Proceedings of Workshop
on
Health Manpower Planning
– Dental Health and Oriental Medicine Manpower, Medical Technicians and Nurse Aides –

Seoul, 25-26 July 1989

Korea Institute for Health and Social Affairs

PREFACE

This report contains the results of the Workshop on Health Manpower Planning which was held at the Ramada Olympia Hotel, Seoul from 25-26 July 1989.

The main objective of the workshop was to exchange information and views among representatives of professional organizations, government officials and scholars on the supply and demand of health manpower. Types of manpower included for the Workshop were dentist, oriental medical doctor, dental technician, dental hygienist, laboratory technician, radiological technician, physical therapist, nursing aide which have never been included in the socio-economic development plan.

The information collected and pigeonholed throughout the Workshop will be utilized effectively by the Korea Institute for Health and Social Affairs (KIHASA) in conducting a comprehensive study on health manpower planning in 1990.

I would like to express my sincere appreciation to the organizations concerned and officials of the Ministry of Health and Social Affairs (MOHSA) who have exerted their best efforts to make this workshop as successful one. Financial support provided by WHO is deeply appreciated. My thanks also go to KIHASA researchers involved in workshop actively not only in organizing and conducting the workshop, but also for writing up the report.

September 1990

Dal-Hyun CHI
President
Korea Institute for Health and
Social Affairs

CONTENTS

1. Background and Objectives

Increased demand for health care service, development of medical treatment technique and rising peoples' expectation on health and medical care bring forth the increased need for health manpower, the providers of medical services. Therefore, the manpower planning based upon the forecast of manpower supply and demand is essential to not only effective functioning of health and medical care system but also preventing wasting manpower.

Responding to this need, the KIHASA plans to conduct a research on health manpower planning in 1990 which will be reflected in the Seventh Five-Year Socio-Economic Development (1992-1996) Plan. It will be a comprehensive study in terms of types of health manpower to be included in the study.

However, we are aware of the fact that it is impossible to draft practical and rational health manpower planning only by the researchers of a specific research institute due to their subjective judgements. It is important that interests and views of the policy makers, consumers, scholars and professional groups are to be reflected in order to make the plan applicable. Positive cooperation of the professional organizations is essential and the policy makers should be able to remove any administrative obstacles in implementing the plan. Whereas the professional groups are tend to overemphasize the quality of medical care and be skeptical on quantitative increase in manpower planning, the policy makers from the consumer's point of view pay more attention on providing basic medical care and facilitating convenience for medical care utilization through quantitative increase of the manpower.

Therefore, it is necessary to collect different views and interests of the various circles before drawing up a workable manpower planning. Organizing a workshop may serve this purpose best. We have an experience of conducting a workshop in 1985 to collect and converge the views of the various circles for the manpower planning of medical doctors, nurses and pharmacists. Outcomes of the workshop was incorporated in the manpower planning study and in turn the result was reflected in the Sixth Five-Year Socio Economic Development Plan (1987-1991). This workshop was planned in this context as a part of the research procedure. It is noteworthy that this workshop deals with health manpower such as dentists, oriental medical doctors, dental hygienists, dental technicians, laboratory technicians, radiological technicians, physical therapist and nursing aides who are small in number and have received little attention from the policy makers in the past. Particularly, roles and tasks of the medical technician and nursing aide are different depending on whom they work for (doctors, dentists or oriental medical doctors) and there are role conflicts between adjacent types of manpower. It was expected that the workshop could contribute to realign their roles and functions and take measures for effective utilization of their expertise. The workshop was organized on the ground of the above-mentioned background and needs. Financial assistance from WHO enabled us to conduct this workshop.

Main objective of this workshop is to exchange and collect views of the representatives of professional organizations, academic circles and policy makers as part of the long term projection of health manpower demand and supply which will be conducted in 1990 by the KIHASA. Detailed objectives of the workshop are as follows:

(1) to set up policy directions for dental health and oriental medicine under national health insurance,

(2) to analyze and project supply and demand of dental health manpower (dentists, dental hygienists and dental technicians),

(3) to analyze and project supply and demand of oriental medicine doctors,

(4) to analyze and project supply and demand of medical technicians (laboratory technicians, radiological technicians and physical therapist), and

(5) to suggest policy alternatives for the health and medical care plan.

2. Planning and Organizing Workshop

a. Workshop Organizing Committee

According to the above mentioned objectives of the workshop, the officials of the MOHSA and professional organizations concerned participated actively from the planning stage. The workshop preparatory committee were consisted of research team of the KIPH, representative of professional organizations and the officials from the Division of Medical Systems, MOHSA.

Preparatory committee met twice on 9th and 23rd of June 1989. At the first meeting, characteristics of workshop, number of papers to be presented, writers of the papers, panelists and guidelines for preparing papers were introduced. Matters on workshop programme, date, place, participants, and chairpersons for the plenary and forum sessions were discussed and decided at the second meeting. In addition, speakers and chairpersons for the forum met on July 7. At the meeting speakers introduced outlines of their papers to be presented and chairpersons were introduced the major topics to be discuss-

ed at the forum. They also exchanged views how to maintain consistency in terms of contents throughout paper presentation and forum session and how to use limited time for discussion effectively to meet the objectives of the workshop. Since paper presentation and forum discussion are the important parts of the workshop, guidelines were prepared and distributed to the speakers and chairpersons. They are as follows:

Guidelines for Paper Preparation

1) Change of the medical care system and adjustment of roles and functions of the specific health manpower

a) Preface

(1) Enforcement of the national health insurance system

- Increase of demand for health services and promotion of equity and efficiency

(2) Historical development of the specific health manpower in terms of number, role and function

(3) Functional conflicts and cooperation with adjacent manpower

(4) Policy directions for future manpower planning

b) Presentation of problems

(1) Lack or oversupply of manpower

(2) Unbalanced distribution of manpower by region, age and others

(3) Low utilization of manpower and productivity

(4) Inappropriate employment and promotion system

(5) Lack of continuing education and supervision

(6) Bad working conditions including payment

(7) Other pending problems

c) How to solve the problems

(1) Role of the government

(2) Role of the colleges and training institutions

(3) Role of the professional groups concerned

2) Supply and demand projection of health manpower

a) Analysis of supply

(1) From the time of government establishment (1948) to the present

(2) Increase
(numbers of training institutions, incoming students and graduates, successful applicants of national examination and licensees, etc.)

(3) Attrition
(death, emigration, retirement, change of occupation)

(4) Present employment
(age, region, work place, unemployment, etc.)

b) Projection of supply

(1) 1989-2005

(2) Increase

(3) Attrition

(4) Baseline projection (based on the present supply)

c) Analysis and projection of demand

(1) Place of employment, role and function, and productivity

(2) Assumption of demand projection

d) Unbalance between supply and demand, and measures to solve unbalance

(1) Alternative projection (based on the adjusted number of supply)

(2) Personnel management (on the job training, inter-regional disposition and employment, etc.)

e) Conclusion and recommendation

Guidelines for Forum Discussion

1) Future direction for health policy and demand for manpower

(Example)

a) Objectives of dental health

b) Problems of dental health-incidence and prevalence rate, care demand

c) Direction for improvement of dental service

- General dental service
- Community dental service
- Hospital dental service

Review of treatment system

- Treating pain
- Repair service
- Fluoridation

→ Prevention

Compensation system such as providing incentives for preventive service

d) Preventive, Curative, Restorative — Service — Definition of tasks to be performed; Type and number of manpower and their educational requirements; Projection of manpower requirement

2) Problem of unbalance and its solution

a) Definition of unbalance

(1) Number, type, function and quality of manpower

(2) National manpower requirement

- ability to employ, support and maintain

(1) and (2) — Discrepancy between these two components

b) Indicators for unbalance

(1) Unbalance in number and distribution

(a) Disagrement in training and job requirements

(b) Under or over-supply compared to a specific norms

(c) Unbalanced distribution

- Region - among cities and provinces, urban and rural
- Types of manpower - between the medical doctor and the nurse and between the dentist and the allied health workers
- Area of speciality - distribution between medical specialist and general practitioner

  - distribution among medical specialists

- Medical institutions - staffing pattern by institutions (market force such as locations, size and prestige)

c) Qualitative unbalance

- o Underqualification (undertraining)
  - Lack of abilities in fulfilling responsibility
    (reasons: inappropriate standard for admission, low level of training, lack of on-the-job training, etc.)
- o Overqualification (overtraining)
  - Over specialization or over supply
- o Misqualification - training program which does not meet the community demand

3) Measures to be taken

a) long-term preventive measures

b) short-term curative measures

b. Workshop Programme and Participants

The workshop was held at the Ramada Olympia Hotel, Seoul, July 25-26,1989. However, the actual duration of the workshop for a group of manpower was one day due to the fact that all the participants were devided into four groups and each group proceeded their own workshop independently. The four groups were dental health manpower (dentist, dental hygienist and dental technician), oriental medical doctor, medical technicians (laboratory technician, radiological technician and physical therapist) and nursing aide.

There were paper presentations and panel discussion in the morning session. Most of the morning hours were shared for expressing professional organizations' views on supply and demand of the health manpower. Afternoon session was used for exchanging views among the participants from various fields based on paper presentation and panel discussion of the morning session was

proceeded by the forum chairperson according to his pre-arranged topics for discussion and conclusions were made by summing up the views expressed by the participants.

Workshop schedule and contents by topics as well as list participants are as follows:

Supply and Demand Projection
for
Dental Health and Oriental Medicine Manpower
July 25, 1989
The Ramada Olympia Hotel, Seoul

09:00-09:30 Registration

09:00-10:00 Opening Ceremony

Opening address by Dr. D.H. CHI, President of KIPH

Encouragement remarks by Dr. W.H. YOO,
Director-General, Bureau of Medical Affairs,
MOHSA

Congratulatory remarks by Mr. Julien F. Bertaux,
WHO Representative

10:00-10:20 Recess

(Subcommittee for Oriental Medical Doctor Manpower)

1. Paper Presentation and Panel Discussion

Chairperson: Dr. I.S. KIM, Dean,
Graduate School of Health Science
and Management, Yonsei University

10:20-11:00 Paper Presentations

(1) "Change of Medical Care System and Roles and Functions of Oriental Medical Doctor"

by Mr. H.Y. CHOI
Vice-President, Seoul Special
City Oriental Medical Doctor's
Association

Paper Presentation

(2) Supply and Demand Projection of Oriental Medical Doctor"

by Prof. K.H. KIM
College of Oriental Medicine,
Kyunghee University

11:40~12:20 Panel Discussion

Panelists: Dr. S.I. LEE, Dean,
College of Oriental Medicine
Kyunghee University

Mr. C.H. PAHN
Editor-in-Chief
The Oriental Medical Doctors' Association News

12:20~13:30 Lunch

13:30~15:30 2. Forum

Chairperson: Prof. K.S. LEE
College of Health Science
Yonsei University

15:00~15:30 Recess

15:30~18:00 Continuation of Forum

18:00~18:30 Recess

18:30~ Reception

(Subcommittee for Dental Health Manpower)

1. Paper Presentation and Discussion

Chairperson: Dr. C.T. KIM
Vice President
KIHASA

10:20-10:50 Paper Presentation

(1) "Change of Medical Care System and Supply and Demand Projection of Dentists"

by Dr. C.R. KIM
President
Dental Health Society

Paper Presentation

(2) "Supply and Demand Projection of Dental Technician"

by Prof. P.K. LEE
Taejon Junior College of Public Health

Paper Presentation

(3) "Supply and Demand Projection of Dental Hygienist"

by Ms. C.S. OH
Director for Arts and Sciences
Dental Hygienics Technicians' Association

11:50-12:20 Panel Discussion

Panelists: Prof. Y.J. CHOI
Dental College
Kyunghee University

Mr. I. MOON
President
Dental Technicians' Association

Ms. K.S. MOON
President
Dental Hygienist Association

12:20-13:30 Lunch

13:30-15:00 2. Forum

Chairperson: Dr. K.Y. SONG
Director
Health System Research Division
KIHASA

15:00-15:30	Recess
15:30-18:00	Continuation of Forum
18:00-18:30	Recess
18:30-	Reception

List of Workshop Participants

1. Subcommittee for Dental Health Manpower (25 persons)

Professional Organizations:

C.R. KIM, President, Dental Health Society

C.H. LEE, Vice-President, Dentist Association

K.H. KIM, Director, Dentist Association

P.K. LEE, Professor, Taejon Junior College of Public Health

I. MOON, President, Dental Technicians' Association

H.M. KWON, Vice-President, Dental Technicians' Association

C.S. OH, Director for Arts and Sciences, Dental Hygienists' Association

K.S. MOON, President, Dental Hygienists' Association

S.H. KIM, Honorary President, Dental Hygienists' Association

Academic Circles:

H.S. MOON, Professor, Seoul Dental College, Seoul National University

Y.J. CHOI, Professor, Dental College, Kyunghee University

O.R. MOON, Professor, Graduate School of Public Health, Seoul National University

H.J. PARK, Dean, Graduate School of Public Health, Inje University

K.H. KIM, Professor, Graduate School of Public Health, Inje University

Governmental Organizations:

W.H. YOO, Director-General, Bureau of Medical Affairs, MOHSA

T.S. SONG, Assistant Director, Medical Administration Division, MOHSA

C.P. KIM, National Institute for Health

K.H. MIN, YunChon County Medical Centre

Mass Media:

C.Y. ROH, Chief Reporter, the Hoosaeng Shinbo (Welfare News)

P.Y. CHUN, Chief, Public Relations Section, The Chisi Shinbo (Dentist News)

KIHASA:

C.T. KIM, Vice-President

K.Y. SONG, Director, Health Systems' Research Division

H.A. PARK, Senior Researcher

K.S. KIM, Researcher

Y.W. PARK, Researcher

List of Participants

2. Subcommittee for Manpower of Oriental Medical Doctor (25 persons)

Professional Organizations:

K.H. KIM, Professor, Oriental Medical College, Kyunghee University

H.Y. CHOI, Vice-President, Secul Special City Oriental Medical Doctor's Association

S.I. LEE, Dean, Oriental Medical College, Kyunghee University

Y.A. CHO, President, Korean Oriental Medical Doctors' Association

S.H. PAI, Vice-President, Korean Physical Therapists' Association

S.K. YUM, Korean Medical Record Association

C.I. SUH, President, Korean Clinic Pathology Technicians' Association

K.T. ROH, Vice-President, Korean Medical Association

K.S. KIM, Director, Policy and Planning Office, Korean Pharmacists' Association

Academic Circles:

I.S. KIM, Dean, Graduate School of Public Health, Yonsei University

C.Y. PARK, Professor, Graduate School of Public Health, Kyungpuk University

Y.I. CHUNG, Professor, Department of Health, Inje University

Governmental Organizations:

C.S. SONG, Director, Medical Systems Div., MOHSA

S.H. HWANG, Medical System Div., MOHSA

Y.H. KIM, Assistant Director, Social Development Div., Economic Planning Board

N.Y. PARK, National Institute of Health

Y.S. CHANG, National Institute of Health

Mass Media:

C.H. PAHN, Editer-in-Chief, The Hanuisa Hyupbo (Oriental Medical Doctor's Association News)

I.W. YU, Editer-in-Chief, The Uihyup Shinbo (Medical Doctor's Association News)

KIHASA:

S.I. JOO, Senior Research Fellow

S.C. KIM, Senior Researcher

Y.I. KIM, Senior Researcher

C.K. YOON, Researcher

Y.H. OH, Researcher

Supply and Demand Project
for
Medical Technician Manpower and Nursing Aide Manpower
Wednesday, 26 July 1989
The Ramada Olympia Hotel, Seoul

09:00~09:30 Registration

09:30~09:40 Opening Ceremony

Opening address by Dr. D.H. CHI, President of KIHASA

09:40~10:00 Recess

(Subcommittee for Nursing Aide Manpower)

1. Paper Presentation and Discussion

Chairperson: H.J. PARK, Dean
Graduate School of Public Health
Inje University

10:00~10:40 Paper Presentation

"Supply and Demand Projection of Nursing Aide"

N.Y. PARK, Officer in Charge
of Health- Nursing Science,
National Institute for Health

10:40 Panel Discussion

Panelists: K.J. LEE, President
Korea Nursing Aide's Association

C.H. PARK, Director
Korea Nurses' Association

I.K. HWANG, Senior Researcher
Research Institute for Hospital
Seoul National University

C.H. WI, President
The Korean Council for Nursing
School Principals

12:00-13:00 Lunch

13:30-15:00 2. Forum

Chairperson: O.R. MOON, Professor
Graduate School of Public Health
Seoul National University

15:20-18:00 Continuation of Forum

18:00-18:30 Recess

18:30- Reception

(Subcommittee for Manpower of Medical Technician)

1. Paper Presentation and Discussion

Chairperson: J.S. SHIN, Director
Severance Hospital,
Yonsei University

10:00-10:30 (1) Supply and Demand Projection for the Radiological Technician

D.K. KWON, Director for Arts
and Science, Korean Radiological
Technicians Association

(2) Supply and Demand Projection for the Physical Therapist

J.H. CHANG, Professor
Wonkwang Junior College of Public
Health

11:00-11:30 (3) Supply and Demand Projection for Laboratory Technician

S.C. HWANG, Dean
Junior College of Public Health
Korea University

11:30-12:00 Panel Discussion

H. CHUNG, President
Korea Radiological Technicians
Association

H.C. SHIN, Professor
Junior College of Public Health
Wonkwang University

J.I. SUH, President
Laboratory Technicians'
Association

12:00-13:30 Lunch

13:00-15:00 2. Forum

Chairperson: C.Y. PARK, Professor
Junior College of Public Health
Kyungpuk University

15:00-15:20 Recess

15:20-18:00 Continuation of Forum

18:00-18:30 Recess

18:30- Reception

List of Workshop Participants

1. Subcommittee for Medical Technician Manpower (26 persons)

Professional Organizations:

J.I. SUH, President, Laboratory Technician's Association

C.M. LEE, Vice-President, Laboratory Technician's Association

S.C. HWANG, Professor, Junior College of Public Health, Korea University

C.S. KIM, President, Physical Therapists' Association

H.C. SHIN, Vice-President, Physical therapists' Association

J.O. CHANG, Professor, Wonkwang Junior College of Public Health

H. CHUNG, President, Radiological Technicians' Association

S.Y. KWAK, Vice-President, Radiological Technicians' Association

D.K. KWON, Director for Arts and Science, Radiological Technicians' Association

M.R. PARK, Korean Medical Records Association

S.K. YOM, Korean Medical Records Association

Academic Circles:

C.Y. PARK, Professor, Graduate School of Public Health, Kyungpuk University

S.I. KIM, Professor, Department of Clinic Pathology, Seoul Medical College

A.R. KOO, Professor, Health and Science College, Yonsei University

J.S. SHIN, Director, Severance Hospital, Yonsei University

K.H. KIM, Professor, Graduate School of Public Health, Inje University

S.M. CHANG, Director, Office of Occupational Technical Training Research, Korea Educational Development Institute

Governmental Organization:

J.S. SONG, Director, Medical Administration Div., MOHSA

S.H. HWANG, Medical Administration Div., MOHSA

Mass Media:

Y.H. KIM, The Pyungwon Shinbo (Hospital News)

S.C. YOON, The Pokun Shinbo (Public Health News)

J.S. CHANG, The Pyungri Hyupbo (Pathological Association News)

KIHASA:

K.Y. SONG, Director, Health System' Research Division

H.A. PARK, Senior Researcher

Y.W. PARK, Researcher

Y.H. OH, Researcher

2. Subcommittee for Nursing Aide Manpower (23 persons)

Professional Organizations:

K.J. LEE, President, Nursing Aide Association

P.E. LIM, Conference for Nursing School Principal

S.E. CHOI, Executive Director, Nursing Aide Association

C.E. LEE, Chairman, Korean Oriental Medicine Society

K.C. CHOI, Director, Korean Dentists' Association

M.H. ROH, Korean Nurses' Association and Director, Department of Nurse, Hanyang University Hospital

Academic Circles:

O.R. MOON, Professor, Graduate School of Public Health, Seoul National University

C.H. PARK, Professor, Nursing Department, Seoul National University

H.J. PARK, Dean, Graduate School of Public Health, Inje University

K.S. LEE, Professor, Health and Science College, Yonsei University

Y.I. CHUNG, Professor, Department of Health, Inje University

I.K. HWANG, Research Institute for Hospital, Seoul National University

Governmental Organizations:

T.S. SONG, Assistant Director, Medical Administration Div., MOHSA

K.H. SUH, Medical Administration Div., MOHSA

N.Y. PARK, National Institute of Health

I.H. MOON, Director, Chongro-ku Health Center, Seoul

H.R. CHO, Social Education Promotion Div., Ministry of Education

Mass Media:

K.A. KIM, Reporter, The Kanhyup Shinbo (Nursing Association News)

Y.H. WON, Reporter, The Kanho Zomusabo (Nursing Aide News)

KIHASA:

J.S. KIM, Senior Research Fellow

Y.I. KIM, Senior Researcher

K.S. KIM, Researcher

C.K. YOON, Researcher

3. Supply and Demand Projection of Dental Health Manpower

a. Summary of Paper Presentation

Chairperson: Dr. C.T. KIM
Vice-President
KIHASA

1) Dentist

Presented by Dr. C.Y. KIM
President
Dental Health Society

- In setting the future policy directions for dental health, there are many factors to be taken into consideration. They are; dental diseases' contraction rate, economic condition, national medical expenses, degree of peoples' knowledge and awareness on the dental health, priorities of the dental health programme, health care delivery system, medical insurance system, school dental health population distribution by region, distance to the dental clinic (geographical accessibility), distribution of dental clinics, etc..

- Incidence and prevalence rates of dental diseases have been increased as the parts of chronic and geriatric diseases due to lengthening of average life expectancy.

- It is not long since the occidental dental care was introduced to Korea. The Western European countries are maintaining high level of dental care in terms of medical technology whereas Korea is still far behind as far as dissemination of the dental health system and dental health care is concerned.

- There is not any post which is solely responsible for dental health policy in the national government. Thus dental health has been treated as a part of general medical care, without paying any special attention on the characteristics of the dental care. In addition, dental health has been given low priority among public health programmes.

- Though a Korea's rate of decayed, missed and filled teeth (DMFT rate) is similar to that of Japan, the rate of keeping permanent teeth is quite lower compared to Japan. Eventhough the need of dental treatment is high, the level of demand is still low.

- There are ten dental schools in total. Seven of them were either authorized or founded in 1970's. The admission quota was 180 in 1972 and was increased to 1,040 in 1981. The number, however, was reduced to 730 in 1988 by dental schools' own effort. But the problem is that those schools with good educational facilities and faculties have exerted their best efforts in decreasing the number of new students whereas those schools with poor capabilities of education did put in little effort.

- The total number of dentist in Korea in 1985 was 4,790 and the ratio of dentist per 100,000 population was 11. This is expected to be increased to 39 by the year 2005.

- The average ratio of dentist per 100,000 population of the advanced countries is ranging from 35 to 50. It can be identified the shortage of dentists in Korea by looking at this index. However, this method is quite unrealistic. In reality, ratio of dental treatment among the Korean children and the frequency of their visits to the dental

clinics are very low. Demand for dentists are correlated with the national income. Those countries with national income which is similar to that of Korea show almost same ratio of population per dentist.

- The average number of daily examination and treatment per dentist is 10. This is less than the number of services which a dentist can provide, which is estimated from 16 to 24 cases.

- According to Boston theory, over supply of dentists have led to unnecessary services which eventually have a harmful effect on dental health.

- In addition to the increase of the number of dentists, upgrading the quality of dentist is very important. The faculties, especially those who are teaching basic knowledge and the educational facilities are far behind the standard. Skill test is to be included in the license examination. There is also a need to implement dental specialist system and to study feasibility of super GP education system to upgrade the standard of dental practitioners.

- The number of freshman quota for dental schools is to be frozen until all the requirements for education are met or reduced according to the ability of educational institutions.

- Eventhough the system of dental hygienist was originally designed to help dentist in dental health programme, they are now utilized as an assistant in dental examination and treatment. But unfortunately, they are not

qualified for assisting treatment due to lack of training. Besides, dental practitioners do not know to utilize them effectively.

2) Dental Hygienist

Presented by Ms. C.S. OH
Director
Dental Hygienists' Association

- o The dental hygienists are taking charge of the works related to prevention of dental diseases and dental hygiene at the general hospitals, dental hospitals and clinics, and public health organizations. Since 1965, two training institution and ten junior colleges of public health have produced dental hygienists and the number of registered licensees totalled 4,777.

- o Five junior colleges of public health for producing dental hygienists were opened in 1970's and five more colleges were added during 1980s. Three more training institutions were established in 1965, 1977 and 1987. The total number of graduates at these educational institutions was ranging from 20 to 43 during 1967-1978. However, the number was increased to 788 in 1988. The cumulative number of graduates totalled to 5,726. The average annual ratio of successful candidate in the national examination is 76 percent during 1975-1988.

- o According to the report received from the members of the Korean Dental Hygienists' Association, employment rate of the dental hygienists was 77 percent and that

of technicians under 26 years old was 85 percent. Particularly, the rate of employment for the newly graduated technician was 94 percent. 64 percent of them were employed either by the dental clinics (35 percent) or the public health centers (29 percent).

- Ideal staffing pattern in terms of effective manpower utilization and allotment of functions is a team consisted of one dentist, one dental hygienist and one aide. Role of dental hygienist within the team is performing the duties related to preventive care and assisting dental treatment.

- The ratio of dental hygienist per dentist in 1988 was 0.62 and that of aide was 0.74. In a near future, one dental hygienist is needed for every dentist. According to this standard, it is estimated that a total of 19,900 dental hygienists will be in need by the year 2005.

- By taking into consideration of the current figures of graduation (933 as of 1989) and the success rate in the national examination (81.0 percent), the number of the licensed hygienists can be estimated as 17,560 by the year 2005. From this figure, the number of employment can be estimated as 10,250 by excluding the losses (emigration and death) and applying the employment rate of 58.4 percent.

- By looking at the discrepancy between demand and supply by the year 2005, the shortage of the technician can be estimated as 2,340 and 9,650 based on the number of licenses and employment respectively.

- In order to increase job opportunities for dental hygienists, following measures are proposed: allowing the married women, to work, providing part time jobs, appointing the dental hygienists at the public health organizations as a regular staff, establishing dental health center at schools, establishing dispensary for dental treatment at the industrial establishments and operating scaling centers.

- In order to promote productivity of the dental hygienists, it is necessary to expand their role and strengthen the on the job training.

- In order to meet the increased demand of the dental hygienists measures such as increasing the number of applicants and training institutions, securing the qualified faculties, extending duration for schooling to four years, strengthening the clinical practice at the dental college hospital, etc. are to be considered.

3) Dental Technician

Presented by Prof. P.K. LEE
Taejon Junior
College of Public
Health

- Dental technicians are responsible for making and repairing dental prosthesis, plug and brace and performing other duties related to dental craftmanship. They are operating their own dental craft shop or being employed by the dental craft shop or being employed by the dental craft section of the hospital or clinic.

- Demand for dental technician in terms of quantity and quality has been increased remarkably owing to the increase of national income and the dental treatment.

- Since dental technicians were trained for the first time in 1965, the number of registered license-holders totalled to 6,641 as of 1989.

- Fourteen junior public health colleges produce 1,238 dental technicians annually. Of 12,318 applicants for the national examination for license, 6,641 persons or 53.9 percent passed the examination during 1965-1988.

- According to information provided by the members of the Korean Dental Technicians' Association, 42.6 percent of them are in their twentieth and 67.3 percent of them are living in four major cities of Seoul, Pusan, Inchon and Taegu. 52 percent of the members are being employed: 22.5 percent of them are working at the dental craft shops; and 77 percent of them are working at the dental hospitals or clinics.

- Demand for dental technicians can be projected by the standards described below:

  a) dental technicians ratio per dentist, and

  b) dental technicians ratio per 100,000 population (mean ratios of 79 countries, 16 advanced countries and 63 developing countries)

  c) level of national income

- Korea's dental technician ratio per dentist in 1989 is 0.79. The average ratio of the ten advanced countries is 0.38.

- The dental technicians' ratio per 100,000 population is 15.4 in 1989 whereas that of the world average is 9.04 - 13.92 for the advanced countries (16 countries) and 0.81 for the developing countries (63 countries).

- Korea's dental technician's ratio per 100,000 population by the unit of GNP per capita 100 dollars was 0.529 and that of the advanced countries (12 countries) was 0.272. Our density of dental technicians in terms of the national income is higher than that of the advanced countries.

- Projected demand for dental technicians based upon the various standards is quite lower than that of the world average. Total number of demand estimated by the ratio per 100,000 population by the unit of GNP per capita 100 dollars was 3,411 whereas the number of registered licensees totalled 6,041, which indicates over supply of the dental technician in 1989.

- The number of dental technicians supply in the year of 2005 is projected at 18,500 by assuming 1,217 graduates per year and 65 percent success rate in the national examination and considering death and emigration. But, the number of the technician demand are projected very low. For instance, when dental technician's ratio per dentist of the advanced countries, 0.38 is applied, the demand will be 8,020; when ratio of dental technician per 100,000 population of the advanced countries, 13.92 is applied, it will be 6,950; and when the ratio of 100,000 population by the unit of income per capita 100 dollars of the advanced countries, 0.272 is applied, it will be 11,500. Therefore, there is a discrepancy between supply and demand projection ranging from 7,000 to 11,550 based upon the baseline projection of supply and above mentioned demand estimates.

- In order to prevent the anticipated over supply, the current number of admission quota is to be reduced by 30 percent and the duration for schooling is to be extended to 3 to 4 years.

- In order to increase the demand for the dental technicians, the fee for performing prosthetics is to be included as one of a medical insurance benefits. And the government should post dental technicians at public health centers and take appropriate administrative actions against about 2,000 unlicensed technicians.

b. Panel Discussion

Panelist: Prof. Y.J. CHOI
Dental College
Kyunghi University

- Current supply and demand of dentist is tallied with the results of the supply and demand survey which was conducted by the Korea Productivity Center in 1982. In determining the proper number of supply of and demand for dentist. Many variables including the rate of dental contraction and the time required for dental treatment are to be taken into consideration. In addition, the examples of other advanced countries and those countries at a comparable level of development are to be referred.

- Spread of the tooth paste containing fluorine was identified as the most influential factor in decreasing the dental contraction at the 1982 Boston conference. Recently, in the United States the number of applicants to dental schools and the number of dental patients were decreased dramatically, which led to voluntary closing

some of dental schools. Japan is also experiencing the decrease of dental patients and has adopted a new policy to reduce the admission quota to dental schools by 20 percent. In Belgium and the Netherlands, for instance, some of dental schools had to close and the dentists should wait 5 years to open their own clinic after graduation from dental school.

o It is very difficult to talk about the supply of and demand for dentist in number however, I share the same view with Professor C.R. Kim in terms of maintaining current rate of supply of and demand for dentists which is also recommended by the Korea Productivity Center.

o In the case of dental technicians, the speaker recommended that fixed admission quota be reduced by 30 percent. It seems that he used examples of the advanced countries in his comparison. And the proposed 30 percent reduction of the number of admissions will have little effect on changing the number of graduates since 800 dentists and 1,320 dental technicians are being newly produced annually. In addition, when we take into account of the total number of dental technicians which already have been produced, attaining 38 percent of the total number of dentists as the level of appropriate number of technicians will hardly be achieved. Further training is to be provided to those who have already graduated so that they could obtain license.

o I agree with the speaker's opinion on the appropriate number of dental technicians, which is 38 percent of total dentists. My research indicated that one third of total dentists would be the appropriate number of dental technicians.

o The speaker has proposed that the duration of schooling for dental technicians and dental hygienists be extended to 3-4 years. The four year of education might be ideal to those who will be teaching. However, extending schooling to three or four years to everyone will not be necessary. Because even the professionals such as the dentists and medical doctors study professional subjects for only four years in addition to 2 years of general education. As a matter fact, about one third of the dental schools in the United States of America have shortened their duration of schooling to 3 years. Therefore, extending the education period to three or four years should be reconsidered carefully.

o In case of dental hygienists, we need to redefine the role of this profession. There are only five more countries with more than 1,000 dental hygienists all over the world in addition to Korea. Currently Korea has 4,777 dental hygienists and the rest of countries with more than 1,000 dental hygienists are U.S.A., England, Canada, Japan and India.

o Most of above mentioned countries have what is called dental chair side assistant totalling five times more than the number of dental hygienists as one of dental health manpower. The role of dental hygienist is limited to preventive activities and another manpower is trained for the purpose of assisting treatment. Australia and New Zealand were cited as examples for role expansion of dental hygienist. We should realize that the actual situation of these countries are totally different from ours. For instance, New Zealand has a

population of only three million with land area which is several times bigger than that of South Korea. It can be easily understood that the role of dental hygienist should be expanded under such a low population density and large area of coverage. In the case of Malaysia, the role of dental hygienist has been expanded due to the relatively small number of dentists. Since each country has its own characteristics, it is not desirable to take a fraction of information in stead of taking into account of all the conditions comprehensively.

o The interpersonal ratio of dentists to dental hygienists is 1:0.31 in the United States and that of Korea is 1:0.62. With this ratio, dental hygienists insist that their role should be expanded to allow them to operate scaling center in addition to performing the job of dental treatment assistant. For better manpower planning of dental hygienist, we need to redefine the role of hygienist at this time.

Panelist: Mr. I. Moon
President
Korea Dental Hygienics
Technicians' Association

o In general, I agree with the contents of papers on the supply and demand projection of the dentist. Even though the rate of disease contraction is high, the over supply of dentist could only cause excessive treatment to limited numbr of dental patients owing to the lack of dental health education.

o Even though I agree with dental technician manpower planning partially, dental technicians are being over-supplied, 2.5 times more than dentists. Besides, we need to worry about the annual production of large number of dental technicians. Even though dental technicians are oversupplied in number in reality, it is hard to secure necessary manpower due to lack of qualified personnel. One of the reasons behind this phenomena is lack of their abilities. For exemple, 1,341 dental technicians applied for the national examination this year and only 342 persons or 25.5 percent passed the examination. In 1968, there were 11 applicants for the examination, only 9.1% of them passed. Those who failed the examination will try next year or go to other profession, which is waste of train-ing.

o Estimation of the number of graduates by year 2005 ?

Perhaps, the number of graduates can be estimated so by taking into account of the national income in reality, there is a problem of eduration. The low success rate of qualifying exam is a problem to all, not only to colleges, but also to parents are the students thomselves. Estimate of the dental technicians is to be made upon the success rate of the national examination from now on.

Panelist: Ms. S.H. Kim
Honorary President
Korea Dental Hygienics
Technicians' Association

o I would like to bring up the matters to be discussed at the afternoon session. When we examine the status of

supply and demand of the dental hygienist and their employment, we feel the necessity of quantitative increase as well as quality upgrading. I would like to hear and discuss about actions to be taken by the administrative authorities on this matter.

- I would also like to discuss about detailed measures to expand the scope of the dental hygienists' responsibilities to meet the increased demand of dental treatment caused by the national health insurance system.

- A panelist brought up a matter of redefining the role of the Korea's dental hygienist. When we talk about dental health team which assist dentist, there are various titles such as the dental hygienist, the dental nurse, the dental therapist, etc.. The scope of their responsibilities in each country are different from other countries. Thus, when we define the role of the dental hygienist, we need to consider the past and present educational background including the curriculum, contents of education and other conditions from the beginning of formal education of dental hygienists rather than copying from the advanced countries. Approximately 5,000 dental hygienists have been produced from 1977. We should trace back to the origin of the title and find out how the title was given and also whether it was followed the pattern of the United States or that of the Japan unique one suited to our own circumstances. And then let's talk about future directions for dental hygienists.

c. Forum

Chairman: Dr. K.Y. Song
Director
Health Systems Research
Division
KIHASA

- o Over supply of health manpower will cause excessive treatment which can be harmful to the dental health. Thus, excessive treatment and creation of a new need will cause medical cost escalation. However, different from this view, the economists will insist the market economy theory which is more supply makes more benefit in cost and accessibility. Usually, opinion of the professional organizations is different from that of the general public. Therefore, how to harmonize the different opinions holds the key to policy making.

- o There is a need to set the objectives of the national dental health programme.

  - Long term objective could be to enable everyone to keep his or her natural teeth throughout his or her life time and short term objective would be "to keep the number of DMFT to two until 12 years old" (it can be achieved by the year 2000 at the earliest).

  - Decreasing the number of DMFT to a certain level is depended upon the degree of development and spread of the dental supplies, and fluoridation of the running water. Therefore, supply and demand of manpower cannot be projected on the basis of the DMFT target, instead, the utilization rate of dental clinic can be used as a target of the programme.

- In Sweden, there is a special dental health education programme for the patients which is called primary preventive dentistry from the level of Maternal and Child Health.

- However, the patients' utilization of the dental clinic does not necessarily reflect the degree of promotion of the fundamental dental health programme since their main purpose to visit dental clinic is to fill decayed tooth. Therefore, making decision as to whether we shall lay our emphasis on treatment or prevention will be the pre-requisite for setting the target.

- In reality, we need to have achievable objectives for the national dental health programme. It is desirable to keep the DMFT ranges from 2.7 to 4.4 until 12 years old as short-term objective and to keep natural teeth throughout the life time as long-term objective.

o Truely speaking, national health insurance system resulted in increasing the demand for dental health programme. However, the speakers and the panelists did not mention anything on this matter.

- The national health insurance system and the increased national income will boost purchasing power of the people, in turn, the gap between need and demand will become narrower while the demand for manpower will increase.

- However, owing to the characteristics of the dental treatment (a) every dental consumer makes more than one visit to the dental clinic, and (b) if the clinic is located within the thirty minutes distance from the consumer's house the consumer will utilize the

clinic more often, it is hardly expected more demand than it is now in the agricultural and fishing communities.

- The peoples' awareness on the dental health is still at a low level. It will take some time before we are able to measure the demand. There are two important things that have to be undertaken; enlightement on the dental health and inclusion of preventive treatment as one of the service item that could be covered under the medical insurance.

- The demand for dental health is expected to be increased to some extent in the long run due to the national health insurance system. In Japan, between 40 to 50 percent of the children under twelve years old are undergoing dental treatment. Even though the demand for dental treatment would be increased in the future, the qualitative promotion is hardly expected.

o The dental health service can be classified into the general dental service, community dental service and hospital dental service.

- General dental service ... the service provided by the dental practitioner.

- Hospital dental service ... the service provided to the patient who require long-term treatment or serious case (the need of this service is being increased, owing to the increase of aged population and diversification of diseases).

- Community dental service ... the service provided to the pregnant women, infants, senior citizens and school children by the community.

o Manpower requirement can be different by way of connecting these dental services.

- Korea introduced the dental specialist system long time ago, but, in reality, the system has not been in operation as yet. Having dental specialist is as important as dental prothesis in maintaining good teeth. From this viewpoint, the increase of insurance benefit for prosthesis and preventive treatment is needed, and specialization of dentistry is to be done as soon as possible.

- The role of public health dentists assigned to the public health centers and the public health sub-centers are ambiguous. Though instructions on the dental health is included in the guidebook published in 1980, it has only stressed upon examination and treatment. Therefore, prevention oriented programme is to be further strengthened at Health Centers, and reinforcement of the equipments is desired at the health sub-center level.

- The dental hygienists at the health center are performing the role of the treatment aide. Though their main function is to conduct dental health education, they are allowed to do so under the supervision of dentists in accordance with the provisions of the Law of Medical Technician. Thus, active participation of dentists in preventive work is important.

- In particular, dentists' preventive work is to be stressed in their curriculum. Preventive dentistry is included in the curriculum of other countries' college education but we do not teach the subject.

- Appointment of a full-time dentist to the public health center instead of public health dentist is desired in order to carry out effective community dental service. Preventive dentistry should be included in the national examination as a part of skill test to be demonstrated by the examinee.

- In order to develop policies on the dental health programme, the responsible post in charge of planning, supply of and demand for dental health manpower is to be created in the MOHSA. At present, an officer in charge of dental health programme at Regional Medical Administration Division, MOHSA, is not the dental health personnel.

- In order to strengthen the functions of dental health programme, appointment of a dental health personnel to the existing organization is a most urgent business prior to creating a new post. The priority of dental health programme has to be readjusted upwardly.

o The roles and functions of dental health manpower, particularly between the dental hygienist and the dental treatment aide are to be clarified.

- It is necessary to discuss whether new assisting manpower for treatment will be developed so that the dental hygienist can be engaged principally in preventive programme or maintain current system as it is.

- Imposing expanded duty of dental health educator and the treatment aide to the dental hygienist is immoderate. The tasks which can be performed with their educational background should be given.

- Supposing that the preventive dentistry were covered by medical insurance, the dental hygienist personnel would be in demand. Therefore, there is a need to develop new aide manpower, so that the functions of dental hygienist and aide should be subdivided. From the dental practitioners' point of view, there is a tendency to utilize the dental treatment aide than the dental hygienist due to personnel expenses. Creation and legistation of the dental aide is being initiated by the Korean Dentists' Association.

- If the dental hygienist were utilized as the treatment aide, clinical practice for the hygienists is to be emphasized. For this end, forming a close linkage with university hospitals is to be studied. Thus there is a need to reclarify job description of the dental hygienist accordingly.

- Since the dental technicians are in oversupply at present, number of the dental technicians can be readjusted by switching admission quota of the dental technician to that of the dental hygienist in 9 junior colleges which are producing both dental technician and hygienist.

- Legalizing the system of the dental aide is to be taken into account after the various actions are taken i.e. improvement of junior colleges' training method and educational facilities, securing the

sufficient number of faculty, clarifying the roles and functions of the dental hygienist, etc.. Dentists' way of thinking needs to be changed before clarifying the role of the dental hygienists.

- The dental hygienists are asking their specialties on quality care and promotion of productivity in dental health to be recognized since they are indispensable element of the dental health team. They are also asserting their functions to be redivided. On the other hand, the dentists are claiming that they actually need the dental aide. Adoption of the dental aide system will have great impact upon the future demand of the dental hygienist.

o In order to strengthen preventive service, incentives are to be given.

- In Sweden capitation payment system is in operation so that the dentists could be payed more by providing preventive services than curative services to certain number of patients. But in Korea, it is rather impossible to adopt the capitation payment system to the dental field alone.

- If the insurance cost for the primary care is readjusted upwardly and, dentist will be concerned and involved in the preventive dentistry would intrigue people. In addition to adjusting medical cost for the preventive and corrective dentistry upwardly, readjustment of existing system of medical cost is inevitable.

- Unbalance of dental health manpower is acute

  - As the standards for demand, projection the ratio of dental hygienist and dental technician to dentist, and international comparison by the level of the national income are being applied but it should be noted that the projection can be different depending on the medical insurance and the peoples' awareness on the dental health. Unbalanced distribution of manpower by region is the common problem to the dentist, the dental technician and the dental hygienist. Distribution of the different types of dental manpower is to be reviewed. Staffing pattern of the dental health manpower by individual organization, for example, hospital, clinic, public health center, are to be reviewed.

  - In addition to quantitative unbalance, qualitative unbalance is also to be reviewed.

    Example:

    Overqualifican of the dental hygienist
    Underqualification of the dental technician
    Misqualification: Three kinds (dentist, dental hygienist and dental technician) of the dental health manpower come under this problem. The contents of the training programme have been set based upon the objectives of the individual educational institution until now,.but preventive dentistry rather than treatment is to be further stressed in matching with the future demand by the community.

- Since statistical reference materials in the area of dental health are scarce. Information collection system is to be created in order to produce highly credible data.
  - We have to develop and create a channel with the support of WHO to provide advices on questionnaire development, survey design, table drawing etc. Also, we need to develop a system to produce statistics on the field of dental health by time and series which will be utilized for planning and evaluation of dental health programme.
  - Demand for the dental treatment is to be analyzed by utilizing medical insurance data by time and series.

d. Subjects for Future Study

- The central figure of the dental health manpower is the dentist. Thus, studies on the norm for the demand projection of dentist is needed. Many factors such as the ratio of dentist per 100,000 population of the advanced countries (35~30), time series analysis of effective demand utilizing the medical insurance data and data on the dental disease contraction, and staffing pattern to promote productivity and quality of treatment by medical facilities are to be taken into consideration in demand projection.

- In estimation the demand for the dental health manpower, types and numbers of manpower requirement ought to be determined by analyzing tasks to be performed based on policy direction for the national dental health programme (objectives of the programme has never been set and the general dental service which is laying the emphasis on

treatment was the core of the programme), types of dental health services- (the general dental service, the community dental service, the hospital dental sevice), and by functions (preventive, curative, restorative service). Particularly, fluoridization of the drinking water is the influential factor to the dental disease contraction and the demand for dental treatment.

- It is projected that the supply of dentists and dental technicians will exceed the demand. However, that of the dental higienist is estimated as insufficient. The outcome of the estimation has to be based upon the demand review, that is, extensive analysis of norm, productivity, expansion of the employment opportunity, and creation of new demand by the medical insurance, supply of resources increased level of population's awareness on the dental health, etc.. In particular, demand of the dental hygienist is depended upon whether a new system of the dental aide will be introduced or not.

- It was felt that conducting thorough analysis on the qualitative unbalance of the dental health manpower such as underqualification, overqualification and misqualification is essential. Based on this analysis, educational requirements of the dental health manpower could be determined and qualified manpower could be supplied. The length of the schooling for the dental technician and the dental hygienist will also be determined on the basis of the research findings.

- Currently, there is no national data on prevalence and treatment needs for dental caries, periodontal disease, dentofacial anomalies, edentulousness, and other condi-

tions available. Information on these subjects are to be collected and analyzed periodically. For data collection, we should seek for feasibility of conducting joint research with the oral health programme of WHO.

- By taking into account of above mentioned pending issues related to supply of and demand for dental health manpower and by utilizing available data effectively we need to review whether peoples' needs are met by the existing dental service. A model for supply of and demand for manpower will be drawn up based on this review for long-term planning and management of manpower.

4. Supply and Demand Projection of the Oriental Medical Doctor

a. Summary of Paper Presentation

Chairperson: Dr. I.S. KIM
Dean
Graduate School of
Public Health
Yonsei University

1) Change of the Medical Care System and Roles and Functions of the Oriental Medical Doctor

Presentation: Mr. H.Y. CHOI
Vice President
Seoul City Oriental
Medical Doctors'
Association

- Until the early part of 19th century Korea's medical care system was entirely relied upon oriental medicine. However, the system was changed to occidental medicine oriented one and the prestige of oriental medical doctors had been gradually faded away due to Japanese invasion and introduction of occidental medicine to Korea. Since the oriental medical doctor system was created by the promulgation of the Law of National Medical care in 1951. The dual medical care system of occidental and oriental medicine have been existing up to now.

- Since the introduction of the medical insurance system in 1977, the government has been making a study on the application of medical insurance system to the oriental medicine due to demand from the citizens and national urgency. A pilot project for the application of the medical insurance system to the oriental medical care was implemented at some local levels in 1984. Benefit

under the medical insurance for the oriental medical care has been extended to all the medical insurance beneficiaries from 1987. When the national health insurance came into operation on 1 July 1989, the insurance benefit for the oriental medical care was also extended to whole nation. However, medical insurance for the oriental medical care is not adequate. Because it has never been taken into account of merits and characteristics of the oriental medical treatment. Without making in depth analysis, the Korean Oriental Medical Doctors' Association with the attitude of "participate first and revise later", only wanting to see if oriental medical care be included as a coverage under the national health insurance. As there still problems exist, the medical insurance for the oriental medical care is neither attracting the general public nor taking root in oriental medical circles as yet. Therefore, it is hard to expect oriental medical manpowers' performing their functions and displaying their skill satisfactorily under the present health insurance system.

- There is a tendency that oriental medical doctors are not following rapid changes of social policies. Existing oriental medical doctors have always been stuck on the traditional practice of medical treatment. Besides, the subjects such as social policy and public health administration related to oriental medicine are not included in the curriculum of the oriental medical school.

- When we talk about the unification of occidental and oriental medicines, there is a tendency to subdivide the components of the oriental medicine and put them

into the frame of existing medical care system. Such an attempt will not be worked out because of the different theoretical background of the oriental medicine which is based on the conception of the wholeness from the human-centerism and its unique physiological and pathological theories from the systematic functionalism. If the unification of the two medicines were materialized, it would only mean absorbing the traditional medicine into the occidental culture and weeding out the traditional medicine. Thus, the community of oriental medicine objects to unification based on worry that a schooling with different view in seeing phenomena of life and theoretical system might be absorbed into another schooling and disappear before the real value of the learning is investigated.

o Problems of health insurance system in relation to oriental medical treatment are as follows: (1) despite of the big difference in conception of terminogy of oriental medicine (i.e., the medical examination and treatment, the basic treatment, initial examination, etc.), terminologies of occidental medicine are being used; (2) a series of medical acts of oriental medicine such as the medical examination, the prescription and dispensing prescription are inseparable. Difference in techniques of and theories on dispensing prescription of oriental medicine should not be ignored. Currently, however, it is difficult to provide qualitative care owing to the limitation in the number of prescription. That is, only 36 kinds of prescription are covered as benefit under the current medical insurance system, and (3) acupuncture which is a

peculiar medical technique to the oriental medicine and to be performed only by oriental medical doctors, occupies lion's share in oriental medical care. However, the accupuncture is being regarded same as intramuscular injection in terms of its cost, which is not reasonable.

o Directions for solving the problems mentioned above can be summarized as follows:

- Including community medicine, public health policy, medical insurance, etc. into the curriculum of oriental medical school.
- Establishing oriental medicine as comprehensive care system with prevention, treatment, and rehabilitation.
- Making proper payment system of the medical insurance in taking account of the characteristics of oriental medicine and reorganization of terminologies of medical insurance related to oriental medicine, improvement of insurance cost for the basic treatment, accupuncture and dispensing prescription, introduction of physical therapy in oriental medicine, and changing the current payment system for the drug from the "prescription name" centered one to the "symptom" centered one.
- Establishment of oriental medical care delivery system, especially seeking for the possibility of linkage with secondary and tertiary occidental health care organizations, rearrangement of oriental medical care function for the primary health care and linkage with occidental care family practitioner.

- Establishment of the national institute for oriental medicine and policy research and mapping out of long-term policies for the pending issues.
- Establishment of the post which will take full charge of oriental medical affairs in the Ministry of Health and Social Affairs and revision of laws and regulations concerned.

2) Supply and Demand Projection of the Oriental Medical Doctor

Presented by Prof. K.H. KIM
Oriental Medical College
Kyunghi University

o Total number of licenses issued to oriental medical doctors was 645 in 1952 and it was increased to 5,663 in 1989. It is estimated that 5,311 persons of them are still alive and residing in Korea.

o 29.3% of the survivors are serving in the army, unemployed, working at public health organizations, or unregistered with the Korean Oriental Medical Doctors' Association. Of the remaining 3,753 persons excluding the inactive manpower: 90.7% is working at oriental medical clinics 7.1% at oriental medical hospitals and 2.3% at educational institutions.

o 92.1 percent of the employed are living in the urban areas, of which 64.6 percent of them are residing in Seoul and five major cities.

o Provided admission quota of five oriental medical colleges is remained as it is, 610 new doctors are expected to

be produced annually from 1995 and a total number of the doctors will become 14,5000 by 2005. However, after considering the numbers of anticipated loss and the unemployed, the number of the employed will be 13,300.

- Demand for oriental medicine is estimated at 17.5 percent of the occidental medical care demand (0.133 visits per person annually). The daily number of patients per doctor are 9.62 at oriental medical hospital and 6.81 at oriental medical clinic.

- In 2004, the demand for oriental medical doctor can be estimated at 13,580 at the maximum on the assumption that the number of visits to the oriental medical institution per person will be increased to 0.2, 0.4, and 0.8 and the number of daily patients per doctor 15 and 20. The estimated number of demand is very close to that of the expected number of the employed (13,300). Estimated demand is based on the assumption that demand would be increased to about 6 times and productivity of doctors would be increased about 3 times in year 2004. Thus, if the assumption does not come true, oriental medical doctor will be oversupplied.

- In order to increase the demand for the oriental medicine, various countermeasures are to be taken. They are review of the medical insurance system for oriental health care introduction of public doctor system for oriental medicine, increase of manpower for army doctor, introduction of oriental medicine specialist system, establishment of oriental medical college in the Seoul National University, establishment of research institute for oriental medicine, securing the faculty members for the oriental medical college, etc..

b. Panel Discussion

Panelist: Prof. S.I. LEE
Dean
Oriental Medical College
Kyunghi University

- Currently, the oriental medical doctors can perform only limited number of tasks by the Law of Medical Treatment.

- The government has not established oriental medical school in the Seoul National University. It implies exclusion of oriental medicine which is our traditional one from the education system of Korea. In addition, owing to the lack of cooperation and coordination between the Ministry of Health and Social Affairs, and the Ministry of Education the manpower supply and demand plan for the oriental medical doctor has not been included in the social security sector of the long-term Socio-Economic Development Plan of the Economic Planning Board.

- Contribution of the oriental medicine towards the nation's public health is hardly expected under the present system. Therefore, there is a need to produce more oriental medical doctors in case of vitalizing both oriental and occidental medicines from an equal standpoint.

- In order to expand oriental medical care through the public health facilities, it is desirable to introduce and utilize public health oriental medical doctor.

- Participation of oriental medical doctor in the army medical services needs to be expanded.

- Best efforts are to be exerted to improve the medical insurance system for the oriental medical care.

Panelist: Mr. C.H. BAN
Chief Editor
The Oriental Medical
Doctors' Association News

- Forty year since introducing oriental medical doctor system is the history that marks the growth of the oriental medicine circles due to continuing effort of their own. The oriental medicine has been systemized and recognized again by the people because of the limit that the modern medicine encountered. With participation of oriental medicine care in the medical insurance system from 1987, a new era of public medical care has begun. Demand for oriental medical care will continuously increase and the era of public demand for the oriental medical care will come soon. In coping with this trend there is a need to develop policies to ensure effective utilization of the skilled manpower of the oriental medicine as well as investment plan for the public sector.

- Since the current ratio of population per oriental medical doctor is 10,000 which is very high, long period of time is required to meet the demand. Demand projection without making positive utilization of manpower is meaningless. Since the oriental medical care is the one which is stood on the basis of the general public, regional unbalance of medical manpower distribution has to be corrected and equality of medical care among different social strata is essential.

- Placing public health doctor is not enough to solve the problems of unbalanced manpower by region. In addition, the quality of oriental medical care should be promoted by establishing oriental medical college in the national

university and increasing investment for the research work.

- o Introduction of family practitioner and training of manpower who can be both doctor and pharmacist are to be reviewed. It is believed that co-existence of two systems of occidental and oriental medical doctor is preferable to unification of two systems.

c. Forum

Chairperson: Dr. K.S. LEE
Professor
College of Health and Science
Yonsei University

- o About the roles of oriental medicine, especially the preventive role and rehabilitative role:
  - There exists conceptional difference between the occidental and oriental medicines.
  - It is natural that oriental medical doctor perform two roles of prevention and rehabilitation.
  - Instead of assigning public health oriental doctor alone, it is desired to assign occidental medical doctor to the same area so that the patient can make a choice.
  - Matters concerning disposition of public health doctors and actions related to rehabilitation are to be depended upon the resolution of the Policy Deliberation Committee for National Medical Care which was held in 1988.

- As for the disposition of public health doctor, those who have clinical experience are to be assigned to the health center.

o About the specialist system:

- Considering its characteristics, the oriental medicine is rather a unified medicine.
- It is necessary to take certain measures for those who completed the courses for intern and resident program of oriental medical college.
- The matter of specialist is to be taken into consideration in relation to national medical expenses and others. The matter of subdivision of the speciality of the oriental medical doctors should be reviewed carefully.
- When we review two medicines of occidental and oriental the viewpoint should be mutually interdependent rather than separate.

o About utilization of modern medical equipments:

- It seems that the modern medical equipments can be used at the oriental medical hospitals and common use of the equipments by the practioners of both occidental and oriental medical doctors is recommendable.
- It is good to use modern equipment in order to make an accurate diagnosis. However, it is recommended that the equipments should be used from the viewpoint of curtailing expenditures.
- There is a need to develop certain measures to guarantee common utilization of the techniques on testing and diagnosis of the two medicines.

- Introduction of devices of ultrasonography and endoscope to the oriental medical clinic is to be avoided.

o About the expansion of medical insurance for the oriental medical care:

- Improving marketing structure for herb medicines is pre requisite to the expansion.
- As for the medical fee system, introduction of case payment system such as the diagnosis related grouping is desirable.
- Expansion of medical insurance benefit is to be studied further.

o About the appropriateness of the supply of and demand for the oriental medical doctor:

- It is very hard to tell whether oriental medical doctors are in over or under supply in number since statistical data are not available.
- In tackling the matter of supply of and demand for oriental medical doctor we should take into account of the existence of oriental pharmacists and redistribution of oriental medical doctors in the urban areas to the local areas.
- A survey on the perference of medical care is to be conducted to project oriental medical doctor demand and supply.
- Since the oriental medicine is favourable among the people, the demand for oriental medical doctor will be continuously increased.

- In order to prove the appropriateness of the supply of and demand for oriental medical doctor, collection of basic data and development of research methods are to be accelerated.

- We are concerned about the quantitative increase of the oriental medical doctor which will eventually create specialist system which, in turn, will lead to the increase in demand.

o About the regional distribution of the oriental medical doctor:

  - The matter of regional distribution of the oriental medical doctor is closely related to the marketing structure of herb medicines the existence of the oriental herb pharmacist. Thus, we can only rely upon the government policy of balanced regional development.

o About the matter of qualitative supply of and demand for the oriental medical doctor:

  - The matter of upgrading the educational level will be easily settled because the students will continuously request the better curriculum.

  - The matter of specialization has to be dealt carefully. However, there are alternatives. They are, the limited specialization within the University Hospitals, and training oriental medical doctors to become family practioners.

  - There is a need to establish oriental medical school in the national university in order to achieve further development of oriental medicine and qualitative improvement of its education. However, the fixed admission quota is to be maintained at the present

level.

o About the division between medical practice and pharmacy:

- Owing to the characteristics of the oriental medicine, a doctor has been doing both medical practice and pharmacy. An attempt to segregate two major functions of the oriental medical doctor from the viewpoint of western medicine is not reasonable.

o About the unification of medical care of the two medicines:

- Since medicine is the science which deals with the human body, unification of the medical care is desirable. However, the proposal drafted by the Korean Medical Association cannot be accepted by the circles of oriental medicine. Ideal rate of composition of two medicines of oriental and occidental in training curriculum would be 50:50.

- Apart from the interests of occidental and oriental medicines, a plan for the unification of medical care is to be proposed through an independent study.

o About the basic data collection:

- Since there is lack of the basic data on oriental medicine, it is desirable to collect and supply data at the level of Government or the Korean Oriental Medical Doctor's Association.

- It is necessary to conduct researches including the changing pattern of people's preference on medical care and the like for demand projection.

o Conclusion:

- Systematic policies and development scheme for the oriental medical field are essential. Continuing policy development is required, based on the results of studies on the linkage of oriental medicine to other fields, because the linkage is very important.

d. Subjects for Future Study

o Further development of the oriental medicine has to be contemplated on the basis of a comprehensive review of the existing health care delivery system, the characteristics of oriental medicine, the peoples' demand for oriental medicine, and so on.

o As the basic data on supply of and demand for oriental medicine medical care is very limited, systematic collection and analysis of the wide range of data are desirable. After the collection of these data, norms for demand projection are to be set up.

o The norms for demand projection have to be reviewed from the various aspects i.e. change of utilization pattern of medical care, preference of oriental medicine, medical insurance policies, and so forth.

o Data on loss (death, emigration, retirement, unemployment and so forth) has to be collected and analyzed systematically.

5. Supply and Demand Projection of Medical Technicians

a. Summary of Paper Presentations

Chairperson: Dr. C.H. SHIN
Director
Severance Hospital
Yonsei University

1) The Radiological Technician

Presentation: Mr. D.H. KWON
Director of Science
Korean Radiological
Technicians'
Association (KRTA)

- The duties of Radiological Technician are categorized in the Medical Technician Law as follows: handling the ionizing and non-ionizing radiations, operating the diagnostic machine with medical pictures, selecting and managing the radiological machines and attached accessories. However, their duties and functions have been increasing owing to the rapid development of medical technique and radiological diagnostic and therapeutic equipments.

- In 1988, the annual graduation quota in educational institutions was 1,650, including 1,430 of 16 junior colleges and 220 of 124 designated training institutions. The cumulative number of applicants for national examination, the successful applicants with passing rate 37.2%, and the registered licenses from 1965 to 1988 were 18,288, 6,775, and 6,754 respectively.

- The enrolled members of the KRTA is totaled to 3,842 (57% of the total licenses), 63% of whom are located in

5 major cities including Seoul. And 66% of them are working at the hospitals or general hospitals, 26% of them are working at the private clinics, and 8% of them are working at public health centers.

o The supply projection of Radiological Technicians is estimated under the assumptions described below:

The graduation quota in educational institutions is fixed; The number applicants for national examination increase by 10% annually; The ratio of successful applicants, 37%, will be applied; And the loss of them due to emigration, change of occupation, military service, death, unemployment ecc., are estimated at about 20%. Upon these assumptions, the total number of licensees can be estimated at 39,900 by year 2025, and the total supply after subtracting the losses from the total licensees will reach to 32,030.

o The demand projection is based on the number of radiation-generating machines. The assumptions in demand projection are as follows: 0.5 person of technician per small radiation-generating machine, and 1.5 person of technician per large radiation-generating machine is necessary respectively; The ratio of small machines to large machines is 37:63; 3% of the total number of radiological generating machine will be added annually; And 0.5% of them willl become superannuated. Upon these assumptions, the demand of radiological technicians is projected to be 12,530 by year 2025.

o Therefore, there is discrepancy of 19,500 technicians between projected supply and demand by year 2025, which means the over-supply of radiological technicians. This

over-supply can be prevented by freezing the graduation quota of 16 junior colleges, controlling the establishment of new colleges, and abrogating the designated medical institutions for training.

- To improve the employment opportunities of radiological technicians, it is necessary to introduce a new quota system of the radiological technicians in medical institutions(one for a simple radiative imaging system, and two for a special radiative imaging system or radiological treatment system) and to prohibit the unlicensed personnel from operating the radiation-generating machine.

- To improve the quality of the radiological technician, introduction of the new ranking system (i.e., the chief engineer of radiological section, chief radiological technician, etc.) on the basis of career and level of skill is desirable. To improve the quality of education, the review of curriculum, the reinforcement of clinical training, the extention of the training period, and securing the excellent faculties, in particular, clinical training lectures are necessary. To secure excellent faculties with theories and clinical background, the bachelor program must be created through the establishment of 4 year college or raising the status of existing junior college to that of university and 4-year college graduate must be given the qualification for continuing his technical study in the graduate school.

2) Physical Therapist

Presentation: Prof. C.H. CHANG
Junior College of
Public Health
Workwang University

- The duties and responsibilities of physical therapist are described in the Enforcement Ordinance of Medical Technician Law as "thermo- therapy, electro-theraphy, photo-therapy, hydro-therapy, therapy with equipment and tools, managing the drugs, the equipments and tools for massage, therapeutic exercise, corrective exercise, and rehabilitative exercise, and the method of treatment that can be placed under the category of physical treatment." The International Physical Therapist Federation defines physical therapist as "a profession in public health who provides the comprehensive public health and medical services, and implements the tasks that are necessary in helping patients recover and promote their health and damaged functions."

- In 1988, the graduation quota in 12 junior colleges and 2 four-year-course colleges was 1,040, and the number of licensees was 4,821. The average success rate for national examination, which is based on the cumulative number of total applicants and successful applicants during 1965-1988, was 58.3%.

- The ratio of the employed physical therapists to total registered licensees is estimated at 48.6%, and 55.8% of them are located in 5 major cities including Seoul.

- The ratio of physical therapists to 100 physicians based on the number of registered licensees was 0.96 in 1970,

and was increased to 11.66 in 1988. But, the ratio of the United States in 1969, at a comparable level of the per capita GNP was 3.33.

- The projected number of licensees by a regression equation using the number of licenses issued during 1965-1988 without considering the losses during this period would be 26,830 by year 2005.

- Number of projected therapist would be 2,830 by year 2005 if the ratio of physical therapists per 100 physicians of United States in 1969, 3.33 is used for demand projection.

- If demand is assumed at 70% of the licenses issued, the demand for physical therapists by year 2005 can be projected to be 18,780.

- Thus, there will be a great difference between supply of and demand for physical therapists by year 2005, which means the over-supply of physical therapists.

- Therefore, to prevent the quantitative increase of physical therapists in the future, it is necessary to control the establishment of new physical therapist department and the admission quota. In order to improve the knowledge and treatment skills of the physical therapist as one of the public and medical professions, the 2-year-course of junior colleges should be extended to 4-year-course like advanced countries.

- The employment opportunities of physical therapists can be increased through posting physical therapists at public health centers or sub-centers, introducing athletic trainer, assigning physical therapist quota

on the basis of optimum number of patients in each kind of medical institutions, prohibiting employment of the unlicensed, allowing to establish treatment center.

3) Laboratory Technician

Presentation: Prof. S.C. WHANG
Dean
Junior College of
Public Health
Korea University

- The duties and responsibilities of laboratory technician are prescribed in the Enforcement Ordinance of Medical Technician Law as: "storing, managing and utilizing equipments, tools, and reagents in clinical laboratory; collecting testing materials and testing; preparing reagents for testing; collecting, handling, preserving, blood sampling; and the other clinic pathological testing tasks in the fields of pathology, microbiology, biochemistry, parasitology, hematology, serology, legal medicine, and physiology chosen by the regulation of the MOHSA."

- In 1989, the total number of educational institutions for laboratory technician (including 3 four-year-course colleges) is 22, the total admission quota of is 2,035, and the cumulative number of registered licensees is 14,961. The number of annual applicants for national examination from 1985 to 1989 is about 120% of the total graduates from all educational institutions, and 65% of the total applicants have passed the examination. On the basis of these data, the annual number of licenses to be issued from 1989 is estimated to be 1,500, and by year

2000 the total number of licensees will be 1,360.

- 36.8% of the total licensees or 5,500 are projected to be employed, and 78.8% of them are working at hospitals or clinics, 54% of them are located in 5 major cities including Seoul.

- In 1989, the ratio of physicians per laboratory technician is 2.7 (4.82 in Japan, 3.15 in England, 8.10 in Taiwan, 1.65 in Sweden), the ratio of beds per laboratory technician is 16.8, and the ratio of population per laboratory technician is 2,910.

- The demand for laboratory technician can be estimated on the basis of the number of beds, clinical laboratory tests, and physicians. The optimum number of beds per laboratory technician is 10 according to the hospital standards established by the Korean Hospital Association. Based on this standard, demand projection would be 29,700 by year 2000. However, if the present ratio of physician per laboratory technician, 12.7 is used the demand by year 2000 is estimated to be 25,540.

- Therefore, in case of freezing the present number of supply, there will be a great difference in 2000 between supply and demand, which is over-supply.

- To prevent this over-supply problem in future, the admission quota must be frozen or reduced. And the quality of laboratory technician would be improved by the extention of educational period to 4-year and the specialization through the establishment of ranking system and technical expert system.

- The employment opportunities can increase through the measures as follows: assigning laboratory technicians quota in hospitals (for example, one technician for 10 beds), strengthening the function of clinical laboratory at public health center, increasing the regular number of laboratory technicians and securing their status, establishing permanent testing system for the out-patients, strengthening the function of laboratory testing in clinics and industries, controlling unqualified technicians, promoting the emigration of laboratory technicians.

b. Panel Discussion

Discussant: W. CHUNG
President
Korean Clinic Pathology
Technicians Association

- Needs for radio therapy are increasing with the establishment of the national health insurance system (The number of patients requesting radio therapy has been increasing at 14-15% annually.).

- The development of electronic industry has achieved the high level of precision of the radiation devices which is necessary in modern medical science. As a result, there is a strong demand for the more skillful technicians who can handle that kind of device which is a different phenomena from the automatic analysing machines in the field of clinical laboratory.

- Currently the percentage of employment is 47%, and the unqualified persons are conducting radiological treatment

at public health and medical institutions such as clinics, hospitals and health centers in spite of the Article 4, Medical Technician Law, that stipulates the prohibition of from the unqualified conducting. The managers of hospital and clinic are violating the Medical Technician Law under the plea of the operational difficulties of their facilities. However, this kind of practice has to be discontinued for the sake of people's health and the safe use of radiological devices.

- o The Law regulate strictly using, acquiring, permitting, abolishing and transfering any radiation-generating devices using the nuclear power, radio active isotope, X-ray, except for the medical X-ray devices. Therefore, in the new age of securing medical services for all the people,
  - Radiation Safety Supervision Law must be enacted, and
  - First of all, there must be some revision and supplementation of the related laws to fit in with the reality; the Medical Service Law, the Enforcement Ordinance of that Law, Article 28 Clause 2 (The standard and norm of the facilities of the medical institution), clause 3 (the safety supervision of medical institution), and clause 4 (the quota of medical personnel) of the Enforcement Regulation of that Law.

- o The educational period for the radiological technician training should be lengthened from the present 2 year to 3-4 year:
  - This extention is required absolutely for learning, maintaining and developing the level of radiological skill that is necessary in modern radiological medicine.

- And this extention of educational period is urgent task when considering the first-line realities in which advanced radiological machinery of a high price must be handled and managed and the picture data demanded for making a correct diagnosis of a pathological change must be created.

- In particular, the development can be started step by step with the establishment of regular 4-year-curriculum in 2-3 junior colleges out of 16 junior colleges related to radiological technician training in order to produce faculties and radiation expert personnel who can manage the advanced MR, CT, and Digital Radiology. In addition, new steps for research development such as the establishment of graduate programs, must be explored.

- Besides, the present educational period must be lengthened to 3-year and the educational courses must be revised, too.

o With the review of the present license system, the license must be issued according to the expert skills in radiology. Even the some qualified expert must be given respective grades by the national examination classifying the degree of skill for continuing education. It must be accomplished to vitalize radiological technicians who can be lazy in working at medical institution with the license after finishing the simple courses of the junior college and to supply more excellent radiological technicians adequately in this society.

o In addition to improving above mentioned matters, the supply of and demand for radiological technicians must be based on the systematic and continuing concerns of

the Ministry of Education and MOHSA, development and utilization of accurate health indicators, consideration of the reality that there are 17,000 radiation generating devices in the medical field, and the premise that the unqualified should not be allowed to manage any radiation devices.

Discussant: Mr. C.I. SUH
President
Korean Laboratory
Technicians' Association

o Currently, laboratory technicians are over-supplied.

  - The total licenses issued till 1989 is 14,961. And the annual rate of increase of laboratory technicians from 1985 is 17.52%, which is 2.7 times as much as that of physicians.

o Assuming that there are 2,200 applicants for the national examination including annual graduates and cumulative number of unsuccessful applicants, and 65% of them passes the examination, the annual increment is estimated to be 1,430. Thus the total number of laboratory technicians in 2004 will be 22,100. There will be 2,300 population per laboratory technician and 2 physicians per laboratory technician. And the ratio of physician to laboratory technician in 1980, 5.28, has been reduced by almost 50% in 1989, which is 1.70.

o The job opportunity for laboratory technicians must be extended.

- In 1989, the total number of the employed is 5,100, which is only 35% of the total number of licenses issued. And the ratio of employed laboratory technicians to beds is 1:22.1. Assuming that the total number of beds reaches to 126,329, and the total number of laboratory technicians reaches to 17,457 by year 1990, the ratio of licensees to beds will be 7.23, and that of the employed (35% of the licensees) to beds will be 20.6.

- According to a survey done on 17 hospitals (1987) including from large hospitals with 1,000 or more beds to small hospitals with 60 beds, the average number of beds to a laboratory technician is 23, and that of tests to a technician is 106. And during the last four years the number of tests was increased by 36-67%, but the number of technicians has not been changed. Therefore, the number of tests to a laboratory technician being 100 or more, is sure to be unreasonable even though the necessary reagents, devices and tools, the processes and test times are various by different types of tests.

o The unbalance of supply of and demand for laboratory technicians should be corrected.

- The mass production of laboratory technicians must be controlled. For the sake of it, the present admission quota must be frozen with no more increase. And the extention of educational period could serve not only to the control of the mass production, but also to the improvement of the quality of technicians.

- Systematic way of demand extention must be explored.

At least the encouragement scheme, "one laboratory technician per 10 beds", which is based on the hospital standardization scheme established by the Korean Hospital Association must be legislated.

- The scope of duty of laboratory technician in a primary health care post must be legalized and the criteria for selecting benefit of medical insurance must be established so that the more laboratory technicians will be employed and the quality the service will be improved.

- The number of laboratory tests conducted at the health centers are increased dramatically due to the emergence of new diseases such as AIDS and hepatities and National Health insurance. Thus, the personnel in laboratory of health centers must be given their reasonable status, and the unqualified personnel should not be allowed to conduct any tests, but more than anything else, these personnel should be replaced with laboratory technicians.

o The testing skills are required to be developed. Tests used to belong to clinical physiology such as physiological chemistry, toxic chemicals, and drug addition tests are transferred as the responsibilities of the pathologist due to social changes, so that counterplans should be considered.

o The problems in supply of and demand for laboratory technicians could be solved by the following measures:

- Legalization of keeping a laboratory technician per 10 beds.

- Stopping the increase of or reducing the number of students majoring in laboratory technicians.
- Improving the quality of laboratory technicians through the reform of the school system (encouraging 4-year-course), and the extention of educational period.
- Specialization of the occupation by establishing the grade system of laboratory technicians and expert system (biochemical expert, microbic expert, etc.).
- Replacement of the unqualified with the qualified.
- Utilizing the unemployed manpower mounting up to 50% of the total licensees through employment.
- Developing the new testing process such as physiological chemistry.
- Establishing the limit of duty and responsibility of clinic pathologist accompanying the health care delivery system introduced with the national health insurance (In particular, in the primary health care system).
- Establishing the policy for women manpower.

c. Forum

Chairperson: Prof. J.Y. PARK
Graduate School of
Public Health
Kyungbuk University

1) Demand Projection of the Medical Technician

c Radiological Technician

- The Radiological Technicians Association insists that

the estimation must be based on the radiation-generating devices (capacity and type), and it seems to be reasonable in the statistical aspect.

- Using diagnostic workload as criteria is imcomplete in statistical aspect that each hospital has its own concept of diagnosis.

- In general, the criteria for demand projection seem to be diagnostic workload, number of beds, number of physicians, and the number and type of radiation-generating devices. However, upon considering the aspect of data utilization, diagnostic workload, number of beds and number of physicians are related to one another that only one of them may be selected as criterium. In particular, the number of beds has very different influence on the number of patients because of the turnover rate of beds. And since the number of radiological technicians can be over-estimated on the basis of the number of registered physicians, the number of employed physicians may be selected as a reasonable criterium. The diagnostic workload is different in terms of outpatient or inpatient, clinic or hospital. In addition, increased quantity of radiological examinations with the national health insurance should be considered.

- In case of number and type of radiation-generating devices, the practical usage rate of the devices in each kind of medical institution should be considered. The uniform estimation like 1 radiological technician per 1 radiation-generating device without any variations would be unreasonable.

- With the spread of new technological know-how, the increasing number of necessary personnel and workload should be kept in mind.

- Since the number of medical specialist in radiology is smaller that of other department, and increasing more rapidly than that of radiological technician, it is difficult to consider all sorts of medical specialists together.

o Physical therapist

- The optimum number of patients treated by one physical therapist per day should be calculated on the basis of the types of disease. But, assigning one physical therapist to 30 physicians could be the second best choice.

- The employment rate should be considered in the aspect of supply. And in 2000, many conditions will be altered so that the uniform way of estimation cannot be applied until that time.

- Whether physical therapy is a field of rehabilitative medicine or not should be defined.

- Demand projection of physical therapist should be based on the number of physical therapy patients rather than number of physicians.

- The demand change derived from the increase of aged patients, various accidents, cerebrovascular patients, rehabilitative facilities, nursing facilities should be considered properly.

o Laboratory technician

- The range of their workload are extensive. Even though the demand can be estimated on the basis of the number of patients and tests the variety of types of tests and necessary time for test is a problem.
- There must be a cooperating system between educational institutions which supply laboratory technicians to prevent the over-production.
- The faculties must be produced urgently.
- Bachelor's program is necessary.
- In demand estimation, the number of physicians, beds, patients, and population must be reviewed comprehensively.
- Both the number of laboratory tests and that of beds are good bases for estimation, but the systematization of public health index is necessary for ensuring correctness of data.
- The development and utilization of new equipments will have an influence on the demand and supply.
- The number of laboratory tests may be an important factor for deciding laboratory technician quota. Therefore, there must be general criteria in estimating the demand.
- The demand is affected by political variables as follows:
  - Socio-economic factors, that is, the bearing capacity of medical service by the people, and
  - The tendancy underestimating the demand for the interests of professions.

- The demand can be estimated through grouping medical institutions according to number of beds, and the number of clinical departments (major, minor). Also, the demand can be projected for each kind of institution on the basis of the compiled data from the national public health and medical service network.

- However, the significance of each variable is required to be tested whenever it is used so that one or two indexes are advised to be selected.

- In demand estimation, the scope and change of the roles and functions of laboratory technician should be considered appropriately.

- There are some difficulties in estimating the change of demand by the medical insurance policy.

2) The educational system

o The present educational system needs to be revised and supplemented. The educational system are pluralized into junior college, college, training institution, and faculties, facilities and educational period are the main problems.

o At least 6-12 months practical training is necessary after 2 year education. Therefore, 3 year of education is required at the minimum.

o The following 3 points should be considered in educating system:

- Overqualification : wasting factor
- Underqualification: insufficient capability

- Misqualification : not based on the realistic needs of the community

o On the job training is necessary after graduation.

o Measures to solve problems which might be happened after the extention of educational period must be prepared.

o It is a problem to authorize the institution without practical exercise facility.

o Since the present Educational Law permits 3 year course in junior college, 1 year extention of educational period is more realistically possible.

o It must be decided where to attache importance to as far as the education of medical technicians is concerned learning or technics.

o Underqualification can be solved by the extention of educational period and on the job training.

o The license renewal system can be introduced as a reforming measure.

o The task of occupational therapist must be differentiated from that of physical therapy.

o The demand for and recognition of occupational therapy is not sufficient.

o Whether the reason for lengthening the educational period is for the interest and quality improvement of their own profession or for the quality care for patients must be recognized.

o In case the educational period is lengthened for the quality care for patients, escalation the medical expenses has to be considered.

- o Therefore, the existing educational institutions must establish the necessary facilities and supplement the faculties by their own efforts.

- o The team work in clinic laboratory is so important that the graduates of other disciplines must be coordinated appropriately.

3) Employment

- o The criteria for the setting quotas of each profession should be established.

- o The unqualified should not be allowed to work.

- o The new kinds of occupation and personnel should be created along with respective qualification system so that job opportunities can be expanded (diagnostic radiological technician, therapeutic radiological technician, electrocardiogram, ultrasonography electroencephalogram, visual therapist, speech therapist, hearing therapist, ambulation trainer, prosthetic applicance technician, medical engineering technician, technician related to oriental medicine.).

- o In order to expand job opportunity, it is necessary to arouse the hospital managers' interest.

- o The deman has been estimated in the field of clinic institutions. But even other fields such as school, health center can be a market for demand creation.

- o However, the roles and functions of public health center must be established before posting any medical technician.

4) Miscellaneous

- The effects of national health insurance system on medical technicians, the payment level and degree of satisfaction of medical technicians must be studied on a comprehensive dimension within present Medical Technician Law.

- If the medical technicians can participate in the screening committee for hospital standardization, it will bring an indirect controlling effect on the unqualified personnel.

- It is desirable for the organizations concerned to take opinions of their own professional technicians in medical service.

d. Subjects for Future Study

- From the viewpoint that the medical technicians have an effect on the public health and medical system and promoting efficiency of health care delivery as the middle step personnel, the measures for the supply demand and management must be explored. In particular, the roles and functions of radiological technicians and laboratory technicians can be changed significantly according to the development of medical skills and the change of the demand for medical service. And demand for physical therapists will be increased due to population aging, frequent occurrence of various accidents, the spread of chronic diseases.

- Even though the demand for radiological technician, laboratory technician and physical therapist is affected by physicians, medical institutions (medical clinic,

beds, radiative machinery), and patients, there is no objective norm for estimating the demands for these kinds of personnel. Moreover, the social, economic, cultural factors affecting this norm have not been discovered yet.

- In the aspect of supply, the problems of underqualification and misqualification are raised, and the extention of educational period is the topic of much concern. These problems and topic should be approached through the in-depth analyses on the anticipated roles and functions of each occupation, the practical capability for providing service, the teamwork and sharing responsibilities with other profession.

- In estimating the supply, the data on active manpower are scarce, and the data on losses (due to death, retirement, unemployment, emigration etc.) are not systematic. Therefore, there are many difficulties in estimating the supply.

- As a consequence, the following will be the significant topics for the research in the future:
  - Developing the norm for demand projection of medical technicians.
  - Analysing the factors affecting the norm.
  - Collecting and analysing data for supply estimation.
  - Redefining roles and functions.
  - Establishing educational requirements.
  - Deciding the educational period.
  - Developing new middle step personnel who will be required by the change of medical demand and expectation to medical service and by the development of medical technics.

6. Supply and Demand Projection of Nursing Aide Manpower

a. Summary of Paper Presentation

Chairman : Dr. H.J. PARK
Dean
Graduate School of
Public Health
Inje University

Presentation: Mr. N.Y. PARK
Officer in Charge of
Health-Nursing
Science
National Institute
for Health

- After the law of Medical Aide was revised on June 5, 1966, the 9 months training course for nursing aide was opened with the support of the government and foreign agencies. Afterward, nursing aides began to be dispatched to health sub-centers. At that time the shortage of nurses was a serious problem due to the lopsided distribution of nurses in favour of urban areas, nurses' emigration for employment to the foreign countries, and the establishment of national network of health subcenters.

- The cumulative number of licenses issued by 1988 totalled 123,115. The number of the employed in Korea was 50,072 (40.7% of the numbers of licenses issued), 59.6% of the employed are located in 5 large urban areas including Seoul.

- Nursing aides are employed in many kinds of medical institutes. 42.2% of them are employed in private clinics, 14.8% in general hospitals, 12.9% in hospitals, and 11.5% in dental clinics. And only 11.0% of them are employed

in the public sector such as health centers and sub-centers.

- In 1988, the number of educational institutes for nursing aides was 46, and the total annual enrollment was 9,120. But the actual number of students attending lectures were about 80% of them. The ratio of successful applicants for qualifying examination are various among cities and provinces. The nationwide average ratio of successful applicants during 1983-88 is 84.2%. It is projected that the total number of supply of nursing aides would be 79,700, if annual number of graduates, 5,752, continues until year 2000 and all the losses (death, emigration, unemployment) are considered.

- The job responsibility of nursing aide is described in Article 2 of the Law of Nursing Aides & Medicine related business as 1) aiding nursing work, 2) aiding medical examination and treatment. But the work responsibilities of nursing aides are various different medical settings. Nursing aides in general hospitals are doing only aiding responsibility. In hospital, they are sometimes conducting some tasks requiring expert skills such as aiding operation, injection, treatment, checking the condition of a patient, oxygen inhalation, narcotizing and so on. And in health sub-centers they promote family planning practice, counsel mother and child health, conduct antituberculosis campaign, and do some administrative work.

- The practical training of nursing aide is generally carried out in general hospitals or hospitals. But the practical training is not performed in private clinics and public health centers which are the main institutions employing

nursing aides. The quality and shortage of teaching faculty is another problem.

- The demand for nursing aides is projected on the basis of the ratio of nurses to nursing aides (3:1) and the number of employed nursing aides in each kind of medical institutions. In this way, the demand for nursing aides in 2000 is estimated at 41,800-53,800.

- Therefore, in comparing the supply and the demand projections of nursing aides in 2000, nursing aides will be over supplied even though the current level of supplying capacity will be continued. But in spite of this over supply in total number of nursing aides, some areas or clinics will be suffered from shortage of nursing aides. Thus, the management of nursing aide manpower is more important than the supply.

- As a countermeasure, the improvement of curriculum and practical training of faculties is needed because the current level of supply of nursing aides is not insufficient.

- To increase the demand for nursing aides, improving the working condition and payment in the private clinics, delegating some responsibilities of nurses, restricting disqualified nursing aides are needed.

- Dual education system for nursing aides needs to be studied. That is, nursing aides for tertiary health care can be trained and employed in the medical institutions, and the nursing aides for private clinics can be trained and produced in current private educational

institutes.

b. Panel Discussion

Panelist: Ms. K.J. LEE
President
Korean Nursing Aides' Association

- It is desirable that the administrative support of the MOHSA should be extended to nursing aides so that they can report regularly their working status and situations.

- General hospitals should not employ the unqualified aide manpower, and the work responsibilities of nursing aides and other aide manpower should be clarified.

- In the Article 28 Clause 4 of Enforcement Regulations of the Medical Law, some of the nurses' post can be replaced with nursing aides. But in the official announcement of the MOHSA there is no clear statement about the number of nurses' post that can be substituted with nursing aides, thus, it is difficult to employ them in reality.

- The ratio of nurses to nursing aids is proposed to be 3:1 in the paper presentation, but it is more desirable to be 3:2.

- The severe unemployment rate of nursing aides could be eased by such measures as the improvement of working conditions and payments and promotion of employment opportunities of nursing aides in the general hospitals.

- The Korean Medical Association recommended that the educational qualification of applicants be lowered to middle school graduates and the qualifying examination be taken once in a year. It is necessary to study these recommendations in depth while considering the fact that ratio of successful applicants is low in spite of current educational qualification of applicants.

- In many cases, the experiences of the nursing aides as the senior family planning field worker or family planning field workers, have not been taken into consideration in their promotion. And as the degree of utilization of the nurses increases, the utilization of the nursing aides have been neglected, which should be corrected. Moreover their working hours on public health duties are reduced since they have to spend many of their working hours on administrative tasks as an officier under the Ministry of Home Affairs.

Panelist: Prof. C.H. PARK
Department of Nursing Science
Seoul National University

- Planning health & medical manpower should be future-oriented in which the Medical Insurance and the trend of population change are considered rather than the Downward Substitution Model used in the developing countries. The policy for utilizing nursing aides should be designed according to this perspective.

- Originally the nursing aides in the general hospitals started to work as bedside nursing aides. However,

according to the task analysis conducted in Seoul National University Hospital, only 13% of them are bedside nursing aides and more than 80% of them are doing some errand-like functions. This finding is stressing that they should be utilized more effectively through on-the-job training at individual medical institution. Moreover, the demand for nursing aides is expected to be reduced because the activities of nurses in general hospitals are changed from team care to individual primary care. The responsibility of the nursing aide has been minimized as the nurse provides total care to a few patients.

- In the field of public health, there is an opinion that, nursing aides are not adequate from the viewpoints of change of the demand, structural changed of nursing manpower model, and their quality as an integrated public health personnel. The utilization of nursing aides will be decreased as specialized nurses are in demand.

- Some functions of nursing aides in the private clinics and hospitals, like injection, measuring blood pressure, and medicating anesthetics are illegal and to be corrected.

- Current system of over production of nursing aide manpower should be reviewed. In particular, it must be reviewed whether current utilization plan of nursing aides is desirable or not. And the opinion of raising the ratio of successful applicants through the change of qualifying examination may not be desirable.

- Nursing aides should be educated in the training institutions designated by the government rather than in the private institutions. It is desirable to train nursing aides according to the specific medical service (for

example, the nursing aides in operating room or psychiatric ward are necessary to be trained properly).

Panelist: Ms. I.K. HWANG
Senior Researcher
Research Institute for Hospital
seoul National University

- The validity of the ratio of nurses to nursing aides 3:1, advocated in paper presentation, should be re-examined. Because the ratio of nurses to ursing aides in the general hospitals is 1:1.7 according to a paper on nursing manpower, and average ratio of all medical institutions including hospitals and clinics even lower, that is 1:0.53 according to the statistical year book of the MOHSA.

- When projecting the future demand for manpower it is desirable to classify the demand into the types of services and medical institutions.

- Even though utilization of the Downward Model should be limited for improving the services in hospitals, the reason of the difference from the reality should be considered. It might hold the key to that question how the improvement of services and the pursuit of efficiency can be balanced.

- Therefore, as an overall opinion it is necessary to develop and produce manpower to satisfy the demand on the basis that the goal of manpower utilization is on the demand of services, and to study how to deliver low price and good quality services when setting the management goal of medical institutions.

Panelist: Mr. P.H. LIM
The Korean Council for Nursing
School Principals

- Before 1983, students enrolled biannually, but it is reduced to only once a year, and from 1988 only 6,000 students less than designated quota have been trained which become bottlenecks to management.

- The low ratio of successful applicants seems to be the result of the poor education, but the main reason is the method of examination. Previously the relative importance of the aspect of attitude in qualifying examination was the main reason for low success rate, so that the practical examination was substituted for written examination. Afterward the questions for the examination on the subjects of environmental sanitation and community health were so difficult that many applicants could not pass the examination.

- The high rate of spontaneous decrease is the reason of unemployment rate after obtaining the nursing aide qualification. It means that the number of applicants has been reduced by the change of socio-economic condition, and there is a tendency for the graduates not to work, and poor work condition and low payment make the nursing aides change their jobs.

- It is necessary to examine as to whether the production and utilization of other aide manpower instead of nursing aides in the general hospitals would produce dual system of nursing aide.

c. Forum

Chairman: Prof. O.R. MOOK
School of Public Health
Seoul National University

o The Roles and Functions of Nursing Aide:

- Nursing aide takes the largest part of health manpower in number, and the number of nursing aides is increased by 33 times in 1988 compared with that of 1968.

- Although the training period of nursing aide has been extended from 9 months to 1 year, it is the shortest one compared with other health manpower. The high unemployment rate, 58%, must be considered significantly in the demand and supply projection. But on the viewpoints of the high employment rate of nursing aides in clinics and the growing relative importance of clinics in medical delivery system, the status and role of nursing aide need to be re-examined and developed by taking account of prospect of their role.

- The roles of doctors, nurses and nursing aides should be changed in accordance with the change in medical delivery system. In reality, the role of nursing aides in the general hospitals is getting smaller. In particular, the tertiary care hospitals are trying to improve the quality of nurses and produce the clinical nurse practitioner. On the other hand clinics want to improve the qualities of nursing aides to the level of Licensed Practical Nurse of America.

- There is an opinion that the working condition of nursing aides in clinics should be improved. The status, func-

tions and payment of the nursing aides are to be considered continuously along with the role expansion of other medical personnel. And what is the delegated task and whether the role is direct or indirect should be discussed.

- Even though the Korean Nursing Aides' Association insists that utilizing other aide manpower than nursing aide in the general hospitals on the basis of different interpretation of Article 28 clause 4 of the Enforcement Regulations of Medical Law and the official announcement of the MOHSA on nursing aides quota should be corrected. But the MOHSA explained that aides manpower in general hospitals could not be compared with nursing aide manpower because they are totally different manpower.

- The utilization of manpower in the genreal hospitals is determined in the direction of promoting productivity and efficiency. Thus, utilizing aide manpower produced by their own hospital instead of nursing aides. Therefore, the role of nursing aides in the general hospitals, hospitals and clinics needs to be re-examined more carefully in depth.

- Patients in the general hospital are cared by tending personnel and this will be systematized. Thus, it is necessary to discuss how the roles of nursing aides are connected with those of tending personnels. Moreover, some opinions appear that nursing aides might be used under the supervision of home-visiting nurse or they can be used in nursing home.

o The Demand for and Supply of Nursing Aides:

- The opinion that the ratio of nurses to nursing aides must be 3:2 needs to be re-examined in depth.
- Since the ratio of patients to nurse an advanced contries is 1:1, and that of Korea is 5:2, the ratio of nurses and that of nursing aides must be discussed together. And the ratio of doctors to nurses, nurses to nursing aides are to be discussed at the same time.
- The medical manpower planning should be set after considering the change of socio-economic condition, that of medical delivery system resulted from the national health insurance, that of service of each related personnel according to their field of activities, and what kind of medical service planning the government has at this point. Thus, the assumptions in short-term manpower planning, at first, needs to be discussed. And the standing research team on manpower is required because new measures are needed according to the change of circumstances.

o The Production of Nursing Aide Manpower:

- There are some practical problems in the recommendations of the Korean Medical Association (KMA) in which the educational qualification of nursing aide need to be lowered to middle school graduation and the qualifying examination needs to be taken once a year. In case of lowering qualification of the applicants to middle school graduates it is possible to train those middle school graduates for 2 years and those high school graduates for 1 year. But the KMA wanted to use the nursing aide manpower for longer time period with shorter

period of education. Moreover, when lowering admission qualification, the applying rate of high school graduates will be lowered, and 94% of middle school graduates go on to high school and the remaining graduates are so poor that they can not pay the tuition fee. Therefore, this recommendation is not possible in reality.

- Job security is very important in social welfare. So, it is a trend for the government to bear the training fee for low ranking technicians as a national policy. Similarly, the training fee for nursing aide manpower could be paid by the Vocational Training Centers. But it might bring about some problems in the respect that the manpower trained by the government fund would be supplied to the private clinics.

- The reason for the regional differences in passing rate of qualifying examination should be analysed more concretely.

- The programs to increase the ratio of successful applicants were discussed in relation to the demand for and supply of manpower. Difficult subjects of examination are medical and contagious disease law; the number of questions on these subjects is 5 and the degree of difficulty is high. Thus, it is suggested that these subjects be included in the outline of public health science, and even the questions on the outline of public health be changed because of their difficulty.

- The standards of training facilities are to follow the criteria of the Ministry of Education and the practical training facilities are the general hospitals and

hospitals. But it is discussed that clinics also could be the training facilities because majority of the nursing aides will be working in the clinics. In addition, the quality of training could be improved if practical training is done in clinics, because other practical training than errand-like tasks can nearly be done in the general hospitals and hospitals.

- The practical training in clinics seems to be done effectively. But the monthly training fee of W50,000 is not enough to send students to many clinics for training.

- The facilities, methods, and instructors of the practical training need to be improved and the standards of those facilities should be improved, and the guidebook for practical training should be prepared.

- It is proposed that some of the scholarship of public health could support the lecturer in the educational institutes.

- The educational courses centered on practical tasks could be examined with the consultation of the MOHSA.

o The Utilization of Nursing Aide Manpower:

- The Korean Nursing Aide Association predicted that working at the clinics would be unpopular, but the number of employed nursing aides will be increased if the working condition is improved.

- The work condition and wage system of medical institution must be discussed in relation to the structure of

whole industry. In particular, in case of clinics they will be changed in accordance with future management pattern of clinics. And the issue of wage can be discussed more concretely after defining what would be the desirable model of clinic management, and distinguishing the functions of doctors, nurses and nursing aides according to the model.

- Conducting skillful tasks by nursing aide as an integrated public health personnel does not seem to be suitable. There is wide difference of the utilization between in clinics and as a public health personnel, this must be studied further more.

o Management of Nursing Aide Manpower:

- It is desirable to study how to collect information and materials on manpower movement.

- The scheme for increasing the employment rate of nursing aides is difficult to discuss because the annual turnover rate is not available.

- If on the job training of nursing aides is necessary, it is desirable for the branches of the Korean Nursing Aid Association to take a direct action by themselves and for the government to support the training programme by training lecturers. In addition, it is desirable to establish evening junior colleges of nursing science in local areas so that the nursing aides who have worked for a certain period of time can go on to a high level education if they want.

o Miscellaneous:

- The Korean Dentists Association proposed the necessity of training dental aides for dental treatment assistance.

- The establishment of the National Institute for the Health Manpower Management was recommended. In addition, educating and evaluating high-level manpower by the academic institutes and educating, evaluating and managing low-level manpower by the KIHASA could be considered.

d. Subjects for Future Study

o After short period of training, nursing aides are employed in various kinds of medical settings, such as general hospitals, hospitals, clinics, dental clinics, oriental medicical clinics, public health sub-centers and so on. Although the curriculum of education is uniform, the roles and functions required by each medical settings are various. This discrepancy between training and utilization seems to be very wide. Therefore, the problems of nursing aides training, in particular, underqualification and misqualification should be studied.

o We have poor data on the supply of and demand for nursing aides. Data on employment and losses in supply projection and the establishment of the criteria and related materials for the demand projection should be collected and analysed continuously.

o The production and utilization strategy of nursing aides should be considered after examining productivities and expenses of medical care, tasks and functions of nursing aides, the range of functional delegation of nurses, etc..

7. Summary and Conclusions

- In order to collect the views of the professional organizations on the supply of and demand for the dentist, oriental medical doctor, medical technician, and nursing aide, a workshop was held from July 25 ~ 26 1989 by the Korea Institute for Health and Social Affairs (KIHASA) as a part of a research on the "Supply of and Demand for Health Manpower Planning" to be conducted in 1990.

- Throughout the meeting, the common interests, views and recommendations of the professional organizations were exchanged and collected. The actual circumstances on problems faced by the professional organizations and their countermeasures, and conflicts and coorperation among the health manpower will be used by the KIPH as the valuable information for health manpower planning.

- Common problems discussed at this workshop relating to health manpower planning can be summerized as: the scarcity of data, lack of information on the employment and loss, difficulty in setting up norms for demand projection, change of roles and functions of health manpower, inappropriate curriculums of the health related education, etc.. The health manpower discussed at this workshop is closely related to the manpower planning of the medical doctor and nurse. Therefore, the workshop became a worthwhile opportunity to recognize the need for preparing a comprehensive manpower planning including the medical doctor, nurse, pharmacist and all the other health manpower.

- In order to conduct a research on the health manpower who provides health care services, best efforts are to be put into various activities such as conducting through examination of the national medical insurance system, setting up directions for preventive medicine and health promotion programmes, setting up policy directions for the future health care system, reviewing the people's expectation on health and medical care and analyzing cost and benefit of medical care. Findings and outcomes of the research will be reflected upon the Seventh Five-Year Socio Economic Development Plan (1992-1996).