



FINAL EVALUATION  
OF THE  
KOREA HEALTH DEMONSTRATION PROJECT  
(AID Loan No. 489-U-092)

AMERICAN PUBLIC HEALTH ASSOCIATION  
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## ABBREVIATIONS

AID	Agency for International Development
APHA	American Public Health Association
AV	Audiovisual
CHA	Community Health Aide
CHC	Community Health Center
CHP	Community Health Practitioner
EPB	Economic Planning Board
FP	Family Planning
KDI	Korea Development Institute
KHDI	Korean Health Development Institute
MCH	Maternal Child Health
MOE	Ministry of Education
MOHSA	Ministry of Health and Social Assistance
MOHA	Ministry of Home Affairs
NIH	National Institutes of Health
OJT	On-the-Job Training
PHC	Primary Health Care
PHU	Primary Health Unit
RN	Registered Nurse
ROK	Republic of Korea
ROKG	Republic of Korea Government
VHA	Village Health Aide
WHO	World Health Organization

## I. INTRODUCTION AND BACKGROUND

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### Health Conditions in Korea

It is instructive to review the state of health conditions in Korea which were examined by the USAID project development team before the consultancy was authorized.

Environmental sanitation is described as "generally poor". The team noted that "breeding places for disease carriers abound in open pit latrines, haphazard garbage disposal, and animal stalls." Most wells and water pumps are said to be "unsatisfactorily close to contamination," and chlorination is reported to be "poor".

The team's observations on nutrition are especially noteworthy. "Nutrition is inadequate. Most households never consume eggs (75 percent); consume fish and chicken less than once a week (74 percent); and consume beef and pork less than once a month (70 percent)...Rice and barley are the main foods." The team pointed out that the overwhelming majority of pregnant women (over 80 percent) receive no prenatal care, and that the deliveries of almost 80 percent of these women are attended only by relatives or neighbors.

Facilities for medical care are said to be limited. Seventy-seven percent of those with acute diseases and 60 percent of the sufferers of chronic disorders are untreated. This lack of treatment is attributed to lack of access to care for physical or financial reasons.

These observations are derived from a household survey, taken in 1972 in Yongin Gun (County), which the authors feel represents a typical target population. Another survey showed that almost 50 percent of the sick in urban areas turn to pharmacies for medical care, but less than one-third seek assistance from outpatient facilities. In rural areas slightly more than one-third of the sick turn to pharmacies first; an equal number seek aid from outpatient facilities.

A variety of sources yield data on the causes of morbidity and mortality; however, none of the data is based on a probability sample of the Korean population. According to the team, the "rank order of causes of morbidity and mortality" are not available, but such baseline data might be obtained through this project.

## Purpose of Project

The Korean Health Demonstration Team Project was designed to address the health problems described above. The goal of the project was "to create and institutionalize a process which gives effective access to basic promotive, preventive, and curative health services at a cost affordable by the Republic of Korea." The purpose of the project was twofold: to "establish the capability within the ROKG to plan, conduct, and evaluate low-cost, integrated health delivery projects directed primarily toward low-income families" and to "demonstrate successfully at least one multi-gun, low-cost integrated health delivery system that is replicable in other parts of Korea."

The Korean Health Development Institute (KHDI) designed and implemented a program of integrated health care in Hongchon Gun, Ogku Gun, and Guneo Gun. The project was evaluated by the Republic of Korea Government (ROKG) and the American Public Health Association (APHA) in June 1978. The KHDI conducted an internal evaluation in mid-1980, and the Korean Development Institute (KDI) conducted an external evaluation at the same time. The Agency for International Development (AID) will terminate soon its financial assistance to this project. The APHA has been asked to assist the ROKG in conducting a final evaluation.

## Methodology

A standard questionnaire was used to interview personnel in the various fixed facilities of the KHDI. This questionnaire and a summary of responses are attached as the Appendix.

## Schedule of Activities

The following is the schedule of activities which the team undertook in evaluating the project.

September 9, 1980 Presentation of Overview and Major Components.

Presentation of Findings of the KHDI:

- o Overview of KHDI Demonstration Project,  
Dr. S. K. Ahn.
- o Community Involvement in the Project,  
Mr. K. B. Yoone.

- o Community Health Practitioner (CHP),  
Dr. K. Y. Lee.
- o Community Health Aide (CHA),  
Ms. J. S. Kim.
- o Village Health Agent (VHA),  
Mr. K. H. Kim.
- o Health Education Program,  
Mr. C. H. Nam.
- o Logistic Support System,  
Mr. Y. H. Cho.
- o Community Health Insurance,  
Mr. S. S. Yang.
- o Management Information System,  
Mr. E. S. Kim.
- o Recent Development of the MCH Service,  
Dr. S. I. Joo.

September 10, 1980      Leave Seoul for Hongchon. Visit Hongchon Gun Health Center, Shidong, and Mulgulee Primary Health Units (PHUs).

September 11, 1980      Visit Yokchunpyong Primary Health Unit. Leave Hongchon for Seoul.

September 12, 1980      Leave Seoul for Ogu. Visit Ogu Gun Health Center, Yoro, and Daekwang Primary Health Units.

September 13, 1980      Visit Daeya Community Health Center. Leave Ogy for Seoul.

September 14, 1980      Sunday; holiday.

September 15, 1980      Leave Seoul for Taegu City.

- September 16, 1980 Leave Taegu for Gunee. Visit Gunee Gun Health Center, Euihung Community Health Center, U-bo, and Goro Primary Health Units. Leave Gunee for Taegu.
- September 17, 1980 Leave Taegu for Kyongju for the ROKG/AID. Evaluation Meeting at the Hotel Chosun Kyongju. Registration; opening ceremony and reception.
- September 18, 1980 Continued Presentation of Major Components of the KHDI Project.
- o Review of KHDI Demonstration Project, Dr. S. W. Lee.
  - o Results of Baseline and Post Evaluation Survey, Mr. K. Y. Song.
  - o KDI External Evaluation and Summary, Dr. H. C. Yeon.
- September 19, 1980 Group Sessions
- September 20, 1980 Plenary Session and Recommendations to the ROKG.
- September 21, 1980 Sunday; holiday.
- September 22, 1980 Write final evaluation report on the KHDI Project in Seoul.

## II. THE ROLE OF AID

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There is a considerable body of abstract and rather complex information on preventive and clinical medicine. Most scholars would agree that epidemiology is the basis of preventive medicine and that a sound background in the basic sciences (i. e., anatomy, physiology, biochemistry, etc.) is essential for a genuine understanding of clinical medicine. Competence in either of the two disciplines is not likely to be acquired through casual study. The evaluators were, therefore, somewhat surprised to learn that only two of the nine members of the project development team have formal backgrounds in the health professions. (One is a public health physician and one is a health educator.) Nonetheless, they believe that the basic design of the program is fundamentally sound. It is conceivable, that however, had more health professionals served on the project development team, there might have been greater emphasis on preventive medicine, particularly in terms of stated goals and objectives. The authors agree with the members of the mid-term evaluation team who stated that ". . . the log frame indicators in the Project Paper for the purpose level are inadequate generalizations." Had these indicators been stated initially in terms of coverage in various categories (as was suggested later by the mid-term evaluation team), it is possible that considerably more could have been accomplished in the field of prevention (i. e., greater coverage with immunizations, provision of more maternal and child (MCH) services, and more improvements in environmental sanitation).

The team does not share unanimous views on the technical assistance which AID provided during implementation of this project. Two advisers in the general area of management were retained for approximately two years. This is consistent with AID's philosophy that a competent project manager can manage any project, no matter how technical or complex it is. We evaluators all agree that the two AID officials in question provided high quality technical assistance. The staff of the KHDI clearly shares this conviction.

Certain numbers of the team seriously question the suitability of specialists in other disciplines or generalists as project managers of or advisers to health programs. The evaluators feel strongly that health projects should be managed by health professionals. They recognize that personnel ceilings and the shortage of health professionals in the Agency make it difficult, if not impossible, to obtain the ideal. Much could have been gained in this project by employing health professionals as short-term consultants.

Thirty-three members of the KHD staff have received "short term observation/courses" lasting three days to three months. The courses are financed by the project. Only one KHDI staff member, a physician, has received long-term training--one year at a school of public health. Brief courses can be useful, but the utility of frequent short-term training, especially the so-called observation tours is questionable. Long-term training can be extremely useful in institution-building. The evaluators suspect that this approach may have been underutilized in this project. Given the critical importance which AID attached to management in this project, one cannot help but wonder why someone on the KHDI staff was not given long-term training in this discipline.

### III. MAJOR FINDINGS AND CONCLUSIONS

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#### Korean Health Development Institute

The Korean Health Demonstration Loan was intended to be used to create and institutionalize a process which gives effective access to promotive, preventive, and curative services at a cost affordable by the Republic of Korea (ROK). Clearly, this goal is broader than the loan project, and it appears that it will be achieved soon. The USAID loan project has been a major factor in spurring the promising movements now underway.

The fifth ROK economic development plan, which is being finalized for 1982-1986, has been renamed the Fifth Economic and Social Development Plan--an indication that the Korean government is ready to move away from exclusively economic development priorities and toward social welfare development activities. The demonstration loan was implemented in timely anticipation of this new direction. Furthermore, the National Health Secretariat (established under this loan) is providing direct and substantive input to the National Economic Planning Board, which is formulating primary health care policies.

Under the loan, the National Health Secretariat received support to conduct and assess research at the Korea Development Institute. This was an effective component of the loan: the KDI is a highly respected research arm of the Economic Planning Board (EPB). In addition, the Health Secretariat was to evaluate the KHDI and recommend actions to the National Health Council. The Health Secretariat has actively served as an external evaluating group for the KHDI. Its role in the work of the National Health Council has not materialized, however.

The administration of Korean public health services involves multiple ministries, including the Ministry of Health and Social Affairs, (MOHSA), the Ministry of Education (MOE), and the Ministry of Home Affairs (MOHA). A National Health Council was established under this loan for this reason. It is to be chaired by the deputy prime minister and will include the heads of the MOHSA, the MOE, the MOHA, and representatives of other interest groups.

That the need for an interagency coordinating committee was anticipated is laudable, but, as the evaluators would point out, the National Health Council is much too high powered a group to conduct the limited activities funded by this loan. In the future, as government efforts to deliver health services expand, some central authority will be needed to set administrative policy and to establish programmatic priorities. An

organization other than the National Health Council, which does not appear to be an adequate long-term solution, should be sought.

Two project objectives were defined under the health demonstration loan project. The first was to "establish the capability with the ROKG to plan, conduct, and evaluate low-cost, integrated health delivery projects directed primarily toward low-income families." Unless one considers only the limited demonstration activities of the KHDI, this objective has not been met. As a matter of fact, it represents a fallacious attitude toward demonstration projects. It is unrealistic to expect a limited demonstration project to effect government organization on a national scale. In this case, the outcome is more promising than might be supposed. The demonstration project has influenced national policy on the establishment of a low-cost national health delivery program. It remains to be seen whether an effective capability to "plan, conduct and evaluate" such a national project can be established.

The second objective was "to demonstrate successfully at least one multi-gun, low-cost integrated health delivery system which is replicable in other parts of Korea. Many questions remain to be answered, but it can be said that this objective has been achieved. The KHDI has carried out the demonstration as intended, although more time is needed to complete field activities, and the concepts of primary health care and of community health (nurse) practitioners have been accepted by both the EPB (for 1982-86) and the MOHSA (for the coming year 1981).

Many questions about the national replicability of these single gun demonstration projects have yet to be answered. It is crucial that CHPs be trained and deployed. In fact, the KHDI has been asked by the MOHSA to do this. It is encouraging that the MOHSA has looked to the KHDI to conduct this activity. This is the first strong indication that the MOHSA needs to be clarified and better defined. In addition to providing skilled trainers the KHDI could be a resource for health services research and planning under the Minister of Health and Social Affairs.

The KHDI is organized as three divisions: training, project implementation, and project research and evaluation. It has been sanctioned by law and will receive a budget to continue its operations after the demonstration loan is terminated. In addition, the KHDI has been designated as a collaborating agency with the World Health Organization (WHO), which means that the KHDI is attaining a level of expertise that will enable it to be a resource for lesser developed countries. This is most encouraging. However, as it moves into a new phase, the KHDI should consider reorganizing itself. It must expand its expertise in educational technology to completely train 400 CHPs in the coming year. It should develop health

service research capabilities in a broader range of discipline as to evaluate field demonstration projects. In order to plan an effective role as a health development institute serving the MOHSA and other ROK agencies, the KHDI must broaden its research and planning perspective to encompass other than demonstration projects.

### Project Implementations

The evaluation team visited the primary health units and the community health centers in three KHDI demonstration areas (Hyangchon, Okgu, and Gune Gun) and the Chuncheon and Kimjae centers, which are outside the KHDI demonstration area. In addition, two village health aides were interviewed.

The team's major findings on PHUs are summarized below.

- o The physical facilities are clean and adequate to handle the present caseload. There is evidence of lack of acceptable water supply and human waste disposal outside the PHU.
- o One CHP and two CHAs manned the facilities which were visited.
- o The caseload for the PHUs was never less than 10 or more than 15 cases reported daily.
- o In the five PHUs which the team visited, the referral system was said to be the satisfactory in three; difficult at times, and especially in winter in one; and poor in the other.
- o Staff at three of the five units visited commented on the widespread use of traditional health practitioners.
- o Most outreach activity is performed by CHAs.
- o The most common condition which brings a patient to the primary health care (PHC) unit is respiratory tract disease. This accounts for 40 percent to 50 percent of the visits. Next in order are gastro-intestinal illnesses and skin and urinary track problems (especially in women).
- o The supply of drugs is consistently reported to be satisfactorily.

- o The performance of CHPs appears to be acceptable. The evaluators were impressed with the frankness, sincerity, and dedication of these individuals. There was frequent reference to low pay, lack of incentive, and excessive paper work. CHPs also said it is difficult to get time off from duty or for vacation. The authors' impression is that CHPs feel that their training and a preparation are not appropriate, given their tasks.
  
- o The data indicate good to excellent success in meeting the targets for maternal and child health, immunizations, and family planning. The major weakness appears to be in the tuberculosis control program. It is partly attributable to inadequate health education, lack of cooperation from patients, transportation problems, and patients' lack of interest.

The evaluation team also visited the community health centers (CHCS) at Hongchon, Okgu, and Gune Gun, which are within the KHD demonstration units, and the Chuncheon and Kimjae centers, which are outside this area. The evaluators' impression is that the facilities, morale, and productivity at the centers within the KHD are somewhat better than conditions at the two centers outside the area. It should be noted that visits to the latter centers were unscheduled and unexpected, a fact that may explain the disparity in conditions.

In general the evaluators found that:

- o The caseload at the CHC is fairly low, ranging from 25 to 50 each day at Okgu and to 135 each day at Hongchon.
  
- o The average, two physicians, one dentist, four nurses (RNs), one CHP, and five CHAs constitute the professional staff.
  
- o The facilities are generally good to excellent. Supervision is reported to be good. There was no serious complaint about the supply system.
  
- o The consensus is that the workload is too heavy, pay and incentives are low, and the referral system is satisfactory to poor.
  
- o Workers at the center at Kimjae reported that other county government agencies "borrow" center staff, thus hampering their work. They clearly are not satisfied with the level of care they provide.

- o There was no evidence of significant programs in preventive medicine; activities are directed toward curative medicine.

The village health aides in Honchon and Gune appear to be competent and dedicated and are obviously respected community leaders. They feel that their productivity could be improved if they were further trained to deal with common problems in health education, information, treatment of disease, maternal and child health, and the use of simple medications.

### Research and Evaluation

The KHDI has accumulated an enormous amount of data on its program from a variety of sources. The primary health units and the community health centers submit monthly reports to the KHDI which enumerate the number of service contacts with patients and clients by fieldworkers. A sample of facility records is reviewed annually to evaluate the performance of the health care system by service category (e.g., medical, maternal, infant and child, family planning services).

Two sample surveys of households were conducted in 1976 and 1979 to compare outcome indicators both before and after the KHDI project was indicated in the demonstration and control areas. One study revealed that less than 10 percent of all patients who seek care in the demonstration areas receive care from community health practitioners. The same study also shows the continued and overwhelming preference of patients to seek aid from pharmacists, although the proportion declined in the demonstration areas between 1976 and 1979. These findings are shown in Table 1.

Table 1  
 CHANGES IN PERCENT OF TREATMENT RECEIVED,  
 BY SOURCE, DURING (1976 AND 1979) 15-DAY PERIOD

<u>Demonstration Areas</u>	<u>Physician</u>	<u>CHP</u>	<u>Pharmacist</u>	<u>Herbalist</u>	<u>Other</u>
1979	12.7	8.9	68.6	5.5	4.5
1976	13.5	-	75.6	6.3	4.6
Change (a-b)	-0.8	8.9	-7.0	-0.8	-0.3
<u>Control Areas</u>					
1979	12.9	-	75.1	4.9	7.1
1976	9.4	-	74.7	6.7	9.2
Change (a-b)	3.5	-	-0.4	-1.8	-2.1

In the demonstration areas, the proportion of patients who expressed satisfaction with the care they received was slightly higher for physicians, 92.8 percent, than for CHPs, 85.5 percent. The proportion of patients in control areas who were satisfied with the care they received from physicians was 89.8 percent, almost the same as the proportion for the demonstration areas.

The KHDI has defined coverage for any given service category with the formula,  $C/P \times 100$ , where C equals the number of persons who received services at least once and P equals the eligible population. By the end of 1979, 33.3 percent coverage had been achieved for infant and child health services in the demonstration areas, but only 4.2 percent coverage had been achieved for the same services in the control areas. Similarly, coverage for family planning reached 29.0 percent in the demonstration areas but only 16.9 percent in the control areas.

Although coverage with three or more doses of DPT vaccine was greater in the demonstration than in the control areas, the degree of change from 1976 to 1979 was identical in the two areas. This is shown in Table 2.

The difficulty in selecting control areas where variables are comparable are well known. Too frequently, important differences become apparent after a selection has been made. Note that in the demonstration areas, 23.9 percent of the children received three or more doses of DPT vaccine before the project began. This was five times the number of children in the control area, 4.6 percent, who received three or more doses of the vaccine. Unfortunately, in the demonstration and control areas there also are striking differences in the data on BCG and measles vaccines, institutional and hygienic home deliveries, and prenatal care. These data are shown in Tables 3, 4, and 5.

The changes suggest that health services in areas served by the KHDI have improved substantially. It is not possible to determine whether these gains exceed in areas served by private practitioners and the Ministry of Health and Social Assistance because in coverage with medical services, and probably the availability of such services, before the KHDI project was initiated are not comparable to medical coverage and access in services in the demonstration areas.

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Table 2  
CHANGES IN PERCENTAGES OF DPT VACCINES RECEIVED  
1976 AND 1979

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	<u>Demonstration Areas</u>	<u>Control Areas</u>
1979	31.6	12.3
1976	23.9	4.6
Change	7.7	7.7

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Table 3  
CHANGES IN PERCENTAGES OF BCG AND MEASLES VACCINES RECEIVED  
1976 AND 1979

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<u>BCG</u>	<u>Demonstration Areas</u>	<u>Control Areas</u>
1979	48.3	21.1
1976	43.6	26.2
Change	4.7	-5.1

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Table 4

CHANGES IN PERCENTAGES OF INSTITUTIONAL DELIVERIES  
AND BIRTHS USING HYGIENIC DELIVERY SET IN THE HOME  
PER 100 BIRTHS, 1976 AND 1979

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	<u>Demonstration Areas</u>	<u>Control Area</u>
1979	43.7	18.7
1976	18.6	6.9
Change	25.1	11.8

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Table 5

CHANGES IN PERCENTAGES OF MOTHERS RECEIVING  
PRENATAL CARE FROM PROFESSIONALS, 1976 AND 1979

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	<u>Demonstration Areas</u>	<u>Control Area</u>
1979	27.3	12.0
1976	14.4	9.4
Change	12.9	2.6

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Given the lack of data on morbidity and mortality and the presence of a number of undifferentiable factors affecting health status, it is impossible to calculate the cost/benefit ratios of health service programs. With income levels, dietary standards, transportation, education levels, etc., all showing rapid increases in Korea, it cannot be said unequivocally that any given change in, for example, tuberculosis is the result of work by the KHDI or any other health service system.

Some broad estimates can be made, however, which suggest strongly that expenditures on health are actually quite competitive with other development priorities. Let us consider, for example, some likely parameters for costs and the possible benefits of an expanded program of tuberculosis control in rural Korea. The prevalence of tuberculosis in Korea is reported to be 2.7 percent (more than one million cases) - a frightening total. The KHDI made 57,111 tuberculosis prevention contacts in 1979 in its limited area; of this total, approximately 5 percent, or 2,855 cases, were positive. The attrition rate among these patients is considerable; perhaps half will not persist through an extended period of treatment. But, for every case detected and rendered non-contagious, further infection of one or more other persons is prevented. Let us assume that attrition is counterbalanced by reduced contagion and that 2,855 persons will be relieved of the disease. The recommended treatment of these patients is expensive. Triple-drug therapy in a hospital for perhaps two months and drug therapy at home for approximately 16 months would cost approximately \$600 for drugs alone. Roughly, one can assume that hospital charges and the costs of health personnel will double the total to about \$1,200 per patient restored to health. The KHDI actually shares a portion of the latter costs with the MOHA, the MOHSA, and the patient, but all such costs are properly included in a social cost/benefit analysis. Thus, the approximate total cost of the cases which the KHDI detected in 1979, if all were treated, would be approximately \$3,426,000 (2,855 patients x \$1,200 cost per patient).

Besides the enormous reduction in human suffering, what is the economic advantage to Korea of such a significant increase in economic activity, because detected and treated persons would be able to avoid prolonged morbidity and eventual mortality. Since 56 percent of all Koreans are actively involved in income-generating activities (ignoring housewives, students, and retired persons, many of whom make real, but not conveniently measurable, contributions to the economy), one can apply that fraction to the average per capita farm income (about \$640 per year) to arrive at \$358.40 per year potential savings per case. Assuming that almost all the detected cases would, if untreated, progress to mortality and that prompt treatment would save an average 15 working years, one would expect that the 1979 KHDI program could, if effectively implemented, eventually result in a savings of \$15,348,480 (2,855 cases x \$358.40 cash income per year x 15 working years saved).

There are many possible objections to this line of reasoning. Following in-depth analysis of Korean medical data, one might revise considerably the parameters used in the above examples. But it is not likely that the thrust of

the analysis would be altered, even after major changes in the parameters, because the dollar benefit from this program is clearly very high. The cost/benefit of, for example, a steel mill, may be said to be favorable if with the expenditure of \$3 in capital, income continues to increase by \$1. To reach the 2,855 cases detected by the KHDI in 1979 with recommended therapy, the KHDI, the MOHA, the MOHSA, and the patients would have to spend roughly \$3,426,000. The estimated return, \$15,348,480 (not discounted for the 15 years), would yield nearly \$5 for every dollar spent, or nearly 15 times that of the steel mill.\*

The many rough parameters in this analysis need to be refined, but one should not therefore assume that the economic benefits of health programs are equal to zero. Nor should one assume, as do competing advocates of other types of development expenditures, that because it is easier to quantify the benefits of such projects, the results are more valid.

One can quantify costs and benefits of other aspects of health delivery systems as more data become available. Korea has, for example, made great strides in family planning, markedly decreasing the child dependency ratio from 81.8 percent in 1966 to 77.1 percent in 1970. This ratio continued to decline in the last decade. Given this reduction, it is possible to increase the percentage of work force participation (55.6 percent in 1965 and 57.6 percent in 1979) and real per capita income. The cost of reaching rural Korean families, the majority of which do not now practice family planning, with advice, drugs, and referrals for contraceptive techniques, will be considerably less per acceptor than the cost for treating patients with tuberculosis.

One cannot prove that a KHDI or any other health service is the sole cause of a noted change in disease incidence or in levels of health practice. This is hardly unique to the institution of health programs. If a society spends an additional \$50 billion on new types of thermonuclear weapons, which may already be obsolete, and if this represents a 10 percent increase in military spending, can one thus say that society is 10 percent safer? To do so is to suggest that development monies are commonly allocated on the implied rather than proven relationship of expenditure to output. Of course, such associations differ in strength, and the more explicit the data are, the more acceptable the association is. Thus, it would be desirable for the KHDI program to be able to isolate all the cost elements--personnel, training, facilities, equipment, drugs, promotion, etc.--of, for example, an effort to increase the number of families practicing family planning. (The KHDI's final internal evaluation showed modest gains for family planning in the demonstration area, as compared with the control area. It was the opinion of field researchers that the

\*For an earlier attempt at cost/benefit analysis for tuberculosis programs, see Jong Huh, M.D. et al., "Cost Benefit Analysis of Tuberculosis Control Program in Korea," Vol. 21, No. 1, January 1973. The authors calculate a similar cost/benefit ratio of 5.97 to 1.

phenomenon of increased awareness among the sampled population (in part because they were sampled) biased the results. If that is true, perhaps more reliable results might be obtained by re-interviewing the same sample after the novelty has worn off.)

In determining the benefit(s) of family planning, it may be useful to measure changes in the dependency ratios of demonstration and control areas to understand the change in per capita real income. The government of Korea has obviously been at the forefront of international efforts to control population growth, and it apparently does not need to be further convinced that family planning pays. What is needed perhaps is proof that the KHDI approach is the optimum approach for increasing contraceptive practice. It has been demonstrated conclusively elsewhere that most prospective clients will not travel far to seek family planning assistance. If the KHDI is to be the designated agency bringing health measures to the rural people, it must incorporate this vital service into its programs. CHA training must be strengthened to increase CHA's effectiveness in delivering family planning services.

Dr. Ha Cheong Yeon of the Korea Development Institute has made a significant contribution to Korean development planning with his External Evaluation of The Health Demonstration Project. In this study, Dr. Yeon offers a cost-effective approach to comparing the primary health care system (KHDI) with the pre-existing health structure. He also translates much KHDI data into shorthand, suggests criteria for setting priorities for expansion, and estimates the costs for expanding KHDI activities nationwide. The AID/APHA evaluation team admires this effort especially, and for the high level of professional competence within the health structure which the members observed throughout Korea.

### Conclusions

The broad conclusions of the KDI study, with which the evaluators concur, are listed below.

1. The KHDI is a viable program, enjoying increasing acceptability among the rural Korean populace.
2. The cost to deliver health care under the KHDI system is demonstrably less than the cost under the preexisting program, which stresses care by physicians in a clinic setting. Total costs are estimated to be 1140 per service contact under the KHDI as compared to 3470 under the more traditional (western) approach.
3. The KHDI, like the system before it, stresses curative care (32.5 percent of its expenditure) over preventive care (6.4 percent of expenditures). Over the long run, increased attention to preventive care will tend to reduce overall costs.

4. Attrition is a problem among KHDI personnel (physicians, CHPs, and especially CHAs). One can expect it to increase as additional demands are made on available health manpower and as more trained, educated, urban workers are sent to isolated health posts. Incentive pay structures should be used where attrition rates are heavy to minimize training expenses and to maintain the continuity of services.
5. To expand the KHDI program nationwide, approximately 16 billion won will be needed each year. Another 16 billion won (spread over 5-7 years) will be needed for capital costs and training.

In the opinion of the AID/APHA team, the estimated expenditures for training should be increased substantially. Each CHA, for instance, will receive less than \$200 in total training. As the primary trust of the outreach program rests with these women, it is imperative that they be properly equipped for the job.

The addition to the ROKG budget, which stands about 6,812,400 million won, represents only about 0.2% percent of the total. The government has repeatedly expressed its commitment to increasing social welfare expenditures. It appears that by expanding the KHDI program, this aim can be realized.

#### IV. RECOMMENDATIONS

#### IV. RECOMMENDATIONS

##### Institution-Building and the Future Role of the KHDI

The Korean Health Development Institute was established by law as a semi-autonomous institute under the Ministry of Health and Social Affairs. The KHDI is legally authorized to:

- conduct health services research and policy analysis and to provide technical assistance in planning;
- develop and evaluate policy-relevant demonstration projects; and
- provide technical assistance to support the implementation of a national health care system.

To fulfill the above functions, both internal and external changes must be made with respect to the future role of the KHDI.

Although the KHDI was organized to meet the objective of the USAID Demonstration Loan, it now needs to reorganize to develop its capabilities in the three areas described above.

Expertise in economic, social, and administrative science, as well as epidemiology and biostatistics, is needed to conduct effective research in health services. Expertise in educational technology and content specialists are needed to provide effective technical assistance in curricular development and to train various levels of health workers.

The KHDI's relationship with the MOHSA, the Economic Planning Board, and other government agencies such as the MOHA and the MOE needs to be clarified and strengthened. The MOHSA needs to make better use of the KHDI as a health service research and development institute. Furthermore, the National Health Council has not been effective at establishing working interagency relationships for the KHDI. As presently constituted, it should be disbanded.

The KHDI is charged with training 400 CHPs in the coming year. This mandate involves a complicated set of logistic and budgetary problems that affect the Ministries of Education and Home Affairs, and the MOHSA. Although the National Health Council was not an effective interagency coordinating committee

during the demonstration loan period, it may be expedient to reactivate it to facilitate the broad-scale training and deployment of CHPs. If such action is taken, a lower-level working committee should be established under the National Health Council.

### Health Care Delivery

The AID/APHA evaluation group notes with satisfaction that the ROKG has decided to award the KHDI permanent status. This will enable it to provide financial support for its staff and current activities and to expand its program of primary health care to serve the rural poor in other guns in the coming year. The KHDI will thus have unique opportunity to enhance the effectiveness of its primary health care program in combating morbidity and mortality. To this end, the evaluators offer the following recommendations.

#### A. Preventive Health Care

Before it expands its present program, the KHDI should carefully identify the principle causes of morbidity and mortality in Korea. Existing sources of information should be used to minimize expense. There is no information on the prevalence of malnutrition in preschool children, the proportion of newborn infants with low birth weight (less than 2,500 grams), and the prevalence of anemia among pregnant and lactating women in the Korean population as a whole. Estimates of nutritional status, the prevalence of anemia, and other variables will have to be obtained from a survey of a probability sample of Korean households.

Simple measures should be used. For example, heights and weights, as well as age, should be calculated to determine the nutritional status of preschool children. More sophisticated and expensive procedures to calculate serum protein, carotene, riboflavin, and ascorbic acid levels should be omitted.

The design of the survey and the selection of an appropriate sample are critical because precise estimates of the parameters selected for study are needed. The KHDI may want to consider consultations with national or international epidemiological and statistical experts.

Given the extent of the morbidity and mortality attributable to pulmonary tuberculosis in Korea, the KHDI should intensify its case-finding efforts. It will be difficult to achieve this commendable goal, as the evaluators recognize. Few specific recommendations are offered here. Certainly, the training of CHAs should be reexamined to answer the following questions:

- o Do CHAs know that tuberculosis in children is especially likely to assume a particularly lethal form (i.e., either miliary tuberculosis or tuberculous meningitis)?
- o Are CHAs aware that intermittent treatment of patients who fail to follow the prescribed regime is the principal cause of drug resistance?

The KHDI could perhaps make CHAs aware of the importance of case-finding by commending those CHAs in each county who discover the largest number of new cases in a given reporting period. Commendations in the form of letters and annual cash awards should be considered.

The KHDI should give more attention to environmental sanitation. Again, this will be difficult, particularly in view of the KHDI's limited resources. One might hope that the primary health units and other fixed facilities would be models. The evaluators were favorably impressed with the cleanliness and orderliness of the PHUs and other physical plants of the KHDI. They were, however, distressed to find that pit privies in two of the facilities were located only a few yards from running streams.

A review of the literature on health conditions in Korea and statements by Korean health professionals suggest that malnutrition in preschool children may be more widespread and serious than is thought. This is most likely to be true in the most economically depressed areas, such as the islands of Okgu Gun. The KHDI should seriously consider initiating a program of nutrition surveillance in such areas. Children should be weighed regularly and their weight recorded on appropriate charts kept by the children's mothers at home. Data from a carefully monitored program would give some insight into the nature and extent of malnutrition in preschool children and demonstrate the effectiveness of nutrition surveillance in combating this disease.

## B. Curative Health Services

The KHDI should give high priority to evaluating the outcome of its program of ambulatory treatment of pulmonary tuberculosis. In light of the problem of non-compliance with treatment regimes (and accompanying drug resistance in other parts of the developing world) and anecdotal evidence that non-compliance may be widespread among patients under the KHDI's care, the KHDI should study the extent of sputum conversion and the drug resistance of the tubercle bacillus in a randomly selected group of patients. Perhaps the MOHSA or the National Institutes of Health (NIH) would be willing to assist in doing sputum cultures and sensitivity tests on all M. tuberculosis recovered by culture. If drug resistance proves to be widespread, the KHDI will have to take measures to reduce it.

The KHDI should reexamine the role of the CHP in diagnosing and treating disease. The evaluators agree that the CHP should be able to diagnose (or at least suspect) congestive heart failure, but they are somewhat less confident in recommending that CHP be allowed to prescribe digitalis. They are particularly concerned about allowing the CHP to use such potent drugs as corticosteroids, even in the short term. It is true that in a very few cases CHPs have been allowed to use such potent drugs as corticosteroids. In most cases, however, CHPs use less potent drugs (e.g., prednisolon). A final determination on this matter will not be made until the demonstration stage of the project has been completed. Conceivably, CHPs would be more effective if they were highly trained to diagnose and manage a limited number of relatively common disorders.

### Curriculum Design and Evaluation

The evaluators reviewed existing KHDI materials on the development of curricula and the training of health workers. They wish to congratulate the KHDI for producing so much in so little time with a small, hard-working training staff.

The following recommendations are intended to facilitate the difficult task of replicating the CHP, CHA, and VHA training program in other parts of Korea.

The KHDI has carefully documented CHP, CHA, and VHA training programs in Background Papers on Health Demonstration Project 1978 and in a series of articles published in 1980 and given to the evaluation team.

#### A. Performance Analysis

The evaluators recommend that the task analysis developed by the KHDI be administered to a group of CHPs, CHAs, and VHAs to determine whether stated tasks correspond to actual functions. Additions or deletions made by fieldworkers should be carefully analyzed and, if necessary, job descriptions should be reviewed.

#### B. Objectives

The objectives for instruction are listed in the documents. Task analysis should be linked to the objectives. Also, objectives should be written in behavioral terms so that the many teachers who will use the documents can understand them more easily (See Exhibit 1).

EXHIBIT 1

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Job Description	Task Analysis
Performs Nutrition Education	<ul style="list-style-type: none"><li data-bbox="740 704 1279 768">o Shows villagers how to place and plant kitchen gardens.</li><li data-bbox="740 804 1395 900">o Demonstrates method of preparing weanling foods with locally available ingredients.</li><li data-bbox="740 936 1395 1000">o Discusses food needs of pregnant and lactating women with villagers.</li><li data-bbox="740 1036 1413 1132">o Shows mothers how to determine whether babies are gaining in weight and height.</li></ul>

Objective:\* Given some garden tools, seed, and access to a small plot of land, the CHA trainee is able to demonstrate how to plant a kitchen garden.

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\*Only one given.

### C. Evaluation

The KHDI evaluation system should be refined to ensure comparability and quality control at all training sites. The clinical checklists which are now available might also be refined. Additional checklists which cover all critical clinical, preventive, and promotive skills of CHPs should be produced. Checklists should be used to assess interpersonal and psychomotor skills. Patient-management problems should be used to assess cognitive skills (i.e., decisionmaking, diagnosis).

A testing procedure similar to that described above should be developed or adapted for use with CHAs and VHAs. The tests should be applied before, during, and after instruction.

### D. Packaged Training

The KHDI produced texts for CHPs, CHAs, and VHAs. The concept of packaged instruction might be adopted as more workers are trained.

The student would receive packages that outline the objectives of the training and that contain teaching materials, text, illustrations, slides, cassettes (if applicable), and instructions for fieldwork and laboratory work) and progress tests. These packages organize instruction; all required materials are assembled and can be used easily by students. The packages should be reviewed by subject matter experts.

Considerable manpower and financial resources are required to produce instructional packages. It is recommended that such resources be made available to the KHDI.

### E. Field Tests

The packaged training materials, including evaluation instruments, should be tested before actual implementation with a small group of CHPs, CHAs, and VHAs to determine whether the students can learn from the materials. The students' ability to perform the critical skills called for in the objectives must also be assessed. Individuals who have the necessary qualifications and who have not been trained should field-test the materials. This process is time-consuming but essential. The results will be useful in determining whether materials can be used with a large number of students in the future.

## F. Revision

The teaching and testing materials need to be revised after the field test. Further advice from subject matter experts may be needed. Revision should be cyclic. As health conditions change and as the site of health delivery changes from a primarily rural to a more urban setting, instructional materials must be revised to conform to evolving measures of treatment and the changed role of the health worker.

## Field Training

Following field training, certification of the CHP, and on-the-job training, the KHDI should modify the quality and quantity of both the curriculum and supervision. Both money and manpower are needed to implement these recommendations. The evaluators recommend that KHDI receive such support to carry out these essential activities.

### A. General Organization

Field training is not merely a process of "exposing" workers to problems encountered at PHUs. Students may be encouraged to make the same mistakes again and again, to reach incorrect conclusions, to give incomplete health care, or to diagnose illnesses inaccurately if they do not receive practical training outside the classroom. The student can improve his skills only if he receives frequent feedback on his performance.

Field training should be conducted at the PHU and CHU, as well as in a hospital setting. The CHP will work at the community level, and not in a hospital. Her problems will not be the acute cases often seen at a hospital, but colds, stomach aches, cuts, rashes, and other common problems. Field training should be integrated with theoretical learning. The student should practice the skills he has recently learned in the classroom. If instructions in theory and practice is provided at widely-spaced intervals, the student will forget the theory. Field learning also should be graded in difficulty. The student should first perform easy tasks and solve the more common and obvious problems. Later, (s)he should be introduced to more difficult tasks and problems.

### B. Supervision

Students should be instructed by appropriate professionals: sanitarians, public health nurses, health educators, general practitioners, social workers, and community action specialists. All these professionals are not required

at the same time, but they should be available to reinforce and shape skills in their area of competence. The evaluators recommend a mobile team of instructors. Each team of five instructors (two full-time, three part-time) would be responsible for training 25 CHPs in the field. They would travel from gun to gun for approximately one week each month, working with a group of 6-8 students in each gun. Increased supervision will ensure that CHPs receive sufficient feedback if this project is replicated. The field training materials which the KHDl is developing will ensure comparability of training from site to site.

### C. Skill-Training

During basic training of all three levels of workers, more emphasis should be placed on:

- communication skills, including health education and behavioral change, in such fields as nutrition and sanitation;
- community organization skills, including needs assessment, motivation, group decisionmaking, project implementation, and follow up; and
- assessment of common complaints at the PHU. In particular, emphasis should be placed on the most common conditions seen in rural settings: respiratory illnesses, especially tuberculosis, and gastro-intestinal and skin diseases. Since CHPs see mostly mothers and children, MCH-related problems should be stressed. Adequate logistic and technical support will be needed.

### Teacher Training

To ensure quality control and uniformity of training from site to site, a comprehensive, rigorous teacher-training program for all three categories of health workers needs to be designed and implemented. The main purpose of such a program would be to help KHDl staff develop training materials and test instruments.

The following should be included in the workshop on teacher training and course management:

- o Training in the definition and application of competency-based training approaches.

- o Use of training materials developed by the KHDI to construct syllabi and session plans for CHP, CHA, and VHA training.
- o Development of comprehensive guides for instructors, including syllabi, session plans, and evaluation instruments.
- o Training in the use of modern teaching methods (e.g., role play, use of mannekins and audiovisual (AV) aids, case methods, and small group discussions).
- o Training in the development of objective tests, test scoring, interpretation of test results, use of test results to improve instruction, and development of performance test checklists.
- o Training in the adaptation of teaching packages to fit individual instructional settings.

The evaluators recommend that a number of these workshops be scheduled to train teachers to use the materials now available and to develop new materials to complete the set of comprehensive training materials. At these training sessions, instructors will learn how to design and deliver competency-based training packages and to use those packages, to write and edit available materials. Continuing bibliographic research is highly recommended.

Appendix

INTERVIEWS BY THE AID EVALUATORS:  
A SUMMARY OF RESPONSES

## Appendix

### INTERVIEWS BY AID EVALUATORS: A SUMMARY OF RESPONSES

The AID evaluation team visited five primary health units and three community health centers, conducting interviews from September 7 to September 16, 1980. Eighteen CHPs and two VHAs were interviewed.

The following questions were asked. The respondents' answers are summarized in the following pages.

1. What is the staffing pattern?
2. What is the case load?
3. What are your four major problems?
4. Do you have sufficient medicines, supplies, and equipment?
5. Are the referral procedure and practice adequate?
6. Is the outreach adequate? How much outreach is performed?
7. Is supervision adequate?
8. Is on-the-job training (OJT) adequate?  
Would you like further training? If so, in what areas?
9. Are media and audiovisual aids used? Are they needed?
10. Do you have sufficient reference books?
11. What are the most common health problems you see?

KHDI  
PRIMARY HEALTH UNITS

## Interviews by AID Evaluation Team

Topic	Hongchon Gun		Okgu Gun		Gunee Gun
	Mulgeolri	Shidong	Yearu	Daekwang	Ubo
1. Staff: CHP CHA	1 1	1 1	1 2	1 1	1 2
2. Caseload	10/day	10-15	10-12	10	15
3. 4 Problems	Transportation of patients	Sanitation poor, flies	Villagers demanding	Would like to prescribe an- tibiotics	Educational level of people low
	People use traditional health practices	People use traditional health prac- tice*	Paper work**	No telephone	People use traditional health practice
	People will not use center	PHU open 24 hours**	PHU open 24 hours	Paper work	Low salary
	People too poor to use center	Military dependents; too much work	People too poor to use PHU	Health post property of community	Poor referral system
					Lack of cultural oppor- tunity
4. Medicine, etc.	Enough	Enough	Sometimes	Enough	Enough
5. Referral	Difficult Winter	OK	OK	OK	Poor

\*The problem that people don't use the PHU because too poor or because they used traditional health practitioners was mentioned six times.

\*\*Paper work was mentioned two times; the fact that PHU was open 24 hours was also mentioned two times.

Topic	Hongchon Gun		Okgu Gun		Gunee Gun
	Mulgeolri	Shidong	Yearu	Daekwang	Ubo
6. Outreach: CHP CHA	8 days/month 20 days/month	15 days/month	OK OK	Rarely 20 days/month	4 days/month 15 days/month
7. Supervision	OK	Good		OK	Not enough
8. OJT/CHP Training Needs	Health Education	Not enough	Respiratory Infection	Diagnosis	Private clinic; rural setting; curative
9. OJT/CHA		Not enough	OK	Curative skills	MCH
10. Media	Needed	People will not read leaflets			Radio, TV
11. Books					Need reference books
12. Most Common Problems			Respiratory GI Skin Genito-Urinary		Respiratory GI

Interviews by AID Evaluation Team  
(Community Health Center Sept. 9-16, 1980)

Topic		Hongchon		Okgu		Gunee		Chuncheon		Kimjoe	
MD	DDS	3	1	1	1	1	1	2	1	2	1
1.	Staff:CHP	1 laboratory, 1 X-ray		-	1	1		2 X-ray		1	1
	CHA	2		3	4	4		2 pab technicians		40	
	RN	4, 1 pharmacy		1	4	4		4		4	
2.	Caseload	135/day		40/day	25-50	40-70		15-20 dental		40	15
3.4	Problems	More medical doctors needed		Workload* too heavy	Too many patients	Staff turnover		Poor reporting County government borrows staff			
-		Open two closed PHUs		Cover 24 hours/day	No time to study	Supplies late Supervision at Myon level poor		Low pay Staff unqualified			
-		Not enough vehicles		Cannot take leave	Taught properly			Laboratory specimens move too slowly			
-		Salary of CHA low**		Income low	Pay low	Chain of command poor		Only minor treatment possible			
4.	Medicine	OK		OK	OK	Supplies late		OK			
5.	Referral	OK; ambulance available		OK; ambu- lance avail- ble	No provision for FU	Poor		Poor			
6.	Outreach:	Good; mobile clinic; MD to Myon twice a month		Through PHU	Do not go; 4/day/week 10 cases/day	Organization poor					
	CHP			Stay in health cen- ter							
	CHA										

\*The heaviness of the workload was mentioned five times.

\*\*The fact that salary is low was mentioned three times.

Topic	Hongchon	Okgu	Gunee	Chuncheon	Kimjoe
7. Supervision	Good	Good	Good	No supervision in subcenters	
8. OJT/CHP	NA	NA	Training should be done in rural setting	NA	NA
9. OJT/CHA	-	Curative	Interpersonal skills, techni- cal skill	1	Sufficient
10. Media	People too busy to read	-	Villagers do not like leaf- lets	-	
11. Books	-	-	Not enough		
12. Health prob- lems				Under 5 years <hr/> Place dingy; no statistics kept	Respiratory GI  Skin Genito-urinary

## Village Health Aides

<u>Topic</u>	<u>Hongchon</u>	<u>Gunee</u>
Hours	15 hours/week Monthly meeting of CHC	1½ hours per week; house visits; monthly meeting in CHC; every 5 days cleaning campaign in village
Problems	-	PHU needs more drugs; specialist services should be provided, ENT, dentist; many non-cooperating mothers
OJT	Yes, MCH	Training in FP, MCH
Supervision	Good; close to PHU	Good; by PHU staff  Fine; she feels proud to do the work