

## 0. Summary

The project was intended to improve the quality of healthcare services offered by ten target District Hospitals (DHs) by installing necessary facilities and equipment. This objective is in line with the development policy of the Lao Government, the development needs of the country, as well as Japan's assistance policy for Laos at the time of planning. Thus, the relevance of the project can be evaluated as high. The number of patients for major healthcare services has increased — in many cases to a great extent — in most of the target DHs, and the level of hospital user satisfaction with services offered by target DHs was found to be very high. In view of these findings, it can be concluded that the project has produced sufficient effects. Although some wastewater and solid waste has been disposed of differently from the methods stipulated in the project plan in some DHs, which raises some concern about environmental implications, the disposal methods practiced by some DHs are in most cases not violating the MoH's environmental standards or their advice. Taking this fact into consideration, the effectiveness and the impact of the project can be evaluated as high. The project was also efficiently implemented with inputs executed and outputs produced almost as planned. However, there are some challenges in respect to maintenance of provided equipment and therefore the sustainability of the project effect is considered fair.

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

## 1. Project Description



Project Locations



Champasak DH



Khoua DH

## 1.1 Background

The Lao People's Democratic Republic (Laos) had exhibited steady economic growth since the transition to a market economy in 1986. The country's Gross National Income (GNI) per capita, however, was USD379 (2004) and still lower than that of neighbouring countries. Growth has been limited to specific areas and economic disparities have been widening between urban areas and rural areas, where 80% of the population resides.

Health indicators show a low level of health status in Laos. In particular, the infant mortality rate, the under-five child mortality rate and the maternal mortality rate in Laos were among the highest in the Asian region. The major causes of death were preventable and curable diseases and diarrhea. The improvement of basic health care services including primary health care is imperative, especially in remote areas where the quality of health care is particularly poor.

The rural medical care system in Laos consists of five regional hospitals, thirteen provincial hospitals and 134 district hospitals (DHs), as well as many health centers. Although regional and provincial hospitals had been renovated or rebuilt with support from development partners, the majority of DH facilities remained old and did not have sufficient basic medical equipment and the local residents was unable to access basic health care services.

In response to this situation, the Ministry of Health (MoH) planned to strengthen the referral system in rural areas by improving DHs located in key traffic areas and turning them into Inter-District Hospitals (IDHs) and upgrading a few neighbouring DHs to Regional District Hospitals (RDHs). For that purpose, the Government of Laos requested Japan's assistance.

## 1.2 Project Outline

The objective of this project was to improve the quality of healthcare services offered by 10 target DHs by constructing facilities and providing medical equipment.

Grant Limit/Actual Grant Amount	Phase 1: 150 million yen/122 million yen Phase 2: 413 million yen/397 million yen Phase 3: 658 million yen/652 million yen
Exchange of Notes Date	Phase 1: February 2006 Phase 2: August 2006 Phase 3: June 2007
Implementing Agency	Department of Healthcare, Ministry of Health
Project Completion Date	December 2008
Main Contractors	Construction: Kanto Construction Co., Ltd. (Phase 2), Kanto Construction Co., Ltd. and Sanpo International (Phase 3) Procurement of equipment: Green Hospital Supply Co., Ltd. (Phase 1 and 3), Ogawa Seiki Co., Ltd. (Phase 2)
Main Consultants	Kume Sekkei Co., Ltd. and Binko International Ltd.

Basic Design	Basic Design Study on the Project for Improvement of District Hospitals in the Lao People's Democratic Republic, February 2005–January 2006
Detailed Design	Phase 1: March 2006–May 2006 Phase 2: October 2006–November 2006 Phase 3: June 2007–October 2007
Related Projects (if any)	[Technical Cooperation] Project for Strengthening Health Services for Children (2002–2007), Project for Strengthening Medical Logistics (2005–2008), Project for Human Resources Development of Nursing/Midwifery (2005–2010), Project for Upgrading Diploma Nurses (2008–2012), Project for Strengthening Integrated Maternal, Neonatal and Child Health Services (2010-2015)

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Rie Fusamae, Foundation for Advanced Studies on International Development

### 2.2 Duration of Evaluation Study

Duration of the Study: November 2011– October 2012

Duration of the Field Study: April 18, 2012– May 7, 2012, and June 25, 2012–June 29, 2012

### 2.3 Constraints during the Evaluation Study

The field study was conducted on five hospitals out of 10 target hospitals due to time constraints, though most data were collected from all 10 hospitals. Therefore, analyses by hospital were carried out only to a limited extent.

## 3. Results of the Evaluation (Overall Rating: A<sup>1</sup>)

### 3.1 Relevance (Rating: ③<sup>2</sup>)

#### 3.1.1 Relevance to the Development Plan of Laos

The project intended to improve the quality of health care services by developing infrastructure and upgrading medical equipment of some DHs that are expected to be turned into IDHs. Such an objective and the approach of the project were in line with the policy of the Lao Government at the time of the project planning. In 2010, the Government of Laos introduced the Health Strategy up to the Year 2020, which aims for full health care coverage and fair health care services. The strategy adopts six health development policies, including the facilitation of community-based health promotion and disease prevention, and the improvement and expansion of hospitals at all levels and in remote areas. The Lao Government also prepared a health master plan in 2002 based on the strategy, with assistance from JICA. The master plan identifies the enhancement of DHs as one of the highest priority programs,

<sup>1</sup> A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

<sup>2</sup> ③: High, ②: Fair, ①: Low

and the government planned to develop, above all, those DHs located in important traffic areas into IDHs.

The project objective remains relevant at the time of ex-post evaluation. The Health Strategy continues to show basic policy orientation of the Lao Government. Under the 7<sup>th</sup> Five-Year Health Sector Development Plan (2011–2015) formulated based on the Strategy, the government aspires to improve the quality of health care services as well as service delivery capacity through the development of human resources and infrastructure.

### **3.1.2 Relevance to the Development Needs of Laos**

The major causes of deaths in Laos at the time of the project planning were preventable and treatable infectious diseases. In rural areas (where 80% of the population live), residents did not have access to basic health care services due to the deterioration of facilities and shortages of basic medical equipment in DHs.

Although a number of health indicators show improvements in health status in Laos at the time of ex-post evaluation, preventable and curable infectious diseases and diarrhea are still leading causes of death.<sup>3</sup> The infant mortality rate, for instance, has been greatly reduced but most infant deaths are still caused by preventable and treatable diseases or conditions such as neonatal conditions, pneumonia, diarrhoea and measles. On the other hand, the maternal mortality rate remains high despite considerable improvements in mother and child health (MCH) services, and the majority of maternal deaths occur in rural and remote areas<sup>4</sup>.

It therefore can be said that the project, which aims to improve rural health care services through the enhancement of DHs, fitted and still fits the needs of Laos.

Target hospitals were selected from among prospective IDHs located in key traffic areas in order to benefit a greater number of people. Priority was given to the northern and the central regions, which are particularly poor. Since there were only six hospitals in those regions suited for the project, four hospitals in the south located at important traffic points were later added. Although three of them are relatively close to provincial hospitals, they cover broad geographical areas and therefore they can be considered appropriate selections in terms of the number of beneficiaries.

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

The project was consistent with Japan's assistance policy towards Laos at the project planning stage. Basic Human Needs (BHN) was one of Japan's priority areas for assistance to Laos. In regards to the health sector in particular, the Japanese Government specifically planned to provide key hospitals with

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<sup>3</sup> World Health Organization Country Cooperation Strategy 2012–2015.

<sup>4</sup> Ibid.

physical support, such as construction and renovation of facilities and equipment supply.

As seen above, this project has been highly relevant to the country’s development plan and development needs, as well as to Japan’s ODA policy. Therefore, its relevance is high.

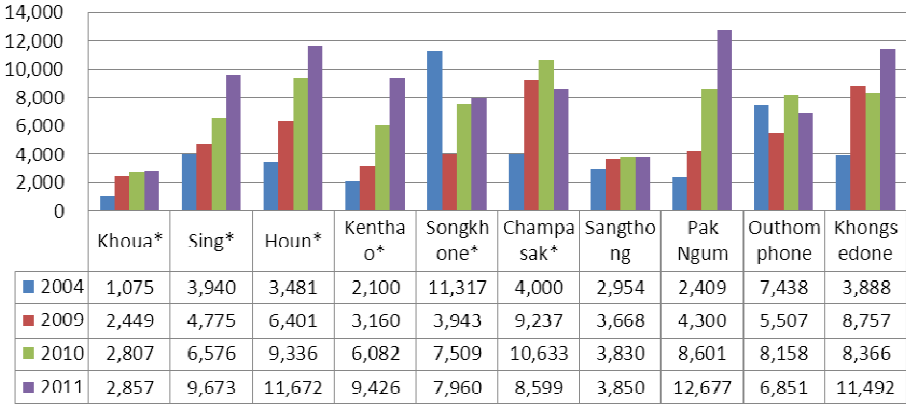
**3.2 Effectiveness (Rating: ③)**

**3.2.1 Quantitative Effects**

The project planning team set targets for the following basic indicators prior to the project implementation: the number of outpatients; the number of inpatients; the number of blood tests; the number of X-ray examinations; the number of deliveries; and the number of antenatal examinations. In order to examine the effects of all the major equipment provided under the project, a few indicators, namely the number of laboratory tests, the number of ultrasound examinations and the number of dental treatments, were added in the ex-post evaluation study.

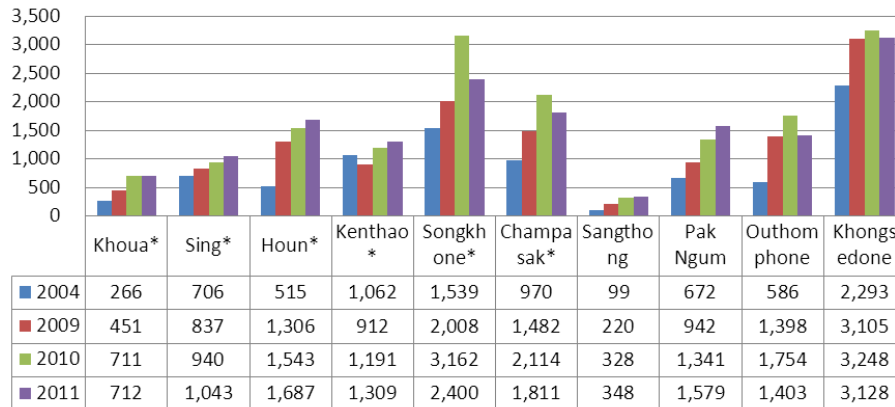
**3.2.1.1 Number of Patients**

The total number of outpatients treated in 10 target hospitals doubled from 51,826 in 2004 to 71,898 in 2010 and 85,057 in 2011. The number of inpatients also increased by about 80% from 8,708 in 2004 to 16,322 in 2010 and 15,420 in 2011. Performance by hospital is shown in Figure 1.



\*Hospitals that received support for facility improvement under the project.  
 Source: Target DHs  
 Note: An approximate annual average before the project implementation is adopted as a baseline for Champasak Hospital and figures for the year 2003 for Sing DH and Khongsedone DH.

Figure 1 Number of Outpatients by Hospital



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 2 Number of Inpatients by Hospital

Though the number of outpatients remarkably increased in most of the target hospitals, the data shows a large decrease in Songkhone DH in the southern province of Savannakhet and little change in Outhomphone DH in the same province. Songkhone DH officials explained that they had a large number of outpatients in 2004 due to various health projects that were going on in the year. On the other hand, MoH analysis holds that the Savannakhet Provincial Health Office is focusing on the enhancement of the health centers and therefore an increasing number of people visit health centers instead of DHs. Contrary to the two hospitals, Pak Ngum DH in the capital Vientiane shows a significant increase of outpatients. They attribute the increase to health promotion projects.

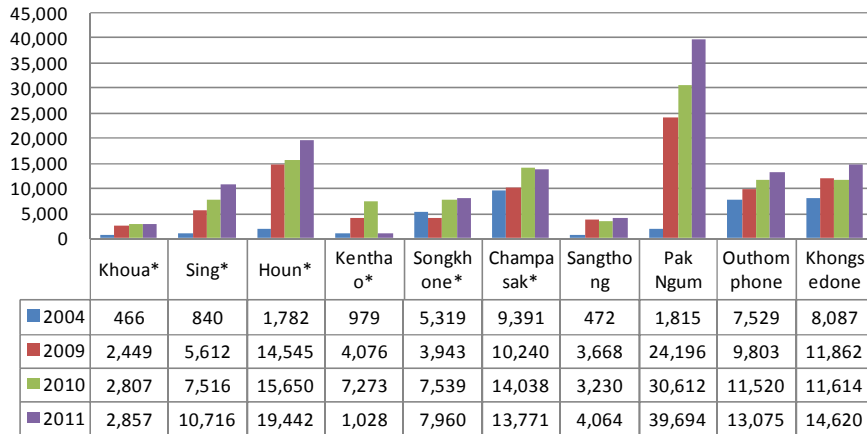
The number of inpatients increased in all of the 10 hospitals.

No significant difference in trends regarding the number of patients was identified between the six hospitals that received support for facility improvement under the project and the remaining four hospitals.

### 3.2.1.2 Number of Tests

The 10 hospitals conducted a total of 38,463 blood tests in 2010 and 41,508 in 2011, three times as many as in 2004 (13,459 tests). The number of laboratory tests also tripled from 36,680 in 2004 to 111,799 in 2010 and 127,227 in 2011. The main reason for the increase, apart from the increase in the number of patients, is that the range of test items has expanded due to new laboratory equipment provided under the project.<sup>5</sup> The numbers of laboratory tests by hospital are shown in Figure 3.

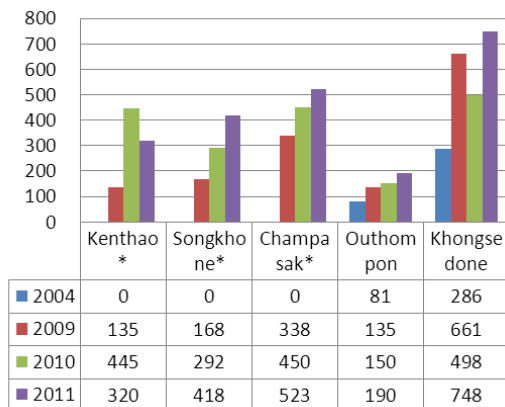
<sup>5</sup> The target hospitals conduct laboratory tests on such items as kidney stones, hepatitis B, hepatitis C, HIV, uric acid level, bilirubin, glucose, cholesterol, etc., while testing was available mainly for malaria, tuberculosis and blood cell counts before the project.



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 3 Number of Laboratory Tests by Hospital

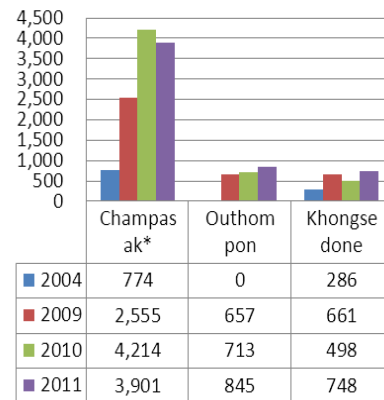
X-ray units and ultrasound scanners were provided only for those hospitals that have the skills to operate those machines. The number of X-ray tests and ultrasound tests is steadily increasing in each of those hospitals (See Figure 4 and 5).



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 4

Number of X-ray Examinations by Hospital



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

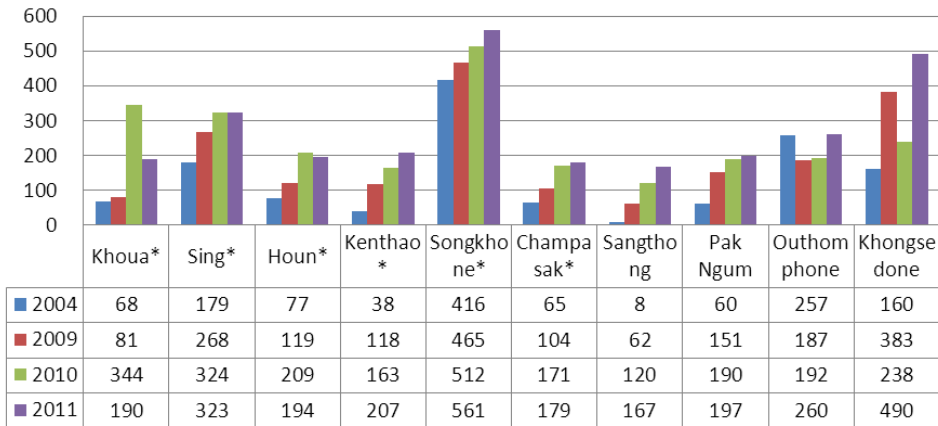
Figure 5

Number of Ultrasound Examinations by Hospital

### 3.2.1.3 Number of MCH Services

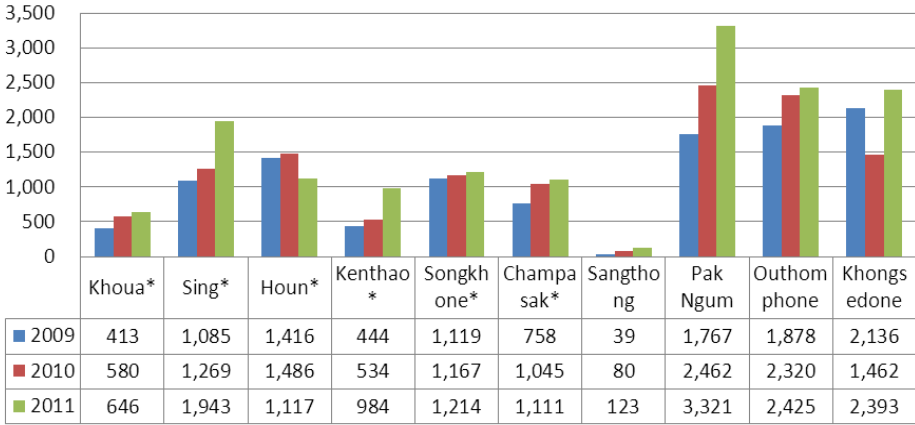
MCH services, one of the major responsibilities of the DHs, have shown great improvement in terms of the number of services offered. The total number of deliveries at the 10 target hospitals nearly doubled from 1,328 in 2004 to 2,343 in 2010 and 2,601 in 2011 (See Figure 6). The number of antenatal examinations also increased from 9,352 in 2004 to 12,405 in 2010 and 15,277 in 2011 — increases of 30% and 60% respectively (See Figure 7).

There is a large increase in the number of deliveries in nine out of the 10 target hospitals. Whilst the project has contributed to this trend, it owes largely to the free delivery campaign being carried out nationwide by the Lao Government. The number of antenatal examinations has also shown a steady increase in almost all of the hospitals over the last three years, though changes before and after the project cannot be examined due to a lack of baseline data. There is no profound difference in trend regarding the number of MCH services between the six hospitals that received facility support and the remaining four hospitals. However, figures indicate that in all of the six hospitals with new facilities, MCH cases are steadily increasing.



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 6 Number of Deliveries by Hospital



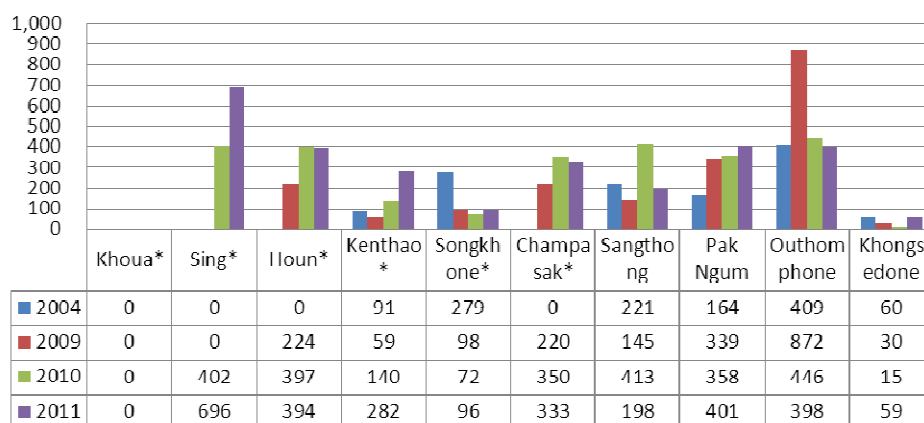
\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 7 Number of Antenatal Examinations by Hospital



### 3.2.1.4 Number of Dental Treatments

A dental unit was provided under the project for all of the 10 target hospitals, out of which four hospitals planned to start dental services. The total number of dental treatments offered by the 10 hospitals was 2,593 in 2010 and 2,857 in 2011, both of which were more than double the number in 2004. On the other hand, performance varied from hospital to hospital (Figure 8). Khoua DH in the northern province of Phongsaly has never offered dental services since they have no dentist. In Songkhone DH in the capital Vientiane, the number of treatments sharply decreased as, according to hospital officials, they had a larger number of dental patients in 2004 because of a dental health project. The number also reduced in Khongsedone DH in the southern province of Saravan where an official dentist was transferred to another position and a volunteer with a license is providing dental services. Since the number of treatments in other target hospitals is also not large, ranging from approximately 200 to 400, it appears that demand for dental services is not as high as other services.



\*Hospitals that received support for facility improvement under the project.  
Source: Target DHs

Figure 8 Number of Dental Treatments by Hospital

As seen above, the numbers of all of the major services except for dental services increased — mostly to a great extent — in eight hospitals, though the numbers of some services in the remaining two hospitals decreased or did not change. With regard to dental services, performance was not as remarkable as in other services, but the number of treatments increased or remains at the same level. Based on the above findings, it can be concluded that the project produced sufficient effects.

## 3.2.2 Qualitative Effects

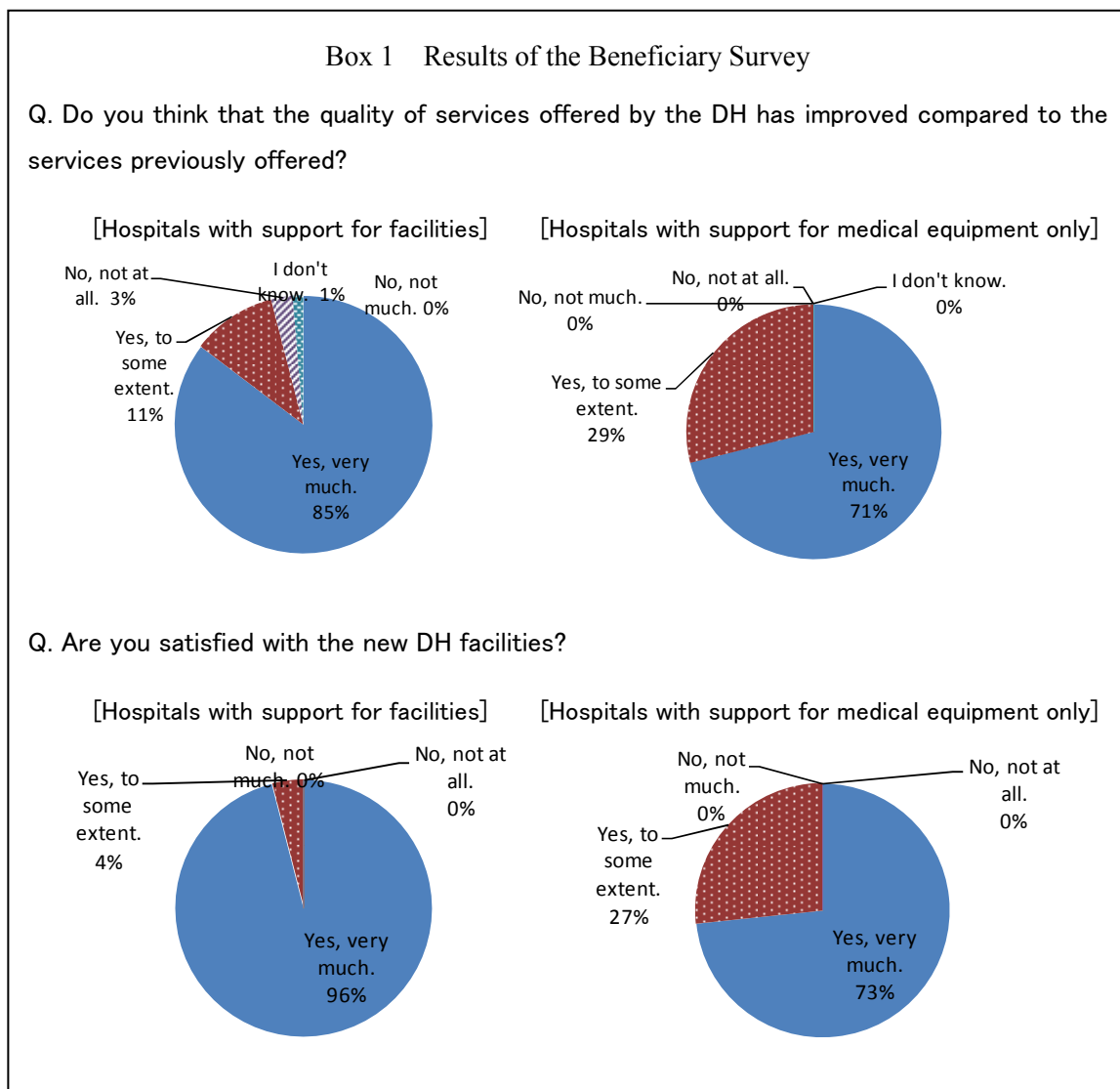
### 3.2.2.1 Satisfaction of Hospital Users

A beneficiary survey was conducted as part of the ex-post evaluation study in order to measure the level of satisfaction with services offered by target hospitals. 120 users of target hospitals,<sup>6</sup> including

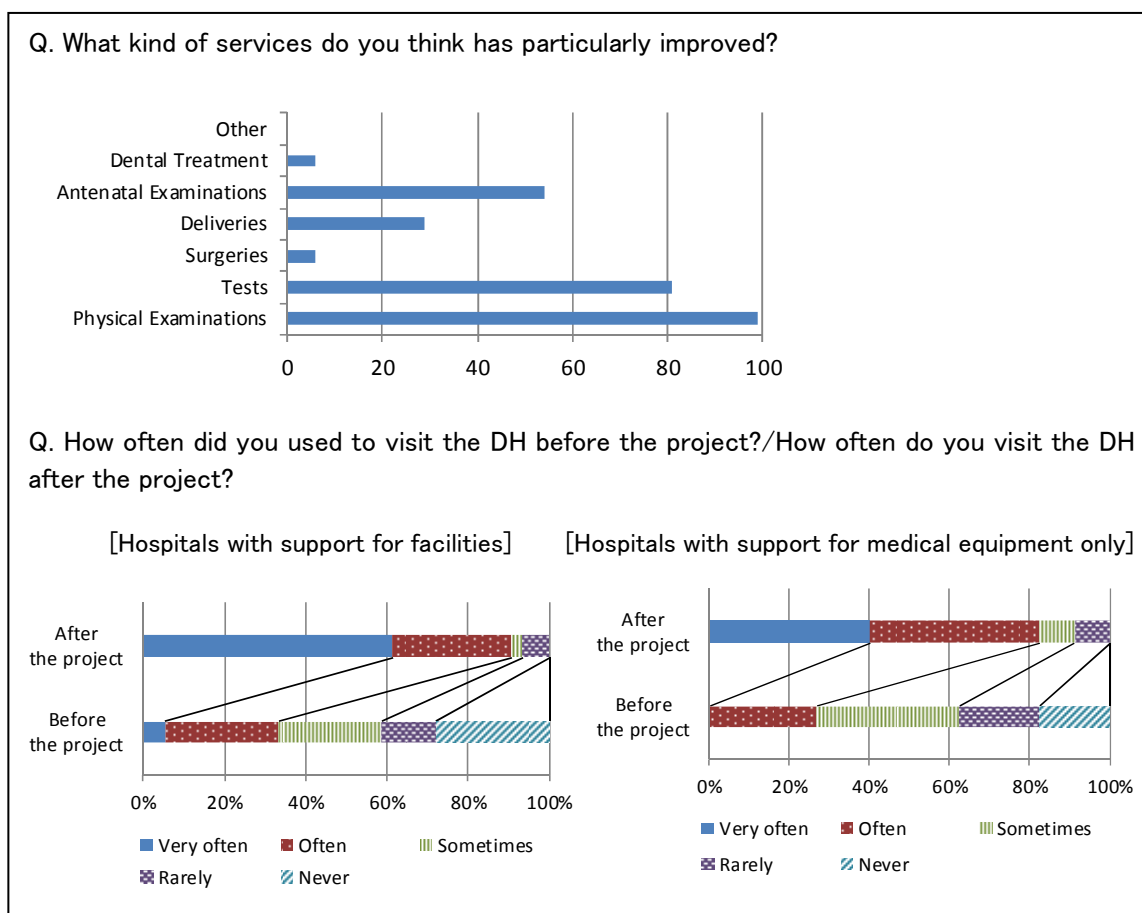
<sup>6</sup> The survey was conducted in eight target hospitals other than Outhompon DH and Songkhone DH.

patients and their family members, responded to the survey.<sup>7</sup>

The survey results show that the satisfaction level of hospital users is very high, particularly with physical examinations, tests and MCH services, all of which the project intended to improve. It is also found that frequency of visits has increased. The level of satisfaction with the quality of services and facilities is higher for those hospitals that received support for facility improvement under the project, though users of the remaining hospitals are satisfied too. Frequency of visits is also higher for the former.



<sup>7</sup> 13 to 17 visitors responded in each hospital. Out of 120 respondents, 75 are users of the hospitals that received facility support and 45 are those of the remaining hospitals. By sex, 55 respondents are male and 65 female. By age, 52 respondents are teens or in their twenties, 43 in their thirties and forties, and 25 are aged 50 or older.



Comments from users mostly indicated a high level of satisfaction with services offered by the hospitals. However, there were some negative remarks as well. A few respondents in each of the surveyed eight hospitals gave negative opinions about the attitude of some doctors and nurses. Issues of the cleanliness of toilets were also raised for five hospitals.

### 3.2.2.2 Appropriateness of Constructed Facilities and Procured Equipment

Almost all the installed facilities and the equipment provided under the project are in use at the time of ex-post evaluation except for equipment under repair or to be repaired. JICA's follow-up study team on the project also found that the facilities and the equipment were mostly being used well.<sup>8</sup>

On the other hand, there are some facilities and equipment that are not in use or being used for unintended purposes as shown in Table 3 below. The middle surgery room was set up for emergency cases in the hospitals in the northern and central regions, in which no mid-scale surgery<sup>9</sup> had been carried out.<sup>10</sup> The X-ray room was installed not only for those hospitals that were to be provided with

<sup>8</sup> Draft report on the follow-up study. The study team inspected current conditions of provided equipment.

<sup>9</sup> According to the Ministry of Health standard, mid-scale surgeries refer to surgeries for, for example, appendicitis, caesarian sections, hernias, ovarian cysts and contraception.

<sup>10</sup> Basic design study report (2005).

X-ray units under the project, but also for the other hospitals, taking future needs into consideration.<sup>11</sup>

Table 3 Facilities and Equipment not in Use or in Use for Unintended Purposes

Facilities/Equipment	Hospitals	Reasons for Non-Use
Digital height and weight scale	All the 10 hospitals (some can be used for a few days with full battery charge)	The battery has run out but not been replaced due to the high cost involved in procuring a new one.
Middle surgery room and instrument set for middle-scale surgeries	Khoua, Sing, Houn, Sangthong, Pak Ngum DHs	It has been used only when doctors of upper level hospitals such as the Provincial Hospital visit since there are no doctors with skills to conduct middle-scale surgeries. Other than on those occasions, it is not used or is used for other purposes.
X-ray room	Khoua, Sing, Houn, Sangthong, Pak Ngum DHs	They do not have an X-ray unit.
Dental room and dental unit	Khoua DH	There is no dentist.
Toilets	Sing DH	They have been closed since they got clogged many times by foreign articles disposed by users.
Ultrasound scanner	Khongsedone DH	It broke down but they did not procure a required part to fix it due to the high cost. They instead purchased a new one made in China, which is cheaper than procuring the part.
Microscope	Kenthao DH	It broke down. They are using a microscope provided under another donor-supported project.
Autoclave	Kenthao DH	They use a larger one provided by another donor.
	Sangthong DH	The doctor that has the required skills to use it got transferred.

Source: Draft follow-up study report and interviews with hospital officials

With some exceptions, most facilities and equipment not in use differ among hospitals and the reasons for non-use also vary. In some cases, there is no doctor that has the required skills to operate a particular device (See 3.5.2 Technical Aspects of Operation and Maintenance). As far as digital height and weight scales are concerned, all the target hospitals share battery problems. The batteries have not been replaced in any hospital due to the high cost of replacement even when it was found to be no longer rechargeable (See 3.5.4 Current Status of Operation and Maintenance). Given this fact, a scale with a battery, which is easy to procure, or separate analogue scales for weight and height would have been more appropriate.<sup>12</sup>

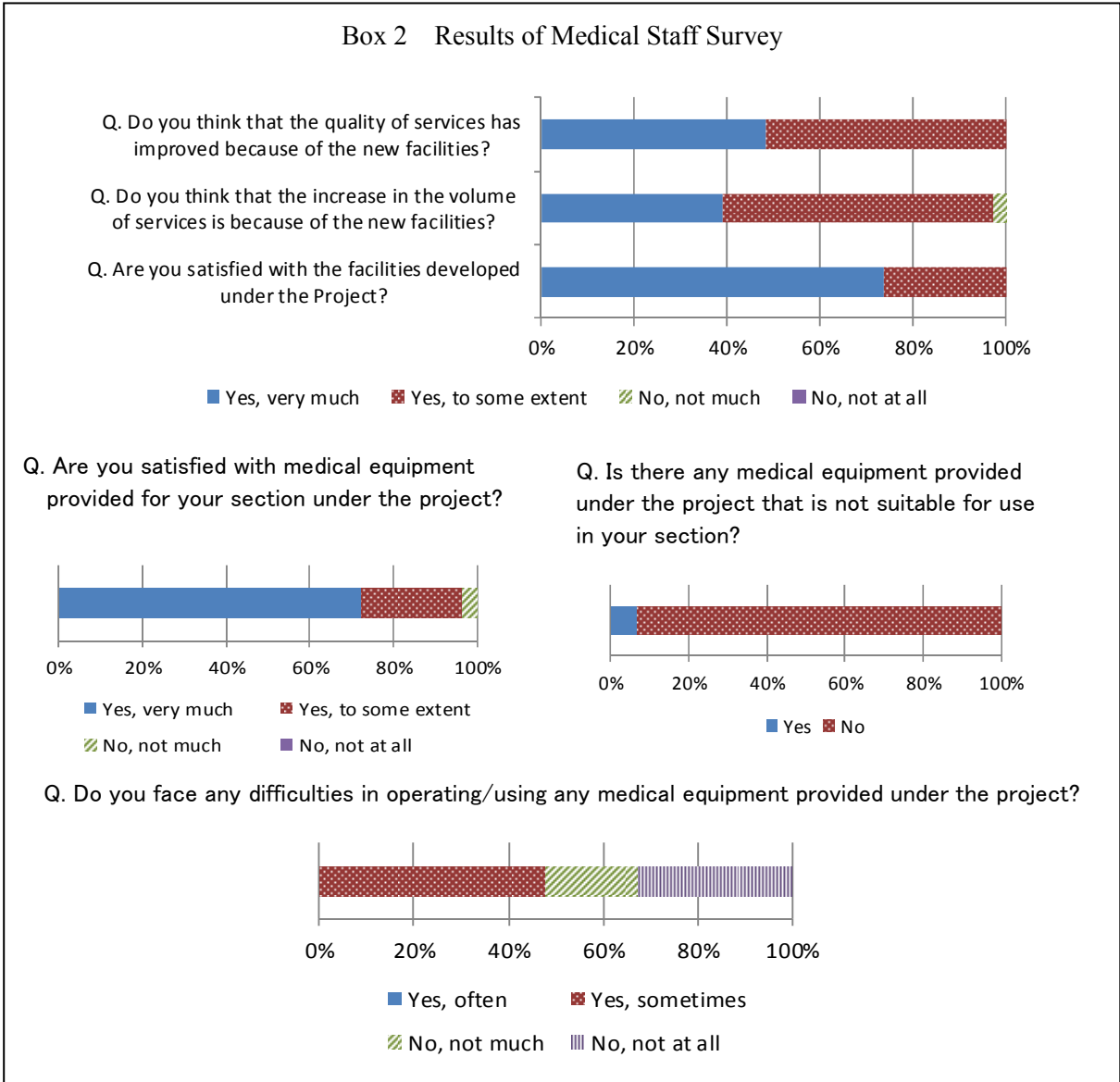
A survey of medical staff of the target hospitals<sup>13</sup> conducted during the ex-post evaluation study revealed that they are mostly satisfied with the facilities developed and the equipment procured under

<sup>11</sup> Ibid.

<sup>12</sup> Some medical staff interviewed commented that analogue scales would have been better. A consultant for the follow-up study on the project also recommends analogue scales in view of the availability of parts. (Interview with the representative of the Medical and Educational Supporting Organization for Asian Children (MESOAC))

<sup>13</sup> The survey was conducted in the same eight target hospitals as the beneficiary survey. A total of 57 medical staff members, 5–11 from each hospital, responded. Out of 57 respondents, 25 are doctors and dentists, 18 nurses, 7 laboratory technicians and 7 others.

the project. Almost 100% of the 57 respondents are satisfied and approximately 70% of them answered “very satisfied” (See Box 2). Almost all the respondents acknowledged the contribution of the project to increasing the number of patients and the improvement in the quality of medical services, though they believe that the project is not the sole reason. They consider that physical examinations, deliveries and tests have particularly been improved. Although few gave complaints about the constructed facilities, many of the respondents in one of the surveyed hospitals noted that an installed septic tank is too small (See 3.3.1 Environmental Impact).<sup>14</sup> For questions regarding the operation of the equipment, the top answer was that they sometimes find it difficult to operate. However, this is mainly due to mechanical troubles, and common technical difficulties among different hospitals were not found. On the other hand, all the surveyed hospitals noted some difficulties in maintenance of the equipment (See 3.5.2).



<sup>14</sup> The same issue was raised in another hospital that received assistance for renovation of some facilities under Japan’s Grassroots Grant Aid Scheme.

### **3.2.2.3 Improvement of Maintenance System**

In addition to facility construction and equipment supply, some technical assistance was provided through workshops on hospital maintenance and monitoring visits by consultants. It aimed to define a hospital maintenance system in each target hospital and encourage them to engage themselves in routine maintenance activities.

According to a questionnaire and interview survey of hospital staff, each hospital has in place a routine checking system and a reporting system on the condition of medical equipment with a designated person in charge for the entire hospital or for each section.<sup>15</sup> Routine checking sheets have been filled out more or less regularly in all the surveyed hospitals. An annual activity plan for maintenance introduced in the above-mentioned workshops has been prepared in some of the target hospitals. In other hospitals, the activity plan has been abolished and targets and indicators on maintenance activities have been set as part of minimum requirements (MRs) to meet for hospital operations, which is a concept that the MoH is promoting.<sup>16</sup> In both cases, medical staff feel that planned maintenance activities have been implemented to some extent but not sufficiently.<sup>17</sup> Medical staff in each hospital recognize the importance of maintenance and point out that they do not have sufficient skills and knowledge required for proper routine maintenance/checking.

## **3.3 Impact**

### **3.3.1 Impacts on the Natural Environment**

The project stipulated that waste from target hospitals be disposed through methods that reduce the burden on the environment. It was planned that wastewater from the laboratories, which contains small amounts of toxic substances, was to be discharged after undergoing a combined treatment, which is the same method through which other wastewater from the hospital is treated. This was considered appropriate as the number of tests is small, and little wastewater was expected to be produced from the tests. It was confirmed that wastewater from tests has been treated in the planned way at the six hospitals constructed under the project.<sup>18</sup> Although the number of tests has increased substantially from the time of the project planning, combined treatment is a standard treatment method adopted by the MoH and therefore it can still be considered appropriate.

Developing fluid for X-ray film was, according to the basic design of the project, supposed to be

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<sup>15</sup> One hospital among the surveyed eight hospitals has no designated person in charge.

<sup>16</sup> The concept of MRs was introduced under Japan's technical cooperation project for strengthening health services for children (2002–2007) and is being expanded across the country by the MoH. Although the annual activity plan introduced in the workshops was prepared applying the same concept, the MR concept that the MoH has adopted is intended for entire hospital operations, not only for hospital maintenance, and therefore maintenance issues are only partly dealt with.

<sup>17</sup> Top answers given to the question of whether annual maintenance plans have been followed were: "Yes, very much" (33%) and "Yes, to some extent (51%). With regard to MRs on maintenance of medical equipment, answers were "All of them have been met" (36%), "Most of them have been met" (21%), and "Some of them have been met" (34%).

<sup>18</sup> On the other hand, in the remaining four hospitals that did not receive facility support from the project, wastewater from the laboratory is discharged untreated into a hole in the ground or into the drainage system.

stored in a tank and collected by the MoH. However, it has been treated in the same way as other wastewater in a septic tank at four hospitals out of the five hospitals that the project supplied X-ray units. At the remaining hospital, it has been discharged untreated into a hole dug in the ground. Although the MoH advises hospitals to store waste developing fluid, the Ministry does not collect it and there is no Ministry standard on a disposal method.<sup>19</sup>

In Champasak DH in the northern province of Champasak, the septic tank installed in the project is unable to treat all wastewater from the hospital and therefore excess wastewater is pumped out and released untreated into the drainage system. Septic tanks for hospitals in the south were designed and installed in consideration of high ground water levels, which makes percolation of wastewater into the soil difficult.<sup>20</sup> Furthermore, the capacity of the septic tanks was determined applying the standard design employed by the Ministry of Communications, Transport, Posts and Construction of Laos.<sup>21</sup> However, as the number of patients increased more than anticipated, more wastewater was produced than initially estimated.<sup>22</sup> Champasak DH plans to install another septic tank at their expense.

Regarding solid waste, all the target hospitals send some of their medical waste such as needles to Provincial Hospitals. It was recommended in the project plan that flammable waste be collected and buried. However, in the MoH's standard design of DHs, a locally manufactured incinerator was adopted, which generates dioxin when incinerating at low temperatures. Five of the six hospitals constructed under the project have been disposing flammable waste in the recommended way. Champasak DH, on the other hand, has been burning flammable waste dumped in a hole dug in the hospital's premises. Incineration has often been hampered in the rainy season causing waste to flow into a drainage ditch.<sup>23</sup> Waste has been incinerated also in Sangthong DH, Pak Ngum DH and Outhompon DH. In fact, many DHs do not have the budget to install an incinerator and there are no dumping sites for them designated by the district administrations. MoH is directing those DHs to incinerate waste in a hole, though they are aware of its environmental implications.

### **3.3.2 Other Impacts**

The MoH plans to make the design of DH facilities developed by the project the Ministry's standard design and encourages the Provincial Health Offices as well as development partners to adopt the design. The Ministry intends to draft a standard guideline for designing of DHs in the near future<sup>24</sup>.

No other impact, positive or negative, has been observed. Resettlement and land acquisition were not

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<sup>19</sup> Interview with the Department of Health Care, MoH.

<sup>20</sup> Interview with the main consultant of the project.

<sup>21</sup> Basic design study report (2005).

<sup>22</sup> Interview with hospital officials and the Department of Health Care, Ministry of Health. Kongsedone District Hospital in the south, which was renovated under Japan's grass-roots grant aid scheme, is facing the same problem.

<sup>23</sup> Champasak hospital officials.

<sup>24</sup> Interview with Department of Healthcare, MoH

required for the project.

Though some issues have been identified regarding waste management, the project has largely achieved its objectives and therefore its effectiveness is high.

### 3.4 Efficiency (Rating: ③)

#### 3.4.1 Project Outputs

Under the project, hospital facilities were constructed in six of the 10 target DHs and medical equipment was provided for all the 10 hospitals. Technical assistance on hospital maintenance was also provided. Planned outputs of the project were produced. Details of the outputs are shown in the table below.

Table 1 Planned and Actual Outputs

Planned	Actual	Changes from the plan
Construction of facilities (Six DHs: Khoua, Sing, Houn, Kenthao, Songkhone, Champasak)		
Outpatient block, inpatient ward, MCH block, surgery block (with or without an operation theatre), administration block, utility block (electric facilities and water supply facilities)	Almost as planned	- Change in the location of the utility block (Champasak DH) - Change in the location of the utility block (Sing DH and Houn DH), a water tank (Sing DH) and a septic tank (Houn DH) - Minor additions, specification changes and location changes of facilities (all the six DHs)
Procurement of medical equipment (6 DHs in the northern and the central regions: Khoua, Sing, Houn, Kenthao, Pak Ngum, Sangthong)		
Outpatient consultation room: Examination table, examination light, instrument set for examination, height and weight scale Dental room: Dental unit, dental instrument set Laboratory: Microscope, centrifuge, refrigerator X-ray room: X-ray unit (for Kenthao DH only) Middle surgery room: Treatment table, instrument set for treatment, resuscitation set, sphygmomanometer, suction unit, stretcher Inpatient ward: Wheel chair, treatment trolley, stethoscope, sphygmomanometer MCH block: Examination table, gynecology, instrument set for MCH, delivery table, instrument set for delivery, infant warmer, weight scale for neonate	As planned	None
Procurement of medical equipment (Four DHs in the southern region: Outhompon, Songkhone, Khongsedone, Champasak)		
In addition to the above equipment, the following equipment was procured: Outpatient consultation room: Ultrasound scanner (for Outhompon DH, Khongsedone DH, Champasak DH only), X-ray room: X-ray unit, mobile X-ray Operating theater: Anesthesia apparatus, electrosurgical unit, X-ray film illuminator, operating table, operating light, stretcher, autoclave	As planned	None
Technical assistance (all the 10 hospitals)		



Workshops on hospital maintenance, monitoring and evaluation visit by consultants	As planned	None
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Source: Basic Design Study Report (2005), Project Completion Reports (2007, 2008, 2009), Reference documents provided by JICA.

There were some minor changes from the plan, such as location changes of a few facilities and addition of some facilities, none of which incurred additional costs and an extension of the project period.

Works and procedures that were to be undertaken by the Lao side prior to the project implementation, such as land levelling and acquisition of necessary permits and approvals were all carried out in each site as planned. In addition to those planned works, the Lao side took measures to prevent landslides around Khoua DH. Some utility works such as works to establish a connection to high-voltage electricity lines and to the public water supply network did not finish by the completion of the project but were completed shortly after. Exterior works such as road and fence construction were undertaken in each site after the project completion.

### 3.4.2 Project Inputs

#### 3.4.2.1 Project Cost

The actual cost of the project was as planned: amounting to 1,172 million yen — nearly 100% of the estimated cost of 1,174 million yen. The capital cost borne by the Lao side was 27 million yen, far exceeding the planned amount of 5 million yen.<sup>2526</sup> This excess was due to costs of exterior works, which were not included in the original estimate.

#### 3.4.2.2 Project Period

The project period (from the detailed design up to the project's completion) was 33 months: shorter than the planned 37 months.

Both the project cost and the project period were within the plan and therefore the efficiency of the project is high.

## 3.5 Sustainability (Rating: ②)

### 3.5.1 Structural Aspects of Operation and Maintenance

The finances of the target DHs are managed by the respective District Health Offices (DHO), as at the time of project planning. However, unlike at that time, the Director of each target DH is now separately appointed from the Director or the Deputy Director of the DHO. This is because the MoH is

<sup>25</sup> The actual costs borne by the Lao side do not include the costs borne by three of the four hospitals that received equipment support only since data was not available. However, the total estimated cost for the three hospitals was less than 100,000 yen according to the Basic Study Design Report.

<sup>26</sup> Converted at the exchange rates used in the basic design study (1 USD=110.69 yen) and at the time of the project completion (1 LAK=0.009 yen), respectively.

planning to separate the DHs from the DHOs. In the near future, the DHOs will assume a role in the implementation of health promotion campaigns and other MoH projects, whilst the DHs will be responsible for treatment and hospital management.<sup>27</sup>

The manpower of most of the target DHs has been enhanced or even doubled in some cases, though it has not changed from the time of project planning in three of the DHs.<sup>28</sup> The number of high-level and middle-level staff<sup>29</sup> has increased in all of the target DHs. Most of the DHs have more doctors (high-level) and medical assistants (middle-level), in particular.<sup>30</sup> Despite such increases, all of the target DHs claims shortages of doctors, especially specialists, such as anaesthetists, gynaecologists, paediatricians and surgeons. New appointments, in terms of number and post, are determined by the MoH and DHs cannot be certain about the prospects of increases in medical staff. However, the MoH is planning to strengthen the manpower of DHs and of health centers.<sup>31</sup>

For the maintenance of hospital facilities and medical equipment, each target DH has a system for daily checking and reporting in place, as mentioned above. (See 3.2.2.3 Improvement of Maintenance System.)

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

No major issues regarding the operation of provided equipment were identified during the ex-post evaluation study. (See 3.2.2.2 Appropriateness of Constructed Facilities and Procured Equipment) Almost all the target hospitals have personnel with qualifications and skills to operate all the provided equipment. The personnel required to conduct X-ray tests and ultrasound examinations have been newly assigned or trained in those DHs that had an X-ray unit (5 DHs) and/or an ultrasound scanner (3 DHs) installed under the project for the first time. On the other hand, one of the target DHs has no dentist to operate the dental unit, which was also newly installed in some DHs, due to the resignation of the dentist who was to provide dental services after the project. Although there is a medical assistant undertaking dental training at his own expense, it is uncertain whether he will return to the hospital after the training. Though there has been no dentist in two other hospitals as well due to personnel reshuffles, both of the hospitals have a volunteer with a license to provide dental treatment. In the surgical arena, five target DHs in the northern and central regions do not have anaesthetists and/or surgeons to use the installed middle surgery room and the provided instruments for mid-scale operations. However, it should be noted that the project did not intend an increase in the number of operations in those hospitals, but rather their readiness in terms of facilities for emergency cases, as

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<sup>27</sup> Interview with DH officials.

<sup>28</sup> However, there is a possibility that some target DHs include staff members on long-term leave for training in their staff numbers.

<sup>29</sup> According to the MoH's classification, high-level staff have expertise in relevant areas such as medicine or pharmaceuticals and middle-level staff have basic medical knowledge.

<sup>30</sup> In Khoua DH in the northern district of Phonsaly, 14 doctors/medical assistants are on long-term leave for training with financial assistance from the Asian Development Bank.

<sup>31</sup> Interview with Department of Health Care, MoH. A decree to increase the manpower of DHs and health centers was issued.

explained earlier. (See 3.2.2.2)

Overall, each target DH is mostly capable of operating the provided equipment. However, in order to use the provided equipment more effectively and to expand services, the assignment of more doctors and medical assistants, as well as the enhancement of those already in service in target DHs, is necessary. As far as training is concerned, opportunities are limited for many of the target DHs, except for the hospitals supported by development partners. Furthermore, the DHOs have not provided any training for staff of the DHs under their jurisdiction.

Each target DH recognizes the shortage of knowledge required for routine checking of equipment and the need for training to overcome the problem. In the medical staff survey mentioned above, the top answer to the question about problems regarding equipment maintenance was that they do not have personnel with maintenance skills (70% of respondents). In addition, some respondents pointed out improper routine checking (14%). In fact, the above-mentioned follow-up study on the project found that some problems with equipment could have been avoided through proper cleaning and routine checking.<sup>32</sup> Some medical staff of the target DHs also complained about services offered by the Medical Equipment Service (MES) of the MoH: 28% of the respondents of the medical staff survey answered that the MES does not have skilled maintenance staff, and 14% pointed out that responses from the MES to repair requests are slow.

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

DHs come under the DHO in their respective district, which looks after the financial management of the hospital. The expenditure of each DHO that controls a target DH has increased about two to four times from their budgets for 2004. The expenditure for the operation and management of the DH has increased accordingly — a three to nine times increase for the six DHs that received support for facility improvement on one hand, and five to 30% increase for the remaining four DHs on the other.

Although the expenditure of each DHO for the operation and management of the DH (excluding personnel expenditure) under their control has also increased, they are still seriously short of funds for that purpose, and its share of the total DHO expenditure remains at the same level as in 2004 (4–9% in 2011 and about 6% in 2004). The shortfall has been, to some extent, made up for by profits from the Drug Revolving Fund (DRF),<sup>33</sup> which has risen at a rapid pace over the last few years. The DHs have also increased their incomes from charges for certain services such as document preparation and testing, and for beds. Such an increase of DH revenue, however, is not sufficient to cover required maintenance costs and it remains difficult for them to procure parts that are expensive or require high transportation costs. As a consequence, in some cases, DHs purchase a cheap new product rather than

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<sup>32</sup> Draft follow-up study report.

<sup>33</sup> DHs can purchase consumable supplies such as medicine, bandages and X-ray films from the MoH via the Provincial Health Office and set selling prices by adding a premium of up to 25% of the original price.

procuring a part required for damaged equipment at a high cost, or they use old equipment instead of repairing the new one.

DHs can make requests to the government for the allocation of funds in the following year for repairing equipment, including procurement costs for parts if the entire cost is high. Although the chance of receiving the funds is limited, some requests have been accepted by the government.

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

The current status of operation and maintenance of equipment provided under the project was scrutinized in the above-mentioned follow-up study on the project, which found some problems in all of the target hospitals. Common problems include: the reduction or expiration of battery life of digital height and weight scales (all the 10 DHs); the deterioration of the surface of sphygmomanometers (all the 10 DHs); the expiration of battery life of operating lights (9 DHs); problems with dental units (7 DHs); and problems with the illumination lamp or lighting circuit of microscopes (4 DHs).<sup>34</sup> Target DHs share problems because most of the common problems were caused by the conditions in which problematic equipment has been used, or the equipment's battery life has expired.<sup>35</sup> Some small instruments, such as sphygmomanometers, have often been used outside, which accelerates their deterioration. Even some batteries or simple parts need to be procured from outside the country, but it is often the case that DHs procure them by themselves without requesting the MES to procure them in an effort to reduce the procurement cost. As a result, DHs sometimes cannot find the necessary batteries or parts, leaving the equipment unusable for a long time, or they procure parts of the wrong size or of inappropriate quality. With regard to the dental units, supplied water containing a high level of calcium has caused clogging of pipes, plumber valves and handpiece nozzles. Though the problems were solved by proper cleaning by the follow-up mission team, the cleaning method may be difficult for medical staff to learn<sup>36</sup> and therefore it is likely that the same problems will occur again. In addition to these common problems, there are individual problems in each hospital. One or two hospitals have problems with such instruments as autoclaves, anaesthesia apparatus, ultrasound scanners and X-ray units. A few of the problems were caused by improper usage of the instruments without sufficient understanding of how they work or what they do.<sup>37</sup>

There was no major problem found regarding the maintenance of installed facilities. Minor problems identified in the follow-up study or in the ex-post evaluation study include the suspension of the automatic water supply system (3 DHs) and the expiration of battery life of generators (2 DHs). The follow-up study mission found that the mishandling of the automatic water supply system at the time of power recovery caused its suspension.<sup>38</sup> In addition, there is no operation and maintenance manual

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<sup>34</sup> Draft follow-up study report.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid.

for the water supply system and therefore routine and regular maintenance has not been done. There were problems with toilets as well. Although the team for the one-year warrantee inspection of the constructed facilities commented that the DHs should educate users not to throw foreign articles into toilets, the toilets got clogged in three DHs and were made unusable for a long period of time in two of the three hospitals. One DH decided to close them for the time being as they found it difficult to educate users and have made old pit latrines available to them instead.<sup>39</sup>

As seen above, some problems have been observed in terms of the technical and financial aspects of operations and maintenance and therefore the sustainability of the project effect is fair.

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

### **4.1 Conclusion**

The project was intended to improve the quality of healthcare services offered by ten target DHs by installing necessary facilities and equipment. This objective is in line with the development policy of the Lao Government, the development needs of the country, as well as Japan's assistance policy for Laos at the time of planning. Thus, the relevance of the project can be evaluated as high. The number of patients for major healthcare services has increased — in many cases to a great extent — in most of the target DHs, and the level of hospital user satisfaction with services offered by target DHs was found to be very high. In view of these findings, it can be concluded that the project has produced sufficient effects. Although wastewater and solid waste has been disposed of differently from the methods stipulated in the project plan, which raises some concern about environmental implications, the disposal methods practiced by some DHs are in most cases not violating the MoH's environmental standards or their advice. Taking this fact into consideration, the effectiveness and the impact of the project can be evaluated as high. The project was also efficiently implemented with inputs executed and outputs produced almost as planned. However, there are some challenges in respect to maintenance of provided equipment and therefore the sustainability of the project effect is considered fair.

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

### **4.2 Recommendations**

#### **4.2.1 Recommendations to the Executing Agency**

##### **(1) Provision of training opportunities**

Although the medical equipment provided under the project is not difficult to operate, target DHs stress the need for training on maintenance and daily checking of the equipment. Since neither the MES nor the DHO has the budget for the provision of training, the only available opportunities are offered on special occasions, such as development partner-supported projects. It may be difficult for

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<sup>39</sup> Officials of the three hospitals commented that the very low literacy rate in their districts made it difficult to educate users.

the MoH to provide training for DHs on a regular basis, but they can explore the possibility of offering it when the need is high. DHs are advised to present their specific training needs to the MES and the MoH in this regard.

(2) Establishment of a system that makes MES visits to DHs easier

The follow-up study mission supported by JICA solved many of DH's problems with medical equipment or clarified what to do with them. Target DHs are eager for such opportunities, specifically regular visits by the MES. However, the current system is that they visit DHs on a request basis and at the DH's expense. It is recommended that the MoH establish a new system to facilitate MES visits to DHs, such as joint requests by a few DHs located in the same district or neighbouring districts.

(3) Actions to reduce environmental load

The ex-post evaluation study found that environmental policies of the project has not been observed in some DHs. Developing fluid for X-ray films has been treated in the same way as other kinds of wastewater, while the project policy was that it should be stored by DHs and collected by the MoH. Although the MoH does not collect developing fluid, it has advised DHs to store and sell it. The MoH needs to ensure that such advice has been observed by the DHs. As far as solid waste is concerned, it has been burned in a way which raises concerns about the generation of dioxin in five target DHs despite the project plan's stipulation that it be buried in the government-designated sites. It is recommended that the MoH ensure through the Provincial Health Offices that all target DHs have a designated dumping site. The MoH should also take swift action through the Provincial Health Office to prevent the spillover of garbage when it rains in Champasak DH.

#### **4.2.2 Recommendations to JICA**

There is no particular recommendation to JICA.

#### **4.3 Lessons Learned**

(1) Instructions on maintenance of equipment

In the ex-post evaluation study, issues regarding the procurement of parts and the maintenance of medical equipment were identified. Since many parts for medical equipment are not available in the domestic market in Laos, the procurement of parts for new equipment is always difficult, particularly for hospitals in rural areas. However, there is room for improvement in routine checking and preventive maintenance by DHs, as well as procurement of parts. Given the fact that target DHs share problems with simple equipment such as sphygmomanometers, it would be effective in a project which involves the provision of medical equipment, to provide detailed technical assistance under the project on basic maintenance skills and procurement of parts. Careful examination of equipment to be provided is also important.

## (2) Criteria on the selection of some equipment

Although it can be argued that medical equipment provided under the project was more or less appropriately selected (See 3.2.2.2 Appropriateness of Constructed Facilities and Procured Equipment), the ex-post evaluation study as well as the follow-up study on the project revealed that many DHs have not been able to procure batteries or parts for routinely used and relatively inexpensive equipment, such as height and weight scales and microscopes. Since DHs do not have sufficient financial resources for maintenance, it would be more appropriate, as far as simple and commonly used equipment is concerned, to give priority to equipment that does not involve high procurement costs for parts.

## (3) Measures for environmental protection

The ex-post evaluation study revealed some environmental concerns. The above-mentioned issues over the disposal method of solid waste and of developing fluid for X-ray films are found throughout hospitals in Laos and are not regulated by the government. In such cases, it is necessary to build a consensus on specific measures through sufficient discussion between the Japanese and the recipient sides at the planning stage, and if it appears that the measures that the Japanese side find appropriate are difficult for the recipient government to execute, consideration should be given to include countermeasures in the project plan, such as the instalment of an incinerator in the case of this project.