

Country Name	<b>The Project for Improvement of Emergency Medical Equipment in Baku City</b>
Republic of Azerbaijan	

**I. Project Outline**

Background	The emergency medical service in Azerbaijan inherited the same system that had existed during the Soviet era. When an emergency call was received, an emergency team (doctor, nurse and driver) was dispatched to provide on-site medical treatment. If the doctor deemed necessary that the patient be transported to a hospital, the patient was then taken to a hospital that admitted emergency patients and provided appropriate medical treatment such as emergency operation etc. However, thorough examination and treatment were not possible due to deterioration and quantitative deficiency of equipment that had been made in the former Soviet Union from 15 to 20 years ago (as of 2007). Emergency service staffs received regular trainings (once in three to five years) in order to maintain a level of emergency medical procedure. However, the Emergency Medical Service Station (EMS) Training Center was not equipped with either human models or observational equipment, which prevented skills improvement of trainees. Although the national economy was being improved at the time of ex-ante evaluation, services in the health sector lagged behind. This applied in particular to emergency medical services which were in a state of crisis requiring urgent improvement measures.				
Objectives of the Project	To improve emergency medical services in four emergency hospitals in Baku city and technical levels of emergency service staffs of EMS by procuring medical equipment for examination, monitoring and treatment of emergency patients required in four emergency hospitals and training equipment required in EMS Training Center, thereby contributing to improvement and strengthening of emergency medical services in Baku metropolitan area.				
Outputs of the Project	<ol style="list-style-type: none"> <li>Project Site: Baku City (Baku City Clinical Hospital No. 3, Unified Hospital No. 26, Republican Neurosurgery Hospital, Baku City Clinical Hospital No. 6, and EMS Training Center)</li> <li>Japanese side Provision of grant required for procurement of medical equipment (examination, observation and treatment) for four emergency hospitals (16 items in total: blood gas analyzer, electrolyte analyzer, blood cell counter, biochemical analyzer, electrocardiograph (ECG), patient monitor, ventilator, defibrillator, syringe pump, etc.) and training equipment for EMS Training Center (12 items in total: cardiopulmonary resuscitation (CPR) model, patient monitor, ECG, stretcher, back board set, etc.)</li> <li>Azerbaijan side: (1) Renovation works for installation of medical equipment (Baku City Clinical Hospital No. 3, Baku City Clinical Hospital No. 6, and EMS Training Center), (2) Appropriate operation and maintenance (O&amp;M) of procured equipment</li> </ol>				
Ex-Ante Evaluation	2006-2007	E/N Date	March 5, 2008	Completion Date	March 10, 2009
Project Cost	E/N Grant Limit: 222 million yen, Actual Grant Amount: 217 million yen				
Implementing Agency	Ministry of Health				
Contracted Agencies	System Science Consultants Inc., Mitsubishi Corporation				

**II. Result of the Evaluation**

1 Relevance
<p><b>Consistency with Azerbaijan's development policy at the time of ex-ante evaluation and ex-post evaluation</b></p> <p>This project has been highly consistent with Azerbaijan's development policy, as 'equitable access to health care services', 'investment in construction and/or rehabilitation of medical facilities', and 'strengthening of the emergency medical services system' etc. are set in a policy document such as State Programme on Poverty Reduction and Sustainable Development (2006-2015) (effective at the time of both ex-ante and ex-post evaluations).</p> <p><b>Consistency with Azerbaijan's development needs at the time of ex-ante evaluation and ex-post evaluation</b></p> <p>The project-targeted hospitals have been top-referral hospitals and/or core hospitals in Baku metropolitan area to which many emergency patients have been transported since prior to the time of ex-ante evaluation through the time of ex-post evaluation. Therefore, the needs for procurement of emergency medical equipment project for these hospitals are high. Moreover, the fact that emergency service staffs receive regular trainings (approximately 20 times a year at the time of ex-post evaluation) in order to maintain a certain level of emergency medical procedure shows the needs for procurement of training equipment.</p> <p><b>Consistency with Japan's ODA policy at the time of ex-ante evaluation</b></p> <p>The project was also consistent with Japan's ODA policy as stated in the ODA Country Data Book (2006), which placed 'social sector (in particular, healthcare and education)' as one of the priority areas in Azerbaijan.</p> <p><b>Evaluation result</b></p> <p>In light of the above, relevance of this project is high.</p>
2 Effectiveness/Impact
<p><b>Effectiveness</b></p> <p>Regarding indicators of quantitative effects, which were set before project implementation, such as 'capacity to accept emergency patients at the four major hospitals' (Indicator 1) and 'of which hospitalized patients' (Indicator 2), it was reported before project implementation (2006) that among approximately 20,000 emergency patients accepted at four hospitals, 5,305 patients (27%) were hospitalized and 14,695 patients were released after receiving primary emergency treatment, and it was estimated that approximately 27% of emergency patients accepted at four hospitals would be hospitalized after project completion. However, according to the project-targeted hospitals, the number of emergency patients accepted at four hospitals and the number of hospitalized emergency patients are the same at</p>

the time of ex-post evaluation. According to this information, the actual figure of Indicator 1 (2014) is 47% of the target (2011), and the actual figure of Indicator 2 (2014) is 178% of the target (2011)<sup>1</sup>. While the figures before project implementation were confirmed by both the Ministry of Health and the targeted hospitals, it is difficult to examine validity of the data collected at the time of ex-post evaluation, as information from the Ministry of Health was not available.

On the other hand, regarding 'the number of trainees among emergency service staffs of EMS in Baku' (Indicator 3), while the number of emergency service staffs has decreased since project completion (in 2014, it decreased to approximately 74% of the number before project implementation) due to organizational restructuring etc., all the emergency service staffs of EMS have attended trainings. According to EMS, the provision of trainings necessary for emergency treatment such as cardiac massage, resuscitation techniques, fixing techniques of injured parts and intubation techniques, etc. have become possible utilizing the CPR models procured under the project.

Moreover, while not included in indicators before project implementation, 'mortality within 48 hours of emergency hospitalization' was checked as supplemental information in order to judge whether utilization of procured equipment has contributed to improvement of the quality of examination and treatment. Regarding this supplemental information, actual figures after project completion have been low<sup>2</sup>. According to the four project-targeted hospitals, more accurate diagnosis has become possible due to utilization of fibroscope set, etc. procured under the project.

In light of the above, while complete investigation is difficult for some indicators before project implementation and at the time of ex-post evaluation, it is considered that the project has achieved its objectives, "to improve emergency medical services in four emergency hospitals in Baku city and technical levels of emergency service staffs of EMS" to a certain extent. In addition, among emergency medical equipment procured under the project, all the training equipment for EMS Training Center (12 items/60 equipment in total) are utilized at the time of ex-post evaluation. However, among medical equipment for examination, monitoring and treatment of emergency patients required in four emergency hospitals (16 items/107 equipment in total), only 10 items and 60 equipment in total (56% of the total number of procured equipment) are utilized at the time of ex-post evaluation. In particular, examination equipment (blood gas analyzers, electrolyte analyzers, blood cell counters, coagulometers, glucoseanalyzers and biochemical analyzers) are not used mainly due to lack of consumables.

### Impact

As for the expected impact, "contributing to improvement and strengthening of emergency medical services in Baku metropolitan area", it is considered that there has been some impact. Regarding 'rate of re-call EMS' and 'mortality after the arrival of emergency service staffs', which were set as supplemental information like 'mortality within 48 hours of emergency hospitalization', actual figures after project completion have been less than 1% and decreasing. According to EMS, this is due to the fact that all the emergency service staffs of EMS have become able to attend trainings and provide appropriate treatment as a result of the project implementation. According to the four project-targeted hospitals, emergency service staffs had transferred patients to the hospitals without emergency treatment before project implementation, however, after project completion, they have learned how to use equipment such as defibrillators, etc., and become able to read electrocardiographic record accurately and provide appropriate treatment to patients based on the record on site or during transportation, which enabled hospital staffs to provide operation smoothly after transportation of patients.

While equipment procured under the project include those which generate liquid laboratory waste, such waste is put in the special storage can and regularly collected by a specialized agent according to regulations set by the Ministry of Ecology and Natural Resources, and sufficient attention is paid to environment. No negative impact on natural environment has been observed, nor have land acquisition and resettlement occurred under this project.

### Evaluation result

While actual figures of the number of emergency patients accepted at four hospitals and hospitalized patients could not be sufficiently verified due to lack of data, those of the number of trainees at EMS have been improved. As for the expected impact, while it is evaluated based on supplemental information, the improvement of technical levels of emergency service staffs of EMS through trainings with procured equipment is considered to have contributed a certain extent to the reduction of the rate of re-call EMS and mortality after the arrival of emergency service staffs in recent years. The fact that approximately 30% of equipment procured under the project (approximately 30% of the total number of equipment procured for hospitals and EMS Training Center) are not adequately utilized should be considered when estimating the degree of contribution of this project to the observed "effectiveness" and "impact".

In light of the above, effectiveness/impact of the project is fair.

### Quantitative Effects

Indicator	Before the project (2006)	Target (2011)	Actual result (2011)	Actual result (2012)	Actual result (2013)	Actual result (2014)
Indicator 1: Capacity to accept emergency patients at the four major hospitals (person) <sup>(1)</sup>	20,000	30,000	7,899	6,284	10,315	14,200
Indicator 2: Of which hospitalized patients (person) <sup>(2)</sup>	5,305	8,000	7,899	6,284	10,315	14,200
Indicator 3: The number of emergency service staffs of EMS (person)	2,400	2,400	N/A	1,880	1,827	1,784
Of which the number of trainees (person) <sup>(3)</sup>	1,200	2,400		1,880	1,827	1,784
Supplemental Information: Mortality within 48 hours of emergency hospitalization (%) <sup>(4)</sup>	N/A	-	6.63	4.70	4.81	6.00
Supplemental Information: Rate of re-call EMS (%) <sup>(5)</sup>	N/A	-	N/A	0.20	0.13	0.09
Supplemental Information: Mortality after the arrival of	N/A	-	0.80	0.75	0.65	0.64

<sup>1</sup> As actual figures that include data from all the four hospitals after project completion are those of 2014 only, a comparison was made between the actual figure in 2014 and the target figure.

<sup>2</sup> For example, a report on the the Ministry of Health, Labour and Welfare's program to promote evaluation and disclosure of quality of medical care prepared by Min-iren (Japanese Federation of Democratic Medical Institutions) shows a median of 6.01%, with a note that the figure differs depending on factors such as size and type of hospital.

emergency service staffs (%) <sup>(6)</sup>						
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Note : (1) 'Capacity to accept emergency patients at the four major hospitals' is the total number of emergency patients who were actually accepted at four hospitals. It should be noted that Baku City Clinical Hospital No. 6 was closed for five months in 2012 and the whole year in 2013 and Republican Neurosurgery Hospital was closed for two years in 2011 and 2012 due to renovations. Thus, actual figures that include data from all the four hospitals after project completion are those of 2014 only. (2) 'Of which hospitalized patients' is the total number of hospitalized patients among emergency patients accepted at four hospitals. As shown in (1) above, actual figures that include data from all the four hospitals after project completion are those of 2014 only. (3) 'The number of emergency service staffs of EMS' and 'of which the number of trainees' are the number of emergency service staffs and trainees at EMS Training Center in Baku. (4) 'Mortality within 48 hours of emergency hospitalization' is calculated by the number of fatalities within 48 hours of emergency hospitalization / the number of hospitalized emergency patients x 100 (average of four hospitals). As shown in (1) above, actual figures that include data from all the four hospitals after project completion are those of 2014 only. (5) 'Rate of re-call EMS' is the rate of re-calling EMS after receiving diagnosis and treatment from emergency service staffs due to worsened health conditions etc. among the total number of emergency calls. (6) 'Mortality after the arrival of emergency service staffs' is the rate of the death cases after the arrival of emergency service staffs at the site and during during treatment on the site or transportation of the patient, among the total number of dispatch of emergency service staffs.

Source : Basic Design Study Report, questionnaires to and interviews with four hospitals and EMS

**3 Efficiency**

Both the project cost and project period were within the plan (ratio against the plan: 98% and 82%, respectively). Therefore, efficiency of this project is high.

**4 Sustainability**

**Institutional aspect**

Medical equipment for four emergency hospitals procured under the project are maintained by medical staffs at laboratories and reanimation rooms in each target hospital, and training equipment for EMS Training Center are maintained by trainers who provide trainings and guidance to emergency service staffs. There have been increases or decreases in the number of doctors and nurses at the project-targeted hospitals compared with the number before project implementation, accompanying changes of the number of departments and beds etc. after renovation of hospitals<sup>3</sup>. However, there is no case where effective utilization, daily and periodical inspections and minor repairs of procured equipment cannot be conducted due to lack of manpower, and thus, it can be said that the allocation of staffs in the project-targeted medical institutions is sufficient.

**Technical Aspect**

As equipment procured under the project are basic medical equipment, medical staffs are familiar with how to operate these equipment. Moreover, there is no case where effective utilization, daily and periodical inspections and minor repairs of procured equipment cannot be conducted due to lack of technical skills, and thus, it can be said that the technical levels of staffs in the project-targeted medical institutions are sufficient. O&M manuals provided under the project are utilized in each institution, and trainings are provided by senior staffs to newly assigned staffs utilizing these manuals to confirm how to operate equipment.

**Financial Aspect**

According to the Ministry of Health, budgets for utilizing equipment procured under the project are secured. It is assumed that certain amount of budgets are spent for maintenance of equipment, as approximately 70% of procured equipment are operational at the time of ex-post evaluation, which is more than five years since procurement.

On the other hand, while minor repairs of medical equipment are financed by budgets of each medical institution, consumables required in all medical institutions are determined to be procured in bulk by the Ministry of Health through Azermedteknika, an agent subordinate to the Ministry, instead of each institution procuring consumables separately. However, procurement and supply of consumables by the Ministry have not been conducted as planned.

According to the basic design study conducted in December 2007, it was confirmed in the Minutes of Discussions that equipment which were planned to be procured under the project were determined based on the operation system, technical levels and financial situations of the Azerbaijan side, and O&M cost including consumables, etc. is to be secured in the Azerbaijan side. However, it is further stated in the Minutes of Discussions that O&M cost including consumables, etc. is to be secured by each project-targeted hospital and EMS, which is partially different from the current system in which the Ministry of Health makes bulk procurement of consumables and spare parts required in all medical institutions.

**Current Status of O&M**

As mentioned above, at the time of ex-post evaluation, approximately 30% of equipment procured under the project are not utilized due to lack of consumables/spare parts and renewal of equipment (according to the Ministry of Health). Inspection and maintenance of equipment are conducted when they malfunction in the project-targeted medical institutions, and when it is difficult to repair equipment in these institutions, the Innovation and Supply Center under the Ministry of Health arranges the repair of such equipment. However, there is no maintenance plan or renewal plan of equipment.

While stakeholders in the Azerbaijan side explained that these equipment are being renewed and/or replaced, there was no sufficient explanation on the policy and plan of the Ministry on O&M and renewal of these equipment, and thus it is difficult to verify the policy and/or plan.

**Evaluation result**

In light of the above, while there is no problem in the institutional and technical aspects, it is difficult to verify the financial aspect, and there are some problems in the current status of O&M. Therefore, sustainability of project effects is fair,

**5 Summary of the Evaluation**

The project has partially achieved its objectives: while actual figures of the number of emergency patients accepted at four hospitals and hospitalized patients could not be sufficiently verified due to lack of data, those of the number of trainees at EMS have been improved. As for the expected impact, the improvement of technical levels of emergency service staffs of EMS through trainings with procured equipment is considered to have contributed a certain extent to the reduction of the rate of re-call EMS and mortality after the arrival of

<sup>3</sup> At the time of ex-post evaluation, the number of medical personnel has increased at Baku City Clinical Hospital No. 3 and Unified Hospital No. 26, while it has decreased at Baku City Clinical Hospital No. 6 and Republican Neurosurgery Hospital, compared with the number before project implementation. The reasons for the increase and decrease include changes in the number of beds and transfer of departments.

emergency service staffs in recent years. Liquid laboratory waste is treated properly and no negative impact on natural environment has been observed.

As for sustainability, while there have been renewals and replacement of equipment as explained by the Ministry of Health, procurement of consumables has not been properly arranged by the Ministry, and there is no maintenance plan or renewal plan of equipment in each medical institution, and thus there are some unclear points and problems in the financial aspect and the current status of O&M.

In light of the above, this project is evaluated to be satisfactory.

### III. Recommendations & Lessons Learned

#### Recommendations to implementing agency:

It is desirable that the Ministry of Health will establish a procurement system of consumables and supply necessary consumables to the project-targeted medical institutions to improve utilization of equipment procured under the project. It is also desirable that each project-targeted medical institution will prepare a maintenance plan and renewal plan of equipment to improve O&M status of equipment.

In case of halt of the use of the equipment procured under this project due to procurement of new equipment, etc., it is desirable that the concerned equipment is disposed through a proper process based on examination of possibility of future use and discussions with the Japanese side.

#### Lessons learned for JICA:

The Ministry of Health explained that equipment which are no longer utilized are being renewed and/or replaced. However, there was no sufficient explanation on the policy and plan of the Ministry on O&M and renewal of these equipment, and thus it is difficult to verify the policy and/or plan.

While there might be sudden changes in policies of the central government after project completion, a consensus should be made in advance on an overall plan including maintenance and renewal plans of equipment with relevant organizations that have influences on decision-makings, in order to better ensure sustainability of project effects.



Infant warmer used at Baku City Clinical Hospital No. 3



Patient monitor used at Unified Hospital No. 26