

No. 04

BASIC DESIGN STUDY REPORT
ON
THE IMPROVEMENT PROJECT OF MEDICAL EQUIPMENT
FOR
INSTITUTE OF CARDIOVASCULAR DISEASES
IN
THE PEOPLE'S REPUBLIC OF BANGLADESH

OCTOBER, 1985

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to the request of the Government of The People's Republic of Bangladesh, the Government of Japan decided to conduct a Basic Design Study on The Project to Improve Medical Equipment for The Institute of Cardiovascular Diseases and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Bangladesh a study team headed by Dr. Hiroshi Sakakibara, Associate Director of National Cardiovascular Center, from July 22 to August 5, 1985.

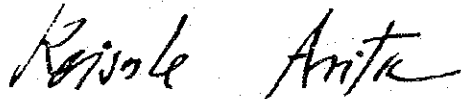
The team had a series of discussions on the Project with the officials concerned of the Government of Bangladesh and conducted a field survey in Dhaka.

After the team returned to Japan, further studies were made and the present Report has been prepared.

I hope that this Report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of The People's Republic of Bangladesh for their close cooperation extended to the team.

October, 1985

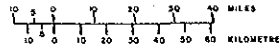


Keisuke ARITA

President

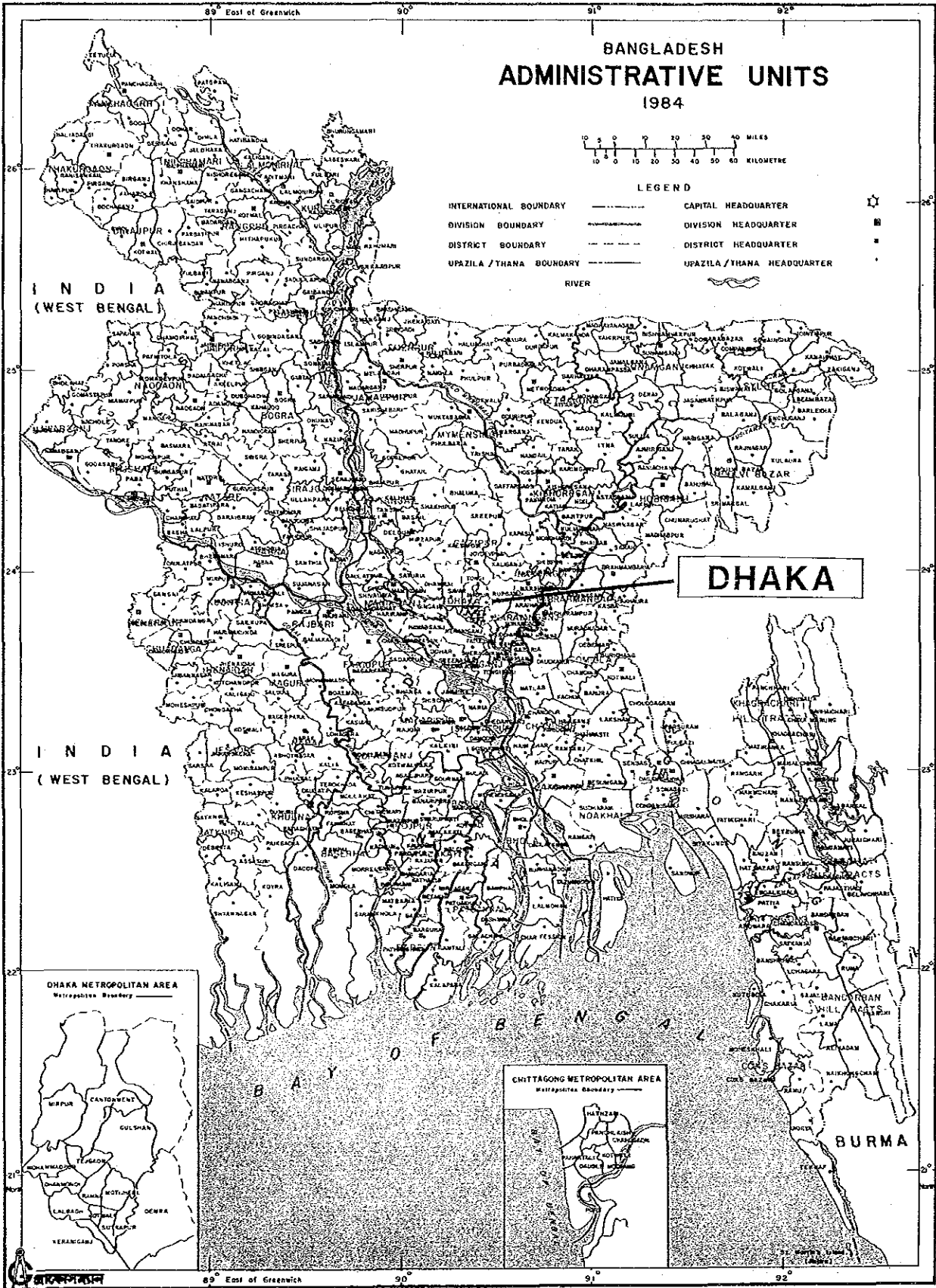
Japan International Cooperation Agency

BANGLADESH ADMINISTRATIVE UNITS 1984



LEGEND

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| DIVISION BOUNDARY | ----- | DIVISION HEADQUARTER | ■ |
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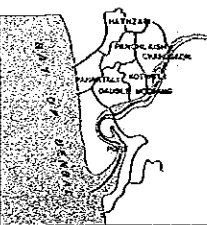


DHAKA

DHAKA METROPOLITAN AREA
Metropolitan Boundary



CHITTAGONG METROPOLITAN AREA
Metropolitan Boundary



BURMA

SUMMARY

The Government of the People's Republic of Bangladesh is placing foremost priorities in wrestling with the amelioration of its undeveloped primary health care services and the improvements in the productivity of drugs, which shall contribute to the promotion of health care based on the Third Five Year Plan aimed to advance its national medical services. One of the most important objectives is to establish measures against cardiovascular diseases; starting with measures against rheumatic heart diseases, which are widely prevalent within the various social strata throughout the country. Next to the health care program the Government of the People's Republic of Bangladesh has promoted the Cardiovascular Diseases Control Project since the latter part of the seventies('70).

The object of this improvement project is for the Institute of Cardiovascular Diseases, Dhaka (ICVD), which was founded in 1978; and is presently equipped with 110 beds. ICVD is the one and only hospital specializing in taking care of cardiovascular diseases, and it has built up an indefatigable position of being the center in promoting control program for these diseases.

Based upon the request of the Government of the People's Republic of Bangladesh, the Government of Japan has, right from the start of the establishment of ICVD, been in close cooperation in providing medical equipment and consumables as well as technical cooperation for medical activities. Namely, in 1979, the year following ICVD's establishment, the Japanese Government decided to perform the grant aid assistance for procurement of most of all medical equipment in ICVD, and from 1979 up till '84, that is for the past 5 years continual technical cooperation was positively carried on. ICVD's full scale operations started after these medical equipment were completely delivered in April 1981, and simultaneously the first Japanese expert team was dispatched to ICVD on the technical

cooperation program. This technical cooperation was initially for 5 years, but it was re-newed to extend for another 2 years ending in February 1986, which is presently at its closing year.

In the meanwhile, ICVD was supported by the united efforts of cooperation from both Governments. ICVD commenced medical services in 1981, and ever since its first successful open heart surgery in 1981, it has achieved outstanding performances of 94 successful cases as well as 687 cases of closed heart surgeries. Thereby, it established for itself within the People's Republic of Bangladesh a reputation of being the most highly developed medical institution. This splendid performances resulted in increasing the sufferers and patients coming to the hospital for treatment tremendously, each year. At present there is no bed available to meet the new demand. To cope with this problem, ICVD plans to enlarge the hospital and to extend the number of beds to 400, which is set forth in the Third Five Year Plan.

On the other hand, ICVD has been facing to the difficulties in performing adequate medical activities due to the following reasons; some of important equipment installed 4 years ago have been worn down and in maleficient conditions, and also have become very difficult quantitatively and functionaly to meet the increasing number of patients as well as the advancing medical care technics.

In view of such a background, the Government of the People's Republic of Bangladesh has drawn up an improvement program of medical equipment to continue and advance ICVD's medical activities, and has placed the request to the Government of Japan for grant aid to realize this program.

In order to study the contents of the request and its propriety, the Government of Japan dispatched a Basic Design Study Team for 15 days from 22 July to 5 August, 1985 through the Japan International Cooperation Agency.

After a series of discussions held between the Study Team and the People's Republic of Bangladesh authorities concerned in this Project, a basic agreement was made between both parties that the Project should only cover the improvement of the medical equipment already installed, to maintain the current level and also meet the future demands. Thereby, it should not be applicable for providing of new sophisticated equipments for ICVD's future expansion program.

From the result of the field survey carried out by the Study Team, The Request was confirmed to be reasonable. In addition to this, taking into consideration the opinion of the experts dispatched to ICVD from the National Cardiovascular Center (Osaka), the Study Team judged that the following medical equipment were appropriate for the Project.

	Department	Major Equipment
1.	Cardiology Dept.	E.C.G. Monitor, Spirometer, Treadmill, etc.
2.	C.C.U.	External Pace-maker, Patient Monitor, Surgical X-T.V. Unit, etc.
3.	Cardiovascular Surgery Dept.	Artificial Heart-Lung Machine Patient Monitor, Defibrillator, etc.
4.	Anesthesia and I.C.U. Dept.	E.C.G. Monitor, C.V.P. Scale, Respirator, etc.
5.	Central Laboratory	Blood Gas Analyzer, Flame-photometer, Respirator, etc.
6.	Radiology Dept.	Improvement of existing Angiography System, Cine-film Processor, etc.
7.	Blood Transfusion Dept.	Centrifuge, Incubator, Microscope, etc.
8.	Administration	Duplicating Machine, Slide Making Machine, Microbus, etc.
9.	Maintenance Dept.	Tool kit, Oscilloscope, Frequency Counter, etc.

The period of the Project would require approximately 14 months to complete for the execution. Needless to say, the existing medical equipment already installed would also be repaired and adjusted during this period.

Preparation work expenses such as the electrical supply, water supply and drainage facilities necessary for the installations of the medical equipment is to be borne by the People's Republic of Bangladesh, which is estimated approximately at TK 85,200 (in Japanese yen 690,000). The operation and maintenance expenses after delivery is estimated at approximately TK 21.6 lakhs (in Japanese yen 17,500,000). The Executive Agency for this Project in the People's Republic of Bangladesh is the Ministry of Health and Population Control.

The medical equipment to be provided by the Project are the ones that ICVD personnel are accustomed in its operation and have already acquired the necessary technics. Therefore, there is no need of additional personnel. Also, this Project aims to keep up ICVD's current functional levels by replacement and repairs of malfunctioning equipment as well as recruiting of shortages or such supplementary equipment to be supplied when the occasion arises. The implementation of this Project for ICVD is expected to contribute substantially in advancing the cardiovascular diseases control project for the People's Republic of Bangladesh.

Nevertheless, ICVD will still be confronted with the problems concerning the supply of special consumables and drugs and the maintenance of medical equipments designed for very specialized medical care. The basic consumables shall continue to be provided by the Central Medical Stores Depot (CMSD). However, other special consumables equivalent to TK 14.8 lakhs (in Japanese yen 12,000,000) per year, which have been provided through Japan's technical cooperation, have to be provided by own budget of the Government of the People's Republic of Bangladesh after the technical cooperation terminates in 1986.

Regarding the maintenance, ICVD established the Maintenance Department one year ago, which is actively contributing in keeping up the standard of equipment. Nevertheless, repairs, supplies of parts and such incidentals will still be required for the Department to function efficiently. Thus the concluding of a maintenance contract between ICVD and the local agents are positively required so as such repairs, supplies of parts could be speedily and efficiently carried out to avoid a long disturbance of medical care.

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MAP OF BANGLADESH

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LIST OF ABBREVIATION

1. Related Organization of the Bangladesh Government

Ministry of Finance	---	ERD (External Resources Division)
Ministry of Health and Population Control	---	DGHS (Directorate General of Health Services)

2. Health Organization and Institute

WHO	---	World Health Organization
PHC	---	Primary Health Care
UHC	---	Upazila Health Complex
CMSD	---	Central Medical Stores Depot
IPGMR	---	Institute of Post-Graduate Medicine & Research
IDCH	---	Institute of Disease of Chest & Hospital
ICVD	---	Institute of Cardiovascular Diseases
RIHD	---	Rehabilitation Institute & Hospital for the Disabled
IO	---	Institute of Ophthalmology
NIPSOM	---	National Institute of Preventive & Social Medicine
IPH	---	Institute of Public Health
ICDDR,B	---	International Centre for Diarrhoeal Disease Research, Bangladesh
CCU	---	Coronary Care Unit
ICU	---	Intensive Care Unit

CHAPTER1. INTRODUCTION

The People's Republic of Bangladesh (hereinafter referred to as "Bangladesh") is placing highest priorities in promoting the primary health care programs as the most important part of its health policy for the purpose of eliminating various infectious diseases and improving the nation's nutritive conditions resulting from the poor sanitary conditions and poverty. The Government of Bangladesh is also pushing forward the control programs for the specific diseases such as tuberculosis, ophthalmic diseases and cancer which have badly affected the health condition of the nation. The control program for cardiovascular diseases which are prevalent in the wide range of social strata is an important part of these programs.

The Institute of Cardiovascular Diseases, Dhaka (hereinafter referred to as "ICVD") which is the subject of this Study, is the one and only national institute specializing in cardiovascular diseases in Bangladesh.

ICVD was inaugurated in July 1978 in Dhaka within the Shaheed Suhrawardy General Hospital Complex, the following year in February 1979, the Government of Japan decided to execute the technical cooperation for the following 5 years. And to back this up, in August 1979, grant aid was also made to provide medical equipment for ICVD.

These equipment granted ranges from medical equipment such as angiography system, artificial heart-lung machine, blood gas analyzer, patient monitors and etc., to air conditioners, emergency power plant generator and up to ambulances. It was made up of all the equipment and facilities necessary to operate ICVD. The actual operation of ICVD started only after the delivery of the equipment from Japan was completed in April, 1981. Accordingly, the first Japanese expert team consisting of 4 members from the National Cardiovascular Center (Osaka) were to be dispatched by the Japan International Cooperation Agency.

During the past 5 years of the technical cooperation the Japanese Government dispatched to ICVD a total of 46 experts for a total of 12 times. On the other hand Japan trained 18 ICVD trainees here in Japan. The period of the technical cooperation was initially for 5 years to be ended in February 1984, which was followed by an extension of another 2 years ending February 1986. During this period technical cooperation to ICVD gave birth to spectacular achievements for the first time open heart surgery was successfully carried out. And at the end of the 5 years, that was in 1984 beds installed were 110, staff 179, annual out patients and in patients 30,238 and 5,989 respectively, and further open heart surgeries 25 and closed heart surgeries 186 cases, cardiac catheterizations 179 cases were performed. Moreover those cases are increasing each year. ICVD has now built an auspicious reputation as the one and only hospital specializing in cardiovascular diseases in Bangladesh. Needless to say the above-mentioned achievements were attained with the help of the medical equipment granted by Japan in 1979 and consumables provided by the technical cooperation since then. Such equipment has worn down under the severe environmental conditions, and has been at the end of its usage. Unless appropriate repairs or supplements are immediately made, it will be practically impossible for ICVD to keep up the current medical level even after March, 1986 when the seven-year technical cooperation terminates. Such being the circumstances, the Government of Bangladesh, has planned to maintain and improve the medical equipment to its proper level in ICVD and has requested to the Japanese Government for grant aid assistance.

In response to the request, the Japanese Government, through Japan International Cooperation Agency, dispatched a Basic Design Study Team (hereinafter referred to as "the Team") to Bangladesh for 15 days from 22 July, to 5 August, 1985 to study the contents of the request and its propriety.

The Study Team headed by Dr. Hiroshi Sakakibara, Associate Director of the National Cardiovascular Center (Osaka), held a series of discussions with the Bangladesh Government and ICVD, collected the necessary data and made survey tours to medical institutions concerning the following subjects:

1. Check on the equipment requested.
2. Study of ICVD organization and its performance on diagnosis and treatment.
3. Study of the present condition of ICVD's facilities and equipment.
4. Study of the supplement of consumables, etc.
5. Confirmation of the health policy and health programs of the Bangladesh Government.
6. Collection of general data concerning socio-economic and medical affairs.
7. Study of other similar medical institutions.

Based on the results of the Study, the Team discussed the basic policies of the Project with the Bangladesh authorities concerned and both parties confirmed the results of the discussions, which is described in the Minutes of Discussions mutually signed and exchanged.

The Minutes of Discussions, schedule, members of the Team, ICVD and the Bangladesh competent authorities who have been interviewed, are noted in Appendix 1, separately.

CHAPTER 2.

BACKGROUND OF THE PROJECT

2-1 Health Situation

2-1-1 Morbidity Patterns

It is generally said that health conditions in Bangladesh are extremely unsatisfactory and that various kinds of infectious diseases are prevalent due to the insufficient environmental hygiene and nutrition. And, there is no nationwide statistics available proving such situation. There is nothing but to know such situation statistically than to analogize the results of survey in a specific area.

The International Center of Diarrhoeal Disease Research, Bangladesh (ICDDR, B) conducted such a survey in 1981 for Matlab Upazila in Comilla District. Table 2-1 shows the statistic of Deaths by Cause on this survey. The area surveyed consists of 149 villages with the total population of 183,000. For the total number of deaths 2,400, Tetanus ranks the top (15%), Respiratory disease the second (13%), Dropsy the third (8%) followed by Fever, Dysentery chronic and Rheumatism. Although the accurate causes of deaths are uncertain due to rough classification of diseases based on symptoms, it can be clearly analogized that most are caused by common diseases such as infectious ones.

On the other hand, heart diseases, which are the main focus of the Study, are placed very low in the fifteenth and occupies only 0.9% in the total number of deaths in this statistics. Such low rank of heart diseases, however, can be considered not to show the actual and accurate situation because of insufficient diagnostic capabilities for complicated diseases at the level of upazila health complex in rural areas. Therefore, actual number of deaths caused by heart diseases, in spite of the statistical rank above, might be increased to higher in consideration of the following conditions.

Table 2-1 Cause of Deaths (Matlab, 1981)

		Male														
		Age at death (years)														
Cause	All ages	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All causes	1165	391	202	31	20	9	14	11	12	17	12	12	32	59	50	273
Small pox	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles	35	8	26	-	-	-	-	-	-	-	-	-	-	-	-	1
Tetanus*	106	174	8	2	-	-	-	1	-	-	-	1	-	-	-	-
Drowning	62	2	28	6	2	1	1	-	-	-	-	-	1	-	-	1
Murder	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Suicide	6	-	-	-	-	1	1	1	-	-	-	-	-	1	2	-
Diarrhoea acute	20	6	7	1	1	1	-	-	-	-	-	-	-	-	-	4
Diarrhoea chronic	11	-	9	1	-	-	-	-	-	-	-	-	-	-	-	1
Dysentery acute	25	4	9	1	-	-	-	1	-	-	-	1	1	-	-	8
Dysentery chronic	54	3	14	2	-	-	-	-	-	-	-	2	1	4	6	22
Childbirth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jaundice	14	1	2	-	2	1	1	-	1	-	1	-	-	1	1	3
Other	273	117	25	5	5	2	6	3	2	7	4	9	7	20	8	53
Disease of G.I.**	42	-	1	2	2	2	2	1	1	-	-	4	5	5	4	13
Respiratory***	162	49	20	1	1	-	2	2	7	1	5	8	7	13	46	
Heart disease	15	-	-	1	-	-	-	-	1	-	1	1	1	3	2	5
Liver disease	23	4	1	-	2	-	-	-	1	-	3	1	3	1	6	
Veneral disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Skin disease	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	
E.N.T. disease	8	-	4	-	-	-	-	-	-	-	-	-	-	1	1	2
Cholera (proved)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dropsy	82	3	22	2	2	-	-	-	4	2	2	4	3	5	2	31
Rheumatism	59	9	2	-	-	-	2	1	-	-	1	2	3	5	6	28
Accident	4	-	1	-	2	1	-	-	-	-	-	-	-	-	-	
Old age	34	-	-	-	-	-	-	-	-	-	-	-	-	-	1	33
Fever (all forms)	66	9	22	7	-	-	1	1	-	1	1	-	1	4	3	16
Unknown	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

		Female														
		Age at death (years)														
Causes	All ages	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
All causes	1235	397	327	50	13	22	20	18	13	12	17	17	27	37	41	224
Small pox	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Measles	56	6	39	11	-	-	-	-	-	-	-	-	-	-	-	-
Tetanus*	183	166	12	-	-	-	1	1	-	3	-	-	-	-	-	-
Drowning	30	1	25	2	-	1	1	-	-	-	-	-	-	-	-	-
Murder	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suicide	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Diarrhoea acute	24	11	5	2	-	1	-	-	-	1	-	-	-	-	1	3
Diarrhoea chronic	22	2	15	2	-	-	-	-	-	-	-	-	-	-	-	3
Dysentery acute	35	4	25	2	-	-	-	-	-	1	-	-	-	-	-	3
Dysentery chronic	70	1	38	3	2	-	-	-	-	2	-	-	1	4	4	15
Childbirth	16	-	-	-	-	4	2	5	5	-	-	-	-	-	-	-
Jaundice	17	1	4	1	-	3	2	2	-	-	-	-	1	2	-	1
Other	294	126	56	4	4	8	4	6	2	3	7	7	10	11	46	
Disease of G.I.**	25	-	1	1	-	1	-	-	-	2	3	-	1	3	6	7
Respiratory***	141	54	34	7	3	1	2	1	1	2	3	1	5	6	1	20
Heart disease	6	1	1	-	-	-	-	-	-	-	-	-	-	2	-	2
Liver disease	19	1	5	-	-	-	2	-	1	1	2	1	3	-	-	3
Veneral disease	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Skin disease	8	3	3	-	-	-	-	-	-	-	-	-	-	-	-	2
E.N.T. disease	8	1	2	4	-	-	1	-	-	-	-	-	-	-	-	-
Cholera (proved)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dropsy	109	2	32	1	1	1	2	-	3	1	1	8	3	1	9	44
Rheumatism	43	5	3	2	-	-	1	1	-	-	2	-	4	2	4	19
Accident	4	-	1	1	-	-	-	-	-	-	-	-	-	2	-	-
Old age	43	-	-	-	-	-	-	-	-	-	-	-	-	-	2	41
Fever (all forms)	76	10	26	7	2	2	3	1	-	-	1	-	2	5	3	14
Unknown	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1

* Takuria, evil spirit.
 ** Other than cholera.
 *** Cold, fever, cough, T.B. and asthma, etc.

Source: ICDDR, B "Scientific Report No. 59"

- 1) A number of heart diseases may be judged to different ones by complications.
- 2) Rheumatism as ranks the 6th, has close relation to Rheumatic Heart Valve Disease which is prevalent next to Hypertension in Bangladesh.
- 3) Deaths of infants and children less than four years old occupy approximately 55% of the total deaths and further more, those are mostly caused by infectious diseases.

Accordingly, the ratio of heart diseases among the deaths of those who over four years old shall not be neglected.

Considering from these aspects, cardiovascular diseases control is not presently seemed to be the first priority in health program and further to be the common interest in comparison with infectious disease control program in Bangladesh. However, cardiovascular diseases control will surely become important as various kinds of infectious diseases will be gradually controlled along with the promotion of Primary Health Care.

2-1-2 Administration

The Ministry of Health and Population Control (hereinafter referred to as Ministry of Health) consists of the following 3 sectors.

- . Administration (under jurisdiction of Joint Secretary) ----
general administration, administration of medical education, health and medical care services, personnel affairs
- . Development (under jurisdiction of Joint Secretary) ----
coordination of foreign aid, planning of health, medical care and population control, design and planning of medical facilities

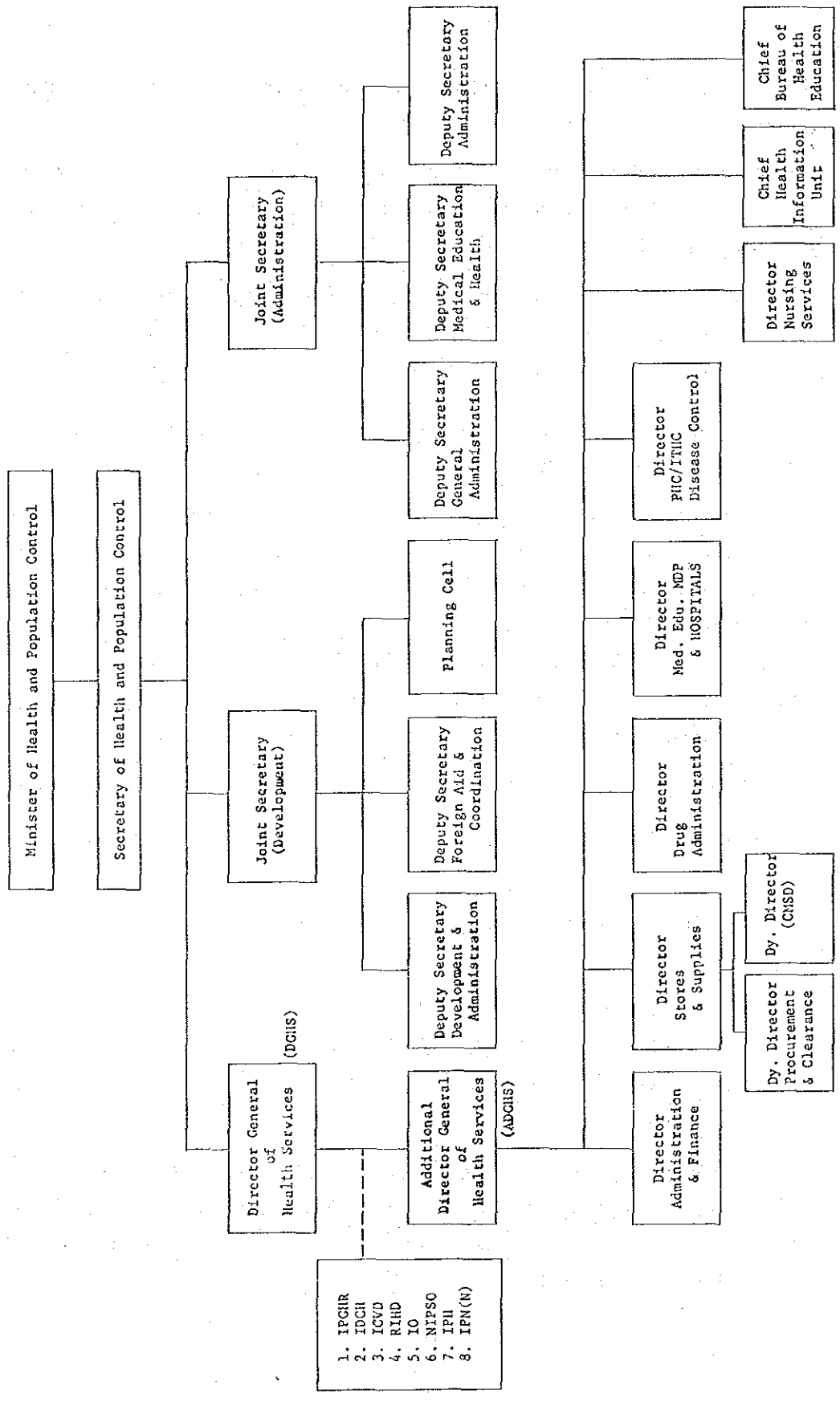


Fig. 2-1 Organization of the Ministry of Health

. Health Service (under jurisdiction of Director General of Health Services: DGHS) ----

delivery of health and medical care services, medical education and research services.

DGHS, which takes charge of health and medical care services, has 8 sections as shown in Fig. 2-1. The Central Medical Stores Depot (CMSD) controls integratedly all medical equipment, consumables and drugs of the Government. Consumables and drugs to be used by the ICVD are supplied from this CMSD. Apart from those administrative sections, 8 institutions shown below are also under jurisdiction of DGHS. These are the highest level hospitals in Bangladesh and act as referral institutions of medical colleges and hospitals. ICVD is one of them.

- 1) Institute of Post-Graduate Medicine & Research (IPGMR)
- 2) Institute of Disease of Chest & Hospital (IDCH)
- 3) Institute of Cardiovascular Diseases (ICVD)
- 4) Rehabilitation Institute and Hospital for the Disabled (RIHD)
- 5) Institute of Ophthalmology (IO)
- 6) National Institute of Preventive & Social Medicine (NIPSOM)
- 7) Institute of Public Health (IPH)
- 8) IPN

2-1-3 Health Services

In Bangladesh, the four-stage health care delivery system is prepared and planned to expand responding to each administrative stage as shown in Fig. 2-2.

Fig. 2-2 Health Care Delivery System

(1983)

Administration		Health Facilities		Health Care Services
Central/ Division	4	. Specialized Hospital	14	(iv) Super Specialised Health Care
		. Medical College Hospital	8	(iii) Tertiary Health Care
District	64	. District/ Sub-divisional Hospital	51	(ii) Secondary Health Care
Upazila	493	. Upazila/Thana Health Complex	313	(i) Primary Health Care
Union	4,472	. Union Health & Family Welfare Centre	571	
Village	85,650	. Rural Health Centre . Dispensary	1,446	

For the basic health services in rural areas, the primary health care and the secondary health care are carried out by the following medical organizations.

- i) Primary Health Care: is the nucleus of health care system carried out mainly by Upazila/Thana Health Complexes (UHC). Each UHC has averagely 31 beds in total (25 beds for general patients and 6 beds for family planning) and is operated by 30 staffs (8 to 10 doctors and 5 nurses). UHC also distributes contraceptive materials for family planning and provides preventive vaccination, and health education.

ii) Secondary Health Care: is a health care system carried out by district/sub-divisional hospitals. Each of these hospitals has 50 to 100 beds, 10 to 15 doctors and operates departments of ophthalmology, dentistry and radiology in addition to outpatient clinic.

The nationwide high level medical care is available at the following institutions which performs the tertiary health care and the super specialized health care.

iii) Tertiary Health Care: is available at eight medical college hospitals and institutes of post-graduate medicine. These hospitals act as the referral institutions of district/sub-divisional hospitals.

iv) Super Specialized Health Care: is available at specialized units in medical and dental college hospitals, institutes of post-medicine and other specialized hospitals especially in Dhaka.

(1) Specialized units of cardiology, nephrology, neuro-surgery, cardiac-surgery, ophthalmology, dentistry, etc. in above hospitals.

(2) Post graduate speciality institutions for ophthalmology, chest-cardiac.

(3) Specialized hospitals like mental, tuberculosis, diabetes, orthopedics and cancer hospitals.

Hospitals taking charge of the super specialized health care act also referral institution of medical colleges and other hospitals and provide the highest medical service in Bangladesh. ICVD is a research institute and hospital taking charge of heart diseases as described in (2) above and has an important role in super specialized health care.

Table 2-2 shows the number of hospitals and beds providing such medical services. As for the hospitals under the Health Division, 54 hospitals and 2078 beds increased during 5 years from 1979 to 1983. Establishment of new Upazila/Thana health complexes, which was one of the main targets in the Second Five Year Plan, had greatly contributed to this increase.

Table 2-2 Hospital and Hospital Beds

Category	1979		1980		1981		1982		1983	
	No. of hospital	No. of bed	No. of hospital	No. of bed	No. of hospital	No. of bed	No. of hospital	No. of bed	No. of hospital	No. of bed
1. Health Division:										
i) District Hospital	13	1408	13	1368	14	1488	14	1488	19	1886
ii) Sub-Divisional Hospital	40	1905	40	1894	37	1905	37	1905	43	2019
iii) Teaching Hospital	10	5853	12	6104	13	6584	13	6343	14	6140
iv) Other big Hospital	3	145	4	165	4	185	4	165	—	—
Specialised Hospitals—										
i) T.B. and Chest Disease	5	906	5	906	4	406	4	406	4	406
ii) T.B. Segregation	8	160	8	160	8	160	8	160	8	160
iii) Leprosy	3	130	3	130	3	130	3	130	3	130
iv) Infectious Diseases	4	160	4	160	5	180	5	180	5	180
v) Mental Hospital	1	400	1	400	1	400	1	400	1	400
vi) Rural Health Centre	275	4263	275	4811	312	5100	312	5100	319	6087
Total Health Division:	362	15330	365	16098	400	16277	401	16277	416	17408
2. Population Control Division:										
Maternity	n.a.	580	96	612	96	612	96	612	96	612
3. Railway Division:										
Railway Hospital	9	451	9	476	9	476	9	476	9	476
4. Jail Division:										
i) Jail Hospital	19	740	19	953	19	1003	19	1003	19	1003
ii) Police Hospital	20	953	21	818	20	768	20	768	20	768
5. Voluntary agencies										
	36	2685	39	3030	164	4771	164	4771	164	4771
Grand Total	446	20739	549	21987	709	23907	709	23907	724	25038

Source: "Statistical Yearbook of Bangladesh 1983 - 84"

Table 2-3 shows the number of beds in 1980 by WHO statistics. Population density per bed, 4545 in Bangladesh is so higher as equivalent to 50 times than that in Japan, and this level is very low in comparison with Asian countries.

Table 2-3 Hospital Beds (1960 - 80)

	Number of Bed			Population per Bed		
	1960	1970	1980	1960	1970	1980
Bangladesh	-	10,310	19,727	-	6,790	4,545
Burma	14,321	23,043	28,889	1,561	1,197	1,222
Thailand	19,531	40,653	71,718	1,393	846	658
Indonesia	69,600	76,938	-	1,343	1,466	-
Philippines	22,598	43,492	93,474	1,208	854	518
India	199,590	331,000	529,066	2,149	1,629	1,254
Japan	842,000	1,311,729	1,319,406	111	79	89

Source: WHO "World Health Statistics Annual 1983"

During the Study in Bangladesh, the Team had made a visit to Dhaka Medical College Hospital, which is responsible for the tertiary health care services, and found that there was few modern medical equipment in its clinical laboratory. Viewing from such a fact, medical care delivery system mentioned above is still now on the stage of future development. Many of upazila health complexes, district hospitals and even more higher level hospitals have, in fact, no satisfactory facilities and medical equipment.

Accordingly, the Government of Bangladesh emphasizes to promote the Primary Health Care, and to construct facilities and improve the equipment of UHCs in the Third Five Year Plan.

2-1-4 Health Manpower

Number of doctors and nurses in Bangladesh in 1983 is 11,496 and 5,146 respectively. According to WHO statistics, number of doctors per population of 10,000 is 1.12 in 1980. This figure shows one-twelfth lower than that of Japan.

To settle such shortage of health manpower, the Bangladesh Government aimed at increasing number of doctors and nurses to 17,000 and 5,660 respectively upto 1985 in the Second Five Year Plan (1980 to 1985). Number of outturns of doctors and health personnels is shown in Table 2-4.

On the other hand, post-graduate courses are not provided in 8 medical colleges and dental college, but provided in six post-graduate institutes in Dhaka. The largest post-graduate institute in Bangladesh is IPGMR established in 1965 and accomodates about 60% of all post-graduates in each year. ICVD is one of such post-graduate institutes and started several courses under Dhaka University --- M.D. in Cardiology: three years course in 1982. Diploma in Cardiology: one year course in 1984 and proposed M.S. in Cardiovascular and Thoracic surgery: three years course.

Table 2-4 Outturn of Medical Personnel

Year	Post-graduate doctors	M. B. B. S. doctors	B. D. S. (dentists)	Medical assistant	Post-graduate nurses	Nurses	Midwives	Lady health visitors
1975	49	658	9	—	31	145	171	56
1976	77	779	13	—	79	226	87	22
1977	60	882	5	—	11	308	164	285 (a)
1978	53	751	18	309	23	467	205	454 (a)
1979	33	858	27	169	n.a.	565	386	372 (a)
1980	48	1047	39	430	24	558	190	8 (a)
1981	60	1031	68	443	56	479	600	508 (a)
1982	126	1692	30	211	27	296	233	278
1983	132	1400	28	350	57	653	522	403

Notes: Annual figures are not obviously progressive totals but only numbers passed in the relevant years.
(a) Family welfare visitors.

Source: Director General of Health Services (Health Information Unit), Ministry of Health and Population Control.

2-2 Health Development Plan

The target and budget of health development plan in Bangladesh have been set and allocated as a part of the socio-economic development plan. The Bangladesh health policy had emphasized traditionally the activities in urban areas and the treatment. However, after the Independence in 1971, the Government changed those policies to emphasize the health care in rural areas and the prevention of diseases.

In the Second Five Year Plan (1980 to 1985) which terminated in June 1985, the initial budget amount of 595 Crores taka (about 48.2 billion yen) was allocated 35% to primary health care (PHC), 10% to public health, 31% to manpower development and 16% to hospitals and clinics, and after all 45% of the budget was allocated to PHC and Public Health services. The public expenditure for health sector during this period grows 15% per year, but the share in GDP is only 0.7% (remaining unchanged) and per capital health expenditure remains as low as 21.76 taka (about 172 yen) in 1983.

According to the health sector program for the Third Five Year Plan (1985 - 1990: Draft), budget allocation is as follows shown in Table 2-5.

Table 2-5 Health Sector Program for TFYP (Draft)
(TK. in crore)

	New	Spill-over	Total	Distribution (%)
1. PHC and ancillary services	288.00	132.27	420.27	42.11%
2. PHC supportive programs	178.00	52.24	228.24	22.87%
3. Health Manpower development	68.00	30.70	98.70	9.89%
4. Hospitals and clinics	124.00	72.02	196.02	19.64%
5. General programs	53.00	-	53.00	5.31%
Total =	711.00	287.00	998.00	100.00%

In the total budget amount of 998 Crores taka (about 80.8 billion yen), 65% is allocated to PHC and its supportive programs. This means that PHC is further emphasized. On the other hand 20% (15.9 billion yen) is allocated to hospitals and clinics, and especially, 4 Crores taka (320 million yen) are allocated for ICVD. This amount is remarkably large for one hospital. Furthermore, 20 Crores taka is allocated for the Shahid Suhrawardy Hospital and 1 Crores taka for the Institute of Ophthalmology. This means that 25 Crores taka (about 2.0 billion yen) is to be allocated for the Suhrawardy Hospital Complex in total. In other words, high priority is given to the improvement of this complex in the Third Five Year Plan.

CHAPTER 3. OUTLINE OF ICVD

3-1 Background

The Government of Bangladesh, for the purpose of developing preventive, diagnostic and curative techniques for heart diseases, established the Institute of Cardiovascular Diseases (ICVD) in the capital city, Dhaka in July 1978. The Cardiovascular Diseases Control Project was considered to be a first priority together with the family planning in national health program, and Suhrawardy Orthopedic Hospital was diverted to ICVD by the government.

The Government of Bangladesh requested to the Government of Japan for the assistance to execute this project. In response to this request, the Government of Japan decided to commence the technical cooperation for 5 years consisting of dispatch of experts, receiving trainees, etc. on the basis of the Record of Discussions in February, 1979. Before the actual starting of medical activity in ICVD in April, 1981, only receiving trainees from ICVD to Japan was implemented. The Government of Japan also decided to perform grant aid for procurement of medical equipment to ICVD on the basis of the Exchange of Notes in August 1979. The equipment by this grant aid, being excluded highly sophisticated ones, consisted of as follows; equipment for diagnosis and treatment aimed mainly for cardiovascular diseases; equipment for bio-chemistry and pathology; equipment for training and teaching, and were installed and delivered to ICVD in March, 1981.

Preparation for actual medical activities in ICVD was completed and the first expert team consisting of the personnel of the National Cardiovascular Center in Osaka, Japan, was dispatched under the technical cooperation program of JICA in April, 1981. ICVD performed the first Open-heart Surgery under the guidance of Japanese experts in September 1981.

Echocardiograph, permanent pacemaker implantation, cardiac catheterization are the main results of the technical cooperation. ICVD has started the post-graduate courses under Dhaka University in addition to its initial function of hospital and research institute, and has a plan to establish C.C.U in medical college all over the country.

As stated so far, this project was implemented with the combination of the grant aid and the technical cooperation by Japan. That is, most of the equipment used for the technical cooperation are those by the grant aid. Another cooperative activity was the dispatch of a repair team by JICA in December 1982 in order to restore of deteriorating functions due to equipment disorder. The members of the team not only made repairs and adjustments of the equipment but also gave advice and instructions on maintenance and operation of the equipment to ICVD's engineers and doctors.

In February 1984, for the purpose of propagation of fruitful results by this project in Bangladesh as well as abroad, Joint Conference was held in Dhaka. Many speakers gathered from Japan, Bangladesh, France, India, Nepal, Pakistan, Thailand, and USSR. At the same time agreement was made on extension of the technical cooperation mainly targeted for technology transfer of A-C bypass in February 1984 to be continued another 2 years till February 1986. Coming near the termination of the technical cooperation, ICVD should solve the problems about procurement of special consumables which had been provided through technical cooperation. Because procurement of special consumable to be imported requires large amount of additional budget.

3-2 Organization

ICVD has following departments and is operated by the total of 213 staffs including 43 doctors at present.

1. Cardiology Department
2. Coronary Care Unit (CCU)
3. Cardiovascular Surgery Department
4. Anaesthesia & Intensive Care Unit (ICU) Department
5. Central Laboratory
6. Radiology Department
7. Blood Transfusion Department
8. Administration Office
9. Maintenance Department

Total Staff	213 (1985 year)
Doctor	43
Nurse	35
Radiology Technologist	3
Clinical Lab. Technologist	9
E.C.G. Technologist	2
Electromedical Technologist	2
Heart Lungs Machine Technologist	2
Instrument Operationer	3
Pharmacist	5
Administrator	109

3-3 Activities

3-3-1 Medical Activities

ICVD, where 110 beds are available, has CCU 8 beds, POST-CCU with 16 beds, ICU with 4 beds and other general beds. 8 senior doctors there have the experience of training in Japan. From the numbers of inpatients, out-patients and examinations by year

in ICVD, it is observed that patients have constantly increased year by year and the beds are always fully occupied. It indicates how important a role ICVD plays in Bangladesh.

	1981	1982	1983	1984	1985 (Up to June)	Total
Inpatients	1,981	2,912	3,618	5,989	3,570	18,070
Outpatients	13,991	16,781	24,053	30,238	17,114	102,177
Surgeries	168	272	362	324	192	1,318
Examinations	49,840	84,995	86,969	89,702	26,749	338,255

Activities in each department are as follows:

1) Cardiology Department

Physiological examination such as echocardiography and electrocardiography are performed. The number of tests has been increasing year by year, but the figures are considered to be lower than the actual demand, judging from the situation that the strict restraint is laid on the use of consumables.

	1981	1982	1983	1984	1985 (Up to June)	Total
Echo cardio- graphy	874	2,042	1,539	1,390	897	6,742
Electro cardiography	9,285	15,526	18,087	24,700	10,132	77,730
Stress test	23	68	56	168	93	408

2) Coronary Care Unit (CCU)

It should be noted that according to the monthly statistics in May 1985, half of 111 inpatients were initially examined and treated at CCU and then transferred to general ward. In another words, emergency patients were accommodated to CCU at first stage, and then transferred to Post-CCU and general ward, because of the shortage of beds in CCU. Diseases pattern of inpatients as follows:

1. Ischaemic heart disease	41	36.9%
2. Heart valve disease	26	23.4
3. Hypertensive heart disease	8	7.2
4. Congenital heart disease	6	5.4
5. A-V block	4	3.6
6. Others	19	17.1
7. Unidentified	7	6.3

Total	111 patients	100.0%
-------	--------------	--------

CCU has the 24-hour monitoring system based on the three times shifts per day:

	Doctor	Nurse
8:00 AM - 2:00 PM	2	3
2:00 PM - 9:00 PM	1	2
9:00 PM - 8:00 AM	1	2

3) Cardiovascular Surgery Department

In the field of cardiovascular surgery, where the effect of technical cooperation is the most outstanding, a total of 1,318 surgery cases were performed from 1981 to '85. Open heart surgeries were performed mainly for atrial septal

defect (A.S.D.) ventricular septal defect (V.S.D.). On the other hand, closed heart surgeries were performed mainly for the cases of closed mitral commissurotomy (C.M.C.) and patent ductus arteriosus (P.D.A.).

	1981	1982	1983	1984	1985 (Up to June)	Total
Case of Surgery	168	272	362	324	192	1,318

It is also noticeable that the number of permanent pacemaker implantation reached more than 50 per year in the past 5 years. Patients after operation are satisfactorily taken care of under the 24-hour care system in ICU.

	1981	1982	1983	1984	1985 (Up to June)	Total
Permanent pacemaker implantation	34	70	64	56	35	259

4) Central Laboratory

Total number of examination has reached 209, 170 upto June 1985, and emergency examination system is arranged also.

	1981	1982	1983	1984	1985 (Up to June)	Total
Clinical examination	30,946	54,926	56,335	54,786	12,177	209,170

5) Radiology Department

More than 100 cases of Cardiac catheterization and Cardiac angiography for the examinations of heart valve, congenital and coronary disease, are performed in a year with repeated uses of disposable goods such as catheters and 3-way stopcocks.

	1981	1982	1983	1984	1985 (Up to June)	Total
Cardiac catheterization test & angiography examination	112	167	157	179	67	682

As for the detailed data of medical activities above, refer to the Appendix 3, Table 3-1 to 3-4.

3-3-2 Budget

The budget of ICVD consists of 1) annual budget, 2) development budget, on the other hand consumable and drugs are supplied through the Central Medical Stores Depot (CMSD).

	Revenue Budget	Development Budget
1984 - 85	42.87 Lakhs	50.90 Lakhs

The annual budget is expended on personnel payment, diet charges, utility charge, etc., and over 2.6 million yen of 3.47 million yen was expended for personnel payment in the fiscal 1984/85. Development budget is expended construction, duties and taxes. Particularly in 1981/82, the budget was expended on the payment of duties and taxes for medical equipment under

Japan's grant aid and on the renovation work for equipment installation. However, the government took a special consideration for ICVD to exempt customs duties and sales tax leviable on the goods received as donation/grant from foreign countries. Therefore, ICVD will be free from additional budget for receiving equipment by donation/grant. As to consumables and drugs supplied from CMSD, ICVD was allocated a budget of 12.3 Lakhs, but actually received only 6.5 Lakhs in 1984/85. As a result, special consumables and drugs were supplied not from CMSD but from Japan through the technical cooperation. In particular, special consumables requires to open heart surgery, shall be purchased continuously from abroad. Therefore, ICVD intends to appropriate this budget after termination of Japan's technical cooperation. (In detail of Budget, Supply through CMSD, refer to Appendix 3 Table 3-6, 7)

3-3-3 Administration

In principle, no payment is charged for patients in ICVD. 40 out of 110 beds in ICVD are accommodated for paying beds as a charge of daily 30 taka, but ICVD is not allowed to spend it for its activity. Such being the situation, ICVD has established the Patient Welfare Fund with donation from wealthy patients to enforce the insufficient annual budget. (as for the Patient Welfare Fund, refer to Appendix 3, Table 3-8) Presently, some patients who can purchase artificial valve, pacemaker. ICVD has plan to charge 30 percent of treatment fee to the patient who can afford.

3-4 Facilities

ICVD is located in the Shaheed Suhrawardy Hospital Complex in Sher-e-Bangla Nagar, west of Dhaka City. This area is a newly developed section in which several governmental buildings,

medical institutions and the National Assembly building have been constructed. The Suhrawardy Hospital Complex was established essentially as an orthopaedic hospital for injured soldiers at the Independent War. At present, the Complex is used dividedly by three medical institutions --- the Institute of Ophthalmology, Suhrawardy General Hospital and ICVD. The Complex in a very wide site is still under development. In addition to an enlargement of these three medical institutes, it is also planned that the School of Tropical Medicine and the Cancer Research Institute will be constructed in the site.

3-4-1 Buildings and Rooms

ICVD has a total of 5,900 m² floor areas, consisting of the south-half 4,300 m² of Suhrawardy Hospital Main Building and a 2-storied annex Ward 1,600 m². Each floor is used as follows. (refer to Appendix 3, Fig. 3-1 - 4 for site plan and each floor plan).

- Main building

Ground Floor: waiting hall, pharmacy, out-patient examination room, blood transfusion dept., administrative office, angiocardiography room, echo room, developing room and doctor's room

1st Floor: operation theatre, ICU, sterilizing room, instrument and medicine storages, treadmill room, cabin, ward and doctors' rooms

2nd Floor: Central laboratory

- Ward Building

Ground Floor: CCU, post-CCU and ward (male)

1st Floor : ward (female)

Since the building was constructed as an orthopaedic hospital, the present layout is not always functional, for example, there are many small rooms without windows and doctors' rooms and examination rooms are scattered on all floors.

3-4-2 Facilities:

- 1) Power supply to the ICVD is from the P.D.B. (Power Development Board) through a 500 kVA transformer. However, this capacity is not sufficient at present. Therefore, Laminar flow bioclean system in the operation theatre is put into operation only before surgery because of voltage drops when used in surgery.
- 2) Central air-conditioning system is installed in the ground floor of the main building. However, due to shortage of the cooling capacity, window type air-conditioners are used in each examination room.
- 3) Water is supplied from the common high water tank (pumping up from the tube wells) located outside the site. Water is filter-processed, but chlorine pasteurization or water-softening is not applied.
- 4) The equipment which were provided to ICVD by Japan's grant aid in 1979, has been installed properly --- there is no equipment which is left unused without necessary facilities.

From among them, the present state of building equipment is as follows;

- Emergency power generators (200 kVA x 2) --- They are installed in the outside electrical house and are in operation satisfactorily. They have played an important role since power failure is caused frequently in this area. At power failure, these generators supply power to

the operation theatre, ICU, CCU, angiography room and other important rooms. Therefore, the capacity has no margin.

- Air-conditioner (window type) --- All units operate well except a few. Defective units are repaired locally.
- Water-softening equipment --- One unit is installed in the laboratory on the second floor and operates satisfactorily. However, consumables (such as a filter element) are not replaced periodically, therefore, it is considered that the water quality after processing may be a problem.
- Laminar flow bioclean system --- This is installed in the operation theatre on the 1st floor. The present state is as described previously.

5) Generally, much attention is not paid to invisible matters, such as water quality, air cleaning, grounding of electricity and radiation protection. Division of clean and unclean zones in the operation theatre, ICU and angiography room. And their cleanliness level are not satisfactory as a cardiovascular hospital. However, compared with other governmental hospitals in Dhaka, there are many unavoidable aspects for this hospital resulting from the fact that the building was constructed for the different purpose.

On the other hand, there are several points which can be evaluated greatly as a self-supporting effort of Bangladesh, for example, the central supply system of oxygen and vacuum has been installed in CCU, post-CCU, ICU and operation theatre.

The present level of facilities in ICVD described above is relatively higher in Bangladesh. It may be impossible to completely settle all problems of facilities within the existing

buildings. It is hoped that all such problems will be settled in the future extension of buildings together with an increase of the power supply capacity.

3-5 Present Condition of Medical Equipment

Major equipment of the ICVD were mostly supplied by the Japan's grant aid in 1979 and technical cooperation of the Government of Japan, and some equipment in a few quantity were provided by WHO. It is said in this way that majority of them were granted by Government of Japan. Present condition of those equipment are briefly explained as follows.

- 1) Some equipment have been deteriorated or partially deteriorated owing to the climatical conditions of high temperature and high humidity in Bangladesh, and their poor situation of the unstable power supply. But most of equipment are repaired repeatedly to use in a normal condition.
- 2) The equipment to be used regularly makes many mechanical troubles, even those were repaired some times in use with spare parts provided by the technical cooperation.
- 3) The repair of sophisticated equipment (sonolayergraph, blood gas analyzer, etc.) seems to be difficult for Bangladesh engineers at the current level of their maintenance technique.
- 4) It is obviously noted that patients has been increasing because of the upgrade treatment in a cardiology field and the achievement of a certain level of surgical operation in cardiovascular diseases, which was supported and led by the technical cooperation. Therefore, a shortage of equipment will become a factor to cause a problem, especially spare parts and consumables are remained to be difficult in procurement after the technical cooperation is terminated.

3-5-1 Main Equipment at Each Department

The following is the present state of the medical equipment used at each department since they were granted.

1) Cardiology Department

Examination rooms are located scatterly in the building and the cardiac function exams in various way using echocardiograph, electrocardiograph and treadmill so far are provided here. As electrocardiographs have been stored in a storage, it was tested whether or not it was possible to use. It seemed to be usable but need to recheck for the precise measurement.

The encephalograph and sprimeter have not been used since they were delivered because it might not be effective to use with in their way of examination.

Treadmill: being used very frequently and heavily deteriorated.

Spirometer: unused

Encephalograph: unused

2) Coronary Care Unit (CCU)

The unit consisting of eight beds is mainly used and accommodated for emergency patients taking 24-hours monitoring system.

Patients who escaped from serious situation are transferred to the post-CCU of 16 beds. The post-CCU is located in the part of general ward. It is planned to expand its space according to the increase of patients. Examination by the E.C.G. is most important for CCU but such equipment are not provided enough. And also major equipment such as central patient monitor and bedside monitors are deteriorated and not equipped well.

Central patient monitor: two channels are defective
(4-ch)

Bedside monitor: only four units provided for
eight beds

Portable X-ray equipment: out of order

In the post-CCU, medical equipment is not provided.

3) Cardiovascular Surgery Department

According to the statistics from 1981 to June 1985, a number of cases for major surgical operations are shown as follows:

Open heart surgery	94 cases
Closed heart surgery	687 cases
Vascular surgery	202 cases

Results of the technical cooperation are most remarkable in this department since the case of operations has been increasing, the equipment has been deteriorated to be used very frequently.

The equipment necessary for operation has been used, regardless of its slight damage or deterioration.

Operating table: highest position cannot be
maintained due to the defective
hydraulic pump system

Operating light: four bulbs are off and electric wire
is appears from ceiling

Electro surgical: electrode chuck handle is broken
unit

Respirator: saddle is loosed

Artificial heart: unit has been used very frequently
lung machine and deteriorated

4) Anaesthesia and I.C.U Department

Generally, ICU accommodates acute patients to use for functional insufficiency of respiration, circulation, metabolism, etc., and to provide strong and centralized treatment. However, ICU of ICVD is used mainly as a recovery room after surgical operation. The unit has four beds and patients are well cared for 24-hour.

The living environment is relatively better than C.C.U.

Bedside monitor: DC monitor is used as an alternative.

Low pressure suction unit: troubles occurs frequently.

Infusion pump: two units only provided for 4 beds.

5) Central Laboratory

Followings are statistics for biochemistry test from 1981 to the end of June, 1985.

(Non-emergency)

Group Year	Bio-chemistry	Serological	Hematological	Blood gas	Urinalysis
1981	6,991	766	251	328	136
1982	15,819	1,318	1,082	519	335
1983	20,891	1,514	1,229	730	267
1984	22,625	1,666	1,297	764	298
1985/ June	11,538	302	273	403	64
Total	77,864	5,566	4,132	2,744	1,100
Average of month 1985	1,923	50	46	67	11

(Emergency)

Group Year	Bio-chemistry	Serological	Hematological	Blood gas	Urinalysis
1981- 1985/ June	78,634	5,559	4,132	2,744	1,103
Average of month	1,457	103	77	54	21

Major test items are as follows:

Biochemistry: glucose NPN Na K Ch

Serological: V.D.R.L. A.S.O. RA test T.P.H.A.

Hematological: Pt Hb P.T. P.T.T. T.W.B.C.

Blood gas: pH PO₂ PCO₂

Urinalysis: Urea Uamy

The biochemistry tests (blood and urine) are conducted by four laboratory technicians covering all exams at ICVD. In the event of emergency, these tests are conducted under the overtime emergency test system.

Blood gas analyzer: out of order
Chloride counter: starter switch contact is not satisfactory
Auto still: two units out of order
Clot timer: no digit is displayed
Blood bank refrigerator: compressor is defective
Double beam spectro-photometer: need adjustment
Dispet: shortage in numbers
Water bath: one unit is defective. temperature adjustment does not work

Blood cell counter: unit becomes defective occasionally
 pH meter: unit is defective

6) Radiology Department

With an increase in number of examination the single plane cine angiography system has been used very frequently and each component has become defective. The single plane cine angiography and fluoscopic radiograph are only provided to use because one of high voltage generators and two cut-film changers are defective.

	1981	1982	1983	1984	1985 (Up to June)
Number of exams for cardiac catheterization and cardiac angiography	112	167	157	179	67

Single plane cine angiography system:

one unit of high voltage generators are defective and catheterization table is not for use for heart examination

Cine projector:

generator makes noise and is partially defective

Automatic injector:

defective

Cine film processor:

consumes too much developing solution and films

7) Rehabilitation Department

"Rehabilitation Department" is not organized particularly. One room is arranged for this purpose, but there is no particular equipment. ICVD has a plan to improve this department.

8) Blood Transfusion Department

This department became independent of the Central Laboratory two years ago. This department provides the blood typing test and blood storage and management. However, the equipment are defective and too old.

9) Administration Office

Copy machines have been frequently defective. Typewriters are manual type and obsolete. The car is used as a public car for the Institute. The microbus is used for transporting of staffs. The van is used for transporting medical goods. The ambulance is not used so regularly because of an increase in use of fire station ambulances.

The total running distance of each car is as follows.

Total running distance (1981 - 1985 June)	
Microbus	95,606 km
Passenger car	99,588 km
Van	118,936 km
Ambulance	29,907 km

10) Maintenance Department

The Department was established one years ago and has two electrical engineers to carry out repair and maintenance of medical equipment. They can achieve a minor repair, however, it is almost impossible to repair and maintain highly sophisticated equipment such as the angiocardiology, artificial heart lung machine, blood gas analyzer, polygraph, sonolayergraph, ultrasonic diagnostic apparatus, ECG monitor, anesthesia apparatus and ultrasonic cleaner. Some of them are left unrepaired.

Activities of ICVD will be disturbed without this department. Therefore, the future improvement in this Department is very important. Apart from the technical level of these engineers, it is essential to promote the maintenance service and to be able to handle the spare parts stock for maintenance activities.

Furthermore, spare part cabinets, maintenance tools, oscilloscope, voltmeter, and frequency counter, etc., are not equipped.

11) Related Equipment

Window type air-conditioners are installed in each room of ICU, CCU, Operation Theatre and Central Laboratory. However, these air-conditioners are not in operation after 2:00 P.M. Some of them are defective. They are not installed in the film developing room and equipment storage.

3-5-2 Consumables and Drugs

Ordinary consumables are supplied from the Central Medical Store Depot (CMSD). Supply of expensive special consumables such as oxygenators and blood circuits necessary for open heart surgery, catheters for cardiac catheterization and angiocardiology, cine film and X-ray film depends entirely on the Japan's technical cooperation. In ICVD, these consumables are stored in a locked storage to avoid possible loss. However, these materials are piled up in the storage with no air-conditioning and strict inventory control is not carried out. Ordinary drugs to be used in every year are appropriated by the Government of Bangladesh and supplied from CMSD, however, the quantity is not sufficient. Therefore, supply of special reagent and tablets depends on the Technical Cooperation. (For consumables, instruments and drugs supplied from CMSD, refer to the attached Appendix 2.)

3-6 Future Plan

ICVD is the one and only hospital specializing for taking care of cardiovascular diseases in Bangladesh. ICVD has a program to make CCU in eight Medical College Hospitals and to establish a nationwide network for treatment of cardiovascular diseases so that the treatment will be possible at each Upazila level. For the first step to realize this program, ICVD started the work shop in 1979 and the post-graduate course under Dhaka University in 1982. Including such a future program, ICVD has a plan to increase the number of beds from 110 to 400 in the Third Five Year Plan to settle the bed shortage which ICVD is confronted with the largest problem at present.

The contents of building improvement are as follows;

- 1) to increase indoor beds over existing 2-storied ward to 5-storied.
- 2) to increase outdoor facility south of the existing main building

This outdoor facility shall have a total of 7,000 m² with one lift, and many rooms as follows on each floor;

- Ground Floor --- entrance hall, ticket office, outpatient and emergency rooms, doctors' rooms.
- 1st Floor --- operation theatre, ICU, doctors' rooms.
- 2nd Floor --- office, conference room, staff rooms.
- 3rd Floor --- class rooms, library, professor rooms.

The plan is still under preparation and not confirmed, but ICVD hopes to excute the extention plan of increasing indoorbeds over existing 2-storied ward to 3-storied.

CHAPTER 4.
CONTENTS OF THE PROJECT

4-1 Objectives

The principal objective of the Project is to maintain and keep up the medical activities of ICVD so as to fully perform its function and role as an only one hospital specializing in cardiovascular diseases in Bangladesh, by replacing and repairing the existing deteriorated equipment.

4-2 Examination of the Request

4-2-1 Contents

The request contains replacement of deteriorated equipment, replenishment of which the quantity is currently short and new equipment which is not granted in the past.

The new equipment requested are: cardiac out front monitor for thermodilution, glucose photometer, electromagnetic flowmeter, bronchoscope, intraaortic ballone pumping, A.C.T. machine, nephelometer, densitometer, dehumidifier and measuring instruments for maintenance. The major equipment of each department is as follows:

1. Cardiac function test equipment for Cardiology Department
2. Heart failure patient monitor for CCU
3. Safety and monitor equipment for all patients with regard to open heart surgery for Cardiovascular Surgery Department
4. Equipment to secure resuscitation, recovery and safety against sudden turn for the worse of patients for ICU
5. Blood analysis equipment for biochemistry test
6. Cardiac catheterization and angiocardiographical equipment and related equipment for Radiology Department
7. Blood typing test and storage equipment for Blood Transfusion Department
8. Equipment relating to Administration

9. Measuring instruments necessary for maintenance
10. Consumables and drugs

For details of the equipment requested, refer to Appendix 2.

4-2-2 Examination

For the request above, examination was made on the basis of following point; necessity, properness at the diagnosis technical level, maintenance and control capacity and safety. The material and equipment to be provided by the technical cooperation of 1984 and 1985 are eliminated from this project.

- 1) Pulsatile flow type of artificial heart-lung machine is to be used for the pulsatile flow extracorporeal circulation which close to physiological blood stream. This expensive unit is not useful for the present diagnostic level. Since technical transfer by the technical cooperation has reached a certain level, the Roller pump type of artificial heart-lung machine, which is the same as the existing machine, is convenient to use.
- 2) Intraaortic ballone pumping is made in foreign country. The agent in Japan has no right to re-export. Therefore, this equipment is eliminated.
- 3) Nephelometer for lipoprotein measurement is requested. However, the measurement of lipoprotein can be achieved by a spectrophotometer. Only reagent will be provided.
- 4) Bi-plane X-ray cine unit is eliminated from the project since the Institute expects that it may be granted by West Germany. The existing single plane cine angiography system is heavily deteriorated and the table itself which was assembled at the beginning is not for catheterization examination. The component will be partially modified catheter table, tube, generator, etc.

- 5) Electromagnetic flowmeter is eliminated since there has been few experience in by-pass operation.
- 6) ACT machine takes a time to check blood clot at the ICU, so that the digital clot timer is more suitable for easy and quick measurement.
- 7) The major objective of this project is to improve medical instruments in proper quantity and quality. Therefore, related equipment should be minimized to adjust for the necessity. Accordingly, a copying machine, an electric typewriter and a car are eliminated from the project. The requested equipment to be provided are shown in the table below along with the present condition of the existing equipment.

T.C. : The Technical Corporation
 Marked "o": Working equipment

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
I. Cardiology Dept.					
1.	Phonocardiograph	1	o	-	
2.	Ergometer	2	o	-	
3.	Doppler Flowscope	1	o	-	
4.	Air Conditioner	2	o	-	
5.	Ultrasonic Cardiograph	2	1 out of order	-	Parts provided by T.C. of 1984 1 provided by T.C. of 1985
6.	Spirometer	2	1 out of order	1	Provide 1
7.	E.C.G. 3-ch	1	deteriorated	1	Provide 1
8.	E.C.G. 1-ch	3	1 out of order	1	Provide 1
9.	Treadmill	1	deteriorated	1	Provide 1
10.	Wheel Chair	5	lack of quantity	-	Provide 5
II. C C U					
1.	Infusion Pump	1	o	-	
2.	Respirator	1	o	-	
3.	Automatic Recording 24 Hrs Blood Pressure	3	o	-	
4.	Emergency Cart	1	o	-	
5.	D.C. Defibrillator	3	1 out of order	-	1 provided by T.C. of 1985

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
6.	Central Monitor	1	2-ch out of order, usable at post-CCU	1	Provide 8-ch
7.	Bedside Monitor	4	lack of quantity	4	1 provided by T.C. of 1985 Provide 3
8.	E.C.G. 3-ch	1	lack of quantity	1	Provide 1
9.	E.C.G. Monitor	1	lack of quantity	1	Provide 1
10.	Mobile X-ray Unit	1	out of order	1	Parts provided by T.C. of 1984 Provide 1 Mobile X-ray TV Unit
11.	Ice Machine	1	small capacity	1	Provide 1
12.	Air Conditioner	5	1 out of order	1	Provide 1
III. Cardiovascular Surgery Dept.					
1.	Hyper/Hypothermia Unit	1	o	-	
2.	Anesthesia Machine	1	o	-	
3.	Small Steam Sterilizer	2	o	-	
4.	Laminar Flow Bioclean System	1	o	-	
5.	Emergency Cart	1	o	-	
6.	Electro Encephalograph	1	o	-	
7.	Patient Monitor	1	o	-	
8.	Sealing Device	1	o	-	
9.	Air Conditioner	2	o	-	

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
10.	Electric Surgical Unit	1	handle part is deteriorated	-	Provide parts
11.	Artificial Heart Lung Machine	1	deteriorated	1	Provide 1
12.	Operating Table	1	deteriorated	1	Provide 1
13.	Operating Light, Stand Ceiling	2 1	3 1 stand deterio- rated ceiling type deteriorated	2	Provide 1 stand type with battery Provide 1 ceiling type
14.	High Pressure Suction Unit	3	2 deteriorated	2	Provide 2
15.	E.O.G. Sterilizer	1	lack of capacity	1	Provide 1
16.	UV Sterilizer, with scrub unit	2	1 deteriorated lack of quantity	4	Provide 4
17.	Respirator	1	partially dete- riorated	-	Provide parts
IV. Anaesthesia and I C U Dept.					
1.	24 Hrs Ambulatory E.C.G. Monitoring	1	o	-	
2.	Patient Monitor	2	o	-	
3.	Emergency Cart	1	o	-	
4.	Medical Refrigerator	1	o	-	
5.	Refrigerator	1	o	-	
6.	Air Conditioner	2	o	-	
7.	D.C. Defibrillator with ECG Monitor	1	lack of quantity	1	Provide 1

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
8.	Low Pressure Suction Unit	4	1 out of order 3 deteriorated	4	1 provided by T.C. of 1985 Provide 3
9.	Respirator	2	1 out of order	1	1 provided by T.C. of 1984 Provide pediatric type
10.	Infusion Pump	2	deteriorated	4	Provide 4
11.	E.C.G. Monitor	2	1 out of order	1	1 provided by T.C. of 1985
V. Central Laboratory					
1.	Clinical Analyzer	1	o	-	
2.	Clinical Refractometer	1	o	-	
3.	Spectrophotometer, Double beam 1 Microflow 1	2	o	-	
4.	Densitometer	1	o	-	
5.	Electrophoresis Apparatus	1	o	-	
6.	Incubator	1	o	-	
7.	Heat Air Circulating Dryer	1	o	-	
8.	Ozonizer	1	o	-	
9.	Water Softner	1	o	-	
10.	Magnetic Stirrer	1	o	-	
11.	Osmometer	1	o	-	
12.	Auto Titer G. Set	1	o	-	

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
13.	Mixing Machine for CRP	1	o	-	
14.	Automatic Coagula Meter	1	o	-	
15.	Blood Cell Calculator	1	o	-	
16.	Blood Cell Counter	1	o	-	
17.	Microscope	2	o	-	
18.	Centrifuge, portable hematocrit	2 1	o	-	
19.	Shaker	1	o	-	
20.	Mixer	3	o	-	
21.	Clinical Urin Analyzer	3	o	-	
22.	Pipette Washer	1	o	-	
23.	Micropipet	1	o	-	
24.	Automatic Tissue Processor	1	o	-	
25.	Paraffin Oven	1	o	-	
26.	Paraffin Spreading Apparatus	1	o	-	
27.	Small Sliding Microtome	1	o	-	
28.	Microtome Knife	1	o	-	
29.	Refrigerator	3	o	-	
30.	Blood Gas Analyzer	1	out of order lack of quantity	1	1 provided by T.C. of 1984 Provide 1
31.	Chloride Counter	1	out of order	1	Provide 1

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
32.	Blood Cell Counter	1	out of order	1	Provide 1
33.	Auto Still	4	2 out of order	2	Provide 2
34.	Water Bath	2	1 out of order	2	Provide 1 small and 1 for cooling
35.	Balance, electric 1 direct reading 1	2	1 out of order	1	Provide 1
36.	Clot Timer	1	out of order	1	Provide 1
37.	pH Meter	1	out of order	1	Provide 1
38.	Air Conditioner	4	1 out of order	1	Provide 1
39.	Flame Photometer, small 1 large 1	2	1 deteriorated 1 need con- sumable	1	Provide parts Provide con- sumable
VI. Radiology Dept.					
1.	Film Dryer	1	o	-	
2.	Film Paper Dryer	1	o	-	
3.	Film Viewer, wall type	2	o	-	
4.	Projector	1	o	-	
5.	16 mm Projector	1	o	-	
6.	Polygraph	1	o	-	
7.	D.C. Defibrillator, with E C G Monitor	1	o	-	
8.	Oximeter	1	o	-	
9.	Single Plane X-ray Cine Machine	1	generator and film changer out of order	1	Provide parts to be modified

No.	Main Equipment at Present	Q'ty	Present Condition	Request	Supply Condition
10.	Cine Film Projector	1	deteriorated	1	Provide 1
11.	Contrast Medium Injector	1	out of order	1	Provide 1
12.	Cine Film Processor	1	old type and deteriorated	1	Provide 1 with water softner
13.	Ordinary Size X-ray Film Automatic Processor	2	needs water softner	-	Provide 2 water softner
14.	Pressure Transducer	1	lack of quantity	4	Provide 4
IX. Administration					
1.	Emergency Diesel Generating Set	2	o	-	
2.	Ambulance	2	o	-	
3.	Microbus	1	approx. 20,000 km/year	1	Provide 1
4.	Pick-up Car	1	approx. 23,000 km/year	1	Provide 1

CHAPTER 5. BASIC DESIGN

5-1 Basic Policy

- 1) The grade and composition of medical instruments shall comply with the present ICVD scale and medical level.
- 2) The quantity of equipment shall not exceed that considered from the consumption and demand of the existing equipment.
- 3) The minimized necessary quantity of the equipment shall be provided to use for maintenance and administration.
- 4) Necessary consumables highly needs, such as heart inspection catheters, three-way stop cocks, sterilizing bags, etc. shall be provided for 2 years.
- 5) Spare parts shall be supplied for the existing equipment which shall not be improved this time such as electro surgical units, respirators and anesthesia apparatus.

5-2 Equipment List

The below list summarizes the equipment to be provided under the design policy of this project.

I. Cardiology Dept.

1) Spirometer, Benedict Roth type	1 pc
2) E.C.G., 3-ch	1 pc
3) E.C.G., 1-ch	1 pc
4) Tread-mill	1 pc
5) Accessories for Echo Machine	1 set
*6) Wheel Chair	5 pcs
*7) De-humidifier	2 pcs
8) Drug	1 lot
9) Spare Parts (Ultrasonic cardiograph)	1 lot

II. CCU

1) External Pacemaker	3 pcs
2) Surgical Instrument Set for external pacemaker	1 set
3) Central Monitor, 8-ch	1 pc
4) Bed Side Monitor, with transmitter	3 pcs
5) E.C.G., 3-ch	1 pc
6) E.C.G. Monitor	1 pc
7) Mobile X-Ray TV Unit	1 set
8) Central Venous Pressure Scale, with stand	4 pcs
*9) Wheel Chair	5 pcs
10) Ice Making Machine	1 pc
11) Air Conditioner	1 pc
12) Stabilizer	8 pcs
*13) Cardiac Out Front Monitor for thermodilution	1 pc
*14) Glucose Photometer	1 pc
*15) Medicine Cabinet	1 pc
*16) X-Ray Protective Screen	2 pcs
17) Consumable	1 lot
18) Spare Parts (Central Monitor, Defibrillator, etc.)	1 lot

III. Cardiovascular Surgery Dept.

1) Artificial Heart-Lung Machine	1 pc
2) Polygraph	1 pc
3) O.P. Table	1 pc
4) O.P. Treatre Light	1 pc
5) D.C. Defibrillator, with internal paddle	1 pc
6) High Pressure Suction Unit	2 pcs
7) Low Pressure Suction Unit	4 pcs
8) Oxygenator, with circuit	50 sets
9) E.O.G. Sterilizer, small size	1 pc
10) UV Sterilizer, with scurb unit	4 pcs

11)	Rechargeable Emergency Lighting Unit	1 pc
12)	Scissors and Forceps	1 set
13)	Brush Sterilizer Box	2 pcs
*14)	Bronchoscope	1 set
*15)	De-humidifier	3 pcs
*16)	Consumable	1 lot
17)	Spare Parts (EOG Sterilizer, Patient Monitor, Artificial Heart-Lung Machine, etc.)	1 lot

IV. Anaesthesia and ICU Dept.

1)	Bed Side E.C.G. Monitor	1 pc
2)	E.C.G. Monitor	1 pc
3)	D.C. Defibrillator with E.C.G. Monitor	1 pc
4)	Central Venous Pressure Scale with stand	2 pcs
5)	Low Pressure Suction Unit	3 pcs
6)	Ultrasonic nebulizer	2 pcs
7)	Respirator	1 pc
8)	Infusion Pump	4 pcs
9)	Syringe Pump	4 pcs
10)	Surgical Tracheostomy Set	1 set
11)	Stabilizer	4 pcs
12)	Clot Timer	1 pc
*13)	Cardiac Out Front Monitor for thermodilution	1 pc
*14)	Dummy for CPR Training	1 pc
*15)	Model of Heart with its chambers	1 pc
*16)	Model of Lungs and Tracheo-brocheal tree	1 pc
*17)	Anti-Bedsore Mattress	2 pcs
18)	Consumable	1 lot
19)	Spare Parts (Respirator, Defibrillator, Patient Monitor, etc.)	1 lot

V. Central Laboratory

1) Blood Gas Analyzer	1 pc
2) Reagent kit for Lipoprotein	1 set
3) Chloride Counter	1 pc
4) Blood Cell Counter	1 pc
5) Auto-still, Fully automatic	2 pcs
6) Water-Bath, for cooling	1 pc
7) Minisize Water Bath	1 pc
8) Electrical Balance, with pan top	1 pc
9) Reagent Kit for EIA	1 set
10) Clot Timer	1 pc
11) pH Meter	1 pc
12) Air Conditioner	1 pc
13) Consumable	1 lot
14) Spare Parts (Flame Photometer, Clinical Analyzer, Auto Still, etc.)	1 lot

VI. Radiology Dept.

1) Modified Parts for Single Plane X-Ray Cine Machine	1 set
2) Cine Film Projector	1 pc
3) Contrast Medium Injector	1 pc
4) Filter Unit, for automatic film Processor	3 pcs
5) Cine Film Processor	1 pc
6) Pressure Transducer	4 pcs
7) Emergency Cart	1 pc
8) Accessories for Projector	1 set
9) Air conditioner	3 pcs
*10) Densitometer	1 pc
*11) De-humidifier	1 pc

- | | |
|---|-------|
| 12) Consumable | 1 lot |
| 13) Spare Parts (Defibrillator, Single Plane
X-Ray Cine Machine, etc.) | 1 lot |

VII. Blood Transfusion Dept.

- | | |
|--|-------|
| 1) Refrigerator | 2 pcs |
| 2) Centrifuge | 1 pc |
| 3) Incubator | 1 pc |
| 4) Hot Air Sterilizer | 1 pc |
| 5) Microscope with illuminator, electric | 2 pcs |
| 6) De-humidifier | 4 pcs |
| 7) Consumable | 1 lot |

VIII. Administration

- | | |
|---|-------|
| 1) Slide Making Machine | 1 pc |
| 2) Microbus | 1 pc |
| 3) Pick-up | 1 pc |
| 4) Duplicating Machine | 1 pc |
| 5) Air Conditioner | 6 pcs |
| 6) Spare Parts (Emergency Diesel-Generator set) | 1 lot |

IX. Maintenance Dept.

- | | |
|-------------------------------|-------|
| *1) Tool Case | 2 pcs |
| *2) Tool Kit | 2 set |
| *3) Desoldering/Cleaning Tool | 1 set |
| *4) Digital Multimeter | 1 pc |
| *5) AVO Meter | 2 pcs |
| *6) AMP-Clamp on volt-ammeter | 1 pc |
| *7) Oscilloscope | 1 pc |
| *8) Frequency Counter | 1 pc |
| *9) Megger Insulator Tester | 1 pc |
| *10) Phase Sequence Meter | 1 pc |
| *11) Storage for spare parts | 6 pcs |

Items marked * are the equipment which are not existing at ICVD at present but requested, and the non-requested equipment such as Protective screens and Wheel chairs which are considered to be necessary to provide for this project. Followings are reasons.

(Cardiology Dept.)

1. Wheel chair This is necessary for patient to move around. (Same as CCU)
2. De-humidifier This is necessary to maintain equipment of Echo room and Examination room.

(CCU)

1. Cardiac Out Front Monitor for Thermodilution One unit provided to ICU but cannot to use with both Dept. because CCU is away from ICU.
Also necessary for treatment of the patient in critical condition.
2. Glucose Photometer Needed to exam patient's blood easily and simply, who is having a complication of diabetes.
3. Medicine Cabinet Necessary for storage of medicine.
4. X-ray Protective Screen Necessary for protection as X-ray unit is used for pacemaker implantation.

(Cardiovascular Surgery Dept.)

1. Bronchoscope Necessary for bronchial examination before surgery.
2. De-humidifier Needed for preparation room, instrument storage and sterilizing room.

(Anaesthesia and ICU Dept.)

1. Cardiac Out Front Monitor for Thermodilution Necessary for the treatment and monitoring of patient in critical condition and also for post operation.
2. Dummy, Model of Heart and Model of Lungs Necessary for training of nurses and post graduate students.
3. Anti-Bedsore Mattress Necessary to keep out of bedsore for a patient.

(Radiology Dept.)

1. Densitometer Necessary for adjustment of the density in X-ray unit, according to the density of film exposure.
2. De-humidifier Necessary to keep films dry in a film changer.

(Administration)

1. Duplicating Machine Necessary for alternative of a copy machine.

(Maintenance Dept.)

1. Tools for repair, Measuring equipment and Parts storage Necessary to maintain all equipment by own.

5-3 Preparation Work for Installation

Preparation works required before installation consists of securing space and providing facilities to accommodate the equipment. Such arrangements should be taken by Bangladesh side. As for the equipment of the Project, those preparation works need not a large scale but an incidental work such as electrical, plumbing installations. Bangladesh shall take charge of electric power supply, water supply and drainage for equipment to the appointed places. ICVD needs information on the necessary preparation works in order to arrange the budget at least 4 or 5 months before equipment delivery. Outline of those works are as follows;

(CCU)

- Mobile X-ray T.V. unit; electric power supply (15 A)
- Ice-maker; electric power supply (10 A) water supply, drainage

(Operation Theater)

- E.O.G sterilizer; electric power supply (8 A), water supply drainage, steam exhaust
- U.V Sterilizer; electric power supply (2 A), water supply, drainage

(Radiology Dept.)

- Water piping for filter units of automatic developer

(Others)

- Air-conditioner; electric power supply (15 A), opening in wall or window, installation of supporting frame.

The additional 44 kW of electrical capacity will be needed mainly due to additional air-conditioners.

5-4 Estimated Project Cost

Cost to be borne by Bangladesh will be estimated approximately TK. 85,200 (¥690,000). This is to be needed for the preparation work described in 5-4, and is also broken down as follows:

- Water supply drainage work - TK. 13,600 (¥110,000)
- Electrical work - TK. 70,000 (¥580,000)

CHAPTER 6.

IMPLEMENTATION SCHEDULE

6-1 Executive Agency

This Project is to be executed based on Japan's Grant Aid program. The executive agency of the Project in the Bangladesh Government is the Ministry of Health and Population Control. ICVD takes charge of the preparation work for the equipment installation, approval and maintenance of the equipment.

6-2 Implementation Program

This Project is carried into effect on the basis of the Exchange of Notes between both Governments. It is completed when the equipment is delivered and accepted by the Bangladesh Government through the procedures of tender invitation, selection of supplier (Japanese corporation), supplier contract consisting of manufacturing, installation, test running of the equipment and operational instruction.

The roles of the consultant (Japanese corporation), on the basis of the Consultant Agreement with the Bangladesh Government, are to supervise the procedures of implementation schedule in accordance with Contract Document, and to instruct, advise and coordinate to the contractor, as a consultant's fair view. Consultant work consists of following services.

- 1) Preparation of the tender document including equipment specifications.
- 2) Selection of supplier, review of the tender prices and management of the supplier contract.
- 3) Inspection and approval for the document submitted by contractors including equipment specifications.
- 4) Inspection and approval for the equipment manufactured.

- 5) Supervision of the equipment transportation.
- 6) Supervision of the equipment installation.
- 7) Inspection for the equipment at the time of delivery, approval of delivery document.
- 8) Reporting to the Bangladesh Government the progress of work at each stage.

With regard to the works above, the consultant also reports to the Government of Japan the progress of the project work at each stage.

6-3 Scope of Work

6-3-1 Undertaking by Japanese Side

- (1) Granting the medical equipment for ICVD.
- (2) Transporting the equipment to ICVD.
- (3) Delivery and installation of the equipment.
- (4) Providing operational instruction on the equipment.

6-3-2 Undertaking by Bangladesh Side

- (1) Customs clearance and tax exemption of the imported medical and other equipment for the Project.
- (2) Exemption Japanese nationals who engage in the Project from customs duties and internal taxes.
- (3) Providing and according necessary permission, licences and other authorization to Japanese nationals who engage in the Project.
- (4) Arrangement and coordination with the concerned Agencies.

- (5) Providing space and facilities necessary for the medical equipment to be installed.
- (6) Providing facilities for distribution of electricity, water supply, drainage and other incidental facilities (those described in section 5-3).
- (7) Providing information and convenience necessary for carry-in and installation of the equipment.

6-4 Procurement of Medical Equipment

The Medical equipment to be granted is not procured locally and all the equipment is basically procured in Japan. The equipment necessary to be transported by air is not included. The following supervisors and period are at least required for installation work. And the adjustment for the existing equipment is to be carried out at the time of installation.

- 1) Heart monitor and measuring equipment, etc.:
1 man x 20 days
- 2) Artificial heart-lung machine, etc.:
1 man x 14 days
- 3) Single plane X-ray cine machine and related equipment:
1 man x 30 days
- 4) General equipment:
1 man x 20 days
- 5) Laboratory equipment:
1 man x 20 days

6-5 Implementation Schedule

As shown in Fig. 6-1, it is expected that thirteen months are necessary to complete the Project from the Exchange of Notes. The total period is divided into the following three stages.

- Detail design stage (three months)

The consultant prepares the tender document including equipment specifications to be approved by the Bangladesh Government.

- Tendering Stage (two months)

Supplier contract is made between the successful tenderer and the Bangladesh Government after tender evaluation.

- Project implementation stage (eight months)

After pre-shipment inspection for the equipment after five months manufacturing, the equipment is delivered to ICVD within minimum two months by sea-freight from Japan to Chittagon, and inland transportation from Chittagon to ICVD, Dhaka.

6-6 Maintenance and Operation

6-6-1 Maintenance and Operation Program

Recently, ICVD has come to recognize the importance of medical equipment maintenance. Because, the disorder of equipment which lasted long period caused the deterioration of daily treatment activity greatly. Japanese special engineers were dispatched to repair high-advanced technology equipment. But, ICVD has set up future target to repair these equipment by ICVD's engineers. For this purpose, Maintenance Department was established one year ago, and two engineers (one senior engineer and one junior engineer) were employed. Senior engineer has experience of work in medical equipment company and received three months training in Japan. However, it is considered that repair of all of ICVD's medical equipment is technically impossible by these two engineers only. Even though ICVD plans to employ more engineers in future, it is advisable at present that technical instruction by Japanese special engineers is the best method for ICVD.

For the equipment already delivered, the supplier contracted five-year regular maintenance services with the local agents. Occasionally, training seems to be provided from the engineer of local agent to ICVD's engineers.

During this survey visit, the team visited ICDDR, B in Dhaka, and observed the successful maintenance service system. This system gave many indications to ICVD's maintenance service. Remarkable points are workshop facility and repairing tools provision. At present, ICVD shall contract regular maintenance services with the local agents and start technology transfer from local agent to ICVD's engineers gradually.

From above fact, in order to keep maintenance easier, the equipment to be supplied through this project shall be the same type of manufacturer as much as possible.

6-6-2 Cost of Maintenance and Operation

The estimated maintenance cost to be borne by ICVD per year will be as follows:

Personnel Cost (2 engineers)	TK. 0.74 lakh (¥596,000.-)
Facility Operation Cost (Lighting)	TK. 6.25 lakh (¥5,066,000.-)
Medical Equipment Maintenance Cost	TK. 14.64 lakh (¥11,859,000.-)
<hr/>	
Total	TK. 21.63 lakh (¥17,521,000.-)

Especially, the amount of the special consumables provided through Japan's technical cooperation during the period from 1982 - 1985 is the one indication for ICVD to procure these special consumables from now on.

Total value: Approx. TK. 58.56 lakh (¥47,435 million)

Breakdown

General (Artificial heart-lung machines, artificial vessels, etc.)

Approx. TK. 27.74 lakh (¥22.47 million)

Radiology (X-ray films, cinefilms, developing solution for automatic processing units, cine developing solutions, etc.)

Approx. TK. 14.83 lakh (¥12.01 million)

Clinical-laboratory exams. (Repair kits for the flame photometer)

Approx. TK. 0.75 lakh (¥0.605 million)

Drugs (Inovan, heparin, mioblock, contrast medium, etc.)

Approx. TK. 15.25 lakh (¥12.35 million)

The expenses borne by ICVD is approx. TK. 14.64 lakh (¥11.859 million) per year. In case, ICVD will contract with the local agents for regular maintenance services of ICVD's equipment, the probable cost will be incurred about TK. 1.23 lakh (¥one million) per year as the two engineers engaged.

CHAPTER 7. PROJECT EVALUATION

This project, as the follow-up for the medical equipment provided last time, can be evaluated as follows:

As the result of both grant aid and technical cooperation, the target of technics transfer relate to cardiovascular surgery was accomplished in ICVD. The reasons are: major doctors in ICVD received training in Japan and they acquired enough technics to operate equipments granted by Japan. From the view point of organization, the numbers of staffs increased compared to the starting time, and many functions have been added simultaneously. This will enable to reinforce ICVD's function deteriorated by the disorder of equipment, and to keep up current level of treatment activity.

Regard to the maintenance of equipment, ICVD recognized its importance and established Maintenance Department with two engineers. ICVD is strengthening this department's function in order to repair ICVD's equipment with ICVD's own engineers.

On the other hand, ICVD is performing training courses to the doctors and nurses under Dhaka University, for the preparation to establish CCU in each medical college during the Third Five Year Plan. In another word, the role of ICVD is not only to provide a guidance and research to the cardiovascular diseases control project but also to facilitate teaching medium for health manpower development. So, this project will contribute to furnishing its function practically.

This project is evaluated as significant project. Because this project will contribute to the expansion of the health care system both in quality and quantity, and to enable the level up of basic health service for the Bangladesh people and also to improve health manpower development.

CHAPTER 8.

CONCLUSIONS AND RECOMMENDATIONS

The Cardiovascular Diseases Control Project is one of the most important health development programs in Bangladesh, and as stated in Project Evaluation, this project will bring great effect in the field of social efficiencies and make significant contribution to grade up of the current health care services in the country. Therefore, it can be concluded that implementing this project by Japan's grant aid is very significant contribution to Bangladesh. Self-efforts by the Bangladesh Government and ICVD will be also required to implement this project more effectively. Recommendation to the Government of Bangladesh.

- 1) ICVD shall recognize the significance of this project and continue to strive for more effective treatment services to patients.
- 2) More efforts shall be made to maintain equipment in proper situation in order to keep up the current medical treatment services with the cooperation of doctors and engineers. (Periodical inspection of the main equipment, efforts to acquire maintenance engineers for long time service and their technics improvement)
- 3) Continuous supply system of special consumables necessary for operating the equipment, shall be ensured.
- 4) Sufficient financial supporting system for ICVD's satisfactory administration shall be arranged.

APPENDIX

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1. DATA OF THE BASIC DESIGN STUDY

1-1. Members of the Study Team

Dr. Hiroshi Sakakibara
Team Leader, Associate Director,
National Cardiovascular Center

Dr. Makoto Takamiya
Technical Official, Director,
Department of Radiology,
National Cardiovascular Center

Dr. Kazushige Masuda
Technical Official, Chief,
Planning Room
National Cardiovascular Center

Kiyomi Okawa
Project Coordinator,
First Basic Design Study Division,
Grant Aid Planning & Survey Department,
Japan International Cooperation Agency (JICA)

Koichi Murao
Technical Expert of Medical Service
International Total Engineering Corporation (ITEC)

Kazuko Hayashi
Technical Expert of Medical Equipment
ITEC

Kazumi Akita
Technical Expert of Facilities Engineering
ITEC

1-2. Schedule of the Study

Date	Particulars
July 22 (Mon)	Leave Tokyo & Osaka via Hong Kong (CX-731 & 502) Stay at Bangkok
23 (Tue)	Leave Bangkok for Dhaka (TG-321) Visit to Japanese Embassy after making arrangement on the schedule at Hotel Sanargaon
24 (Wed)	Courteous visit to M.O.H. Joint Secretary, and E.R.D. Joint Secretary in the Ministry of Finance in the morning Visit to Director Dr. Malik, ICVD in the afternoon
25 (Thu)	Meeting at ICVD Dinner hosted by ICVD
26 (Fri)	Meeting among Team members
27 (Sat)	Visit to Dhaka Medical College Hospital, P.G. Hospital Courteous visit to M.O.H. Secretary Meeting at ICVD
28 (Sun)	Meeting at ICVD in the morning Exchange of Minutes of Discussions at Hotel Sonargaon and visit to ICDDR, B in the afternoon
29 (Mon)	Meeting at ICVD Luncheon hosted by Japanese Ambassador
30 (Tue)	Meeting at ICVD Team Leader Dr. Sakakibara and other 3 officials leave Dhaka
31 (Wed)	Meeting at ICVD
Aug. 1 (Thu)	Meeting at ICVD
2 (Fri)	Meeting among Team members Visit to Narayanganj District Hospital
3 (Sat)	Meeting at ICVD Visit to M.O.H. Joint Secretary
4 (Sun)	Visit to Dr. Malik, ICVD, Report on the study to JICA office, Leave Dhaka (TG-322) and stay at Bangkok
5 (Mon)	Leave Bangkok and arrive in Tokyo (LH-640)

1-3. Major Persons Interviewed

1) Embassy of Japan in Dhaka

Ambassador Yoshitomo Tanaka
Minister Yasuhide Hayashi
First Secretary Takumi Ohashi

2) JICA, Dhaka Office

Resident Representative Masahisa Ezaki
Staff Member Keizo Egawa
Project Coordinator Kenji Yokoi

3) Ministry of Finance, ERD

Mr. M. Akhtar Ali (Joint Secretary)

4) Ministry of Health and Population Control

Mr. A.B.M. Ghulam Mostafa (Secretary)
Mr. M. Mukhlesur Rahman (Joint Secretary)
Brig. M. Hedayetullah (Director General)
Mr. J.A. Rashid (Deputy Secretary)

5) ICVD

Brig (Dr) A. Malik (Director-cum-Professor)
Prof. R.K. Kandaker (Chief of Cardiology Dept.)
Prof. A. Zafar (Consultant Cardiologist)
Ass. Prof. M. Jalaluddin (Consultant Cardiologist)
Prof. N.A. Khan (Consultant Cardiac Surgeon)
Prof. S.R. Khan (Consultant Cardiac Surgeon)
Ass. Prof. Md. K. Rahman (Senior Anaesthetist)
Dr. M.A. Sabur (Radiologist)
Ass. Prof. Md. Amanullah (Consultant Cardiologist)
Dr. Md. Nazrul Islam (Consultant Cardiologist)
Ass. Prof. Dr. MN. Bashar (Radiologist)
Ass. Prof. Dr. Md. J. Ali (Biochemistry)
Dr. Tahmina Begum (Senior Pathologist)
Mr. Nazrul Islam (Senior Service Engineer)

6) Other Institutions

Dr. A.R. Khan

(Director, Dhaka Medical College Hospital)

Prof. N. Islam

(Director, Institute of Postgraduate Medicine & Research,
Dhaka)

Dr. Hajera Mahtab

(Medical Director, Bangladesh Institute of Diabetes,
Endocrine & Metabolic Disorders)

Mr. Matloob Sobhani

(Head, Biomedical Engineering Cell, International Centre
for Diarrhoeal Disease Research, Bangladesh)

1-4. Minutes of Discussions

MINUTES OF DISCUSSIONS

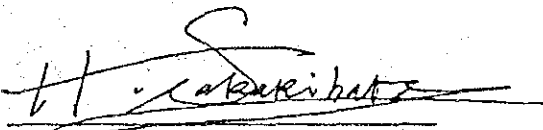
ON
THE IMPROVEMENT PROJECT OF MEDICAL EQUIPMENT
FOR
INSTITUTE OF CARDIOVASCULAR DISEASES
IN
PEOPLE'S REPUBLIC OF BANGLADESH

In response to the request made by the Government of the People's Republic of Bangladesh for a grant aid of the Improvement Project of Medical Equipment for Institute of Cardiovascular Diseases in Dhaka (hereinafter referred to as " The Project "), the Government of Japan has dispatched, through the Japan International Cooperation Agency (JICA), a survey team headed by Dr. Hiroshi Sakakibara, Associate Director of National Cardiovascular Center (hereinafter referred to as " The Team") to conduct the basic design study on the Project for 10 days from July 22 to July 31, 1985.

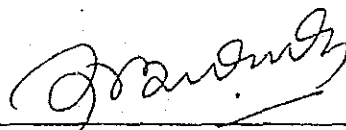
The Team has carried out a field survey, had a series of discussions and exchanged views with the Bangladesh authorities concerned of the Project.

As a result of the survey and discussions, the Team and the Bangladesh authorities have agreed to recommend to their respective Governments that the results of the discussions attached herewith should be examined toward the realization of the Project.

Dhaka, July 28th, 1985.



DR. HIROSHI SAKAKIBARA
Team Leader
Japanese Survey Team



DR. JOARDER ABDUR RASHID
Deputy Secretary
Ministry of Health

ATTACHMENT

1. The objective of the Project is to provide medical equipment for Cardiovascular Diseases so as to meet the need of Institute of Cardiovascular Diseases as a leading and special hospital in Bangladesh.
2. Institute of Cardiovascular Diseases for which the Ministry of Health is totally responsible will be the implementing body of the Project in the Bangladesh side.
3. The team will convey the desire of the Government of Bangladesh to the Government of Japan that the Government of Japan will take necessary measures to cooperate in implementing the Project within the scope of Japan's Economic Cooperation Program in grant form.
4. Medical equipment to be provided will be finalized by the Team based on the request of the Bangladesh side and the result of the study.
5. The Bangladesh authorities concerned have responsibility to take necessary measures to make arrangement of maintenance and supply of consumables and reagents for medical equipment to be provided.
6. The Bangladesh authorities concerned have understood and confirmed Japan's Grant Aid System explained by the Team which includes a principle of use of a Japanese consultant firm and a Japanese general contractor for implementation of the Project.
7. The Bangladesh authorities concerned have confirmed the Government of Bangladesh will take necessary measures as listed in Annex on condition that the grant aid by the Government of Japan is extended to the Project.

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ANNEX

Following measures are to be undertaken by the Government of Bangladesh.

1. To provide space and facilities necessary for the medical equipment to be installed.
2. To provide facilities for distribution of electricity, water supply, drainage and other incidental facilities.
3. To provide stock sheds for the medical equipment to be supplied in case that the medical equipment is required to be stored for some time for installation.
4. To ensure prompt unloading, customs clearance in Bangladesh and tax exemption of the imported medical equipment and materials for the Project.
5. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Bangladesh with respect to the supply of the products and services under the verified contracts.
6. To provide and accord necessary permission, licences and other authorization required for the Project.
7. To bear all the expenses other than those to be borne by the grant, necessary for the supply of the medical equipment.
8. To maintain and use properly and effectively the medical equipment for the Project.

Sub

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1-5. List of Equipment required

I Cardiology Dept.

1. Spirometer, Benedict Roth type	1 set
2. D.C. Defibrillator	1 set
3. E.C.G., 3-ch	1 set
4. E.C.G., 1-ch	1 set
5. Tred-mill	1 set
6. Strip Chart Recorder, for echo machine SSH10A	1 set
- ditto -, but for SSH60A	1 set
Probe for echo machine SSH10A	2 pcs.
- ditto -, but for SSH60A	3 pcs.
7. De-humidifier	2 sets
8. Drug	1 lot
9. Spare Parts	1 lot

II Coronary Care Unit (C C U)

1. External Pace Maker, with electrode	4 sets
2. Surgical Instrument Set, for external pace maker	1 set
3. Central Monitor, 8-ch	1 set
4. Bed Side Monitor, with transformer	4 sets
5. E.C.G., 3-ch	1 set
6. E.C.G. Monitor	1 set
7. Mobile X-Ray TV Unit	1 set
8. Central Venous Pressure Scale, with stand	4 sets
9. Ice Making Machine	1 set
10. Air Conditioner	1 set
11. Voltage Stabilizer	8 sets
12. Cardiac Out-put Computer, for thermo-dilution	1 set
13. Glucose Photometer	1 set
14. Medicine Cabinet	1 set
15. X-Ray Protective Screen	2 pcs.
16. Consumables	1 lot
17. Spare Parts	1 lot

III Cardiovascular Surgery Dept.

1. Artificial Heart-Lung Machine, (pulse flow, requested)	1 set
2. Polygraph, 4-ch (pressure 2, ECG 1, temperature 1)	1 set
3. O. P. Table	1 set
4. O. P. Theatre Light	1 set
5. D. C. Defibrillator, with internal paddle for adult 2 pairs and child 2 pairs	1 set
6. - ditto -, but with external paddle	1 set
7. High Pressure Suction Machine	2 sets
8. Low Pressure Suction Machine	4 sets
9. Thoracotomy Set	1 set
10. Oxygenator, with circuit	50 sets
11. E. O. G. Sterilizer, large size	1 set
12. UV Sterilizer, with scrub unit	4 sets
13. Rechargeable Emergency Lighting Unit	1 set
14. Forceps	1 set
15. Brush Sterilizer Box	1 set
15.	
16. Magnetic Flowmeter	1 set
17. Fiber Optic Bronchoscope	1 set
18. De-humidifier	3 sets
19. Consumables	1 lot
20. Spare Parts	1 lot

IV Anesthesia and I.C.U. Dept.

1. Bed Side E.C.G. Monitor, with transmitter.	1 set
2. Bed Side E.C.G., battery operated (heart rate monitor, digital)	1 set
3. Cardiac Monitor (ECG 1, pressure 1)	1 set
4. D. C. Defibrillator, with ECC Monitor	1 set
5. C. V. P. Scale, with stand	2 sets
6. Low Pressure Suction Pump	4 sets
7. Micronebulizer	2 sets
8. Respirator	1 set
9. Infusion Pump	4 sets
10. Syringe Pump	4 sets
11. Cardiac Out Front Monitor, for thermo-dilution	1 set
12. A. C. T. Machine	1 set
13. Anti-Bedsore Mattress	1 set
14. Surgical Tracheostomy Set	1 set
15. Voltage Stabilizer	4 sets
16. Dummy for CPR Training	1 set
17. Model of Heart with its chambers	1 set
18. Model of Lungs and Tracheo-brocheal Tree	1 set
19. Consumables	1 lot
20. Spare Parts	1 lot

V Central Laboratory

1. Blood Gas Analyzer	1 set
2. Double Beam Spectrophotometer	1 set
3. Nephelometer for lipoprotein	1 set
4. Flame-photometer	1 set
5. Chloride Counter	1 set
6. Micro Cell Counter	1 set
7. Auto-still, fully automatic	2 sets
8. Water Bath, for cooling	1 set
9. Minisize Water Bath	1 set
10. Electrical Balance, with pan top	1 set
11. E I A Kit	1 set
12. Digital Clot Timer	1 set
13. PH Meter	1 set
14. Air Conditioner	1 set
15. Consumables	1 lot
16. Spare Parts	1 lot
	3 pcs.

VI Radiology Dept.

1. Single Plane X-Ray Cine Machine, consisting of large format film changer with moving table top facilities	1 set
2. Cine Film Projector	1 set
3. Automatic Injector, with six sets of permanent syringes	1 set
4. Water Softner, for automatic film processor	1 set

5. Cine Film Processor	1 set
6. Pressure Transducer	4 sets
7. Emergency Cart	1 set
8. Accessories for Vanguard Projector	
* 35 mm Camera Attachment	1 set
* 8 x 10" Copy Device	1 set
9. Air Conditioner	3 sets
10. Densitometer and Test Wedge Exposure Device for cine quality control	1 set
11. De-humidifier	4 sets
12. Consumables	1 lot
13. Spare Parts	1 lot

VII Blood Transfusion Dept.

1. Refrigerator, small	1 set
2. Centrifuge, table top type	1 set
3. Incubator, small	1 set
4. Hot Air Sterilizer	1 set
5. Microscope, with illuminator, electric	1 set
6. De-humidifier	4 sets
7. Consumables	1 lot

VIII Administration Dept.

1. Photo Copier Machine	2 sets
2. Slide Making Machine	1 set
3. Microbus	1 set
4. Pick-up	1 set
5. Car, 1300 cc	1 set
6. Duplicating Machine	1 set
7. Electronic Typewriter	1 set
8. Air Conditioner	6 sets
9. Spare Parts	1 lot

IX Maintenance Dept.

1. Tool Case	2 pcs.
2. Tool Kit	2 sets
3. Desoldering/Cleaning Tool w/ vacuum pump system	1 set
4. Digital Multimeter Autoranging (table model)	1 pcs.
5. AVO Meter, portable DMM	2 pcs.
6. AMP-Clamp on volt-ammeter/ Clip-on-meter	1 pc.
7. Dual Trace Oscilloscope 5"	1 pc.
8. Frequency Counter	1 pc.
9. Megger Insulator Tester	1 pc.
10. Phase Sequence Meter	1 pc.
11. Cabinet with drawers	6 pcs.
12. Storage for spare parts	6 pcs.
13. Steel Rack	10 pcs.

2. DATA OF THE PROJECT

Table 2-1. Number of Patients

NUMBER OF PATIENTS (YEAR WISE)	1981	1982	1983	1984	1985 (upto 30. Jun.)	TOTAL
	13991	16781	24053	30238	17114	102177
<u>OUT PATIENTS ATTENDANCE :</u>						
Total						
<u>ADMISSION :</u>						
General Beds & Cabins	928	1910	1941	4235	2510	11524
Coronary Care Unit (CCU)	933	802	1303	1483	904	5425
Intensive Care Unit (ICU)	120	200	374	271	156	1121
Total Admission	1981	2912	3618	5989	3570	18070
<u>OPERATION :</u>						
Open heart surgery	1	33	26	25	9	94
Closed heart surgery	56	125	174	172	96	623
Vascular surgery	21	26	40	36	38	161
Others	56	18	58	35	14	181
Permanent Pacemaker implantation	34	70	64	56	35	259
Total Operation	168	272	362	324	192	1318
<u>EXAMINATION :</u>						
Cardiac Catheterization & Angiocardiology	112	167	157	179	67	682
Electrocardiography (E.C.G.)	9285	15526	18087	24700	10132	77730
Echocardiography	874	2042	1539	1390	897	6742
Exercise Stress Test	23	68	56	168	93	408
Radiological Examination	8600	12266	10795	8479	3383	43523
Laboratory Examination	30946	54926	56335	54786	12177	209170
(Pathology & Biochemistry)						

Table 2-3. Statistics of Cardiac Catheterization & Angiography

INSTITUTE OF CARDIOVASCULAR DISEASES
 DHAKA, BANGLADESH
 STATISTICS OF CARDIAC CATHETERIZATION & ANGIOGRAPHY

YEAR	M.S.	M.R.	A.S.D.	V.S.D.	P.D.A.	T.O.F.	A.R.	K.S.	P.S.	CORONARY ANGIO.	RENAL ANGIO.	COARC- TATION	PERIPHERAL ANGIO.	OTHERS	TOTAL
1981.	48	6	13	6	8	4	2	2	2	2	8	2	16	3	112
1982.	61	5	21	16	10	7	5	2	5	1	10	2	12	13	167
1983.	53	7	39	9	8	9	4	1	1	1	8	5	10	3	157
1984	34	9	31	16	12	11	3	2	6	9	11	1	27	10	179
1985 upto 30th June.	7	2	19	6	5	10	2	2	1	2	2	2	9		67

Table 2-4. Emergency Test (1 - 4 - 1981 to 30 - 6 - 1985)

	No. of Indoor Samples	No. of Outdoor Samples	Total Number	Average/month
1. Blood Sugar	1261	2673	15284	300
2. BUN	7647	2278	9925	195
3. S. Electrolytes	6230	454	6684	131
4. SGOT	6472	444	6916	135
5. CPK	6382	389	6771	132
6. Blood Gas Analysis	2700	44	2744	54
7. LHD LDH	6355	293	6648	130
8. SGPT	5575	308	5883	115
9. Hct % WBC	1874	-	1874	37
10. Hb % MCV	1874	-	1874	37
11. Alkaline phosphatase	2699	534	3233	63
12. S. Amylase	591	77	668	13
13. C.T. (Coagulation Time)	-	-	-	-
14. B.T. (Bleeding Time)	-	-	-	-
15. P.T. (Prothombin Time)	340	44	384	8
16. T.W.B.C.	-	-	-	-

N.B. The above mentioned investigations were done on emergency basis after office hours. (from 2PM to 7:30 AM)

Table 2-5. Development and Revenue Budget

<u>DEVELOPMENT BUDGET</u>	
<u>Year</u>	<u>ALLOCATION OF FUND</u>
1. 1977-78	1.90 Lakhs
2. 1978-79	5.06 "
3. 1979-80	10.00 "
4. 1980-81	50.00 "
5. 1981-82	377.36 "
6. 1982-83	37.00 "
7. 1983-84	81.47 "
8. 1984-85	50.90 "

<u>REVENUE BUDGET</u>	
1. 1978-79	15,00,000/-
2. 1979-80	15,00,000/-
3. 1980-81	15,00,000/-
4. 1981-82	31,57,000/-
5. 1982-83	34,25,000/-
6. 1983-84	42,87,000/-
7. 1984-85	

Table 2-6. Amount Received & Spent from Development Budget

<u>YEAR</u>	<u>AMOUNT RECEIVED & SPENT</u>
1977-78	1.90 Lakhs.
1978-79	5.06 "
1979-80	10.00 "
1980-81	50.00 "
1981-82	377.36 "
1-1982-83	37.00 "
<hr/>	
	461.32 Lakhs.

<u>NATURE OF ITEMS</u>	<u>AMOUNT</u>
1. Construction	Tk. 1,04,15,124/-
2. Electrification	Tk. 28,56,955/-
3. Purchase of Furniture	Tk. 4,00,000/-
4. Custom duty & sale Taxes	Tk. 3,36,00,000/-
5. F.A.B.A.	Tk. 6,00,000/-
6. Expenditure for Estab.	Tk. 2,60,000/-
<hr/>	
	Tk. 4,81,32,079/-
	Say Tk. 481.32 Lakhs.

Foreign Exchange for Equipments
as Grant from Govt. of Japan. Tk. 487.00 Lakhs.

Table 2-7. MSR Budget from CMSD (1)

MSR BUDGET FOR INSTITUTE OF CARDIOVASCULAR DISEASES
FROM CENTRAL MEDICAL STORE.

Sl.No.	Name of item.	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Total	Stock in hand.	
		Budget Received	Budget Received	Budget, Recv.	Budget Recv.	Budget Recv.	Budget Recv.			
		tk:1000000/7600000	1000000,955000	1000000,1065000,1000000,1177000,1000000,1200000,650000,1000000/-						
<u>Injection Group.</u>										
1.	Inj. Juscopan	500	1700	-	-	500	-	2,800	318	
2.	" Lignocaine	250	500	-	600	-	50	1400	40	
3.	" Digoxin	270	-	-	200	-	-	470	-	
4.	" Oradren	1600	3600	1750	4400	5400	550	17,400	957	
5.	" Loxix	500	500	2950	1,970	3,900	-	9,820	-	
6.	" Pathedine	900	9,400	700	1100	5000	-	17,100	3,169	
7.	" Cardinal Sodium	1100	-	-	-	-	-	1000	-	
8.	" Atropine	1200	1000	-	2020	-	100	4300	-	
9.	" Morphine	1500	3500	10,000	45-	-	-	15,000	10890	
10.	" Penicillin	15500	1000	8500	100	11000	3000	391000	2700	
11.	" 25% Glucose	2000	3600	1000	5000	-	-	7,100	-	
12.	" Stimital	500	-	400	200	920	-	2020	172	
13.	" Phenergan	800	700	2300	600	2400	1000	7000	876	
14.	" -revedyl-E	50	220	338	-	1000	-	508	-	
15.	" Flaxedyl	200	200	900	250	1500	3050	3050	990	
16.	" Pantothale	300	100	600	-	-	2000	1400	500	
17.	" Cerumine	1000	500	1400	-	-	-	2900	-	

Contd.....P/2

Table 2-7. MSR Budget from CMSD (2)

Sl. No.	Name Item	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Total	Stock in hand
18.	Inj. Interon	700	1500	200	-	-	700	3100	950
19.	Inj. Amphotri	200	200	800	2650	2650	-	6500	-
20.	Inj. Diaminal Penicillin 1400	-	-	30	200	-	300	1930	268
21.	Inj. Seduxin	1300	1600	-	1900	4400	800	100000	1,718
22.	Inj. Prostigmen	450	1900	-	950	-	-	3,300	-
23.	Inj. Naxxi Sodiumcarb	300	50	200	250	-	-	900	-
24.	Inj. Streptomycin	5000	5000	-	-	-	-	10000	-
25.	Inj. Aynopiline	300	15000	500	1400	1500	1800	7000	1,835
26.	Inj. Plazyl	-	-	-	10	-	-	18	10
27.	Tab. Reserpine	200	100	-	-	-	-	300	-
28.	Inj. Insuline	-	-	-	20	240	210	470	30
29.	Inj. Hypaque 45%	-	70	800	10	75	-	955	-
30.	Inj. Blood pack	-	-	300	300	600	-	1200	215
31.	Inj. Adrenalinic	700	-	800	700	1,000	2200	3200	195
32.	Inj. Heparine	-	5	-	-	300	200	505	125
33.	Inj. Sincortel	-	-	410	450	630	260	740	29
34.	Inj. Monitel	-	-	200	-	-	-	200	133
35.	Inj. A.T.S	-	-	200	-	-	-	200	-
36.	Inj. Gentamycin	-	-	50	650	-	-	700	-
37.	Inj. Levonor	-	-	-	50	-	-	50	50

Table 2-7. MSR Budget from CMSD (3)

		Budget for Institute of Cardiovascular diseases from Central Medical Stores.									
Sl. No.	Name of item	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Total	Stock in hand		
1.	Tab. Seduren	18,000	50,000	72,000	25,000	35,000	15,000	2,15,000	26,960		
2.	Tab. Ismaline	1,200	-	-	-	-	-	-	395		
3.	Tab. Histacin	12,000	10,000	41,000	50,000	40,000	10,000	1,63,000	5,407		
4.	Thienex	500	5,000	-	-	-	-	5,500	4,423		
5.	Tab. Iamix	7,100	31,500	25,000	83,000	31,000	-	1,67,000	4,423		
6.	" Lurgactil	500	7,000	5,000	-	-	-	12,500	9,473		
7.	" APC	12,000	20,000	40,000	10,000	50,000	-	1,12,000	4,910		
8.	" Piperzine	10,000	-	5,000	-	-	-	15,000	4577		
9.	" Combantrin	1,000	-	-	-	-	-	1000	Nil		
10.	" Butazolidin	1000	-	-	-	-	-	100	Nil		
11.	" Chloroquine	2,000	20,000	-	-	-	-	22,000	1677.		
12.	" Erythromycin	200	-	-	-	-	-	200	-		
13.	" F. Sulph.	55,000	70,000	70,000	45,000	1,15,000	-	3,59,000	45,067		
14.	" M. Vita	12,000	30,000	-	-	-	-	42,000	-		
15.	" Indoral 40mg.	5,200	16,500	8,000	20,000	10,000	-	59,700	15811		
16.	" Angised	11,000	5,000	-	2,000	31,000	1000	50,000	12,483		
17.	" Digoxin	15,500	30,000	25,000	20,000	-	-	90,500	5,549		
18.	" Aminophylline	1000	-	6000	3000	27,000	5000	42,000	5790		
19.	" Daemil	4000	10,300	8000	-	100	500	22,900	554		
20.	" Depeyl	24000	4000	15,500	34,500	25000	1000	1,40,000	-		

Table 2-7. MSR Budget from CMSD (4)

(2)

Sl.No.	Name of the Item	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Total Stock in hand
21.	TabOracyn X	15,000	50,000	10,000	70,000	1,00,000	10,000	2,55,000
22.	" SulphaS	10,000	25,000	10,000	45,000	-	-	45,000
23.	Tab. Lederal 10mg	2000	1,000	4,000	71,000	4,500	-	16,600
24.	Tab. Ultra Carbon	-	5,000	-	-	-	-	7,000
25.	" Tulpaque	-	-	600	600	600	-	18,000
26.	Tab. B.complex	-	-	30,000	-	-	-	30,000
27.	" Stimilil	-	-	4,000	7,000	6,000	9	17,000
28.	" Becodex	-	-	15,000	-	-	-	15,000
29.	" Oraduron	-	-	5,000	-	2,000	-	7,000
30.	" Aldomet	-	-	3,000	-	-	-	3,000
31.	" Ventoline	-	-	1,000	9,000	12,100	-	22,100
32.	" Muscolycin/ outapen	-	-	-	1,000	22,000	3,000	26,000
33.	" Antacid	30,000	1,00,000	33,000	65,000	60,000	20,000	3,08,000
34.	" Paracetamol	20,000	20,000	40,000	80,000	70,000	40,000	2,70,000
35.	" Daxilon	5,000	5,000	2,000	12,000	-	-	24,000
36.	" Newaclex	5,000	8,000	107,000	9,000	-	5,000	37,000
37.	" Pritreat	10,000	1,000	-	-	-	-	11,000
38.	" VitaminC	35,000	-	-	5,000	-	-	40,000
39.	" Metronidazol	-	7,000	6,000	20,000	11,000	10,000	44,000
40.	" SDZ.	-	15,000	43,000	-	65,000	5,000	1,23,000
41.	" Decuris	-	1,000	3,000	3,000	2,000	-	9,000
								1,518

Table 2-7. MSR Budget from CMSD (5)

(3)

Sl.No.	Name of item	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	Total	Stock in hand
42.	Tab. Cotrom/Methoprim	3,000	4,000	18,500	-	25,500	-	25,500	1,711
43.	" A/D Capsule	5,000	20,000	-	-	-	-	45,000	-
44.	ECG Paper	555	-	10 Kpl.	-	-	-	565 Kpl.	-
45.	Syrup Ampicilline	-	150 Ph.	520 Ph.	320 Ph.	320 Ph.	60 Ph.	1,450 Ph.	25 Ph.
46.	Capsule Ampicilline	13,000	68,000	60,000	71,000	94,000	15,000	3,18,000	11000
47.	" Tetracycline	15,000	10,000	3,000	10,000	20,000	Nil	58,000	20,113
48.	" Orzamine	-	-	-	3,000	22,000	1,000	26,000	1,592

Antibiotic Group.

Table 2-7. MSR Budget from CMSD (6)

List of Equipments

SL NO.	Name of Items	Received during the year				Total	Balance	SL NO.	Name of Items	Received during the year				Total	Balance
		1981	1982	1983	1984					1981	1982	1983	1984		
1	Catheter Connection Tube	-	-	-	20 pcs	20 pcs	-	19	Compressed Air Hose Pipe	-	-	-	2 m	2 m	-
2	Centrifuge Graduated	-	-	20 pcs	-	20 pcs	-	20	Iron Cot	50	-	-	-	50	-
3	Molybdate Paste	-	-	-	1 tube	1 tube	-	21	X-Ray Developer	-	56	50	62	168	-
4	Umbo Bag	-	-	-	2 pcs	2 pcs	-	22	Fixing Salt	-	50	20	30	100	-
5	Winrode Tube	20 pcs	-	-	-	20 pcs	-	23	Filter Paper	100	22	-	-	122 pkts	-
6	Aptonox Apparatus	-	-	-	1 set	1 set	-	24	Cover Glass	-	100	-	-	100	-
7	Face Mask, size 1, 2, 3, 4	-	-	-	8 pcs	8 pcs	-	25	Suction Urinal, size 2, 3, 4	-	-	60 pcs	-	60 pcs	-
8	Test Tube, Roke	24 pcs	-	-	-	24 pcs	-	26	Flow Meter Unit	-	-	-	33	33	-
9	Doctor's Coat	50 pcs	-	-	-	50 pcs	-	27	Film Ranger	-	-	-	4 pcs	4 pcs	-
10	Catheter Mount Tube	-	-	-	4 pcs	4 pcs	-	28	Leucep lart	800	1,000	200	-	2,000 rolls	-
11	Surgical Towel	12 doz	-	-	-	12 doz	-	29	Mask Cension Rubber	60 pcs	-	-	-	60 pcs	-
12	Expirstory Bulb on heart	-	-	-	2 nos	2 nos	-	30	Suction Controller, high	-	-	-	13	13	-
13	Oxygen (prove remote)	-	-	-	1	1	-	31	- ditto -, but low	-	-	-	13	13	-
14	Nitrous (prove remote)	-	-	-	1	1	-	32	Rose Coupling	-	-	-	25	25	-
15	Compressed Air (prove remote)	-	-	-	1	1	-	33	Receiving Jar	-	-	-	13	13	-
16	Vacuum (prove remote)	-	-	-	1	1	-	34	Air Set	1 set	-	-	-	1 set	-
17	Oxygen (prove direct)	-	-	-	23	23	-	35	Test Bag Set, with accessories	1 set	-	-	-	1 set	-
18	Vacuum (prove direct)	-	-	-	13	13	-								

Table 2-7. MSR Budget from CMSD (7)

SL NO.	Name of Items	Received during the year				Total	Balance	SL NO.	Name of Items	Received during the year				Total	Balance	
		1981	1982	1983	1984					1985	1981	1982	1983			1984
36	Cylinder (small)	4 pcs	-	-	-	4 pcs	-	53	Stop Watch	1	-	1	-	-	2	-
37	Wall Plate	-	-	-	13	13	-	54	Tongue Depressor	2	-	-	-	-	2	-
38	Carrying Cart	1 pc	-	-	-	1 pc	-	55	Rubber Belt	1	1	-	-	-	2	-
39	E.C.G. Cable, with accessories	1 set	-	-	-	1 set	-	56	Sterilizing Box	1	-	-	-	-	1	-
40	Mask, with plastic bag	19 pcs	-	-	-	19 pcs	-	57	Blood Culture Bottle	10	-	-	-	-	10	-
41	Cannula, Butterfly	3,000	-	-	-	3,000	-	58	B.P. Instruments	-	20	10	3	-	33	-
42	Scissors, curved, s.s.	10 pcs	-	-	-	30 pcs	-	59	E.P. Blade (different size)	-	-	-	-	-	5,000 pcs	-
43	- ditto -, but straight	10 pcs	-	-	-	10 pcs	-	60	Medical Electronic Instruments	-	1 set	-	-	-	1 set	-
44	Needle-Cutting, curved	200	-	-	-	200	-	61	Gloves Rubber (size 6 1/2, 7)	81 to 85	-	-	-	-	1,000 pcs	-
45	Cur Gut (different size)	5,000	-	-	-	5,000	-	62	Follics Catheter	-	75	-	-	-	75	-
46	Catheter, U. Rubber 8, 9, 10	300	-	-	-	300	-	63	Mosquito Forceps	-	36	-	-	-	36	-
47	Volumetric Flask, 50 cc	20 pcs	-	-	-	20 pcs	-	64	Surgical Tray, with cover	-	-	100	-	-	100	-
48	- ditto -, but 250 cc	20 pcs	-	-	-	20 pcs	-	65	Cardiovascular Catheter	-	-	100	-	-	100	-
49	Petri Dish,	10 pcs	-	-	-	40 pcs	-	66	Disposable Syringe, size 2, 5, 10, 20, 50cc, 200 pcs each	1,000	1,000	1,000	1,000	1,000	5,000	-
50	B.P. Blade (different size)	-	-	-	500 pcs	500 pcs	-	67	Disposable Needle	81 to 85	-	-	-	-	5,000	-
51	Childie Forceps	6 pcs	-	-	-	6 pcs	-	68	Stethoscope	81 to 85	-	-	-	-	30	-
52	Spongeholding Forceps	5 pcs	24 pcs	6 pcs	-	35 pcs	-									

Table 2-7. MSR Budget from CMSD (8)

SL NO.	Name of Items	Received during the year				Total	Balance
		1981	1982	1983	1984		
69	Diagnostic Set	2 sets	-	-	-	2 sets	-
70	Thermometer	81 to 85	-	-	-	4 doze	-
71	Urinal, s.s.	81 to 85	-	-	-	15 pcs	-
72	Duplicating Machine	1 set	-	-	-	1 set	-
73	Black Silk (2-0, 3-0)	100 pcs	-	-	-	100 pcs	-
74	Hammer (Rubber)	10 pcs	-	-	-	10 pcs	-
75	Surgical Tray, s.s.	2	-	-	-	2 pcs	-
76	Medicine Trolley	1	-	-	-	1	-
77	Surgical Drum, s.s.	1	-	-	-	1	-

Table 2-8. Patient Welfare Fund

BALANCE SHEET
 PATIENT WELFARE FUND-I.C.V.D.
 AS ON 29.4.1985

<u>INCOME</u>	<u>EXPENDITURE</u>
1. ECHO - 1,73,150/-	Equipment Repair - 15,791/-
2. Open heart Surgery. 1,57,000/-	B Poor Patient help. 15,167.50
3. Cabin '8' 40,250/-	Drugs - 38,485/-
4. Donation. 51,826/-	Return to donor 5,500/-
5. Pace Maker. 53,601/-	Misc- 3,490/-
6. Closed Heart Surgery. 6,001/-	Cashier Pay- 4,150/-
7. Angiography. 4,000/-	82,533.50
8. Exercise ECG 48,040/-	Loan to ICVD- 11,905.00
9. Bank Interest 9,005/-	94488.50
Total- 5,42,873/-	BALANCE 4,48,334.50
	Present deposit- 3,47,884.50
	P.D.R. 100,000.00
	Emergency fund- 500.00

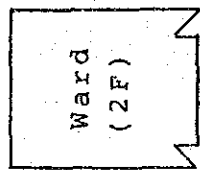
Rahau
 (Treasurer PWF)

Nazrul
 Secretary PWF

Suhrawardy General Hospital

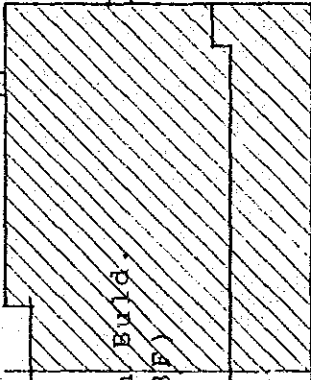
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ICVD

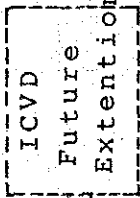


Future Extension to 5F.

Main Bldg. (3F)



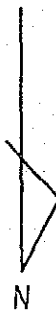
ICVD Future Extension Bld. (4F)



Entrance

ICVD

Emergency Generator



MIRPUR ROAD

Fig. 2-1. ICVD Site Plan

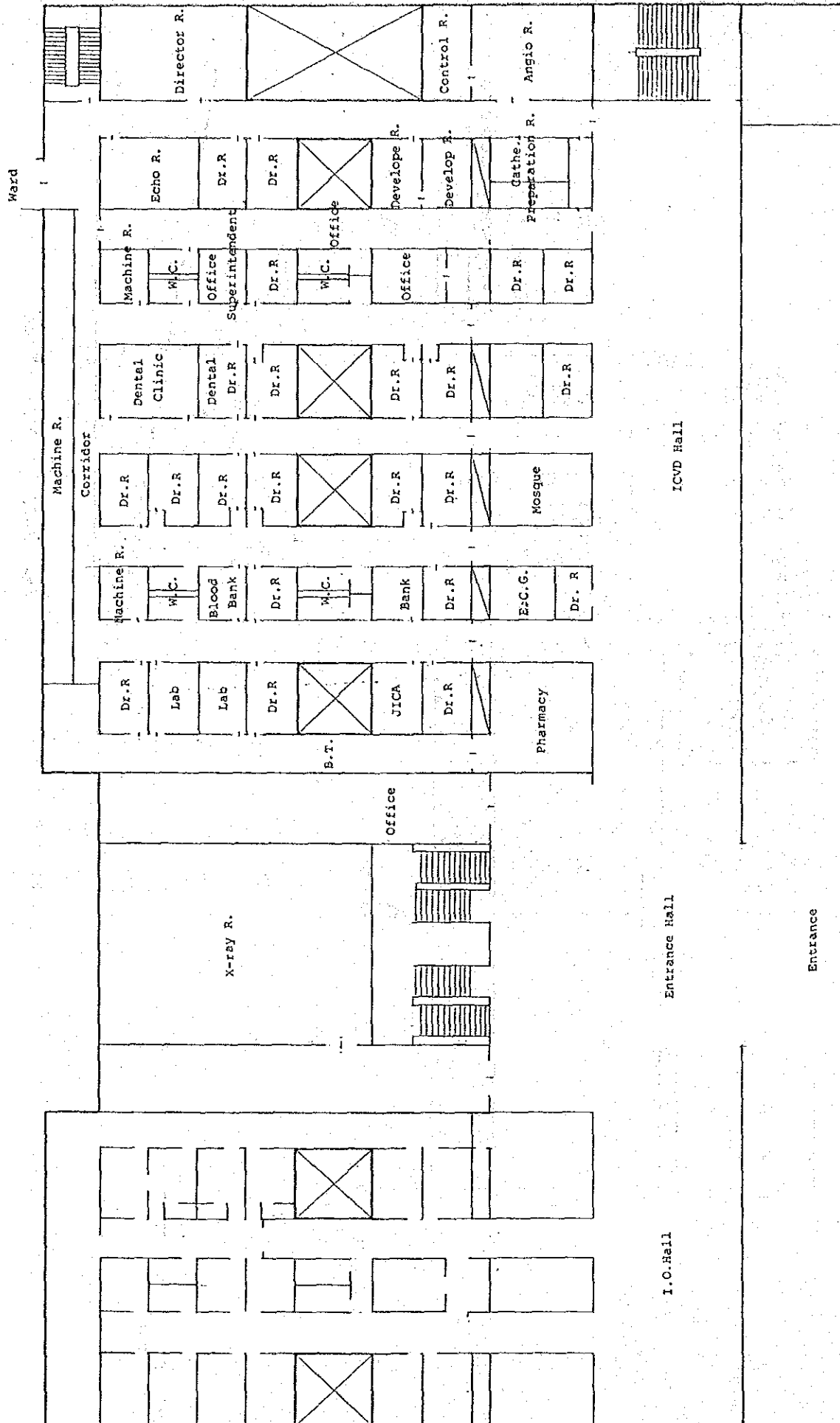


Fig. 2-2. ICVD Ground Floor Plan

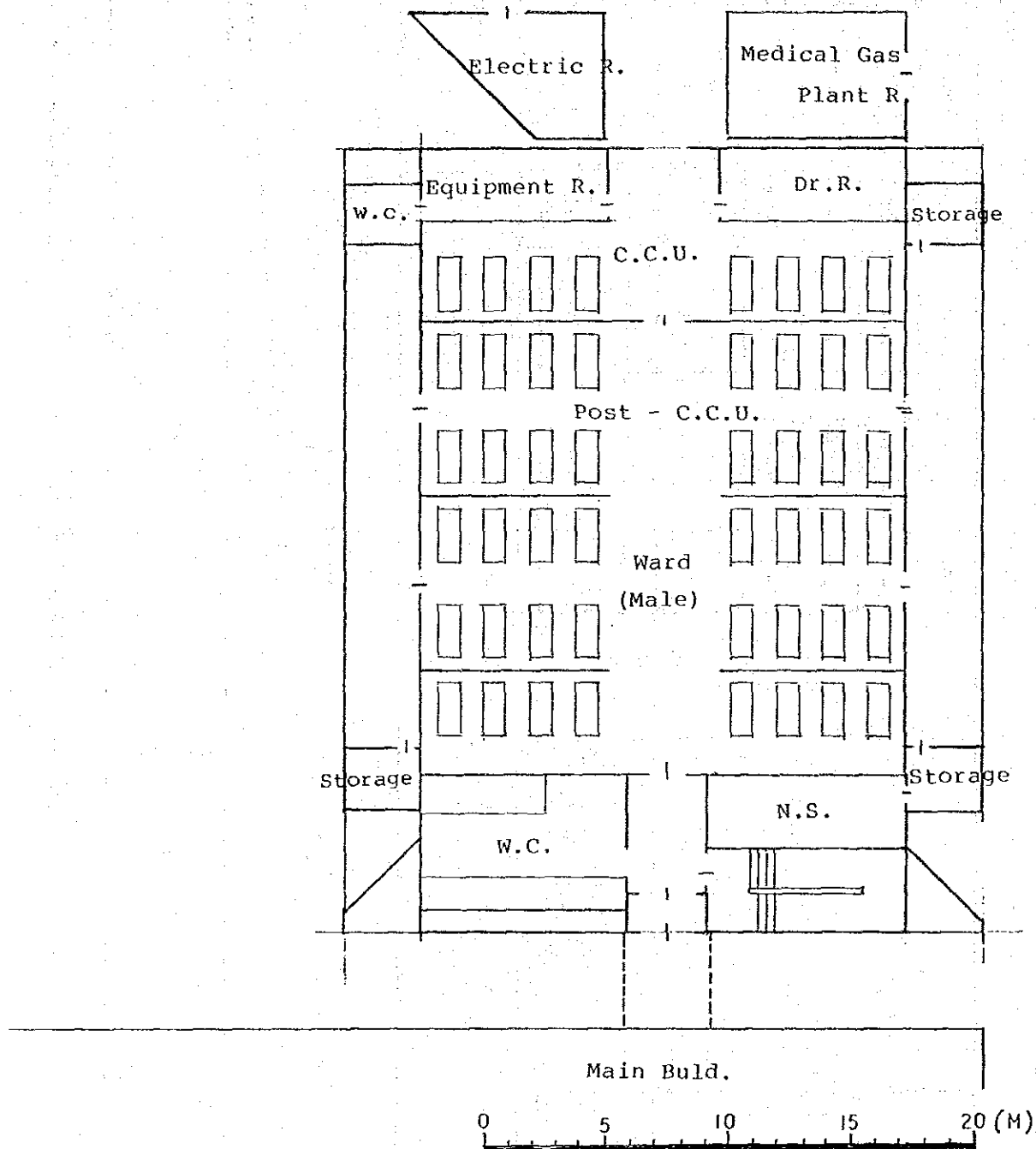


Fig. 2-4. ICVD Ward Plan

JICA