

Country Name	<b>The Project for Improvement of Equipment of Navoi Regional Multidisciplinary Medical Center</b>
Republic of Uzbekistan	

**I. Project Outline**

Background	In Uzbekistan, non-communicable diseases (NCDs) such as cardiovascular diseases had come to account for majority of the causes of deaths. However, vertically segmented, fragmented health system was not able to adequately cope with serious chronic diseases and their complications, thus precluded the provision of proper medical services. As a solution to these issues, the Uzbekistan government decided to newly establish a regional general hospital in each region as a regional-level center for tertiary medical care. In Navoi region, the establishment of the Navoi Regional Multidisciplinary Medical Center (NRMMC) was decided. This plan included the renovation of an existing facility to NRMMC (completed in 2014) and the borrowing or transferring of some of the medical equipment to be used at NRMMC from other hospitals within the region. However, the pieces of equipment used in existing hospitals in the region were aged and unable to cope with the situation in terms of both quality and quantity. New equipment was therefore needed for NRMMC to provide proper medical services.					
Objectives of the Project	This project aimed to establish the medical service delivery system of NRMMC in Navoi city, Navoi region, by upgrading the testing, diagnostic and treatment equipment in NRMMC, thereby contributing to the improvement of the regional health system in the region.					
Contents of the Project	1. Project Site: Navoi city, Navoi region 2. Japanese side (1) Provision of grant necessary for procurement of medical equipment (92 items) - Laparoscope set, X-ray Apparatus (General, C-arm, Mobile), CT scanner, X-ray System Angiography, Ultrasound Apparatus, Ventilator, Operating Table, Blood Coagulation Analyzer, Autoclave, Electronic Surgical Unit, etc. (including maintenance service for 3 years for CT scanner, X-ray System Angiography) (2) Soft Component: User training for learning of appropriate operating procedures and introduction of“Operation and Maintenance Passport for Medical Equipment” 3. Uzbekistan side: - Securing space of delivering procured equipment and arrangement of receiving system - Employing medical professionals and other staff necessary for the full opening of NRMMC and implementing the operating budget - Setting up facilities and purchasing equipment and consumables that are not to be procured as part of Japan’s Grant Aid - Doing necessary repair work of the rooms into which procured equipment are placed upon delivery					
Project Period	E/N Date	October 25, 2015	Completion Date (ex-ante)	November 2019	Completion Date (actual)	March 31, 2020 (Completion of the maintenance agreement for CT scanner and X-ray System Angiography)
	G/A Date	October 25, 2015				
Project Cost	E/N Grant Limit / G/A Grant Limit: 686 million yen			Actual Grant Amount: 682 million yen		
Executing Agency	Ministry of Health (MOH)					
Contracted Agencies	Main Contractor: Marubeni Protechs Corporation Main Consultant: International Techno Center Co., Ltd.					

**II. Result of the Evaluation**

## &lt;Constraints on Evaluation&gt;

• The outcome of the project studied under this ex-post evaluation is the combined effects by the equipment procured and facility renovation done by NRMMC and MOH.

## &lt; Special Perspectives Considered in the Ex-Post Evaluation &gt;

## [Use of Supplementary Information]

• In addition to the five indicators set at the ex-ante evaluation, this evaluation uses the utilization of procured equipment and the effects of the soft component as Supplementary Information 1 and 2 respectively. In evaluation judgment, less weights are given to the supplementary information than the original indicators.

## [How to deal with qualitative effects]

• As for qualitative effects specified at the ex-ante evaluation, two effects, such as "Medical services to complications, in addition to the major diseases have been properly provided in NRMMC by sharing the information of patients with specific disease among multiple departments" and "Improvement of the medical service delivery system in Navoi region by NRMMC assuming the role as a multidisciplinary medical center for adult patients which is temporarily covered by other hospitals" are to be examined as expected impact. [Completion date for the effectiveness]

• Completion date is stated as March 31, 2020 when the maintenance agreement for CT scanner and X-ray System Angiography was completed according to the ex-ante evaluation sheet. However, the actual completion year used to examine the quantitative effects is the year when the equipment was handed over to NRMMC.

## [Target year for the effectiveness]

• Due to the delay of project implementation, the target year was deferred by one year later than that of stated in the ex-ante evaluation sheet.

**1 Relevance**

## &lt;Consistency with the Development Policy of Uzbekistan at the Time of Ex-Ante Evaluation&gt;

At the time of ex-ante evaluation, this project was consistent with the comprehensive national health development plan for the country known as "Welfare Improvement Strategy Paper of the Republic of Uzbekistan for 2013-2015 (WISP-2)" in which strengthening of regional multidisciplinary medical centers was stated as a priority. This Strategy was also made references to a policy of introducing

modern medical equipment to prevent and mitigate diseases on the rise.

<Consistency with the Development Needs of Uzbekistan at the Time of Ex-Ante Evaluation>

This project was consistent with Uzbekistan's development needs of improvement of the regional health system at the time of ex-ante evaluation as described in "Background" above.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

At the time of ex-ante evaluation, this project was consistent with the "Country Assistance Policy for Uzbekistan (2012)" in which the Japanese assistance aimed to support the promotion of economic growth and the correction of disparities. The project was consistent with one of the priority areas of this policy, "Assistance toward the reconstruction of social sector (Agriculture Reform, Regional Development, Medicine and Health)".

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

<Effectiveness>

The project objective to establish the medical service delivery system of NRMMC in Navoi city, Navoi region, by upgrading the testing, diagnostic and treatment equipment in NRMMC was achieved.

Annual number of outpatients achieved only 24.6% of planned target for 2020, while annual number of inpatients achieved 94.3% of the target<sup>1</sup> (Indicator 1-1 and 1-2). The low level of achievement of annual number of outpatients was due to the fact that in 2020, NRMMC received only COVID-19 patients for the period of 7 months, and exceptionally accepted other patients who needed the urgent care. This drastic decrease of outpatient number affected the number of examinations conducted by utilizing the equipment provided by the project. Annual number of CT scanner examinations achieved 49.0%, annual number of Angiography examinations achieved 112.1%,<sup>2</sup> and annual number of General Radiography and Fluoroscopy examinations achieved 74.5% of respective targets for 2020 (Indicator 1-3, 1-4 and 1-5). Considering that all of five indicators had already achieved more than 80%<sup>3</sup> of the respective targets for 2020 prior to the target year (2018 and 2019), it is fair to say that COVID-19 proved decisive to the low achievement of those indicators at the target year when 5 months alone were only available for their ordinary services. Magnitude of influence by COVID-19 on achievement of indicators is also proven by the fact that the number of examinations has gradually been resumed in 2021 when the COVID-19 has become well-managed, though not drastically diminished. The monthly average number of CT scanner examinations as well as those of General Radiography and Fluoroscopy examinations for the period of January to May 2021 has almost the same or even exceeded the monthly average number of planned targets for 2020. For the above reasons, it is judged that the project objective was achieved.

As for the qualitative effects, it was confirmed by the interview with the Chief Doctor of NRMMC that the equipment has provided opportunity to make proper diagnosis and treatments to the local patients. And every health professional interviewed during the site visits ensured that the project contributed to the improvement of medical services in the region. Most of procured equipment have been properly utilized as originally intended except three items. Lithotripter<sup>4</sup> has not been used since December 2019 due to that the membrane is out of order, which affects the medical treatment of kidney diseases for local patients. Autoclave has been out of order since April 2021 as there is a problem with lid. The printer attached to X-ray apparatus is not available due to no supplies of paper in the local market. NRMMC has contacted the local agent for repair of those equipment and requested the regional finance department to allocate the fund for maintenance and procurement of spare parts and supplies, but they have been not yet fixed (Supplementary Information 1). It was confirmed by the study that the user-manual developed by the project has been effectively utilized whenever a medical doctor is newly assigned. Staff of NRMMC found the training conducted by the project very useful and helped them for understandings of proper operation of equipment in a short-time basis (Supplementary Information 2).

<Impact>

The project has contributed to the improvement of the regional health system in the region. Information sharing among multiple departments which was made available by having various equipment for examination has led to earlier detection of diseases and complications. It was confirmed by the study that a case conference attended by medical doctors with specialty to discuss on the proper diagnosis and treatment for a specific disease is held on daily basis. Thus, medical services to complications, in addition to the major diseases, have been properly provided in NRMMC by sharing the information of patients with specific disease among multiple departments. For example, one patient who had the surgery of gall bladder received an ECG (electrocardiogram). Medical staff in physiotherapy confirmed the result of ECG and found the possibility of other problem with cardiac. Then, the staff shared this information to the department of cardio surgery for further treatment. In Navoi region, the high-tech diagnostic and treatment measures were previously carried out only in the capital hospitals, such as the Republican Scientific Center for Emergency Medical Services (RSCEMS). After the project, the medical service of the same level has become available in NRMMC by utilizing the procured equipment. Currently, patients of NRMMC can receive the advanced treatment measures, such as MRI angiography, multi-slice CT angiography, X-ray angiography, Kidney transplantation, installation of pacemakers, ablation of an ectopic focus in the myocardium, remote and contact lithotripsy, endourological operations, etc. As a result, there are no cases of non-emergency patients (adult patients) admitted to RSCEMS since 2018. In other words, NRMMC has been able to take over the role of RSCEMS for adult patients. Furthermore, there have been no cases of sending patients from Navoi region to Tashkent for treatment of complex diseases after the project. It was also remarkably identified by the study that some of equipment provided by the project, such as multi-slice CT, fluoroscopy, ultrasound, oxygen concentrator and laboratory equipment such as analyzers, electrocardiogram have been timely used for the diagnoses of COVID-19. The first deputy head of Navoi Regional Health Department confirmed that it is obvious that NRMMC has brought about positive change in Navoi region.

<sup>1</sup>Annual number of in-patient includes those patients admitted under the treatment of the COVID-19.

<sup>2</sup>Since June 2017, when a cardiovascular specialist was assigned as director of NRMMC, more focus has been put on the treatment of cardiovascular diseases, thus the number of Angiography examinations has increased more than originally projected. In other words, the projection of target number for 2020 turn out to be underestimated. This has partly contributed to high performance of Angiography examination number in 2020 even under the COVID-19.

<sup>3</sup>According to the judgment criteria of JICA's ex-post evaluation, the achievement level of more than 80% is judged as "achieved" in principle.

<sup>4</sup>Lithotripter is a device allowing pulverization of calculi by shock waves produced outside the body, with no incision of the skin. This is used for the treatment of kidney diseases to local patients.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Quantitative Effects

Indicators	Baseline 2015 Baseline Year	Target 2020 3 Years after Completion	Actual 2017 Completion Year	Actual 2018 1 Year after Completion	Actual 2019 2 Years after Completion	<i>Achievement of 2019 (against target for 2020)</i>	Actual 2020 3 Years after Completion	<i>Achievement of 2020 (against target for 2020)</i>	
Indicator 1-1: Annual number of Outpatients	27,000	54,000	57,025	49,806	49,352	91.4%	13,287	24.6%	Source: NRMMC
Indicator 1-2: Annual number of Inpatients	2,500	6,000	6,362	7,557	8,583	143.1%	5,655	94.3%	Source: NRMMC
Indicator 1-3: Annual number of CT scanner examinations	0	4,200	700	3,844	9,460	225.2%	2,060	49.0%	Source: NRMMC
Indicator 1-4: Annual number of Angiography examinations	0	240	300	410	533	222.1%	269	112.1%	Source: NRMMC
Indicator 1-5: Annual number of General Radiography and Fluoroscopy examinations	0	6,000	2,294	11,312	23,919	398.7%	4,471	74.5%	Source: NRMMC

3 Efficiency

While the project cost was within the plan, the project period slightly exceeded the plan (ratio against plan: 99%, 104%, respectively). The project period was extended by two months due to the delay of customs clearance of the equipment and the postponement of the workshop under the soft component to meet with the availability of responsible staff of NRMMC. The outputs of the project were produced as planned.

Therefore, the efficiency of the project is fair.

4 Sustainability

< Institutional/Organizational Aspect>

Under MOH which assumes the overall responsibility, the Health Department, Navoi region performs duties as a local agency and supervises the operation of NRMMC including the budget. NRMMC has maintained the structure as it was at the time of ex-ante evaluation, as a top referral medical facility to handle tertiary medical care. To upgrade NRMMC to a regional-level center for tertiary medical care for Navoi region, the number of staff has been increased. As a result, there is enough medical doctors (physicians) who can operate the equipment provided by the project and deal with specific examinations, such as X-ray, Angiography, Electromyography<sup>5</sup>, etc. The number of those physicians increased from 28 at the time of ex-ante evaluation to 62 at the time of ex-post evaluation. However, there is a shortage of medical equipment technicians serving under the permanent technician responsible for its maintenance (the number decreased from 3 to 1 for the same period). NRMMC has tried to employ a technician, but it has not been successful due to financial reasons. Since the warranty period is over, it is necessary to conclude a contract for technical maintenance services with local agents.

<Technical Aspect>

NRMMC follows the priority task of continuous trainings for staff practiced in any other medical institutions in Uzbekistan. NRMMC staff has maintained the sufficient technical level through internal trainings, domestic trainings conducted at the Center of Institute of Advanced Training for Doctors in Tashkent and the trainings done in the foreign countries including JICA Knowledge Co-creation Program trainings. Every year, about 10 to 15 medical doctors with specialty are trained on various advanced training programs. Furthermore, whenever it is possible, NRMMC invites leading medical specialists from overseas to provide the short-term training programs on various methods of diagnosis and treatment. Medical doctors who participate in those trainings are required to transfer the knowledge and experience to other staff at NRMMC. Operation of equipment is carried out according to the guidance and recommendations of medical doctors who acquired the technical skills by referring to a corresponding manual. As for the maintenance, each medical doctor has a corresponding passport, known as "Operation and Maintenance Passport for Medical Equipment (passport)" introduced by the project to keep track on the condition as well as the maintenance records of the equipment.

<Financial Aspect>

As shown below, the budget amounts of Health Department, Navoi region as well as that of NRMMC were drastically increased in the last three years. It is identified by the study that the utility costs to operate the hospital facility including the equipment, such as the fuel and water

<sup>5</sup>Electromyography is translated into Pneumography in Russian term. This is an instrumental diagnostic method aimed at assessing the state of muscles and the functioning of the peripheral nervous system of a person.

supply have been increased and its percentage for the expenditure has also been increasing.<sup>6</sup> Nevertheless, there is neither enough budget for the stock of supplies and spare parts, nor the repair cost for equipment.

At the time of ex-ante evaluation, it was anticipated that medical service fees would increase, and it would cover the maintenance expenses for the procured equipment. However, at the legislation level, namely Article 64 of the Budget Code, which prohibits the utilization of granted equipment for paid medical services has made it difficult for NRMMC to finance the costs of operation and maintenance (O&M) for the equipment since NRMMC could not earn any medical services fees with the granted equipment by the project. NRMMC and the government have kept discussing on this issue and a request has been submitted to allocate necessary budget for maintenance of medical equipment as well as to cover the payroll expenses for medical equipment technicians. Moreover, at the termination of maintenance agreement for CT scanner and X-ray System Angiography on March 2020, urgent action is expected. However, the issue has still been pending at the time of ex-post evaluation. The situation on O&M can be improved if Article 64 is eliminated, so that NRMMC could earn any medical services fees with the granted equipment by the project for maintenance of medical equipment.

#### Budget of Health Department, Navoi Region

Unit of currency (million soum)

Items	2018	2019	2020
Total budget	309,342.9	407,596.3	535,061.7
Budget source			
Local government	292,294.4	384,626.3	512,456.7
Grant	8,876.6	2,297.6	9,139.3
(Grant in million US\$)	(1.10)	(0.26)	(0.91)
Others	8,171.9	20,672.4	13,465.7

#### NRMMC's budget and expenditure

Unit of currency (million soum)

Items	2018	2019	2020
Total budget	4,207.5	6,958.7	8,902.9
Total expenditure	4,207.5	6,958.7	8,902.9
Utility costs to operate the hospital facility including equipment*	129.4	334.6	674.1
(Percentage for the total expenditure)	(3.1%)	(4.8%)	(7.5%)

Note: \*It is not possible to obtain the utility cost for the equipment alone. No other costs are expensed for the equipment.

<Source> NRMMC

#### <Current Status of Operation and Maintenance>

Medical doctors who operate the certain equipment regularly monitor the operation of the equipment using “passport” and if a malfunction is detected, they contact with medical equipment technicians. If it is surgery equipment, it is the surgeon who monitors and checks the condition of the equipment. The Chief Doctor together with heads of department oversee the supervision of the inventory for monitoring, and they also review the inventory of equipment either on daily or weekly basis. As for the supplies and spare-parts, NRMMC does not have any stocks due to lack of budget.

#### <Evaluation Result>

Some problems have been observed in terms of the institutional/organizational aspect and financial aspect. Therefore, sustainability of the project effects is fair.

#### 5 Summary of the Evaluation

The project achieved its objectives. The medical service delivery system of NRMMC as a regional-level center for tertiary medical care in Navoi region was established. With the upgraded testing, diagnostic and treatment equipment procured by the project, the number of outpatients and inpatients as well as the number of several examinations drastically increased one year after the project completion. Such achievements were plunged in 2020, but this was exclusively due to the influence of COVID-19. Thus, the achievements have gradually been resumed in 2021. Moreover, it is worth mentioning that some equipment of the project is used and helped a lot in providing medical treatment to the corona patients. These positive results by the project have been contributing to the fact that there have been no cases of transferring patients from Navoi region to Tashkent for the treatment of complex disease since 2017, and NRMMC has now been able to take over the role of RSCEMS as a regional center for adult patients.

As for sustainability, there was no major issue in technical aspect, but some concerns were identified in the institutional/organizational and financial aspects. Regarding efficiency, the project period exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

### III. Recommendations & Lessons Learned

#### Recommendations to Executing Agency:

To: Ministry of Health (as well as Ministry of Investments and Foreign Trade, Ministry of Finance)

- 1) It is necessary to prepare draft amendment to the Article 64 of the Budget Code and submit it to the Cabinet of Ministers for consideration. After consideration of the amendment, Cabinet of Ministers shall submit it to the National Parliament for consideration as well. After approval by the National Parliament, President of Uzbekistan shall sign the amendment which will provide a right to utilize granted equipment for paid medical services and to collect necessary fee which is expected to cover the maintenance of medical equipment, such as the costs of spare parts, supplies and payroll cost for a medical equipment technician.

<sup>6</sup> Affected by the relatively high annual inflation rate, which was around 10% to 20% during the period from 2018 to 2020 (Central Bank of the Republic of Uzbekistan), it is said that the budget increase does not provide much for NRMMC.

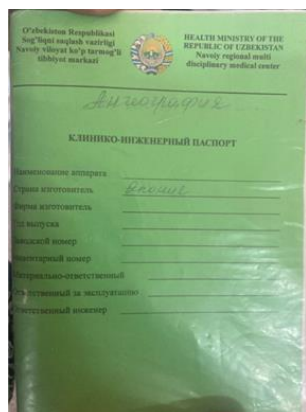
At the legislation level, namely Article 64 of the Budget Code, there is a prohibition to utilize granted equipment for paid medical services which leads to the lack of budget in NRMMC, not enough for maintenance of medical equipment since NRMMC could not earn any medical services fees with the granted equipment by the project. This issue and budget support have been discussed by JICA with relevant ministries since 2019. On December 25, 2019, President of Uzbekistan, held an internal government meeting to discuss urgent challenges on the active attraction and effective use of grant funds. President of Uzbekistan agreed with the proposal to make relevant amendments in the Budget Code so that the public hospitals can obtain a right to provide paid medical services to cover expenses related to the use of medical equipment. According to the Ministry of Health of Uzbekistan and other relevant ministries making amendments will take time with involvement of discussion of the National Parliament of Uzbekistan. Until the amendment is made, the government of Uzbekistan ensured JICA that they would allocate necessary budget for maintenance of medical equipment for NRMMC. JICA will monitor developments on this issue.

- 2) Since the warranty period is over for CT scanner and X-ray System Angiography, it is recommended that NRMMC should conclude a contract for technical maintenance services with local agents.

In order to deal with the increasing number of cardiovascular diseases, it is imperative to use the testing, diagnostic and treatment equipment, namely the CT scanner and X-ray System Angiography which should be always in an operative condition. It is recommended, therefore, that these equipment items should be under the contract of technical maintenance services.

#### Lessons Learned for JICA:

1. It is necessary to pay attention to the availability of consumable in locale market, as it may affect the proper use and maintenance of provided equipment. After all consumables provided by the JICA grant aid project are run out, NRMMC cannot use the X-ray printer due to a lack of special film/paper which is not available in the local market. So that examination results cannot be printed out (it should be noted that X-ray diagnostic data are currently used and shared on electronic basis). Several optional solutions are: 1) to include an issue of purchasability of consumables in a scope for future JICA survey at the planning stage, 2) to reconfirm this issue, i.e. purchasing consumables at the local market, with the government of partner country prior to the grant agreement.
2. Before concluding grant agreement between JICA and the government of recipient country, it is necessary to confirm the budget allocation system of equipment and to continuously follow on how the system is operated because there might be the special law or rule in the country and there is a possibility of change on its operation status. According to the Article 64 of the Budget Code, there is a prohibition to utilize granted equipment for paid medical services which leads to the lack of budget in the local hospitals, not enough for maintenance of medical equipment.



Дата	Время	Время	Среднее	Отклонения	Время	Примечания
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20/05	22:30	22:40	3.0, 1.1	0.1	0.1	
20/05	22:40	22:50	3.0, 1.1	0.1	0.1	
20/05	22:50	23:00	3.0, 1.1	0.1	0.1	
20/05	23:00	23:10	3.0, 1.1	0.1	0.1	
20/05	23:10	23:20	3.0, 1.1	0.1	0.1	
20/05	23:20	23:30	3.0, 1.1	0.1	0.1	
20/05	23:30	23:40	3.0, 1.1	0.1	0.1	
20/05	23:40	23:50	3.0, 1.1	0.1	0.1	
20/05	23:50	00:00	3.0, 1.1	0.1	0.1	



A cover page and the recording part inside of “passport” for Angiography in which the condition as well as the maintenance records of the equipment have been shown.

CT scanner has been effectively utilized for the diagnoses of various diseases, including cardiovascular ones.