

Country Name	<b>The Project for the Improvement of the Medical Equipment of the Regional Level Emergency Centers</b>
Republic of Albania	

**I. Project Outline**

Background	In Albania, there was a shift of the major cause of mortality from preventable infectious diseases, which had been overcome due to the expansion of primary healthcare, to non-communicable diseases, such as circulatory diseases and injuries caused by traffic accidents. To prevent fatalities linked to circulatory diseases and traffic accidents, there was a need to provide quick diagnosis and treatment at the facilities nearest the patients, and hence to establish an emergency medical system throughout Albania. However, emergency sections (in hospitals), located in both metropolitan and rural areas, faced problems such as the obsolescence of ambulances, shortages of lifesaving equipment used inside them, and shortages and obsolescence of emergency medical equipment at emergency focal point facilities. These problems adversely affected the lifesaving rate, and promoted a lack of trust among Albanian nationals in public health and medical services.				
Objectives of the Project	To provide swift and appropriate emergency medical services to emergency patients by procuring ambulances and emergency medical equipment for two tertiary medical institutions in Tirana (capital) (Mother Teresa Pediatric Hospital and the Emergency Dispatch Center) and 12 secondary medical institutions (regional and district hospitals throughout Albania), thereby contributing to enhancement of emergency lifesaving rate.				
Outputs of the Project	<ol style="list-style-type: none"> <li>1. Project Site: Tirana (capital), Lezha, Kukes, Diber, Durres, Elbasan, Fier, Berat, Vlore, Gjirokaster, Korce, Lushnje, Sarande</li> <li>2. Japanese side (1) Provision of grant necessary for procurement and installation of emergency medical equipment including ambulances (47 items in total)<sup>1</sup>, (2) Implementation of soft components (trainings) to establish a “Preventive Maintenance System”</li> <li>3. Albanian side: (1) Removal of existing equipment to be renewed such as X-ray unit, etc., (2) Renovation work of the room in which the installation of X-ray equipment, etc. is scheduled, (3) Power supply and water supply (including discharging) to the room where the equipment is installed</li> </ol>				
Ex-Ante Evaluation	2009	E/N Date	December 17, 2009	Completion Date	May 12, 2012
Project Cost	E/N Grant Limit: : 718 million yen, Actual Grant Amount: 507 million yen				
Implementing Agency	Ministry of Health (MOH)				
Contracted Agencies	Binko International Ltd., Mitsubishi Corporation				

**II. Result of the Evaluation**

1 Relevance
<p><b>Consistency with Albania’s development policy at the time of ex-ante evaluation and ex-post evaluation</b></p> <p>This project has been highly consistent with Albania’s development policy, as establishment and improvement of emergency medical services are set in policy documents such as the Long-Term Strategy for the Development of the Albanian Health System (2004) (effective at the time of both ex-ante and ex-post evaluations), the National Strategy on Development and Integration (2008-2013) (at the time of ex-ante evaluation), and the Program of Government of Albania for the Health Sector (2013-2017) (at the time of ex-post evaluation).</p> <p><b>Consistency with Albania’s development needs at the time of ex-ante evaluation and ex-post evaluation</b></p> <p>At the time of ex-ante evaluation, emergency sections in hospitals faced shortages and obsolescence of necessary emergency medical equipment including ambulances, which made hospitals unable to provide sufficient medical services. On the other hand, at the time of ex-post evaluation, the number of emergency calls as well as that of emergency patients accepted at emergency sections in hospitals has increased from year to year. Therefore, the project has been highly consistent with Albania’s development needs.</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 (2008), which placed ‘education and health’ as one of the priority areas in Albania.</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>The project has partially achieved its objectives, “to provide swift and appropriate emergency medical services to emergency patients”. While most of medical equipment procured under the project (47 items in total)<sup>1</sup> have been widely utilized, some equipment have not been continuously utilized as expected. For example, (1) three out of six units of mobile X-ray are not in use at the time of ex-post evaluation due to defects or fear of radiation caused by lack of protective vests against radiation and lack of awareness of the medical staff, and there would also be high probability that the other three units are not used as frequently as originally expected for the same reasons; (2) five defibrillators with pacing (26 units were procured in total), 14 pulse oxymeters (26 units were procured in total), and four</p>

<sup>1</sup> Major equipment procured includes the followings: (1) Emergency lifesaving equipment including 18 advanced life support ambulances, 2 automatic ventilators, 4 blood cell counters, 26 defibrillators, 15 ECGs and 23 patient monitors; (2) Imaging diagnostic equipment including 8 ultrasound scanners, 6 mobile X-rays, 1 fluoroscopy X-ray unit, 4 fluoroscopy and radiography X-ray units, 2 CT scanners; (3) Operation Theater related equipment including 2 surgical C-arm X-ray units, 1 operational table for pediatric, 1 anesthesia apparatus with ventilator.

electrocardiographs (15 units were procured in total) are not used at the time of ex-post evaluation, due to defects and a lack of batteries or spare parts; (3) while four fluoroscopy/radiography X-ray units were procured under the project and all of them are in operation, three of them have problems such as a stain shown on images, leakage of oil, and non-working of fluoroscopy; and (4) while 18 life support ambulances were procured under the project and all of them have been utilized, the use rate of ambulance is estimated at approximately 60% due to the one-driver and one-vehicle system, in which ambulances, whose drivers are out of duty, are not used.

On the other hand, emergency treatment to patients during transportation by an ambulance has become possible due to medical equipment procured under the project, and the number of emergency calls for ambulance from patients has increased in Tirana Emergency Dispatch Center (Indicator 1) and in most regional and district hospitals<sup>2</sup> (Indicator 2). Moreover, the number of emergency patients accepted at hospitals has increased in most regional and district hospitals<sup>3</sup> (Indicator 3). Furthermore, the number of emergency operation cases handled at pediatric emergency ward of the Mother Teresa Pediatric Hospital has also increased (Indicator 4). In general, emergency medical services in project-targeted hospitals have been improved and less patients in rural areas need to be transported to hospitals in Tirana over long hours compared to the situation before the project implementation, as medical equipment procured under the project including ultrasound scanner, CT scanner and X-ray units have enabled prompt and appropriate diagnosis of various diseases and injuries, although procured equipment are not used fully at the time of ex-post evaluation, which causes some difficulties for medical staff in diagnosing patients. As described in “4 Sustainability” below, the aim of the soft component to introduce preventive maintenance to each targeted hospital was not duly achieved mainly due to a lack of enforcement by the management of hospitals, change of staff and limited budget.

#### Impact

As for the expected impact, “contributing to enhancement of emergency lifesaving rate”, reliable data on lifesaving rate is not available. Alternatively, mortality figures were partly collected and analyzed. Mortality figures related to circulatory diseases that were only partially available do not show decrease, but it was difficult to analyze the underlying factors with limited data. On the other hand, mortality figures related to traffic accidents at the country level have decreased since project completion. During the same period, according to MOH, the number of inpatients due to traffic accidents at the country level increased by 24% from 438.5 persons per 0.1 million population in 2009 to 544.7 persons per 0.1 million population in 2012, which suggests that lifesaving rate on traffic accidents may have been improved after the deployment of the equipment under this project<sup>4</sup>. While it is difficult to prove a direct causal relation between such improvement and this project, it is considered that this project may have partially contributed to the improvement by enabling emergency treatment to patients during transportation by an ambulance and prompt and appropriate diagnosis and treatment of various injuries through procurement of emergency medical equipment.

Medical wastes related to equipment procured under the project have been treated properly before disposal at each project-targeted hospital according to the Albanian law (Government Decision No. 798 of 2010), and renovation works for X-ray leakage protection were completed before installation of X-ray equipment in all hospitals where such equipment was installed. While it is legally required to obtain a license from Institute of Public Health for the radiation protection standard, four hospitals (Diber, Kukes, Gjirokaster and Elbasan) have not obtained the license yet due to a complicated administrative procedure. Nonetheless, no radiation leakage has been detected, no negative impact on natural environment has been observed, nor has land acquisition been occurred under this project.

#### Evaluation result

Actual figures of all the performance indicators were improved after project completion, but some equipment procured under this project have not been well utilized. Also, the degree of achievement of the expected impact could not have been fully verified due to unavailability of essential data, while the improved emergency services of the targeted hospitals are considered to have partly contributed to reduction of mortality from traffic accidents.

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

#### Quantitative Effects

Indicator	Before the project (2008)	Target (2014)	Actual result (2012)	Actual result (2013)	Actual result (2014)
Indicator 1: The number of emergency calls for ambulance from patients in metropolitan area (case) <sup>(1)</sup>	16,429	Increase	22,000	26,720	44,439
Indicator 2: The number of emergency calls for ambulance from patients in rural areas (case) <sup>(2)</sup>	53,055	Increase	66,058	67,137	77,035
Indicator 3: The number of emergency patients accepted at regional and district hospitals (case) <sup>(3)</sup>	167,348	Increase	213,870	214,480	247,839
Indicator 4: The number of emergency operation cases handled at pediatric emergency ward of the Mother Teresa Pediatric Hospital (case)	1,070 <sup>(4)</sup>	Increase	1,287	1,310	1,370
Supplemental Information 1: Mortality related to circulatory diseases in the country (person per 100,000 population)	281.9 <sup>(5)</sup>	Decrease	Not available	Not available	364.2
Supplemental Information 2: Mortality related to traffic accidents in the country (person per 100,000 population)	44.4 <sup>(6)</sup>	Decrease	11.1	10.2	9.1

Note : (1) Indicator 1 is the number of emergency calls for ambulance received at Tirana Emergency Dispatch Center.

(2) Indicator 2 is the total number of emergency calls for ambulance received at regional and district hospitals in Lezha, Kukes, Diber, Durres, Elbasan,

<sup>2</sup> The number has actually decreased by approximately two to 65% in three out of 12 regional and district hospitals, which was due to a possibility that the baseline figures may not have been accurate etc.

<sup>3</sup> The number has actually decreased by approximately ten to 50% in four out of 12 regional and district hospitals, which was explained by those hospitals as due to the improvement of the primary healthcare service in these regions. In the last five to six years, the service and performance of primary healthcare centers have been improved and patients with minor symptoms and injuries have become able to be treated at these centers.

<sup>4</sup> The handover of the equipment and ambulances was in April 2011 and May 2011, respectively.

Fier, Beratt, Vlore, Gjirokaster, Korce, Lushnje, and Sarande. Data was not available for Elbasan in 2012 and 2013 and Lushnje in 2012, 2013 and 2014.

(3) Indicator 3 is the total number of emergency patients accepted at regional and district hospitals. Data was not available for Fier and Sarande in 2008, Elbasan in 2012 and 2013, and Lushnje in 2012, 2013 and 2014. The baseline figure in Berat was not available in Basic Design Study Report, however, the figure (16,238 cases) was obtained from the hospital during ex-post evaluation.

(4) The baseline year for Indicator 4 is 2009. The baseline figure was stated as zero in Basic Design Study Report, however, it was actually 1,070 according to the hospital.

(5) The baseline year for supplemental information 1 is 2006. Mortality related to circulatory diseases was calculated based on data that were informally collected by Albanian Institute of Statistics for this ex-post evaluation.

(6) The baseline year for the supplemental information 2 is 2006. The baseline data include mortality related to injuries and poisoning.

Source : Basic Design Study Report, questionnaires to Tirana Emergency Dispatch Center, Mother Teresa Pediatric Hospital, regional and district hospitals, Albanian Institute of Statistics

### 3 Efficiency

Although the project cost was within the plan (ratio against the plan: 71%), project period exceeded the plan (ratio against the plan: 123%) because of longer time required for manufacturing and shipment of medical equipment. The outputs of the project were produced as planned. Therefore, efficiency of this project is fair.

### 4 Sustainability

#### **Institutional aspect**

Before the project implementation, there was only one Emergency Dispatch Center (Tirana) in Albania, and most ambulances were allocated to hospitals, where emergency calls were dealt by each hospital. In 2014 the government of Albania established a new Law (No.147/2014) and created the National Center of Emergency Service in 2015 based on the law, in order to secure more prompt and professional emergency medical service all over the country. All the emergency calls are managed in the Center at the national level and necessary instructions are issued from the Center to a local emergency center (hospital) nearest the patient. This new system is expected to improve the country's emergency medical services (handling emergency calls), however, as mentioned above, the one-driver and one-vehicle system has been persistent. This is because the government budget allocated for maintenance of ambulances is very limited, and thus one ambulance is allocated to only one driver, who is responsible for appropriate use and maintenance of the vehicle within the limited budget. In fact, minor repairs are often covered by drivers' personal expenses, and it is believed that if more than one driver is assigned to one ambulance, motivation for appropriate use and maintenance of the vehicle will be decreased, which will shorten the service life of the vehicle.

Regarding maintenance of medical equipment within hospitals, before the project implementation, maintenance was conducted by biomedical engineers (BME), and in hospitals where BME was absent, maintenance was conducted by BME who belong to the National Center of Biomedical Engineering (NCBE) located in Tirana on a service call basis (only when equipment malfunctioned). However, NCBE's function has been decentralized and hospitals themselves have been responsible for maintenance of medical equipment by outsourcing the maintenance to external service providers since 2011. At the time of ex-post evaluation, medical staff and operation and maintenance (O&M) staff in project-targeted hospitals conduct daily maintenance such as checking the performance of equipment, cleaning, supply of consumables and handling minor technical problems etc., and contracted service providers conduct maintenance and repair of all the equipment based on a contract. The number of medical staff in project-targeted hospitals is sufficient to use equipment procured under the project effectively and conduct daily maintenance. While the number of O&M staff in project-targeted hospitals has slightly increased compared with the number before the project implementation, the current number is insufficient to conduct preventive maintenance. Although maintenance and repair of all the equipment are outsourced, preventive maintenance is usually not covered by the contract due to the limited amount of available budget, and therefore the preventive maintenance needs to be conducted by hospital staff, which is not duly applied in practice as expected.

#### **Technical Aspect**

Trainings were provided under the project to establish "Preventive Maintenance System", such as the preparation of working guidelines for start and end, daily and periodical checking, which can be used by medical equipment operators to understand how to manage and maintain equipment. The trainings improved the ability of medical staff and O&M staff, however, some staff who attended the trainings have been replaced, and continuous exchange or dissemination of knowledge acquired in the trainings among hospital staff have not been conducted, and thus newly assigned staff are not aware of the contents of the trainings. O&M manual and check lists for start and end, daily and periodical checking of medical equipment prepared in the project have not been utilized, nor have trainings been conducted to enhance technical skills of medical staff and O&M staff regarding O&M of medical equipment in project-targeted hospitals, as maintenance and repair of medical equipment are outsourced to external service providers.

#### **Financial Aspect**

MOH had been the provider of main financial sources for health and medical services (hospital income from medical service fee were absorbed into MOH budget). However, following the health financial reform in 2009, MOH has delegated the function of providing budget for health services to the Compulsory Health Insurance Fund (CHIF), which is an institution under MOH, since 2010<sup>5</sup>. MOH provides budget related only to capital investment such as renovation of hospital buildings and construction of new facilities, and CHIF provides budget for all the other expenditures related to health and medical services including personnel cost and O&M cost of medical equipment. It was confirmed from the CHIF data that budget provided from CHIF to project-targeted hospitals for equipment maintenance has been secured every year and in most cases it has increased from year to year. At the same time, however, detailed financial data of project-targeted hospitals is not available, and there were comments from the targeted hospitals that budget allocated for maintenance of equipment is generally not sufficient to conduct necessary maintenance and repair including preventive maintenance to all equipment procured under this project due to limited amount of financial resources for the health sector in the country.

#### **Current Status of O&M**

Maintenance contract for important and expensive equipment such as CT scanners and X-ray units is managed by NCBE in Tirana. NCBE concludes a contract with a service provider and manages the contract at the national level by setting the frequency of preventive

<sup>5</sup> CHIF is the public and autonomous institution, which manages and develops the compulsory health insurance scheme in Albania. CHIF finances the health services delivered by public and private providers in compliance with national health care policies (source: Annual Report 2014, CHIF).

maintenance as well as specifying the conditions of maintenance services, rates and costs in case of defects found, and the cost of maintenance is born by hospitals. Periodical check is conducted every six months for CT scanners and once a year for X-ray units. Maintenance and repair of other equipment including management of necessary spare parts are contracted to external service providers by each hospital. Daily maintenance is conducted by medical staff and O&M staff in project-targeted hospitals, however, no detailed maintenance plan was evidenced during site visit to these hospitals, nor is preventive maintenance conducted. Nonetheless, most equipment procured under the project were found to be in a good condition at the time of ex-post evaluation with some exceptions as explained above.

#### **Evaluation result**

In light of the above, sustainability of project effects is fair, as there are some issues in institutional, technical and financial aspects and the current status of most of the equipment are in a good condition, but these are not serious problems.

#### **5 Summary of the Evaluation**

The project has partially achieved its objectives: actual figures of all the performance indicators were improved after project completion compared with those of before the project implementation, while some procured equipment have not been continuously utilized as expected. Positive impact was identified in terms of mortality related to traffic accidents having been decreased, and it is considered that this project partially contributed to the decrease by enabling emergency treatment to patients during transportation by an ambulance and prompt and appropriate diagnosis and treatment of various injuries through procurement of emergency medical equipment. As for sustainability, there are some problems in institutional, technical and financial aspects, as preventive maintenance is not conducted except for expensive equipment, and budget for O&M cost is not sufficiently secured to cover all the procured equipment, though most of the procured equipment are in a good condition. As for efficiency, the project period exceeded the plan.

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

### **III. Recommendations & Lessons Learned**

#### **Recommendations to implementing agency:**

1. MOH needs to take measures to establish a “Preventive Maintenance System” in project-targeted hospitals. Although maintenance of equipment is outsourced, preventive maintenance needs to be conducted by hospital staff, and thus they need to be encouraged to apply soft component of the project in practice by using O&M manual, work guidelines and check lists on daily and periodical bases, in order to extend the life span of the procured equipment. The management of each targeted hospital also needs to take measures and establish new regulations that encourage medical and O&M staff to utilize manuals, work guidelines and check lists regularly.
2. MOH is advised to promote provision of trainings for emergency medical staff and O&M staff in project-targeted hospitals every year, so that newly assigned staff as well as existing staff can conduct preventive and regular maintenance appropriately.
3. MOH and project-targeted hospitals are advised to improve drivers’ and ambulances’ work formation in order to increase the utilization rate of ambulances. It can be more cost effective to use one vehicle in three shifts with three drivers, instead of keeping three vehicles with three drivers. Utilization of an ambulance with more than one driver can be piloted in certain hospitals and then further applied to other hospitals.
4. MOH and project-targeted hospitals need to collect and manage important statistical data including mortality rate for circulatory related diseases and traffic accidents, as well as detailed financial data related to resources spent for maintenance of procured equipment in order to clearly evaluate the effects of the project and propose some countermeasures in case of not achieving the expected outcome of the project.
5. It is strongly recommended to provide the protection vest against the radiation for the technicians that utilize the mobile x-ray and to increase awareness among medical staff about the radiation that equipment emits in order to achieve their full utilization.
6. It is preferable that the project-targeted hospitals rehabilitate some equipment and provide spare parts immediately in order to maintain appropriate operation in the hospitals.

#### **Lessons learned for JICA:**

It was a good decision to include the soft component of the project at the planning stage, as it is necessary to extend the lifespan of procured equipment. However, introduction of new practices, such as preventive maintenance using O&M manuals and daily check lists, should be developed more carefully by JICA and Implementing Agency with considering continuous monitoring and support activities until the practices have become routine, in order to materialize expected results.



Photo 1: Emergency ambulance in Berat Regional Hospital



Photo 2: Fluoroscopy X-ray Unit in Sarande District Hospital