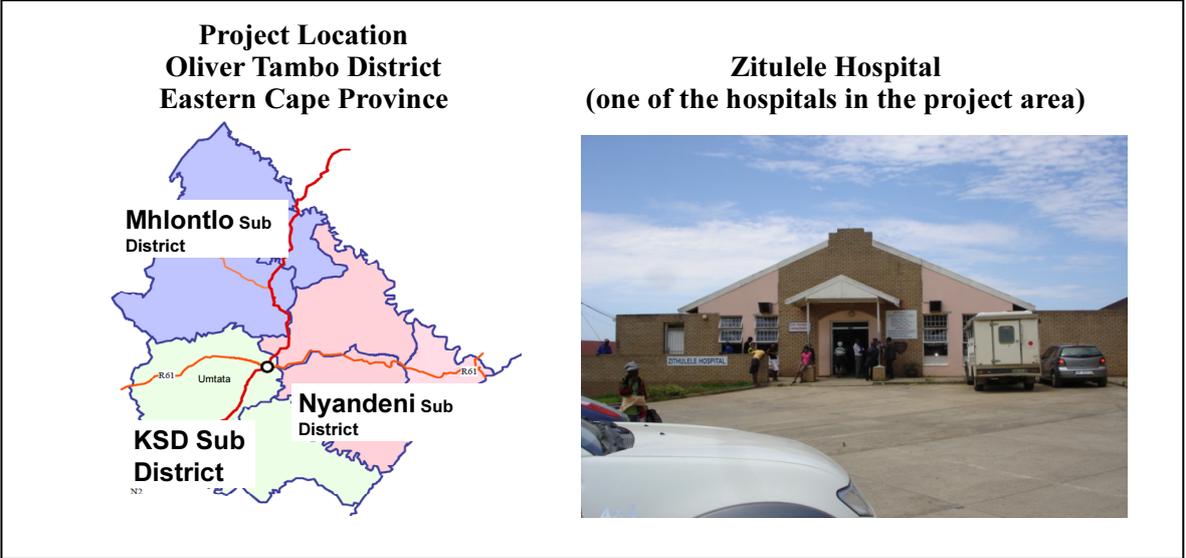


Republic of South Africa

Ex-Post Evaluation of Japanese Grant Aid Project  
“Improvement of Medical Equipment for Primary Health Care Institutes  
in Eastern Cape Province”

External Evaluator: Yasuhiro Hiruma  
International Techno Center Co., Ltd - INTER-TECHNO

1. Project Description



1.1 Project Background

Apartheid (racial segregation policy)<sup>2</sup> had long been in force in the Republic of South Africa until the formation of the national reconciliation government after the all-inclusive general election in 1994. Subsequently, a Reconstruction and Development Plan was formulated for the purpose of eliminating socio-economic, racial and regional disparities created under the former regime and recovery from the economic recession caused by international economic sanctions. Although the central government, in cooperation with the governments of all the nine provinces in the country, has been trying to reform all the sectors, including infrastructure development, housing, health, farmland redistribution and education, there still exist racial disparities. For example, the two-tier structure in the health sector has not yet been eliminated and, while the health care institutions for white people provide medical services comparable to those in developed countries, the services provided at the institutions for the black people in black settlements<sup>3</sup> in rural cities and former homelands<sup>3</sup> are on a

<sup>2</sup> Apartheid was the racial segregation policy implemented in South Africa, in particular, which stipulated various discriminatory relations between white and non-white people. Apartheid in South Africa was legislated in 1948. It became unsustainable in the late 1980s because of strong condemnation by the international community and economic sanctions and the then President de Klerk declared abolition of the discriminatory laws in 1991. After the subsequent first all-inclusive general election in 1994, apartheid was completely abolished.

<sup>3</sup> Homeland is the name given to a former self-governing territory for non-white people by the apartheid South African Government

par with those provided in other African countries. This Project was implemented in Oliver Tambo District, Eastern Cape Province. Oliver Tambo District used to be a homeland called Transkei<sup>4</sup> where people suffered greatly from the former apartheid policies. Because of the underdevelopment of institutions providing primary and secondary medical services, health care in the district is much poorer than in other areas. The central government has been tackling this problem and the Department of Health of Eastern Cape Province has been repairing and reconstructing district hospitals, community health centers and clinics in the former homeland with its own budget. However, sufficient budget has not been allocated to the improvement of equipment. Therefore, the central and provincial governments implemented this project to provide equipment to the five district hospitals, six health centers and 83 clinics in Oliver Tambo District, because of its extremely fragile health care system, with the aim of improving the quality of medical services and improving access to the services by increasing and upgrading the mobile clinics.

## 1.2 Project Outline

The objective of this Project was to improve primary medical services in Oliver Tambo District in Eastern Cape Province by provision of medical equipment to the primary health care institutions in the district.

Grant limit / Actual Grant Amount		1,038 million yen / 969 million yen
Exchange of Notes Date		January 2005
Implementing Agency		Department of Health, Eastern Cape Province
Project Completion Date		March 2006
Main Contractors	Procurement	Lots 1 and 2: Sojitz Corporation. Lot 3: Ogawa Seiki Co., Ltd. Lot 4: Mitsubishi Corporation
	Consulting Services	Binko International, Ltd.
Basic Design		March 2003– September 2003
Detailed Design		April 2005 – March 2006
Related Cooperation (if any)		Technical cooperation: Capacity building in medical equipment maintenance and management for South Africa (2009 – 2012) Grant aid: Project for Improvement of Hospital Medical Equipment (1997) (Nelson Mandela Academic Hospital)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Yasuhiro Hiruma, International Techno Center Co., Ltd. - INTER-TECHNO

<sup>4</sup> Transkei was a self-governing homeland that once existed in the eastern part of Eastern Cape Province in South Africa. It became a homeland in 1963 with the approval of the South African Parliament and became independent as the Republic of Transkei (capital: Umtata) in 1976. However, only South Africa recognized its independence. It was reunited with the rest of South Africa in 1994.

## **2.2 Duration of Evaluation Study**

For this ex-post evaluation, surveys were carried out as follows:

Duration of the Study: December 2009 – September 2010

Duration of the Field Study: February 4th – March 15th and April 18th – May 12th, 2010.

## **2.3 Constrains During Evaluation Study**

Oliver Tambo District consists of Mhlontlo, Nyandeni and KSD Sub-districts. The five hospitals, six health centers and 83 clinics at which this project was implemented are sparsely located throughout the vast Oliver Tambo District (*ca.* 250 km in the north-south direction and *ca.* 200 km in the east-west direction). Some of the 83 clinics are located far from highways or in areas with poor road access. Therefore, only 22 clinics were visited in this survey.

## **3. Results of the Evaluation (Overall Rating: A)**

### **3.1 Relevance (Rating: a)**

#### **3.1.1 Relevance with the Development Plan of South Africa**

At the basic design stage, the National Department of Health of South Africa considered development of a health care system with emphasis on community health care as one of the priority issues in the “National Health Plan” formulated in 1994. The “Health Strategies for Eastern Cape Province 2002-2005” described establishment of a public health care system aimed at qualitative improvement of the lives of the people, improvement in the quality of and access to medical services, aggressive promotion of health projects by local authorities, etc. as the strategic objectives.

The National Health Plan (2010/11 – 2012/13) obtained during the ex-post evaluation survey also describes development of a system for the improvement of community health care as a priority issue. In addition, the “Health Strategies for Eastern Cape Province 2009/10” also mentions improvement of the community health care system and health services.

#### **3.1.2 Relevance with the Development Needs of South Africa**

In Oliver Tambo District, Eastern Cape Province, the clinics and health centers which sick residents visited first were not sufficiently equipped with basic diagnostic equipment. Also, in the district hospitals, health care institutions at a higher level than the health centers and clinics, dilapidation and shortage of equipment was causing problems in examinations and treatment.

Because it is impossible for people living in remote areas to visit health care institutions because of the lack of means of transport, the Department of Health of Eastern Cape Province provides examination and treatment services at mobile clinics. However, since the number of vehicles used as mobile clinics was very limited and they were too old and in too poor condition to make frequent visits to remote areas to provide sufficient examination and treatment services, the health system in those areas was fragile.

At the basic design stage (in 2002), under-five mortality in the project area was 106 per 1000

births, which was significantly worse than the national average of 69 per 1000 births. The health indices obtained from the National and Provincial Departments of Health during the ex-post evaluation show that the under-five mortality in the project area had improved somewhat to 90 per 1000 births in 2009. However, this figure is still significantly worse than the national average of 60 per 1000 births.

From these facts, it is considered that the project to procure medical equipment for the improvement of health and medical services has been consistent with the development needs since the basic design stage and, thus, the necessity for the project implementation was high.

### **3.1.3 Relevance with Japan's ODA Policy**

The ODA Charter of Japan (published in August 2003) gives high priority to such sectors as education, health care and welfare, water and sanitation and agriculture in "3. Priority Issues (1) Poverty reduction." Africa is mentioned in "4. Priority Regions" of the same charter. In the policy consultations between Japan and South Africa held in 1998 and 1999, human resource development, basic education, health care, promotion of small- and medium-sized enterprises, environment and regional cooperation in Southern Africa were decided as the priority areas in Japan's assistance policy to South Africa.

Japan's assistance strategy to South Africa (including the Japan-South Africa Partnership Forum in 2002) at the time when this Project was adopted included cooperation in such sectors as health, culture and environment. Assistance to the poor in the health and other sectors had been considered as a priority issue in the numerous consultations up to the "Ninth Japan-South Africa Partnership Forum" in 2009.

The project has been highly relevant with the country's development plan, development needs, as well as Japan's ODA policy, therefore its relevance is high.

## **3.2 Efficiency (Rating: a)**

### **3.2.1 Project Outputs**

The equipment to be procured in this Project included 1,396 pieces of equipment (188 types) for the district hospitals (five locations), 564 pieces of equipment (30 types) for the health centers (six locations) and 2,887 pieces of equipment (29 types) for the clinics (83 locations).

- District hospitals

The planned outputs and the actual outputs of the Project were compared. Because of the large number of pieces of equipment, only the planned and actual quantities and the frequency of use of the major (expensive) equipment are shown in Tables 1 and 2, respectively.

**Table 1: Major equipment for district hospitals**

Equipment	Planned quantity	Actual quantity	Difference
Accessories for radiography equipment A <sup>5</sup>	4	4	As planned
Accessories for radiography equipment B <sup>6</sup>	1	1	As planned
Ambulances	5	5	As planned
Autoclaves	4	4	As planned
Patient monitors	18	18	As planned
Defibrillators	13	13	As planned
Dental chair units	3	3	As planned
Electric surgical knives	6	6	As planned
General surgical operation apparatus	10	10	As planned
Operating tables	3	3	As planned
Retractors	2	2	As planned
Ultra sound systems	4	4	As planned
Radiography equipment	5	5	As planned
Mobile radiography equipment	3	3	As planned
Infant monitors	5	5	As planned
Vehicles for mobile clinics	6	6	As planned

**Table 2: Frequency of use of major equipment at district hospitals**

Equipment	Average frequency of use
Ambulances	22 - 30 times/month: The ambulances are used frequently, almost every day.
Ultra sound scope systems	6 patients/day: As it takes 30 to 40 minutes to diagnose a patient, the systems are used almost the whole day.
Autoclaves	2 - 3 times/day: As the sterilization cycle takes approximately two hours, the autoclaves are used almost the whole day.
Infant patient monitors	22 to 30 times/month: The monitors are used frequently, almost every day.
Electric surgical knives	2 – 3 times/day: There are approximately 3 operations per day on average and the knives are used almost every day.
Radiography equipment	200 – 400 radiograms/month: As approximately three radiograms are taken per patient and radiograms are taken of approximately 150 people per day, the equipment is used frequently
Mobile radiography equipment	22 – 30 times/month: The equipment is used almost every day
Patient monitors	40 - 45 times/month: The monitors are used on <i>ca.</i> two patients per day.
Operation apparatus sets	12 - 16 times/week: The figures imply an average of <i>ca.</i> three operations per day. The sets are used almost every day.
Vehicles for mobile clinics	22 - 24 times/month: The vehicles are used frequently, almost every day.

<sup>5</sup> Stationary radiography equipment and accessories including radiation protective screens and aprons

<sup>6</sup> Mobile radiography equipment and accessories including protective aprons and gloves

- Health centers and clinics

Table 3 below shows the planned outputs and the actual outputs of this project at the health centers and the clinics.

**Table 3: Major equipment for health centers and clinics**

Equipment	Health center		Clinic	
	Planned quantity	Actual quantity	Planned quantity	Actual quantity
Peak flow meters	18	18	83	83
Scales for children	18	18	83	83
Scales	18	18	83	83
Height scales	18	18	83	83
Bed-type height scales for infants	18	18	83	83
Refrigerators (operated by both electricity and gas)	18	18	83	83
Stethoscopes	36	36	166	166
Sphygmomanometers	36	36	166	166
Inhalers	24	24	166	166
Fetal phonocardiography equipment	6	6	83	83
Resuscitators (for new-born babies and for adults)	18	18	83	83
Oxygen flow meters	18	18	83	83
Boiling disinfectors	18	18	83	83
Treatment apparatus (general and gynecological)	72	72	332	332
Delivery apparatus	18	18	77	77
Hemoglobin meters	6	6	83	83
Glucose meters	6	6	83	83
Generators	0	0	83	83

As described above, the equipment for the hospitals, health centers and clinics was procured as planned.

However, because a shortage of doctors had forced some health centers and clinics to change their services, several pieces of the procured equipment (such as the delivery apparatus), which had been in use immediately after the procurement, were found to be not in use.

Because the procured equipment was for the replacement of existing old and dilapidated equipment or as a supplement to existing equipment, medical personnel at the health care institutions were familiar with how to use most of the equipment. Therefore, the procured equipment has been used without problem and has fulfilled the diagnostic and treatment purposes. However, there have been a very limited number of cases where medical personnel (mainly nurses) are unsure of how to use equipment which they have not used for a long time since the explanation was given to them. In addition, only a limited time can be allocated for operational training in each piece of equipment when many types of equipment are procured for many locations, such as in this project. In such cases, the efficiency of the training may be improved by providing training to the medical personnel of all

the institutions at a few central institutions.

Damage supposedly caused by vibration was found in some of the equipment for mobile clinics loaded onto vehicles. All the clinics were provided with generator for examination lamps. However, because the clinics do not provide medical services at night and the power outages do not occur frequently, the generators are not fully utilized in all but 20 clinics where no electricity is provided. It is considered that there was a need to examine the conditions and the frequency of the use of examination lamps and the conditions of the electricity supply in each clinic more thoroughly when formulating a plan for the procurement of the examination lamps and the generators.

**3.2.2 Project Inputs**

**3.2.2.1 Project Period**

The project period assumed at the basic design stage was from January 2005 (conclusion of E/N) to March 2006 (15 months). The actual work was completed within the said period.

**3.2.2.2 Project Costs**

The project costs were estimated at 1,034 million yen (1,033 million yen and 1 million yen for the Japanese and South African sides, respectively) in the project design. The actual project costs were 969 million yen (968 million yen and 1 million yen for the Japanese and South African sides, respectively), or 94 % of the costs estimated in the project design.

The construction works whose costs were borne by the South African side were for Nessie Knight Hospital, St. Lucy’s Hospital and Canzibe Hospital. The content and breakdown of the project costs were as follows:

- Nessie Knight Hospital: Floor work in the Radiography Room      100,000 yen
  - St. Lucy’s Hospital: Repair of ICU and Dental Clinic                      700,000 yen
  - Canzibe Hospital: Repair of ICU    500,000 yen
- Total                      1,300,000 yen

Although there were very few pieces of the equipment which were not used as frequently as originally planned, almost all the equipment procured in this project was used as planned or more frequently. Although the project period and project cost were mostly as planned, therefore efficiency of the project is fair.

**3.3 Effectiveness (Rating: a)**

**3.3.1 Quantitative Effects**

This project was to provide medical equipment to primary and secondary health care institutions in Oliver Tambo District, Eastern Cape Province, thus to improve medical services to ca. 1.13 million people in the district to reduce their under-five mortality and prevent various infectious and chronic diseases, therefore to improve their health condition.

Because there are few employment opportunities in sectors other than the primary sector of the economy in the project area, many young people move to large cities (such as Johannesburg, Cape Town and Port Elizabeth) in search of employment. As a result, for the eight-year period between the time of the design (2003) and the time of the evaluation (2010), the population of Eastern Cape Province decreased by 6.1 % to 6.64 million (in 2009).

### 3.3.1.1 Results from Operation Effects Indicators

During the ex-post evaluation, the following operation indices established for each type of health care institution at the basic design stage were examined.

- (1) District hospitals: Annual number of outpatients treated, number of X-ray examinations, number of surgical operations, number of ICU cases, number of patient referrals (from lower-level institutions), number of dental patients and number of outpatients who received traumatic injury treatment
- (2) Health centers: Annual number of outpatients treated, number of normal childbirths and number of outpatients who received traumatic injury treatment
- (3) Clinics: Number of normal childbirths, number of vaccinations, number of sputum and blood tests and number of outpatients who received traumatic injury treatment
- (4) Mobile clinics: Number of “mobile points” (places visited), number of visits, number of pregnant/parturient patients who received antenatal care, number of vaccinations, number of sputum and blood tests, number of patients who received initial treatment and number of tests for sexually transmitted diseases

### 3.3.1.2 District Hospitals (Total of Five Hospitals)

<b>Index</b>	<b>Before project implementation (2002)</b>	<b>Target figure after project implementation (2007)</b>	<b>Actual figure at the time of ex-post evaluation (2009)</b>
Annual number of outpatients treated	22,586	Increase	20,291
Number of X-ray examinations	5,130	Increase	3,904
Number of surgical operations (regardless of scale, including Abdominal operation) (cases)	85	Increase	315
Number ICU cases (people)	Treatment not available	Treatment available	220
Number of patient referrals (people)	2,810	Increase	270
Number of dental patients	No data	N/A	1,744
Number of outpatients who received traumatic injury treatment	No data	N/A	1,299

The reduction in the numbers of outpatients treated, X-ray examinations and patient referrals from the numbers before project implementation is thought to have resulted from an increase in the number of people using lower-level health care institutions, i.e. the health centers and clinics, as

mentioned in “Qualitative effects” below, as well as a reduction in the total population of the district.

The number of patient referrals before project implementation was the total of the number of patients referred to the district hospitals from lower-level health care institutions and the number of patients referred to the higher-level institution (Nelson Mandela Academic Hospital) from the district hospitals. At the time of the ex-post evaluation, only the patients referred to the higher-level institution were counted. Therefore, these figures are not directly comparable. Nevertheless, the average of *ca.* one patient referral per working day is considered to be an indication that the number of examination and treatment services available at the district hospitals has increased because of the procurement of the equipment.

### 3.3.1.3 Health Centers (Total of Six Centers)

<b>Index (unit)</b>	<b>Before project implementation (2002)</b>	<b>Target figure after project implementation (2007)</b>	<b>Actual figure at the time of ex-post evaluation (2009)</b>
Annual number of outpatients treated	681	Increase	86,565
Number of (normal) childbirths	No data	N/A	3,871
Number of outpatients who received traumatic injury treatment	No data	N/A	276

### 3.3.1.4 Clinics (Total of 22 Clinics)

<b>Index (unit)</b>	<b>Before project implementation (2002)</b>	<b>Target figure after project implementation (2007)</b>	<b>Actual figure at the time of ex-post evaluation (2009)</b>
Number of (normal) childbirths	No data	N/A	1,459
Number of vaccinations	No data	N/A	2,956
Number of sputum and blood tests	No data	N/A	1,722
Number of outpatients who received traumatic injury treatment	No data	N/A	448

Since the method of counting the number of patients treated at the health centers at the time of the ex-post evaluation by counting patients’ visits was different from that used before project implementation, it is difficult to verify the increase in the number of patients simply by comparing the figures. Nevertheless, the number of patients had increased compared with before project implementation and personnel at the health centers confirmed the increase in the interviews.

Because neither actual measurement nor target setting had been conducted for some indices for the clinics before project implementation, the figures in the table above are irrelevant for the evaluation. However, personnel at the clinics confirmed a large increase compared with before project implementation in each index in the questionnaire survey. It should be noted that some inconsistencies have been found in the data because of differences in the counting methods used by the clinics.

### 3.3.1.5 Mobile Clinics

Index (unit)	Before project implementation (2002)	Target figure after project implementation (2007)	Actual figure at the time of ex-post evaluation (2009)
Number of mobile points (number of vehicles)	105 points (3 vehicles)	Increase	80 points ((3+6) vehicles)
Number of visits (number of visits per year/vehicle)	Once/4 weeks (35 times/year/vehicle)	Shorter interval between visits	4.5 times/4 weeks (54 times/year /vehicle)
Number of pregnant/parturient patients who received antenatal care	No data	N/A	121
Number of vaccinations	No data	N/A	1,152
Number of sputum and blood tests	No data	N/A	62,291
Number of patients who received initial treatment	No data	N/A	71,577
Number of tests for sexually transmitted diseases	No data	N/A	166

There were 105 mobile points before the project implementation. This figure had been reduced to 80 after the implementation because of the population decrease.

It is difficult to compare the numbers of visits to the mobile points before and after project implementation because the mobile clinics could not visit all the mobile points before implementation. Nevertheless, analysis of data obtained from the Sub-district Offices responsible for the mobile clinics revealed a reduction in the work load of each vehicle from 35 points before implementation to 13 points (9 points if the points that existed before implementation are included) after implementation.

While the frequency of visits to a point was around once a month before implementation, it increased to around 4.5 times a month after implementation. As increases have been observed in other indices, including a marked increase in the number of patients who received initial treatment, it is considered that the mobile clinics are serving the intended purpose.

### 3.3.2 Qualitative Effects

In the questionnaire and interview surveys conducted during this ex-post evaluation, some medical personnel replied that the procured equipment was easier to operate and functioned better than the existing equipment and had made examinations and treatment easier. Others replied that the new equipment had reduced mistakes in measurement and errors in reading measurements.

One ambulance was procured for each of the five district hospitals. Two of the hospitals replied that the efficiency of transport of patients had improved, while another reported no change. The ambulance at one of the remaining two hospitals had broken down and that of the other hospital had been stolen. Therefore, these two hospitals were using ambulances operated by the respective cities. The other three hospitals where the procured ambulances were in use replied that they were also

using the ambulances operated by the respective cities when two ambulances were required at the same time or when a patient had to be transported a long distance.

Meanwhile, a survey of the beneficiaries of the health care institutions (a questionnaire to a total of 118 patients at the hospitals, health centers and clinics) revealed that nearly 70% of patients replied in the affirmative to the question whether they were satisfied with the services provided by the hospitals. More than 70% also replied in the affirmative to the question whether their confidence in the service content provided by the hospitals had increased. More than 90% replied that they visited the health centers and clinics for regular check-ups and vaccinations more often than before. In a similar inquiry of the patients, 40% of the respondents replied that the opportunities for ante- and post-natal check-ups and check-ups for infants and small children had increased, while 20% replied that there had been no change. The number of check-ups of expectant and nursing mothers and infants/small children is thought to have decreased because of the exodus of young people.

As mentioned above, more than 70% of the beneficiaries replied that they were more satisfied with the medical services provided at the various health care institutions than before. Since the respondents were users of the health care institutions, some of them might have given favorable views of the institutions regardless of the actual state of the services. Even taking the possible bias derived from this partiality into consideration in the analysis of the survey results, it is still considered that the project had a considerable effect on the beneficiaries.

This project has largely achieved its objectives, therefore its effectiveness is high.

### **3.4 Impact**

#### **3.4.1 Emergence of Impacts**

The above-mentioned questionnaire to users of the institutions revealed an increase in the number of people who visit the clinics and health centers first for initial examinations and treatment and use the hospital later, if further examinations and/or treatment are required. Therefore, the implementation of this project has contributed to improvement of the referral system in the district to a certain extent.

#### **3.4.2 Other Impacts**

It was confirmed that a specialized waste collection company visited the district hospitals, health centers and clinics in turn to collect solid medical waste. Since protective measures against radiation have been taken at the existing radiography rooms in the district hospitals, no negative impact on personnel or the natural environment has been recorded. Since this project is for replacement of equipment in existing institutions, problems resulting from resettlement or land acquisition have not occurred.

### **3.5 Sustainability (Rating: b)**

#### **3.5.1 Structural Aspects of Operation and Maintenance**

At the design stage of this project, the Department of Health of Eastern Cape Province was expected to establish a department responsible for maintenance of the equipment at the health care institutions where this project was to be implemented. At the time of the ex-post evaluation, although the department had been established, only one person had been assigned to the department and, thus, the department was unable to provide adequate services. This maintenance department is also responsible for the procurement of supplies and spare parts for all the health care institutions in the province (748 institutions in seven districts). However, such a responsibility cannot be borne by a single person because of the huge service area.

Meanwhile, no maintenance system has been established in the individual health care institutions. It will be necessary to develop such a system so that maintenance services can be provided at each institution in the province.

The role of JICA's technical cooperation project, "Capacity Building in Medical Equipment Maintenance and Management for Southern Africa (2009 – 2012)<sup>7</sup>," will be crucial in establishing the maintenance system. The project includes plans to provide advice and support to establish a call center and to develop an equipment maintenance database for improvement of the maintenance system.

#### **3.5.2 Technical Aspects of Operation and Maintenance**

The interview survey of the medical personnel has revealed that, although training in how to use the new equipment was provided by the suppliers when it was installed, the content of the training was not very substantial. However, because the medical personnel had already known how to use the equipment almost completely, the procured equipment has been used without major problem.

During the basic design survey, establishment of maintenance workshops and implementation of training in maintenance under the responsibility of the Sub-District Health Offices were acknowledged as future tasks for the Department of Health of Eastern Cape Province, due to their necessity. However, the workshops have not been established and the training has not been provided. Since the responsibility for keeping the operation manuals for the equipment is not assigned to a single responsible person at each health care institution, some of the manuals have been misplaced.

For much of the technically sophisticated equipment, such as the radiography equipment, regular maintenance agreements, which are renewed every three months, have been concluded with the suppliers since the time of their procurement. Since these suppliers reportedly have engineers

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<sup>7</sup> A technical cooperation project being implemented by JICA (from 2009 to 2012) to strengthen the medical equipment maintenance system, one of the priority issues for the improvement of health and medical services. Maintenance of medical equipment is largely outsourced to private companies. In addition, many health care institutions do not have a workshop, particularly in areas where the poor live. Such differences in equipment maintenance have led to regional disparities in the quality of medical services. This project aims at the alleviation of current problems in the maintenance of medical equipment and improvement of maintenance mainly through 1) establishment of a medical equipment maintenance system, 2) development of human resources with sufficient experience in the maintenance of medical equipment and 3) dissemination of the concept of preventive maintenance to medical personnel.

who have been officially trained at the manufacturers' training centers, their technical level is considered adequate.

### **3.5.3 Financial Aspects of Operation and Maintenance**

The budget for maintenance is for both the equipment and the facilities and is not broken down into equipment maintenance and facility maintenance. The budget for maintenance in 2008/09 was 1,036,222,000 South African rand. Construction and repair of the facilities, procurement and maintenance of the equipment, etc. were implemented within this amount. However, because of the lack of accurate information on the breakdown of the maintenance budget, it is not possible to know how much was spent on equipment maintenance. Therefore, accurate information on expenditure is required.

Since 2008, procurement contracts for the equipment procured by the Department of Health, Eastern Cape Province, with the national budget have included maintenance costs for the first five years after delivery. Such a contract provision is considered beneficial from the viewpoint of ensuring sustainability.

### **3.5.4 Current Status of Operation and Maintenance**

To the extent confirmed during this survey, the equipment procured in this project was in good condition in general. However, the medical personnel at the health care institutions where this project was implemented are not fully aware of the concept of daily preventive maintenance, which is important for the operation and maintenance of medical equipment. Therefore, equipment is used until it breaks down with no measures being taken and, as a consequence, high expenses are required for the repair of the broken-down equipment.

Since the maintenance of sophisticated equipment such as radiography equipment is outsourced to the suppliers, such equipment is working with no particular problems. However, the maintenance of other medical equipment is problematic. It is difficult for the Department of Health of Eastern Cape Province to visit and repair malfunctioning equipment at the health care institutions located in the huge project area. Establishment of a collection and shipment system for transport of portable equipment is recommended.

As the first step toward solving the maintenance problem, much is expected from the establishment of a maintenance system and the capacity development of engineers in "Capacity Building in Medical Equipment Maintenance and Management for Southern Arica" that commenced in June 2009. Because of the huge project area and the short period of project implementation, the effects of the project have not materialized yet.

Some problems have been observed in terms of structural, technical and financial aspects, therefore sustainability of the project is fair.

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

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

### **4.2 Recommendations**

#### **4.2.1 Recommendations to the Local Implementing Agency**

- Implementation of small workshops on equipment operation

Differences in the ability to handle medical equipment have been noted among the medical technologists (mainly nurses) in the health care institutions, including the district hospitals, health centers and clinics. There are some who are not able to use even simple equipment. Therefore, the standardization of services has not been achieved. Implementation of small workshops or in-house study group meetings on equipment operation led by proficient nurses or other medical personnel is recommended.

- Assignment of mobile maintenance managers

Many of the malfunctions in the equipment (not procured in this project) found during this survey had simple causes such as run-down batteries, loose screws, burnt-out bulbs, blown fuses and broken wires. Medical personnel tend to abandon equipment as soon as it stops working, considering it to have broken down, instead of looking for the cause of the problem and taking measures to remedy it.

Assignment of mobile maintenance managers (such as maintenance engineers from the Nelson Mandela Academic Hospital), who will visit the health care institutions in turn to provide training in simple maintenance procedures and to verify the condition of the equipment, is recommended.

- Improvement in data collection

Although the Department of Health possesses basic data on medical indices, the persons in charge of data collection at the health care institutions do not understand the methods of collecting various statistical data including medical data and the meaning of the data being collected. In order to utilize the collected data to improve operation of the Department of Health and health care institutions, improvement of the data collection methods, including the simplification of data collection forms at the Department of Health and health care institutions, reduction in the amount of data recorded and adoption of computer-scored data sheets, is recommended.

### **4.3 Lessons Learned**

- Appropriate design for road conditions

Damage presumably caused by the poor local road condition was observed on some of the equipment loaded in vehicles for the mobile clinics.

In future, equipment specifications should be determined with a wide variety of opinions and

experiences of the people concerned on the ground (including counterpart and drivers) incorporated and measures against almost all thinkable external factors, including vibration, considered sufficiently in similar projects in order to make designs of such projects appropriate to actual conditions of project sites.

- Relocation of procured equipment

The procured equipment was not in use at a few health care institutions because the services had been relocated to other institutions, in accordance with changes in the policy of the Department of Health.

Equipment installed in a designated institution in accordance with the Basic Design may be relocated to another institution with approval from the Embassy of Japan. However, the Department of Health and health care institutions concerned do not seem to be well aware of this approval procedure and, in some cases, they misunderstand that the equipment may not be moved from the institutions designated in the Basic Design even if there is a valid reason to do so. Therefore, they will have to be well informed of the approval procedure for relocating equipment and other changes.

For effective use of the procured equipment, it is recommended that the Department of Health and health care institutions concerned should have consultation on equipment which is not in use at an institution because of the changes in the services and take measures, such as application for the approval for relocation of the equipment concerned to another institution, appropriate for the circumstances.

- Training in equipment operation in projects where many types of equipment are procured for many institutions

In reality, it is impossible for the contractor in charge of the procurement of equipment to find sufficient time to provide an explanation of how to use the equipment in projects where many types of equipment are provided to many health care institutions, such as this project, because the contractor has to spend much time for the transport and hand-over of the equipment. Receiving an explanation on operation of many types of equipment in a short time is confusing for the medical personnel and not much is expected from such explanations. Therefore, it is better and more efficient to provide training in equipment operation at core institutions in the district to maintenance personnel of the health care institutions within the district for longer periods.

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Comment on this Project from Specialist

INDEPENDENT REPORT ON THE PROJECT FOR IMPROVEMENT OF MEDICAL  
EQUIPMENT FOR PRIMARY HEALTHCARE INSTITUTIONS IN THE EASTERN CAPE IN  
THE REPUBLIC OF SOUTH AFRICA.

This project was implemented to improve the quality and accessibility of healthcare in the old Bantu Homelands of the Eastern Cape as part of corrective action to redress racial disparity in the medical field created by the old apartheid regime in South Africa.

The Republic of South Africa and the Eastern Cape Department of health is indeed grateful to Japanese government for the support received in the form of this project.

For the Aid recipients, namely the 5 hospitals, 6 health centres and 83 clinics, the scope of the project and the strategy for its implementation has directly impacted healthcare delivery. The facilities and medical equipment provided under this project have greatly improved the quality and accessibility of healthcare in this previously disadvantaged district of the Eastern Cape. With improved equipment and facilities, staff morale is also boosted since the health care workers in these facilities are now empowered to serve the patients in their communities better. This project has also helped patients who previously had to travel long distances for access to quality treatment to no longer have to go very far except in exceptional circumstances, because the medical equipment needed for their treatment are now available in their nearest health centres and clinics.

Some challenges that surfaced during the implementation of the project were mainly related to the lack of infrastructural support for the supply or installation of certain equipment. Some of these rural communities had no reliable supply of electricity and water, while some others did not have qualified personnel to use highly specialized equipment. For instance, it was impracticable to accede to requests for medical equipment that must run on adequate and reliable power supply where the necessary infrastructural support is inadequate. Neither was it reasonable to provide expensive medical equipment to a facility where no staff had the necessary skill or training to use it, since storage of such equipment without use could lead to deterioration over time.

In conclusion, it is now up to the Eastern Cape department of health and the facilities that have directly benefitted from this project to ensure the proper and effective use and maintenance of the facilities and equipment provided by the Japanese government under the Grant Aid. This can be done by ensuring adequate manpower development through continuous training and retraining of hospital staff that use, service and maintain the equipment. This will ensure safe and proper use, prolong the useful life of the equipment and keep them in good working condition for longer.

Comment by Mr. Timothy A. Okhai.

Lecturer of Clinical Engineering Department, Tshwane University of Technology