

**OVERVIEW AND ANALYSIS OF  
THE HEALTH CARE SYSTEM  
WITHIN KOREA**

**A REPORT ON MEDICAL INFRASTRUCTURE  
AND  
REGIONAL MEDICAL FACILITY DEFICIENCY**

**By**

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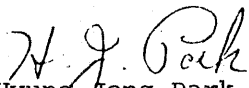
**KOREA HEALTH DEVELOPMENT INSTITUTE**



### Foreward

As this institute is devoted to the development of the health sector in Korea, it is with great pleasure that this report is submitted. In this report Dr. Kim and Mr. Waxer have attempted to bring together in a meaningful way an analysis of the current health sector in Korea, together with the projected national planning and requisite infrastructure necessary for comprehensive development.

In this light, I would like to express my appreciation to Dr. Kim and Mr. Waxer, for their diligent and comprehensive work. Also, I wish to thank the many scholars who provided consultation for this analysis. It is my hope that this report may serve as a source of guideline and analysis of the Korean health sector, in the interest of health development.

  
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President  
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## I. PREFACE

As a country develops both economically and socially, there is a greater emphasis by the population towards health care. Health and medical care is one of the few intransient rights developed societies confer onto all. Therefore, in the rapid pace of Korean development, the right to health has also developed. This movement is sure to continue as Korea joins the ranks of the post-industrialized countries.

This study is written with the goal of overviewing and analyzing the status of health and medical care, and its related infrastructure, in Korea.

Our aim was to provide an integrated analysis for not only those directly in the medical field, but for policy makers as well. We sincerely trust that this study may serve as a source of information and overview for those who have the blessing (and curse), of formulating policy. Our goal is simple, namely, the structured development of the health sector, such that the overall availability and quality of health and medical care, in Korea, reflects its true place among the rights of man, as the most basic.

#### ACKNOWLEDGEMENTS

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## II. PRINCIPAL FINDINGS

In the body of this study an analysis and evaluation was conducted on the medical care system and on the unmet need for medical facilities within Korea. The principal results and conclusions are as follows:

A. The past development of the medical sector has largely been funded through the private sector. This has resulted in a large number of small facilities having an average of only 6.7 beds per medical facility. This study has found that larger facilities use less manpower per occupied bed and also have a greater percentage of occupiable beds. Additionally, we have found that the low average utilization rate of Korean medical facilities is in large part due to the small size of the average facility coupled often with inefficiency. Therefore, the current status of the medical care system is characterized by;

- 1) A strong private sector centered on the free market system.
- 2) Facility, manpower and fiscal inefficiency.
- 3) A lack of coordination characterized by a low rate of medical referrals.
- 4) A lack of comprehensive organization.

B. The Korean government is presently emphasizing social development, and thereby is increasing the public sector's role towards the comprehensive development of the health sector. Three areas of public input that will affect the future development of the health care system are:

- 1) An urbanization plan, where 75% of the populace will reside in urban centers by 1991.
- 2) The introduction of several medical insurance systems that by 1980 will reach 30% of the populace.
- 3) The planning by 1981 for the construction of 35 hospitals in medically underserved industrial and rural areas.

C. In order to appraise the unmet need in the medical sector. This study developed a model that estimates as a result, three key criteria, on a regional (health district) basis:

- 1) The medical facility bed requirement of the population.
- 2) The existing occupiable beds, and as a result the efficiency of medical facilities.
- 3) The unmet need or bed deficiency.

Overall, we estimate that by 1981 Korea will require on the average 1.62 occupiable beds/1,000 population, at a 80% occupation rate. Currently Korea has in total 0.64 occupiable medical facility beds per 1,000 population.

One result of this calculation is that almost all areas in Korea have a bed deficiency with respect to 1981 projected medical demand.

D. This study evaluated the government plan for hospital construction with reference to the priority list criteria developed. The results of this analysis are as follows:

- 1) Of the total of 35 hospitals, and 3,515 beds planned for construction, 25 of the hospitals and 77% of the total beds fell within priority 1 and 23 inclusive.
- 2) Of the 10 remaining locations that were randomly distributed in priority, due to a small population, each after further analysis, conforms to a rural county with an extreme deficiency in hospital beds (0 beds in all but one of the locations).

Therefore, it is concluded that all of the locations selected in the government plan are

areas that have a bed deficiency great enough  
to require the introduction of hospital beds.

### III. NATIONAL HEALTH CARE SYSTEM

#### A. Background

Introduction of  
western health  
care

Western Health Care was originally introduced in Korea in the 1870's. At that time only royalty and the wealthy could afford medical care. In 1910, Korea came under the administrative control of Japan and up until 1945, health care was available in small scale city and provincial hospitals built and operated during the Japanese administration, and through a small private sector of physicians. Again, during this time medical care was reserved for the Japanese residents or the affluent. Most Koreans utilized traditional or herb medicine as their primary health resource.

Korean war ...

During the Korean War of 1950-'53, about 70 percent of the existing facilities were damaged or destroyed and many health care personnel lost.

... epidemics

During and after this time, health became a major problem with the mass spreading of communicable disease vectors, especially typhoid, smallpox and others. Tuberculosis infection was widespread. Subsequent to 1953, disease epidemics were brought under control with the aid

of a massive immunization campaign through private sector physicians.

Pre-development  
health status

The health status of the population in the 1950's was typical to that of many underdeveloped countries high infant mortality, inadequate nutrition, widespread disease vectors, although limited control was established. Parasitic infection was widespread. Until 1962, economic and political instability led to little improvement in the populations health status.

HEALTH INDICATORS

	1953-1962
Infant Mortality	86/1,000 live births
Maternal Mortality	200/100,000 live births*
Protein Intake	50g/Person/Day*
Typhoid	7,000 Cases/Year
Dyptheria	2,000/Year
Life expectancy	50 Years

\* Regression estimate from more current data.

1st Five-Year  
Development  
Plan ...

In 1962 the First Five-Year Economic Development Plan was implemented. This plan included for the health sector the construction and operation of health centers

... health  
center  
introduction ...

... staffing

2nd and 3rd  
Five-Year  
Development Plan

... Myon health  
workers

... increase in  
facilities,  
manpower

in every county and city. These centers served to provide health care concerned with communicable disease control, T.B. control, family planning and maternal and child health. These county and city health centers were staffed with a director, usually a physician, several nurses, a few technical staff and a number of administrative supporting staff. During the period '63-'66 these centers were expanded both in numbers of staff and in physical size.

During the 2nd and 3rd Five-Year Economic Development Plans, government health planning continued to be organized around these health centers. Additionally, Myon level projects were organized and by 1967 all 1330 Myons in Korea were covered by at least three health workers concentrating respectively on family planning, T.B. control and MCH (Maternal and Child Health). Facility construction such as General hospitals showed an increase of 350%, while total health manpower increased by 217% during this period.

# FACILITY AND MANPOWER TREND

	1968	1973	1977	Total % Change '68-'77
<b>Facilities</b>				
General Hospital	12	17	54	+ 350.0
Clinic	5,211	5,993	6,008	+ 15.3
<b>Licence Issued</b>				
Physician	12,727	16,377	18,405	+ 44.6
Dentist	1,854	2,363	2,823	+ 52.3
Herb Doctor	2,446	2,691	2,610	+ 6.7
Nurse	11,925	21,953	30,294	+ 159.3
Nurse Aid	850	24,429	40,210	+ 4,631.0
<b>Total Manpower</b>	<b>29,802</b>	<b>67,813</b>	<b>94,342</b>	<b>+ 217</b>

SOURCE: Yearbook of Public Health and Social Statistics, Ministry of Health and Social Affairs, 1978.

Free market  
medical care  
system ...

... introduction  
of specialty  
qualification  
standards

The Japanese medical approach implemented prior to 1945 has continued basically unchanged to the present. Essentially, this approach adopts a free market enterprise system where medical care becomes, in principle, a commodity to be bought at the highest price. However subsequent to this time Korea introduced a qualification system for medical specialties



beginning in the 1950's.

National health  
expenditures ...

During the period 1970-1974 the total national health expenditure remained at approximately 2.7% of the GNP although the GNP increased 160% in the same period. Thereby, per capita health expenditure in Korea almost tripled in this period reaching \$12/Person in 1974. Of the total health expenditures, the private sector has remained as the dominant factor in being responsible for 85% of all expenditures.

... private  
sector  
dominant

# NATIONAL HEALTH CARE EXPENDITURE 1970-1974

(in 100 Million Won)

	1970	1971	1972	1973	1974
Public Sector Expenditure	106 (16.4)	147 (18.2)	165 (15.4)	181 (13.8)	214 (11.2)
Central Government	47	73	76	82	95
Local Government	59	74	89	99	119
Private Sector Expenditure	540 (83.6)	659 (91.8)	908 (84.6)	1,127 (86.2)	1,712 (89.8)
Private Expenditure	523	649	896	1,112	1,681
Voluntary Organization	7	10	12	15	21
TOTAL EXPENDITURE	646 (100)	806 (100)	1,073 (100)	1,348 (100)	1,916 (100)
GNP	25,893	31,515	38,600	49,287	67,791
Population	31,435	31,828	32,360	32,905	33,459
Total Health Expenditure to GNP	2.5	2.6	2.8	2.7	2.8
Per Capita Health Expenditure in Won	2,055	2,532	3,316	3,975	5,726

SOURCE: The 4th Five-Year Economic Development Plan.  
Ministry of Health, 1976.

Per capita  
income increase ...

During the period 1962 to 1977 the per capita income  
has shown a dramatic rise from \$36.00 to \$860.00.

... increased  
geographical  
accessability

This along with an increase in geographical accessability  
due to more facilities and improved roads has led to a

... increased  
medical  
demand

337% increase in the number of hospitalized patients  
while in the same period there was only an increase of  
164% in the number of hospital beds.

#### HOSPITAL UTILIZATION TREND

	1962	1967	1972	1977	Total % change '62-'77
Population (in 1,000)	26,513	30,131	33,505	36,450	+ 37.5
No. of Hospital Beds	9,637	14,948	16,373	25,465	+ 164.2
No. of Beds/1,000 persons	0.363	0.496	0.489	0.699	+ 92.6
No. of pts hospitalized/ year	107,020	188,498	239,785	468,016	+ 337.3
Hospitalized pts/1,000 prs./ year	4,037	6,256	7,157	12,840	+ 218.1
No. of days hospitalization	1,948,835	3,455,797	3,068,495	5,498,206	+ 182.1
Average length of stay	18	18	13	12	- 33.3
Bed occupancy rate	55.4	63.3	51.3	59.2	+ 6.9
Bed turn over rate	11.2	12.8	14.4	18.0	+ 60.7
OPD visits	4,407,610	5,815,231	5,583,156	11,812,836	+ 168.0

SOURCE: Yearbook of Public Health and Social Statistics, 1978, Ministry of Health and Social Affairs.

Increases in  
health  
manpower

In order to increase the number of qualified health manpower, the government expanded the size of the classes within nursing schools between 1970 and 1976. It also increased the number of medical schools from 14 in 1976 to 17 in 1979. These measures increased the health manpower by 40% per year.

NO. OF MEDICAL COLLEGE BY YEAR

Year	Number	Remarks
1976	14	
1977	14	
1978	16	Kang Won : Wonju Yeonsei Univ., Branch Chung Nam : Ah San, Soon Cheon Hang Medical College
1979	17	Pusan : Injae Medical College

\* Yeong Nam Univ.,  
Gae Myong Univ., will be authorized during 1979.

4th Five-Year  
Development  
Plan ...

... 56  
health districts ...

... medicaid  
program  
organized ...

... benefits

Employee  
medical  
insurance  
implemented ...

In January 1977 the 4th Five-Year Economic Development Plan organized a medicaid program. The government divided the country into 56 health districts and implemented this program for the low income and indigent sectors of the population. The benefits for the approximately 400,000 indigents (individuals less than 18 years of age or greater than 60 years of age and with no immediate relatives) were cost free medical services at government designated clinics and hospitals. For the low income group of approximately 1,600,000 persons, qualification requires a monthly income of less than \$33.00. Benefits include cost free out-patient visits and inpatient visits at designated facilities, of which 30% is paid by government and 70% by the patient in a short-term loan of 1 to 5 years. This medicaid program albeit limited in coverage helped to provide basic health service availability to sectors of the population that had previously had no financial accessability to health care.

Beginning July 1977, a medical insurance system was implemented mandatorily for all companys employing greater than 500 persons. Additionally, smaller firms

... employee  
premiums ...

in the same industrial areas also were required to provide this insurance coverage. Each area affected thereby organized an insurance union. Premiums range from 3% to 8% of the employees wages, split between the employee and the firm.

PERSONS COVERED BY EMPLOYEE'S MEDICAL INSURANCE SYSTEM

As of Dec.-31-1977

Province	Persons Covered(,000)			Population (,000)	Coverage in %
	Employees	Dependants	Total		
Seoul	628	1,143	1,771	6,879	25.7
Busan	165	229	394	2,451	16.1
Gyeonggi	125	177	302	4,036	7.5
Kangwon	20	56	76	1,862	4.1
Chung-Buk	8	12	20	1,521	1.3
Chung-Nam	30	42	72	2,947	2.4
Jeon-Buk	17	22	39	2,455	1.6
Jeon-Nam	16	30	47	3,983	1.2
Kyong-Buk	71	93	164	4,856	3.4
Kyong-Nam	105	150	255	3,279	7.8
Total	1,185	1,955	3,140	34,269	9.2

SOURCE: Ministry of Health and Social Affairs, major Statistics of MOHSA, 1978.

... benefits

The benefits are inclusive of family dependants and range from 50% to 70% of total medical costs paid by the insurance union. In total, this system reached over 3 million persons. In January 1979 medical insurance was implemented for all government employees, and all instructors, as well as their dependants. Premiums are 3.8% of wages and are divided equally between government and employees. Benefits range from 60% to 80% of total medical costs paid by the insurance union. This program reached over 3 million persons.

Public employee  
medical  
insurance

Extent of  
health insurance

Therefore, in a very short time health insurance has reached over 8 million Koreans or 22% of the population.

Increased  
medical care  
demand ...

One of the effects the implementation of health insurance has had is to dramatically raise the utilization rate of medical facilities. Early data from Seoul, where 20% of all residents were covered by some form of health insurance, shows that the utilization of medical facilities in terms of hospital beds went up from 55% in 1976 to over 90% in 1977-'78. This corresponds to a bed requirement of 2.6/1,000 persons up from the 1976 figure of 1.6/1,000.

... increased  
facility  
utilization

B. Present Status

OVERVIEW OF KOREAN SITUATION

Health sector  
development

The Korean medical care situation is very diverse and complex. As the health sector is currently in the developing stage, a dichotomy exists in the utilization and understanding of medical services by the public.

Basically, Korean health care is divided into 3 branches from the public's view:

Major health  
divisions ...

- 1) Western, physician based medical centered around hospitals, clinics, and health centers, including primary care projects.
- 2) Pharmacies
- 3) Shamanistic practices and oriental medicine.

... pharmacies ...

Due to the limited number of medical manpower and facilities, especially in the rural areas, as well as limited financial accessibility, a large number of people utilize pharmacies as their primary health resource.

... shamanism,  
oriental  
medicine ...

Additionally, while shamanism and oriental medicine are not typically utilized as a primary health resource, they often are utilized secondarily or tertiarily. Of course, the trend is changing rapidly towards a western physician based system including the use of para-medical practitioners for primary care. Still, in regard to



hospitals, they remain by far the primary resource for acute and serious care. Also, as the educational level and the income level of the populace increases, the trend will continue towards the western based system due to its general effectiveness.

Therefore, we must look at the current status of health infrastructure in order to later appraise the areas that are deficient, and to serve as a guide towards the implementation of changes.

#### HEALTH FACILITIES IN KOREA

	Hospitals	Clinics	Health Center	Pharmacies	Non-Western Clinics	Total
Number	234	6,008	202	10,191	2,353	18,990
Staff	4,563	6,149	5,645	10,648	2,448	29,453

SOURCE: Yearbook of Public Health and Social Affairs, 1978.  
Special Hospital were excluded from this statistics.

Of the total number of health facilities in Korea, only 1% are hospitals and of these only 54 can be considered general hospitals, which overall give the highest level of care. But in that light it is easy to

... shortage of  
general  
hospitals ...

see that each general hospital, all other things being equal, is responsible for over 700,000 Koreans. Of course this is a simplistic approximation but it identifies an overall shortage in Korea of quality medical facilities.

... inadequate  
hospital based  
care

The term 'hospital' in Korea can be used for any facility with 20 or more beds. Taking into account all hospitals, even with perfect distribution, each would have a target population of almost 200,000 persons. Unfortunately, proper distribution is lacking with many areas having totally inadequate or non-existent medical care.

... misuse of  
pharmacies ...

Another concern is that of the large number of pharmacies. Previously, when adequate facilities were lacking, pharmacies partially filled the gap by supplying various modern medications to the populace. Unfortunately the misuse of pharmacies by the population as diagnostic and prescriptive centers has led to negative effect instead of serving as ancillary dispensaries for the proper acquisition of prescribed drugs. The existing clinics serve to provide a substantive level of medical care to the populace. As each practitioner is highly qualified, the only drawbacks are that most clinics are not

... clinics ...

... limitations of  
clinics ...

suitable for acute cases and long term pathologies.

Also, the medical equipment at clinics are often marginal.

Therefore, clinics do not generally provide a balanced  
medical delivery service.

... limitations of  
non-western  
based care

The non-western clinics, while considered by some to  
deliver adequate health care, cannot be considered to  
contribute in any overall positive way towards the  
populace's health according to existing data. Instead  
we often see maltreatment and a lack of proper referrals  
for serious cases.

Principle health  
resources ...

We shall now concentrate on the three primary health  
resources available in Korea that provide supervised  
western medical care, namely the hospitals, clinics and  
health centers. Pharmacies and non-western clinics are  
considered to be ancillary infrastructure in regards to  
medical and health care.

... clinics ...

First, it is clear that of these three types of facilities,  
private clinics comprise more than 93% of the total,  
while they house more than half of the 'beds' and employ  
55% of the physicians in the Korean health care system.

... small size

Therefore, clinics have a great impact on the availability  
of medical care. Clinics on the average have 3.5 beds,

	Total Hospitals	Gen. Hospitals	Other Hospitals	Clinics	Health Centers	Total
Number	236	54	180	6,008	202	6,446
Number of Beds	22,636	13,977	8,659	23,422	-	46,058
Total Physicians	4,563	4,078	485	6,149	355	11,067
Specialists	2,150		2,150	2,559	-	4,709
General Physicians	2,413		2,413	3,590	-	6,003
Nurses + Midwives	6,693	5,780	913	846	690	8,229
Other Medical Staff	1,429	1,149	280	817	1,555*	3,801

SOURCE: Yearbook of Public Health and Social Affairs, Special Hospital were excluded from this statistics.

... utilization low but the actual utilization rates of these beds are quite low. Therefore, some of the strengths of the private clinics are:

- Advantages of clinics ...
- 1) They are widespread and there is overall high geographical accessability.
  - 2) They are staffed by a qualified physician or specialist.
  - 3) They provide a basic foundation for primary and often secondary care.
  - 4) While most are in urban areas they provide services to many areas not within the target area of hospitals.

These advantages make private clinics very desirable, but many drawbacks and areas for improvement still remain:

- Clinic disadvantages ...
- 1) All of the clinics are within the private sector free market system. This leads to a profit maximizing approach that often compromises the quality of the health care.
  - 2) Clinics tend to conglomerate in the urban areas, and in areas of high income in order to optimize profits. Thereby, areas of lower income have increasingly inadequate medical care.

... inadequate  
equipment for  
acute care

- 3) Clinics are not generally equipped with  
the necessary manpower and equipment to  
treat patients on a secondary or tertiary basis,  
nor for extended stays.

Clinics  
organization and  
coordination  
deficient

It is apparent that while clinics serve a needed and  
useful function towards Korean health, their approach  
is random and unbalanced. In terms of a coordinated  
national health care system, the clinics still remain  
too diverse both in quality and availability.

Additionally, clinics are generally not able to meet  
the secondary and tertiary medical care needs of the  
populace.

Medical security  
and insurance ...

One key element of the national health system in Korea  
is the implementation of a medical security and  
insurance system. This system under public control will  
have reached 30% of the population by July 1979.

... 30% popula-  
tion coverage ...

Therefore, the financial accessibility to quality  
medical care, especially hospital based care, is  
currently greatly enhanced for this sector of the  
populace due to the new medical insurance systems.

... increased  
populace  
financial  
accessability to  
medical care

POPULATION COVERAGE UNDER THE MEDICAL SECURITY AND INSURANCE SYSTEMS

Program/Plan	As of the 1977 Persons Covered	% to Pop.	July 1979 Persons Covered	% to Pop.
Employee's Insurance	3,140,000	8.9	5,045,000	14.3
Government Official and Private School Teacher	-		3,620,000	9.8
Non-employee's Insurance	57,000	0.2	57,000	0.2
Medical Program	2,096,000	5.7	2,090,000	5.7
	5,293,000	14.8	10,812,000	30.0

Problems in national health strategies ...

Although these elements are of great importance and significance and have overall increased the quality and availability of health care to the populace, there still remain many problems in the current strategies:

- ... health center system ...
- ... manpower deficiency ...
- ... limited services
- 1) The health center and sub-center systems have limited ability to attract physicians and other professionals resulting in a shortage of medical manpower. Also, the services provided are limited in scope as they are mainly centered around community health services as opposed to personal health services.



HEALTH CENTER MANPOWER

(as of the 30th Sept. 1978)

	No. of Post	No. of Post Occupied	Excess or Shortage
Physician	257	175	- 82
Dentist	62	26	- 36
Technologist			- 44
Clinical Lab.	238	194	- 25
X-Ray	236	211	- 25
Pharmacist	258	194	- 122
Nurse	871	744	- 127
Family Planning Worker	1,062	1,036	- 26
MCH Worker	104	102	- 2
T.B. Worker	490	466	- 4
Leprosy Worker	105	104	- 1
Other Health Worker	572	553	- 19
Clerk	711	689	- 22
Temporary Employee	526	592	+ 30
Others	415	405	- 10
TOTAL	6,125	5,612	- 511

SOURCE: Present Status of the Medical Administration, Ministry of Health and Social Affairs, Oct. 1978.

... deficiency  
of public  
hospitals ...

2. There are only 19 general and 52 other hospitals in the public sector in Korea. This shortage of public hospitals limits accessibility to large sectors of the population.

... insufficient  
hospital  
facilities ...

3. Due to the increased demand for quality medical care by the public since the introduction of medical insurance, it is evident that there are insufficient hospital facilities existing currently, both in quality and number.

... free market  
system  
dominates

4. Because 96% of all medical facilities are in the private sector, the free market system still overwhelmingly dominates the health care system in Korea.

NO. OF HOSPITAL AND HOSPITAL BEDS BY SECTOR

	Public Sector	Private Sector	Total
No. of Hospital			
General Hospital	19 (35.2)	35 (64.8)	54
Hospital	41 (22.8)	139 (77.2)	180
Special Hospital	11 (57.9)	8 (42.1)	19
Total	71 (28.1%)	182 (71.9%)	253
No. of Hospital beds			
General Hospital	5,027 (36.0)	8,950 (64.0)	13,977
Hospital	2,337 (27.0)	6,322 (73.0)	8,659
Special Hospital	3,074 (68.4)	1,421 (31.6)	4,495
Total	10,438 (38.5)	16,693 (61.5)	27,131

Therefore, until steps are taken to coordinate the development of the private sector in the interest of integrated national health care development, there will be limits to the benefits national health care systems may make.

Overall, the present national health care system has attempted to fill the gap separating medical demand and existing resources. Some of the most positive aspects of the national system are:

- 1) There exists a web of health centers and health subcenters providing primary health care services.
- 2) There are several publicly owned provincial and government hospitals providing secondary and tertiary care.
- 3) Medicaid and medical security insurance systems have been implemented to a large sector of the population. This promises to increase the financial accessibility of medical care.

C. INTENDED DEVELOPMENT

GENERAL GOVERNMENT PLAN

5th Five-Year  
Development  
Plan ...

In the government 5th Five-Year Economic Development Plan (to begin in 1982), continuous economic growth along with a high rate of social development will be stressed. For the health sector, there are several elements correlated with the country's future growth that will affect the utilization and demand for health directly.

... social  
development  
stressed

Industrializa-  
tion ...

Due to the rapid pace of industrialization presently existing and its continuance as a dominant factor in Korea's economic growth, as well as a less agrarian economy, there will continue to be a high rate of urbanization. By 1991, 75% of the population will live within cities. In fact many areas now slated to be industrial centers will quickly become highly populated urban centers.

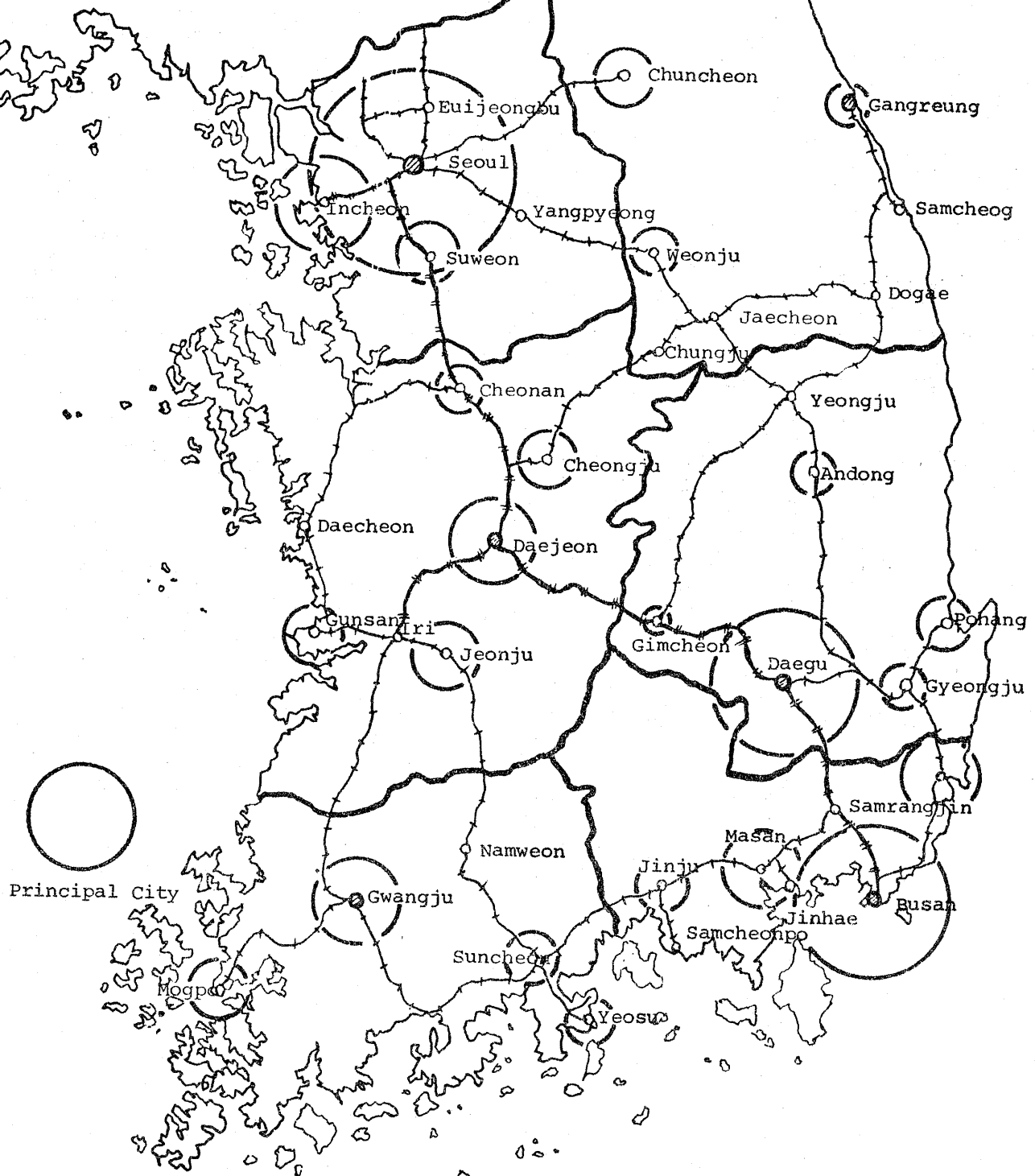
... continued  
urbanization

LAND, POPULATION AND URBANIZATION TREND

	1976	1981	1986	1991
Land in Km <sup>2</sup>	99,807	98,909	98,865	99,022
Population (in 10,000)	3,586	3,881	4,209	4,525
Pop-Density	363	392	425	457
Urban Population (10,000)	1,865	2,290	2,778	3,394
% of Population Urban	52	59	66	75

SOURCE: Long term Socio-Economic Development 1977-1991, Korea Development Institute.

Major City Urbanization Plan for Korea



### Age Structure

Change in  
population  
age  
structure ...

... post-  
industrial  
phase ...

... reduced  
birth, and  
death rates

... increased  
old age  
sector ...

... increase in  
medical demand

More complex  
medical  
services ...

As Korea becomes increasingly more industrialized, one most noticable element of change will be the population age structure. Basically, with modernization and improved health care, we see a clear trend identical to that taken by all developed countries in their post-industrial phase, namely, a reduction in infant mortality and disease vectors with a concurrent lowering of the birth rate and the death rate.

Of course, in practical terms for Korea, this means a larger retired and old age group as well as a relatively larger number of people over twenty five. In terms of the health sector, this forewarns an increasing future demand for health care as the health care needs of the population will inevitably increase with the greater number of middle and old age people.

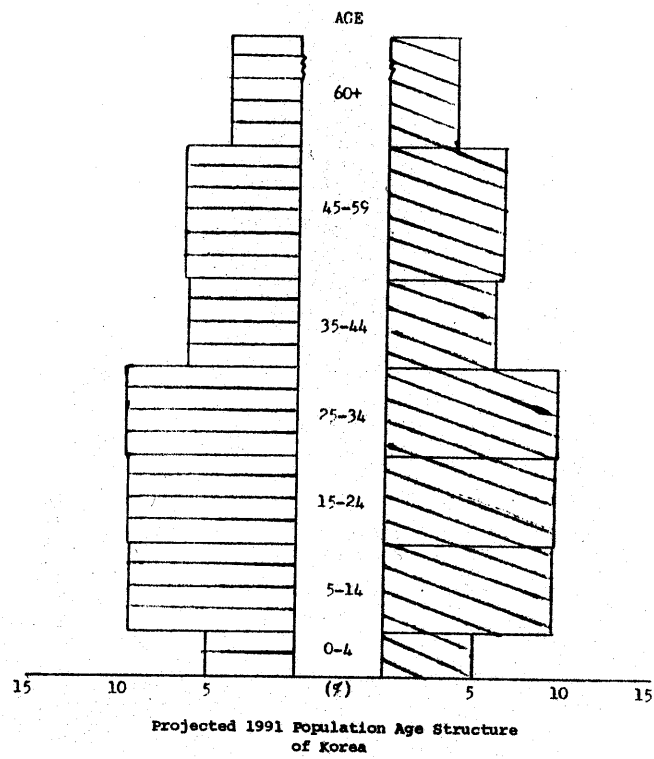
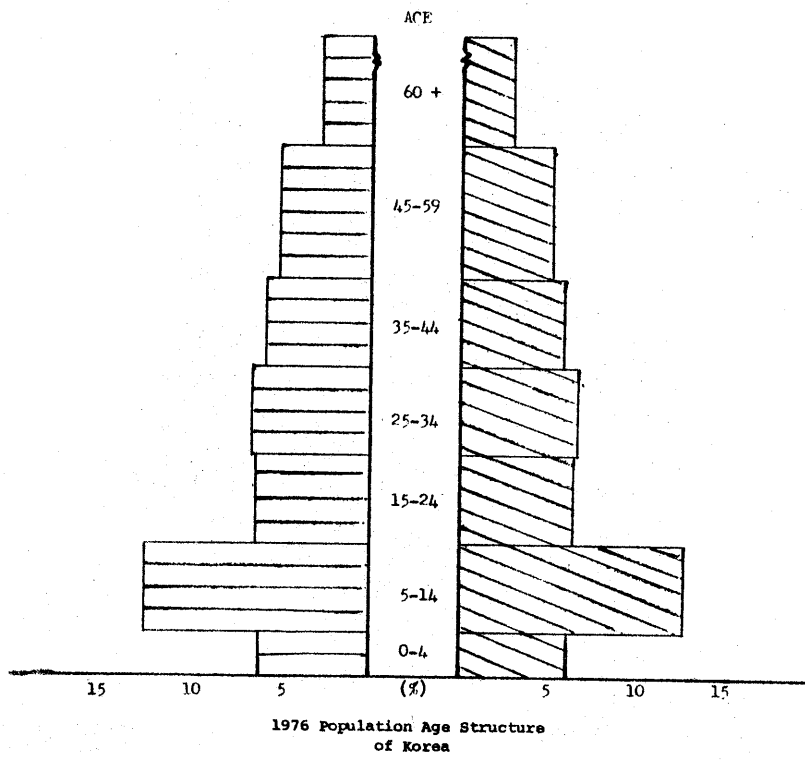
The required medical care will surely require more complex medical services and coorespondingly, a higher investment in facilities, equipment and perhaps most importantly, well trained professionals.

Projection of Age Specific Population Structure

	1961		1976		1981		1986		1991	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
TOTAL	25,766	100.0	35,860	100.0	38,807	100.0	42,080	100.0	45,251	100.0
0 - 4	4,729	18.4	4,392	12.3	4,162	10.7	4,506	10.9	4,532	10.0
5 - 14	6,336	24.6	9,052	25.2	8,798	22.7	8,357	19.9	8,564	18.9
15 - 24	4,750	18.4	7,828	12.8	8,906	22.9	8,859	21.0	8,614	19.0
25 - 34	3,638	14.1	4,797	13.4	5,786	14.9	7,548	17.9	8,622	19.1
35 - 44	2,532	9.8	4,157	11.6	4,353	11.2	4,575	10.9	5,556	12.3
45 - 59	2,494	9.7	3,627	10.1	4,416	11.4	5,254	12.5	5,855	12.9
60 +	1,287	5.0	2,007	5.6	2,394	6.2	2,909	6.9	3,508	7.8

Source: Long term Socio-Economic Development 1977-1991, Korea Development Institute.





### Income

Increased  
liquid  
income ...

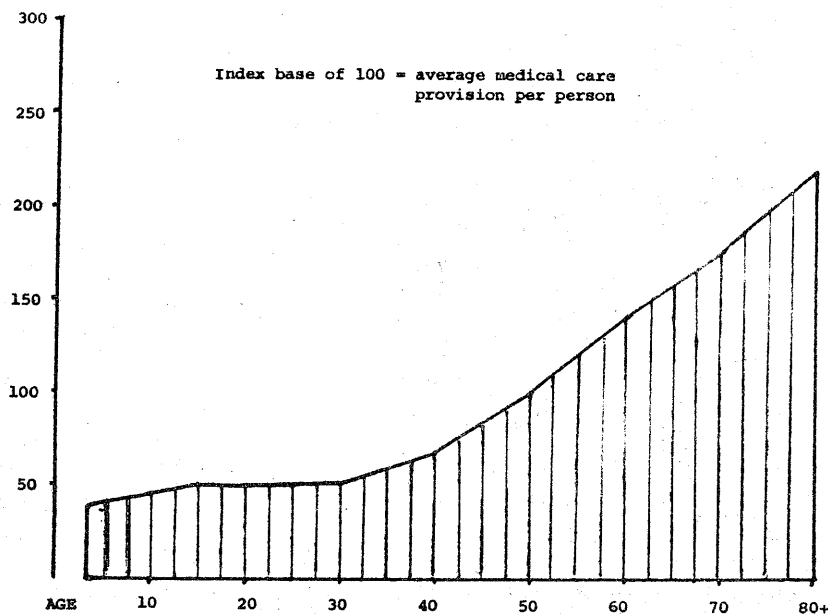
... rural  
income will  
approach  
urban income ...

... increased  
financial  
accessability ...

... increase in  
rural  
medical  
demand

With the rapid increase in gross national product, and coorespondingly per-capita income. The liquid income available to the population will rise quickly. Also, the household income of the rural residents is rapidly equalling that of the urban counterparts. This trend undoubtedly will give rise to an increase in financial accessability for all sectors of the population, urban and rural, towards high quality health care. Additionally, the demand for medical services by the rural residents who have previously had limited financial accessability will surely rise.

Medical Care at Different Ages in Sweden



Source: The Needs of Medical  
Education and Medical Progress  
Stockholm, Government Printing  
Office 1961

PROJECTION OF INCOME BY CATEGORY AND BY YEAR

(Unit : 1,000 Won)

	1970	1976	1981	1986	1991
<hr/>					
Household Income of Non Farmer					
Non-Farmer	1,136	1,522	2,132	2,841	3,903
Employee	689	919	1,353	2,006	3,007
Farm Household Income					
Agricultural Expenditure excluded	641	1,003	1,493	2,216	3,388
Proportion of Side Business Income	24.2	20.3	28.3	37.5	50.0
<hr/>					

SOURCE: Long term Socio-Economic Development 1977-1991, Korea Development Institute.

### Health Sector Plan

Future plan ...

... increased  
demand for  
medical  
services ...

... must  
increase manpower  
and  
facilities ...

... must  
coordinate  
resources with  
medical  
insurance, and  
demand

The future development of the health sector must take into account an increased demand for medical services and for the highest quality of care possible. In order to meet this change there must be coordinated activities aimed at increasing the number of medical professionals available, as well as increasing the number of facilities. Only by coordinating these increases with the future increase of medical insurance coverage of the population, can an effective and efficient medical system be developed. Therefore, the government plans, on a long term basis, to coordinate these activities in the interest of insuring the adequate availability of medical care for all.

LONG TERM PLAN FOR HEALTH SECTOR

	Unit	1976	1981	1986	1991
Total Population	1,000	35,860	38,807	42,088	45,251
0 - 14	1,000	13,444	12,960	12,943	13,097
	%	(37.5)	(33.4)	(30.8)	(28.9)
15 - 59	1,000	20,409	23,453	26,236	28,646
	%	(56.9)	960.4)	(62.3)	(63.3)
60 or more	1,000	2,007	2,394	2,909	3,508
	%	(5.6)	(6.2)	(6.9)	(7.8)
Manpower					
Population/physician		2,210	1,740	1,592	1,283
Population/Dentist		13,087	9,653	8,403	6,199
Population/Nurse		1,184	741	578	504 (include nurse-aid)
Population/Bed		796	427	229	123
No. of Beds		45,050	90,880	183,790	367,890
Facility delivery (%)		22	45	65	75
Medical Security					
Total (covered by medical security)		5,658	15,975	24,148	36,077
To total population		16.0%	41.2%	57.4%	79.7%
Medical Insurance		3,203	13,272	21,675	33,983
		9.1	34.2	51.5	75.1
Medicaid		2,455	2,703	2,473	2,094
		6.9	7.0	5.9	4.1
Industrial accident insurance		2,270	4,714	8,090	13,878
To employee		43.6	63.9	77.2	93.2

Source: 5th Five Year Economic Development Plan, Ministry of Health and Social Affairs.

Developing  
health sector ...

... environmental  
and public  
health ...

... stimulate  
growth through  
investment  
and policy

During the fourth Five-Year Economic Development Plan the government is following a policy of developing the health sector in order to meet present and future needs. Also, much emphasis is being put on environmental health and public health. The government intends to stimulate the growth of the health sector directly by initiating the investment of resources and by coordinating the direction of growth of the private sector, both through policy and mutual investments.

Government Investment Plan for Health Sector During the 4th Five-Year Economic Development Plan

(Unit : Million Won)

		Total Investment	Central Government	- 62% - Local Government	Others
TOTAL	(\$369 million)	179,081	77,478	33,601	68,002
Health Facility Expansion		73,640	19,816	121	53,703
Health Center Bedding and Equipment Renovation		3,174	3,053	121	-
Health Sub-center renovation includ Delivery Facility Bedding		4,230	4,230	-	-
City/Provincial Hosp. renovation		39,472	2,972	-	36,500
Mental Hospital Renovation		2,784	2,784	-	-
TB sanatorium renovation		2,977	2,977	-	-
New Private Hospital Construction		15,000	-	-	15,000
Facilities for Physicianless Area		2,500	2,500	-	-
Health Demonstration Project		2,940	737	-	2,203
Other related project		563	563	-	-
Public Health Project		32,609	25,584	7,061	-
Environmental Project		72,832	32,114	26,419	-

SOURCE: Health Sector Plan for the 4th Five-Year Economic Development Plan, Ministry of Health and Social Affairs.

# HEALTH MANPOWER REQUIREMENTS

	1975		1981		1990	
	No.	To pop.	No.	Pop. Professional	No.	
Physician	13,000	2,713	20,190	1,923	33,610	1,325
Nurse (total)	25,600	1,398	58,000	669	97,474	457
Registered Nurse	11,300	3,122	26,900	1,443	50,420	883
Nurse Aid	14,300	2,467	31,000	1,248	47,054	946
Technician						
X-ray	860	41,024	2,020	19,225	4,030	11,054
Clinical lab.	1,400	25,200	3,030	12,816	5,380	8,280
Midwife	1,600	22,050	4,150	9,357	6,720	6,627
Herb Doctor	2,400	14,700	2,910	13,345	3,900	11,422
Pharmacist	16,500	2,138	18,100	2,145	20,800	2,141
Dentist	2,200	16,036	3,870	10,035	6,720	6,629
Dental Hygienist	680	51,883	970	40,036	1,654	26,934

SOURCE: National Health Plan for the 4th Economic Development Planning Period, MOHSA, 1976.



Demand for  
hospital  
beds ...

... plan for  
hospital  
construction ...

... to be built  
in areas of  
rapid growth ...

... areas of  
acute deficiency

To meet the existing need for hospital beds and other medical facilities, as well as to plan for the future demand for medical care, the government in the Fourth Five-Year Economic Development Plan has planned to increase the number of beds in Korea by over 7,000. 3,400 of these beds are to be in hospitals planned for construction in this development period while another 3,420 beds will be introduced as part of reconstruction and renovation work on existing facilities. The majority of the new hospitals planned for construction in this period will be best utilized in two kinds of areas:

- 1) Industrially developing areas where the population is increasing rapidly.
- 2) Rural medically-underserved areas where there are little or no existing hospital facilities.

Therefore, all of these government planned hospitals built during this 4th Five-Year Economic Development Plan will be built in areas characterisable by one of the two above determinants, such that maximum benefit can be realized for Korean health.

BED RELATED FACILITY PLAN FOR 4th ECONOMIC PLANNING PERIOD

	Total	77	78	79	80	81
Health Sub-center Expansion						
New Building construction	309	26	70	70	70	72
Delivery Facility construction	500	-	125	125	125	125
City/Provincial Hospital						
New Building construction	6	-	-	2	2	2
No. of Beds	1,400	-	-	400	600	400
Reconstruction	33	7	6	7	7	6
No. of Beds	2,640	560	480	560	560	480
Mental Hospital						
Bed Expansion (No. of Beds)	400	-	-	200	200	-
T.B. Sanatorium						
Bed Expansion (No. of Beds)	380	-	-	-	190	190
Private Hospital Support						
No. of Beds	2,000	350	350	400	450	450
Number of Loans for Facilities in Doctor less Area	500	100	100	100	100	100

SOURCE: National Health Plan for 4th Economic Development Planning Period,  
MOHSA, 1976.

#### IV. MEDICAL INFRASTRUCTURE

##### A. HEALTH DISTRICTS

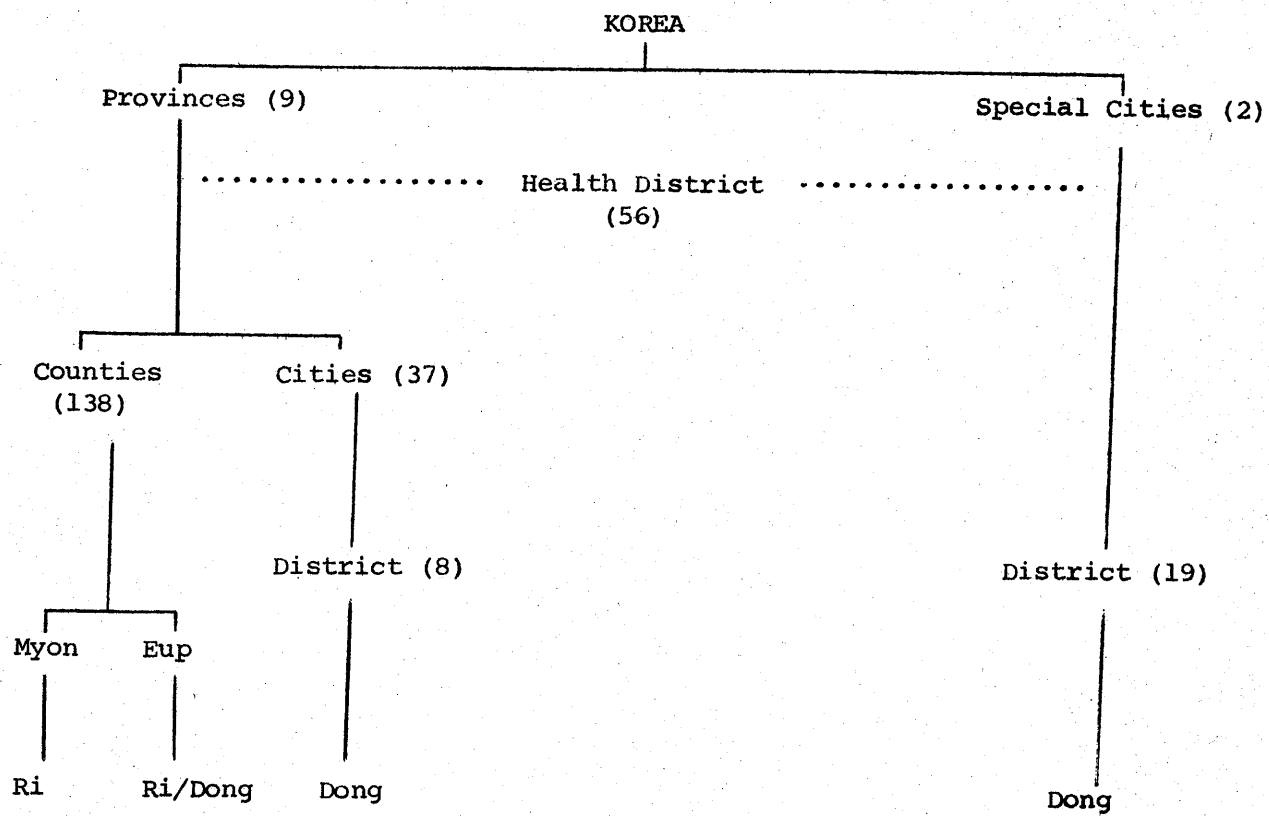
Medical  
infrastructure

In order to appraise the medical and health infrastructural status of Korea to an extent suitable for regional analysis, we must subdivide the country into primary units or districts.

Administrative  
subdivisions of  
Korea

Korea, a country with an area of 98,000 Km<sup>2</sup>, is presently administratively subdivided into nine provinces and two special cities. Additionally, each province is divided into several cities and counties. Correspondingly, each special city and large city is divided into several districts (Ku's).

ADMINISTRATIVE SUBDIVISION OF KOREA



56 Health  
districts ...

... advantages ...

... geography  
considered ...

... organization  
unit is larger  
than counties ...

Disadvantages ...

... health districts  
constructed from  
smaller  
administrative  
units ...

In 1977 the government administratively subdivided the country into 56 health districts. These districts were created in order to effeciently implement a national medicaid program. Some of the advantages of these districts over the previous subdivisions are:

- 1) They take into account geographical divisions such as mountains and rivers.
- 2) They organize into units larger than counties but smaller than provinces reflecting the close cooperation of health units across county borders.
- 3) Infrastructure is considered.

While these points are definitely advantageous, there are also several limitations inherent in these divisions:

- 1) The divisions are not exactly accurate, i.e. each health district is made up of several counties and never contain counties from more than one province. Therefore, each health district was constructed from smaller administrative units (counties) that previously existed.

... contain  
asymmetric  
counties ...

- 2) Health districts at times contain counties  
with of widely different economics and  
environments.

- 3) Health districts at times contain counties  
isolated from one another infrastructurally.

Therefore, even though the health districts do make  
an attempt at equity, it is clear that they are not  
always the best unit of organization in order to  
appraise a community's health infrastructure.

Health districts  
chosen as units  
for regional  
analysis ...

We have chosen to evaluate the existing health  
infrastructure in Korea based on these 56 health  
districts. But, as each individual case emerges  
for consideration, we often must look closely at  
a smaller unit of organization in order to fully  
appraise the status. Therefore, the health status  
in each of these 56 districts provide a thorough  
yet incomplete view of any particular community.  
Nevertheless, in terms of comparisons, they  
provide sufficient accuracy.

... sufficient for  
comparisons

## B. FACILITY INFRASTRUCTURE

Basically, the medical infrastructure of Korea can be divided into 3 categories:

### 1) General hospitals

General hospitals ...

... 8 disciplines ...

... balanced services

... large facilities ...

... only 54 in Korea ...

... high efficiency and occupation rates ...

... highest medical standards ...

... rural deficiency

These hospitals provide a minimum of eight disciplines, five clinical and three supportive, inclusive of dentistry. Therefore, they are able to provide a balanced delivery service of medical care to the populace. General hospitals are generally large by Korean standards, housing an average of 259 beds. Unfortunately, there are only 54 general hospitals within Korea and only 16 of the 56 health districts have one or more general hospitals. Also, general hospitals have the highest overall occupiable bed rate of the medical facilities, averaging 83%. Therefore of the 14,000 beds in general hospitals, approximately 11,600 are occupiable and can directly serve the populace. These 11,000 beds are, by and large, the highest quality of hospital beds in Korea. One area of concern is that only 2 of these general hospitals reside in the rural areas. This is indicative of a generally lower quality of medical care within rural areas.

## 2) Hospitals (Other than general)

Other  
hospitals ...

This category of facilities is quite diverse.

... needs only  
20 or more  
beds ...

For example, a hospital by definition requires a minimum of only 20 beds. These hospitals can best be viewed as those facilities housing greater than 20 beds but generally less than 80 beds. Of these 180

... average,  
only 48 beds ...

hospitals, the average holds only 48 beds. The small size of these hospitals allows them to be economical in areas of low demand. These hospitals usually employ only a limited number of qualified manpower, and have a reduced rate of occupiable beds in contrast to general hospitals.

... can be  
economical in  
areas of low  
demand ...

... less efficient  
than general  
hospitals ...

These hospitals have an average occupiable bed rate of under 66%. Therefore, of these 8,659 hospital beds,

... 21% in  
rural areas

only 5,709 are occupiable. Of the 180 hospitals distributed in Korea, only 21% reside in the rural areas which have 50% of the population. Still, hospitals are the highest quality facility available in the rural areas (aside from the two general hospitals.).

## 3) Clinics

Clinics ...

The term clinic refers to a type of facility that is

... diverse  
standards ...

difficult to classify adequately. Clinics are by

... equivalent  
to a one  
physician  
private practice ...

definition any location where one or more physicians have a private practice. In Korea most private clinics



... follow free market system ...	only have one physician. Generally, clinics follow the parameters affecting businesses. They are enterprises and as in any enterprise, optimization of profits is a compelling objective. There are over 6,600 clinics in Korea, each having an average of 3.5 beds.
... maximize profits ...	
... only 3.5 beds per average clinic ...	
... no clinic equipment standards ...	There is presently no system of licensing for equipment standards in order for a clinic to have beds. Therefore, clinics generally have little in terms of sophisticated medical equipment. The large number of clinics aid in the accessibility of primary care to the populace, especially the rural populace, but unfortunately, clinics are not generally adequate resources for secondary and tertiary care. Due to the low equipment standards and limited number of beds per facilities, clinics only have a 25% occupation rate for inpatients.
... have minimal equipment...	
... aid in making primary care accessible ...	
... not adequate for acute care ...	
... low rate of occupiable beds ...	This rate is indicative of the low number of beds per facility and of inadequate medical standards for in-patient care. This low occupation rate, is not, as a cursory assumption might make, singularly indicative of low utilization by the populace.
... not indicative of low utilization by populace	

### C. MANPOWER INFRASTRUCTURE

Development led by  
private sector ...

... unorganized  
development ...

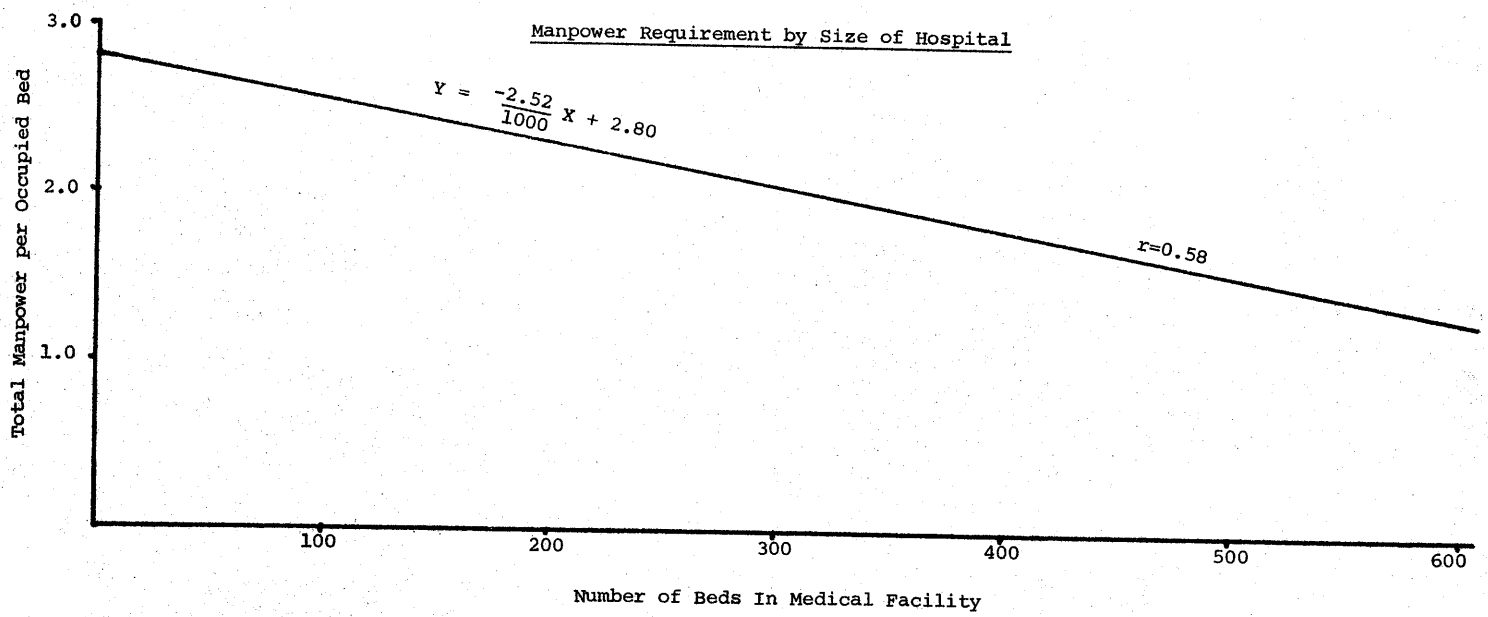
... led to many  
small  
facilities ...

... only 6.7 beds  
per average  
medical facility ...

... low overall  
efficiency ...

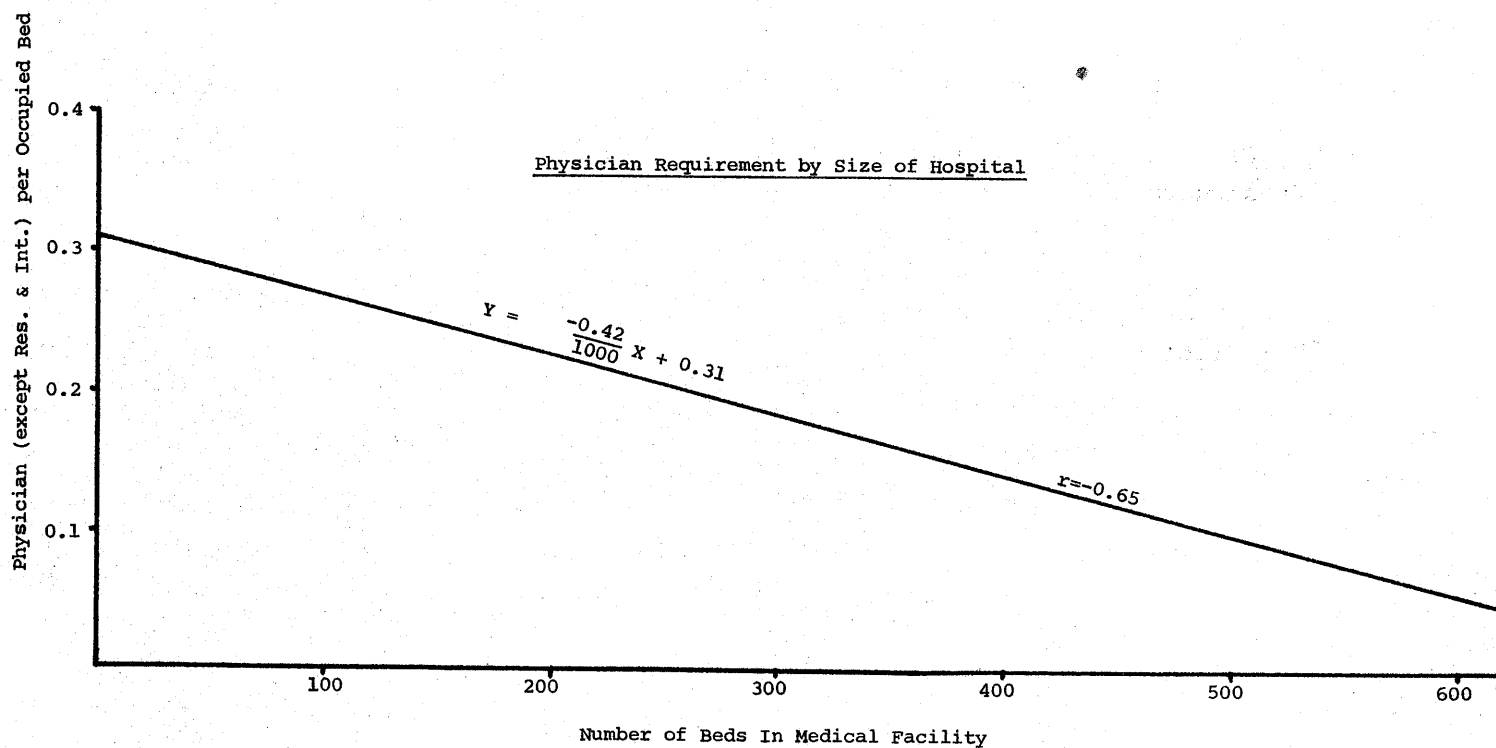
... larger  
facilities have  
greater efficiency  
with respect to  
manpower

Medical facility development in Korea has generally been led by the private sector organized around the private practice physician. This has resulted in a redundant and unorganized approach to medical delivery with respect to national planning. Also, this has, due to economics led to large numbers of very small specialized facilities and low numbers of larger more balanced facilities. Currently, the average medical facility in Korea has only 6.7 beds. Because of this unstructured approach, the efficiency of the current medical care system is quite low. From data on manpower utilization, we have made an analysis to determine the required number of manpower per bed. It is clear, as the following graph shows, that the larger medical facilities have a lower manpower to occupied bed ratio than the smaller facilities;



Larger  
facilities have  
greater  
efficiency with  
respect to  
physician  
manpower

Also, our data shows that there is a cooresponding  
reduction in physician manpower requirements per  
occupied bed as the size of the facility increases,  
as follows:



Trend towards  
small facilities  
is inefficient ...

... 'counting  
beds' is not  
adequate method  
of assessing  
medical  
infrastructure ...

... current  
system  
inefficient

This analysis indicates that the present trend towards very small facilities is inefficient from a manpower perspective and correspondingly from a financial perspective. This is why simply 'counting the beds' in Korea is not an adequate method of evaluating medical infrastructure. Instead, due to the random development in the past, the current system is plagued with inefficiency, multiple coverage in the affluent areas, and with inadequate medical coverage in the poorer regions.

In section V a model is developed to take into account the present inefficiency such that a more accurate appraisal of the existing resources can be made.

A list of data on medical infrastructure in Korea is contained in the ANNEX, Section IX.

V. EVALUATION OF DETERMINANTS AFFECTING THE NEED FOR  
ADDITIONAL MEDICAL CARE

A. CRITERIA

In evaluating  
need, infinite  
numbers of  
criteria  
variables ...

... only a few  
can be  
considered ...

... prerequisites  
for  
consideration ...

... relevancy of  
variable ...  
... availability  
of data

From available  
data,  
determined most  
relevant  
factors ...

... physical  
parameters ...

... population ...

... and  
projection ....

... density ...

... facilities ...

In determining the criteria for the evaluation of the  
relative need between areas in Korea, there are almost  
an infinite number of variables that could be  
incorporated. Unfortunately, in a real-time analysis  
only a selected few factors can be considered. Two  
prerequisites for consideration are first, the correlation  
or effect a variable has on the determination of  
future health and medical care and secondly the  
availability of data concerning this variable.

Therefore in our analysis we started from the available  
data and then determined the factors most relevant to  
medical priority. As listed in section 4.0 we had a  
fair amount of information available such as;

1) Health District Physical Parameters

A) Population

1. Urban

2. Rural

3. Projected urban population

B) Area of Health District

1. Density

2) Health District Medical Infrastructure

A) Facilities

1. General hospital
  - i. Number
  - ii. Number of beds
2. Hospitals
  - i. Number
  - ii. Number of beds
3. Clinics
  - i. Number
  - ii. Number of beds
4. Special hospitals
  - i. Number
  - ii. Number of beds
5. Health Centers
  - i. Number

... facility  
manpower

B) Manpower

1. Hospital Manpower (Total for all 4  
kinds of hospitals)
2. Clinic Manpower
  - i. By discipline
3. Health Center Manpower

Task to find  
method of  
assessing  
relative need ...

Out of the above mentioned data our task was to find an equitable method for appraising relative need. It must be pointed out that as there are 56 health districts each added variable adds 56 more determinants to be



evaluated and compared in the priority analysis.

First, calculate  
medical  
facility  
requirements ...

... then  
existing  
resources ...

... then deficit

In appraising the priority of health districts for additional hospital beds, a calculation must initially be made to determine the bed requirement for that health district. Then existing resources could be evaluated and a determination of the remaining deficit could be calculated.

Bed  
requirement  
calculation,  
parameters ...

Therefore, in our first step towards criteria determination, the health district bed requirement must be calculated. The factors used to determine bed requirement consists of:

- 1) The medical care need of the populace
- 2) The population
- 3) The density of the health district
- 4) Projected near future trends

... medical  
care need ...

... analyzed  
from insurance  
data ....

... estimated  
urban bed  
requirement

In terms of the medical care need of the populace, data was analyzed from an insurance program operating in Seoul. In this program over 500,000 persons are insured which is 20% of the total population of Seoul, according to the statistics, this calculates to a hospital bed requirement of 2.46 beds/1,000 persons for Seoul insured residents. We chose this figure as an estimate for the Korean urban hospital bed requirement of course other

urban areas perhaps have lower rates but we believe this figure is indicative of the situation prevailing and conservative for the near future. Additionally this 2.46 beds/1,000 pop. calculates actually to 3.10 assuming 80% occupation rates. Still we chose a conservative 2.5/1,000 for our estimate of the overall urban population bed requirement.

URBAN POPULATION BED REQUIREMENT ESTIMATE

---

Total Insured approximately 500,000 persons in Seoul

---

	<u>Inpatient cases/1,000 persons</u>	<u>Average length of stay</u>
Subscribers	77.5	8.2
Dependants (Cases except maternity)	127	7.4
(Maternity cases)	48	3.4

Ratio of Dependents to subscribers = 1.28

Therefore      44% = Subscribers  
                 56% = Dependents

$$\frac{44 \times 77.5 \times 8.2}{365} + \frac{56 \times 127 \times 7.4}{365} + \frac{56 \times 48 \times 3.4}{365} = \frac{2.46 \text{ Beds}}{1,000 \text{ persons}}$$

---

Note : This calculation assumes 100% occupancy.  
Source : Employee health insurance data 1977.

Data shows  
decreased  
medical  
facility demand  
by rural  
residents ...

... limited  
financial  
accessability ...

... limited  
cultural  
accessability

... rural demand  
estimated at  
40% of urban

Can now  
determine  
regional bed  
requirements ...

... must consider  
1981 population  
projection ...

Also, several studies suggest that rural residents in Korea have a decreased utilization and demand for hospital beds with respect to urban residents. This is partly due to a reduced liquid income in comparison to their urban counterparts, as well as traditional values and beliefs that deemphasize western hospital based medical care. The data estimates a rural resident demand for medical care to be between 30% and 50% of the urban demand. Careful analysis conservatively estimated this demand at 40% of the urban bed requirement. Therefore with these two criteria we can roughly estimate the bed requirement for each health district. Of course this estimate would be somewhat simplistic. To provide greater accuracy we believe that the urban population projected for 1981 must be used in the calculation principally because Korea is rapidly undergoing urbanization. Therefore we have projected the urban population to 1981, a modest 3 year projection. Now our calculation would be more reliable but still one factor remains.

#### B. DENSITY FACTOR

In a very dense city such as Seoul or Pusan or various others we have an overlapping of hospital target areas

Hospital target  
radii differ by  
density ...

... must analyze  
regional  
density ...

... density  
factor ...

... adjusts for  
areas of low  
density which  
need more beds  
to cover the  
same target  
population

and less areas that are outside of hospital target radii,  
while in less dense areas often 'gaps' exist in the  
hospital target area coverage. This means that even  
given, bed requirement ratios applicable to all rural  
and urban residents, we must take into account also the  
density of each health district. For example the Seoul  
health district has a density of 12,000 persons/Km<sup>2</sup>  
while the Chuncheon health district has a density of  
only 91 persons/Km<sup>2</sup>. Therefore, in order to systematically  
appraise bed need, we must also consider a 'density  
factor'. This factor contributes to bed need to adjust  
for density. With all of these elements evaluated we  
can then appraise the bed requirement for each health  
district depending upon its intrinsic characteristics.

### Density Factor

A density factor is calculated by the following equation.

$$\text{Density Factor} = \left[ 1 + \left[ \text{Log} \left[ \frac{\text{Pu} + \text{Pr} + \text{Pu81}}{\text{Ahd. Ds}} \right]^{-2} \left[ \text{Log (Pt)} \right]^{-1} \right]^2 \right]$$

Pu = Urban population of health district  
Pr = Rural population of health district  
Pu81 = Urban population increase to 1981  
Ahd = Area of health district  
Ds = Density of Seoul  
Pt = Total Population of Korea in 1981

C. EXISTING RESOURCES

Appraise  
existing  
resources ...

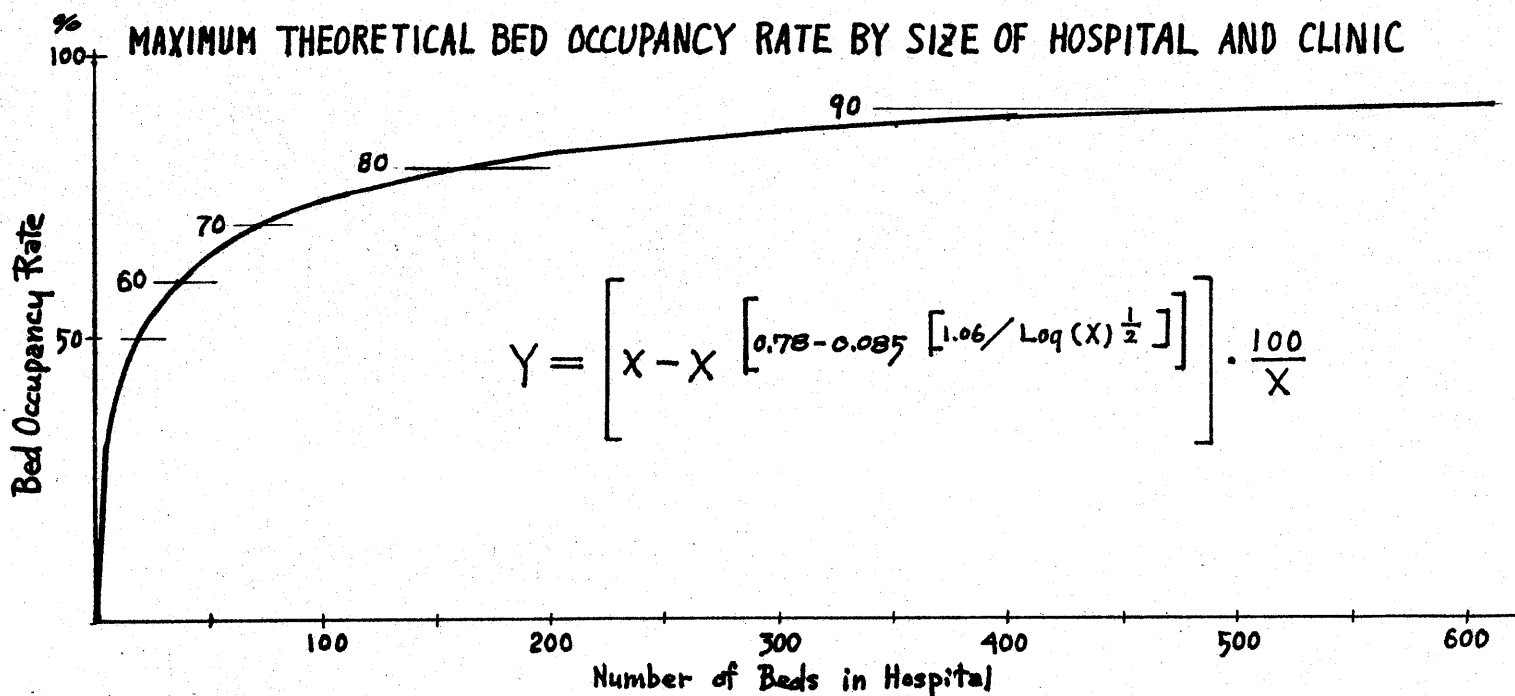
... must  
determine actual,  
useable  
resources ...

... determine  
net beds from  
gross beds ...

... calculate  
occupiable beds ...

... theoretical  
model  
developed

Once a bed requirement has been established, the next step in criteria analysis is to appraise the existing resources and the extent of their effect on meeting the medical requirement. Therefore the crucial criteria here is an estimation of the real and usable elements of the existing facilities. An initial simplistic approach would simply add up all existing medical facility beds. Unfortunately, this approach would be far from accurate, for what is needed is an appraisal of the existing occupiable beds as opposed to total beds. For example the average clinic has only 3.5 beds yet there are 23,500 clinic beds and 6,600 clinics, therefore each and every clinic bed is not occupiable. Instead we must estimate the ratio that are occupiable. Lacking occupation rate data on each medical facility by health district in Korea, we instead developed a theoretical model that emulates the Korean facility situation. The data we do have on the overall Korean situation supports our theoretical model strongly.





Model developed  
to predict  
occupiable beds  
by region

Our approach was primarily statistical and conservative.

Our equation determines the number of occupiable beds as a function of the total number of beds. It is clear to argue hypothetically, that a one bed hospital could not have a 100% occupation rate. Because of this 'weighted' standard deviation, we were able to synthesize an equation that gives the expected average occupation rate by size of hospital.

Model applicable  
to all three  
kinds of  
facilities ...

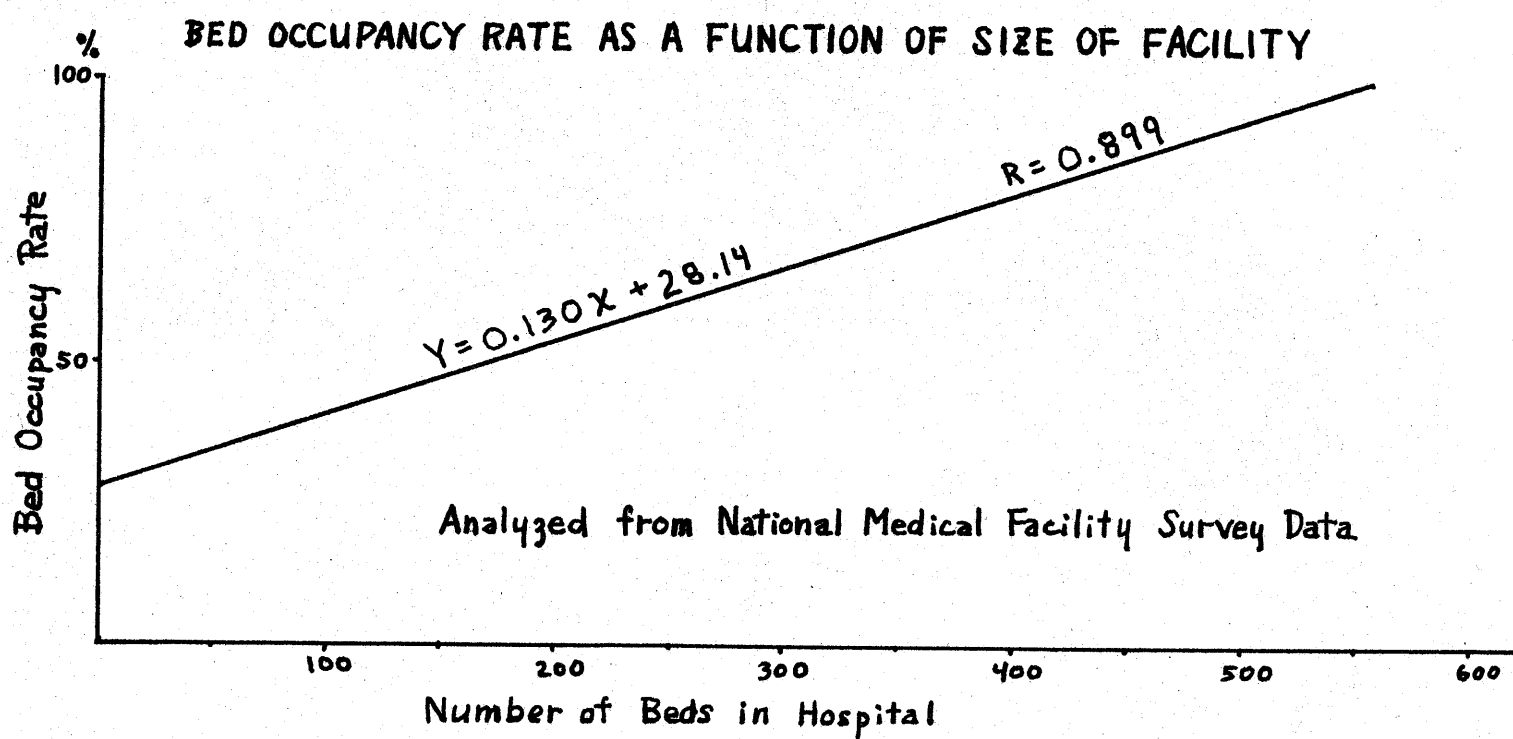
... model is  
approximated  
linearly by  
existing  
occupation rate  
data ...

... model gives  
a maximum  
expected rate,  
not average

Can now determine  
net resources by  
region

The strength of this equation is that it is a continuous function that can be used systematically for each health district. Additionally, this one equation is accurately applicable to all three types of medical facilities under analysis, i.e. general hospitals, hospitals, and clinics. One more factor of importance is that the linear equation analog of the Korean data approximates this curve in a first-order sense. It is clear that our theoretical analog is conservative in providing the maximum occupation rate by size of hospital whereas the Korean data criteria gives us a combination of several factors arranged in a linear equation format. From a careful study of the Korean utilization data, it is clear that our theoretical model yields a higher result for all facilities with greater than 4 beds, and less than 468 beds.

In this light we believe the theoretical construct to be highly correlated with the actual maximum occupiable bed rate of the medical facilities in Korea. By applying this theoretical equation to each type of facility within each health district, we are then able to calculate the number of occupiable beds per health district.



D. UNMET NEED

Can determine  
unmet need ...

With both a bed requirement determination and a determination of the existing utilizable facilities beds we then can find the unmet need in each health district as follows,

$$\left( \begin{array}{l} \text{Required number of beds} \\ \text{in health district} \end{array} \right) - \left( \begin{array}{l} \text{Existing occupiable beds} \end{array} \right)$$

= Unmet need (Bed deficiency)

... criteria  
used ...

Therefore the final criteria utilized to evaluate priority among the health districts was data that could give us the most accurate determination of the above factors as follows;

1) Health District Bed Requirement

- a Urban population of health district
- b Urban population increase of health district  
in 1981
- c Rural population of health district
- d Urban population bed requirement/1,000  
persons
- e Rural population bed requirement/1,000  
persons
- f Area of health district
- g Density of health district (From a, b, c and f)

2) Health District Existing Occupiable Beds

a) General hospital

- i. Total number in health district
- ii. Total number of beds in health district

b) Hospital (Other than general)

- i. Total number in health district
- ii. Total number of beds in health district

c) Clinic

- i. Total number in health district
- ii. Total number of clinic beds in health district

Bed requirement  
equation

Therefore, our final equation for the determination  
of the bed requirement in each health district took the  
form of;

(Initial Bed Requirement)

(Density Factor)

$$B_r = \left[ U_b \left[ \frac{P_u + P_{u81}}{1,000} \right] + R_b \left[ \frac{P_r}{1,000} \right] \right] \left[ 1 + \left[ \log \left[ \frac{P_u + P_r + P_{u81}}{A_{hd} \cdot D_s} \right]^{-2} \left[ \log (P_r) \right]^{-1} \right]^2 \right]$$

(Crude Bed Requirement)

(Adjustment Due to Density)

Br = Total bed requirement  
Ub = Bed requirement urban/1,000 persons  
Rb = Bed requirement rural/1,000 persons  
Pu = Health district urban population  
Pu81 = 1981 urban population increase in health district  
Pr = Health district rural population  
Ahd = Area of health district  
Ds = Density of Seoul  
Pt = Total population of Korea 1981

Equation to  
determine  
occupiable  
resources

And our equation for the determination of the  
occupiable beds in each health district took the  
following form:

$$T_{ob} = N_{hg} \left[ \frac{B_{hg}}{N_{hg}} - \left[ \frac{B_{hg}}{N_{hg}} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left( \frac{B_{hg}}{N_{hg}} \right) \right]^{\frac{1}{2}} \right] \right] +$$

Occupiable general hospital beds in health district

$$N_{ho} \left[ \frac{B_{ho}}{N_{ho}} - \left[ \frac{B_{ho}}{N_{ho}} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left( \frac{B_{ho}}{N_{ho}} \right) \right]^{\frac{1}{2}} \right] \right] +$$

Occupiable hospital (except general) beds in health district

$$N_c \left[ \frac{B_c}{N_c} - \left[ \frac{B_c}{N_c} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left( \frac{B_c}{N_c} \right) \right]^{\frac{1}{2}} \right] \right]$$

Occupiable clinic beds in health district

- $T_{ob}$  = Total occupiable beds in health district  
 $N_{hg}$  = Number of general hospitals in health district  
 $B_{hg}$  = Total general hospital beds in health district  
 $N_{ho}$  = Number of other hospitals in health district  
 $B_{ho}$  = Total other hospital beds in health district  
 $N_c$  = Number of clinics in health district  
 $B_c$  = Total clinic beds in health district



VI. UNMET MEDICAL NEED; A PRIORITY LIST OF MEDICAL  
FACILITY DEFICIENCY IN KOREA

A. PRIORITY EQUATION

Equation to  
produce relative  
unmet need

From section V the necessary criteria and the corresponding required data was determined. Therefore, from these criteria a complete priority equation can be produced that will integrate all of the determinants into one final element corresponding to priority. As explained in the previous section the entire priority equation produces as a result the unmet bed need in each health district. Therefore application of the following formula to each of the 56 health districts will produce a bed deficiency result;

$$\begin{aligned}
X_p = & \left[ U_b \left( \frac{P_u + P_{u81}}{1000} \right) + R_b \left( \frac{P_r}{1000} \right) \right] \left[ \left( \frac{\log \left[ \frac{P_u + P_r + P_{u81}}{A_{hd} D_s} \right]^{-2} \left[ \log [P_t] \right]^{-1}}{\left[ \log [P_t] \right]^{-1}} \right)^2 + 1 \right] \\
& - N_{hg} \left[ \frac{B_{hd}}{N_{hg}} - \left[ \frac{B_{hg}}{N_{hg}} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left[ \frac{B_{hg}}{N_{hg}} \right] \right] \right] \right] \\
& - N_{ho} \left[ \frac{B_{ho}}{N_{ho}} - \left[ \frac{B_{ho}}{N_{ho}} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left[ \frac{B_{ho}}{N_{ho}} \right] \right] \right] \right] \\
& - N_c \left[ \frac{B_c}{N_c} - \left[ \frac{B_c}{N_c} \right] \left[ 0.78 - 0.085 \left[ 1.06 / \log \left[ \frac{B_c}{N_c} \right] \right] \right] \right]
\end{aligned}$$

$X_p$  = Priority based on bed deficiency

$U_b$  = Urban population hospital bed requirement/1,000 persons

$R_b$  = Rural population hospital bed requirement/1,000 persons

$P_u$  = Urban population

$D_s$  = Population density of Seoul

$P_r$  = Rural Population

$B_{hg}$  = Total general hospital beds in health district

$P_{u81}$  = Additional urban population 1981

$N_{hg}$  = Number of general hospital in health district

$A_{hd}$  = Area of health district Km<sup>2</sup>

$B_{ho}$  = Total other hospital beds in health district

$P_t$  = Population of Korea 1981

$N_{ho}$  = Number of other hospitals in health district

$B_c$  = Total clinic beds in health district

$N_c$  = Number of clinics in health district

B. MEDICAL FACILITY EFFICIENCY; OCCUPATION RATES

Initially in evaluating this equation it is helpful to analyze partial results. One of the important factors produced by this equation is the number of occupiable beds in each health district by type of facility. It is clear from this result that general hospitals have by far the overall greatest impact on the quantity of existing resources. Overall there are 13,977 general hospital beds and after analysis by the previous equation we find 11,632 beds occupiable giving an average 83.2% occupation rate. Hospitals other than general contributed 5,709 total beds yielding a 65.9% average occupation rate. And, clinics with the greatest numbers of beds 24,341, yielded only 6,097 occupiable beds a 25% average occupation rate. Therefore, in the following table we can find detailed data on existing medical facilities for each health district in Korea, computed as partial results from the priority equation.

Partial result ...

... regional occupation rates, by type of facility

General hospitals ...

... 83% occupation ...

Hospitals, 66% ...

... clinics, 25%

### Medical Facility Beds by Health District

Province	Health District	General Hospital			Hospital			Clinic			Total		
		Existing Beds	Occupiable Beds	%	Existing	Occupiable	%	Existing	Occupiable	%	Existing	Occupiable	%
Total		13,977	11,632	83.2	8,659	5,709	65.9	24,341	6,093	25.0	46,977	23,434	49.9
Seoul		7,802	6,563	84.1	1,607	1,023	63.7	4,889	836	17.1	14,298	8,422	58.9
Pusan		1,219	1,006	82.5	1,444	1,016	70.4	2,484	583	23.5	5,147	2,605	50.6
Gyeonggi		685	545	79.0	1,181	761	64.4	3,022	828	27.4	4,888	2,134	43.7
	Buwon	195	157	80.5	510	329	64.5	1,056	297	28.1	1,761	783	44.5
	Incheon	490	388	79.2	317	204	64.4	900	247	27.4	1,707	839	49.2
	Si-jongbu	-	-	-	137	83	60.6	463	126	27.2	600	209	34.8
	Ichon	-	-	-	54	36	66.7	116	21	18.1	170	57	33.5
	Paju	-	-	-	83	52	62.7	163	43	26.4	246	95	38.0
Gangwon		-	-	-	80	57	71.2	324	94	29.0	404	151	37.4
	Chuncheon	654	519	79.4	296	183	61.8	1,377	446	32.4	2,327	1,148	49.3
	Wonju	154	121	78.6	65	39	60.0	383	98	25.6	602	258	42.9
	Gangneung	220	180	81.8	45	29	64.4	244	64	26.6	489	273	55.8
	Sogho	-	-	-	50	33	66.0	184	64	34.8	234	97	41.5
	Youngwall	100	74	74.0	44	23	52.3	242	95	39.3	386	182	47.1
Chungbuk		180	144	80.0	35	21	60.0	282	111	39.4	497	276	55.5
	Chungju	150	177	78.0	296	190	64.2	931	250	26.9	1,377	557	40.4
	Cheungju	150	177	78.0	86	55	64.0	539	155	28.8	778	327	42.2
	Okcheon	-	-	-	170	114	67.1	301	80	26.6	471	194	41.2
Chungnam		-	-	-	40	21	52.5	91	15	16.5	131	36	27.5
	Daejeon	300	252	84.0	542	348	64.2	1,776	455	25.6	2,618	1,055	40.3
	Chunan	300	252	84.0	252	173	68.7	716	191	26.7	1,268	616	48.6
	Gongju	-	-	-	14	6	42.9	133	21	15.8	147	27	18.4
	Hongseong	-	-	-	75	46	61.3	190	36	18.9	265	82	30.9
	Boreong	-	-	-	56	38	67.9	274	74	27.0	330	112	33.9
	Seosan	-	-	-	84	53	63.1	278	91	32.7	368	144	39.8
	Seosan	-	-	-	61	32	52.5	185	42	22.7	246	74	30.1
Jeonbuk		641	542	84.0	370	258	69.7	1,882	544	28.9	2,893	1,344	46.5
	Jeonju	641	542	84.6	65	39	60.0	652	184	28.2	1,358	765	56.3
	Gunsan	-	-	-	202	150	74.3	539	166	30.8	741	316	42.6
	Namwon	-	-	-	67	47	70.1	242	60	24.8	309	107	34.6
	Jeongeup	-	-	-	-	-	-	374	115	30.7	374	115	30.7
	Jangsu	-	-	-	36	22	61.1	75	19	25.3	111	41	36.9
Jeonnam		917	773	84.3	985	624	63.4	2,547	695	27.3	4,449	2,092	47.0
	Gwangju	917	773	84.3	409	246	60.1	1,063	293	27.6	2,389	1,312	54.9
	Mogpo	-	-	-	433	296	68.4	327	81	24.8	760	377	49.6
	Sancheon	-	-	-	85	49	57.6	211	61	28.9	296	110	37.2
	Yeosu	-	-	-	34	20	58.8	136	34	25.0	170	54	31.8
	Gukseong	-	-	-	-	-	-	124	33	26.6	134	33	26.6
	Gohseong	-	-	-	-	-	-	227	72	31.2	237	72	31.7
	Gangjin	-	-	-	24	13	54.2	220	63	28.6	244	76	31.1
	Heanan	-	-	-	-	-	-	155	43	27.7	155	43	27.7
	Youngkwang	-	-	-	-	-	-	84	15	17.9	84	15	17.9
Gyeongbuk		1,264	1,054	83.4	1,083	737	68.1	3,121	864	27.7	5,468	2,655	48.6
	Daegu	1,034	880	85.1	353	247	70.0	1,835	559	30.5	3,222	1,686	52.3
	Gimcheon	-	-	-	105	70	66.7	291	84	28.0	396	134	33.8
	Gyeongsu	-	-	-	68	47	69.1	162	39	24.1	230	86	37.4
	Pohang	230	174	75.7	153	101	66.0	250	67	26.8	633	342	54.0
	Biseong	-	-	-	172	116	67.4	112	25	22.3	284	141	49.6
	Andong	-	-	-	157	112	71.3	103	14	13.6	260	126	48.5
	Youngju	-	-	-	49	32	65.3	142	36	25.4	191	68	35.6
	Hangyeong	-	-	-	-	-	-	130	31	23.8	130	31	23.8
	Buljin	-	-	-	30	18	60.0	57	14	24.6	77	24	31.2
	Bulreung	-	-	-	6	2	33.3	39	15	38.5	45	17	37.8
Gyeongnam		345	261	75.7	680	463	68.1	2,006	509	25.4	3,031	1,233	40.7
	Masan	210	157	74.8	108	66	61.1	840	214	25.5	1,158	437	37.7
	Jinju	-	-	-	312	214	68.6	476	128	26.9	788	342	43.4
	Hapcheon	-	-	-	45	29	64.4	214	54	25.2	259	83	32.0
	Chungmu	-	-	-	40	25	62.5	139	35	25.2	179	60	33.5
	Goje	-	-	-	40	25	62.5	24	3	12.5	64	28	43.8
	Bulsan	135	104	77.0	135	104	77.0	200	40	20.0	470	248	52.8
Jeju		-	-	-	-	-	-	113	36	31.0	113	35	31.0
	Jeju	-	-	-	175	106	60.6	306	83	27.1	481	189	39.3
	Ham Jeju	-	-	-	145	89	61.4	217	57	26.3	362	146	40.3
		-	-	-	30	17	56.7	89	26	29.2	119	43	36.1

Average of 7  
beds per  
facility ...

... result, low  
rate of  
occupiable  
beds ...

... not populace  
under-  
utilization

Under  
utilizable  
facilities, mainly  
clinics ...

... facilities  
without clinics  
average 77%

Results from  
priority  
equation

It is interesting to note that the average number of beds per medical facility is less than 7 beds/facility. This extremely low average helps to indicate why our calculation found only a 50% average occupation rate for all facilities in Korea. The key element is, that what is being witnessed is not an under utilization of facilities by the populace, but instead an excess of facilities that are unable to be highly occupied.

These under utilizable facilities are by and large the clinics. Analyzing all medical facilities without the clinics, yields an average occupation rate of 77%. It is clear that the larger facilities especially general hospitals show a healthy and substantial occupation rate. Therefore, the calculation of occupiable beds as opposed to total beds gives us a much more realistic and reliable estimation of the existing medical resources by health district in Korea.

#### C. PRIORITY PARAMETERS

Now that a calculation has been made for existing resources by health district, a determination of unmet need in bed deficiency can be produced and from this a priority list of locations. The following table lists all key elements and partial products from the entire priority list equation.

# Medical Criteria Analysis by Health Districts within Korea

Province	Health District	Urban Population		Rural Population	Area of Health District (Km <sup>2</sup> )	Density Pop./Km <sup>2</sup>	Density Factor	Bed Requirement		Existing Occupiable Beds		Bed Deficiency
		Existing	1981 Increase					Number of Beds	Bed Req. 1,000 pop.	Total Number	Beds 1,000 pop.	
Total		17,398	5,500	17,951	98,413	415	-	82,603	2.02	23,434	.66	59,169
Seoul		7,255	355	-	628	12,118	-	19,025	2.50	8,422	1.16	10,603
Pusan		2,574	416	-	375	7,973	.002	7,490	2.50	2,605	1.01	4,885
Gyeonggi		1,612	967	2,538	11,028	464	-	9,988	1.95	2,134	.51	7,854
	Seoul	669	482	647	2,484	724	.10	3,877	2.16	783	.60	3,094
	Incheon	830	384	362	1,293	1,218	.07	3,635	2.31	839	.70	2,796
	Siheung	113	101	538	3,385	222	.21	1,298	1.73	209	.32	1,089
	Yongin	-	-	321	1,957	166	.24	398	1.24	57	.18	341
	Paju	-	-	311	926	336	.17	364	1.17	95	.31	269
Gangwon	Anseong	-	-	359	983	363	.16	416	1.16	151	.42	265
		429	332	1,412	16,828	129	-	4,184	1.92	148	.62	3,036
	Chuncheon	142	128	385	7,173	91	.31	1,389	2.12	258	.49	1,131
	Wonju	124	111	247	3,365	143	.26	1,051	2.18	273	.74	778
	Gangneung	91	29	145	1,030	257	.19	530	2.00	97	.41	433
	Sogye	72	64	97	1,327	176	.23	538	2.31	52	.31	486
Chungbuk	Yongju	-	-	249	2,297	109	.29	321	1.29	192	.77	129
	Samcheok	-	-	289	1,636	177	.23	355	1.23	276	.96	79
	Chungju	308	277	1,205	7,488	239	-	3,182	1.78	557	.37	2,625
	Cheongju	201	181	518	2,866	314	.17	1,723	1.91	327	.45	1,396
Chungnam	Okcheon	107	96	383	2,647	222	.21	1,079	1.84	194	.40	885
		-	-	304	1,975	154	.25	380	1.25	36	.12	344
	Deajeon	623	316	2,337	8,756	374	-	5,351	1.63	1,055	.36	4,296
	Chunan	522	188	359	1,478	723	.10	2,347	2.20	616	.70	1,731
Jeonbuk	Gongju	101	29	279	1,147	357	.16	702	1.71	27	.07	675
	Bongseong	-	99	581	2,215	307	.18	978	1.44	82	.14	896
	Boseong	-	-	385	1,428	270	.19	458	1.19	112	.29	346
	Seosan	-	-	299	932	321	.17	350	1.17	144	.49	206
		-	-	434	1,556	279	.19	516	1.19	74	.17	442
	Jeonju	602	432	1,843	8,058	357	-	5,060	1.76	1,344	.55	3,716
Jeonnam	Gunsan	322	288	478	2,347	464	.14	2,283	2.10	765	.96	1,518
	Namwon	280	144	289	894	798	.10	1,484	2.08	316	.56	1,168
	Jeongeup	-	-	366	1,886	194	.22	447	1.22	107	.29	340
	Jangsu	-	-	570	1,756	325	.17	667	1.17	115	.20	552
		-	-	140	1,175	119	.28	179	1.28	41	.29	138
	Gwangju	1,067	622	2,934	12,043	384	-	8,180	1.77	2,092	.52	6,088
Gyeongbuk	Gyeongsan	625	225	688	2,809	548	.13	3,179	2.07	1,312	1.00	1,867
	Mogyo	197	177	405	1,536	507	.13	1,514	1.94	377	.63	1,137
	Sunchon	110	99	225	1,320	329	.17	875	2.02	110	.33	765
	Yosu	135	121	154	487	842	.09	865	2.11	54	.19	811
	Gukseong	-	-	159	990	161	.24	197	1.24	33	.21	164
	Goseong	-	-	371	1,360	273	.19	441	1.19	72	.19	369
	Gangjin	-	-	375	1,443	260	.19	446	1.19	76	.20	370
	Heanjin	-	-	297	1,257	237	.20	356	1.20	43	.14	313
	Yongkwang	-	-	260	841	309	.18	307	1.18	15	.06	292
	Daegu	1,788	878	3,115	19,751	293	-	11,282	1.95	2,655	.54	8,627
	Gimcheon	1,359	591	883	4,451	636	.11	6,391	2.26	1,686	.75	4,705
Gyeongnam	Gyeongsu	69	62	482	2,813	218	.21	979	1.60	134	.24	845
	Pohang	110	-	175	1,315	216	.21	545	1.91	86	.30	459
	Hiseong	152	137	300	1,819	324	.17	1,196	2.03	342	.76	854
	Andong	-	-	242	1,757	138	.26	305	1.26	141	.58	164
	Yongju	98	88	313	3,139	159	.25	973	1.95	126	.31	847
	Yongju	-	-	288	1,842	156	.25	360	1.25	68	.24	292
	Mangyeong	-	-	302	1,564	193	.22	368	1.22	31	.10	337
	Buljin	-	-	103	980	105	.30	134	1.30	24	.23	110
	Bulreung	-	-	27	71	386	.16	31	1.15	17	.63	14
	Maean	1,001	780	2,285	11,865	342	-	7,780	1.92	1,233	.38	6,547
	Jinju	442	305	750	3,024	495	.13	2,958	1.98	437	.37	2,521
Jeju	Hapcheon	161	145	523	2,999	277	.19	1,534	1.85	342	.50	1,192
	Chungmu	-	-	378	2,520	150	.25	473	1.25	83	.22	390
	Gose	68	61	186	748	421	.15	585	1.86	60	.24	525
	Gulsan	-	-	122	402	279	.19	133	1.19	28	.25	105
	Samcheong	270	242	245	1,759	430	.15	1,754	2.32	248	.48	1,506
		60	27	81	413	407	.15	343	2.04	35	.25	308
Jeju	Jeju	139	125	282	1,593	343	-	1,081	1.98	189	.45	892
	Ham Jeju	139	125	118	729	524	.13	879	2.30	146	.57	733
		-	-	164	864	189	.23	202	1.23	43	.26	159

Listed are ...

... bed  
requirement ...

... density factor  
...

... bed  
deficiency ...

Korea shortage  
of 59,000 beds ...

... corresponds  
to 1.62 beds/  
1,000 persons,  
for 1981

Priority list  
from bed  
deficiency ...

... scientifically  
assesses  
regional unmet  
need

Note that the listed data include the bed requirement total, for each health district, as well as the density factor. Also, the total occupiable beds are listed, and finally the bed deficiency. The bed deficiency ranged from 14 beds in Eulreung to 10,603 beds in Seoul. Additionally it is clear that overall Korea has a shortage of at least 59,000 beds. Still, even if all of these 59,000 beds existed by 1981, Korea would still only have 2.02 total beds/1,000 population. Accounting for 80% occupation the real total would be 1.62 occupiable beds per 1,000 population. Therefore, it is clear that these figures are conservative. Additionally, it is believed that these figures are accurate and reflect the actual bed requirement to 1981.

#### D. PRIORITY LIST

With the bed deficiency calculation we can then rearrange the health districts in order of priority from highest unmet need to lowest unmet need. This then is our finalized priority list taking into account the criteria listed in section IV. Additionally, the strength of this priority list is that it scientifically and uniformly assesses the unmet need throughout all of Korea and yields a result only determined by the existing and

Priority List of Health Districts by Bed Deficiency in Korea

Priority Order	Health District	Population 1981	Bed Requirement 1981		Existing Occupiable Beds 1977		Bed Deficiency
			Number	Beds/1,000	Number	Beds/1,000	
	Total	40,849	82,603	2.02	23,434	.66	59,169
* 1	Seoul	7,610	19,025	2.50	8,422	1.16	10,603
2	Busan	2,990	7,490	2.50	2,605	1.01	4,885
3	Daegu	2,838	6,391	2.26	1,668	0.75	4,705
* 4	Ulsan	1,798	3,877	2.16	783	.60	3,094
5	Incheon	1,576	3,635	2.31	839	.70	2,796
6	Masan	1,497	2,958	1.98	437	.37	2,521
7	Kwangju	1,538	3,179	2.07	1,312	1.00	1,867
* 8	Daejeon	1,069	2,347	2.20	616	.70	1,731
+ 9	Jeonju	1,088	2,283	2.10	765	.96	1,518
** 10	Dulsan	757	1,754	2.32	248	.48	1,506
** 11	Cheongju	900	1,723	1.91	327	.45	1,396
** 12	Jinju	829	1,534	1.85	342	.50	1,192
13	Gunsan	713	1,484	2.08	316	.56	1,168
14	Mogpo	779	1,514	1.94	377	.63	1,137
15	Chuncheon	655	1,389	2.12	258	.49	1,131
16	Eijeongbu	752	1,298	1.73	209	.32	1,089
+ 17	Gongju	680	978	1.44	82	.14	896
* 18	Chungju	586	1,097	1.84	194	.40	885
* 19	Pohang	589	1,196	2.03	342	.76	854
20	Andong	499	973	1.95	126	.31	847
21	Gimcheon	613	979	1.60	134	.24	845
* 22	Yeosu	410	865	2.11	54	.19	811
** 23	Wonju	482	1,051	2.18	273	.74	778
24	Suncheon	434	875	2.02	110	.33	765
25	Jeju	382	879	2.30	146	.57	733
26	Cheonan	409	702	1.71	27	.07	675
27	Jeongeup	570	667	1.17	115	.20	552
28	Chungmu	315	585	1.86	60	.24	525
29	Sogcho	233	583	2.31	52	.31	486
30	Kyeongju	285	545	1.91	86	.30	459
31	Seosan	434	516	1.19	74	.17	442
32	Kangneung	265	530	2.00	97	.41	433
33	Hapcheon	378	473	1.25	83	.22	390
34	Gangjin	375	446	1.19	76	.20	370
35	Gohseong	371	441	1.19	72	.19	369
36	Hongseong	385	458	1.19	112	.29	346
37	Okcheon	304	380	1.25	36	.12	344
+ 38	Icheon	321	398	1.24	57	.18	341
39	Namwon	366	447	1.22	107	.29	340
40	Munbyeong	302	368	1.22	31	.10	337
41	Haenam	297	356	1.20	43	.14	313
42	Samchunpo	168	343	2.04	35	.25	308
43	Youngju	288	360	1.25	68	.24	292
+ 44	Youngkwang	260	307	1.18	15	.06	292
45	Paju	311	364	1.17	95	.31	269
46	Anseong	359	416	1.16	151	.42	265
47	Boreong	299	350	1.17	144	.48	206
48	Kukseong	159	197	1.24	33	.21	164
49	Eiseong	242	305	1.26	141	.58	164
50	Nam Jeju	164	202	1.23	43	.26	159
51	Jangsu	140	179	1.28	41	.29	138
52	Yongwall	249	321	1.29	192	.77	129
53	Buljin	103	134	1.30	24	.23	110
54	Goje	122	133	1.19	28	.25	105
55	Samcheok	289	355	1.23	276	.96	79
56	Eulreong	27	31	1.15	17	.63	14



projected, medical and geographical, criteria.

E. CONCLUSION

Other criteria  
can also be  
relevant ...

... the value is  
in how the  
results are  
analyzed and  
implemented ...

... to determine  
areas of  
greatest need ...

... in the context  
of non-medical  
constraints

While this priority list yields a useable result of  
bed deficiency and thereby unmet need, it can be  
argued that other factors or results are also as  
relevant in a priority analysis. It is believed that  
the real value of any priority list is not the list  
itself but how the result is analyzed and then  
implemented. Therefore, in the next section an analysis  
will be made based on this priority list, in order to  
determine the areas most suitable for the provision of  
additional medical facilities. In other words, this  
priority list can only be evaluated in the framework  
of the existing fiscal, geographic and political  
situation, thereby entering in as a part of an overall  
equation to be evaluated by policy makers, given the  
non-medical constraints in any policy.

VII. ANALYSIS AND EVALUATION OF PRIORITY LIST  
AND NATIONAL MEDICAL PLANNING

A. NATIONAL FACILITY PLANNING

National planning  
selected  
locations for  
medical  
facilities ...

In the Fourth Five-Year Economic Development plan for  
the health sector a tentative list of locations for  
the establishment of medical facilities was determined.

All of the locations selected as potential facility  
sites are characterized by one of the following  
categories:

... industrial  
complex areas  
with insufficient  
medical  
resources ...

- 1) Areas where industrial complexes currently  
or will shortly exist. Where there are  
insufficient medical facilities to meet  
present and/or future needs.

... rural,  
medically under-  
served areas

- 2) Rural areas, presently lacking in a  
hospital based facility care either  
partially or totally.

Planning to  
introduce  
facilities when  
need is  
greatest

The aim of this planning was to introduce medical  
facilities to the areas of highest need and highest  
growth. The government plans for the construction,  
by 1981, of 35 such hospitals.

... by 1981, 35  
hospitals ...

... 20 rural ...

Twenty of these hospitals are to be constructed in  
rural medically under-served areas and fifteen are  
to be constructed within industrial complex target  
areas.

... 15 industrial  
complex

Financing  
from 4  
sources ...

It is planned that financing for these hospitals  
will be provided through four sources,

- 1) The Korean government
- 2) A West-German loan
- 3) A Japanese loan
- 4) Private industry and corporations within  
Korea.

Therefore, the planned hospitals by number of beds  
and source of finance are listed in the following  
table:

Planned Hospital Bed Construction

Province	Health District	Planned Total	Government	KPW Loan	JICA Loan	Private
Total		3,515	210	1,810	510	985
Seoul		100		100 (Guro)		
Pusan		150			150 (Sasang)	
Gyeonggi	Suwon	170		170 (Bamwol)		
	Incheon					
	Eijongbu	100		50 (Yoju)	50 (Yangpyong)	
	Icheon					
	Paju					
	Anseong					
Gangweon	Chuncheon	85				85 (Inje)
	Wonju	180		100 (Wonju) 80 (Pyongchang)		
	Gangneung					
	Sogcho					
	Youngwall					
	Samcheok					
Chungbug	Chungju	160		80 (Cheongju) 80 (Gaesan)		
	Cheungju	80		80 (Jechon)		
	Okcheon					
Chungnam	Daejeon	150		150 (Daejeon)		
	Chunan					
	Gongju	80		80 (Wonsan)		
	Hongseong					
	Boreong	100				100 (Boreung)
	Seasan					
Jeonbug	Jeonju	50		50 (Jinan)		
	Gunsan	150			150 (Iri)	
	Namwon					
	Jeongeup	100				100 (Jeongeup)
	Jangsu					
Jeonnam	Gwangju					
	Mogpo	80		80 (Mogpo)		
	Suncheon					
	Yeosu	150		150 (Yochon)		
	Gukseong					
	Goheong	150				150 (Boseong)
	Gangjin					
	Heanam	80			80 (Haenam)	
	Youngkwang	80		80 (Nampyeong)		
Gyeongbug	Daegu	150				150 (Daegu)
	Gimcheon	150				150 (Gumi)
	Gyeongju					
	Pohang	250		150 (Pohang)		100 (Yongduk)
	Eiseong	50	50 (Gunsu)			
	Andong					
	Youngju					
	Mangyeong	160	80 (Mungyong)		80 (Jeomchon)	
	Euljin					
	Eulreung					
Gyeongnam	Masan	230	80 (Milyang)			150 (Masan)
	Jinju	130		80 (Madong) 50 (Eulryong)		
	Hapcheon					
	Chungmu					
	Goje					
	Eulsan	200		100 (Eulsan) 100 (Onsan)		
	Samchungpo					
Jeju	Jeju					
	Nam Jeju					

SOURCE: Logistic Division, Ministry of Health and Social Affairs.

Evaluate  
national plan  
with priority  
list ...

Of the 27 health districts selected in the government plan, we now must evaluate how well they integrate with the priority list developed in the previous section.

It must be emphasized that the priority list was developed scientifically and only by the criteria list in section 5.0. Government planning was not a part of the priority list's criteria. It would be beneficial to appraise how well the planned locations compare with the priorities determined earlier. Therefore have listed the planned hospital construction locations in the same arrangement as the priority list in order to compare the planned hospitals with priority rank.

Government Planned Hospital Construction  
Arranged by Priority List

Priority Order	Health District	Total	Government	West-German Loan		JICA Loan	Private
				Indus. Complex	Rural		
	Total	3,515	210	1,180	630	510	985
1	Seoul	100		100			
2	Busan	150				150	
3	Daegu	150					150
4	Suwon	170		170			
5	Incheon						
6	Masan	230	80				150
7	Kwangju						
8	Daejeon	150		150			
9	Jeonju	50			50		
10	Eulsan	200		100, 100			
11	Cheongju	160		80	80		
12	Jinju	130			80, 50		
13	Gunsan	150				150	
14	Mogpo	80		80			
15	Chuncheon	85					85
16	Ei-jeongbu						
17	Gongju	80			80		
18	Chungju	80			80		
19	Pohang	150		150			100
20	Andong						
21	Gimcheon	150					150
22	Yeosu	150		150			
23	Wonju	180		100	80		
24	Sunchon						
25	Jeju						
26	Cheonan						
27	Jeongeup	100					100
28	Chungmu						
29	Sogcho						
30	Kyeongju						
31	Seosan						
32	Kangneung						
33	Hapcheon						
34	Gangjin						
35	Goheong	150					150
36	Hongseong						
37	Okcheon						
38	Icheon	100			50	50	
39	Namwon						
40	Mukyeong	160	80			80	
41	Haenam	80				80	
42	Samchunpo						
43	Youngju						
44	Youngkwang	80			80		
45	Paju						
46	Anseong						
47	Boreong	100					100
48	Kukseong						
49	Eiseong	50	50				
50	Nam Jeju						
51	Jangsu						
52	Yongwall						
53	Euljin						
54	Goje						
55	Samcheok						
56	Eulreong						

B. PRIORITY LIST ANALYSIS

Majority of  
national plan  
follows  
priority  
list ...

From a careful analysis of the previous table it is interesting to note that the majority of planned hospital locations fall within the first 23 priority locations. In fact 25 of the planned 35 hospitals and 77% of the planned hospital beds occur between ranks 1 and 23 in priority, inclusive.

This correlation is encouraging in that the great majority of planned hospitals are located in areas of greatest need.

1) Additional variables

Analysis of  
4 areas not  
in national  
plan ...

... fiscal,  
temporal  
constraints ...

Analysis of the previous table shows that four areas between priority and 23 have no hospital construction presently planned. We believe there are good reasons for this. One major element, of course, is in a fiscally limited system only a certain number of hospitals can be built. Still there are other criteria affecting these four areas that were not a part of the priority list equation criteria, but were nevertheless taken into account by policy makers. They are as follows.

Priority Number 5, Incheon

Incheon ...

The principal reasons Incheon is presently less

satisfactory as a location than the priority order indicates are:

... close to  
Seoul ...

- A) Incheon is adjacent to Seoul and has direct subway access to metropolitan Seoul, therefore Incheon is accessible to the many medical facilities in northern Seoul.
- B) Because Incheon is an evolving urban center there is already a private company planning to build an additional 150 bed hospital there.

... 150 bed  
private hospital  
planned ...

Priority Number 7, Kwangju

Kwang ju ...

Kwangju is less satisfactory as a location due to:

... has 14  
hospitals ...

- A) Kwangju presently has 14 hospitals, 3 of which are general hospitals, therefore there is good health care distribution.
- B) Kwangju as a large urban center is attractive to the private medical sector, and privately initiated medical development is sure to continue.

... private  
investment  
likely ...

Priority Number 16, Eijeongbu

Eijeongbu

Eijeongbu is presently unsatisfactory as a location due to:

... close to  
Seoul ...

- A) Eijongbu is directly adjacent to Seoul and has a high degree of accessibility to the Seoul area for medical care.



... public  
hospital  
expanded ...

- B) The existing government operated provincial hospital in Eijongbu is presently being expanded.

... Andong ...

Priority Number 20, Andong

Andong is unsatisfactory as a location due to:

... rural area  
is accessible to  
care ...

- A) Andong has a large rural population that currently is more highly accessible to medical facilities than many other rural areas in Korea.

... public hospital  
expanded ...

- B) The provincial hospital is currently being expanded to provide services for a larger target population.

2) Analysis of Seoul

Seoul ...

It is noted that priority number 1, Seoul was also selected in the government plan. The area selected in the south of Seoul, Guro, satisfies the criteria of being a key industrial complex area. Of course, the future development of medical facilities in the urban areas are left for private development. Only these areas of extreme deficiency and social importance are considered in the government plan. Other criteria of importance in this selection is that Seoul is geographically divided into northern and southern

... Guro, in  
southern Seoul  
selected ...

... Seoul  
geographically  
divided ...

... northern  
part  
developed ...

... southern  
part  
expanding, less  
developed ...

... Govt.  
emphasizing  
growth ...

... initiated  
tax  
incentives ...

Only 20%  
hospitals in  
southern  
Seoul ...

... satellite  
cities medical  
target areas  
of Seoul ...

halves by the Han river. The northern part of Seoul currently has 4.8 million residents. In the last 10 years the northern population has increased by 50%. The northern part of Seoul is the Seoul most commonly known, for it is where the greatest amount of development has occurred. The southern part of Seoul currently has over 2.4 million residents, but in the last 10 years this part has shown a 322% increase in population. The government plans to emphasize growth of the southern part of Seoul over that of the northern part. Currently, there is rapid industrialization occurring in the southern part of Seoul with a rapid increase in population. One of the reasons for this is a government initiated program of reduced property taxes for development of land in parts of the southern areas of Seoul. Of the total hospital beds in Seoul, only 20% exist in the southern areas. Many satellite cities and areas administratively in Gyonggi province, rely on southern Seoul as a source of employment and as a source of medical care. Due to this the medical facilities in southern Seoul have a target population that considerably exceeds the administrative boundaries. Therefore, the southern part

Guro, is  
rapidly  
developing  
industrial  
area ...

of Seoul is a rapidly developing urban industrial area with few existing medical resources. In order to meet present and future medical care demands, medical resources must be introduced into the area.

... has  
deficiency  
of medical  
facilities

The hospital planned for Seoul is to be located in one of the areas of highest need, where rapidly growing industrial complexes are centered. This area (Guro) has a much greater deficiency of medical facilities than the other more well developed areas of Seoul. Therefore, it was selected in the government planning as a location for additional medical facilities due to the fact that it currently is a central industrial complex area with an insufficient number of medical facilities.

#### C. RURAL MEDICALLY UNDERSERVED AREAS OF LOW POPULATION

Priority  
correlated  
with  
population ...

Another element to be considered is that the priority list is derived from bed deficiency criteria. While this is a reliable and accurate method, it is correlated strongly with population. Therefore, many rural, medically underserved areas with a relatively low population received a lower priority rating. This reflects true bed need, but does not directly reflect the fact that there is an extreme deficiency of medical resources

... some low  
population  
areas were of  
low priority ...

... but, still  
extreme  
deficiency of  
medical  
resources exist  
there

... several of  
those rural  
areas in  
national plan ...

... do have  
large unmet  
need ...

in these locations. Therefore, several locations were selected by the government that fall lower down on the list of priority. We must emphasize that these areas do have a large unmet need and generally a total lack of adequate medical resources. Therefore, in the following table we give some data on these rural medically underserved areas that were low on the priority list.

Data on Rural Medically Under-Served Counties of Low Priority

Priority Number	Health District	County	Population	Existing occupiable Hospital Beds	Beds 1,000 pop.	Number of Beds planned for Construction	Financing source
27	Jeongeup	Jeongeup	245,000	ø	ø	100	Korean Private
35	Goheong	Goheong	220,000	ø	ø	150	Korean Private
38	Incheon	Yeoju	104,000	ø	ø	50	West-Germany
		Yangpyong	105,000	ø	ø	50	Japan
40	Munkyeong	Munkyeong	157,000	ø	ø	80	Korean Government
		Chuncheon	143,000	ø	ø	80	Japan
41	Heanam	Heanam	197,000	ø	ø	80	Korean Govt.
44	Young-kwang	Hampyeong	118,000	ø	ø	80	West-Germany
47	Boreong	Boreong	158,000	53	0.34	100	Korean Private
49	Eiseong	Gunee	66,000	ø	ø	50	Korean Govt.

VIII. ANNEX

List of Tables

A. National Planning

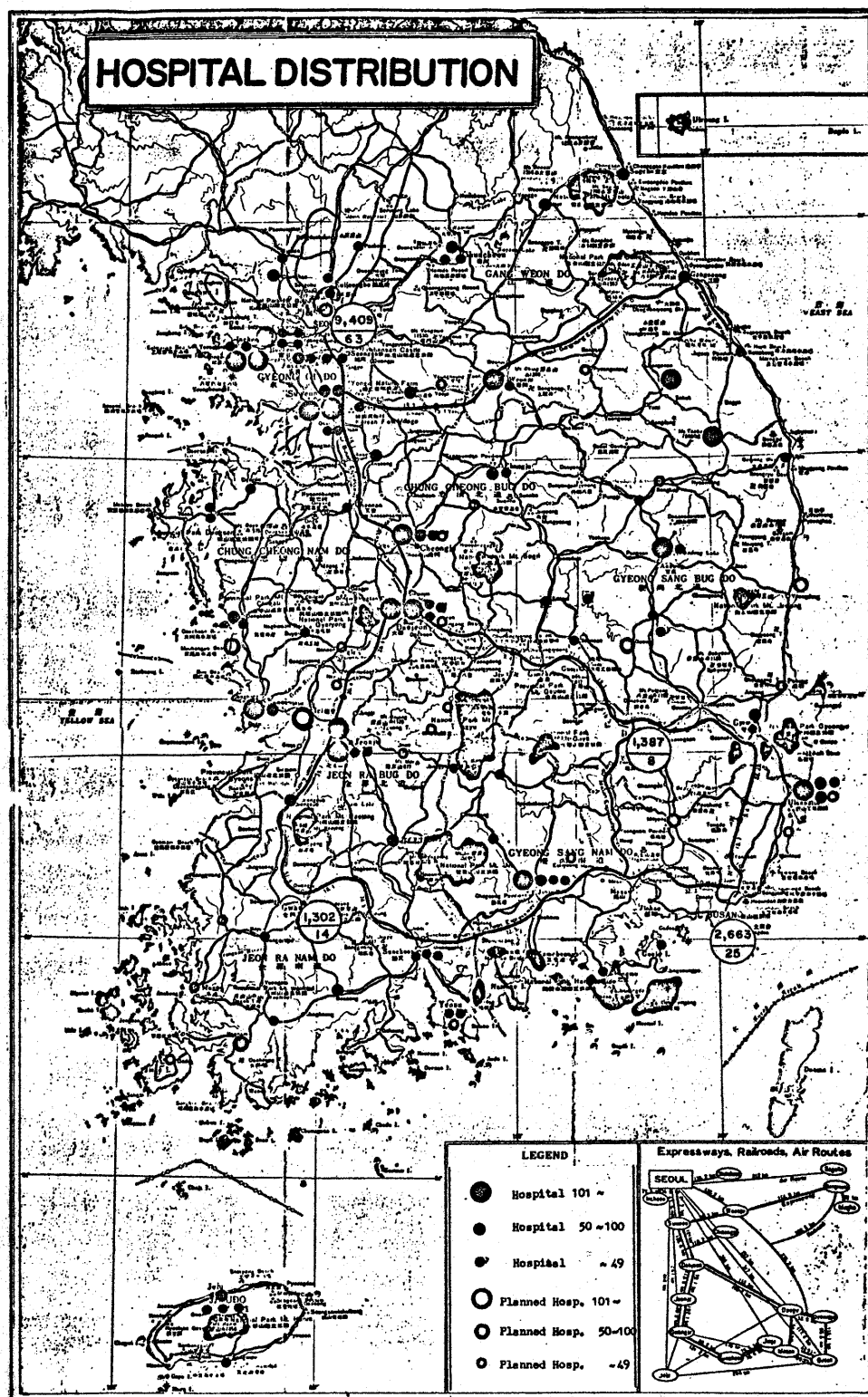
- 1) Hospital Distribution
- 2) Health Care Expenditure
- 3) International Comparison of Health Indices
- 4) Inventory of Health Resources by Health District
- 5) Utilization Pattern Before and After Insurance Implementation
- 6) Population Characteristics of a Representative Province
- 7) Present and Planned Population by City.

B. Medical Facilities; Availability and Utilization Indices

- 1) Urban-Rural Hospital and Hospital Bed Distribution
- 2) Hospital Distribution by Sector
- 3) Bed and Hospital Distribution by District
- 4) Number of Hospital Beds by Category and by Year
- 5) Hospital Related Indices by Year
- 6) Health Center Distribution
- 7) Size of Hospitals by Region
- 8) Bed Occupancy Rate by Size of Hospital
- 9) Proportion of Hospitalization by Discipline

C. Manpower Indices

- 1) Health Manpower by Type of Facility
- 2) Urban-Rural Distribution of Actively Practicing Health Professionals
- 3) Manpower Distribution by Region
- 4) Prospectives for Health Center
- 5) Hospital Manpower by District
- 6) Clinic Physicians by Discipline and Region
- 7) Clinic Physicians Per 100,000 Population by Discipline and Region
- 8) Physician Distribution by Discipline and Hospital Size
- 9) Professionally Active Physicians by City/Province
- 10) Number of Pharmacists by Province
- 11) Physician Productively (Inpatient)
- 12) Physician Productively (Outpatient)
- 13) Manpower and Utilization Status of Sample Hospitals
- 14) Hospital Manpower Per 100 Occupied Beds by Size of Hospital





# HEALTH CARE EXPENDITURE

	Unit	1970	1975
Health Care Expenditure to GNP	%	2.5	2.8
Health Care Expenditure to Government Budget	%	0.97	0.84
Health Care Expenditure Index (Medical Expenditure/Person)	'70=100	100	286
Consumer Price Index	'70=100	100	166
% of household income for health care			
Urban	%	1.13	2.59
Rural	%	2.96	3.34

SOURCE: Health Sector Plan for 4th Five Year Economic Development Plan, Ministry of Health and Social Affairs, 1976

International Comparison of Health Indices

	Population per Physician	Population per Hosp. Beds	Hosp. Beds per Physician	Hosp. Beds per Hospital
<b>AFRICA</b>				
Egypt	1,516	461	3.1	52.1
Gabon	5,208	98	52.0	113.5
Kenya	16,292	759	20.8	?
Liberia	12,576	509	16.5	19.8
Morocco	13,345	693	19.7	171.9
Nigeria	25,463	1,378	18.0	?
<b>NORTH AMERICA</b>				
Costa Rica	1,413	256	5.6	156.6
Cuba	1,153	228	5.6	120.8
Canada	613	106	5.8	149.9
Guatemala	4,338	412	10.5	126.1
Mexico	1,385	785	1.6	41.1
Panama	1,339	249	4.7	95.3
Puerto Rico	855	219	4.0	89.6
United States	622	145	4.3	194.8
<b>SOUTH AMERICA</b>				
Argentina	479	176	2.7	46.7
Brazil	2,025	266	7.9	86.4
Chile	1,836	291	6.3	136.3
Colombia	2,184	525	4.2	58.5
Ecuador	2,928	478	6.5	62.8
Guyana	3,584	190	18.8	92.7
Peru	1,802	497	3.6	66.9
Uruguay	911	193	4.6	155.7
Venezuela	866	327	2.6	99.5
<b>ASIA</b>				
Hong Kong	1,642	252	6.5	161.6
India	4,162	1,471	2.4	20.7
Israel	351	169	2.0	209.4
Japan	868	78	10.9	35.7
KOREA	2,571	1,651	1.5	74.9
Kuwait	800	241	3.6	172.7
Malaysia	4,774	276	17.8	157.0
Mongolia	518	103	5.0	33.1
Philippines	2,632	822	3.1	56.9
Saudi Arabia	4,995	897	4.6	128.8
Singapore	1,399	269	5.2	479.2
Thailand	?	774	11.0	83.6
<b>EUROPE</b>				
Denmark	624	103	6.0	161.2
France	?	95	7.2	?
Germany (West)	530	88	6.1	202.5
Germany (East)	557	92	6.0	315.4
Italy	502	95	5.3	262.8
Norway	623	74	8.5	63.6
Sweden	645	66	9.8	170.8
Switzerland	620	88	6.9	162.7
England & Wales	787	110	7.2	181.6
<b>OCEANIA</b>				
Australia	721	81	8.9	69.9
New Zealand	846	93	9.3	?
USSR	363	86	4.2	131.2

SOURCE: United Nation's Statistical Yearbook, 1975.

Inventory of Health Resources by 56 Health Districts

Province	Health District	* Hosp.	Clinic	Health Sub-Center	Dental Clinic	Herb Clinic	Midwifery Clinic	Pharmacy and Drug Store
Total		252	5,511	514	1,728	3,852	499	14,773
Seoul		71	2,185	-	925	971	131	4,532
Pusan		25	690	-	103	174	29	1,173
Gyeonggi		33	478	105	152	482	113	1,871
	Suwon	14	148	28	42	162	28	577
	Incheon	11	188	12	75	152	57	832
	Ei-jongbu	4	60	29	15	60	12	231
	Icheon	1	18	15	6	40	4	63
	Paju	2	22	14	5	21	7	64
	Anseong	1	42	7	9	47	5	104
Gangwon		12	150	43	37	178	35	682
	Chuncheon	3	60	11	8	44	11	186
	Wonju	2	32	16	15	77	10	237
	Gangneung	1	16	4	8	38	9	91
	Sogcho	1	10	2	3	9	5	60
	Youngwall	3	12	6	3	10	-	64
	Samcheok	2	20	4	-	-	-	44
Chungbuk		8	119	45	31	163	8	471
	Chungju	3	65	21	18	65	1	234
	Cheungju	3	41	12	8	62	6	144
	Okcheon	2	13	12	5	36	1	93
Chungnam		16	300	92	81	402	16	968
	Daejeon	6	147	13	41	115	9	368
	Chunan	1	42	14	10	60	2	140
	Gongju	3	33	21	9	109	-	140
	Hongseong	1	30	17	10	59	2	130
	Boreong	2	22	12	4	25	-	86
	Seasan	3	26	15	7	34	3	104
Jeonbuk		9	277	46	48	149	16	692
	Jeonju	4	94	10	24	38	4	265
	Gunsan	3	7,594	8	16	60	9	195
	Namwon	1	25	6	2	28	2	101
	Jeongeup	-	26	16	5	17	1	95
	Jangsu	1	7	6	1	6	-	36
Jeonnam		30	353	52	58	255	50	1,208
	Gwangju	16	168	6	30	61	27	495
	Mogpo	8	55	8	6	79	11	178
	Suncheon	3	23	4	4	26	5	81
	Yeosu	2	35	6	7	16	4	76
	Gukseong	-	7	2	1	22	-	49
	Goheong	-	14	8	6	18	2	78
	Gangjin	1	20	8	2	22	-	106
	Heanam	-	15	6	1	11	-	78
	Youngkwang	-	16	4	1	-	1	71
Gyeongbuk		25	617	51	203	719	49	1,874
	Daegu	9	417	6	150	390	28	1,174
	Gimcheon	2	50	13	7	80	2	144
	Gyeongju	1	32	6	5	30	6	88
	Pohang	5	36	10	13	51	4	136
	Kiseong	3	11	2	5	40	3	67
	Andong	2	36	5	6	24	1	94
	Youngju	1	16	-	8	42	1	59
	Mangyeong	-	15	6	6	55	3	78
	Euljin	1	7	3	3	4	1	25
	Eulreung	1	2	-	-	3	-	9
Gyeongnam		18	291	71	80	327	47	1,161
	Masan	6	147	19	38	104	28	341
	Jinju	5	49	18	9	70	-	246
	Hapcheon	1	15	8	5	40	1	122
	Chungma	1	14	5	6	42	4	155
	Goje	1	8	-	1	13	1	40
	Eulsan	4	46	18	17	49	10	208
	Samchungpo	-	12	3	4	9	3	49
Jeju		5	51	9	10	32	5	141
	Jeju	4	40	4	7	19	2	89
	Nam Jeju	1	11	5	3	13	3	52

SOURCE: Ministry of Health and Social Affairs, National Report on Medical Facility Survey, 1977.

\* Journal of the Korean Hospital Association, Vol. 7, No. 4-5, May 1978.

UTILIZATION PATTERN BEFORE AND AFTER IMPLEMENTATION INSURANCE PLAN

	Before	After (1978)
Physician (OPD) visits/person/year	0.4-1.1	✓
Survey range	0.7	1.0-6.3
Hospitalization/1,000 person/year		
Survey range	6.2-9.9	73.2-175.2 (Seoul Area)
		16.3-49.1 (Whole Country)
Hospital stay/case	4.3-12.4	6.8-14.0
Hospital stay/delivery	2.9	2.8-3.4

POPULATION CHARACTERISTIC BY URBAN AND RURAL AREA (GyeongBug Province)

Age	Deagu	Pohang	Gyeongju	Gimcheon	Andong	Gumi	Urban total	Rural total
0 - 4	132,452 ( 8.9)	23,202 (12.9)	9,621 ( 8.7)	6,732 ( 9.6)	9,292 ( 9.2)	8,293 ( 9.3)	189,592 ( 9.3)	230,579 ( 7.9)
5- 15	328,084 (22.0)	37,932 (20.6)	26,801 (23.5)	16,458 (23.4)	25,551 (25.2)	14,586 (16.3)	449,412 (22.0)	769,750 (26.5)
15- 24	399,561 (26.8)	38,214 (20.8)	25,778 (22.6)	16,937 (24.1)	25,886 (25.5)	34,156 (38.1)	540,532 (26.4)	593,177 (20.4)
25- 34	241,171 (16.2)	43,202 (23.5)	16,077 (16.7)	10,029 (14.3)	13,292 (13.1)	15,875 (17.7)	339,646 (16.6)	317,289 (10.9)
35- 44	180,319 (12.1)	20,685 (11.2)	13,761 (12.1)	8,480 (12.1)	11,769 (11.6)	7,646 ( 8.5)	242,660 (11.9)	328,747 (11.3)
45- 59	141,457 ( 9.5)	13,992 ( 7.6)	13,517 (11.9)	7,693 (10.9)	10,089 ( 9.9)	5,706 ( 6.4)	192,454 ( 9.4)	390,635 (13.5)
60 +	64,055 ( 4.3)	6,182 ( 3.7)	8,066 ( 7.1)	4,019 ( 5.7)	5,615 ( 5.5)	3,350 ( 3.7)	91,287 ( 4.5)	271,656 ( 9.4)
TOTAL	1,487,099	183,409	113,621	170,348	101,494	89,612	2,045,583	2,901,833
Economically active Population in ratio	64.6	63.1	63.3	61.4	60.1	70.7	64.3	56.1
Dependency ratio	35.4	36.9	36.7	38.6	39.9	29.3	35.7	43.9
Dependency index	54.8	58.5	58.0	62.9	66.4	41.4	55.5	78.3

Source: Annual Population Survey Result, 1978, GyeongBug Province.

**PRESENT AND PLANNED POPULATION BY CITY**

in 1,000

	<u>1977</u>	<u>1981</u>	<u>1986</u>	<u>1991</u>
Seoul	7,255	7,610	8,260	8,970
Busan	2,574	2,990	3,530	4,160
Daegu	1,359	1,950	2,710	3,770
Incheon	830	1,110	1,470	1,930
Kwangju	625	850	1,130	1,500
Daejeon	522	710	930	1,230
Masan	338	550	750	1,040
Jeonju	322	611	757	956
Seongnam	285	541	670	846
Ulsan	270	512	635	802
Suwon	235	330	540	630
Cheongju	201	382	472	597
Mokpo	197	374	463	585
Jinju	161	306	378	478
Gunsan	160	304	376	475
Pohang	152	289	357	451
Anyang	146	277	343	434
Chuncheon	142	270	334	422
Jeju	139	264	327	413
Yeosu	135	256	317	401
Weonju	124	235	291	368
Bucheon	120	228	282	356
Euijeongbu	113	214	266	336
Geongju	110	209	259	327
Suncheon	110	209	259	327
Chungju	107	203	251	318
Chinhae	103	196	242	306
Cheonan	101	130	180	230
Andong	98	186	230	291
Gangneung	91	120	160	210
Sokcho	71	135	167	214
Kincheon	69	131	162	205
Chungmu	68	129	160	202
Samcheonpo	60	87	120	160

SOURCE: Long Term Development Plan, Korea Development Institute, 1978.

Urban-Rural Hospital and Hospital Bed Distribution

	Urban	Rural	Total
No. of Hospital			
General Hospital	52 (96.3)	2 (3.7)	54
Hospital	140 (77.8)	40 (22.2)	180
Special Hospital	10 (52.6)	9 (47.4)	19
<u>Total</u>	<u>202 (79.8)</u>	<u>51 (20.2)</u>	<u>253</u>
No. of Hospital Beds			
General Hospital	13,697 (98.0)	280 (2.0)	13,977
Hospital	7,155 (82.6)	1,504 (13.4)	8,659
Special Hospital	3,507 (78.0)	988 (22.0)	4,495
<u>Total</u>	<u>24,359 (89.8)</u>	<u>2,772 (10.2)</u>	<u>27,131</u>

SOURCE: The Journal of the Korean Hospital Association, Vol. 7,  
No. 4-5, May 1978.

\*National Leprosy Center was excluded from this  
statistics.

\*Special Hospital means Mental hospital and hospital  
for crippled patients and TB/Leprosy Sanatoriums.

No. of Hospital Bed by Sector

Province	Area	Public			Private			Total	Public H. Total	Private H. Total
		General Hospital	Hospital	Special Hospital	General Hospital	Hospital	Special Hospital			
Total		5,027(19)	2,337(41)	3,074(11)	8,950(35)	6,322(139)	1,421(8)	27,131(253)	10,438(71)	16,693(182)
Seoul		2,419(9)	20(1)	2,015(5)	5,383(17)	1,587(36)	574(3)	11,998(71)	4,454(15)	7,544(56)
Pusan		295(1)	360(3)	-	924(4)	1,084(17)	-	2,669(25)	655(4)	2,008(21)
Gyeonggi		150(1)	521(8)	140(2)	535(3)	660(18)	100(1)	2,106(33)	811(11)	1,295(22)
	Suwon	-	110(1)	20(1)	195(1)	400(10)	100(1)	825(14)	130(2)	695(12)
	Incheon	150(1)	138(2)	120(1)	340(2)	179(5)	-	927(13)	408(4)	519(7)
	Eijongbu	-	80(2)	-	-	57(2)	-	137(4)	80(2)	57(2)
	Incheon	-	54(1)	-	-	-	-	54(1)	54(1)	-
	Paju	-	59(1)	-	-	24(1)	-	83(2)	59(1)	24(1)
	Anseong	-	80(1)	-	-	-	-	80(1)	80(1)	-
Gangwon		154(1)	237(6)	-	500(3)	59(2)	-	950(12)	391(7)	559(5)
	Chuncheon	154(1)	30(1)	-	-	25(1)	-	219(3)	184(2)	35(1)
	Wonju	-	45(1)	-	220(1)	-	-	265(2)	45(1)	220(1)
	Gangneung	-	50(1)	-	-	-	-	50(1)	50(1)	-
	Sogcho	-	57(1)	-	-	-	-	57(1)	57(1)	-
	Youngwall	-	20(1)	-	100(1)	24(1)	-	144(3)	20(1)	124(2)
	Saichak	-	35(1)	-	180(1)	-	-	215(2)	35(1)	180(1)
Chungbuk		150(1)	72(1)	-	-	224(6)	-	446(8)	222(2)	224(6)
	Chungju	150(1)	-	-	-	86(2)	-	236(3)	150(1)	86(2)
	Cheungju	-	72(1)	-	-	98(2)	-	170(3)	72(1)	98(2)
	Okcheon	-	-	-	-	40(2)	-	40(2)	-	40(2)
Chungnam		300(1)	126(4)	337(1)	-	416(9)	41(1)	1,220(16)	763(6)	457(10)
	Daejeon	300(1)	-	-	-	252(4)	41(1)	593(6)	300(1)	293(5)
	Chunan	-	14(1)	-	-	-	-	14(1)	14(1)	-
	Gongju	-	45(1)	337(1)	-	30(1)	-	412(3)	382(2)	30(1)
	Hongseong	-	56(1)	-	-	-	-	56(1)	56(1)	-
	Boreong	-	-	-	-	84(2)	-	84(2)	-	84(2)
	Seosan	-	11(1)	-	-	50(2)	-	61(3)	11(1)	50(2)
Jeonbuk		372(1)	167(2)	-	269(1)	203(4)	85(1)	1,096(9)	539(3)	557(6)
	Jeonju	372(1)	-	-	269(1)	65(2)	-	706(4)	372(1)	334(3)
	Gunsan	-	100(1)	-	-	102(1)	85(1)	287(3)	100(1)	187(2)
	Namwon	-	67(1)	-	-	-	-	67(1)	67(1)	-
	Jeonseub	-	-	-	-	-	-	-	-	-
	Jangsu	-	-	-	-	36(1)	-	36(1)	-	36(1)
Jeonnam		517(1)	239(4)	82(2)	400(2)	746(20)	21(1)	2,005(30)	838(7)	1,167(23)
	Gwangju	517(1)	-	12(1)	400(2)	409(12)	-	1,338(16)	529(2)	809(14)
	Mokpo	-	185(2)	70(1)	-	248(5)	-	503(8)	255(3)	248(5)
	Suncheon	-	30(1)	-	-	55(2)	-	85(3)	30(1)	55(2)
	Yeosu	-	-	-	-	34(1)	21(1)	55(2)	-	55(2)
	Gukseong	-	-	-	-	-	-	-	-	-
	Goheong	-	-	-	-	-	-	-	-	-
	Gangjin	-	24(1)	-	-	-	-	24(1)	24(1)	-
	Raenam	-	-	-	-	-	-	-	-	-
	Youngkwang	-	-	-	-	-	-	-	-	-
Gyeongbuk		570(2)	308(7)	-	694(3)	775(13)	600(1)	2,947(26)	878(9)	2,069(17)
	Daegu	440(1)	167(2)	-	594(2)	186(3)	600(1)	1,987(9)	607(3)	1,380(6)
	Gimcheon	-	78(2)	-	-	27(1)	-	105(3)	78(2)	27(1)
	Gyeongju	-	-	-	-	68(1)	-	68(1)	-	68(1)
	Pohang	130(1)	-	-	100(1)	153(3)	-	383(5)	130(1)	253(4)
	Eiseong	-	-	-	-	172(3)	-	172(3)	-	172(3)
	Andong	-	37(1)	-	-	120(1)	-	157(2)	37(1)	120(1)
	Youngju	-	-	-	-	49(1)	-	49(1)	-	49(1)
	Hangyeong	-	-	-	-	-	-	-	-	-
	Buljin	-	20(1)	-	-	-	-	20(1)	20(1)	-
	Bulreung	-	6(1)	-	-	-	-	6(1)	6(1)	-
Gyeongnam		100(1)	205(3)	500(1)	245(2)	475(11)	-	1,525(18)	805(5)	720(13)
	Masan	100(1)	-	500(1)	110(1)	108(3)	-	818(6)	600(2)	218(4)
	Jinju	-	120(1)	-	-	192(4)	-	312(5)	120(1)	192(4)
	Hapcheon	-	45(1)	-	-	-	-	45(1)	45(1)	-
	Chungmu	-	40(1)	-	-	-	-	40(1)	40(1)	-
	Goje	-	-	-	-	40(1)	-	40(1)	-	40(1)
	Bulsan	-	-	-	135(1)	135(3)	-	270(4)	-	270(4)
	Samchungpo	-	-	-	-	-	-	-	-	-
Jeju		-	82(2)	-	-	93(3)	-	175(5)	82(2)	93(3)
	Jeju	-	52(1)	-	-	93(3)	-	145(4)	52(1)	93(3)
	Manjeju	-	30(1)	-	-	-	-	30(1)	30(1)	-

SOURCE: Journal of the Korean Hospital Association, Vol. 7, 4-5, May 1978.

Note: ( ) is No. of Hospital

National leprosy center was excluded from this statistics. Special Hospital means long stay hospital such as TB sanatoriums, mental hospitals and leprosy hospital.



Bed and Hospital Distribution by District

Province	Areas	Urban			Rural			Total (exclude special hospital)			Special Hospital	Grand Total
		General Hospital	Hospital	Sub-Total	General Hospital	Hospital	Sub-Total	Total	General Hospital	Hospital		
Total		13,697 (52)	7,236 (142)	20,927 (194)	280 (2)	1,439 (38)	1,719 (40)	22,646 (234)	13,977 (54)	8,659 (180)	4,495 (19)	27,131 (253)
Seoul		7,802 (26)	1,607 (37)	9,409 (63)	-	-	-	9,409 (63)	7,802 (26)	1,607 (37)	2,589 (8)	11,998 (71)
Pusan		1,219 (5)	1,444 (20)	2,663 (25)	-	-	-	2,663 (25)	1,219 (5)	1,444 (20)	-	2,663 (25)
Gyeonggi		685 (4)	743 (16)	1,428 (20)	-	438 (10)	438 (10)	1,866 (30)	685 (4)	1,181 (26)	240 (3)	2,106 (33)
	Seucon	195 (1)	442 (8)	637 (9)	-	68 (3)	68 (3)	705 (12)	195 (1)	510 (11)	120 (2)	825 (14)
	Incheon	490 (3)	224 (6)	714 (9)	-	93 (1)	93 (1)	807 (10)	490 (3)	317 (7)	120 (1)	927 (11)
	Eijongbu	-	77 (2)	77 (2)	-	60 (2)	60 (2)	137 (4)	-	137 (4)	-	137 (4)
	Icheon	-	-	-	-	54 (1)	54 (1)	54 (1)	-	54 (1)	-	54 (1)
	Peju	-	-	-	-	83 (2)	83 (2)	83 (2)	-	83 (2)	-	83 (2)
	Anseong	-	-	-	-	80 (1)	80 (1)	80 (1)	-	80 (1)	-	80 (1)
Gangwon		374 (2)	217 (5)	591 (7)	280 (2)	79 (3)	359 (5)	950 (12)	654 (4)	296 (8)	-	950 (12)
	Chuncheon	154 (1)	65 (2)	219 (3)	-	-	-	219 (3)	154 (1)	65 (2)	-	219 (3)
	Wonju	220 (1)	45 (1)	265 (2)	-	-	-	265 (2)	220 (1)	45 (1)	-	265 (2)
	Gangneung	-	50 (1)	50 (1)	-	-	-	50 (1)	-	50 (1)	-	50 (1)
	Sogcho	-	57 (1)	57 (1)	-	-	-	57 (1)	-	57 (1)	-	57 (1)
	Youngwall	-	-	-	100 (1)	44 (2)	144 (3)	144 (3)	100 (1)	44 (2)	-	144 (3)
	Samcheok	-	-	-	180 (1)	35 (1)	215 (2)	215 (2)	180 (1)	35 (1)	-	215 (2)
Chungbuk		150 (1)	178 (4)	328 (5)	-	118 (3)	118 (3)	446 (8)	150 (1)	296 (7)	-	446 (8)
	Chungju	150 (1)	86 (2)	236 (3)	-	-	-	236 (3)	150 (1)	86 (2)	-	236 (3)
	Cheungju	-	92 (2)	92 (2)	-	78 (1)	78 (1)	170 (3)	-	170 (3)	-	170 (3)
	Okcheon	-	-	-	-	40 (2)	40 (2)	40 (2)	-	40 (2)	-	40 (2)
Chungnam		300 (1)	311 (6)	611 (7)	-	231 (7)	231 (7)	887 (14)	300 (1)	542 (13)	378 (2)	1,220 (16)
	Daejeon	300 (1)	252 (4)	552 (5)	-	-	-	552 (5)	300 (1)	252 (4)	41 (1)	593 (6)
	Chunan	-	14 (1)	14 (1)	-	-	-	14 (1)	-	14 (1)	-	14 (1)
	Gongju	-	45 (1)	45 (1)	-	30 (1)	30 (1)	75 (2)	-	75 (2)	337 (1)	412 (3)
	Hongseong	-	-	-	-	56 (1)	56 (1)	56 (1)	-	56 (1)	-	56 (1)
	Boreong	-	-	-	-	84 (2)	84 (2)	84 (2)	-	84 (2)	-	84 (2)
	Seosan	-	-	-	-	61 (3)	61 (3)	61 (3)	-	61 (3)	-	61 (3)
Jeonbuk		641 (2)	267 (4)	908 (6)	-	103 (2)	103 (2)	1,011 (8)	641 (2)	370 (6)	85 (1)	1,096 (9)
	Jeonju	641 (2)	65 (2)	706 (4)	-	-	-	706 (4)	641 (2)	65 (2)	-	706 (4)
	Gunsan	-	202 (2)	202 (2)	-	-	-	202 (2)	-	202 (2)	85 (1)	287 (3)
	Namwon	-	-	-	-	67 (1)	67 (1)	67 (1)	-	67 (1)	-	67 (1)
	Jeonsu	-	-	-	-	-	-	-	-	-	-	-
	Jangsu	-	-	-	-	36 (1)	36 (1)	36 (1)	-	36 (1)	-	36 (1)
Jeonnam		917 (3)	937 (22)	1,854 (25)	-	48 (2)	48 (2)	1,902 (27)	917 (3)	985 (24)	103 (3)	2,005 (30)
	Gwangju	917 (3)	385 (11)	1,302 (14)	-	24 (1)	24 (1)	1,326 (15)	917 (3)	409 (12)	12 (1)	1,338 (16)
	Mogpo	-	433 (7)	433 (7)	-	-	-	433 (7)	-	433 (7)	70 (1)	503 (8)
	Suncheon	-	85 (3)	85 (3)	-	-	-	85 (3)	-	85 (3)	-	85 (3)
	Yosu	-	34 (1)	34 (1)	-	-	-	34 (1)	-	34 (1)	21 (1)	55 (2)
	Gukseong	-	-	-	-	-	-	-	-	-	-	-
	Goheong	-	-	-	-	-	-	-	-	-	-	-
	Gangjin	-	-	-	-	24 (1)	24 (1)	24 (1)	-	24 (1)	-	24 (1)
	Haenam	-	-	-	-	-	-	-	-	-	-	-
	Youngkwang	-	-	-	-	-	-	-	-	-	-	-
Gyeongbuk		1,264 (5)	809 (13)	2,073 (18)	-	274 (7)	274 (7)	2,347 (25)	1,264 (5)	1,083 (20)	600 (1)	2,947 (25)
	Daegu	1,034 (3)	353 (5)	1,387 (8)	-	-	-	1,387 (8)	1,034 (3)	353 (5)	600 (1)	1,987 (9)
	Ginscheon	-	78 (2)	78 (2)	-	27 (1)	27 (1)	105 (3)	-	105 (3)	-	105 (3)
	Gyeongju	-	68 (1)	68 (1)	-	-	-	68 (1)	-	68 (1)	-	68 (1)
	Pohang	230 (2)	153 (3)	383 (5)	-	-	-	383 (5)	230 (2)	153 (3)	-	383 (5)
	Eiseong	-	-	-	-	172 (3)	172 (3)	172 (3)	-	172 (3)	-	172 (3)
	Andong	-	157 (2)	157 (2)	-	-	-	157 (2)	-	157 (2)	-	157 (2)
	Youngju	-	-	-	-	49 (1)	49 (1)	49 (1)	-	49 (1)	-	49 (1)
	Mangyeong	-	-	-	-	-	-	-	-	-	-	-
	Euljin	-	-	-	-	20 (1)	20 (1)	20 (1)	-	20 (1)	-	20 (1)
	Eulreung	-	-	-	-	6 (1)	6 (1)	6 (1)	-	6 (1)	-	6 (1)
Gyeongnam		345 (3)	572 (11)	917 (14)	-	108 (3)	108 (3)	1,025 (17)	345 (3)	680 (14)	500 (1)	1,525 (18)
	Masan	210 (2)	108 (3)	318 (5)	-	-	-	318 (5)	210 (2)	108 (3)	500 (1)	818 (6)
	Jinju	-	289 (4)	289 (4)	-	23 (1)	23 (1)	312 (5)	-	312 (5)	-	312 (5)
	Hapcheon	-	-	-	-	45 (1)	45 (1)	45 (1)	-	45 (1)	-	45 (1)
	Chungmu	-	40 (1)	40 (1)	-	-	-	40 (1)	-	40 (1)	-	40 (1)
	Goje	-	-	-	-	40 (1)	40 (1)	40 (1)	-	40 (1)	-	40 (1)
	Bulsan	135 (1)	135 (3)	270 (4)	-	-	-	270 (4)	135 (1)	135 (3)	-	270 (4)
	Sanchunpo	-	-	-	-	-	-	-	-	-	-	-
Jeju		-	145 (4)	145 (4)	-	30 (1)	30 (1)	175 (5)	-	175 (5)	-	175 (5)
	Jeju	-	145 (4)	145 (4)	-	-	-	145 (4)	-	145 (4)	-	145 (4)
	NamJeju	-	-	-	-	30 (1)	30 (1)	30 (1)	-	30 (1)	-	30 (1)

SOURCE: Journal of the Korean Hospital Association, Vol. 7, 4-5, May 1978.

Note: ( ) is No. of Hospital.

National leprosy center was excluded from this statistics.

Special hospital means long stay hospital such as TB sanatoriums, mental hospitals and leprosy hospitals.

Number of Hospital Beds by Category and by Year

	1972	1973	1974	1975	1976
National ( Total )	3,460	4,104	4,339	4,711	4,409
General	1,858	2,370	2,782	3,046	2,823
Communicable disease	48	203		77	296
T.B.	950	935	951	982	682
Mental	604	596	606	606	608
Public ( Total )	3,917	3,480	4,235	4,312	4,842
General	2,339	2,301	2,696	2,761	3,006
Communicable disease	503	463		463	493
T.B.	785	659	1,224	763	1,035
Mental	290	57	315	325	308
Private ( Total )	8,996	10,722	10,488	10,966	13,541
General	7,946	9,684	9,421	9,956	12,050
Communicable disease	22	431		72	336
T.B.	361	141	409	314	215
Mental	667	466	658	624	940
General	12,143	14,355	14,899	15,763	17,879
Communicable disease	573	1,097		612	1,125
T.B.	2,096	1,735	2,584	2,059	1,932
Mental	1,561	1,119	1,579	1,555	1,856
TOTAL	16,373	18,306	19,062	19,989	22,792

SOURCE : Yearbook of Public Health and Social Statistics, MOHSA

HOSPITAL RELATED VARIOUS INDICES BY YEAR

Year	Hospital Beds	Hospital Stay	Hospitalized Patients	Average OPD Visits
1961	100.0	100.0	100.0	100.0
1962	108.4	113.6	127.1	123.9
1963	117.8	134.5	144.2	129.0
1964	119.3	138.4	156.0	149.0
1965	128.3	137.4	168.2	147.1
1966	144.9	151.3	190.8	170.6
1967	168.1	201.5	223.9	163.4
1968	176.5	189.4	240.1	174.5
1969	182.9	197.9	256.9	190.8
1970	185.9	205.5	294.5	200.4
1971	196.8	210.9	299.4	193.5
1972	184.1	178.9	284.9	156.9
1973	205.8	224.7	338.4	223.9

Source: Yearbook of Public Health and Social Statistics, MOHSA

Health Center Distribution

City/Province	Total	District	City	Gun (County)
SEOUL	13	13	-	-
BUSAN	8	8	-	-
Gyeonggi	27	4	5	18
Gangweon	19	-	4	15
Chungbug	12	-	2	10
Chungnam	18	2	1	15
Jeonbug	16	-	3	13
Jeonnam	27	2	3	22
Gyeongbug	34	5	5	24
Gyeongnam	25	-	6	19
Jeju	3	-	1	2
TOTAL	202	24	30	138

SOURCE: Present status of the Medical Administration, Ministry of Health and Social Affairs, Oct. 1978.

SIZE OF GENERAL HOSPITAL AND HOSPITAL BY CITY/PROVINCE

	General Hospital						Hospital					Total
	- 199	200-299	300-399	400-499	500 +	SUB-TOTAL	- 49	50-99	100-149	150-199	SUB-TOTAL	
Seoul	9	6	5	2	4	26	24	10	2	-	36	62
Busan	-	4	1	-	-	5	8	5	6	1	20	25
Geonggi	3	1	-	-	-	4	18	7	1	-	26	30
Gangweon	3	1	-	-	-	4	6	2	-	-	8	12
ChungBug	1	-	-	-	-	1	4	3	-	-	7	8
ChungNam	-	-	1	-	-	1	11	2	-	1	14	15
JeonBug	-	1	1	-	-	2	3	1	2	-	6	8
JeonNam	-	2	-	-	1	3	20	1	3	-	24	27
GeongBug	3	-	-	2	-	5	13	3	4	-	20	25
GeongNam	3	-	-	-	-	3	9	4	1	-	14	17
Jeju	-	-	-	-	-	-	4	1	-	-	5	5
TOTAL	22	15	8	4	5	54	120	39	19	2	180	234

SOURCE: The Journal of the Korean Hospital Association, Vol. 7, No. 4 - 5, May 1978.  
Long stay hospital were excluded.

BED OCCUPANCY RATE BY SIZE OF HOSPITAL, 1978

Size of Hospital	Bed Occupancy Rate	No. of Sample Hospital
-50	42.2	16
51-100	52.3	5
101-200	81.1	3
201-300	76.5	2
300 +	97.5	4

SOURCE: Data from the KHDI Hospital Feasibility Survey.

PROPORTION OF PATIENT HOSPITALIZED  
BY DISCIPLIN

GENERAL HOSPITAL	Hospitalized Cases	Total Hosp. Stay	Average Hosp. Stay
Internal Medicine	25.58%	17.86%	9.78 days
Pediatric	15.91	7.49	6.60
Neuro-psychiatric	2.68	4.56	23.90
General Surgery	12.28	12.18	13.90
Orthopedic Surgery	8.19	27.60	47.24
Neuro-Surgery	6.86	11.52	23.51
Thoracic Surgery	1.08	2.19	28.38
Plastic Surgery	0.50	0.72	20.18
OB-GYN	17.22	5.93	4.82
Ophthalmology	2.60	2.74	14.79
ENT	3.34	2.42	10.12
Dermatology	0.48	0.19	5.56
Urology	2.64	3.67	19.51
Tuberculosis	0.25	0.44	24.61
Dental	0.38	0.49	17.93
AVERAGE HOSPITAL STAY - - - - -			<u>14.02</u> days

SMALL HOSPITAL

Internal Medicine	31.17%	35.06%	7.64
Pediatric	8.21	4.13	3.41
General Surgery	29.25	30.13	7.00
Orthopadic Surgery	9.55	14.07	10.00
Thoracic Surgery	4.61	1.39	2.04
OB-GYN	13.97	11.10	5.39
ENT	1.49	1.07	4.88
Urology	1.71	3.03	12.00
Dental	0.03	0.04	9.50
AVERAGE HOSPITAL STAY _ - - - -			-6.79 days

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KHDI Survey Result: Sample Hospital (total) 13  
                                   General Hosp. 6  
                                   Small Hosp. 7

HEALTH MANPOWER- by Type of Facility

	Licence Issued	Total	Professionally Active Manpower					Teaching Research Others
			General Hospital	Hospital	Clinic	Midwifery	Dental Technic Center	
Physician	18,405	12,583	4,078	485	5,773	9	-	2,278
Dentist	2,823	2,213	156	68	1,633	-	2	354
Herb Doctor	2,610	2,248	15	36	2,150	-	-	47
Nurse	30,294	9,071	5,603	856	732	87	6	1,787
Lab. Technician	2,683	1,207	671	145	370	-	-	21
Midwife	4,222	972	177	57	114	500	-	124
Physical Therapist	406	192	111	18	16	-	-	47
X-Ray Technician	1,224	658	310	104	203	-	-	41
Dental Technician	980	448	37	11	215	-	184	1

SOURCE: YEARBOOK OF PUBLIC HEALTH AND SOCIAL STATISTICS, Ministry of Health and Social Affairs, 1978.



Urban-Rural DISTRIBUTION OF ACTIVELY PRACTICING  
HEALTH PROFESSIONALS

	Urban	Rural
Physician	10,457	1,277
Dentist	1,855	172
Herb Doctor	1,982	422
Limited Doctor	35	429
Limited Dentist	21	47
Midwife	1,367	383
Nurse	9,214	1,725

SOURCE: Present Status of Medical Administration, Ministry  
of Health and Social Affairs, Oct. 1978.  
Military and other services were excluded.

MANPOWER DISTRIBUTION BY CITY/PROVINCE

	Population	Physician	Dentist	Midwife	Nurse
TOTAL	35,341,016	11,734	2,027	1,750	10,939
Seoul	7,254,958	5,954	1,210	452	4,404
Busan	2,573,713	1,272	187	252	1,104
Gyeonggi	4,150,324	754	118	175	769
Gangweon	1,842,363	323	40	100	582
ChungBug	1,513,465	168	33	60	232
ChungNam	2,960,590	505	82	110	524
JeonBug	2,445,149	442	43	163	706
JeonNam	4,001,698	714	59	122	848
GeongBug	4,902,059	1,091	180	135	1,201
GeongNam	3,275,867	435	63	156	441
Jeju	420,830	76	12	25	128

SOURCE: Present Status of Medical Administration, Published by Ministry of Health and Social Affairs on Oct. 1978, Page 27.

This figures are based on Annual Registration in accordance with Medical Law.

PROSPECTIVES FOR HEALTH SECTOR

	1970	1976	1981	1986	1991
Population per physician	2,107	2,011	1,545	1,317	1,166
Population per Nurse	1,742	572	405	323	275
Population per Bed	909	742	390	250	130
Bed utilization rate	58.4	64.5	75.0	80.0	83.0
Percentage of childbirths within Health facility (%)	14	22	45	65	75

Source; National Health Plan for 4th Economic Development Planning Period, MOHSA, 1976.

Hospital Staff

Province	Districts	Physicians				Dentists			Pharmacists	Nurses					
		Total	Specialist	General	R.Int	Total	Dr.	R.Int		Total	Midwife	Nurse	N.Aide	Technical	Other
Total		5,117	1,813	282	3,022	263	144	119	256	8,600	221	6,071	2,308	1,416	9,272
Seoul		3,094	1,060	126	1,908	204	106	98	42	4,474	64	3,364	1,046	841	4,800
Pusan		447	176	15	256	11	9	2	46	986	78	609	299	121	1,032
Gyeonggi	Seoul	208	95	26	87	4	4	-	28	516	10	337	169	69	688
	Incheon	68	35	9	24	-	-	-	8	189	8	128	53	22	316
	Ulsan	118	47	11	60	3	3	-	14	276	-	176	100	35	318
	Daegu	11	7	2	2	1	1	-	3	28	1	12	15	6	29
	Chungcheong	3	2	1	-	-	-	-	1	8	-	8	-	2	12
	Jeonju	4	3	1	-	-	-	-	1	9	1	7	1	2	5
	Anseong	4	1	2	1	-	-	-	1	6	-	6	-	2	8
Gangwon	Chuncheon	123	51	15	57	5	5	-	15	320	8	239	73	45	329
	Wonju	16	6	6	4	1	1	-	4	45	-	44	1	8	51
	Gangneung	65	20	1	44	1	1	-	4	141	-	97	44	18	132
	Sogoh	7	4	2	1	-	-	-	1	14	-	11	3	2	14
	Youngwol	2	-	2	-	-	-	-	1	9	-	7	2	2	7
Chungbuk		33	21	4	8	3	3	-	5	111	8	80	23	15	125
	Cheongju	31	22	4	5	1	1	-	6	70	1	44	25	12	57
	Okcheon	16	10	1	5	-	-	-	2	30	-	20	10	3	11
Chungnam		10	8	2	-	1	1	-	3	29	1	16	12	7	30
		5	4	1	-	-	-	-	1	11	-	8	3	2	16
		149	49	11	89	1	1	-	14	198	3	150	45	37	261
Jeonbuk	Daejeon	120	39	-	81	1	1	-	8	125	3	92	30	21	111
	Cheonan	3	2	1	-	-	-	-	1	5	-	4	1	2	9
	Gongju	11	3	4	4	-	-	-	2	40	-	38	2	7	102
	Hongseong	4	-	1	3	-	-	-	1	5	-	5	-	2	8
	Boryeong	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Seosan	11	5	5	1	-	-	-	2	23	-	11	12	5	31
		169	52	9	108	3	3	-	18	318	22	266	30	44	366
Jeonnam	Jeonju	141	43	1	97	2	2	-	12	232	20	200	12	41	347
	Gunsan	23	8	6	9	1	1	-	5	71	2	55	14	-	-
	Namwon	4	1	1	2	-	-	-	1	12	-	10	2	2	16
Jeonnam	Jeonshu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Jangsu	1	-	1	-	-	-	-	-	3	-	1	2	1	3
		363	120	21	222	11	5	6	24	561	7	316	238	81	618
Jeonnam	Kwangju	327	105	7	215	11	5	6	16	420	-	244	176	63	434
	Gopgo	19	10	9	-	-	-	-	3	95	6	49	40	11	91
		6	2	1	3	-	-	-	1	5	-	5	-	2	5
Gyeonggi	Suncheon	3	3	-	-	-	-	-	1	20	1	3	16	3	32
	Yeosu	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gokseong	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gohseong	5	-	1	4	-	-	-	2	17	-	12	5	-	52
	Gangjin	3	-	3	-	-	-	-	1	4	-	3	1	2	4
	Haenam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Youngkwang	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gyeonggi		452	146	31	275	20	7	13	46	875	21	577	277	121	823
	Daegu	396	117	16	263	18	5	13	35	649	14	410	225	90	592
	Glscheon	7	4	1	2	-	-	-	3	16	-	13	3	6	19
	Gyeongju	7	6	1	-	-	-	-	1	30	1	21	8	4	32
	Pohang	14	6	6	2	1	1	-	3	71	-	56	15	8	70
	Eiseong	6	2	4	-	-	-	-	1	20	4	16	-	4	8
	Andong	19	11	3	5	1	1	-	3	82	2	54	26	9	93
	Youngju	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mangyeong	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Uijjin	1	-	-	1	-	-	-	-	3	-	3	-	-	6
	Elreung	2	-	-	2	-	-	-	-	4	-	4	-	-	3
		64	35	19	10	1	1	-	14	230	4	148	78	35	262
Gyeongnam	Hasan	36	21	9	6	-	-	-	8	130	-	97	33	21	158
	Jinju	11	3	4	4	-	-	-	3	20	1	14	5	6	29
	Hapcheon	2	2	-	-	-	-	-	1	12	-	5	7	2	14
	Chungmu	3	1	2	-	-	-	-	1	18	-	11	7	2	14
	Goje	5	2	3	-	1	1	-	-	26	2	11	13	1	26
	Bulsan	7	6	1	-	-	-	-	1	24	1	10	13	3	21
	Samchungpo	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jeju		17	7	5	5	2	2	-	3	52	3	21	28	10	36
	Jeju	12	6	4	2	2	2	-	2	47	3	16	28	8	29
	Nam Jeju	5	1	1	3	-	-	-	1	5	-	5	-	2	7

SOURCE: Ministry of Health and Social Affairs, National Medical Facility Survey Report, 1977.

## MANPOWER

## CLINIC PHYSICIANS BY DISCIPLINE AND REGION

City/ Province	Health District	Population	Total	General Practitioner	Sub- Total	Internal Medicine	Pediatric	Neuro- Psychiatric	General Surgery	Orthopedic Surgery	Neuro- Surgery	Thoracic Surgery	Plastic Surgery	Anesthesiology	OB-GYN	Ophthalmology	ENT	Dermatology	Urology	Radiology	TB
	Total	35,341,016	5,468	3,007	2,461	308	304	63	563	139	52	8	8	1	418	133	212	82	107	45	15
Seoul	Northern Han River	7,254,958	2,106	1,200	906	121	154	28	165	36	14	2	7	1	128	54	89	39	46	18	4
	Southern Han River	4,865,411	1,692	924	768	97	102	26	115	25	10	2	7	1	178	45	71	36	38	16	4
		2,389,547	514	276	238	24	52	2	50	11	4	-	-	-	55	9	18	3	8	2	-
Pusan	Pusan	2,573,713	696	299	397	56	43	10	67	21	14	1	-	-	71	17	21	9	25	5	7
Gyeong-Gi	Suwon	4,150,324	496	303	193	20	19	3	40	8	2	1	1	-	56	15	16	4	5	2	1
	Incheon	1,316,084	153	94	59	6	7	1	13	1	1	-	-	-	16	5	6	1	2	-	-
	Si-Jong-Bu	1,191,584	202	105	97	10	9	2	15	5	1	-	1	-	32	7	7	2	2	2	1
	Seoul	651,224	38	39	19	1	2	-	7	1	-	1	-	-	3	1	2	-	1	-	-
	Paju	321,369	19	17	2	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
	Anseong	310,788	22	22	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
Gang-Weon		359,311	42	26	16	3	1	-	4	1	-	-	-	-	4	2	1	-	-	-	-
	Chuncheon	1,842,363	158	114	44	6	4	-	18	5	1	-	-	-	4	3	1	-	2	-	-
	Wonju	526,668	61	45	16	3	2	-	5	1	1	-	-	-	2	1	-	-	1	-	-
	Gangneung	371,066	26	13	13	3	2	-	2	1	-	-	-	-	1	-	-	-	-	-	-
	Sogcho	236,488	24	19	5	-	-	-	5	-	-	-	-	-	1	2	1	-	1	-	-
	Seogho	169,381	10	8	2	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
	Young Wall	249,426	14	11	3	-	-	-	1	2	-	-	-	-	1	-	-	-	-	-	-
	Samcheok	289,334	23	18	5	-	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-
	Chung Ju	1,513,465	130	81	49	4	5	1	18	2	1	-	-	-	7	3	4	2	1	1	1
	Chung Ju	719,276	75	37	38	4	4	1	12	2	-	-	-	-	6	2	3	2	1	1	-
Chung Nam	Okcheon	490,666	19	29	10	-	-	-	1	-	-	-	-	-	1	1	1	-	-	-	-
		303,523	16	15	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Daejeon	2,960,590	310	172	138	13	11	4	43	10	3	-	-	-	30	5	9	4	1	4	1
	Cheon An	881,043	153	69	84	11	10	4	17	6	2	-	-	-	16	3	6	4	1	3	1
	Gong Ju	380,727	44	27	17	-	-	-	7	1	1	-	-	-	5	1	1	-	-	1	-
	Hong Seong	580,669	33	24	9	-	-	-	3	-	-	-	-	-	5	-	1	-	-	-	-
	Borwong	385,124	31	19	12	-	-	-	9	-	-	-	-	-	1	1	1	-	-	-	-
	Seosan	299,120	23	14	9	1	-	-	3	3	-	-	-	-	2	-	-	-	-	-	-
Jeon Bug		433,907	26	19	7	1	1	-	4	1	-	-	-	-	1	-	-	-	-	-	-
	Jeon Ju	2,445,149	231	122	109	10	10	2	33	7	2	2	-	-	23	4	11	3	1	1	-
	Gunsan	799,988	96	36	60	6	6	1	16	4	2	1	-	-	11	3	5	3	1	1	-
	Namwon	569,239	76	38	38	4	2	1	10	3	-	1	-	-	11	1	5	-	-	-	-
	Jeongsub	366,184	25	20	5	-	1	-	3	-	-	-	-	-	-	-	1	-	-	-	-
	Jangsu	570,180	27	21	6	-	1	-	4	-	-	-	-	-	1	-	-	-	-	-	-
Jeon Nam		139,558	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gwang Ju	4,001,698	361	196	165	19	18	5	42	9	3	-	-	-	29	8	14	5	3	7	-
	Mogyo	1,312,813	169	62	107	10	14	3	26	7	3	-	-	-	18	6	8	4	3	5	-
	Suncheon	602,263	56	34	22	3	2	-	4	1	-	-	-	-	5	1	3	1	-	2	-
	Yeosu	334,765	25	11	14	4	1	1	3	-	-	-	-	-	3	-	2	-	-	-	-
	Guk Seong	288,897	36	20	16	2	1	1	6	1	-	-	-	-	3	1	1	-	-	-	-
	Go Hwang	159,175	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gang Jin	370,825	14	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hae Nam	375,414	20	19	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Young Kwang	297,308	15	14	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
		260,238	16	15	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Gyeong Bug	Daeju	4,909,059	625	311	314	38	29	5	79	29	7	1	-	-	51	16	24	14	15	5	1
	Gyeongju	2,242,061	410	177	233	28	22	5	55	21	6	1	-	-	40	12	16	9	13	5	-
	Po Hwang	550,912	47	29	18	2	2	-	7	2	-	-	-	-	3	1	1	-	-	-	-
	Si Seong	451,566	26	18	8	1	1	-	2	1	-	-	-	-	1	-	1	1	-	-	-
	Andong	242,101	11	9	2	-	3	-	6	3	1	-	-	-	4	2	2	-	2	-	-
	Yong Ju	410,795	37	24	13	2	1	-	3	1	-	-	-	-	-	-	-	-	-	-	-
	Moon Gyeong	287,738	17	13	4	-	-	-	-	-	-	-	-	-	1	2	2	-	-	-	1
	Buljin	301,816	23	14	9	-	-	-	4	1	-	-	-	-	1	-	1	2	-	-	-
	Bulneung	102,941	7	7	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-	-	-
		27,468	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gyeong Nam	Masan	3,275,867	301	173	128	17	10	4	33	11	4	1	-	-	16	7	13	2	7	2	1
	Jinju	1,191,668	155	76	79	11	6	2	19	8	2	1	-	-	10	4	6	2	5	1	-
	Hapcheon	684,498	49	30	19	3	1	1	6	1	-	-	-	-	3	1	3	-	-	-	-
	Chungmu	377,721	15	14	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Goje	254,061	17	14	3	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-
	Pulsan	112,044	9	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Samcheonpo	515,172	46	19	27	3	3	1	5	1	2	-	-	-	3	2	3	-	2	1	1
Jeju		140,703	12	11	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Bukjeju	420,830	54	36	18	4	1	1	5	1	1	-	-	-	3	1	-	-	1	-	-
	Namjeju	257,317	43	27	16	3	1	1	5	1	1	-	-	-	2	1	-	-	1	-	-
		163,513	11	9	2	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-

CLINIC PHYSICIANS PER 100,000 POPULATION BY DISCIPLINE AND REGION

City/Province	Health District	Total	General Practitioner	Sub-Total	Internal Medicine	Pediatric	Neuro-Psychiatric	General Surgery	Orthopedic Surgery	Neuro-Surgery	Thoracic Surgery	Plastic Surgery	Anesthesiology	OB-GYN	Ophthalmology	ENT	Dermatology	Urology	X-ray Radiology	TS
	Total	15.47	8.50	6.96	0.87	0.86	0.17	1.59	0.39	0.14	0.02	0.02		1.18	0.37	0.59	0.23	0.30	0.12	0.04
Seoul		29.02	16.54	12.48	1.66	2.12	0.38	2.27	0.49	0.19	0.02	0.09		1.76	0.74	1.22	0.53	0.63	0.24	0.05
	Northern Han River	34.77	18.99	15.78	1.99	2.09	0.53	2.36	0.51	0.20	0.04	0.14		3.55	0.92	1.45	0.73	0.78	0.32	0.08
	Southern Han River	21.51	11.55	9.96	1.00	2.17	0.08	2.09	0.46	0.16	-	-		2.30	0.37	0.75	0.12	0.34	0.08	-
	Pusan	27.04	11.61	15.42	2.17	1.67	0.38	3.38	0.81	0.54	-	-		2.75	0.66	1.20	0.34	0.97	0.19	0.27
Gyeong-Gi		11.59	7.30	4.65	0.48	0.45	0.07	0.96	0.19	0.04	0.02	0.02		1.34	0.36	0.38	0.09	0.12	0.04	0.02
	Suwon	11.62	7.14	4.46	0.45	0.45	0.07	0.98	0.07	0.07	-	-		1.21	0.37	0.45	0.07	0.15	-	-
	Incheon	16.95	8.81	8.14	0.83	0.75	0.16	1.25	0.41	0.08	-	0.08		2.68	0.58	0.58	0.25	0.16	0.16	0.08
	Si-Jong-Bu	9.90	5.98	2.91	0.15	0.30	-	0.07	0.15	-	0.15	-		0.46	0.15	0.30	-	0.15	-	-
	Icheon	5.31	5.28	0.62	-	-	-	0.31	-	-	-	-		0.31	-	-	-	-	-	-
	Paju	7.07	7.07	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Anseong	11.08	7.23	4.45	0.83	0.27	-	1.11	0.27	-	-	-		1.11	0.55	0.27	-	-	-	-
		8.57	6.18	2.38	0.32	0.21	-	0.97	0.27	0.05	-	-		0.21	0.16	0.05	0.10	-	-	-
Gang-Weon		11.58	8.54	3.03	0.56	0.37	-	0.94	0.18	0.18	-	-		0.37	0.18	-	-	0.18	-	-
	Chuncheon	7.00	3.50	3.50	0.80	0.53	-	0.53	0.26	-	-	-		0.26	0.53	0.26	-	0.26	-	-
	Wonju	10.14	8.03	2.11	-	-	-	2.11	-	-	-	-		-	-	-	-	-	-	-
	Gangneung	5.90	4.71	1.18	-	-	-	0.59	-	-	-	-		0.59	-	-	-	-	-	-
	Sogcho	5.63	4.41	1.20	-	-	-	0.40	0.80	-	-	-		-	-	-	-	-	-	-
	Young Wall	7.94	6.62	1.72	-	-	-	1.38	0.34	-	-	-		-	-	-	-	-	-	-
	Samcheok	8.58	5.35	3.23	0.26	0.33	0.06	1.18	0.13	0.06	-	-		0.64	0.19	0.26	0.13	0.06	0.06	-
		10.42	5.14	5.28	0.55	0.55	0.13	1.66	0.27	-	-	-		0.83	0.27	0.41	0.27	0.13	0.13	-
Chung-Bug		7.94	5.91	2.03	-	0.20	-	1.01	-	0.20	-	-		0.20	0.20	0.20	-	-	-	-
	Cheongju	5.27	4.94	0.32	-	-	-	0.32	-	-	-	-		-	-	-	-	-	-	-
	Chungju	10.47	5.80	4.66	0.43	0.37	0.13	1.45	0.33	0.10	-	-		1.01	0.16	0.30	0.13	0.03	0.13	0.03
	Okcheon	17.36	7.83	9.58	1.24	1.13	0.45	0.92	0.68	0.22	-	-		1.81	0.34	0.68	0.45	0.11	0.34	0.11
Chung-Nam		11.55	7.09	4.46	-	-	-	1.83	0.26	0.26	-	-		1.31	0.26	0.26	-	-	-	-
	Daejeon	5.68	4.13	1.54	-	-	-	0.51	-	-	-	-		0.86	-	0.17	-	-	-	-
	CheonAn	6.04	4.93	3.11	-	-	-	2.33	-	-	-	-		0.25	0.25	0.25	-	-	-	-
	Gongju	7.68	4.68	3.00	0.33	-	-	1.00	1.00	-	-	-		0.66	-	-	-	-	-	-
	Hong Seong	5.99	4.37	1.61	0.23	0.23	-	0.92	-	-	-	-		0.23	-	-	-	-	-	-
	Boreong	9.44	4.98	4.45	0.40	0.40	0.08	1.34	0.28	0.08	0.08	-		0.94	0.16	0.44	0.12	0.04	0.04	-
	Seosan	12.00	4.50	7.50	0.87	0.87	0.12	2.00	0.50	0.25	0.12	-		1.37	0.37	0.62	0.37	0.12	0.12	-
		13.35	6.67	6.67	0.70	0.35	0.17	1.75	0.52	-	0.17	-		1.93	0.17	0.87	-	-	-	-
Jeon-Bug		6.82	5.46	1.36	-	0.27	-	0.81	-	-	-	-		-	-	0.27	-	-	-	-
	Jeon Ju	4.73	3.68	1.05	-	0.17	-	0.70	-	-	-	-		0.17	-	-	-	-	-	-
	Gunsan	5.01	5.01	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Wanmoo	9.02	4.89	4.12	0.47	0.44	0.12	1.04	0.22	0.07	-	-		0.72	0.19	0.34	0.12	0.07	0.17	-
Jeon-Nam		12.87	4.72	8.15	0.76	1.06	0.22	1.98	0.53	0.22	-	-		1.37	0.45	0.60	0.30	0.22	0.38	-
	Gwang Ju	9.29	5.64	3.65	0.49	0.33	-	0.66	0.16	-	-	-		0.83	0.16	0.49	0.16	-	0.33	-
	Mogpo	7.46	3.28	4.18	1.19	0.29	0.29	0.89	-	-	-	-		0.89	-	0.59	-	-	-	-
	Sunchon	12.46	6.92	5.53	0.69	0.34	0.34	2.07	0.34	-	-	-		1.03	0.34	0.34	-	-	-	-
	Yeosu	4.39	4.39	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	GukSeong	3.77	3.77	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Go Hung	5.32	5.06	0.26	-	-	-	0.26	-	-	-	-		-	-	-	-	-	-	-
	Gang Jin	5.04	4.70	0.33	-	-	-	0.33	-	-	-	-		-	-	-	-	-	-	-
	Hae Nam	6.14	5.76	0.38	-	-	-	0.38	-	-	-	-		-	-	-	-	-	-	-
	Young Kwang	12.74	6.34	6.40	0.77	0.59	0.10	1.61	0.59	0.14	0.02	-		1.04	0.32	0.48	0.28	0.30	0.10	0.02
		18.28	7.89	10.39	1.24	0.89	0.22	2.45	0.93	0.26	0.04	-		1.78	0.53	0.71	0.40	0.57	0.22	-
	Daegu	8.53	5.26	3.26	0.36	0.36	-	1.27	0.36	-	-	-		0.54	0.18	0.18	-	-	-	-
Gyeong-Bug		9.13	6.32	2.81	0.35	0.35	-	0.70	0.35	-	-	-		0.35	-	0.35	0.35	-	-	-
	Gimcheon	9.96	3.76	6.20	1.10	0.66	-	1.32	0.66	0.22	-	-		0.88	0.44	0.44	-	0.44	-	-
	Gyeongju	4.54	3.71	0.82	-	-	-	0.82	-	-	-	-		-	-	-	-	-	-	-
	Po Hang	9.00	5.84	3.16	0.48	0.24	-	0.73	0.24	-	-	-		0.24	0.48	0.48	-	-	-	-
	Eiseong	5.90	4.51	1.39	-	-	-	-	-	-	-	-		0.34	-	0.34	0.69	-	-	-
	Antong	7.62	4.63	2.98	-	-	-	1.32	0.33	-	-	-		0.33	-	0.33	0.66	-	-	-
	Young Ju	6.80	6.80	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Moon Gyeong	10.92	10.92	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Bulju	9.18	5.28	3.90	0.51	0.30	0.12	1.00	0.33	0.12	0.03	-		0.48	0.21	0.39	0.06	0.21	0.06	0.03
	Eulneung	13.00	6.37	6.62	0.92	0.50	0.16	1.59	0.67	0.16	0.08	-		0.83	0.33	0.50	0.16	0.41	0.08	-
		7.15	4.38	2.77	0.43	0.14	0.14	0.87	0.14	-	-	-		0.43	0.14	0.43	-	-	-	-
	Mosan	3.97	3.70	0.26	-	-	-	0.26	-	-	-	-		-	-	-	-	-	-	-
Gyeong-Nam		6.69	5.51	1.18	-	-	-	0.39	0.39	-	-	-		-	-	0.39	-	-	-	-
	Hapcheon	8.03	6.03	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Chungmu	8.92	8.68	5.24	0.58	0.58	0.19	0.97	0.19	0.38	-	-		0.58	0.38	0.58	-	0.38	0.19	0.19
	Goje	8.52	7.81	0.71	-	-	-	0.71	-	-	-	-		-	-	-	-	-	-	-
	Rulsan	12.83	8.55	4.27	0.95	0.23	0.23	1.18	0.23	0.23	-	-		0.71	0.23	-	-	0.23	-	-
	Samchunpo	16.71	10.49	6.21	1.16	0.38	0.38	1.94	0.38	0.38	-	-		0.77	0.38	-	-	0.38	-	-
		6.72	5.55	1.22	0.61	-	-	-	-	-	-	-		-	-	-	-	-	-	-
	Bukjeju																			
Jeju																				
	Namjeju																			

SOURCE: Ministry of Health and Social Affairs, National Medical Facility Survey Report, 1977.

PHYSICIAN DISTRIBUTION BY DISCIPLINE AND SIZE OF HOSPITAL

	— 50	51 - 100	101 - 150	151 - 200	251 - 300	301 +
Internal Medicine	24.6	14.1	21.6	19.5	18.6	14.3
Pediatrics	4.6	6.2	11.8	11.5	10.2	12.1
Neuro-psychiatry	-	3.1	-	2.3	7.2	4.8
General Surgery	21.5	12.5	17.6	18.4	10.8	11.9
Orthopedic Surgery	6.2	6.2	9.8	8.0	9.0	9.5
Neuro-surgery	1.5	1.6	3.9	3.4	6.0	5.0
OB - GYN	18.5	9.4	7.8	11.5	9.6	11.7
Ophthalmology	-	4.7	2.1	2.3	4.2	5.5
ENT	3.1	4.7	7.8	4.6	6.6	5.9
Dermatology	-	1.6	3.9	3.4	4.2	5.5
Urology	-	3.1	2.0	6.7	6.0	5.0
Dentist	4.6	4.7	7.8	5.7	2.4	1.4
Others	15.4	28.1	3.9	3.7	5.2	7.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

SOURCE: The Data from the KHDI Hospital Feasibility Survey.

PROFESSIONALLY ACTIVE PHYSICIAN BY CITY/PROVINCE

City/Province	Population	No. of physician	Persons/Physician	MC/100,000 prs.
TOTAL	35,341,016	11,734	3,012	32.2
Seoul	7,254,958	5,954	1,219	82.1
Busan	2,573,713	1,272	2,023	49.4
Gyeonggi	4,150,324	754	5,504	18.2
Gangweon	1,842,363	323	5,704	17.5
Chungbuk	1,513,465	168	9,009	11.1
Chungnam	2,960,590	505	5,863	17.1
Jeonbug	2,445,149	442	5,532	18.1
Jeonnam	4,001,698	714	5,605	17.8
Gyeongbug	4,902,059	1,091	4,493	22.3
Gyeongnam	3,275,867	435	7,531	13.3
Jeju	420,830	76	5,537	18.1

SOURCE: Present Status of Medical Administration, published by Ministry of Health and Social Affairs on Oct. 1978, p. 27.



NUMBER OF PHARMACISTS BY PROVINCE

	Total	Open pharmacy or work at pharmacy	Manufacture/ wholesale	Hospital	Education and others
Seoul	8,283	4,658	861	219	2,545
Busan	1,536	1,135	70	45	286
Gyeonggi	1,263	966	130	21	146
Gangweon	341	295	9	11	26
Chungbug	274	229	6	6	33
Chungnam	648	518	53	10	67
Jeonbug	565	451	25	15	74
Jeonnam	900	681	42	26	151
Gyeongbug	1,501	1,119	57	37	288
Gyeongnam	574	476	20	8	70
Jeju	117	93	1	4	19
	16,002	10,621	1,274	402	3,705

PER PHYSICIAN PRODUCTIVITY BY SIZE OF HOSPITAL (Inpatient Cases) (Unit : Cases/Year/Physician)

	- 50	51 - 100	101 - 150	151 - 200	250 - 300	301 +
Internal Medicine	186	160	79	167	373	141
Pediatrics	205	62	66	225	303	131
Neuro-psychiatry	-	9	-	67	100	49
General Surgery	241	199	193	104	241	84
Orthopedic Surgery	321	390	52	96	443	57
Neuro-Surgery	574	90	79	128	565	114
OB - GYN	193	121	158	7	110	100
Ophthalmology	56	14	6	37	48	36
ENT	-	30	152	88	300	57
Dermatology	-	-	5	8	126	9
Urology	-	8	63	28	264	42
Dental(Jaw Surgery)	-	8	6	2	27	19

SOURCE: The Data from the KHDI Hospital Feasibility Survey.

PER PHYSICIAN PRODUCTIVITY BY SIZE OF HOSPITAL(OPD) (Unit : Cases/Year/Physician)						
Discipline	- 50	51 - 100	101 - 150	151 - 200	251 - 300	301 +
Internal Medicine	7,847	6,167	5,061	3,786	1,798	2,593
Pediatrics	9,128	2,881	4,535	4,702	1,187	1,329
Neuro-Psychiatry	-	1,959	-	1,702	993	1,331
General Surgery	6,023	2,813	2,674	1,498	370	552
Orthopedic Surgery	7,411	4,781	1,868	1,940	883	336
Neuro-surgery	-	190	1,279	2,214	940	743
OB - GYN	3,795	2,093	3,543	3,463	803	1,155
Ophthalmology	3,089	1,573	1,530	6,265	1,960	1,822
ENT	-	2,723	2,642	6,905	2,262	2,468
Dermatology	-	1,082	5,122	6,412	1,571	2,268
Urology	-	995	2,799	2,418	1,181	1,148
Dental	-	1,730	3,490	3,537	2,338	6,273

SOURCE: Data from the KHDH Hospital Feasibility Survey.

MANPOWER AND BED UTILIZATION STATUS in 1978

	No. of Beds	Bed Occup. Rate	Average Hospital Stay	Bed to Manpower		
				M.D.	Nurse	Others
Busan National Univ.	295	99.3	19.3	0.54	0.43	0.61
ChungNam National Univ.	230	99.7	13.9	0.55	0.39	0.58
JeonBug National Univ.	286	52.1		0.30	0.31	0.44
Vincent(Chatholic Med. Col)	195	82.8	9.2	0.22	0.84	0.89
Busan Merinol	320	90.3	11.4	0.23	0.65	0.68
JangSeong	180	84.4	24.2	0.09	0.32	0.63
National Busan	105	46.5	17.6	0.21	0.31	0.50
Pohang Chatholoc	100	58.1		0.18	0.80	1.01
TongHea Medical Center	130	24.9	5.0	0.10	0.28	0.47
Andong Provincial Hosp.	45	42.6	8.8	0.18	0.24	0.51
Jinjiu Provincial Hosp.	14	36.7	8.5	0.50	0.86	1.29
HamJung (Seoul)	66	66.7	12.0	0.09	0.29	0.62
Geongju Christian Hosp.	40	44.5	4.2	0.15	0.78	0.95
Seoul Samil	33	22.1	3.6	0.12	0.45	0.42
AnYang Tongil	30	69.7		0.13	0.43	0.63
Boeun Chatholic	20	32.2		0.25	0.35	0.50
Seoul Shinjiung	20	42.5		0.30	0.30	0.60
AVERAGE	General Hospital			0.32	0.49	0.64
	Provincial Hospital			0.11	0.24	0.40
	Private Hospital(Small)			0.12	0.36	0.54

KHDI Survey Result

HOSPITAL MANPOWER PER 100 OCCUPIED BEDS BY SIZE OF HOSPITAL

	Physician (w/o res. and intern)	Dentist	Pharmacist	Nurse and Nurse-aid	Tech.	Administ.	Other Employee	Total Manpower
< 50	43	0.8	10	136	25	47	88	354
50-100	27	1.1	5.8	94	15	35	67	252
101-150	19	1.3	4.8	80	9	21	56	208
151-200	15	1.6	3.6	84	11	27	64	229
201-250	20	0.8	4.2	73	10	25	37	210
251-300	17	1.3	4.5	74	13	28	76	250
301-350	17	1.0	3.9	70	11	20	56	212
351 +	18	1.3	4.8	69	15	21	51	180
<b>TOTAL</b>	<b>20</b>	<b>1.3</b>	<b>4.8</b>	<b>80.3</b>	<b>13</b>	<b>25</b>	<b>59</b>	<b>232</b>

SOURCE: National Medical Facility Survey, 1976, MOHSA.

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