The State Committee of the Kyrgyz Republic
on Foreign Investment and Economic Development
The Kyrgyz Republic

Basic Design Study Report

on

The Project for Upgrading the Emergency Medical System

in

Bishkek

in

The Kyrgyz Republic

March 1999

Japan International Cooperation Agency

Nihon Healthcare Consultants, Inc.

Nihon Sekkei, Inc.

PREFACE

In response to a request from the Government of the Kyrgyz Republic the Government of Japan decided to conduct a basic design study on the Project for Upgrading the Emergency Medical System in Bishkek in the Kyrgyz Republic and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Kyrgyz a study team from September 16th to October 20th, 1998.

The team held discussions with the officials concerned of the Government of Kyrgyz, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Kyrgyz in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Kyrgyz Republic for their close cooperation extended to the teams.

March 1999

Kimio Fujita

President

Japan International Cooperation Agency

March, 1999

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Upgrading the Emergency Medical System in Bishkek in the Kyrgyz Republic.

This study was conducted by Nihon Healthcare Consultants Inc. under a contract to JICA, during the period from September 11th, 1998 to March 31st, 1999. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Kyrgyz and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

中島 護

Mamoru Nakajima

Project manager,

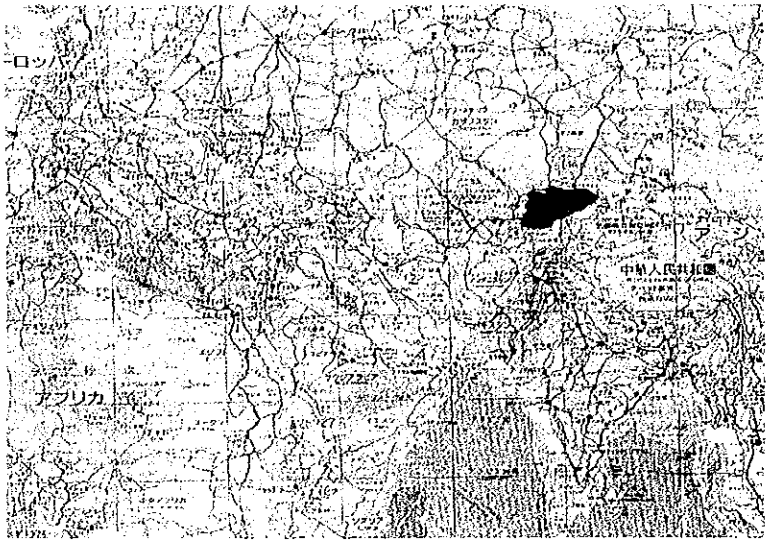
Basic design study team on

The Project for Upgrading the Emergency

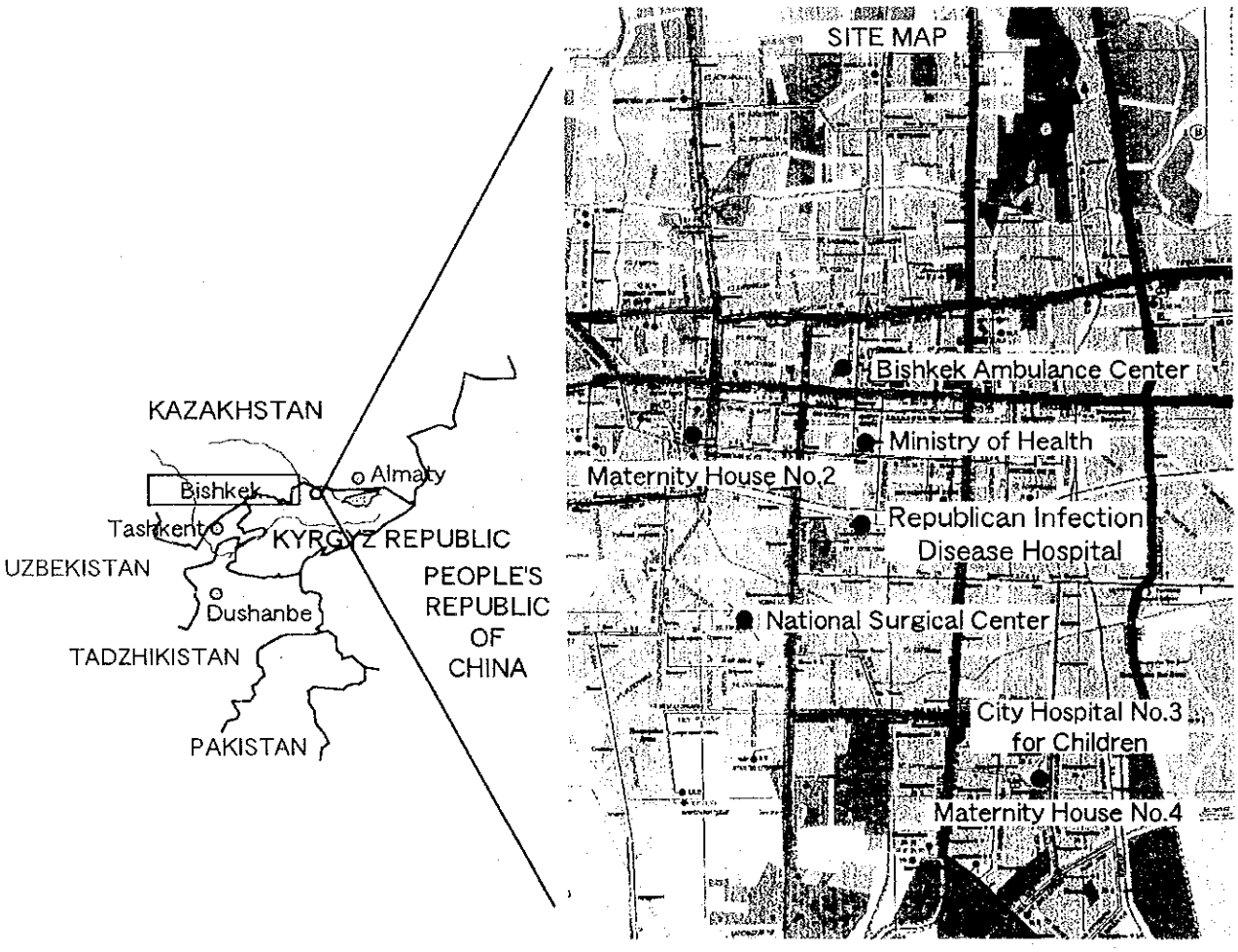
Medical System in Bishkek in the Kyrgyz Republic

Nihon Healthcare Consultants, Inc.

KYRGYZ REPUBLIC



BISHKEK CITY



ABREVIATION

A D B	Asian Development Bank
A I D S	Acquired Immune Deficienay Syndrome
B O P	Balance of Payment
C I S	Community of Independent States
C L B	China Land and Bridge
E B R D	European Bank for Reconstruction & Development
E P P	Export Promotion Policy
F S U	Former Soviet Union
G D P	Gross Domestic Product
G T Z	German Technical Cooperation Agency
H I V	Human Immunodeficiency Virus
I C U	Intensive Care Unit
I D A	Internantional Development Association
I F C	International Finance Corporation
I M F	International Monetary Fund
J I C A	Japan International Cooperation Agency
K S E H C	Kyrgyzstan State Energy Holding Company
M O F	Ministry of Finance
M R I	Magnetic Resonance Imaging
N B K	National Bank of Kyrgys Republic
O D A	Official Develpoment Assistance
O E C D	Organization for Economic Cooperation and Development
O E C F	The Overseas Economic Cooperation Fund
P H C	Primary Health Care
P I P	Public Investment Programme
S C E	State Committee for the Economy
S L B	Siberia Land and Bridge
S P F	State Property Fund
T B	Tuber c ulosis
U K	United Kingdam
U N D P	United Nations Development Program
U N D P	United National Development Programme
U S A I D	United States Agency for International Development
W B	World Bank
W H O	World Health Organization

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Chapter 1

Background of the Project

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 The background of the requirement

Kyrgyz Republic (hereinafter "Kyrgyz") has been in the severe economic crisis since country declared independence from Soviet Union in 1991. The Gross Domestic Products (GDP) in 1995 had decreased by 50.3% before independence (1990). The economy has shown upward tendency since 1996, though the economic conditions have been seriously because GDP per capita. is still $375 US (6,521Som). The budget of the health sector was slashed by 50 % before independence. Therefore all of health and medical institutions face to serious shortage of medicines and medical equipment.

National health indicator in 1994 shows following data: ①infant mortality was 29.4 per 1000 births, ②maternal mortality was 80.1 per 100,000 births, ③average life expectancy was 68.3 years. (Male: 64.3, female: 72.4) These data indicates worse situation of health care system in Kyrgyz comparing with other countries of former Soviet Union and other middle class developing countries. The major causes of death are circulatory disease (40%), respiratory disease (15%), accident/trauma and poisoning (10.8%) and malignant tumor (8.3%). The main causes of high infant mortality and maternal mortality that shorten the average life expectancy are much lack of the strength of pregnant woman reflected by serious economic conditions, respiratory organs diseases, digestive organ diseases and infectious diseases. These facts are the problems which be able to be improved by raising the consciousness of people for taking care of oneself and popularizing preventology and also show the importance of emergency medical care.

For the purpose of upgrading each health indicator and constructing efficient and economic medical service system, the government of Kyrgyz prepared MANAS Health Care Reform Program (hereinafter "MANAS Program") in 1996 as the master plan of reforming health care system.

MANAS Program has three major contents. The first is establishment of an efficient and economical medical service system by reorganizing over-specialized medical institutions and reducing the number of surplus beds in hospitals and surplus medical staffs. The second is establishment of the referral system based on primary health care by the establishing of a home doctor system. The third is enactment of the medical insurance system and the upgrading of the quality of medical service by user charging system.

The emergency medical service system in Kyrgyz is the taken over system from former Soviet Union. The system is operated as follows that the medical teams, each consisting of physicians and nurses, stand ready for emergency call during 24 hours at the ambulance center. After calling for emergency care, a medical team rush to the site by the ambulance car, then give the patient medical treatment on the site and deliver to hospital, if necessary.

The emergency medical system in Bishkek is also operated according to the system mentioned above. The system consists of Bishkek ambulance center including three sub centers, 14 national and

municipal hospitals and a few maternity houses. In 1997, 41 medical teams are working at Bishkek ambulance center including sub centers for emergency care. However the quantity of ambulance cars able to work was only 36 cars. Therefore, due to the shortage of ambulance cars, the arriving with delay to the site by the medical team has resulted serious problem as the lateness for saving life some times. The existing ambulance cars, which have not been replaced or repaired substantially due to the ongoing economic crisis or which have become superannuated or broken down, have to be discarded one after another. This has resulted in more serious shortage of ambulance cars and is expected to make it difficult for the ambulance center to provide efficient emergency medical care services. The decrepit ambulance cars shall be compelled to be disused every year. It is expected that in a couple of years the severe shortage of ambulance cars will be caused and emergency medical action will be seriously damaged unless the new ambulance cars are supplied.

On the other hand, the emergency designated hospitals that receive emergency patients are subdivided depending on the disease of patient and their age. However due to the aggravation of economic conditions in Kyrgyz and the suspension and stop of supplement of equipment parts from Russia, the shortage of spare parts were caused seriously. Therefore the function of medical service with the characteristic of system in the former Soviet Union was reduced at the hospital. The reduction of emergency medical service gave the citizen's life severe damage and the fact is proved as the aggravation of the each health care indicator.

Under such a condition the government of Kyrgyz formulated a project in order to improve and enhance the emergency medical system in Bishkek and as the model project of reform of emergency medical system in the whole country. The government has requested the Japan's Grand Aid for the implementation of the project.

1-2 Out line of the Request

(1) Objective of the request

The objective of the Project is to improve and enhance the function of emergency medical care system in Bishkek through the procurement of ambulance cars with medical equipment to the Bishkek Ambulance Center and the procurement of the equipment associated with emergency medical care to the five institutions consisted of National Surgical Center, Republican Infection Disease Hospital, City Hospital No.3 for Children, Maternity House No.2, and Maternity House No.4. Because all of these institutions have the damage on the medical care service by the shortage of equipment. Therefore, it will be expected that the recovery and improvement of function of emergency medical care in Bishkek and upgrading of health care indicator.

(2) Outline of the Request

1) Bishkek Ambulance Center

Ambulance Cars, Defibrillator, Electrocardiographs, Suction unit and intubation sets, Mobile artificial respiration apparatuses, Ambu bags, Steam sterilizer, Communication devices, etc.

2) National Surgical Center

Operation room and Sterilization: Operating tables, Operating lights, Patient monitors, Defibrillators, C-arm X-ray unit, ambu bags, Steam sterilizers, etc.

ICU: Defibrillators, Bedside monitors, Low pressure continuous suction units, Oxygen tent, Blood gas analyzer, Ambu bags, Coagulometer, etc.

Endoscopy: Bronchoscope/flexible, Gastrointestinal fiberscope, Thoracoscope, Ultrasounds, etc.

Basic Essential Equipment (Common use)

3) Republican Infection Disease Hospital

Pediatric/Neonatal Reanimation: Infant incubators, Ultrasonic nubulizers, Infant ventilators, Neonatal monitors, Syringe infusion pumps, Infusion pumps, Oxygen tent , Suction pumps, Endotracheal Sets, etc.

ICU: Ventilators, Bedside monitors, Defibrillator,

X-ray diagnostics: X-ray unit, X-ray Film Processor, etc.

Clinical Laboratory: Blood Cell Counter, Binocular Microscope, Hematocrit Centrifuge, Na, K, Cl Analyzer, Glucose Analyzer, Clinical Refractometer, Hot Air Sterilizer, etc.

Sterilizing and Others: Steam Sterilizer, Ultrasound, Blood Gas Analizer

Basic Essential Equipment (Common use)

4) City Hospital No.3 for Children

X-ray diagnostics: X-ray unit, Mobile X-ray units,

Operation Room and Sterilization: Anesthesia apparatuses with ventilator, Defibrillators, Pulse oxymeters, Multipurpose operating tables, Hypo/hyperthermia units, Electro-surgical units, Operating light, Stand type operating lights, Electric suction units, Operating microscopes, Steam Sterilizers, Distillators

Pediatric and Others: Syringe infusion pumps, Pediatric surgical incubators, Pulse oxymeters, Suction unit, Ventilators, Blood gas analyzers, Bedside monitors, Na,K,Cl analyzers, Ultrasonic nebulizers

Endoscope and Others: Rigid respiratory bronchoscope, Gastroduodeno fiberscopes, Halogen light sources, endoscopic suction units and endoscopic trolleys, Endoscopic tables, Cysto-urethroscopes, Halogen light sources.

Basic Essential Equipment (Common Use)

5) Maternity House No.2

Reanimation: Infant incubators, Infant warmers, Syringe pumps, Phototherapy units, Ambu

bags, Infant ventilators, Automatic resuscitators, Oxygen flowmeter, Neonatal monitors, Reanimation sets, Ventilators, Bedside monitors, Electrocardiographs, Na,K,Cl analyzer, Blood gas analyzer, Infusion pumps.

Obstetrics and Gynecology: Fetal monitors, Ultrasound, Colposcope

Operation Room and Sterilization: Operating instrument sets (Ob/Gye), Anesthesia apparatuses, Steam sterilizers,

Basic Essential Equipment (Common Use)

6) Maternity House No.4

Delivery Rooms, Operating Rooms, Others: Vacuum extractors, Suction pumps, Fetal monitors, Neonatal monitors, Automatic infant scales, Automatic resuscitator, Fetal Dopplers, Lamps for examination, Infant incubators, ultrasound Dopplers, Electro cardiographs, Automatic recording densitometer, Electrophoresis apparatus, Ventilators for adults, Ventilators for children, Anesthesia apparatuses with ventilator, Blood gas analyzers and Na, K Cl analyzers, Operating tables, Operating light, Ultrasonic nebulizers, Colposcopes

Basic Essential Equipment (Common Use)

Chapter 2

Contents of the Project

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objectives of the Project

The emergency medical care system of Bishkek of Kyrgyz consists of the Bishkek Ambulance Center (which has three sub-centers) and 14 designated emergency hospitals. Due to the severe economic conditions since the country declared independence from the Soviet Union, the number of ambulance cars has been decreasing without replacement of new one. This fact creates the emergency service malfunction of the ambulance center (delays in the arrival of ambulance car at the sites). The designated emergency hospitals are also finding it difficult to replace, repair, maintain and manage the medical equipment. As a result of the shortage of the medical equipment, the medical care functions of these emergency hospitals are declining sharply. All in all, the emergency medical care system of Bishkek is in a critical situation. On the other hand, the Government of Kyrgyz is in the process of reforming the country's medical care system with utmost emphasis on primary health care in accordance with "MANAS Program". It will therefore be possible to enhance the medical care services for emergency cases and realize a more efficient emergency medical care system by procuring the equipment to the institutions where are faced with a shortage of medical equipment. Namely, the procurement of ambulance cars with medical equipment and communication devices for Bishkek Ambulance Center and procuring medical equipment for use in emergency medical care for the National Surgical Center, Republican Infection Disease Hospital, City Hospital No. 3 for Children, Maternity House No. 2 and Maternity House No. 4. Therefore, this project is thus aimed at contributing greatly to the health and safety of population and improving the national health care indicators by enhancing the emergency medical care system and medical care functions in Bishkek.

2-2 Basic Concept of the Project

The MANAS Program, which defines the basic policy for the medical care service system, does not refer to an emergency medical care system. But it aims to reform the present emergency medical care system established during former Soviet Union period into the new medical care service system with emphasis on primary health care based on a home doctor system. This project is expected to contribute to the upgrading the emergency medical system according as this basic policy. In consideration of the severe economic conditions, this project is to be designed to maximize the cost-effectiveness of maintenance, management and operation of the medical institutions concerned.

2-2-1 Guidelines for Cooperation

1. The organization of medical teams of the Bishkek Ambulance Center are expected to retain until 2001 when a referral system is to be established based on the establishment of a home doctor

system and a user charging system, and after that be scaled down gradually. Under this project, therefore, the procurement of ambulance cars should be planed taking that in consideration.

2. This project should be aimed at procuring the equipment required to restore the function and quality of emergency medical care services in the project institutions and related equipment

3. The equipment to be procured under this project should be those, which are in extremely short supply, which are urgently needed, and which are indispensable in providing emergency medical care services.

4. In principle, only the equipment, which are to replace or replenish the existing ones, should be procured under this project. High-grade items of equipment which require training in operating skills, those which require additional budgetary appropriations for maintenance, management and operation, and those which require recruitment of additional staff members should be excluded from this project.

5. Equipment procurement should be carried out giving due consideration to the size of the project institutions concerned, the number of patients, the details of the activities and the specialties in charge of emergency medical care at the Bishkek, as well as to the present conditions of the project institutions.

6. In light of the difficulty of acquisition of foreign currencies in Kyrgyz, the equipment for which consumables such as reagents can be procured with the local currency (Som) should be selected.

2-2-2 Examination of the Details of the Request

(1) Necessity and Propriety of the Project

As stated earlier, the emergency medical care system of Bishkek is in a critical situation reflecting the present economic conditions in the country. However, the reform of medical care service system contemplated in the MANAS Program is aimed at establishing an economical and efficient medical care system and therefore places emphasis on primary health care based on a home doctor system. It is an institutional reform that includes the establishment of a social insurance system and a radical change in the residents' awareness of health care and is therefore to be achieved over a long period of time. The present emergency medical care system is to be improved step by step within the framework of the MANAS Program, but no concrete guidelines have been worked out for the work to improve the system. As the health care indicators, on the other hand, the health care situation, which has deteriorated following the economic crisis, is very unlikely to take a turn for the better. In this context, it is imperative to improve the quality of emergency care of circulatory ailments, perinatal diseases, infectious diseases and accident injuries for the sake of health and safety of the citizens of the city of Bishkek. It is thus urgently necessary and very appropriate to implement this project, a project aimed at improving the emergency medical care functions of the project institutions, which are playing a key role in the emergency medical care system of Bishkek.

(2) Examination of the Roles and Functions of the Project Institutions

1) Bishkek Ambulance Center

This is a medical institution where medical teams, each consisting of physicians and nurses, always stand ready for emergency medical care. Its special medical teams selected at the request of the citizens, rush to the sites of accidents in an ambulance car for emergency medical care and transport patients to appropriate hospitals if necessary. As such, the ambulance center is playing a pivotal role in the city's emergency medical care system.

The existing ambulance cars, which have not been replaced or repaired substantially due to the ongoing economic crisis or which have become superannuated or broken down, have to be discarded one after another. This has resulted in an even more serious shortage of ambulance cars, which in turn is expected to make it difficult for the ambulance center to provide efficient emergency medical care services. All this is posing a serious threat to the citizens' health and safety. Of the total number of ambulance car dispatches on a certain day, 10.65 % (34/319) were delays of more than 15 minutes (they should arrive to the site within 4 minutes by regulation) after receipt of requests for emergency medical care. (See Exhibit 1)

Most of the facilities of the Emergency Call Reception Center, which receives emergency calls from the citizens have become superannuated. These facilities may break down at any time. Should any of these facilities breaks down, the city's entire emergency medical care system will immediately be brought to a standstill.

2) National Surgical Center

This medical institution, which is responsible mainly for pectoral and abdominal surgery, accepts the largest number of emergency patient of all the designated emergency hospitals in the city. Most of medical equipment used at the hospital were procured before 1991 and therefore are no longer serviceable. But they are repaired for further use. It is difficult to procure old spare parts. In addition, the ongoing economic crisis is making it difficult to replace equipment. The resultant deterioration of the hospital's medical care functions is badly affecting the city's emergency medical care system.

3) Republican Infection Disease Hospital

This is the largest medical institution responsible for treatment of infectious diseases in Kyrgyz. Like the National Surgical Center, this medical institution is also faced with a shortage of medical equipment. There is a marked shortage of respirators and beside monitors for use with emergency cases receiving treatment in the ICU, and its sterilizer, which is a very important device for the hospital, is not functioning well. It is a serious matter that the hospital' ability to treat infectious respiratory diseases and digestion organ diseases, which are the main causes of death, is declining.

4) City Hospital No. 3 for Children

This is the only emergency hospital for children in Bishkek. The main causes of deaths of the emergency cases taken to the hospital are death from suffocation (newborn babies), intussusception and brain contusion, all of which require very careful emergency medical care. This hospital is also faced with a shortage of medical equipment, particularly medical equipment for use in the Operating Room and the X-ray Unit.

5) Maternity House No. 2

Since circulatory diseases are among the main causes of death and these diseases have an exceptionally high incidence, this hospital is serving as a perinatal hospital specializing in treatment of pregnant women for heart diseases. Like the National Surgical Center, the hospital is also faced with a shortage of medical equipment, particularly respirators and medical equipment for use with newborn babies. It is essential to replenish or replace these items of equipment in order to reduce the infant mortality rate and the maternal mortality rate in the country.

6) Maternity House No. 4

This hospital is the country's key medical institution conducting treatment of perinatal diseases. It is responsible for treatment of all perinatal diseases excepting those referred to in 5 above. This hospital is also faced with a shortage of medical equipment. It is essential to replenish or replace those equipment which are required to reduce the rate of deaths of prematurely born babies (which are attributable mainly to premature births) and the maternal mortality rate.

(3) Examination of the Requested Equipment

The necessity of, and the urgent need for, the requested items were examined through an analysis of the role, functions and activities of each of the project institutions. The details of the examination are as described below.

1) Bishkek Ambulance Center

①Replacement of Ambulance Cars

As of October 1997, the ambulance center had a total of 42 ambulance cars (12 were in good shape, 34 required repairs, and 33 were not longer serviceable). These ambulance cars are to be discarded in due order (in order of date of manufacture and service life). Under the present circumstances, those ambulance cars which are no longer serviceable (including those which may break down at any time) are repaired for further use. The following table shows the ambulance center's yearly ambulance car discarding plans which give priority to the cars badly damaged or required to repair. The longest allowable mileage is 300,000 km, 100,000 km in Japanese standard. (See Exhibit 2 for details). The ambulance center's existing ambulance cars should be

replaced in accordance with these plans.

Yearly Ambulance Car Discarding Plans

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
No. of Registered car in previous year	51	46	38	26	21	18	15	8	2	1
No. of Discarded car in previous year	5	8	12	5	3	3	7	6	1	1
No. of Registered car in Janualy	46	38	26	21	18	15	8	2	1	0
No. of Medical team of Ambulance Center	36	36	36	32	28	26	23	23	23	23

②Medical Equipment for Use in Ambulance Cars

Replacement/replenishment of portable defibrillators (requested no. of units: 20): Portable defibrillators are indispensable for emergency medical care. At the ambulance center, its medical teams use portable defibrillators about 484 times a year (1997). Most of the existing defibrillators are no longer serviceable. Five of them are repaired for further use. But they may break down at any time. On the assumption that under this project seven portable defibrillators will be procured for the cardiology team, and three for reanimation team, the total required number of portable defibrillators is 10.

Replacement of electrocardiographs (requested no. of units: 20): Electrocardiograph is indispensable for examinations of the functions of the heart and circulatory organs. The cardiology teams and reanimation team carry an electrocardiograph to the site always and use it in the patients' homes. At present, a total of 15 electrocardiographs are in use, all of which are one-channel-type electrocardiographs manufactured between 1989 and 1991. It is desirable that, of the 20 ambulance cars to be procured under this project, 10 (seven for cardiology team and three for the reanimation team) be equipped with a newly procured electrocardiograph. Thus a total of 10 electrocardiographs are to be procured under this project.

Replacement of electrical suction units and intubation sets: Each of the 10 ambulance cars newly procured under this project for the cardiology team and the reanimation team is to be equipped with an electrical suction unit and an intubation set.

Replacement of charger: The charger serves as the power supply for electrical equipment for use in ambulance cars. Procurement of charger is to be excluded from this project since the ambulance cars procured under this project are equipped with such device.

Replacement of mobile artificial respiration apparatuses: Each of the 10 ambulances for the use of the cardiology teams and the reanimation team is to be quipped with a mobile artificial respiration apparatus.

Replacement of ambu bags: The ambu bag is an important equipment used in emergency treatment for reanimation. Each of the ambulance cars procured under this project is to be provided with this equipment. On the assumption that six ambulance cars will be for pediatrics team, six of the ambu bags procured under this project are for use in emergency treatment of children, and the

remaining 14 sets for use in emergency treatment of adults.

Introduction of glucose analyzers: In 1997 there was a total of 1,473 blood sugar tests of patients particularly pregnant mothers, therefore it is necessary to procure glucose analyzers under this project. A total of five glucose analyzers (two for use in the ambulance center's ambulance cars and one each of the three sub-stations) are to be procured.

Replacement of sphygmomanometers: Since the sphygmomanometer is a basic equipment necessary for diagnosis of emergency patient, each of the ambulance cars should be equipped with a sphygmomanometer. It is desirable that six sphygmomanometers for children and 14 for adults be procured.

Replacement of bags for drugs: The medical teams quite often conduct emergency treatment and use bags for drugs, which are peculiar to the country for patients on site. The drugs bags can be used further, medical teams are accustomed to use and also can be procured cheaply at local market therefore replacement of these bags is excluded from this project. However, each of the ambulance cars is to be provided with a small medicine box as a standard item of equipment.

Replenishment of spare parts for the existing ambulance cars: The ambulance center's vehicle repair shop has some stock of spare parts. But it is impossible, to estimate the exact amount of spare parts for bidding under this project. In addition, the requested spare parts will have to be specified the existing ambulance cars. For these reasons, it is difficult to procure these spare parts within the scope of grant aid cooperation of the Government of Japan.

③Equipment to be installed in Bishkek Ambulance Center

Replacement of the steam sterilizer: Ambulance cars are dispatched about 135,000 times a year. Of the total number of emergency cases, about 30 percent are transported to appropriate medical facilities and the remaining 70 percent receive on-site emergency treatment. For this reason, all of the ambulance cars are equipped with emergency treatment instruments sterilized in the ambulance center. The steam sterilizer is used twice a day. Installed 15 years ago, however, it is often repaired for further use. It is therefore imperative to replace the existing steam sterilizer.

Replacement of communication devices: The ambulance center has six dispatcher consoles to receive medical emergency calls (03 calls). All of them were manufactured in the former Soviet Union, and two of them, which were manufactured more than 15 years ago, have broken down and remain unrepaired due to the unavailability of replacement parts. The ambulance center also has three double senior dispatcher consoles. A physician is staying to give counsel to senior dispatchers. These devices have also become superannuated. They may break down at any time. Therefore, the dispatcher consoles and the senior dispatcher consoles, including the switchboard, related terminals and wiring, are to be replaced. Since the original functions of both the dispatcher consoles and the senior dispatcher consoles can be secured by adding special functions to standard multifunctional telephones, however, 10 dispatcher console of the same model are to be procured

under this project. In keeping with the replacement of the switchboard, the 20 existing standard telephones are to be replaced with simpler models. Two personal computers--one for standby physicians to retrieve treatment examples and the other for processing a mass of data--are also to be procured. It should be noted that the public address system installed in the dispatcher room, which is functioning satisfactorily under the present circumstances, and the U.S.-made radio relay equipment, which was provided by an NGO, are operated in good condition and will be able to cope with the newly procured radio communication equipment for ambulance cars. These items of equipment are therefore to be excluded from this project. As to the radio communication equipment for ambulance cars, seven units for the existing ambulance cars which are becoming superannuated are to be replaced in addition to the procurement of 20 units for ambulance cars.

2) National Surgical Center

①Operating Room and Sterilization

This surgical center has a total of eight operating rooms. About 10,000 operations are performed a year. On the average three to four operations are performed a day in each room.

These operating rooms are functioning as a designated hospital specializing in emergency pectoral and abdominal surgery. However, most of medical equipment in these operating rooms have become very superannuated, making it difficult to perform as much as 10,000 operations. The improvement of the medical equipment for these operating rooms will result in an enhancement of the surgical center's ability to perform emergency operations more efficiently.

Of the eight operating rooms, six are used for emergency operation. Under this project, the existing medical equipment in these six operating rooms are to be replaced or necessary medical equipment are to be newly procured. Since these six operating rooms are located on from the second to the fourth floors, two rooms on each floor, it is difficult for these operating rooms to share the co-use of medical equipment. As a result, it will be necessary to procure a larger number of units for each of these operating rooms than in the case of standard operating rooms.

Replacement of electro-surgical units: All the existing equipment for use in operations are extremely superannuated At present, these operating rooms are not equipped with electro-surgical units such as Japanese and Western standards. Since the electro-surgical unit is an indispensable medical equipment for operating rooms, an electro-surgical unit should be planned in each operating rooms.

Replacement/procurement of electric suction units: These operating rooms are provided with no electric suction systems. Old-fashioned electric suction systems are used there. At present, there are only three old-fashioned electric suction units for six operating rooms. At least one standard type electric suction unit should be planned in each operating rooms.

Replacement of operating tables: All the operating tables were installed more than 15 years ago. It is necessary to replace them immediately.

Replacement of operating lights: The existing operating lights in each rooms has become extremely superannuated. Each operating room is equipped with a 14-bulb type operating light, but every operating light in each room is used with some bulbs burned out. This problem is not simply as a shortage of replacement bulbs. It is caused by the poor performance of the operating lights itself.

Replacement of stand-type operating lights: There are three stand-type operating lights, each with an back up battery system for emergency use at the time of power failure. But all of them have become superannuated. They may break down at any time. It is appropriate, therefore, to procure a stand-type operating unit for two operating rooms on each floor.

Replacement of anesthesia apparatuses with ventilator: Old-fashioned anesthesia apparatuses and ventilators, all of which were procured from the 1970s to the 1980s, are used. At this department, a total of six anesthesia apparatuses (one is manually operated type) are repaired repeatedly for current use. Since this equipment is indispensable for operations, each operating room should be provided with an anesthesia apparatus with ventilator.

Introduction of patient monitors: No patient monitors are in use at this department, making it difficult to obtain vital signs of patients. The introduction of patient monitors will improve safety in emergency operations. Usually a patient monitor is installed in each operating room. Because of no using of patient monitors in this department at present, it is desirable that the co-use of a patient monitor to be shared by two operating rooms.

Replacement of defibrillators: There is only one defibrillator available for the six operating rooms, though the one has broken down due to superannuating. A defibrillator at the ICU is moved frequently to this department for emergency operations. As the defibrillator is an important equipment for emergency care, it is desirable that a defibrillator be procured for each floor (the use of a defibrillator be shared by two operating rooms).

Introduction of pulse oxymeters: This medical equipment is used for management of patients' respiration information during operations. Specifically, it is used for the measurement of the oxygen saturation level in blood and the pulse rate. Under this project, patient monitors provided with the function of the pulse oxymeter are to be planned. It is therefore desirable to exclude this equipment from this project.

Replacement of film illuminators: No film illuminators are in use because of discarding. It is desirable to install a film illuminator in each operating room.

Replacement of C-arm X-ray units: This surgical center has a total of six mobile X-ray units, but all of them have become too superannuated for continued use. The existing C-arm X-ray units are also extremely superannuated. Since it is necessary to look at the abdomen of the patients suffering from digestive organ diseases through the fluoroscope, it is imperative to replace them.

Replenishment of the ambu bags: It is appropriate to procure an ambu bag for each floor (the use of an ambu bag is to be shared by two operating rooms).

Replacement of steam sterilizers: This equipment is indispensable for sterilization of medical

instruments used in emergency operations, which are performed around the clock at this surgical center. The Sterilization Room has a total of seven steam sterilizers (a large-size one, three medium-size ones and three small-size ones), but only the large-size one and two of the small-size ones are in use (they are often repaired for continued use). In addition, even the sterilizers in use are no longer serviceable. They may break down at any time. It is desirable to replace the two oldest ones under this project.

Operating instrument sets, common surgery instrument sets, stainless instruments: It will be possible to continue to use the existing ones. In addition, new ones can be procured at low prices by the Kyrgyzstan side in neighboring countries on demand. For these reasons, these equipment are to be excluded from this project.

②ICU

Replenishment of defibrillators: At this surgical center, the only one existing defibrillator is shared by its 15-bed ICU (13 beds and two single rooms, each with a bed). It is necessary to newly procure at least one defibrillator in case of the existing one's breakdown.

Introduction of bedside monitors: Since this project is aimed at improving the Bishkek city's emergency service system, it is imperative to introduce this equipment, for use in monitoring the critical condition of serious patients facing the danger of life and death. Under this project, one bedside monitor for each single room and four bedside monitors for the 13 beds (one unit for one group) are to be procured.

Replacement of and replenishment of the present stock of ventilators: There is four ventilators installed in the ICU, but all of them are extremely superannuated. Under this project, six ventilators are to be planned as the same standard plan of bedside monitors.

At present, four to five serious cases for surgical operations are treated a day on the average at the ICU. The increase of demand for medical treatment in ICU is presupposed in this institution in future.

Replacement/replenishment of the supply of sphygmomanometers: 12 sphygmomanometers are to be procured under this project. Six of them are to be for use at the ICU only, and the remaining six ones for use at the emergency department (one for the small-scale operating room, one for the treatment room , three for the three clinical laboratories and one for the gynecological laboratory).

Automatic resuscitators: Under this project, the present hand-operated resuscitators (ambu bags), accustomed local medical staffs, are to be replenished. These requested specifications of equipment are therefore to be excluded from this project.

Introduction of low pressure continuous suction units : This surgical center has no low pressure continuous suction units, and ordinary-type ones are used. Totally 12 electric suction units are requested. Though, one unit for each of the two single rooms and four units for the 13-bed ICU--six units in total--will be sufficient.

Ultrasonic nebulizer: This surgical center does not offer medical service to infants or children. In addition, it is not expected that this equipment will be used frequently for the treatment of adult patients. For these reasons, this equipment is to be excluded from this project.

Introduction of oxygen tent: Since oxygen is supplied through a central plumbing system to this ICU department, this equipment will be effective for emergency cases.

Replenishment of the supply of ambu bags: A total of three ambu bags--one for the two single rooms and one for the 13 beds--are to be procured under this project.

Replacement of blood gas analyzer: The existing one has been discarded due to superannuating. Since the measurement of the concentration volume of oxygen and carbon dioxide in blood, as well as PH, is important in determining the seriousness of respiratory diseases, circulatory diseases and metabolic disorders and in monitoring the condition of serious cases requiring emergency operations or treatment by the use of the ventilator, a blood gas analyzer should be procured under this project.

Introduction of coagulometer: This equipment, which is used to determine the dosage of hemostatic after an emergency or ordinary surgical operation by measuring the value of coagulation for the patient, is indispensable in performing surgical operations.

There are about 45,000 emergency laboratory tests conducted at this center. The above-mentioned blood gas analyzer and the coagulometer are to be installed in the clinical laboratory of the ICU department, and emergency tests for other department will be examined also. It expects great benefit for surgical center with the procurement of these equipment.

③Endoscopy (Abdominal) department and Others

Introduction of bronchoscope/flexible: Laboratory tests with the bronchoscope/flexible make possible diagnosis of hemorrhagic ulcers, tumors and polyps, as well as screening of pathological changes. Digestive organ diseases rank high in the country's main diseases, therefore this equipment is urgently needed and the surgical center will greatly benefit from its procurement under this project. This equipment is also effective in examining and removing a foreign body in a patient's bronchus suffering from bronchial diseases.

Introduction of gastrointestinal fiberscope: This equipment is used for direct image inspections of the inner parts of such digestive organs as the gullet, the stomach and the duodenum. As 10 to 15 patients are examined for stomach ulcer (or bleeding) and treated a day at this center, it is appropriate to procure this equipment under this project.

Replenishment of the halogen light sources, endoscopic suction pumps and endoscopic trolleys: these equipment are standard attachments to the above-mentioned two types of fiberscopes. Since at this center bronchoscopes/flexible and gastrointestinal fiberscopes are to be used in different clinical laboratories, two units of each of these fiberscopes should be procured under this project. As this center has an endoscopy room and some of the existing endoscopes are already in use, there

will be no problem with the technical level of the medical staffs to use and maintain them.

Introduction of thoracoscope: This equipment is to be used mainly for the treatment of stab wounds and pus in the chest.

The use of this type of equipment will require sufficient experience and skills of the surgeons. The annual number of abdominal operations performed by laparoscope has been about 700 for the past several years, therefore the introduction of this equipment will pose no problem as to their technical level of medical staffs.

Replenishment of the cabinets for endoscope: An additional supply of cabinets for endoscope, used to store sterilized endoscopes against hospital infection control, is necessary.

Replenishment of the present stock of ultrasounds: The ultrasound is medical equipment which provides noninvasive diagnosis with visual information by ultrasonic waves. The center's existing ultrasound has become extremely superannuated. As the existing ultrasound is a monochrome screen type (without doppler probe), however, it is difficult to conduct proper diagnosis of deep portion in body such as the liver and bleeding problem in the kidney. A colored doppler probe is able to diagnose the bloodstream of vessel. Judging from the fact that 15 to 20 patients undergo ultrasonography a day , the center will greatly benefit from the replacement of this equipment.

④Basic Essential Equipment (Common Use)

Replacement/replenishment of the supply of basic essential equipment: These equipment are to be replaced and replenished for emergency care at the treatment rooms, in particular. It is presumed, however, that in principle, these equipment will be used at the following departments.

Equipment	Quantity	Department
Height measuring rod	1	Emergency reception room
Weight scale	1	Emergency reception room
Stethoscopes	15	Operating department 12, Emergency department 3
Diagnostic sets	2	Emergency reception room
Clinical thermometers	2	Emergency reception room
Small operating instrument sets	2	Emergency treatment room , minor operating room
Boiling sterilizers	4	Operating department 3, Emergency department 1
Instrument sterilizing cases	14	Operating department 12, Emergency department 2
Dressing jars with stand	8	Operating department 6, Emergency department 2
Stretchers	7	Operating dpt. 3, ICU 2, Emergency department 2
Instrument tables	8	Operating department 6, Emergency department 2
Instrument carriages	8	Operating department 6, Emergency department 2
Emergency carts	3	Operating dpt. 1, ICU 1, Emergency department 1
Ambu bags	2	Emergency department

3) Republican Infection Disease Hospital

①Pediatric/Neonatal Reanimation

Compared with the other four hospitals, this hospital has a relatively large number of equipment broken down and not in use (mainly those installed in the resuscitation room and the ICU). The main reasons for the high frequency of equipment breakdowns are presumably the difficulty of equipment maintenance (the maintenance engineers do not have free access to the patients rooms for infectious diseases) and the superannuating of equipment and the high frequency of equipment breakdowns due to the over use of chemicals for infection control purpose.

Replacement of infant incubators: Of the annual total number of 608 under one-month-old neonatal babies (for 1997), 214 received special treatment with infant incubator at this department. Moreover, a great number of infants (one to three months old) were hospitalized and treated in infant incubators. Of the three existing infant incubators, one has become hard to repair and has therefore been discarded. The remaining two units are still in use, but it is uncertain whether they can be used for continuously or not. Under such circumstances, it seems necessary to replace all the three existing units--one unit for the patient rooms, and the remaining two units for the reanimation room.

Replacement of infant scales: Since this hospital is an infection disease hospital, the use of infant scales cannot be shared by another hospital rooms. Since at this hospital there is an infant scale for each reanimation room, it is desirable to renew two reanimation rooms and three patient rooms.

Replacement of ultrasonic nebulizers: All the existing ultrasonic nebulizers have been discarded. It is desirable to procure an ultrasonic nebulizer for each patient room.

Replacement / replenishment of the infant ventilators: Since every year a total of 162 newborn babies undergo treatment with the infant ventilator for one to four days, it is imperative to procure this equipment under this project (of the 162 neonates, 62 were suffering from respiratory diseases, and 100 from gastrointestinal diseases). The existing infant ventilator breaks down frequently. It is therefore desirable to procure two infant ventilators--one each for the two reanimation rooms.

Replacement / replenishment of the present ambu bags for neonate and adults: The ambu bags used in the two reanimation rooms are to be replaced. It is also desirable to replenish the present ambu bags three of the five patient rooms, where the ratio of serious cases is relatively high).

Replacement / replenishment of the present neonatal monitors: A neonate stays in the hospital for three to eight days on the average, and about 214 neonates are hospitalized into this department per year. It seems imperative, therefore, to newly procure neonatal monitors under this project. Only one of the existing neonatal monitors remains, but it has broken down. The Kyrgyzstan side requests for procurement of two units of this equipment is judged to be appropriate.

Introduction of syringe infusion pumps: It is appropriate to procure two syringe infusion pumps under this project, one for each of the two reanimation rooms.

Replenishment of the present infusion pumps: Since about 30 percent of the annual total number of

5,151 patients suffering from infectious diseases (for 1997) underwent treatment by the use of infusions, it seems necessary to procure a total of five infusion pumps (one for each patient room).

Introduction of oxygen tent: This equipment should be excluded from this project because this hospital has no experience of using it and also there is no urgent need to introduce it.

Replacement of suction pumps: Two suction pumps are to be procured for the reanimation rooms. The two existing ones are to be moved to the another patient rooms for continued use.

Replenishment of the present endotracheal sets: An additional endotracheal set is to be procured for use in the reanimation rooms.

②ICU

Replacement of ventilators: The three existing ventilators have all become superannuated and are no longer serviceable. A total of 1,031 patients were hospitalized for resuscitation treatment, more than 300 underwent treatment with ventilator, it is necessary to procure additional two ventilators (for use in the reanimation rooms).

Replacement of and replenishment of the present bedside monitors: Only one of the existing bedside monitors remain. Four bedside monitors are requested, but judging from the present need for this equipment at the hospital, it seems necessary to procure at least two bedside monitors under this project.

Replacement of defibrillators: All the existing defibrillators have become discarded due to superannuation, and there are no defibrillators available at the hospital. It is necessary to procure at least one defibrillator under this project.

Replacement of ECGs: The hospital presently owns only one superannuated one-channel ECG. Of the annual total number of 7,655 patients, 1,568 underwent electrocardiography, which shows the strong demand for this equipment at the hospital. It is necessary to replace the existing one with a three-channel ECG for treatment of serious infectious diseases (such as diphtheria).

Introduction of low pressure continuous suction units: This item of equipment should be excluded from this equipment because there is no urgent need for it.

Replenishment of the present ultrasonic nebulizers: All the existing ultrasonic nebulizers for use in the reanimation rooms have been discarded due to superannuation It is therefore desirable to procure one ultrasonic nebulizer for each reanimation room.

Replacement of endotracheal sets: It seems appropriate to procure an endotracheal set for adults for each reanimation room.

③X-ray Diagnosis Department

Replacement of X-ray units: The existing X-ray units are general-purpose X-ray diagnosis units with fluoroscopes. These X-ray units, manufactured more than 10 years in the former Soviet Union, are all extremely superannuated. They often break down and their functions have deteriorated markedly. Due to a lack of manufacturers' or local distributors' after-sales service,

the fluoroscopes are now hard to repair. With the difficulty of transfering patients of infectious diseases to other hospitals for radiography purpose, it is judged to be urgently necessary to replace the existing X-ray units. These are essential items of basic diagnosis equipment, and it is necessary to take chest X-ray film for about 50 percent of the annual total numbers of inpatients. Since these X-ray units are used every day, it is urgently necessary to replace them.

Replacement of X-ray film processors: The existing X-ray film processors are all extremely superannuated and are hardly serviceable.

Replacement of X-ray film illuminators: The existing X-ray film illuminators are extremely superannuated and therefore they must be replaced immediately

④Clinical Laboratory

Replacement of cell counters: All of the 11 existing hand-powered cell counters have become superannuated and break down frequently. At the clinical laboratory 130 to 140 patients undergo hemocytometric tests a day. Leukocytemetric tests are also conducted at the clinical laboratory. It seems appropriate to procure an automatic cell counter under this project.

Replacement of and replenishment of the present binocular microscopes: Microscopes are necessary for all kinds of laboratory tests and are therefore essential equipment. In 1997, a total of 351,119 laboratory tests were conducted at the clinical laboratory, of which 114,765 were blood tests, 246 were malaria tests and 142 were parasite tests. At present, the clinical laboratory is provided with three monocular type microscopes. In order to improve efficiency at the clinical laboratory examination, it is appropriate to procure two binocular microscopes under this project.

Replacement of hematocrit centrifuges: Those hematocrit centrifuges have been discarded due to superannuation. At present, an old general-purpose centrifuge is used, but this centrifuge is also no longer serviceable.

Replacement of Na, K, Cl analyzer: Of the annual total number of 5,152 patients, acute abdominal infectious diseases, 1,031 received intensive care resuscitation treatment. The emergency examination of electrolyte balance condition is indispensable in treating these serious patients. It is judged to be necessary, therefore, to replace the existing Na, K, Cl analyzer.

Replacement of glucose analyzer: The existing glucose analyzer has been discarded due to superannuation. At present, the clinical laboratory has no glucose analyzer. It is appropriate to newly procure at least a glucose analyzer.

Replacement of versatile clinical refractometer: The existing versatile clinical refractometer has broken down.

Replacement of hot air sterilizers: At an infection disease hospital, the hot air sterilizer is indispensable in sterilizing contaminated or infected instruments. The clinical laboratory has several hot air sterilizers, but all of them are extremely superannuated and break down frequently. Under this project, one of them with no longer be repaired, is to be replaced.

Introduction of digital micro pipette set: The existing normal-type pipette still remains

serviceable. As the introduction of this equipment will result in a rise in the maintenance cost due to purchases of related expendables, this equipment should be excluded from this project.

⑤Sterilizing and Others

Replacement of steam sterilizers: Same as hot air sterilizer, the steam sterilizer is a very important equipment for infection disease hospitals. This hospital has two steam sterilizers, but both of them break down frequently. At least one of them should be replaced immediately.

Replacement of ultrasound: At present an ultrasound is used in various types of examination, but it is superannuated. In addition, it is now impossible to procure necessary probes which play an important role as standard attachments to the ultrasound. Of the annual total number of 3,031 patients (for 1997), 1,840, or about 25 a day, underwent examinations by ultrasound. At this hospital examinations are conducted mainly for liver and heart disorders as well as brain diseases (of under one-year-old infants). In 1997, 67 patients for tumors and 15 for liver disorders underwent examinations with the ultrasound. It is therefore imperative to replace the existing ultrasound.

Replacement of blood gas analyzers: This hospital's old-fashioned gas analyzers have all been displaced, and at present there are no blood gas analyzers at this hospital. This equipment is indispensable in measuring the oxygen and carbon dioxide concentration volume in blood, as well as pH, and in determining the seriousness of respiratory, circulatory and metabolic disorders. It also plays an important role in checking up on the condition of serious cases who require emergency operations or treatment by the use of the ventilator. It is therefore urgently necessary to procure this item of equipment under this project.

⑥Basic Essential Equipment (Common Use)

Replacement/replenishment of the supply of basic essential equipment: Procurement of the minimum necessary items of equipment for use in the reanimation rooms and the ICU is requested. The requested number of units of these equipment is judged to be appropriate.

3) City Hospital No. 3 for Children

①X-ray Diagnosis Department

Replacement of X-ray units: The existing X-ray units are general-type X-ray units with fluoroscopes, all of which are considerably superannuated . (They were all installed in 1986. The fluoroscopes were manufactured in the former Soviet Union, and the general-type X-ray units in Poland.) The fluoroscopes have broken down and can hardly be repaired. 60 to 80 patients undergo radiography a day at the hospital and annual total of 17,604 patients who underwent ordinary radiography, 14,351 underwent emergency radiography, it is necessary to replace the existing X-ray units immediately.

Mobile X-ray units: The hospital has several mobile X-ray units, but all of them have broken down due to superannuation. Since about 40 percent of the total number of inpatients are those who have difficulty in walking, this equipment is indispensable in treating such inpatients. It is also necessary for taking X-ray photographs of infectious disease patients who are kept in isolation.

②Operation Room and Sterilization

This hospital has a total of six operation rooms and a total of 12 operating tables. At this hospital 15 to 16 operations are conducted a day on the average. The equipment requested for this department are those for use in the room for emergency operation for injuries (with an operating table), the emergency operation room (with two operating tables), the room for emergency operation for urinary diseases (with an operating table) and the "dirty" operation room (with two operating tables).

Replacement of anesthesia apparatuses with ventilator: The existing anesthesia apparatuses, one in each of the above-mentioned operating rooms, are all of the old type (one of them being manually operated). Of the four existing anesthesia apparatuses, only two are in use, being repaired frequently. Since at present the use of the new anesthesia apparatus, which was donated by the United States, is being shared by the six operating rooms, it is impossible to perform two or more emergency operations at a time. It sometimes happens that two operations are conducted simultaneously. For these reasons, it is necessary to replace all of the four existing anesthesia apparatuses.

Replenishment of defibrillators: At present one unit of this equipment is available for use in the reanimation department. The emergency operation rooms are provided with no defibrillators. As heart failure and other accidental cases are likely to occur during operations, it is necessary to procure at least one defibrillator.

Replenishment of pulse oxymeters: Almost all items of equipment used in the operation rooms have superannuated, and at present these rooms are provided with no equipment for patient monitors. From a medical view point, it is important that each operation room shall be provided with a pulse oxymeter, which has minor patient monitoring function.

Replacement of multipurpose operating tables: The existing multipurpose operating tables have become extremely superannuated and can hardly be repaired. It is therefore necessary to replace them immediately.

Replacement of hypo/hyperthermia units: All of hypo/hyperthermia units have been discarded. This kind of equipment should be installed in the operation rooms of this hospital. It is judged to be appropriate to procure one hypo/hyperthermia unit for six operating tables.

Replacement/replenishment of the supply of electro-surgical units: The three existing old-fashioned electro-surgical units are repaired frequently for continued use. It is appropriate to newly procure two electro-surgical units for six operating tables.

Replacement of operating lights: All the existing operating lights are extremely superannuated and can hardly be repaired. It is necessary to replace them immediately.

Replenishment of stand type operating lights: The stand type operating light is a mobile operating light provided with an emergency power supply for emergency use. This department has two old-fashioned stand type operating lights. It is appropriate to procure two units under this project.

Introduction of electric suction units: One of five existing electric suction units is extremely superannuated. Since each operating table should be provided with an electric suction unit, it is appropriate to procure two units of this equipment under this project.

Introduction of operating microscopes: At present this hospital is provided with no operating microscopes. But this equipment is necessary for abdominal operations. In addition, it sometimes happens that a neonate suffering from congenital digestive organ deformity is taken to this hospital in an ambulance car. There is a strong need to procure this equipment. For example, 20 percent of the total of 43 patients in abdominal operations in 1997 died while undergoing surgical operations. Judging from above fact, it is judged to be appropriate to procure an operating microscope under this project.

Replacement of steam sterilizers: Two steam sterilizers are used in the Sterilization Room, but both of them are extremely superannuated. They may break down at any time. It is therefore necessary to replace at least one steam sterilizer immediately.

Replenishment of distillators: As the city water used in this hospital is hard water (hardness: about 200), distilled water is used with steam sterilizers and for washing operating instruments. The existing distillator's distilling production capacity is not sufficient. In addition, it is no longer serviceable. It is necessary, therefore, to procure a distillator under this project.

③Pediatric Department and Others

Introduction of syringe infusion pumps: In the case of premature babies and newborn babies, who are incapable of generating optimal body temperature, it is best treatment to take care such babies in incubators. Since many of them have difficulty in breathing, the ventilator and the small volume of dosing syringe infusion pumps are indispensable for treatment.

Introduction of pediatric surgical incubators: The number of premature babies and newborn babies hospitalized into this hospital is increasing. With the World Bank's project, part of the main building has been refurbished. As a result, the hospital is now facing shortage of incubators. Procurement of pediatric surgical incubators is requested, but standard-type incubators should be procured under this project because it can be treated well by using such incubators.

Pulse oxymeters: The reanimation department is provided with a pulse oxymeter, supplied in 1997. This equipment is necessary for emergency treatment of infants hospitalized into this hospital by ambulance cars (the reanimation rooms are equipped with a total of 18 beds). Since the ages of emergency services patients to this department range from under 3 months to 15 years, it is

appropriate to procure four pulse oxymeters, each with minor patient monitoring function, under this project.

Replenishment of the supply of suction units: At present there are only two suction units for use in the six reanimation rooms. It is appropriate to procure four suction units under this project.

Replenishment of the supply of ventilators: At present there is only one ventilator for the six reanimation rooms. It is necessary to procure at least two ventilators under this project.

Blood gas analyzers: The existing blood gas analyzers have been discarded due to superannuation. This department has to treat 900 to 1,000 patients with a blood gas analysis a year . It is therefore urgently necessary to procure one under this project even if the addition of this equipment may lead to an increase in the equipment maintenance and management cost.

Replenishment of the supply of bedside monitors: A relatively newly purchased bedside monitor is used in this department. It is therefore appropriate to procure six bedside monitors under this project.

Replenishment of the supply of Na, K, Cl analyzers: All the existing Na, K, Cl analyzers have been discarded. The emergency examination of electrolyte balance condition such as dehydrated patients is an essential condition for treatment. It is judged to be necessary to procure Na, K, Cl analyzers under this project.

Replenishment of ultrasonic nebulizers: Since the repairing of the facilities, numbers of patients are increasing from year to year. It is appropriate to replenish the ultrasonic nebulizers under this project. The only one existing ultrasonic nebulizer is of the old and simple type.

④Endo-scope Department and Others

Replacement of rigid respiratory bronchoscope: Emergency operations on infants particularly for the removal of a foreign body in the upper respiratory bronchus are frequently performed at this hospital. The existing rigid respiratory bronchoscope has become superannuated. Though existing bronchoscope is for adult, they used it for infants. About 130 operations are conducted a year, it is appropriate to replace it under this project.

Replenishment of gastroduodeno fiberscopes: At this hospital as much as 300 to 400 endoscopic examinations by using of the colon endoscope are conducted a year. It is appropriate to procure a gastroduodeno fiberscope under this project in order to facilitate treatment of gastric bleeding.

Replenishment of halogen light sources, endoscopic suction units and endoscopic trolleys: It is necessary to procure these equipment as standard attachments to the gastroduodeno fiberscope.

Replenishment of the supply of endoscopic tables: This hospital has an endoscopy room provided with an endoscopic table. Since the existing endoscopic table is used properly in the endoscopy room, introduction of a gastroduodeno fiberscope should be excluded from this project.

Replenishment of cysto-urethroscopes: At this hospital 60 to 70 surgical operations to remove stones in the bladder are conducted a year. It is therefore appropriate to procure this type of

endoscope for use in cysto-urethral examinations.

Replenishment of the supply of halogen light sources: The halogen light source is an attachment to the cysto-urethroscope.

⑤Basic Essential Equipment (Common Use)

Replacement/replenishment of basic essential equipment: Under this project, these equipment are to be procured for use in the departments concerned with emergency rooms. In principle, these equipment are to be used in the following departments.

Equipment	Quantity	Department
Weight scale	4	Emergency reception room1, Reception of Reanimation department 2, Physiotherapy room 1
Stethoscopes	10	Emergency reception room 2,Reception of Reanimation department 4, Reanimation room 4
Sphygmomanometer	6	Emergency reception room 2, Reanimation room 4
Diagnostic sets	2	Reanimation room
Clinical thermometers	1	Reanimation room
Laryngoscopes	3	Reanimation room 2, Injury department 1,
Small operating instrument sets	6	Operating department
Boiling sterilizers	7	Reanimation department 2, Emergency department 1, Operating department 4
Instrument sterilizing cases	8	Operating department 6, Reanimation department 2
Dressing jars with stand	7	Reanimation room 6, Injury department 1,
Stretchers	6	Operating department 4, Reanimation department 1, Injury department 1
Instrument tables	8	Operating department
Instrument carriages	6	Reanimation department 3, Hospital room 3
Emergency carts	2	Emergency department 1, Reanimation department 1
Mobile stand lamp	4	Reanimation room 2, Injury department 1,

Of the five requested "height measuring rods," one is for use in the emergency reception room, two for use in the two emergency reception rooms (one for use in each emergency reception room) of the reanimation department, and one for use in the physiotherapy room in the main building. But it is appropriate to procure four units of this equipment under this project. The two "diagnostic sets" are for use in the reanimation rooms. The 20 "clinical thermometers" are for use in the reanimation rooms. Of the three "laryngoscopes," two are for use in the reanimation rooms, and one for use in the injury department. The six "minor operating instrument sets" are for

common use in the operation department. The eight "operating instrument sets" are to be excluded from this project. The reasons are that the existing ones are available for common use and that this item of equipment can be purchased at low prices in the country. Of the seven "steam sterilizers," two are for use in the reanimation rooms, one for use in the emergency reception room, and four for use in the four operating rooms (one for use in each operating room). Of the eight "boiling sterilizers," six are for use in the operation department, and two for use in the reanimation department. Of the seven "dressing jars with stand," six are for use in the operation department, and one for use in the reanimation department. The eight "instrument tables" are for use in the operation department. Of the six "instrument carriages," three are for use in the reanimation department, and the remaining three for use in the hospital rooms. Of the two "emergency carts," one is for use in the emergency case reception room, and the other for use in the reanimation department.

5) Maternity House No. 2

①Reanimation Department

The existing equipment in the reanimation rooms for neonates were supplied as secondhand equipment from the U.S.A. donation program. Many of them are no longer serviceable and they appear to be hard to repair.

Replacement/replenishment of the supply of infant incubators and infant warmers.: The hospital has eight infant incubators and four infant warmers. Two of the eight infant incubators are extremely superannuated and are now not in use. Three others break down frequently and therefore the use of them with serious cases is open to question. Since there are as much as 1,150 neonates require treatment by the use of the infant incubator a year, procurement of six units of this equipment is requested. It is necessary to replace the above-mentioned five units. The existing infant warmers do not satisfy necessary function for emergency treatment. Two units are therefore to be procured under this project in order to improve the quality of emergency care.

Replenishment of the supply of syringe pumps: An infusion pump of the old type is used with each infant incubator. Since these syringe pumps can be used with all of the existing eight infant incubators and four infant warmers, it is appropriate to procure two syringe pumps under this project.

Replacement/replenishment of phototherapy units: Of the two existing phototherapy units, one is extremely superannuated and hard to repair. Procurement of three phototherapy units for this hospital is requested. But it will be sufficient to replace one of them, which has broken down, and to procure one under this project.

Replenishment of the supply of ambu bags: It is appropriate to procure three hand-operated ambu bags for adults and three more for infants.

Replacement of infant ventilators: Of the four existing infant ventilators, only one is in use.

About 700 neonates undergo special treatment in the reanimation room a year. Of them, about 215 require continued treatment by the use of the infant ventilator, which usually lasts several days. Procurement of four infant ventilators is requested by the hospital. But it is judged to be appropriate to replace three of the four existing ones, which have broken down, under this project.

Introduction of automatic resuscitators: Procurement of hand-operated resuscitators, the current hospital's staffs are accustomed (ambu bags and laryngoscopes), will make it possible to conduct satisfactory treatment for resuscitation. It is therefore judged to be unnecessary to procure automatic resuscitators under this project.

Introduction of oxygen flowmeter: The requested specification of oxygen flowmeter needs connection device to a central medical gas (oxygen) outlet. The medical gas outlets installed both the current operating rooms and the delivery rooms are old type, to which cannot be connected the requested specification of oxygen flowmeter. For this reason, this equipment should be excluded from this project.

Replacement of neonatal monitors: All of the three existing neonatal monitors have broken down and none of them is now in use. It is necessary to replace two of them.

Replenishment of the supply of reanimation sets: Two laryngoscopes for adults and two more for infants are to be procured under this project.

Replacement/replenishment of ventilators: This hospital has different buildings for revisit outpatients and new patients taken to the hospital as emergency cases. At this hospital the former patients are referred to as "clean," and the latter as "dirty." The "clean" reanimation room (ICU) consists of a single room and a three-bed room. A respirator of the old type is the only existing item of equipment. Since this hospital accepts mainly heart diseases pregnant mothers, it is appropriate to procure two ventilators (one for use in the single room and the other for use in the three-bed room). The "dirty" reanimation room for adults also has only one "hand-operated" ventilator. This one should also be replaced.

Replenishment of the supply of bedside monitors: All of the existing bedside monitors have been discarded due to superannuating. It is necessary to procure two bedside monitors, one for use in each of the two reanimation rooms in the "clean" building.

Replacement of electrocardiographs: The electrocardiograph is one of the essential equipment. It is desirable that the existing electrocardiograph, which is used in the reanimation rooms in the "clean" building, be moved for use in the reanimation rooms in the "dirty" building and that one unit of this equipment be procured for use in the reanimation rooms in the "clean" building.

Replacement of Na, K, Cl analyzer: This item of equipment plays an important role in emergency analysis of electrolytes imbalance in serious patients. The existing one, which has broken down due to superannuation, is to be replaced.

Introduction of blood gas analyzer: Since the procurement of built-in type of Na, K, Cl analyzer and blood gas analyzer, which is requested by this hospital, will likely affect adversely the medical

service activities in the view of additional budgetary arrangement for equipment maintenance cost, therefore this specification type of equipment are to be excluded from this project.

Replacement/replenishment of the supply of infusion pumps: All the existing infusion pumps have been discarded. It is therefore appropriate to procure one infusion pump for each of the reanimation rooms in the "clean" building.

②Obstetrics and Gynecology

Replenishment of fetal monitors: This department has an old type of fetal monitor, which is often repaired for continued use. The annual total number of deliveries is as much as 1,150. It is judged to be urgently necessary to increase the number of fetal monitors for this department for the treatment of normal labor pains and deliveries of high-risk pregnant mothers. Procurement of four fetal monitors, three for use in the two delivery rooms in the "clean" building (one for use with two delivery tables because one of the delivery rooms is provided with four delivery tables and the other with two delivery tables) and one for use in the three delivery rooms in the "dirty" building, will help improve the quality of this hospital's emergency medical care service.

Replacement of ultrasound: A secondhand ultrasound, manufactured in the 1980s, was procured through MOH. Hospital has only one existing ultrasound. With small screen type equipment with a linear type probe. As it has been using for long time, it is extremely superannuated. It is therefore necessary to replace it.

Replacement of colposcope: The existing colposcope is old type. As about 15 patients (provided with 20 beds) undergo medical examination and treatment by colposcope a day, it is judged to be necessary to replace it.

③Operation Room and Sterilization Room

Operating instrument sets (Ob/Gye): The existing sets still remain serviceable. In addition, it will be possible to procure at relatively low prices in neighboring countries on demand. For these reasons, this item of equipment is to be excluded from this project.

Replacement of anesthesia apparatuses: At present an anesthesia apparatus is used in each operation room. But all of these anesthesia apparatuses were manufactured in the former Soviet Union, two of them being manually operated. In view of the fact that about 1,000 obstetric and gynecological operations are performed a year in the three operating rooms (with four operating tables) and the four delivery rooms, it is judged to be necessary to replace all of the existing anesthesia apparatuses.

Replacement of steam sterilizers: Judging from the annual total number of operations conducted at this hospital, it is urgently necessary to procure a steam sterilizer under this project. Two units of this equipment are requested by this hospital. Judging from the space and the equipment situation of the Sterilization Room, however, it is appropriate to replace only one unit under this project.

④Basic Essential Equipment (Common Use)

Replacement of basic essential items of equipment: The minimum necessary equipment in the reanimation rooms, the operating rooms and the emergency reception rooms are requested. The requested number of items is appropriate. However, the clinical thermometer is to be excluded from this project.

Equipment	Quantity	Department
Height measuring rod	2	Maternity department
Weight scale	2	Maternity department
Stethoscopes	17	Reanimation rooms for adult 10, Reanimation room for neonates 7
Sphygmomanometer	10	Reanimation rooms for adult
Larygoscopes	3	Operating Department
Small operating instrument sets	4	Delivery rooms
Boiling sterilizers	4	Operating department 1
Instrument sterilizing cases	6	Operating department
Dressing jars with stand	5	Operating department 3, Delivery rooms 2
Stretchers	2	Operating department 1, Delivery rooms 1
Instrument tables	2	Operating department
Instrument carriages	2	Operating department
Emergency carts	3	Reanimation rooms for adult
Mobile stand lamp	2	Delivery rooms

6) Maternity House No. 4

①Delivery Rooms, Operating Rooms, Others

At this hospital there are 750 to 800 operation a year. In 1997, a total of 2,647 anesthetization were performed, of which 79 percent were emergency treatment for resuscitation. By type of disease, 723 patients suffering from endotracheal disorders, 19 patients suffering from cerebral edema and 54 patients suffering from natal bleeding/shock received treatment by the ventilator for four to 16 days.

Introduction of vacuum extractor: Although no vacuum extractors are in use at this hospital, it is desirable to procure one unit of this equipment under this project for greater efficiency in the hospital's emergency care.

Replacement/replenishment of the supply of suction pumps: The existing suction pumps used in the delivery rooms are extremely superannuated. Two of them are to be replaced. It is desirable to procure a suction pump for common use by two operating rooms.

Replacement of fetal monitors: All the existing fetal monitors have been discarded. A total of three fetal monitors are to be procured to help this hospital deal with normal labor pains and

deliveries of high-risk pregnant mothers more efficiently.

Replenishment of neonatal monitors: The neonatal resuscitation department is separated to four places (one is on the first floor, two are on the second floor, and the other is on the third floor). The neonatal ICU and the reanimation room on the second floor were newly established following the integration of Maternity House No 3. to this hospital in May 1996. It is necessary to replenish two neonatal monitors for these rooms.

Replacement of automatic infant scales: The automatic infant scales used in the two delivery rooms are to be replaced.

Automatic resuscitator (1) : Since the existing resuscitators still remain serviceable, the request is to be excluded from this project.

Replenishment of the supply of fetal Dopplers: It is desirable to procure a total of three fetal Dopllers for the two delivery rooms on the first floor and for the gynecology department.

Replacement of lamps for examination: The existing ones used in the delivery rooms are no longer serviceable. Therefore it is urgently necessary to replace them.

Automatic resuscitator (2): For the same reason as mentioned above about automatic resuscitator (1), no new ones are to be procured under this project.

Replenishment of the supply of infant incubators: At this hospital there are 3,800 to 4,000 deliveries a year, of which 700 to 750 are deliveries of premature babies. Since some premature babies are hospitalized for long time period, it is urgently necessary to replenish infant incubators. Two units of this equipment are to be procured for each neonatal ICU of four sections.

Replenishment of the supply of ultrasound Dopplers: At present an ultrasound Doppler is used in the gynecology section's consultation room. This equipment is indispensable for the diagnosis of both adults and infant. It is expected that this equipment will greatly contribute to the diagnosis of neonates (premature babies) for congenital diseases. Under this project ultrasound Dopplers are to be procured exclusively for the ICU and the reanimation rooms.

Replacement of electrocardiographs: The electrocardiograph for adults which is used in the ICU is repaired frequently for continued use. As it is no longer serviceable, it is necessary to replace it.

Introduction of automatic recording densitometer: Having little relevance to the emergency care service within this project, this equipment should be excluded from this project.

Introduction of electrophoresis apparatus: For the same reason as mentioned above about automatic recording densitometer, this equipment should be excluded from this project. There will be difficulty for additional budgetary arrangement for procurement and maintenance of reagents and consumables.

Replacement of ventilators for adults: This hospital has two ventilators for adults, one is a hand-operated type ventilator. However, these existing ventilators break down and are repaired frequently for continued use. It is therefore urgently necessary to replace them.

Replenishment of the supply of ventilators for children: It is necessary to procure a ventilator for

children for each of the reanimation rooms for infants and ICU, these rooms located on the second floor.

Replacement of anesthesia apparatuses with ventilator: The existing anesthesia apparatuses normal function only for three hours and after that the reliable quantity of oxygen flow to be reduced. At present this problem is overcome by keeping another stand by anesthesia. The anesthesia apparatuses used in the two operating rooms are extremely superannuated and therefore it is urgently necessary to replace them.

Replenishment of the supply of blood gas analyzers and Na, K, Cl analyzers: These equipment perform a very important role in measuring the oxygen and carbon dioxide concentration volume, pH and electrolyte imbalance in blood. If the hospital arrange budgetary appropriations for the operation and maintenance cost of the items, procurement of this equipment under this project will prove very effective. It is desirable, however, to procure separate blood gas analyzers and an Na, K, Cl analyzers rather than procure a built-in type of a blood gas analyzer and Na, K, Cl analyzer.

Replacement of operating tables: As the existing ones are superannuated, it is urgently necessary to replace them.

Replacement of operating lights: The same as above.

Replacement/replenishment of bedside monitors: One bedside monitor is installed in ICU (two beds for adults), but it is extremely superannuated and must be replaced. It is desirable to procure bedside monitor for each of the two beds.

Replenishment of ultrasonic nebulizers: It is desirable to procure an ultrasonic nebulizer for each of the four sections of the neonate resuscitation department.

Replenishment of colposcopes: Since this equipment is indispensable for the examination and treatment of gynecological diseases (tumors within the uterus, such as uterine cancer), it is imperative to procure a colposcope under this project.

②Basic Essential Equipment (Common Use)

Replacement/replenishment of basic essential equipment: Procurement of the minimum necessary equipment for use in the reanimation rooms, the operating rooms and the delivery rooms is requested. The requested number of units is judged to be appropriate. However, the minor operating instrument set, the operating instrument set and the stand type lamp should be excluded from this project because the existing ones are judged to be still serviceable.

Equipment	Quantity	Department
Height measuring rod	1	Emergency reception room
Weight scale	2	Emergency reception room 1, Reception of maternity department 1
Stethoscopes	5	ICU 2, Gynecological department 1, Delivery rooms 2
Sphymomamanometer	5	ICU 2, Gynecological department 1, Delivery rooms 2

Portable sterilizers	2	Operating department 1, Delivery rooms 1
Instrument sterilizing cases	12	Operating department 6, Delivery rooms 6
Dressing jars with stand	6	Operating department 3, Delivery rooms 3
Stretchers	4	Operating department 2, ICU 1,Delivery rooms 1
Instrument tables	2	Operating department
Instrument carriages	2	Operating department
Emergency carts	3	Delivery rooms 2, ICU 1

(4) Examination of the Timing of the Implementation of the Project

The equipment plan under this project includes no special items of equipment, and the medical institutions concerned are all in operation. There will be no problem with the installation of the equipment procured. For these reasons, this project is to be implemented in 1999.