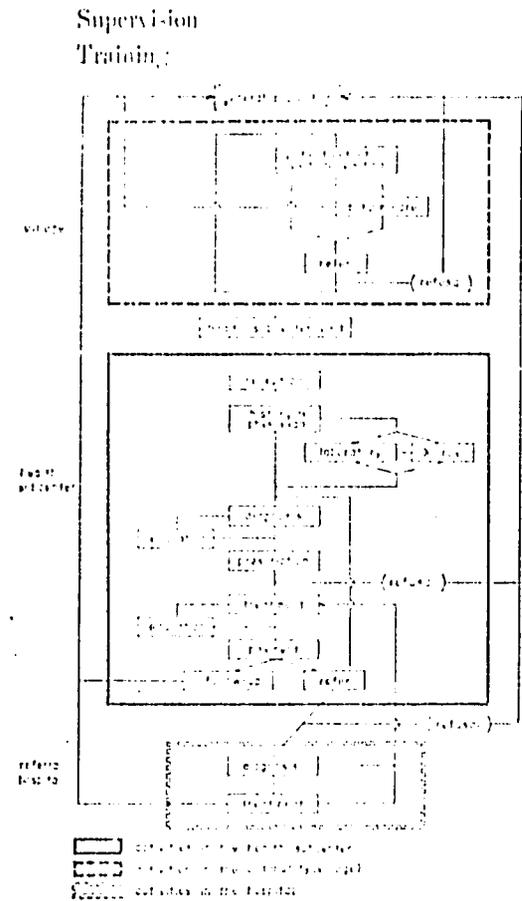


Figure 7-1. Flow Diagram for Medical Relief Function

2. Service Components of the Child Health Care Program

A flow diagram for an overall child health care management system at the *ri* and *myun* level is shown in Figure 7-2.

The service components of child health care management are listed below:

Village Level (*ri*)

- Registering client
- Weighing children
- Health education
- Referring problem cases to MHS

Health Subcenter Level (*myun*)

- Receiving client
- Checking vaccination history
- Giving vaccinations
- Educating parents about vaccination schedule

- Record keeping
- Receiving fees
- Reporting to GHC
- Receiving vaccine and supplies from GHC
- Overall
 - Planning and evaluation
 - Supervision
 - Training

- Receiving client
- History taking
- Testing urine (plano-sac test)
- Testing hemoglobin
- Examining abdomen
- Measuring blood pressure
- Weighing
- Performing pelvic examination
- Registering client at MHS
- Educating client
- Performing antenatal care
- Consulting physician about high risk cases
- Examining and caring for high risk cases
- Record keeping
- Sterilizing delivery kits
- Delivering delivery kits
- Educating about use of delivery kit
- Caring for spontaneous abortion cases
- Assisting delivery

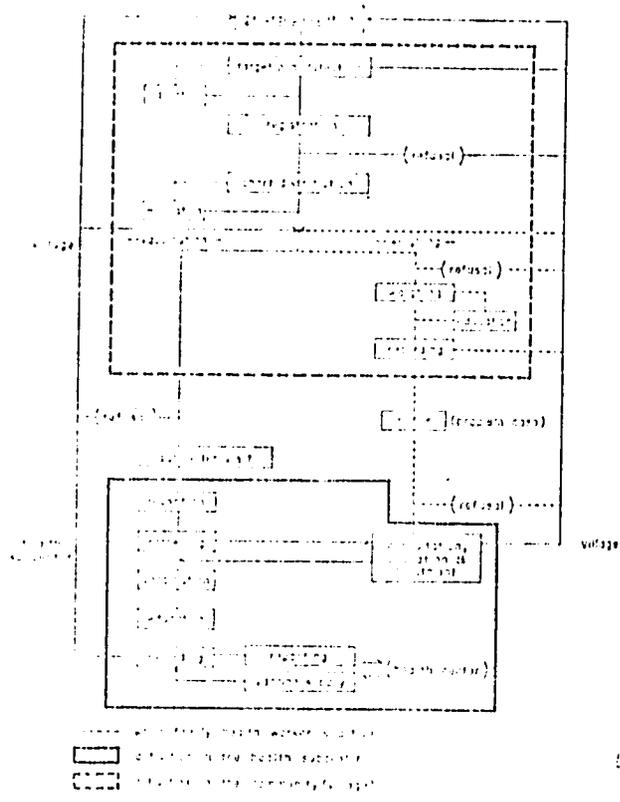


Figure 7-2. Flow Diagram for Child Care Program

3. Service Components of the Maternity Care Management Program

Figure 7-3 is the flow diagram which demonstrates the service components of the maternity care program.

Detailed components of the program, identified by the flow diagram, are listed below:

- Village Level (*ri*)
 - Case finding
 - Registering pregnant women
 - Referring to MHS
- Health Subcenter Level (*myun*)

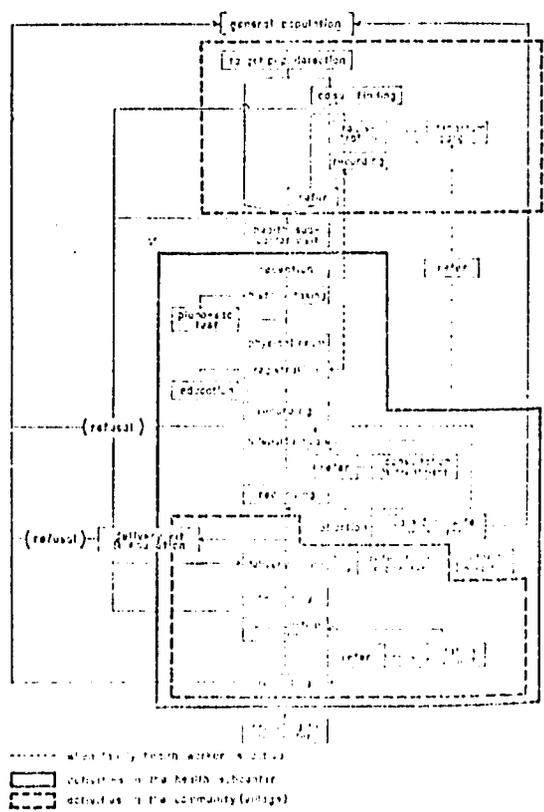


Figure 7-3. Flow Diagram for Maternity Care Program

Referring problem cases to the physician
 Managing the problem cases
 Performing postnatal care
 Postpartum management of problem cases
 Reporting to GHC

Overall

Planning and evaluation
 Supervision
 Training

4. Service Components of the Family Planning Service

The flow diagram in Figure 7-1 identifies the components of service.

Detailed components of service to be delivered in the family planning program are listed below:

Village Level (*ri*)

Case finding
 Group education
 Educating during home visiting
 Registering clients at the health post
 Referring clients to MBS
 Distributing condoms and oral pills

Health Subcenter Level (*myun*)

Receiving client at the MHS
 History taking
 Education and advice
 Screening of patient
 Performing "menstrual regulation" (early induced abortion)
 Inserting IUDs
 Performing mini-laparotomy
 Performing vasectomy
 Distributing condoms and pills
 Performing induced abortion
 Sterilization of surgical equipment and supplies
 Record keeping
 Receiving fees for medical care
 Reporting to GHC
 Receiving supplies from GHC
 Follow-up

Overall

Planning and evaluation
 Supervision & Training

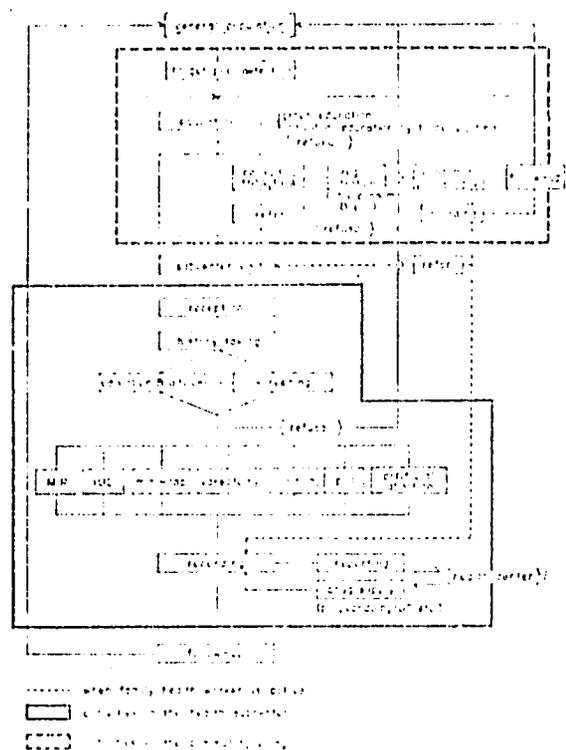


Figure 7-4. Flow Diagram for Family Planning Program

5. Service Components of the Tuberculosis Control Program

The flow diagram in figure 7-5 shows the service components of the tuberculosis control program. The components of this program are shown below:

Village Level (*ri*):

Health education
 Collecting sputum
 Home visiting for follow-up

Health Subcenter Level (*myun*)

Taking X-rays
 Reading X-ray films
 Examining sputum
 PPD testing
 Registering patients
 Referring patient to GHC
 Receiving drugs and supplies from GHC
 Distributing drugs
 Educating patients about use of drugs
 Educating patients about method of in

- jection
- Injecting streptomycin
- Record keeping
- Reporting to GHC
- Overall
 - Planning and evaluation
 - Supervision
 - Training

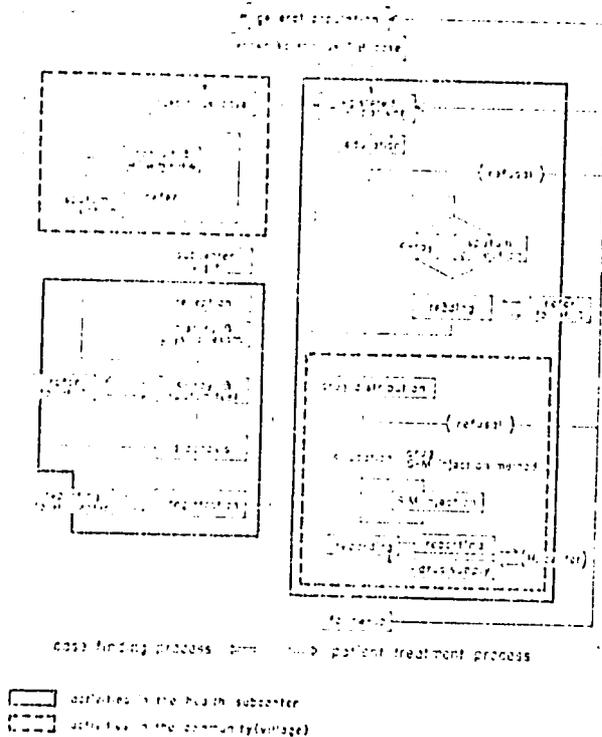


Figure 7-5. Flow Diagram for Tuberculosis Control Program

6. Other Miscellaneous Programs

Other functions such as health education, internal management and public relations, should be approached flexibly and programs must be tailored to meet current condition. For this reason flow diagrams and detailed service components for these miscellaneous programs were not developed.

D. Job Descriptions for Health Care Personnel

Since the service components of each of the programs have now been identified, individual

job descriptions for each type of health personnel can now be defined.

There are some problems in deciding which types of work to assign to each of the many types of health personnel. First, most jobs except specialized jobs such as physical examination or delivery assistance, may be assigned to any of the types of personnel available. Second, some of the service components of certain programs can most effectively be implemented through the team work of different types of health personnel. For example, in family planning, the different components should be handled by different types of health personnel working as a team: a) family planning education and distribution of contraceptives by public health nurse and MPWs, b) insertion of intrauterine device by midwife and c) operations for a vasectomy or mini-laparotomy by physicians. Third, the MHS proposed by this study may be accepted by the Government, but the implementation of this type of center throughout the country probably will have to be show very gradual in Korea.

Therefore, consequently only part of the health personnel suggested by this study, would be utilized for the time being. When manpower is insufficient the vacant functions should be covered by some of the available health personnel, so that the basic health requirement can be met.

Recently a "Team Approach Concept" came to the front as the most efficient and effective way to organize working relationships among various health personnel. Overly restrictive job descriptions and a hierarchical administrative system only to result in inefficiency and ineffectiveness. Health care is a purely service-oriented program for the community people.

This study was done to develop a new job allocation chart in consideration of the problems previously stated and the team concept. In the charts detailed service components are listed on the left side and types of health per-

sonnel are shown across the top, with job responsibility indicated in the cells of the chart. In the table, the responsibility for each service by the indicated health personnel is coded with a letter, (e.g. A,B,C,N, or X.)

Personnel who are given an "A" rating for a particular service component will assume the primary role and "B" indicates a secondary role, "C" a minor role and "N" signifies no role. When the person who is to perform the primary role (A) is absent, "X" will substitute for "A" rather than "B" because although "B" has responsibility for a secondary role, "B" usually does not have the skill to perform the primary role.

In every service, one who performs the primary role will consult with "B" and "C" and work as a team with them to accomplish the assigned duty.

The advantages of this type of job responsibility allocation table are: i) job allocation will be easier when new health personnel are appointed ii) it is easy to point out the responsibility when problems occur, and iii) health personnel will be encouraged to help one another on the basis of a "team concept".

Job allocation charts for medical relief, child care, maternal care and family planning and tuberculosis control are shown in Table 7-1 through 7-1 below.

Table 7-1. Job Allocation and Description for Curative Service by Type of Health Personnel at the MHS

	Physician	PHN	Midwife	MPW	Medical aid	Technician aid
					A: primary role	
					B: secondary role	
					C: minor role	
					N: no role	
					X: substitute for A when A does not exist	
(Village level)						
Case finding by home visiting	N	BX	N	A	N	N
Simple care and first aid	N	BX	N	A	N	N
Patient referral to Health subcenter	N	BX	N	A	N	N
(Health subcenter)						
Receiving Patient	C	C	N	BX	A	C
History taking & physical examination	A	NX	N	N	N	N
Laboratory tests	BX	N	N	N	N	A
Interpretation of the test	A	N	N	N	N	N
Taking X ray	BX	N	N	N	N	A
Reading X-ray	A	N	N	N	N	N
Final diagnosis	A	N	N	N	N	N
Prescribing drugs	A	N	N	N	N	N
Dispensing drugs	CX	C	N	C	A	N
Giving injections	A	CX	C	C	B	N
Applying dressings	A	C	C	N	BX	N
Performing minor surgery	A	N	N	N	C	N
Educating the patient	A	BX	N	C	N	N
Receiving fee for medical care	C	C	N	BX	A	N
Hospital referral	A	BX	C	N	N	N
Follow-up	C	BX	N	A	N	N
Recording	A	C	N	N	C	C
Receiving home calls	A	N	N	N	C	N
Receiving night calls	A	N	N	N	C	N
(Overall)						
Planning and evaluation	A	BX	C	C	N	N
Supervision	A	BX	C	C	N	N
Training	A	BX	C	C	N	N

Table 7-2. Job Allocation and Description for Child Health by Type of Health Personnel at Health Subcenter

	Physi- cian	PHN	Midwife	MPW	Medical aid	Techni- cian aid
A: primary role B: secondary role C: minor role N: no role X: substitute for A when A does not exist						
(Village level)						
Registering client	N	B	N	A	N	N
Weighing children	N	BB	N	A	N	N
Health education	N	B	N	A	N	N
Referring problem cases to MHS	N	B	N	A	N	N
(Health subcenter level)						
Receiving client	N	C	N	A	BX	N
Checking vaccination history	B	BX	N	A	N	N
Giving vaccinations	C	BX	N	A	B	N
Educating parents about vaccination schedule	C	BX	N	A	N	N
Record keeping	C	BX	N	A	N	N
Receiving fee	N	C	N	A	BX	N
Reporting to GHC	C	BX	N	A	N	N
Receiving vaccine & supplies CHC	N	BX	C	A	N	N
(Overall)						
Planning and evaluation	BX	A	C	C	N	N
Supervision	BX	A	C	N	N	N
Training	BX	A	C	N	N	N

Table 7-3. Job Allocation and Description for Maternity Care by Type of Health Personnel at Health Subcenter

	Physi- cian	PHN	Midwife	MPW	Medical aid	Techni- cian aid
A: primary role B: secondary role C: minor role N: no role X: substitute for A when A does not exist						
(Village level)						
Case finding	N	CX	C	A	N	N
Registering pregnant women at Health Post	N	CX	C	A	N	N
Referral to MHS	N	CX	C	A	N	N
(Health subcenter level)						
Receiving client	N	C	A	B	BX	N
History taking	BX	C	A	C	N	N
Testing urine (plano-sac test)	C	B	A	C	N	BX
Testing hemoglobin	C	C	BX	C	N	A
Examining abdomen	BX	A	A	N	N	N
Measuring blood pressure	N	C	A	BX	N	N
Weighing	N	C	A	BX	B	N
Performing pelvic examination	BX	N	A	N	N	N
Registering client at MHS	C	C	A	BX	N	N
Educating client	B	C	A	BX	N	N
Performing antenatal care	BX	C	A	B	N	N
Consulting Physician about high-risk case	N	N	A	BX	N	N

Examining and caring for high-risk case	A	N	B	N	N	N
Record Keeping	BX	C	A	B	N	N
Sterilizing delivery kits	N	N	BX	C	A	N
Delivering delivery Kits	N	C	BX	A	N	N
Educating about use delivery kit	N	C	A	BX	N	N
Caring for spontaneous abortion cases	BX	N	A	N	N	N
Assisting delivery	BX	N	A	N	N	N
Referring problem cases to the physician	N	N	A	N	N	N
Managing the problem cases	A	N	B	N	C	N
Performing postnatal care	N	N	A	BX	N	N
Postpartum management of problem cases	A	N	B	N	C	N
Reporting to GHC	C	BX	A	C	N	N
(Overall)						
Planning and evaluation	BX	A	B	C	N	N
Supervision	BX	A	B	C	N	N
Training	BX	A	B	C	N	N

Table 7-4. Job Allocation and Description by Types of Health Personnel at Health Subcenter for Family Planning

A: primary role
 B: secondary role
 C: minor role
 N: no role
 X: substitute for A
 when A does not exist

	Physi- cian	PHN	Midwife	MPW	Medical aid	Techni- cian aid
(Village level)						
Case finding	N	B	C	A	N	N
Group education	C	A	N	BX	N	N
Education during home visiting	N	B	N	A	N	N
Consultation at the health post	N	B	N	A	N	N
Registering client at the health post	A	B	C	A	N	N
Referring clients to MHS	N	B	C	A	N	N
Distributing condoms and oral pills	N	B	N	A	N	N
(Health subcenter level)						
Receiving client at the MHS	N	C	N	A	BX	N
History taking	C	BX	C	A	N	N
Education and advice	C	BX	C	A	N	N
Screening of patient	A	B	N	BX	N	N
Performing "menstrual regulation" (early induced abortion)	A	N	N	N	C	N
Inserting IUD	BX	N	A	N	N	N
Performing Mini-Laparotomy	A	N	N	N	C	N
Performing vasectomy	A	N	N	N	C	N
Distributing condoms and pills	C	BX	N	A	N	N
Performing (later) induced abortion	A	N	N	N	C	N
Sterilization of surgical equipment & supplies	N	C	N	BX	A	N
Record keeping	C	BX	N	A	N	N
Receiving fee for medical care	C	B	N	BX	A	N
Reporting to GHC	C	BX	N	A	N	N
Receiving supply from GHC	N	BX	C	A	N	N
Follow-up	N	BX	N	A	N	N
(Overall)						
Planning and evaluation	BX	A	C	C	N	N
Supervision	BX	A	C	N	N	N
Training	BX	A	C	N	N	N

Table 7.5. Job Allocation and Description for Tuberculosis Control Program by Type of Health Personnel at Health Subcenter

	Physician	PHN	Midwife	MPW	Medical aid	Technician aid
A: primary role B: secondary role C: minor role N: no role X: substitute for A when A does not exist						
(Village level)						
Health education	N	BX	N	A	N	N
Collecting sputum	N	C	N	A	N	N
(Health subcenter level)						
Taking X-ray	BX	N	N	N	N	A
Reading X-ray films	A	N	N	N	N	N
Examining sputum	BX	N	N	N	N	A
PPD testing	C	BX	N	A	N	N
Registering patients	C	BX	N	A	N	N
Referring patient to GHC	A	N	N	N	N	N
Receiving drugs and supplies from GHC	N	EX	C	A	N	N
Distributing drugs	N	EX	N	A	N	N
Educating patients about use of drugs	C	BX	N	A	N	N
Educating patients about method of injection	N	BX	N	A	N	N
Injecting streptomycin	N	BX	N	A	N	N
Record keeping	C	BX	N	A	N	N
Reporting to GHC	C	BX	N	A	N	N
Home visiting for follow-up	N	BX	N	A	N	N
(Overall)						
Planning and evaluation	BX	A	C	C	N	N
Supervision	BX	A	C	N	N	N
Training	BX	A	C	N	N	N

REFERENCES

1) Ministry of Health and Social Affairs: Field Operations Manual-General Health Services Development, Aug., 1971.

2) Kang Wha Community Health Teaching Project: Project Philosophy and Strategies for Implementation. Yonsei University, College of Medicine, Aug., 1971.

CHAPTER 8 NUMBER OF HEALTH PERSONNEL REQUIRED FOR THE MYUN HEALTH SUBCENTER

In Chapter 7 the types of personnel required and their job descriptions in relationship to the functioning of the *myun* health subcenter (MHS) were compiled. In this chapter the numbers of each type of personnel required to perform the determined services are calculated.

To calculate the number of required health personnel, first, the total amount of health care services to be provided for a certain

period of time should be identified, and second, the quantity of service to be expected from each health personnel for a certain period of time should be specified.

The total amount of health care services to be provided by the MHS has already been calculated in Chapter 6. However, separate research concerning the quantity of service that can be managed by one health worker

during a certain period of time should be studied. This research can not be done at a desk, but rather, the amount of time required by health personnel in the field to complete assigned tasks should be obtained. For example, the time required for home-visiting can only be obtained by surveying those who actually make home-visits. For this purpose, a "time-activity study" was conducted.

A. Total Working Days (Hours) per Health Worker per Year

The average annual number of working days of a health worker includes all the weekdays of the year with the exception of official holidays, annual leave, sick leave and time off for training. Saturday is considered a half day and Sundays are excluded. Sundays, official holiday and annual leave are all fixed, but days for sick leave and training were obtained from the personnel records of the Kang Wha GHC for the year of 1975.

Table 3-1. Working Days (Hours) per Health Worker per Year

Days in year	365
Non working days in year:	105
Sundays	52
Saturdays	$52 \times 1/2 = 26$
Holidays and vacation	22
Education and other leaves	5
Total working days per year	260
Total working hours per year	$260 \times 8 \text{ hrs.} = 2,080$ (hrs.)

As the Table 3-1 shows, there are a total of 105 non-working days and 260 working days each year. Considering 8 hours as one working day, the total working hours per year is calculated to be 2,080 hours. However, according to the survey the actual *myun* health worker worked an average of 8 hours and 40 minutes a day including Saturdays, and sometimes the physician and midwife did additional work at night.

B. Time Required per Unit of Activities by Types of Health Worker

A "time-activity study" on 35 *myun* health

workers who were working in the one *cup* and 12 *myuns* of Kang Wha *Gun* was conducted during the month of September, 1976 in order to calculate the time required per unit of activity.¹⁾

Two preliminary surveys were conducted to test the questionnaire for the "time-activity study". First, six *myun* health workers were asked to keep a detailed diary of their daily activities for 6 days to provide a basis for questionnaire construction. The results were analyzed and then a structured survey form was developed. This structured form was then tested for 15 days with 6 *myun* health workers before the finalized questionnaire was developed, and then the form was finalized. The form has 26 different items and each worker is supposed to record the length of time for certain activities on the form everyday. One sheet was used for each day. For the actual survey all health workers were given mimeographed instructions on how to fill out the items properly.

Surveys on activities of the physician, public health nurse and midwife were also conducted. Since their functions are quite different from those of the *myun* health workers, separate survey questionnaires were developed. A study of the activities of two physicians, two public health nurses and two midwives from two *myuns* of the Kang Wha Community Health Demonstration Project was done for two weeks. From this study the total number of hours of activity, the time required to complete the service target, and the average amount of time required per unit of activity were obtained.

In some cases it was possible to calculate the time required per unit activity, but in other cases it was impossible. In cases where calculation was impossible, several similar activity units were grouped together for the calculation. The time required for patient treatment was calculated, but for the other activities of the physician, it was too complicated to calculate the time required per

unit activity. In the public health service, the time required for home visiting was calculated and the unit time for other activities of the various health personnel was also examined.

In the maternity health service, the time per unit of service for delivery assistance, prenatal care and postnatal care was calculated but other auxiliary functions were lumped together, because it was not possible to calculate the required time unit of activity. The summarized results of the "time-activity analysis" are in Table 3-2.

Table 3-2. Actual Time Spent to Perform a Unit of Activities

Activity	Minutes	Hours
Patient management	15	0.25
Home delivery	360	6.0
P.H. clinic session	240	4.0
Home visit and travel:		
Special visit	40±20	1.0
Multipurpose visit	21±15	0.6
Prenatal care	30	0.5
Postnatal care	90	1.5
Meeting & other similar activities	160	4.0

The average amount of physician time required for diagnosis and treatment of one patient was approximately 15 minutes. The time required for house call and special patients were not included, because it was not common practice in the area. The average time required for delivery assistance by the midwife was approximately 6 hours including preparation and waiting time, however, the range of time required for delivery was very wide.

The average time required for meeting, group discussion or education was 4 hours. Some meetings may only actually take about 15 minutes, but usually much more time is spent waiting for participants to arrive.

The time required for home visiting by the *myun* health workers and the public health nurse was calculated. Home visiting was classified into 'special visits' by the public health nurse and the 'regular visits' by the multipurpose *myun* health worker. The special

visits required about 60 minutes including 20 minutes of travel time and the regular visits took about 35 minutes including 15 minutes of travelling.

C. Recommended Allocation of Working Hours for Health Personnel

There is a problem in the utilization of data obtained from the "time-activity study". The results obtained through this study merely indicate the actual time used for various activities by health personnel at the health demonstration project area, and may not be the ideal use of time. Therefore, an ideal allocation of working hours of health personnel should be determined by health care experts based on the above result.

In this study, the optimum allocation of working hours was determined by the consensus of the specialists engaged in the Kang Wha Community Health Demonstration Project. The activity of each health worker was classified into main activities, supporting activities, and other miscellaneous activities. The main activity for each was direct service to the patient or client. The summary of the optimum allocation of hours of working for each type of health personnel is shown in Table 3-3.

Table 3-3. Recommended Allocation of Hours of Work by Activities and Health Personnel

Activities	Physician	PHN	Midwife	MPW	
Main activities:					
Patient care	} 60%		50%	10%	
Clinical work			10%	10%	
Home visit, etc.		30%	15%	60%	
Supporting services: (Fixed assignment)					
Health education	} 10%	20%	} 15%	} 20%	
Community relation		10%			
Supervision and training		10%			20%
Management and planning		10%			10%
Free time and others	10%	10%	10%	10%	
Total	100%	100%	100%	100%	

1. Physician

The main activities of the physician include

diagnosis and treatment of patients and other clinical work. According to the survey conducted only about 15% of daily activity hours were utilized for the curative activities because there were not many patients visiting the health subcenter. The rest of the time was used for developing community relations, private affairs, management of the MHS and supervision of health workers. However, utilization of 60% of working hours for the main activities and 30% for the supervision of health workers and operation of the MHS were recommended as an optimum time allocation for the physician.

2. Public Health Nurse

Most of the public health nurse's time was utilized for the supervision of health personnel, health education and other administrative management of the MHS, and only 15% of her time was used for home-visiting. Caution should be exercised in making recommendations about the utilization of working hours of the public health nurse. An important reason for her introduction into the MHS staff was to help smooth the functioning of public health part of the MHS.

The main direct service activity of the public health nurse is home-visiting problem homes, 30% of her working hours was considered to be desirable for this purpose.

3. Midwife

The survey showed that about 75% of the midwife's working hours were actually utilized for her main activities (delivery assistance, pre- and post-natal care) and 15% of her time was used for supporting functions. The recommended time allocation for her main work was 75% with 15% for auxiliary functions.

4. Multipurpose Health Worker

Survey results showed that about 55% of the health worker's time was actually utilized for the main activity of home-visiting. It was recommended that 60% of her working hours be utilized for home-visiting and, on the average, 10-15% allotted to personal affairs, lunch and rest of each worker.

In Table 3-4 the total hours available for each type of activity per year are shown.

Table 3-4. Allocation of Available Working Hours of Health Personnel by Activities per Year

Physician:	
Total hours available for a year	2,080 hrs.
Patient care(60%)	1,248 hrs.
Management and planning(10%)	208 hrs.
Community relations and health education(10%)	208 hrs.
Supervision, training and education(10%)	208 hrs.
Free time and others(10%)	208 hrs.
Public health nurse:	
Total hours available for a year	2,080 hrs.
Home visiting(30%)	624 hrs.
Supervision and training(30%)	624 hrs.
Planning and management(10%)	208 hrs.
Health education(20%)	416 hrs.
Community relations(10%)	208 hrs.
Free time and others(10%)	208 hrs.
Midwife:	
Total hours available for a year	2,080 hrs.
Prenatal care at subcenter(10%)	208 hrs.
Postnatal care at home(15%)	312 hrs.
Delivery care(50%)	1040 hrs.
Supporting services(15%)	312 hrs.
Free time and others(10%)	208 hrs.
Multipurpose health worker(nurse aid):	
Total hours available for a year	2,080 hrs.
Home visiting(60%)	1,248 hrs.
Clinical work(10%)	208 hrs.
Supporting services(20%)	416 hrs.
Free time and others(10%)	208 hrs.

D. Actual Time Required for Each Unit of Service for Different Types of Health Personnel

1. Physician

The actual time required for patient care by physician is shown in Table 3-5. The number of patients visiting the MHS in a *myan* of 10,000 population during a year was estimated to be about 5,200 persons (see Chapter VI). The time required for patient care per patient was 15 minutes. Therefore, 1,450 hours a year are necessary to perform this service during a year. When health insurance covers the whole population the number of annual patient visits will rise to 11,200 which will require

2,799 hours of physician time annually. Time allocated to administrative management and planning, community relations, supervision, training, lunch and other activities was 10% for each area, or a total of 263 hours per area per year. Therefore, the total number of hours required for these purposes were calculated to be 2,232 hours presently or 2,633 hours after the health insurance program is implemented.

Table 3-5. Time Required for Covering All Activities of the Physician

Patient care	
(3,200 pt. visits x 0.25 hrs./pt.)	1,150 hrs.
(1,196 pt. visits x 0.25 hrs./pt.)*	(2,799 hrs.)*
Management & planning (fixed%)	263 hrs.
Community relations (fixed%)	263 hrs.
Supervision, training and education (fixed%)	263 hrs.
Free time and others (fixed%)	263 hrs.
Total hours required	2,282 hrs.
	(3,631 hrs.)*

*When health insurance is applied.

2. Public Health Nurse

For the public health nurse, the main service priority was placed on home visiting of problem families and health education for the solution of problems. About one third of the total households in the Kang Wha Community Health Demonstration Project area are considered "problem families". Of these, about one third have problems that cannot be solved by the multipurpose health worker alone. Therefore, the public health nurse must visit about 10% of the total number of households which are in the *myun* area. If the public health nurse visits this 10% of the households once every 3 months, some 300 visits will have to be made for a year. The time required for one home visit was about 1 hour including travel time. Therefore, total time required for home visiting is 300 hours per year. The supportive activities of the public health nurse include supervision and training, community relations, health education, free time and other miscellaneous activities. It was recommended that the hours for each of the above services be fixed even though the supportive activities

of the public health nurse are just as important as the main activity. The total time required to meet the annual service target is 2,256 hours (see Table 3-6).

Table 3-6. Time Required for Covering All Activities of PHN

Home visiting	
(2,600 households x 0.1*x	
4 time a year**x 1.0 hrs.)	800 hrs.
Supervision and training (fixed%)	416 hrs.
Management and planning (fixed%)	263 hrs.
Community relations (fixed%)	263 hrs.
Health education (fixed%)	416 hrs.
Free time and others (fixed%)	263 hrs.
Total hours required	2,256 hrs.

*Problem family ratio

**Every three months

3. Midwife

The total number of pregnant women requiring prenatal care has been calculated to be 573 per year per 10,000 population. Prenatal care requires about 30 minutes per client or a total of 295 hours is required. 210 cases would be delivered in a year, each of which requires 6 hours of care. Therefore, the total time required for delivery care is 1,410 hours. Each of the 210 postnatal care visits requires 90 minutes, for an annual total of 360 hours. The time allocated to supportive service (administrative management and education) by the midwife was fixed at 312 hours, and 263 hours were allowed for free time and other activities. The total number of hours required for the midwife to meet the service target is shown in Table 3-7.

Table 3-7. Time Required for Covering All Activities of the Midwife

Prenatal care at the subcenter	
(573 cases x 0.5hrs.)	295 hrs.
Delivery care (210 cases x 6 hrs.)	1,410 hrs.
Postnatal care at home	
(210 cases x 1.5 hrs.)	360 hrs.
Supporting services (fixed%)	312 hrs.
Free time and others (fixed%)	263 hrs.
Total hours required	2,600 hrs.

4. Multipurpose Health Worker (MPW)

The main service activity of the MPW is home-visiting. Each MPW will be expected to make a regular visit to each household in her assigned area at least once every 3 months. This should facilitate the detection and registration of pregnancy in the first trimester, regular collection of sputum for the T.B. control program, and vaccinations according to the schedule. Each home-visit requires 0.6 hours, so a total of 1,800 hours are required for these regular visits. Revisiting problem families for family planning, T.B. control or maternity and child health care is also necessary for about 1/3 of all the households. Therefore, the MPW would be required to revisit a total of 670 households which would require a total of 1,608 hours a year. Other activities, besides home-visiting include clinical work (such as sterilization of equipment, vaccination at the MHS and other minor activities (such as meetings for supervision, etc.). The total number of hours for these activities will amount to 332 hours per health worker. The total hours required annually for activities carried out by multi-purpose health

workers is 7,240 hours (see Table 8-8).

Table 8-8. Time Required for Covering All Activities of the MPW

Multipurpose home visit	6,408 hrs.
Regular visit (2,000 households x 4 times a year x 0.6 hrs.)	4,800 hrs.
Problem family visit (2,000 households x 0.33** x 4 times a year x 0.6 hrs.)	1,680 hrs.
Clinical work (fixed%)	208 hrs.
Supporting services (fixed%)	416 hrs.
Free time and others (fixed%)	208 hrs.
Total hours required	7,240 hrs.

*Every three month

**Problem family ratio

E. Number of Health Personnel Required to Accomplish the Service Targets of the Myun. Health Subcenter.

The required number of health personnel of each type was calculated by comparing the annual work hours available per employee with the time required to accomplish the main activities and the total hours necessary to perform all the activities of the service targets.

Table 8-9. Number of Health Personnel Required

Personnel	1) Total	2) Total	3) Total	4) Total	5)	6)	7)
	hours available per each health worker	hours available for main activities	hours required to cover the target	hours required for the main activities in the target			
Physician	2080 hrs.	1248 hrs.	2282 hrs. (3631 hrs.)*	1450 hrs. (2799 hrs.)*	1.10 (1.75)*	1.16 (2.24)*	1 (2)*
PHN	2080 hrs.	624 hrs.	2256 hrs.	800 hrs.	1.08	1.28	1
Midwife	2080 hrs.	1560 hrs.	2606.5 hrs.	2086.5 hrs.	1.25	1.34	1
MPW	2080 hrs.	1248 hrs.	7240 hrs.	6408 hrs.	—	5.13	5

*When insurance is applied.

As defined earlier the "main activities" are the direct service provided to the community

population, and supporting activities are those services necessary for the smooth operation of

MHS programs which provide direct services. "Other miscellaneous activities" include the personal affairs of health personnel and any service that is not related to health problems. The quantity of manpower calculated to man-hours necessary to attain the target can be calculated for only the main activities. The time needed for supporting activities depends on the increase or decrease in the main activities. If more health personnel are needed to accomplish the main activities, more supporting activities are also to be expected. Therefore, the total hours needed to attain target by one health worker can be calculated, but in the case when more than two are required the calculating becomes difficult because of the increased time for supporting activities. In Table 8-9 the number of hours required to obtain the service target for the main activities of the MPWs were calculated. However, because it was impossible to estimate the amount of time required for supporting activities, it was not possible to calculate the actual number of MPWs needed. The time of the physician is utilized in so many various ways that it was impossible to make an exact calculation of the time required for his supporting activities. So finally, the calculation of numbers of each type of personnel required was based on only their main functions (see Table 8-9, number 6).

For the public health nurse, however, who uses only 30% of her time in her "main activity" (direct health service), the calculation in column 5 in Table 8-9 was used.

In summary, the numbers and types of health personnel estimated to be necessary for the operation of a typical MHS included one physician, one midwife, one public health nurse and five MPWs.

The number of physicians needed to meet the present health demand was calculated as 1.16 per MHS. In other words, one physician is not sufficient to deliver enough medical care to meet the present level of demand. However it has already been determined that one medical

care aid should be hired to receive patients and prepare the prescriptions for the doctor. Therefore, with the assistance of a medical care aid one physician can possibly manage the delivery of curative services of a MHS.

When the majority of the population is covered by health insurance two physicians will be needed because the health care demand will be doubled. However appointment of two physicians to the MHS is impossible due to insufficiency of physicians and for economic reasons. Therefore, some of the work of physicians will have to be delegated to other health personnel. In general, time allocations are flexible enough to adjust to changes as needed.

The required number of public health nurse was calculated to be 1.1 but with some flexibility in the allocation of working hours and some overtime work it should be possible to manage with only one public health nurse.

The required number of midwife is 1.3 per MHS. Most of the time is allotted to delivery assistance, sometimes during the night, so the midwife should be allowed flexibility in her working hours.

Five MPWs are considered to be needed. At present only 2-3 *avva* health workers are available. The health needs can be met however if family health workers are functioning on a voluntary basis from among local mothers, as in the Kang Wha Community Health Demonstration Project. This system has the advantage of being able to meet and without increasing the number of MPWs.

Other workers are also needed for operation

Table 8-10. Number of Health Personnel Required

Type of health personnel	Number
Physician	1
Public health nurse	1
Midwife	1
Multipurpose health worker	5(2)*
Multipurpose technician	1
Medical aid	1

*When family health workers are available.

of X-ray and laboratory facilities at the health subcenter and for the administrative work. However, the uses this kind of worker has never been tested at the *myun* level.

In conclusion the type and number of health personnel required to fulfill the functions of the MHS have been summarized in Table

8-10.

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CHAPTER 9 ANALYSIS OF CURATIVE ACTIVITIES AT THE MYUN HEALTH SUBCENTER

Even the public health system, which was established mainly for preventive health care service, provides some secondary and tertiary medical care service through the national and provincial hospitals. However only very minimal primary care has been provided by the Government. The government primary care has mainly been given in the *myuns* by *myun* public physicians who are usually restricted to one geographical area and are working there on a contract basis.

Curative service is one of the most important functions of the MHS proposed by this study, and if implemented it will become the first Government attempt to provide full scale primary health care service.

The programs, facilities, equipment and other materials necessary to operate public health activities at the *myun* level have already been identified relatively well through long past experiences. However, the primary medical care activities at the *myun* level have never been established or studied well so far.¹⁾²⁾³⁾⁴⁾⁵⁾⁶⁾⁷⁾

In this study it was considered that the following areas should be investigated before establishing curative services: i) identification of the characteristics of the patients, ii) survey of the types of diseases most commonly seen at the MHS, iii) determination of the diagnostic methods and types of treatment required for satisfactory management of these diseases, also the number and proportion of cases which require referral to higher levels of medical

care and the cost of such care was investigated.

Curative service which are tailored to meet the needs of the community, can only be organized on the basis of such information. Qualifications of the manpower required, geographic location and type of facilities, equipment, materials, drugs and the budget necessary to organized curative services can then be determined with this information.

Because of the complexity and lack of experience in curative activities and the reasons outlined above a separate analysis of curative services at the MHS was undertaken.

A. Methods

Two *myuns* and their health subcenters, which have been operated by the Kang Wha Community Health Demonstration Project of Yonsei University, were selected for the analysis. These health subcenters have functioned as primary health care institutions for the past two years in a manner very similar to that of the proposed MHS in this study.⁸⁾⁹⁾

Medical records of 1,596 patients who visited the two health subcenters in Nae Ga *Myun* and Sun Woo *Myun* during the period from May 1975 to April, 1976, were analyzed.

Diseases were classified according to the C-list of the World Health Organization, International Disease Classification.¹⁰⁾

B. Results

1. Demographic Characteristics of Patients

The sex ratio of patients was 12 male to 57.3% female, or there were 1.35 times as many female patients. For patients under

20 years of age, the sex ratio showed equal numbers of male and female patients, but over 20 years of age, there were twice as many females as males¹⁰ (see Table 9-1).

Table 9-1. Age-Sex Distribution of Patients

Age group	Male		Female		Total	
	Number of patient	% (%) [*]	Number of patient	% (%) [*]	Number of patient	% (%) [*]
0	91	13.8 (51.0)	80	8.7 (46.0)	171	10.9 (100.0)
1-4	148	21.7 (48.7)	156	17.0 (51.3)	304	19.0 (100.0)
5-14	138	20.3 (51.5)	115	12.6 (45.5)	253	12.9 (100.0)
15-24	61	9.0 (36.1)	108	11.8 (63.9)	169	10.6 (100.0)
25-44	115	16.9 (39.3)	264	28.9 (69.7)	379	23.7 (100.0)
45-64	78	11.5 (37.0)	133	14.5 (63.0)	211	13.2 (100.0)
65	47	6.9 (44.3)	59	6.4 (55.7)	106	6.6 (100.0)
Total	681	100.1 (12.7)	915	99.9 (57.3)	1,596	100.0 (100.0)

percentage by sex

Table 9-2. The 25 Most Common Diseases Seen at Health Subcenters in Kang Wha Gun (May, 1975—April, 1976)

Order	C-List [*] code	Disease category	Number	%	Cum.%
1.	59	Acute respiratory infections	492	25.5	25.5
2.	59	Infections of skin and subcutaneous tissue	143	6.9	32.4
3.	3	Enterities and other diarrhoeal diseases	132	6.8	39.2
4.	60	Other diseases of skin and subcutaneous tissue	111	5.8	45.0
5.	72	Neuralgia, myalgia and back pain	95	4.9	49.9
6.	70	All other injuries	76	3.9	53.8
7.	55	Other diseases of genito-urinary system	72	3.7	57.5
8.	39	Otitis media and mastoiditis	68	3.5	61.0
9.	51	Other diseases of digestive system	65	3.4	64.4
10.	71	Acute gastritis	63	3.3	67.7
11.	47	Peptic ulcer	42	2.2	69.9
12.	65	Other specified and ill-defined diseases	42	2.2	72.1
13.	73	Family planning (including M.R.)	37	1.9	74.0
14.	71	Headache (simple)	37	1.9	75.9
15.	4	Tuberculosis of respiratory system	34	1.8	77.7
16.	75	Fever(ill-defined)	34	1.8	79.5
17.	42	Bronchitis, emphysema and asthma	32	1.7	81.2
18.	27	Psychosis and non-psychotic mental disorders	28	1.5	82.7
19.	34	Hypertensive disease	28	1.5	84.2
20.	31	Other diseases of nervous system and sense organs	26	1.3	85.5
21.	28	Inflammatory diseases of eye	25	1.3	86.8
22.	77	Pregnancy	20	1.0	87.8
23.	19	All other infective and parasitic diseases	16	0.8	88.6
24.	45	Other diseases of respiratory system	16	0.8	89.4
25.	52	Nephritis and nephrosis	16	0.8	90.2
26.		All others	189	9.8	100.0
Total			1,930	100.0	

* International Disease Classification C-List, Numbers 71-77 were added for adaption to the Korean rural situation.

The 0-4 age group occupied 29.9% of the total patients and patients under 10-year-old comprised 40.5% of all patients.

2. Types of Diseases

(1) Most Common Types of Disease

Most common diseases, based on actual diagnosis and/or "chief complaint" were "acute respiratory infection" (25.5%), "infections of skin and subcutaneous tissue" (6.9%), "enteritis and other diarrheal diseases" (6.8%) and others as shown in Table 9-2. The three most common diseases occupied 46% of the total, the 10 most common diseases 67.7% and the 25 most common diseases comprised 90.2% of all diseases diagnosed. Observing the result of this analysis, the majority of diseases seen at the rural health subcenters were relatively minor diseases which could be easily treated and cured (see Table 9-2).

(2) Types of Most Common Diseases by Sex

The sex differences of the 10 most common diseases were compared. In general, the disease pattern was about the same, but among males, injuries ranked fourth place while tuber-

culosis of respiratory tract was tenth. In females, G-U infection (6.0%) was the sixth most common complaint while request for family planning devices (3.3%) was in the ninth place. In the category of neuralgia and back pain, more females (6.1%) had this complaint than males (3.3%) (see Table 9-3).

(3) Most Common Types of Disease by Age Group

The 10 most common diseases were analyzed by four age groups as shown in Table 9-4. The age groups 0, 1-4, 25-44 and 65+ were selected because they are the age groups where meaningful morbidity pattern are evident. In the 0-age group, a characteristic pattern emerged showing U.R.I. (48%) as the most common disease followed by fever (1.7%), eye inflammation (2.0%), gastritis (0.8%), and intestinal obstruction and hernia (0.8%). There was not much difference between the sexes. In the 1-4 year-old group, parasite infection (1.3%) was the seventh most prevalent disease, while the rest of the diseases were generally similar to those of under 1 age group. In the 25-44 year-old group, G-U infection (0.9%), neuralgia and back pain (7.8%), family planning (7.1%), injuries (5.3%) and peptic ulcer were the characteristic diseases. In 65 and over, disease of old age, such as chronic obstructive respiratory disease (6.3%), diseases of the nervous system and sense organs (6.3%), tuberculosis of respiratory system (5.5%) and cardiovascular disease (4.7%), were the most common (see Table 9-4).

Table 9-3. Most Common 10 Diseases by Sex

Male		Female	
Disease category	%	Disease category	%
U. R. I.	29.4	U. R. I.	22.6
Skin infection	8.1	Skin disease	6.3
Enteritis	7.7	Enteritis	6.2
Injuries	6.3	Neuralgia & back pain	6.1
Skin disease	5.9	Skin infection	6.1
Gastritis	4.0	G-U infection	6.0
Otitis media	3.8	G-I trouble	3.7
Neuralgia & back pain	3.3	Otitis Media	3.3
G-I trouble	2.9	Family planning	3.3
Pulmonary tuberculosis	2.3	Gastritis	2.7
Fever	2.3	All others	33.7
All others	24.9		
Total	100.0	Total	100.0

3. Methods of Diagnosis and Treatment Applied

(1) Utilization Rates for Laboratory Services and X-ray Examination

The utilization rates for laboratory test and X-ray examinations necessary for the diagnosis of diseases at the MHS were identified in order to determine the number of X-ray and laboratory examinations necessary for the

Table 9-4. The 10 Most Common Diseases by Age Group

Under 1		1-4		25-44		65+	
Disease category	%	Disease category	%	Disease category	%	Disease category	%
U.R.I.	18.0	U.R.I.	29.5	U.R.I.	10.4	U.R.I.	12.5
Enteritis	20.6	Enteritis	11.3	G-U infection	9.0	Neuralgia & back pain	10.9
Skin infection	5.5	Skin infection	11.7	Neuralgia & back pain	7.8	Chronic obstructive respiratory disease	6.3
Otitis media	5.1	Skin disease	8.8	Family planning	7.1	Disease of sensory & nerve system	6.3
Fever	4.7	Fever	4.2	Injuries	5.3	Pulmonary tuberculosis	5.5
Skin disease	4.0	Otitis media	3.1	Skin infection	5.1	Skin disease	5.5
G-I trouble	2.4	Stomatitis	2.3	Peptic ulcer	4.6	Ill-defined disease	5.5
Eye inflammation	2.0	Injuries	1.8	G-I trouble	4.4	C-V disease	4.7
Injuries	1.6	Parasite	1.8	Otitis media	3.7	Skin infection	4.7
Gastritis	0.8	G-I trouble	1.3			Peptic ulcer	3.9
Intestinal obstruction & hernia	0.8	Eye inflammation	1.3			G-I trouble	3.9
Other tuberculosis	0.8	Ill-defined disease	1.3				
All others	3.6	All others	8.2			All others	35.0
Total	100.0		100.0		100.0		100.0

average MHS.

The medical records of the patients were examined by two physicians, and the diseases were classified by whether a laboratory test and X-ray examination were needed. The criteria for the classification were based on the seriousness and types of the diseases, but also modified by current rural economic conditions.

Table 9-5. Utilization Rates of Services and X-ray Examination Indicated for the Diagnosis of Diseases

Method	No. of acute cases		No. of chronic cases		Total	
	No.	%	No.	%	No.	%
Simple physical exam. only	1,275	99.2	369	74.2	1,644	86.1
Laboratory	91	6.4	46	9.3	137	7.2
X-ray	39	2.8	16	3.3	55	2.9
X-ray & Lab.	6	0.4	33	6.6	39	2.0
Undetermined	2	0.1	3	0.6	5	0.3
Total	1,413	100.0	497	100.0	1,910	100.0

Laboratory tests were indicated in 6.8% of the acute diseases and 15.9% of the chronic diseases. X-ray examinations were indicated in 3.2% of the acute cases and 15.9% of the chronic cases. In total about 9.2% required laboratory tests, 6.5% required X-ray examinations and 13.6% required either X-ray examinations or laboratory tests (see Table 9-5).

(2) Methods of Disease Management

The methods used in the treatment of disease largely depend on the individual physician's preference and training. Therefore, the methods of treatment recommended here can not be generalized. Medical records of the patients were again examined by two physicians and methods of treatment were categorized into nine groups. They are i) consultation only, ii) prescription of low-cost drugs, iii) prescription of expensive drugs, iv) injection of low cost drugs, v) injection of expensive drugs, vi) dressing only, vii) simple surgery, viii)

referral after treatment, and ix) immediate referral.

Diseases and health problems included in the classification as "consultation" were those diseases which could be managed by consultation alone. When only simple medications such as antipyretics and antacids were needed, the diseases were classed under "prescription of low cost drugs". The "expensive drugs" implies mainly the need for antibiotics, but other expensive drugs such as diuretics were included in some cases. "Expensive injections" implies injections mostly of antibiotics and rarely other special drugs. The "simple surgery" includes use of such minor surgical techniques as suturing and incision and drainage. In these cases injections and prescription of antibiotics were often used in conjunction with the operation. "Referral after treatment" indicates that emergency or palliative treatments rural medical care.

were undertaken before referral.

Drugs and injections were divided into two categories, low cost and high cost, because there are so many types of drugs and injections available. Cost is considered to be one of most important factors in the practice of

As shown in Table 9-6, almost half (42%)

Table 9-6. Types of Treatment Indicated for Patients Visiting the Health Subcenters

Type	No. of acute cases	%	No. of chronic cases	%	Total	%
Consultation	136	8.0	161	20.3	297	11.0
Low cost drugs	636	40.5	233	46.9	869	42.0
Expensive drugs	211	13.4	53	10.7	264	12.8
Low cost injections	225	14.3	33	6.6	258	12.5
Expensive injections	127	8.1	22	4.4	149	7.2
Dressing	181	11.7	25	5.0	206	10.1
Simple surgery	40	2.5	2	0.4	42	2.0
Referral after treatment	2	0.1	4	0.8	6	0.3
Referral	17	1.1	24	4.8	41	2.0
Others	2	0.1	0	0.0	2	0.1
Total	1,570	100.0	497	100.0	2,067	100.0

of all the diseases could be managed with inexpensive drugs, 12.3% with expensive drugs, 12.5% with low cost injection, 11.0% with just consultation, 10.1% with dressing, 7.2% with expensive injection, 2.0% with simple or minor surgery, 2.0% with immediate transfer and 0.3% with transfer after treatment.

In acute diseases, 8.0% were managed by consultation only, 0.1% by transfer after treatment, 1.1% by immediate transfer, which were comparatively low rates. In chronic diseases, a relatively high proportion (20.3%) were managed only by consultation, 6.6% needed low cost injections, and 4.4% required high cost injections. Transfers after treatment and immediate transfers were 0.8% and 4.3% respectively (see Table 9-6).

Among the total diseases seen at the health subcenters, 42% could be taken care of with common, inexpensive drugs, while one fifth of the total diseases required either expensive drugs or expensive injections like antibiotics.

4. Estimation of Medical Care Fees

The average cost of diagnosis and treatment, at rural health subcenters equipped with clinical laboratory and X-ray facilities, was estimated.

In estimating such fees, the actual unit cost per laboratory test or X-ray examination should first be determined and with these figures, the average fees for both diagnosis and treatment can be calculated. With this information it is possible to calculate the average total cost per outpatient visit. This fee, being an average value, is not specific for individual diseases. The unit costs of laboratory tests, X-ray examinations, and methods of treatment were estimated arbitrary by two physicians who have had experience with the Kang Wha health subcenters. They were based on a consideration of the fees charged at both the *gun* health center and at private clinics in the community and also take into account the economic capability of the average patient in Kang Wha *Gun*.

The individual unit cost determined by above methods does not seem very accurate and rational but this is the most practical way. The average total cost per out-patient visit is subject to change if there are changes in the drug prices, wage increase or inflation. Of course, the estimated cost per visit can not be accepted a valid for application to all rural communities in Korea, since this will be influenced by local factors and must be calculated for each locale.

The unit costs of some of the services at the demonstration health subcenters at the Kang Wha Community Health Demonstration Project are shown in Table 9-7.

Table 9-7. Criteria for Determining Medical Care Fees at the MHS

Type	Unit: Won (₩)
Laboratory	500
Chest X-ray (direct)	1,500
Consultation	500
Low cost drugs	600(for 3 days)
High cost drugs	1,000(for 3 days)
Low cost injection	800(one shot + low cost drug for 3 days)
High cost injection	1,500(one shot + high cost drug for 3 days)
Dressing	500
Minor, simple surgery	2,500(+one high cost injection and high cost drugs for 3 days)

The unit cost per visit for laboratory tests averaged 82 Won per case in acute diseases and 318 Won per case per visit for chronic disease, giving an overall average of 113.5 Won per case.

The average cost of treatment and management per clinic visit for acute diseases was 759.4 Won, while chronic diseases averaged 615.1 Won. The overall average for both types of cases was 726 Won. Summing up these figures, it was found that the average medical care cost for the acute case was 811.4 Won, for the chronic case 933.1 Won, and the overall total average cost was 869.5 Won (see

Table 9-8).

Table 9-8. Calculation of Average Medical Care Cost per Patient

	Acute diseases	Chronic diseases	Total
Laboratory & X-ray	82	318	113.5
Treatment & care	759.4	615.1	726.0
Total	841.4	933.1	869.5

(Won)

The estimated cost of medical care was the actual fees which were charged at the health subcenters in Kang Wha *Gun* in 1976. These medical care fees were believed to be some 30% cheaper than those of general private clinics in the *rup* area. The costs at the MHS were generally within the financial means of the community and accepted quite well.

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CHAPTER 10 LOGISTICS

In this Chapter, the equality and quantity of the facilities, equipment, drugs, materials and replenishment needed for performing the functions of the MHS, defined in the preceding chapters, will be identified. Emphasis was placed on quantification, but many things were difficult to quantify and therefore estimates for these items were supplemented by the experience obtained at the Community Health Demonstration Project in Kang Wha Gun.

A. Drugs and Materials

To determine the quantity of drugs and materials necessary for the performance of functions of MHS, the drugs and materials used at the health subcenters of the Kang Wha Community Health Demonstration Project from May, 1975 to April, 1976, which were recorded on prescriptions and medical records were used. These records were then analyzed and quantified. The prescriptions and medical records of patients were reviewed by two physicians who determined the amount and kinds of drugs and materials necessary. The quantities of drugs and materials calculated were the projected amount needed for a *myun* with a population of 10,000 set as a standard. As shown in Chapter 6, the total number of patients expected to visit the MHS in an average sized *myun* is 5,300 per year. A total

of 11,196 visits per year are expected if the whole community population of 10,000 are enrolled in health insurance. Required quantities of drugs and materials were calculated on the basis of these figures and also on the types of diseases described in Chapter 9.

1. Drugs

It is almost impossible to generalize about the kinds of drugs necessary because the selection of drugs depends on the physician's prescription. The types of drugs needed and the amount used for a certain disease varies with the preference of the individual physician.

Therefore, the necessary drugs were largely classified by their pharmacological activities and naming of specific drugs were avoided. Quantities of drugs needed were based on the adult dosage. Annual quantities required were calculated by multiplying the prevalence rate of the disease by the amount needed for the average adult course of treatment.

(1) Medicine for Oral Use

Calculation of oral medicine was based on the assumption that drugs would be given for 3 days each time the patient visited. Required types and quantities of oral drugs are listed in Table 10-1.

(2) Injectable Drugs

Calculations for injectable drugs were based

Table 10-1. Types and Amounts of Oral Drugs Required Annually at a MHS

Drugs	Dosage/day	Amount necessary for 1 year
Antipyretics & analgesics		
ASA	1.0-3.0 gm	6,360 gm
Digestants		
Ebiase	1.0 gm	15,000 gm
3-SP(Digestive mixture)	2.0-3.0 gm	3,300 gm
Antacids		
Normo san	3.0 gm	900 gm
Antidiarrheal drugs		
B.T.K. (Bismus, Tannate & Kaolin)	3.0 gm	3,060 gm
Bronchodilators		
Ephedrine	60 mg	314 gm
Cough mixture	20 c.c.	60,000 c.c.
Antihistamine		
Pheniramine (Chloro-Trimeton)	8 mg	11.2 gm
Diuretics		
Lasix	40 mg	7.2 gm
Dichlozide	50 mg	21.0 gm
Antihypertensive drugs		
Reserpine	75 mg	18.0 gm
Dichlozide	50 mg	21.0 gm
Antiemetics		
Trimine	8 mg	1.92 gm
Carthartics		
Glycerin for enema	2 amp	80 amp
Antispasmodics		
Buscopan	20 mg	2.1 gm
Dilantine	100 mg	9 mg
Sedatives		
Phenobarbitol	60 mg	150 gm
Sulfa drugs		
Gantricin	2.0 gm	1,020 gm
Antibiotics		
Cliacl(Penicillin V)	4.8 MU	2,880 MU
Tetraacycline	1.0-2.0 gm	2,880 gm
Chloramphenicol	2.0 gm	1,020 gm
Steroids		
Prednisolone	15 mg	9.9 gm
Antiparasitic drugs		
Piperazine	12 T	180 T
Flagyl	250 mg	60 gm
Nutritional supplements		
Multi-vitamin	when indicated	
Fe ₂ SO ₄	when indicated	
Cardiotonics		
Digoxin	1.0 mg	60 mg

MU:Million unit

Table 10-2. Types and Amount of Injectable Drugs Required Annually at a MHS

Drugs	Dosage/1 shot	Amount necessary for 1 year
Antipyretics		
Alpain	2 ml	3,080 ml
Antihistamines		
Avil	2 ml	600 ml
Bronchodilators		
Ephedrine	25 mg(1 amp)	25 gm (1,000 amp)
Analgesics		
Procaine	1% 10 c.c.	2,000 c.c.
Baralgin	5 c.c.	1,500 c.c.
Diuretics		
Lasix	2 ml	120 ml
Antispasmodics		
Atropine	10 ml	200 ml
Bucopan	5 c.c.	700 c.c.
Sedatives		
Promazine	2 ml	120 ml
Sympathomimetics		
Epinephrine	0.5 mg	50 mg
Sulfa drugs		
Sulcin	2 ml	2,000 ml
Antibiotics		
Penicillin(Hostacillin)	2 MU	800 MU(million unit)
Tetracycline	100 mg	120 gm
Chloramphenicol	1.0 gm	340 gm
Kanamycin	1.0 gm	300 gm

on one injection per clinic visit. Series of multiple injections are usually not given unless the patient can be supervised closely. The dose per injection was used for calculation. Required types and quantities of injectable drugs are listed in Table 10-2.

(3) Medicine for External Use

The quantities of drugs for external use depend on the size of area to which they are to be applied. Therefore, it is very difficult to determine accurate quantities. In this study it was estimated that one bottle or one ointment container was given to each patient per visit. Types and quantities of medicines for external use are listed in Table 10-3.

Table 10-3. Types and Amounts of Drugs for External Use Required Annually at a MHS

Drugs	Dosage/day	Amount necessary for 1 year
0.5% chloramphenicol sol.	5 c.c.	200 c.c.
0.5% steroid sol.	5 c.c.	200 c.c.
Antibiotic ointment	2 mg	1,120 mg
Antifungal ointment	2 mg	600 mg
Benzyl benzoate sol.	30 c.c.	4,000 c.c.
Calamine lotion	30 c.c.	8,000 c.c.
Gentian-violet		1,200 c.c.
AgNO ₃		1,200 c.c.

(4) Intravenous fluids

Each bottle of I.V. fluid contains 1,000 c.c. and it was estimated that when needed, 1 bottle was used per patient per visit. The re-

quired quantities of I.V. fluid listed in Table 10-4.

Table 10-4. Types and Amounts of I.V. Fluids Required Annually

Fluids	Dosage/day	Amount necessary for 1 year
5% dextrose in water	1,000 c.c.	150,000 c.c.
5% dextrose in saline	1,000 c.c.	100,000 c.c.

(5) Disinfectants

The quantities of the disinfectants used for cleaning injuries and for sterilizing small equipment were determined on the basis of actual amounts used at the health subcenters at the Kang Wha Community Health Demonstration Project area during the past year. The results are shown in Table 10-5.

Table 10-5. Types and Amounts of Disinfectants Required Annually

Disinfectants	Amount necessary for 1 year
70% alcohol	24,000 c.c.
Hydrogen peroxide(H ₂ O ₂)	12,000 c.c.
Iodine	6,000 c.c.
Togo	24,000 c.c.
3% boric acid	12,000 c.c.
Cresol	24,000 c.c.

(6) Antituberculosis Agents

In 1975, 51 persons per 10,000 were registered as tuberculosis patients. Using this number, the amount of primary anti-TB drugs required each year was calculated. Secondary drugs were not included in this study since the government has not yet decided to routinely supply secondary drugs. The annual quantities of antituberculosis drugs necessary for 51 patients are listed in Table 10-6.

Table 10-6. Types and Amount of Anti-tuberculosis Drugs Necessary Annually for Registered Cases Only

Drugs	Dosage/day	Amount necessary for 1 year
INH	400 mg	7,416 gm
PAS	12 gm	223,380 gm
S-M	1.0 gm	6,630 gm

(7) Vaccine

About 250 to 300 children should be eligible to be vaccinated in a standard population of 10,000. For this estimation, BCG, DPT, poliomyelitis, measles and small pox were considered to be the basic vaccinations. Including booster injections, four injections each for DPT and polio and one injection each for BCG, small pox and measles would be required. Typhoid fever and Japanese encephalitis vaccinations were not included as basic vaccinations. The required quantities of each vaccine are listed in Table 10-7.

Table 10-7. Types and Quantity of Vaccines Necessary Annually

Vaccines	Amount necessary for 1 year
BCG	250-300 person dosage
DPT	1,000-1,200 person dosage
Poliomyelitis	1,000-1,200 person dosage
Lilugen(Measles)	250-300 person dosage
Small pox	250-300 person dosage

2. Materials and Replenishment

Plaster, gauze, bandages, cotton, syringes, syringe needles, and other miscellaneous items are in the category of materials and supplies which must be occasionally or continually replaced. Besides, wrapping materials for drugs such as sheets for wrapping individual doses, envelopes, bottles and ointment containers, and towel and soap are also included in this category. The calculation was based on the quantities which have been used at the two health subcenters at the Kang Wha Project during the past 12 months. The quantities of syringes, syringe needles, soap and towel were estimated from experience at the two health subcenters in Kang Wha Gun. Amounts are shown in Table 10-8.

Table 10-8. Types and Quantities of Consumable Supplies Required Annually for the MHS

Item	Amount necessary for 1 year
Syringes:	
100 c.c.	1
50 c.c.	1
20 c.c.	2
10 c.c.	10
5 c.c.	10
2 c.c.	20
Syringe needles	
19-25 gauge	20 each gauge
Suture needles	3 each size
Suture silk	10 each kind
Scalpel blades	100
Lancets	100
Adhesive tape (gauze)	60
Gauze (15cm x 1,800 cm)	40
Bandages (large)	300 rolls
Cotton (large packages)	30 packages
Soap	60 bars
Towel	20
Drug packages:	
Wrapping sheets	100,000 sheets
Envelopes	10,600
Bottles	1,500
Ointment containers	1,000
Reagents:	
Uricitic	4,200
Phenobarb (pregnancy test)	600

B. Facilities and Equipment

The facilities and equipment necessary to fulfill the given functions of the MHS were determined. The facilities and equipment presently supplied to health subcenters are mainly for preventive health services, and these are not sufficient for curative activities which will be one of the basic functions of the proposed health subcenter. The existing facilities and equipment are not sufficient to allow delivery of primary curative services and most of the materials and supplies are also insufficient. The laboratory and X-ray facilities needed for strengthening medical care activities of the MHS are wholly lacking. Therefore a list of

the minimum facilities and types and quantities of equipment for operating both a curative program and preventive program at the proposed MHS are listed in Table 10-9, 10-10, 10-11 and 10-12. These tables also show those facilities and equipment which have already supplied by the Government to the health subcenters. For convenience, they were divided into 4 parts: (i) equipment necessary for diagnostic procedures, (ii) equipment necessary for treatment, (iii) facilities and equipment necessary for laboratory and X-ray services, and (iv) other equipment.

1. Equipments Necessary for Diagnostic Procedures

The equipment necessary for physical examination of the patient in the MHS is mainly in this category. The minimum equipment necessary for this purpose is listed in Table 10-9.

Table 10-9. Equipment Necessary for Diagnostic Procedures

Item	Needed	Presently existing
Stethoscopes	2	1
Percussion hammer	1	1
Flash light	2	1
Sphygmometer		
Stand	2	1
Portable	1	1
Ophthalmoscope and otoscope	1	1
Head mirror	1	1
Tongue depressors	10	10
Portable lamp	1	1
Thermometers:		
Oral	10	3
Anal		2
Nasal speculum	1	1
Vaginal speculum	5	3
Laryngoscope	1	1
Height scale	1	1
Weight scale	2	1

2. Equipment Necessary for Treatment

The equipment necessary for holding disinfectants, sponges and sterile equipment used

in treatment of patients is included in this category. The minimum equipment necessary is listed in Table 10-10.

3. Facilities and Equipment Necessary for Laboratory and X-ray Services

A small 300V portable X-ray machine, equipment and supplies needed for establishing a simple clinical laboratory are included in this category. A cost-benefit analysis should be done to identify which types of equipment should be provided. But other factors should also be considered besides just the cost of equipment. It was impossible to conduct a cost-benefit analysis at the time of this study, however, such a study should be done as more experience is gained in using the facilities at the MHS. Reasons for the necessity of an X-ray machine and a clinical laboratory at the MHS, other than just the economic justifications, are outlined in detail below.

Table 10-10. Equipment Necessary for Treatment

Item	Needed	Presently existing
Treatment cart (Dressing cart)	2	2
Mayo stand	1	—
Gauze canister:		
Large	2	1
Medium	2	1
Small	2	1
Covered trays	3	3
Trays:		
Large	1	1
Medium	1	1
Small	1	—
Pus pans (Kidney basins)	3	3
Foreop jars	2	—
Forceps:		
Syringe forceps	1	1
Long forceps	2	1
Short forceps	2	1
E.N.T. forceps	2	—
Ring forceps	2	2
Long obstetrical forceps	2	2
Forceps with teeth	2	2
Hemostats	5	5

Kelly clamps	5	5
Morquitos	5	5
Needle holders	2	1
Scalpels	2	2
Probes	2	2
Hole towels	5	—
Bowls	3	—
Irrigator stand	1	1
Gastric lavage apparatus	1	1
Mouth gag	1	—
Syringes:		
100 c.c.	1	1
50 c.c.	1	1
20 c.c.	2	1
10 c.c.	10	5
5 c.c.	10	5
2 c.c.	20	5
Needles:		
19-25 Gauge needle	20 each	5 each
Paracentesis needle	2	—
Thoracentesis needle	2	—
Scissors:		
Cutting scissors	2	—
Bandage scissors	2	1
Gloves	10	—
Air way tubes	2	2
Tracheal tube	1	—
Levin tubes	2	—
Catheters	3 each	3 each type
Atomizer	1	1
Waste baskets	2	1
Sounds	3	1
Cervix dilators (Hegar's)	1 set	1 set
D & C curettes	3	—
Retractors	5	—
Menstrual regulation kit (for early abortions)	5	—
Bottles for wet sponges	5	2
Suction apparatus	1 set	—

First, on many occasions, X-ray examinations and laboratory tests are necessary for rendering curative service to the patient and delivering public health service at the MHS. As pointed out in Chapter 9, 6.5% of the total patients require X-ray examination and 9.2% require laboratory tests for diagnosis. Using the figure of 5,500 expected outpatient visits per year as the basis for calculation, a total of 377 patients need X-ray examination.

and 531 patients need laboratory services each year. If the health insurance system is expanded to the entire population in the future, the number of outpatient visits is expected to increase to 11,200 per year (see Chapter 6), and the annual number of patients who will require X-ray and laboratory examinations will be 723 and 1,030 respectively. In addition to the curative services for patients, another 205 direct X-ray examinations will be required during a year for the tuberculosis control program (see Chapter 6), and even more X-rays will be expected if the indirect X-rays are included. In the field of laboratory examination, annually 792 sputum examinations will be required for case-finding and follow-up in the tuberculosis control program and 573 laboratory tests will be needed for prenatal care of pregnant women annually (see Chapter 6).

Therefore, it is expected that each year a total of 582 X-ray examinations and 1,899 laboratory tests will be required and, when the health insurance system is fully established, the figures will rise to 933 and 2,395 respectively.

Second, if the X-ray machine and laboratory facilities set are installed at the MHS the credibility of the health subcenter will be increased in the community. At present, community people consider the curative services and facilities that exist in the health subcenter to be of rather low quality, and feel that the health subcenter is a place which is only suitable for children and women to have immunizations and family planning advice. It is very important for the community to gain confidence in the MHS as a facility which is able to provide comprehensive health service for them. When a patient must be referred to the hospital or a clinic equipped with better facilities only because the health subcenter has no X-ray or laboratory facilities, this causes a lack of confidence in the ability of the health subcenter to deliver adequate health care.

Third, the curative and public health services

Table 10-11. Facilities and Equipment Necessary for Laboratory & X-ray Services

Item	Needed	Presently existing
Barometer	2	1
Key operated counter for CBC	1	--
Timer	1	--
Alcohol lamp	1	1
Alcohol lamp stand	1	--
Flasks:		
100 c.c.	1	--
50 c.c.	1	--
Beakers:		
500 c.c.	2	--
100 c.c.	2	--
Test tubes	20	--
Test tube stand	1	--
Culture dish	1	1
Centrifuger	1	--
Centrifuge tubes	10	--
Pipettes:		
10 c.c.	1	--
1 c.c.	1	--
Stirrer	2	--
Plain pipettes with rubber bulbs	2	--
WBC pipettes	2	--
RFC pipettes	2	--
Sahli pipettes	5	--
Specific gravity meter	1	--
Water examination kit	1 set	--
WBC count slide glass	1	--
Slides	100	--
Cover glasses	100	--
Brush	1	--
Incubator	1	--
Microscope	1	--
20 MA X-ray machine:	1 set	--
Stand	1	--
Rubber protector	1	--
Cassettes	5	--

of the MHS can be done more effectively with the proposed X-ray and laboratory facilities. If every patient who requires an X-ray examination or laboratory tests must go to the GHC from his own village, this makes it very difficult for the public health service to be done effectively. When X-ray examinations and sputum tests can be done for tuber-

culosis patients and laboratory tests for prenatal care, the public health service will be improved considerably. If these facilities are located at the local MHS, many patients who have for a long time bypassed the MHS will begin to utilize its facilities. This will also improve the curative functions of the *myun* health subcenter.

As mentioned in Chapter 3, the above justification is based on the assumption that a physician with adequate training is being appointed to the MHS as director.

The equipment necessary for setting up a laboratory includes the things necessary to perform routine CBC, urinalysis, Gram stains, AFB stains and water testing.

An X-ray machine with 30-mA capacity can be used for chest P-A and simple fractures.

The proposed facilities and equipment for the laboratory and X-ray service are listed in Table 10-11.

4. Miscellaneous

Miscellaneous equipment include those supplies needed for preserving drugs, sterilizing other equipment, dispensing drugs and the physician's visiting bag.

Table 10-12. Miscellaneous Facilities and Equipment Necessary

Item	Needed	Presently existing
Refrigerator	1	1
Autoclave:		
Steam autoclave	1	1
High pressure steam autoclave	1	1
Physician bag	1	1
Emergency kit bag	1	—
Balance type scale	1	—
Dispensing dishes & spoon		
for pharmacy	2	2
Motorbike	1	—
Bicycle	3	1

A motorbike was also included as a simple means of transportation to facilitate frequent contacts with the community people, house calls by the physician, and effective supervi-

sion of the health activities as well increasing the physician's mobility to enable him to make a more accurate diagnosis of the health problems in the community. Other types of miscellaneous supplies are listed in Table 10-12.

C. Space

The existing health subcenters have a floor area of about 20-pyongs (66m²), and were built exclusively for the service of curative functions, without extra space for conducting the preventive functions proposed by this study. Therefore, the size and floor plan of the health subcenter should be redesigned to allow implementation of the proposed new functions at the MHS. In this study, two sources were consulted before making recommendations about the minimum space required to implement the program proposed for the MHS. The first opinion was that of an architect, and the second was the "Model Health Center" abstracted from the report of the Conference of Missionary Societies in Great Britain and Ireland.

The patient flow in the course of processing in the MHS, from the time of arrival until departure after treatment, was closely examined in considering the floor plan and placement of various offices and facilities in the MHS. The number of patients and clients, and the amount of time spent waiting at the MHS were studied for the analysis.

Required space was kept to the minimum size absolutely necessary in the interest of economy, and lodging facilities for health personnel were not included here.

1. Basic Format

The health subcenter programs were largely divided into two parts, as mentioned early, the preventive service and curative service. Since maternity health problems were given special in the preventive service, the functions of the health subcenter could be separated in

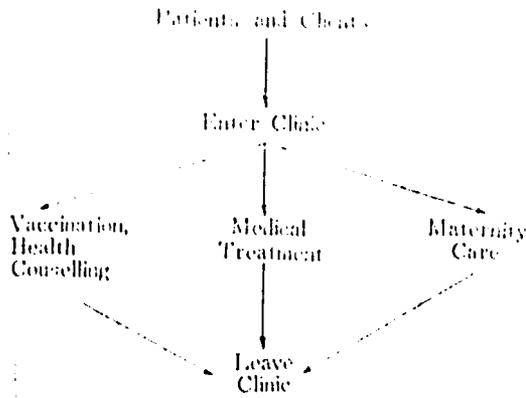


Figure 10-1. Basic Format to Identify Necessary Space

three sections: i) medical treatment ii) vaccination and health counselling and iii) maternity care (see Chapter 5). Any patient or client visiting the MHS will pass through one of these three units, according to the flow diagram shown in Figure 10-1.

The quantitative flow of the patient and client for each major section was also calculated. For this purpose, the flow diagram in Figure 10-2 was drawn, based on data from the Kang Wha health subcenters. This flow diagram shows ratios of the various types of patients at the health subcenter. Quantitatively 85% were at the MHS for medical treatment, 14% for vaccination and counselling, and the remaining 1% were the target of the maternity health unit. The course of the patients requiring curative services was determined by the types of service required for diagnosis and treatment (see Chapter 9). About 13,200 patients and clients are expected to visit the MHS based on 10,000 population in health subcenters in Kang Wha Community Health Demonstration Project Area.

2. Required Space

The required space can be calculated with the flow diagrams shown Figures 10-1 and 10-2. Space is required for the following activities:

- a. waiting lounge: space for patients and clients waiting for registration or other services

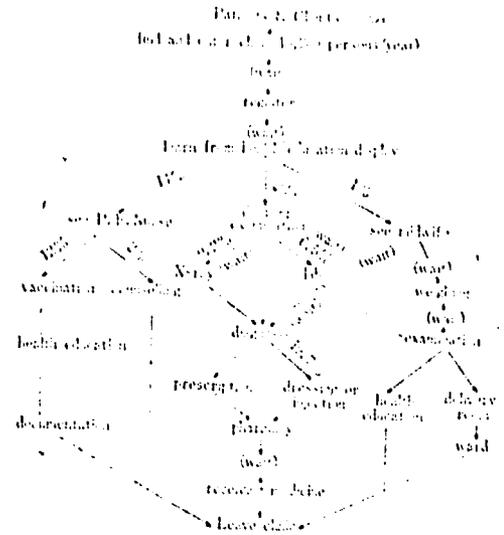


Figure 10-2. Basic Flow of Patients and Clients at the Myun Health Sub-center

- b. reception and registration: space for registering patients and clients, and for keeping various records
- c. examination room: space for the examination of patients and clients by physician
- d. treatment room: space for dressing and/or injection
- e. X-ray room: space for taking X-ray and a darkroom for developing films
- f. laboratory room: space for clinical laboratory and for facilities
- g. pharmacy: space for keeping drugs and filling prescriptions
- h. P.H. nurse office: space for public health nurse to carry on her activities and meet health personnel.
- i. P.H. counselling room: space for public health counselling of clients by the public health nurse
- j. maternity examination room: space for prenatal and postnatal care
- k. in-patient ward: space for pregnant women or patients for overnight stay.
- l. Kitchen for in-patients: space for

- families of in-patients to prepare meals for the patient
- m. toilet for in-patients: toilet facility exclusively for in-patient use for use by the out-patients
- n. toilet for out-patients: toilet facility
- o. night duty room: space for health personnel on night duty
- q. passages and hallways
- p. storage room: space for storage

r. other miscellaneous space

3. Floor Area Analysis and Arrangement

Required spaces were studied in the previous section. The size of the individual space were then calculated taking into consideration the number of health personnel working in the space, and the arrangement of equipment and furniture. To determine size of space, a flow analysis was done and an example of

Table 10-13. Floor Area Analysis of Proposed MHS

Space	Size(m ²)	Space available per person
Waiting lounge (lobby)	15	0.5m ² — 2.5/person
Administration office	7.5	7.0m ² — 9.2/person
Examination room	7.5	7.4m ² —11.0/person
Dressing room	7.5	7.4m ² —11.0/person
Public Health counselling room	9	7.0m ² — 9.2/person
Delivery room	13.5	9.2m ²
Inpatient ward for labor	6	
Inpatient ward	9	6.3m ² —9.3m ² /bed
Pharmacy	6	4.85m ²
Laboratory room	7.5	3.5m ² —9.8/person
X-ray room	13.5	9.2m ² /person
Dark room for X-ray	3	
Toilet	7.5	5.4%
Corridor	20	11.28%(Average 15%)
Total floor area	130(12.4 Pyung)	

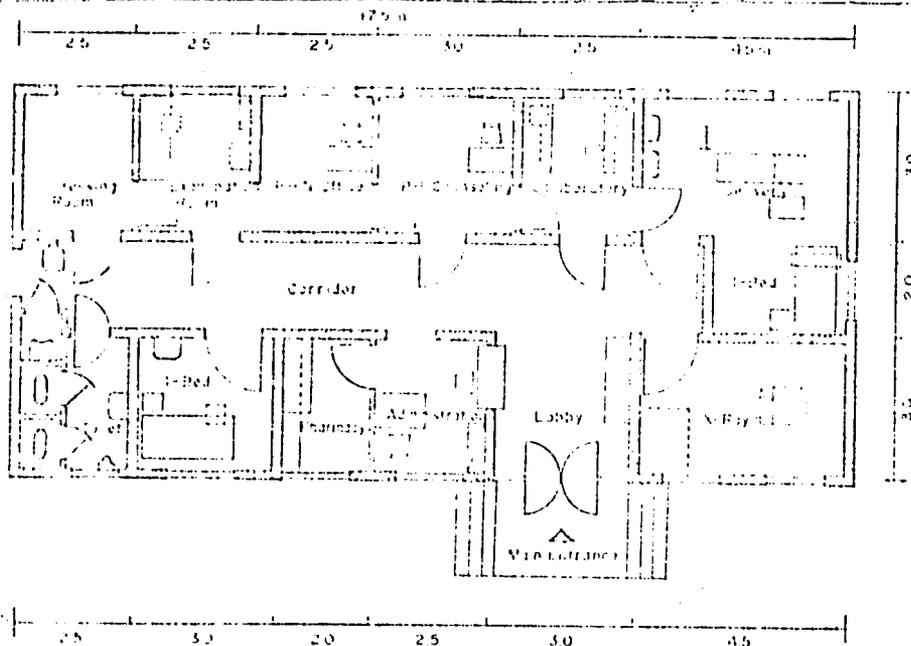


Figure 10-3. An Example of Arrangement of Space

the arrangement of space was illustrated.

The space requirements for each area was set in consultation with an architect, taking into consideration the number of personnel and activities to be done in the space. Calculation of the size of space required was based on the number of patients and health personnel who would simultaneously utilize a particular area.

The minimum size of a functional MHS was calculated to be 12.1 pyongs (127.2m²). The results of the space analysis are shown in Table 10-13, and a sample floor plan showing proposed space arrangement is shown in Figure 10-3.

D. Furnitures

The furniture required for the structure and space of the proposed MHS was listed. Types and quantities of the furniture were determined by consultation with experienced physicians, public health nurses, and the health personnel working at health subcenters. Types and quantities of furniture required are listed in Table 10-14.

Table 10-14. Furniture Necessary for the Myun Health Subcenter

Item	Needed	Presently existing
Waiting lounge:		
Shoe box	1	--
Blackboard (Announcement board)	1	1
Benches	4	1
Administration office:		
Desk	1	--
Chair	1	--
File box (large)	1	--
File cabinet	1	--
Examination room:		
Desk	1	1
Chairs	2	1
Revolving stool	1	1
Examination table	1	1
Screen (divider)	1 set	1 set
File box (small)	1	--
Film reading box	1	1

Basin	2	2
Basin stand	1	1
Dressing room:		
Instrument cabinet	1	1
Chairs	2	1
Operating table	1	--
X ray room:		
Desk	1	--
Chair	1	--
Film reading box	1	--
Film & reagent cabinet	1	--
Laboratory room:		
Table (laboratory)	1	--
Chairs	2	--
Cabinet	1	--
Pharmacy:		
Table	1	--
Chairs	2	--
Cabinet	1	--
P.H. Nurse office:		
Tables	3	--
Chairs	8	--
Desk	1	--
Cabinets	2	--
File box	1	--
P.H. Counselling room:		
Desk	3	3
Chairs	3	3
Cabinet	1	1
File boxes	3	1
Benches	1	1
Delivery room:		
Desk	1	1
Chairs	2	1
Obstetric table	1	1
In-patient ward:		
I.V. fluid poles	2	--
Cabinets	2	--
Kitchen:		
Sink table	1	--

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CHAPTER 11 FINANCIAL MANAGEMENT

Because of the administrative structure of the present public health system health subcenters have not needed to have an independent system for financial management even though they have utilized significant manpower and financial resources in the delivery of health care services. This is because the Government has always considered the *gan* health center (GHC) to be the front-line health care delivery organization. However if the present *myan* health subcenter (MHS) is to be reorganized and developed so that it can perform its proposed functions, a new system of financial management and budgeting is required.

The quantity and quality of health service to be given at the MHS depend on the re-

sources which can be provided for this purpose. The services to be offered or the objectives to be attained in any organization or institution may be limitless, but the resources which support these objectives are limited. To attain the maximum effect with the limited funds available, it is important to make budget allocations which are effective and efficient.

Any plan without an appropriate budget is meaningless, for the budget directly affects the project plans. Through the review of the MHS budget, GHC and the provincial health department can evaluate the programs and performance of the MHS. Therefore, a detailed and rational budget guideline for MHS should be provided.

In this Chapter, emphasis is placed on the

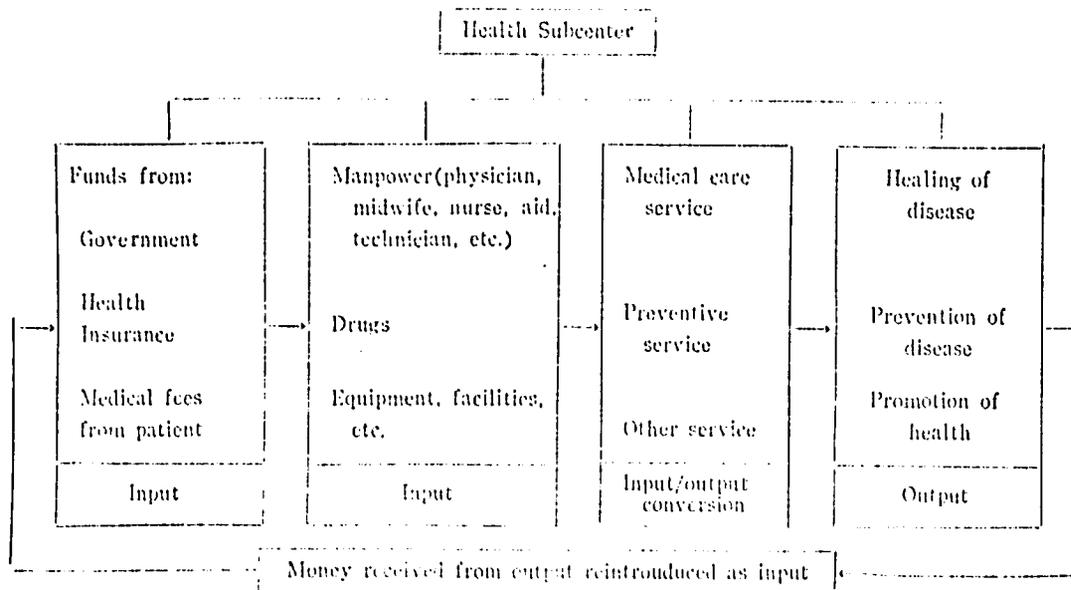


Figure 11-1. System Model to Formulate Financial Function of MHS

development of an example of the type of budget needed for establishment and strengthening of the functions of the MHS. However the theoretical background of the related financial function and financial management upon which the budget is based are also presented.

A. Financial Function

The system model of input and output, formulated to identify financial functioning of the MHS, is shown in Figure 11-1 below. For the implementation of the programs of the MHS, financial support is needed. The sources of this income will be partly from the Government and partly either from health insurance or from medical fees received from the patients. The actual services and supplies, such as manpower, drugs, facilities and equipment, which are necessary for the operation of MHS, must be purchased with these funds, and with these resources the curative services and preventive services are performed. The service fees received from patients will be returned

to the operating funds of the MHS. Because the public health services are largely non-revenue producing, the MHS will have a dual financial structure, with public health programs supported by Government subsidy and curative services being largely self-supporting through payment of fees for services and/or a medical insurance program.

The effectiveness and efficiency of the MHS service can possibly be measured when a budget is set up and executed in accordance with the above proposed system model.

B. Financial Management

The financial and administrative activity of an institution can be classified into three parts: i) decision making ii) executive action and iii) control process. The first and the third are in the realm of management because they are undertaken to raise efficiency of the organization.

A totally independent financial management structure is actually not needed for the MHS, but some financial management ac-

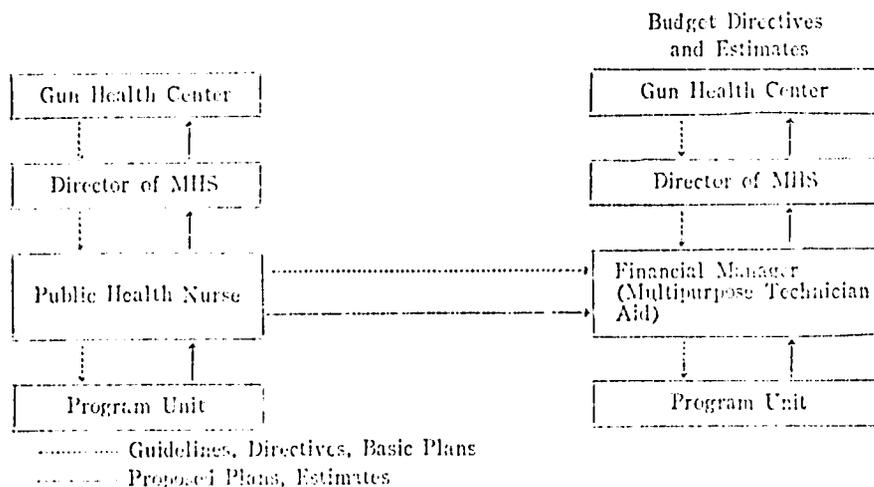


Figure 11-2. Lines of Authority in Program and Budget Planning at the MHS Plans and Programs

tivities must be undertaken to maintain the organization. Decision making, such as determination of the size of the total budget and establishment of service targets, even though it is not the function of MHS, can

not be effective without concrete input from the *myun* level where the actual management of resources takes place in the MHS. The process involved in planning programs and budget compilation in the management of the

MHS are illustrated in Figure 11-2.

For this study channels of authority for plans and budgets were developed as the two parts are inseparately related to each other. The ultimate authority in decision making on the plans and budgets of the MHS is the GHC. This follows the structure of the Government hierarchical system in the public health organization. The director of MHS will be in charge of the management of MHS. In the area of program planning the public health nurse will be in charge of three program units, the curative unit, the public health unit and the maternity unit. In preparing budget directives and estimates, all data from each program unit will be collected by the financial manager of the MHS and put together for the budget, and then forwarded to the GHC through the MHS director. Because the scale and quantity of service of the subcenter is rather modest, the multipurpose technician aid should be able to assume the work of budget preparation without hiring any additional personnel for financial management.

C. Example of a MHS Budget

The budget is a type of financial plan which is not only used to estimate the amount of financial support needed for programs, but also is used as a basis for financial control. Therefore, it becomes one of the most important management tools. The budget shows the final outcome of the decision made in the process of selection of objectives to pursue and methods to finance them, which are decided in the program planning process of an organization. The budget is the starting point of administrative control when the planned program is carried out.

The form, process of preparation and execution of a budget will vary with the financial mechanism and purpose of the organization. These also depend on whether it is a private or commercial organization or a public organization.

The health subcenter has a dual structure

of private and public. The physician, not a public servant, works as a public health doctor on a contract basis, and is rather free to perform practice almost privately in the curative sector of the MHS program. This study has already established a principle for operating the MHS which will allow for continuous utilization of the existing community doctor and the double organizational structure of the present health subcenter could be maintained as before. The curative function would be performed on a fee for service principle and public health function would be financed by Government. However it may be necessary for the Government to partially subsidize the curative function so that sufficient salary incentive is given to secure public doctors for rural areas. The capital costs for establishing the MHS must be supported by the Government.

The budget is divided into two parts based on use. The first part is capital expenditures for long lasting items such as facilities, equipment and vehicles, the other part is for operating expenses and supplies which are relatively quickly used up such as fuel, drugs, personnel expenses, etc.

As mentioned in the previous section, the Government will assume responsibility for provision of the total capital expenditure and funds for operation of the public health service.

1. Method of Budget Preparation

The budget estimates for operating expenditures and capital expenditure were prepared separately.

(1) Operating Expenditures

a. classification of budget items

Budget items needed for the management of MHS were categorized according to a "standard form" which was recommended by the Institute of Municipal Treasurers and Accountants (I.M.T.A.),

For grouping of the expenditure items a

Table 11-1. Subjective Classification of Expenditures

I. Standard grouping	II. Subgrouping	III. Detailed headings
Employment	Physician	
	Public health nurse	
	Midwife	
	Multipurpose worker	
	Technician aid	
	Medical aid	
Running expenses	Premises	Heating
		Water
		Electricity
		Others (Repair of building, etc.)
	Drugs and replenishment	Drugs and reagents
		Replenishment of supplies
		X-ray films
		Vaccines
		Anti-T.B. drugs
		Oral pills
	Record, data and materials	Contraceptive devices
		Printing
		Collecting & analysis
Publication		
Transportation	Educational materials	
	Fuel	
Administration	Maintenance	
	Office supplies	
Equipment maintenance	Telephone, postage	
	Contingency fund	

Table 11-2. Objective Classification of Expenditures for Program Building

I. Main service heading (Function)	II. Division of service heading (Program)	III. Sub-division of service heading (Activity)
Curative services	Curative services	
Public health (Prevention and promotion of health)	Maternity care	
	Child care	Home visiting
	Family planning	Vaccination
	Tuberculosis control	Weighing
	Sanitation	Education
	Miscellaneous	Miscellaneous

subjective classification was used and for the program budget an objective classification was used (see Table 11-1, 11-2). Under the ob-

jective classification system, items were grouped in following order: function, program and activity or itemized under main service

heading, divisions of the service heading and subdivisions of the service heading. For income, a subjective classification with two groups was used, and income was divided into Government grants and income from patients (see Table 11-3).

b. Estimation of budget

Generally when the items for the budget are estimated, the estimates are based on information and data from the actual expenditures over the past few years, but such data

Table 11-3. Subjective Classification of Income

I. Standard grouping	II. Subgrouping	III. Detailed headings
Government grants	Salary	Public health nurse
		Midwife
		Multipurpose workers
	Subsidy	Physician
	Administration	Office supplies
		Telephone, postage
	Premises	Heating
		Water
		Electricity
		Others
	Transportation	Fuel
		Maintenance
	Records data and material	
	Medical supplies	T.B. drugs
	Vaccines	
	X-ray films for T.B.	
	Oral pills	
	Contraceptive devices	
Fee for service charges or income from health insurance cooperative union	Salary	Physician
		Technician aid
		Medical aid
	Drugs and replenishment for patient care	
	Equipment maintenance	
	Contingency	

simply is not available for the proposed MHS. Therefore, the actual expenditure incurred in 1976 at the two health subcenters under the Kang Wha Community Health Demonstration Project were utilized for this study.

In estimating the cost of wages and salaries, the fixed salary of CHC workers across the country was used for estimation of the salary for multipurpose workers and the wages for the physician, public health nurse and midwife were based on the pay scale (1977) in use at the subcenter in Kang Wha plus the income, if any, from the curative service at

the subcenter.

Estimations were also made on the budget allocations necessary to provide the equipment, drugs, and consumable supplies required for operation of the expanded programs proposed for the MHS.

(2) Capital Expenditures

The capital expenditures involve the funds necessary to provide for expansion of floor space, supplementary equipment, set up the X-ray and laboratory facilities, furniture and vehicle.

The budget estimations were based on the requirements for space, facilities and equipment determined previously (see Chapter 9, 10).

2. Proposed Budget

(1) Operating Expenditure

Expenditure

a. Line Item Budget

Salaries				W11,680,000
	Person	salary	months*	
Physician	1	250,000	16	4,800,000
Public Health Nurse	1	80,000	16	1,280,000
Midwife	1	80,000	16	1,280,000
Multipurpose Worker	5	50,000	16	4,000,000
Clinical Aid	1	20,000	16	320,000
Technician Aid	1	50,000	16	800,000

*Includes 400% bonus

Drugs and Replenishment of Supplies					W 1,681,000
	amount	price	months		
Drugs and reagents	5,800 (person)	200	--	1,160,000	
Replenishment of supplies	--	12,000	12	144,000	
X-ray film	377	1,000	--	377,000	

Drugs & Materials Supplied by the Government

Anti-T.B. drug
Vaccines
X-ray films for the T.B. program
Oral contraceptives
Contraceptive devices

Premises				W 291,000
	unit	price	months	
Heating	750 (briquets)	40	5	150,000
Water and electricity	--	7,000	12	84,000
Miscellaneous	--	5,000	12	60,000

Records, Data and Educational

Material W200,000
Printing

Data collection & analysis

Publications

Education Materials

Transportation (Motor bike) W145,000

	unit	price	months	
Fuel	--	10,000	12	120,000
Maintenance	--	--	--	25,000

Administration W120,000

Office supplies -- 5,000 12 60,000

Telephone, Postage -- 5,000 12 60,000

Equipment Maintenance W120,000

	unit	price	months	
	--	10,000	12	120,000

Contingency W179,000

Total W11,719,000

b. Program Budget

Quartive Services W7,666,000

Salaries 5,120,000

Drugs and Replenishment of supplies 1,681,000

Transportation 145,000

Equipment maintenance 120,000

Public Health W6,760,000

Salaries 6,599,000

Data gathering 200,000

Material supplied by the Government

T.B. drugs

Vaccines

X-ray films for T.B. program

Oral pills

Contraceptive devices

Administration W114,000

Building and space 291,000

Office supplies 60,000

Telephone, Postage 60,000

Equipment Maintenance W120,000

	unit	price	months	
	--	10,000	12	120,000

Contingency W179,000

Total W11,719,000

Income				
a. Government				
				W8,919,600
Salary and Subsidy				
				W8,160,000
	No.	amount	months	Total
Physician	Present 4	45,000	11	630,000
	Proposed 1	100,000	16	1,600,000
P.H.N.	Present --	--	--	--
	Proposed 1	80,000	16	1,280,000
Midwife	Present --	--	--	--
	Proposed 1	80,000	16	1,280,000
M.P.W.	Present 3	50,000	16	2,400,000
	Proposed 5	50,000	16	4,000,000
Premises				W291,000
Administration				W120,000
Transportation				W145,000
Records, Data, and Material				W200,000
Material Supply				
T.B. Drugs, Vaccines, X-ray films for T.B. program, Oral pills and other contraceptive devices.				
b. Clinic Expenses				W5,800,000
	cost/visit	No. of visit		
	1,000	5,800		
Total				W11,719,000

(2) Capital Expenditures

a. Expansion of floor space	W3,000,000
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b. Equipment (supplementary)	W85,000
c. X-ray facilities	W485,500
d. Laboratory facilities	W773,310
e. Furnitures	W117,300
f. Vehicles	W550,000
Motor bike 1	500,000
Bicycles 2	50,000
Total	W5,011,140

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