People's Republic of China

Ex-Post Evaluation of Japanese ODA Loan
Public Health Infrastructure Facility Improvement Project
(Hunan Province, Jiangxi Province, Anhui Province, Shanxi Province, Jilin Province, Heilongjiang Province, Liaoning Province)

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0. Summary

This project aimed at procuring equipment and developing human resources in order to reinforce China's weak public health system that was exposed during the outbreak of SARS. A high relevance of the planning and design of this project is recognized based on the timely execution of the required equipment procurement and training, and the consistency with the Chinese government's policy as well as the need to strengthen the public health system at that time. The project's effectiveness is high as the development of an appropriate project plan led to raising the levels of prevention, testing and therapeutic capabilities of the Centers for Disease Control and Prevention (CDC), infectious disease hospitals and emergency centers that are the core of the public health system. This effect is also reflected in the improvement of the response to infectious diseases such as the novel avian influenza that broke out after the implementation of the project. With the exception of the human resources development, the project was carried out within a period that was nearly according to the plan and the total cost was also kept within the plan, therefore the efficiency of the project is considered fair. Many of the distributed equipment were still being effectively utilized at the moment of the ex-post evaluation under an appropriate management system. Furthermore, judging from the Chinese government's policy that emphasizes the strengthening of the public health system, there are no major concerns in the institutional and financial sustainability as well.

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

1. Project Description

Project Locations

Negative pressure emergency ambulances acquired by the Project (Heilongjiang province)

1.1 Background

In China, the number of cases of legally-designated infectious diseases had been decreasing dramatically since the 1990s. However, the appearance of emerging infectious diseases such as HIV/AIDS and the problem of public health in rural areas[1] where the incidence of infectious diseases was still high, continued to be critical issues to the healthcare sector. Under such circumstances, Severe Acute Respiratory Syndrome (SARS)[2] broke out in November 2002 and spread rapidly throughout China reaching a cumulative total number of 5,327 patients and 349 deaths. This spread of SARS exposed the vulnerability of the public health infrastructure represented by flaws in the Chinese infectious diseases countermeasures, information network and vigilance system, as well as the lack of maintenance and aging of various medical facilities. Given such situation, the Chinese government drew up a master plan targeting the entire country including programs such as the "Plan for the construction of disease prevention and control systems" and the "National plan for the construction of medical treatment systems in case of public health emergency" and embarked on the establishment of a surveillance network, maintenance of the emergency system, improvement of the disease prevention and control system, etc. in order to enhance the basic infrastructure for public health.

1.2 Project Outline

This project covers seven inland provinces in China and its objective is to improve the vulnerability of the public health system uncovered by the SARS calamity and to strengthen measures against infectious diseases in provincial and prefectural-level cities[3] by procuring equipment and developing human resources in basic facilities involved in public health, thereby contributing to the improvement of the health of local residents.

The specific content of the project is shown below. It is comprised of provision of medical equipment to facilities inside the public health system that are responsible for conducting prevention, testing and therapeutic practices, as well as a variety of training programs directed at health care professionals. The details of the equipment to be procured and the training content were planned according to the actual situation of each province.

[1] There were issues that were specific to rural areas, such as lack of medical doctors due to their outflow to rapidly-growing urban areas, an undeveloped health-care insurance system, and a higher risk of domestic animals infectious diseases compared to urban areas due to rural areas concentrating mostly on stock farming.
[2] Official name: Severe Acute Respiratory Syndrome.
[3] An administrative division in China which is equivalent to a "City" in Japan.

Table 1: Outline of the project

Entities	Main functions and content of the assistance
Centers for Disease Control and Prevention (CDC) 7 provinces 91 sites	**1.** Function: administrative and executive public health agency with the combined roles of both health care center and public health research institute. Their main tasks are the prevention and control of the top ten diseases, preventive immunization, supervision of food sanitation, etc. **2.** Content of the assistance: a variety of sample-analysis equipment, information equipment, mobile emergency-testing laboratories, among others.
Infectious disease hospitals 7 provinces 85 sites	**1.** Function: actual testing and treatment of patients with infectious diseases. **2.** Content of the assistance: diagnostic equipment, disinfection and treatment equipment, ambulances, beds, among others.
Emergency centers 5 provinces 19 sites	**1.** Function: emergency transportation and first-aid attention. **2.** Content of the assistance: diagnostic equipment, disinfection and treatment equipment, ambulance, among others.
Human resources development training	**1.** Content of the assistance: dispatch of personnel involved in infectious diseases countermeasures to a higher level administrative facility and/or to training courses in Japan (with the exception of Jilin Province), invitation of specialists from Beijing and Shanghai.

Figure 1: Exterior view of the Xiangtan City CDC

Figure 2: PCR[4] machine (thermal cycler) at the Jiangxi provincial CDC

A list of the main equipment distributed to each facility is shown below.

[4] Abbreviation for "Polymerase Chain Reaction". It is a diagnostic method that identifies virus, etc. present in the sample by amplifying the DNA in a short time.

Table 2: Example of equipment procured by the project

	Detailed examples
CDC	
1. Laboratory equipment	85 types (super-speed refrigerated centrifuge, gas chromatograph, etc.)
2. Specialized laboratories	P2-3 laboratories, incubators, etc.
3. Equipment for health education	Video cameras, etc.
4. Information equipment	Web server, etc.
5. Vehicles	Mobile emergency-testing laboratories, etc.
6. Cold-chain facilities and instruments	-20°C freezer
Infectious disease hospital	Example: at 800 beds level hospital (equipment to be procured was determined according to the number of beds)
1. Emergency-related equipment	13 types (respirator, defibrillator, etc.)
2. Radiological and other diagnostic equipment	15 types (MRI, CT, X-ray imaging apparatus, etc.)
3. Biochemical analysis equipment	32 types (biochemical analysis apparatus, etc.)
4. Surgical equipment	7 types (multi-functional anesthesia machine, etc.)
5. Disinfection-related equipment	7 types (ultraviolet light sterilization vehicle, etc.)
6. Treatment-related equipment	4 types (ultrasonic atomizer, etc.)
7. Decoction equipment	2 types (Chinese medicine decoction equipment, packaging machine)
8. Others	8 types (ambulances, etc.)
Emergency centers	
1. Normal ambulance, 2. Negative pressure ambulance, 3. Electrocardiograph, 4. Defibrillator, 5. Aspirator	

It should be noted that the Public Health Infrastructure Facility Improvement Project agreed to the granting of a Japanese ODA loan in March 2004 and was implemented in the 10 provinces listed below as targets. However, considering the difference in project completion timing between provinces, this ex-post evaluation study was conducted focusing on the seven provinces in which the loan disbursement was finalized as of 2010.

1. Shanxi Province, 2. Liaoning Province, 3. Jilin Province, 4. Heilongjiang Province, 5. Anhui Province, 6. Jiangxi Province, 7. Hunan Province, 8. Hebei Province, 9. Henan Province, 10. Hubei Province (from which 1-7 was covered by this evaluation)

Loan Approved Amount / Disbursed Amount	16,969 million yen / 16,021 million yen
Exchange of Notes Date / Loan Agreement Signing Date	March 2004 / March 2004
Terms and Conditions	【Equipment】 Interest Rate: 1.5% Repayment Period: 30 years (Grace Period: 10 years) General untied 【Training】 Interest Rate: 0.75% Repayment Period: 40 years (Grace Period: 10 years) General untied
Borrower / Executing Agencies	Borrower: the Government of the People's Republic of China Executing Agency: (1) Hunan Province People's Government (Health Department) (2) Jiangxi Province People's Government (Public Health Department) (3) Anhui Province People's Government (Finance Department) (4) Shanxi Province People's Government (Finance Department) (5) Jilin Province People's Government (Health Department) (6) Heilongjiang Province People's Government (Health Department) (7) Liaoning Province People's Government (Health Department)
Final Disbursement Date	August, 2010
Feasibility Studies, etc.	F/S made by the Chinese side
Related Projects	【Japanese ODA Loan】 • Public Health Infrastructure Facility Improvement Project Post-training (Jiangxi, Heilongjiang provinces) (2011) 【Technical Cooperation】 • Poliomyelitis Control Project (1991-1999) • National Public Health Policy Plan Management Project (2012-2016) 【Grant Aid】 • Expanded Program on Immunization (1999) • Program for Tuberculosis Control in Disadvantaged Areas (2000-2006) 【Other donors, agencies】 • The World Bank: a number of loan projects such as the "Rural Health and Medical Education Project" (1984), "Rural Health and Preventive Medicine Project" (1986), "Infectious and Endemic Disease Control Project" (1991-2002), "Ninth Health Project" (2009), "TB

	Control Project" (2001-2010), etc. • British Department for International Development (DFID)/Canadian International Development Agency (CIDA): "Province, City and County-level Hospital Medical Equipment" (1998-2002) • The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM): "Nationwide Expansion of Directly Observed Treatment, Short Course to Fight the TB Epidemic in China" (2003), etc.

2. Outline of the Evaluation Study

2.1 External Evaluators

Kenji Momota, Hiromi Suzuki S., Shima Hayase (IC Net Limited).

2.2 Duration of Evaluation Study

Duration of the Evaluation Study: August, 2012 - October, 2013

Duration of the Field Studies: April 19, 2013 - April 26, 2013 (Hunan and Jiangxi provinces); May 14, 2013 - May 23, 2013 (Shanxi and Anhui provinces); May 18, 2013 - May 30, 2013 (Heilongjiang, Jilin, and Liaoning provinces); August 5, 2013 - August 23, 2013 (Hunan, Jiangxi, Liaoning, and Anhui provinces) .

2.3 Constraints during the Evaluation Study

The present evaluation is an ex-post evaluation of seven projects that covered seven provinces in China. In real terms, each province implemented the project independently within an established project framework, thus it was determined that it was realistically difficult to consider all seven projects as one. For this reason, the present evaluation established a common evaluation framework as well as evaluation viewpoints, and based on these, each province's implementation content was evaluated as independent projects. On this basis, the results of each province were summarized and a general evaluation was derived from the analysis of the overall trend. Besides the use of a comprehensive evaluation method, the actual inspection adopted a sample extraction approach on which the assessment of the existing situation was based. It was necessary to follow this method because each province has an enormous number of facilities assisted by the project, which made it difficult to examine all of them. The different analyses that are described below were derived from the analysis of these samples and have constraints on statistical reliability.

3. Results of the Evaluation (Overall Rating: A[5])

3.1 Relevance (Rating: ③[6])

3.1.1 Relevance to the Development Plan of China

1) Development plan at the moment of the project planning

China's "10th Five Year Plan (2001-2005)" established the strengthening of emergency and disease prevention systems in urban areas thorough the promotion of monitoring and containment of infectious and endemic diseases. Similarly, the "10th Five Year plan (2001-2005)" of the respective provinces touched upon strengthening of the disease prevention system, maintenance of the sanitary management system, information network, strengthening of diverse surveillance systems, and the like. Nevertheless, the 2002 SARS outbreak caused heavy damage throughout China including the death of 349 persons. The reason behind this situation was the weak public health infrastructure which in turn resulted in the incapability to implement effective countermeasures. Based on the above, programs such as the "Plan for the construction of disease prevention and control systems (CDC)" and the "Plan for the construction of medical treatment systems in case of public health emergency" were formulated, and a national plan for the reinforcement of basic public health facilities was elaborated. This project was considered as one of the projects that aimed to materialize these programs.

2) Development plan at the moment of the ex-post evaluation

The current "12th Five Year plan (2011-2015)" sets forth the "establishment of a sound basic public service system". In terms of establishing a basic healthcare system, it aims to strengthen the public health service system, reinforce the urban and rural medical service system, restore the medical insurance system, complete the medicine supply security system, active and steady advancement of the reform of public hospitals, etc.

In particular, the following three points are considered to be the focus areas: the development of a basic medical insurance system that covers the whole population; the application of a new operation system in the basic drug supply system and at end medical health agencies; and the reform of public hospitals. As a concrete target, the plan aims to increase the public health service cost per capita to equal or above 40 yuan in 2015.

3.1.2 Relevance to the Development Needs of China

1) Project development needs at the planning stage

The public initiatives applied to the public health of the 7 provinces covered by this project were inadequate compared to other provinces. The needs for developing basic disease prevention systems and health management systems such as renovation and extension of basic public health facilities, procurement of equipment, and reinforcement of the capabilities of the personnel

[5] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[6] ③: High, ② Fair, ① Low

involved in infectious diseases response were high. For example, the "number of hospital beds per 1000 population", which is a representative indicator that measures the level of public health performance, was 3.8 in one of the provinces of this project (Liaoning province), far behind compared to a developed country (in Japan the number was 14.6). In addition, issues such as insufficient number of healthcare professional and limited capacity proved that there was a need for comprehensive measures towards improving the public healthcare infrastructure.

2) Public health policy after project implementation and the role of this project

The Chinese government amended the "Law on Preventing and Controlling Notifiable Diseases" in 2004 in response to the 2002 SARS outbreak and established provisions such as the strengthening –of nosocomial infection prevention, the maintenance of the intra-laboratory pathogen control system, the setup of the system for reporting notifiable disease situations, the enhancement of control measures during infectious disease epidemics, the materialization of preventive treatment services, and the strengthening of financial safeguard. After a number of revisions, this law is positioned currently as the basic law that regulates infectious disease prevention. A focused development of the medical service delivery system such as the development of medical facilities and fostering and training of healthcare professionals is underway in rural and poverty areas as part of the medical and health system reforms put into effect since April 2009. As can be seen, public health service reforms are progressing continuously after the implementation of this project.

The need to strengthen the public health system increased rapidly after the SARS outbreak, but the testing system at that moment was suffering from insufficient equipment and competent staff, and in order to materialize these polices, enhancement of the overall capacity became an urgent need. This project was implemented to deal with such challenges and it can be assessed that the need was high. In fact, a novel avian influenza outbreak was reported in China when this ex-post evaluation was conducted (2013), indicating that the risk of onset of notifiable disease still exists. The risk of infectious disease epidemics is intrinsically high in China where the population is dense and the mobility of the people is high, therefore the implementation of countermeasures based on early detection remains an important issue.

This project continues to play a role as part of the public health system that was strengthened in order to respond to such situations, and its need continues to be high.

3) Planning and implementation process of the project

The number of provinces covered by this project totaled 10 spread all over China (from which this ex-post evaluation covers seven)[7] and the number of facilities covered in each province was also quite large. In order to achieve a uniformity of the whole project and an efficient procurement, the project was designed by taking into consideration its special characteristics from

[7] As mentioned in "1.2 Project Outline", this project was planned and implemented in 10 provinces in China, and a common project implementation method was applied to all 10 provinces.

the planning stage.

1. First, based on the "Law on Preventing and Controlling Notifiable Diseases", a list of equipment required to attain the required standard test systems as well as capabilities of each facility was made. Then, a procurement list that classified them into mandatory procurement equipment and recommended procurement equipment was made.
2. Each facility purchased the necessary equipment from this procurement list based on the respective region's needs and lacking equipment within the budget allocated to each facility.
3. The detailed specifications, type of machine, etc. of the equipment to be procured were decided by the health bureau of each province, and JICA only checked the presence or absence of the equipment against the procurement list and provided consent.

Figure 3: Laminar flow clean bench at the Liaoning Provincial CDC

Figure 4: Mobile emergency-testing laboratory in the Heilongjiang Provincial CDC

While the strengthening process of the public health system was calling for urgent attention, a timely input of equipment was crucial to fulfill the objectives of this project and consequently required a speedy procurement process. This procurement method can be evaluated as appropriate in order to be able to respond to such needs. The following points provide a reference for the implementation of similar projects that cover a large number of facilities in equally broad areas when an efficient project execution is being pursued.

1. In the process of creating the procurement list, a meeting with all the personnel involved was held at each facility to understand the actual needs, thus the specifications of the selected equipment had only minimum deviations from those needs.
2. The reduced and simplified process of JICA's concurrence allowed the procurements to advance rapidly; in addition, even after JICA's concurrence process was simplified, making an appropriate procurement list that did not deviate from the actual needs led to the implementation of a balanced procurement plan.

As described above, this project's implementation plan was considered as efficient as a whole.

On the other hand, although the procurement process in each province was appropriate in general, the detailed examination showed that some differences were observed in reference to the efficiency of the procurement and the degree of manifestation of the project effect. The relevance of the project design to the development needs could have been much higher if these differences had been eliminated. The following points are examples of the effects that led to higher project effects and the cases that, on the contrary, resulted in problems.

- Hunan province: although each facility applied for equipment after considering factors such as future demand, the equipment that were delivered did not match the needs (e.g. voltage mismatching, vulnerable to humidity, etc.) because the provincial health bureau put more weight on the price during the purchasing procedure[8].
- Liaoning province: following the recommendations of technical experts during the procurement selection stage, fully-automated analytical instruments that were expensive and costly to maintain at that time were purchased. This turned out to be the right choice, because afterwards, the number of required samples rose and a need to respond to such requirement increased. Repeated negotiations among the involved persons took place during the selection process. A positive result was attained, taking into consideration of the increasing speed of the Chinese public health test system at that time, and the medium- to long-term testing needs.
- Jiangxi province: healthcare professionals participated in the project management office of the province, and at the procurement list elaboration stage, after the local situation of each region's medical facilities was examined carefully; discussions were held and assistance was provided.[9]

One characteristic of the provinces that utilize the procured equipment effectively is the deep involvement of technical experts in the selection of items from the above mentioned procurement list. As a result of introducing expensive equipment in anticipation of a medium- to long-term technical innovation, following the recommendations of these experts that are familiar with the actual worksite, such equipment has been well utilized. In contrast, the selection from the procurement list has resulted in a low utilization of the equipment when only the price was prioritized.

[8] The reasons behind this decision were not clear because at the time of the ex-post evaluation as nobody involved in the project was in the executing agency anymore. However, according to interviews conducted during the site visits, there were opinions from the emergency hospitals such as "if people with knowledge on the actual medical practices had been involved in the procurement process, the quality of the equipment would have been taken into consideration as well".

[9] Specifics of the discussion process are as follows. (1) Through written notification, each facility was solicited to provide the information on the equipment that they intended to procure, and a list was prepared based on this information. (2) Documents containing technical information of equipment relevant to the project was collected by participating in nationwide medical equipment exhibitions to have a grip on manufacturers, model numbers, quality, market share, price, after-sale services, etc. (3) Guidance and opinion of specialists were deliberated in an advisory conference in which experts in radiation, ultrasound, testing, etc. of the provinces participated. (4) Staff from each facility toured similar types of institutions located in developed regions of the country (Jiangsu, Shanghai, and Guangzhou) in order to grasp the on-site situation of the equipment.

3.1.3 Relevance to Japan's ODA Policy

At the time of appraisal, Japan's assistance policy towards China was the "Economic Cooperation Plan for China (developed in 2001)", where the engagement in measures against infectious diseases including HIV/AIDS and tuberculosis and the reinforcement of human resources development, etc. were established as focus areas. Additionally, the Country Assistance Strategy also stated the strengthening of measures against infectious diseases, especially the improvement of public health infrastructure facilities and the development of human resources, as ways to deal with the vulnerability of the Chinese public health system exposed by the sudden expansion of SARS.

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

3.2 Effectiveness[10] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

The objective of this project was to strengthen the infectious diseases countermeasures and to enhance the functions that each of the facilities was expected to play, i.e. "prevention" for CDCs, "treatment" for infectious disease hospitals, and "transportation" for emergency centers. As the result of these measures, the whole public health system was expected to be strengthened, and effects such as the control of the spread of infectious diseases were expected by reinforcing and speeding up the notifiable diseases onset reporting system. The findings which are based on a sample survey[11] regarding the effects on the strengthening of these functions are indicated below.

(1) Overall function improvement: handling of sudden epidemics

The table below compares the specified time frame and the average actual time frame from the onset of an infectious disease to the official reporting. Responses were obtained from Jiangxi and Heilongjiang provinces and both show that the response time frame for the handling of Class B notifiable diseases is much shorter than the specified time frame.

[10] Sub-rating for Effectiveness is to be put with consideration of Impact.

[11] In principle, the sample survey incorporated all provincial CDCs, five sample city/municipal level CDCs, and five sample hospitals that were selected from target facilities. The sampling method was selected based on discussions with each province's Health Department. Although there were slight differences between provinces, in principle the method used was random sampling. However, since facilities that could be visited during the field surveys were included in the sample, the sampling method was not strictly random. As mentioned in the beginning in 2.3, the result of this survey does not fully reflect or grasp the overall tendency due to the limited number of investigated samples. Nevertheless, there are certain commonalities such as the fact that this project was implemented based on a common procurement content; CDCs and hospitals of each province have essentially an equivalent positioning from the legal and systemic point of view; and that the state-enforced content of the assistance and policies are the same. Given these points, it is determined that it is reasonable to assume that an overall tendency can be estimated through this sample.

Province	Specified time frames from onset to reporting	Average actual time frame
Jiangxi	Class A notifiable diseases 2 hours Class B notifiable diseases 1 day	Class A notifiable diseases 2 hours Class B notifiable diseases 7 hours
Heilongjiang	Class A notifiable diseases 2 hours Class B notifiable diseases 1 day	Class A notifiable diseases n.a Class B notifiable disease s 2 hours

Source: Provincial health bureaus questionnaire responses.

*Class A notifiable diseases: plague and cholera. Highly infectious and urgent legally-designated infectious diseases (2 diseases)

*Class B notifiable diseases: HIV, dengue fever, etc. Other legally-designated infectious diseases (25 diseases)

It is difficult to fully corroborate the connection between this project and the improvement of the time frame from the onset to reporting of infectious diseases because the strengthening of provisions and initiatives of health bureaus were involved as well. However, these health bureaus made use of the communication and multimedia equipment introduced by this project to develop an on-line infectious diseases network system connecting from the national level to the county level facilities. Currently, test results and reports on the onset of infectious diseases (or suspected cases) of each institutions are being continuously communicated online through this network allowing an immediate confirmation of the cases. It can be said that, by sharing this system among the facilities, the improvement of the testing capacity accomplished through the project led to the development of a mechanism that strengthened the whole network. Moreover, as it is mentioned below, capacity advancements achieved through this project such as the shortening of the testing time and the increase in the number of samples has had an effect of reducing the time required to identify infectious diseases. These combined efforts brought about an improvement of the public health network as a whole and contributed to the shortening of the reporting time as well.

It should be noted that accurate statistics records did not exist in the remaining five provinces and it was not possible to obtain their responses. However, considering that the above mentioned online surveillance system was introduced in all provinces collectively, it can be assumed that at least the efficiency of the response time would have progressed to some extent in the remaining provinces as well.

(2) Functional improvement of CDCs

The role of the CDCs includes items such as testing capacity, training and educational activities for residents as part of the infectious disease countermeasures. The "sufficiency rate of test items required by the Central Government" was investigated as a criterion to evaluate the testing capability which is particularly important. Currently, the CDCs specify the required test items[12] such as infectious disease testing and food inspection, etc. in accordance with the facility level and based on the Central Government Policy Enforcement No. 108 of 2004. In addition, an achievement of a proportion of testable items above the stipulated 85% is required under the

[12] For example, foot-and-mouth disease virus testing and tetanus bacillus isolation-identification testing are mandatory items in provincial level CDCs, but these are just recommended items at the city/municipal level.

guidance of the Department of Health, and the degree of achievement of this percentage is one indicator of the capability of the public health testing system. A summary of the response capability to the test items, i.e. the proportion of testable items per province based on the sample survey is indicated below.

Table 3: Current response status of the legally-set testing capabilities of each provincial CDC

Province	Legally set number of test items		Number of feasible test items				Norm (85%) Achievement status	
	Provincial CDC	City/ Municipal CDC	Provincial CDC	Sufficiency rate	City/ Municipal CDC	Sufficiency rate	Provincial CDC	City/ Municipal CDC
Hunan*	333	226	305	91.6%	170	75.2%	Achieved	Not achieved
Jiangxi*	300	226	257	85.7%	204	90.3%	Achieved	Achieved
Anhui	387	226	385	99%	n.a	n.a	Achieved	Nearly achieved
Shanxi	387	226	350	90%	n.a	n.a	Achieved	n.a
Jilin	387	226	337	87%	n.a	n.a	Achieved	Nearly achieved
Heilongjiang	387	226	387	100%	n.a	n.a	Achieved	Nearly achieved
Liaoning	387	226	330	85%	196	87%	Achieved	Achieved

Source: prepared by the evaluators based on questionnaire responses obtained from provincial health bureaus

* In the provinces of Hunan and Jiangxi the tasks of the legally-set 387 test items are shared among the provincial CDC and specialized testing organizations, and provincial and city/municipal CDCs have their own legally-set number of items unlike the other provinces.

1) At provincial level CDCs, all 7 provinces achieved 85% of the testing capability stipulated by law and the enhancement of the testing capability sought by the law was attained. Of these, the sufficiency rate of the city/municipal level CDCs in Hunan province was relatively low due to the delay in the response to carcinogenic testing of some foods and cosmetics. In addition, it is considered that the problems encountered at the time of procurement, as mentioned in the "Relevance" section, have an impact in the sufficiency rate of Hunan province. Specifically, the poor quality of the purchased equipment, and failures for not being able to receive service from the manufacturers because the equipment was purchased through representative agents, are among the factors that might have influenced the sufficiency rate.
2) At the city/municipal level CDCs, 5 provinces "achieved" or "nearly achieved" the sufficiency rate, one province was evaluated as "Not achieved"[13] and Shanxi province was designated "n.a." due to the lack of response. In the above table, four provinces that did not provide their sufficiency rate, three were marked as "nearly achieved" based on the answers received from the health administration personnel of the provinces of Jilin, Heilongjiang and Anhui.

[13] It was not possible to obtain accurate data in some cities/municipalities of some provinces. Thus the information on the current achievement status is an estimation based on interviews to personnel at each of the facilities as well as the operation status of the facilities observed at the moment of the field inspection.

Next, the current implementation state of the tests by the CDCs is compared on the basis of number of analysed samples and the required time for analysis before and after the project.

The following table compares the situation of the main items selected from the "number of sample analyses implemented in each province per year" before and after the project.

Table 4: Number of sample analyses of main infectious diseases (provincial CDC)

Province	Infectious disease	Before the project *1	2012
Hunan	Influenza	3,902	8,156
	Hand, foot and mouth disease	197	398
Jiangxi	Influenza	926	1,007
Anhui	Influenza	600	1,000
	Hand, foot and mouth disease	No testing capacity	100
Shanxi	Influenza	184	1,026
	Poliomyelitis	418	394
Jilin	Influenza	346	433
	Hand, foot and mouth disease	No testing capacity	73
Heilongjiang*2	Hepatitis A, E	No testing capacity	4,152
	HIV	1,500	2,839
Liaoning	Influenza	89	898
	Hand, foot and mouth disease	No testing capacity	635

Source: prepared by the evaluators based on questionnaire responses obtained from each province.

*1 Data before the project implementation was adopted from the 2005-2008 data that could be confirmed.

*2 In Heilongjiang province, sample results of city/municipal CDCs was adopted because data of provincial CDCs could not be corroborated.

Based on the above, the following achievements can be confirmed.

- Analysis of items that had not been able to be tested in the past such as the hand, foot and mouth disease became possible.
- There are items in which the number of analysed samples increased significantly such as influenza samples.

Regarding the number of analysed samples, it was not possible to evaluate the effect of the project based only on the simple increase in the number of samples because this depends on the situation of the notifiable diseases of each year. However, it was possible to corroborate the existence of items for which testing was impossible in the past that became possible now -such as the case of hand, foot and mouth disease for which actual numbers of analysed samples were also confirmed-, as well as a significant increase in the number of analyses of some items when compared to the previous numbers. These facts indicate that a capacity to perform bigger numbers of sample analyses efficiently at the onset of infectious diseases was established and this represents an overall improvement of the testing capability.

Furthermore, the director of the Jilin provincial CDC indicated that not only the numbers of

conducted tests have improved, but also the accuracy of the tests. Specifically, the lowest detection limit of certain analyte of interest was 0.1 mg/kg in the past, but currently an amount as small as 0.01 mg/kg can be detected. In addition, it has become possible to perform more sample analyses while maintaining this high precision, therefore it can be evaluated that the testing capability of the CDCs has improved in terms of both accuracy and implementation.

One of the factors that enabled the increase in the number of performed tests is the reduction of the time taken for the analysis of each sample. A table comparing the sample analysis time before and after the project implementation based on the sample survey is shown below.

Table 5: Changes in sample analysis time of the main infectious diseases (provincial CDC)

Province	Infectious disease	Before project implementation	2012
Hunan	Influenza (selective culture)	Not feasible	3 days
	Influenza (nucleic acid analysis)	1- 3.5 days	4 hours
Jiangxi	Influenza (nucleic acid analysis)	6 hours	4 hours
	Biochemical identification of the infectious agent	1 day	2-8 hours
Anhui	Biochemical identification of the infectious agent	Not feasible	6-8 hours
	Influenza (nucleic acid analysis)	4.5 hours	2.5 hours
	Novel Influenza A (H1N1)	Not feasible	2.5 hours
Shanxi	Poliomyelitis	28 days	18 days
Jilin	Virus (nucleic acid analysis)	8 hours	1.5 hours
Heilongjiang	HIV antibodies	1 day	5 hours
	Cholera bacterium (selective culture)	3 days	8 hours
Liaoning	Hemorrhagic fever	1.5 hours	40 minutes
	Salmonella infection	7 days	1 day

Source: prepared by the evaluators based on questionnaire responses obtained from each province.

It is clear from Table 5 that the required time for selective culture and testing of pathogens shows a great improvement compared to the past.

The strengthening of the CDC testing system that was explained above, has resulted in the early detection and speeding up of the response during the onset of various infectious diseases that emerged after SARS. The main effects corroborated in each province are described in the table below.

Table 6: Main infectious diseases and the response of each province after the project implementation

Item	Actions implemented
Overall capability improvement, nationwide spillover effect	• **Liaoning Province:** around 2005, only half of the 14 city/municipal CDCs in the province had the capacity to perform molecular biological analysis (PCR) and culture of agents such as influenza. After the implementation of this project, molecular biology analysis using PCR, cell culture, and isolation of virus became possible in all 14 city/municipal CDCs. • **Liaoning Province:** the introduction of real-time fluorescence-based quantitative PCR machine to the provincial CDC allowed the development of a method to quantify 13 types of respiratory viruses simultaneously by running only a couple of instrumental analysis rounds. Currently this measurement method is not only widespread throughout the province, but it has already been introduced into the national key surveillance project as well, and it is being used for surveillance activities in the provinces of Tianjin, Heilongjiang and Jilin. • **Jiangxi Province:** 37 categories of infectious and endemic diseases were considered as requiring reporting in Jiangxi in 2004. This number has increased to more than 40 diseases including SARS, novel influenza (H1N1), hand, foot and mouth disease, etc. in 2012 on account of the procurement of equipment that was a contribution from this project, and a reporting system was consolidated at the same time as well. Surveillance of main diseases started since 2005 during the implementation of the project, and the time frame from onset to reporting has also been reduced significantly, leading to the strengthening of the public health system of Jiangxi Province.
Highly pathogenic avian influenza (H5N1), 2009-novel influenza (H1N1)	• **Liaoning Province:** now that equipment and testing systems have fully been established, the city/municipal CDCs became members of the National Influenza Surveillance Laboratory Network, as both the equipment and testing systems made the detection and analysis of virus strain types possible. As a result, a swift surveillance could be performed within the province when notifiable diseases shown on the left column emerged and had an impact on limiting the spread of symptoms. • **Hunan province:** a city/municipal CDC detected the first case of the 2009 novel influenza in China. This was made possible by the introduction of PCR and this precedent strengthened the surveillance in the entire province and also led to raising awareness.
Hand, foot and mouth disease (2010-11)	• **Liaoning province:** the etiologic agents of hand, foot and mouth disease suffered mutations in 2010 and 2011 and enterovirus 71 (EV71) and coxsackievirus that caused more severe forms of the disease were detected. However, the cases of death by hand, foot and mouth disease were limited to a very few in Liaoning province compared with other provinces because the report to the government was done briefly after the detection and measures such as closing of schools and working places were taken.
Novel avian influenza (H7N9) 2013	• **Jiangxi province:** surveillance was launched immediately after the outbreak of H7N9 in Shanghai in March 2013 and the number of cases reported as positive was 3 at the moment of the on-site inspection of the ex-post evaluation and in all cases a full recovery was attained. It was possible to minimize the damage to livestock farmers within the province. • **Hunan province:** surveillance was launched immediately after the

	outbreak of H7N9 in Shanghai in March 2013 and the number of cases reported as positive was 4 at the moment of the on-site inspection of the ex-post evaluation, from which only one case advanced to a severe condition, but it was possible to minimize the damage to the livestock farmers in within the province. • **Jilin province:** the Changchun City infectious disease hospital is currently designated as a sentinel hospital for Jilin province in case of the occurrence of sudden public health incidents. Class B (stage 2) management standards are normally (legally) applied at the onset of novel influenza, but this hospital operationally applied class A (stage 3) measures such as quarantine. In these responses, it is possible to see that the equipment and the protective measures, etc. that were reinforced after this project are playing a major role, and they are expected to have an impact in controlling the spreading out of infectious diseases.

Source: prepared by the evaluators based on questionnaire responses of each province

From the above comparisons between the amount of feasible sample analyses and its actual achievement, as well as the significant reduction in processing time, it was confirmed that the testing capability of the CDCs has improved through this project in terms of number of test items, sample analysis time, and both amount and quality of the analysis. Effects on the response to an actual onset of infectious diseases were also noticeable. Although a quantitative comparison of the current situation with the one previous to the project is difficult, it is possible to say that high outcomes have been achieved considering the current degree of attainment of the national standards.

(3) Functional improvement of hospitals

A sample survey concerning the functional improvement of infectious disease hospitals with a focus on indicators such as nosocomial infection rate, mortality rate, number of different tests run was conducted in five to six hospitals in each province to measure how the therapeutic capability, testing capability and hospital management capacity were strengthened.

Figure 5: A ward in the Liaoning Provincial People's Hospital

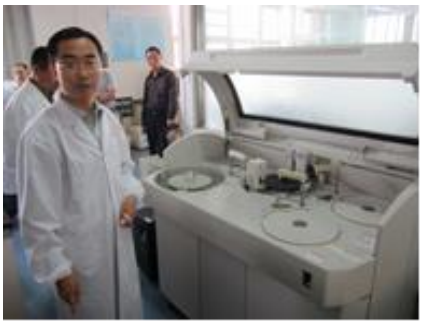

Figure 6: Equipment at the Wuhu Infectious Diseases Hospital in Anhui province

The results of the sample survey on the relevant indicators comparing the situation before the project (2005) and the present are shown below.

Table 7: Changes in treatment and testing performance at infectious disease hospitals

Province	Indicator	2005	2012
Hunan	Nosocomial infection rate (%)	7.87%	4.83%
5 samples	In-hospital mortality rate (%)	1.37%	0.88%
	Number of implemented tests	49,868	185,464
Jiangxi	Nosocomial infection rate (%)	2.86%	1.64%
5 samples	In-hospital mortality rate (%)	0.90%	0.53%
	Number of implemented tests	24,567	90,933
Anhui	Nosocomial infection rate (%)	n.a	1.66%
6 samples	In-hospital mortality rate (%)	n.a	0.84%
	Number of implemented tests	n.a	509,362
Shanxi	Nosocomial infection rate (%)	2.79%	0.86%
5 samples	In-hospital mortality rate (%)	0.48%	0.40%
	Number of implemented tests	709,813	1,206,731
Jilin	Nosocomial infection rate (%)	4.21%	1.85%
5 samples	In-hospital mortality rate (%)	n.a	n.a
	Number of implemented tests	181,137	1,591,527
Heilongjiang	Nosocomial infection rate (%)	n.a	n.a
5 samples	In-hospital mortality rate (%)	1.94%	1.06%
	Therapeutic outcome (cases)	9,119	25,134
Liaoning	Nosocomial infection rate (%)	n.a	n.a
5 samples	In-hospital mortality rate (%)	2.03%	0.92%
	Therapeutic outcome (cases)	116,634	234,362

Source: prepared by the evaluators based on questionnaire responses of each province

Based on the above, the following trends can be deduced.

1) Almost all provinces show an improvement in in-hospital mortality rate and nosocomial infection rate before and after project implementation.
2) Many provinces showed a significant increase in the actual achievement of various in-hospital tests which indicates that there is an overall improvement in their capability.
3) Regarding therapeutic outcomes, progress in the rate of complete cured cases per number of cases treated and the rate of improvements per treated cases were observed in many hospitals.

In this project, equipment involved in therapeutic actions such as operating tables and equipment involved in testing were procured to improve the function of the infectious disease hospitals. Not all the improvements in the indicators listed above can be attributed to this project, but all the procured equipment is essential for the improvement of the hospitals' competence/capabilities. It can be estimated that the strengthening of these capabilities by the project contributed to a certain degree to the overall progress. From an overall perspective, the effects of the project on the functional improvement of the hospitals have been manifested and can be evaluated as being satisfactory.

(4) Functional improvement of the emergency centers

Regarding the improvement in the function of emergency centers, the analysis focused mainly on two points: emergency services and emergency transportation capacity. The results of the sample survey on the main indicators are summarized below.

Table 8: Changes in service implementation status of the emergency centers

Province	Indicator	2005	2012	
			Minimal required	Actual
Hunan	Service radius[14]	12 km	8 km	5-8 km
1 sample	Emergency response time	10-30 min	15 minutes	10-20 minutes
	Number of emergency transportation (cases)	18,453		31,657
Jiangxi	Service radius	3-5 km	3-5 km	2.7 km
4 samples	Emergency response time	12 minutes	15 minutes	11.5 minutes
	Number of emergency transportation (cases)	5,794		17,297
Shanxi	Service radius	5-15 km	3-8 km	3-8 km
3 samples	Emergency response time	15-20 minutes	15 minutes	15 minutes
	Number of emergency transportation (cases)	29,067		56,297
Jilin	Service radius	n.a	2.5 km	2.5 km
1 sample	Emergency response time	n.a	15 minutes	8.6 minutes
	Number of emergency transportation (cases)	25,800		48,000
Heilongjiang	Service radius	8	10 km	6 km
5 samples	Emergency response time	17 minutes	20 minutes	12 minutes
	Number of emergency transportation (cases)	12,211		35,959

Source: prepared by the evaluators based on questionnaire responses of each province

* Service radius: radius of the area under the responsibility of an emergency center. A smaller radius allows a faster emergency service.

* Emergency response time: average time required from the report of a request for emergency transportation to the arrival at the scene/site. A shorter response time means quicker emergency transportation.

* Assistance was not provided to emergency centers in the provinces of Liaoning and Anhui.

Based on the above, the following trends can be deduced.

1) The increase in the number of ambulances increased the number of ambulance stations. In most cases, the service radius started improving since 2005 and a service radius below the specified value was fulfilled in 2012. It can be seen that the actual emergency response was able to react quicker than stipulated.
2) It was corroborated that the number of emergency transportations increased substantially in all provinces and that the emergency transportation capacity clearly improved.

[14] Service radius and emergency response time are important indicators that determine the response speed from reporting to transportation. Smaller service radius and shorter emergency response times allow a more rapid response.

3) In particular, the introduction of negative pressure ambulances[15] through this project allowed the establishment of a system to safely transport cases such as novel influenza.

As seen above, the strengthening of the capacity of the emergency centers showed a clear improvement trend. The improvement in the emergency transportation was not only confirmed quantitatively, but also qualitatively as demonstrated by the completeness of the first aid rescue instruments procured through the project such as the defibrillator.[16] Thus, it can be evaluated that an overall level of improvement has been achieved.

(5) Overall evaluation of the quantitative effects by province

Based on the above results, the evaluation of the overall achievement level of the project effects in each of the provinces was conducted as follows. In general, each facility possesses the capacity to perform the expected functions; and it was confirmed also from the actual operation status that these medical facilities show significant improvements compared to the situation that existed before the implementation of the project.

Table 9: Overall evaluation of the effectiveness of each province

Province	Overall evaluation
Hunan	**Satisfactory. However, there is some room for improvement.** The basic testing system has been developed, but the sufficiency rate of the test items of city/municipal CDCs has still room for improvement.
Jiangxi	**Satisfactory. However, there is some room for improvement.** The testing capacity of the provincial CDCs shows some deficiencies. Test items are shared among the provincial CDC and specialized testing organizations, and although no major problems were found, there is still room for improvement.
Anhui	**Satisfactory.** Although this is a temporary judgment due to insufficient data, it can be said that the basic testing capacity is sufficient and it is assumed that the improvement on the capability of the hospitals has been fulfilled to some extent, thus there are no problems in general.
Shanxi	**Satisfactory.** Improvement in the capabilities of each facility was clearly corroborated. The results have been demonstrated in the response to actual infectious disease onset and it can be evaluated that the expected results were achieved.
Jilin	**Satisfactory.** Although this is a temporary judgment due to insufficient data, it can be said that the basic testing capacity is sufficient and it is assumed that the improvement on the capability of the hospitals has been fulfilled to some extent, thus there are no problems in general.
Heilongjiang	**Satisfactory.** Improvement in the capabilities of each facility was clearly corroborated. The results have been demonstrated in the response to actual infectious disease onset and it can be evaluated that the expected results were achieved.
Liaoning	**Satisfactory.** Improvement in the capabilities of each facility was clearly corroborated. The surveillance system accomplished through the project was introduced also in a national project and applied in other provinces producing a spillover effect.

[15] Negative pressure ambulances differ from the ordinary ones in that the atmospheric pressure inside the transportation cabin can be lowered, which prevent the spread of microbes. This has a big effect on the prevention of dissemination, especially during the transportation of patients with serious infectious diseases.

[16] Device used to treat arrhythmias. Mainly applied during atrial fibrillation and ventricular fibrillation to reestablish the normal heart rhythm.

3.2.2 Qualitative Effects

In this project, training was provided both by dispatching personnel involved in infectious diseases countermeasures to Japan and major cities such as Beijing, Shanghai, and by inviting specialists to each province. Although accurate records, such as the exact number of participants, could not be verified in some provinces, some examples of actual achievements are shown below.

Table 10: Main achievements in human resources development training

Province	Actual	
Jiangxi	• Training in Japan:	100 participants
	• Invitation of specialists:	5 participants
	• Domestic training:	Approximately 127,000 participants
Liaoning	• Training in Japan:	33 participants (planned: 36 participants)
	• Domestic training:	Unknown number
Anhui	• Training in Japan:	62 participants
	• Domestic training:	453 participants
Shanxi	• Training in Japan:	2 participants
	• Domestic training:	2,709 participants

Opinions that evaluated the effects of these trainings were obtained from persons involved in each of the provinces. Several examples of the effective application of the experiences gained during the trainings in Japan in their current practice were confirmed through the interviews conducted to the participants during the field studies. The main ones are presented below.

Reference: Training experience in Japan and achievements

(1) Case of the Fuzhou City First Hospital, Jiangxi Province

A total of 6 physicians and nurses from the First People's Hospital participated in the trainings in Japan between 2007-2008. The training content consisted of handling of the Olympus automated biochemical analysis equipment and practical trainings at the Showa Hospital. The leader of the trainees' delegation Dr. Cao Rui Lin is the Chief Physician of the mentioned hospital since then and currently also the Head of the Emergency Center. Holding a managing position in the hospital, Dr. Cao is applying the experience gained during the training in Japan to the current hospital administration in areas such as the operation of the entire hospital and human resources development policy, among others. For example, she established once-a-week scientific exchange gatherings, created a city-level emergency specialists committee (academic meetings, evaluation, specialists networking, etc.) and promoted personnel interaction. Other measures applied are the configuration of Japanese hospital emergency rooms to make functional emergency rooms by securing efficient circulation planning, introducing an administrator system where a person in charge controls the inventory of consumables, instruments, medicines, etc., organizing shifts and handover procedures, among others; maintenance; technical training for the nursing staff on the handling of the ultrasound equipment to reinforce the overall capacity of the emergency rooms, etc. She continues incorporating measures that lead to the strengthening of the global capability rather than focusing only on the response to infectious diseases.

(2) Case of the Nanchang City Emergency Center, Jiangxi Province

Deputy Chief Xie Ping of the Nanchang City Emergency Center visited Japan in the end of 2006 and participated in study tours to various medical facilities such as The University of Tokyo Hospital and the National Institute of Infectious Diseases, among others. Deputy Chief Xie Ping was inspired by the structure of the ambulances of one of the visited sites, the Osaka Mishima Emergency Medical Center, and changed the general layout of the interior of the ambulances of the Nanchang City Emergency Center on his return and improved the overall usage effect. Thereafter, newly introduced ambulances are based on the concept of a pre-hospital care unit and ambulances with high medical functionality are deployed. For example, reforms made in power supply, lighting, and inverter system, expanded the range of therapeutic activities that can be performed inside the ambulance; and the introduction of automatically-lifting stretcher system fulfilled expeditious transportation activities. All of these are effective measures in improving the efficiency of the practice of emergency transportation.

Figure 7: Trainees from the Fuzhou City First People's Hospital

Figure 8: Improved ambulance (Nanchang City)

The effects of the training such as the ones mentioned above mainly resulted in the

improvement of the intangible aspects of facilities such as operation and administration. Therefore it is difficult to measure the direct effect of the project in contrast to the procurement of tangible medical equipment. However, many accounts similar to the examples presented above were heard in the each of the provinces during the field studies, and it can be considered that a certain effect of the technical transfer necessary to efficiently utilize the equipment procured by the project can be recognized. In addition, these trainings can also be recognized as having an effect on the manifestation of the effectiveness of the project described so far.

3.3 Impact

3.3.1 Intended Impacts

The ultimate goal of the infectious diseases countermeasures was "the improvement of the health of the local residents", more specifically the "reduction of morbidity and mortality of infectious diseases". It was expected that the strengthening of infectious diseases countermeasures through this project would result in the improvement and enhancement of the health conditions of local residents and a reduction in morbidity and mortality due to infectious diseases. Disease death rate due to main infectious diseases and statistical data on the main infectious diseases are summarized below showing the changes before and after the implementation of the project. Because the statistical data that was obtained differed per province, this is not a uniform analysis of the effect but rather an analysis mainly of the relationship with the strengthening of the public health system.

Table 11: Current generation status of the main infectious diseases

Province		2006	2011	2012
Hunan	Infectious disease death rate (%)	n.a	n.a	n.a
Jiangxi	Infectious disease death rate (%)	0.65%	0.32%	
Anhui	Infectious disease death rate (%)	0.18%	0.13%	0.12%
Shanxi	Infectious disease death rate (%)	n.a	0.12%	0.10%
Jilin	Infectious disease death rate (%)	0.18%	0.17%	0.13%
	Pulmonary tuberculosis mortality/100,000 population	0.2356	0.2949	0.1491
	HIV/100,000 population	0.0368	0.1966	0.2182
	Hepatitis/100,000 population	0.0368	0.0728	0.0218
Heilongjiang	Infectious disease death rate (%)	n.a	n.a	n.a
Liaoning	Infectious disease death rate (%)	n.a	n.a	n.a
	Morbidity-specific mortality/1000 population			
	Hemorrhagic fever	0.97	0.41	0.36
	Hand, foot and mouth disease	n.a	0.015	0.0023
	Infectious disease deaths per total number of deaths per disease ratio (%)	1.1%	1.17%	1.1%

Source: prepared by the evaluators based on questionnaire responses of each province

It is difficult to show a clear tendency towards improvement over time because the generation

status of infectious diseases differs according to the epidemic trends of each year. However, conspicuous outbreaks of infectious diseases have not occurred since the late 2000s when the project was implemented and all the diseases have been limited to relatively small epidemics. As can be noticed in the table above, the disease death rate due to infectious diseases shows a slight decreasing trend. At the present time, only a number of years have passed since the project implementation and under the current conditions it is difficult to derive a clear conclusion about the relationship of the project with the infectious diseases epidemic trend. Confirmation of the trends at medium- and long-term is necessary. However, early detection of epidemic diseases and the identification of the source of infection, both of which play an important function in limiting the spread of infection, became possible through the strengthening of the surveillance system; and, it can be assumed that the strengthening of the public health system by this project made a certain contribution to this effect considering the fact that severe infectious disease epidemics have been contained in a relatively mild range after SARS.

3.3.2 Other Impacts

(1) Impacts on the natural environment

At the planning stage, this project was classified as one likely to have no significant adverse impact on the environment based on the "Guidelines for Confirmation of Environmental and Social Considerations in Japanese ODA Loan projects"[17]. The Environmental Impact Evaluation report was already prepared at the project planning stage and final authorization had been obtained from the authorities of each province. Medical waste and wastewater discharged from each facility were already planned to be processed according to the central government regulations and discharge standards, therefore it was expected that there would be no problems of air, soil and underground water pollution. In fact, no particular problems have occurred.

Methods to process the medical waste discharged from facilities followed the indications of "Medical Waste Management Regulation" and "Medical and Health Agencies Medical Waste Management Method", and facilities of each level carry out waste accumulation, temporary management and handover to specialized entities. The wastewater generated in the facilities passes through the treatment plant located inside the medical facilities where it is chemically treated and then discharged. In addition, the material used in microbiological culture, etc. is treated with high-pressure sterilization processing or chemical agents. The disposal of waste is being performed in line with the laws and regulations. Problems of air pollution are not generated because the main items of the project were the procurement of testing or other type of equipment.

It was possible to corroborate that the wastewater was being processed according to regulations in the interviews conducted during the field surveys, and considering that the facilities are periodically monitored by the Environmental Protection Agency, no problems are expected.

(2) Land Acquisition and Resettlement

[17] "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" (formulated in April, 2002)

Appraisal documents and records of the project, as well as the answers to questionnaires received from local health bureaus and other involved persons confirmed that resettlement and land acquisition associated with this project have not occurred.

(3) Unintended Positive/Negative Impact

The absence of major problems regarding other positive/negative impacts were mostly confirmed at the moment of the appraisal, therefore it was considered sufficient to obtain confirmation by interviews based on questionnaires completed by the health bureaus. The responses did not point out any particular problem.

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

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Figure 9: Ultrasound examination equipment (Heilongjiang province)

Figure 10: Anhui provincial CDC

The number of facilities that were actually covered by the project in each province is shown in the table below. Except for some facilities that were excluded in the provinces of Liaoning and Hunan, the project was carried out according to plan. As mentioned in the “Relevance” section, the acquired equipment was decided based on a procurement list prepared beforehand thus there are almost no changes in the actual output.

Table 12: Number of facilities covered with the Project in each province

Province	Plan		Actual (compared to plan)	
Liaoning	CDC	14 facilities	CDC	13 facilities (-1)
	Hospitals	18 facilities	Hospitals	17 facilities (-1)
	Emergency centers	0 facilities	Emergency centers	0 facilities
Heilongjiang	CDC	14 facilities	CDC	14 facilities
	Hospitals	3 facilities	Hospitals	13 facilities
	Emergency centers	6 facilities	Emergency centers	6 facilities
Jilin	CDC	10 facilities	CDC	10 facilities
	Hospitals	9 facilities	Hospitals	9 facilities
	Emergency centers	1 facility	Emergency centers	1 facility
Anhui	CDC	15 facilities	CDC	15 facilities
	Hospitals	15 facilities	Hospitals	15 facilities
	Emergency centers	0 facilities	Emergency centers	0 facilities
Jiangxi	CDC	11 facilities	CDC	11 facilities
	Hospitals	9 facilities	Hospitals	9 facilities
	Emergency centers	4 facilities	Emergency centers	4 facilities
Hunan	CDC	15 facilities	CDC	14 facilities (-1)
	Hospitals	14 facilities	Hospitals	14 facilities
	Emergency centers	1 facility	Emergency centers	1 facility
Shanxi	CDC	12 facilities	CDC	12 facilities
	Hospitals	7 facilities	Hospitals	7 facilities
	Emergency centers	7 facilities	Emergency centers	7 facilities

In Liaoning Province, the Shenyang City CDC and the Shenyang City Infectious Disease Hospital were excluded from the project due to adjustments made by the Ministry of Health. There were no involved persons who had detailed information of the reasons for these changes, but it was explained that a self-financed development was carried out in the excluded facilities as well.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total cost of this project was approximately 32,400 million yen, from which the Japanese ODA Loan accounts for approximately 16,000 million yen. This is 88% of the initially planned 36,500 million yen, which is within the plan. The project cost of each province also remained roughly within the planned costs, and it can be said the actual achievement is nearly as planned even taking into account the scope change caused by the reduction in target equipment that occurred in the provinces of Hunan and Liaoning. It should be noted that in Jiangxi Province the actual cost of the project exceeded considerably what was planned, but this is due to a substantial addition of testing equipment purchased with own funds. The planned and actual project costs by province are indicated below.

Table 13: Planned and actual project costs by province

Province	Plan	Actual (% compared to plan)
Liaoning	Total project cost 4,209 million yen	Total project cost 3,965 million yen (94%)
Heilongjiang*	Total project cost 2,288 million yen	Total project cost 2,278 million yen (99.6%)
Jilin	Total project cost 4,971 million yen	Total project cost 5,027 million yen (101%)
Anhui	Total project cost 4,010 million yen	Total project cost 3,296 million yen (82%)
Jiangxi	Total project cost 3,912 million yen	Total project cost 11,539million yen (295%)
Hunan*	Total project cost 2,855 million yen	Total project cost 2,738 million yen (96%)
Shanxi	Total project cost 4,056 million yen	Total project cost 3,557million yen (88%)

* The actual amount of own funds were unknown for the provinces of Hunan and Heilongjiang, thus the comparison in the table above, was made excluding the local currency portion also from the plan.

As a general trend, it became possible to control the price at the moment of the competitive bidding process of the equipment procurement and it can be evaluated that an efficient procurement was conducted. However, as already mentioned in the "Relevance" section, in the case of Hunan Province, having given priority to the procurement of low-cost equipment has affected their useful life. Although this was a rare case in the whole scheme of things, it can be said that with respect to the specifications of the equipment to be procured, it is necessary to consider the balance between price and specification.

3.4.2.2 Project Period

The implementation of this project was planned for a period of 58 months from March 2004 to December 2007, but the actual time required to implement the project was 82 months from March 2004 to December 2010, which was longer than planned (141% compared to plan). The planned and actual implementation in the 7 provinces is shown below.

Table 14: Planned and actual project period by province

Province	Plan	Actual achievement (compared to plan)
Liaoning	3/2004～12/2007 (46 months)	3/2004～12/2009 (70 months -152%)
Heilongjiang	3/2004～6/2006 (28 months)	3/2004 ～9/2009 (67 months -239%)
Jilin	3/2004～12/2007 (46 months)	3/2004～12/2010 (82 months -178%)
Anhui	3/2004～8/2008 (54 months)	3/2004～8/2010 (78 months -144%)
Jiangxi	3/2004～11/2005 (33 months)	3/2004～2/2007 (48 months -145%)
Hunan	3/2004～11/2007 (45 months)	3/2004～9/2008 (55 months -122%)
Shanxi	3/2004～8/2007 (42 months)	3/2004～2/2011 (84 months - 200%)

The overall project period was longer than planned and its breakdown showed that, with the exception of some provinces, the cause of the delay was primarily due to the human resources development training component, and there were no big delays in the main equipment

procurement and civil engineering work. As mentioned in the “Relevance” section, the enhanced efficiency of the procurement procedure seems to have contributed to the latter. Regarding the component on human resources development, the reasons for the delay were the selection of the personnel to be dispatched and the coordination with the institutions that would receive them. It should be noted that there were delays in the equipment procurement in the provinces of Shanxi, Anhui and Jilin. The factors behind these delays were the prolonged time required in the preparation which was caused in turn by the increase in the size of the procurement packages, slow response of the bidding company (Jilin Province), change in specifications and the consequent longer time required for the approval process (provinces of Shanxi and Anhui), among others.

3.4.3 Results of Calculations of Internal Rates of Return (IRR)

Due to the nature of the project, it was difficult to estimate its economic benefits. The calculation of the Internal Rate of Return was not done at the planning stage, thus it was excluded also from the scope of the evaluation.

Although the project cost was within the plan, the project period was exceeded, therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ③)

The objective of this project was to “strengthen the public health system” and it is necessary to take into account the sustainability of the entire system when analysing the sustainability criterion. Additionally, the equipment that was acquired in this project is quite detailed and subdivided, and among the precision machinery, which has a relatively short useful life, there were some equipment that has already exceeded their useful life. Instead of assessing the sustainability of the project based on the usage of the facilities to date, the evaluation included aspects such as "whether it is likely that the capacity of each equipment procured through the project, the tests, the research and the treatment environment will be maintained continuously thereafter”. In other words, the evaluation was performed based on the "general capacity to maintain the service of the facilities" including points such as the prospects of continuous update of the equipment and the existence of the technical abilities required for those updates.

3.5.1 Institutional Aspects of Operation and Maintenance

The management system of public health is governed by national laws such as the “Law on Preventing and Controlling Notifiable Diseases” and the basic organization is shared among the seven provinces. The outline of the system is presented below.

1) Health bureaus that make decisions on the various countermeasures and policies at the onset of infectious diseases are placed at all levels from province to counties.

2) As entities that perform the actual tasks such as gathering the information necessary for the decision-making, CDCs are placed in a similar way from provincial to county levels.
3) Hospitals and emergency centers are positioned as the executing agencies in charge of reporting and treatment at the onset of infectious diseases.
4) Organization at the onset of infectious disease: the coordination system between the provincial health bureaus and the lower institutions is defined in the "Law on Preventing and Controlling Notifiable Diseases" and the "Public Servants Law". As can be seen in the figure below, the health bureaus on the decision-making line and the CDCs that are the organizations performing the actual tasks cooperate to manage each provincial, city/municipal, and county level. The results of the surveillance are regularly entered into an online monitoring system and the system is setup in such a way that the reports can be shared immediately by the high-order organizations.

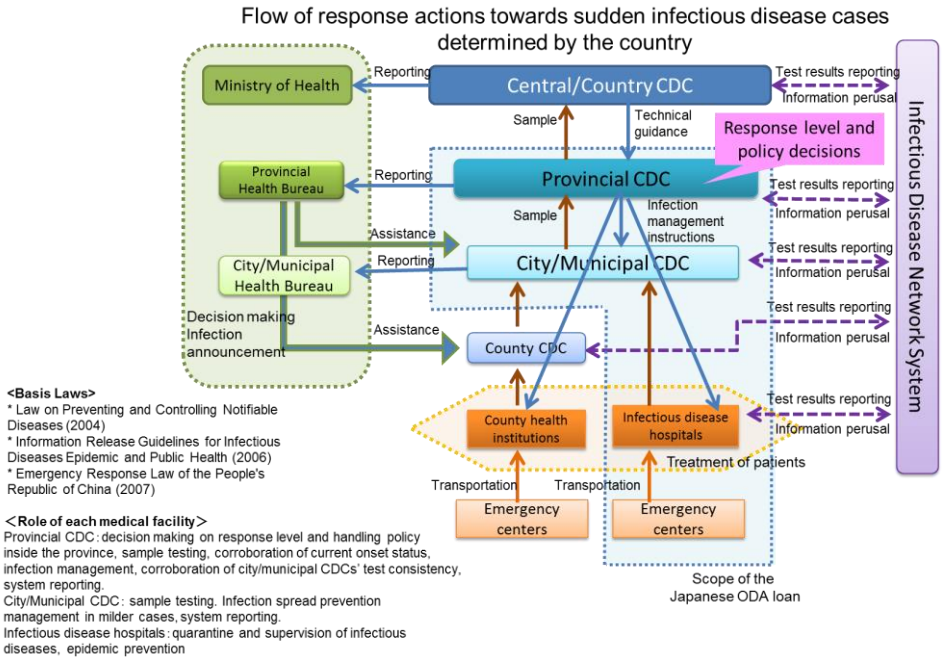

Figure 11: Public health system and the positioning of this project

The roles and functions of the facilities targeted to receive the assistance of this project and their current involvement in this Japanese ODA loan project within this system are presented below.

1) Provincial Health Bureau: due to the nature of this project, currently a department exclusively dedicated to this project does not exist. The provincial health bureaus supervise and manage the facilities including the ones that were part of this project, as part of the administration tasks of the general public health system.
2) CDC: play a determined function at provincial and city/municipal levels. Organization, chain of command and size (laboratory technicians comprise 10-20% of the total staff number) have

been secured for that purpose. At the onset of infectious diseases, coordination personnel are placed in each facility and communicate directly with staff members of each location and each unit using both formal written notifications and informal communication means such as e-mail, fax, and telephone calls.

3) Hospitals and emergency centers: each infectious disease hospital and emergency center has established a system based on the "Law on Preventing and Controlling Notifiable Diseases" and a communication system in line with the manual is in place.

Organization, current state and challenges specific to each province other than above are as follows.

Table 15: Institutional challenges confirmed in each province

Province	Specific challenges and current state
Hunan	The infectious disease specialized teams of some hospitals face difficulties to secure human resources caused by the high number of personnel that resign due to problems such as the complexity of the work, poor treatment, and high risk of infection. A training system is in place, but it is difficult for the infectious disease team facing such a shortage of human resources to participate in those on a regular basis.
Jiangxi	Opinions such as the following were heard: if the number of emergency personnel dispatching centers is not increased in accordance with the urban population growth as well as expansion of urban areas, it will be impossible to fulfill the cases that should be covered inside the radius of a determined emergency dispatch center and to provide the first-aid that is meant to be applied to emergency patients in the ambulance.
Anhui	The number of laboratory technicians was insufficient in some CDCs. But the situation as a whole is sufficient.

Source: prepared by the evaluators based on questionnaire responses of each province

3.5.2 Technical Aspects of Operation and Maintenance

The actual situation of the operational techniques was confirmed by visiting each facility during the field study. As shown below, a more or less common trend was confirmed in each province, and in general it can be said that the executing agencies have the technical infrastructure necessary for the implementation of this project and no major problems were identified.

(1) CDC: each CDC has the technical infrastructure necessary for the implementation of the countermeasures defined in the "Law on Preventing and Controlling Notifiable Diseases". A lot of trainings are being implemented, and no particular problems were observed in the technical level of the laboratory technicians who many of them have graduate degrees. The manual for the operation and maintenance of equipment and records are prepared and administrated in each CDC and a sufficient management capacity including their operational methods was corroborated in the facilities. The maintenance frequency is based on the

equipment quality control inspection (calibration) and decided according to the equipment level. It was confirmed that all the above has been carried out and passed the inspection according to standards.

(2) Hospitals: operation and maintenance technology as well as the operation manual of equipment are well kept and no particular problems were found in the inspected facilities. However, from the current situation in which the wards and laboratories have a continuously high usage rate and the medical personnel are extremely busy, it was found in the inspections that, when compared to the CDC, there is room for improvement for safety management and organization/arrangement of the equipment and laboratories.

(3) Emergency centers: maintenance management, service records and maintenance manuals were implemented in accordance with the relevant national laws, regulations, department rules and practice norms. The vehicle condition of most of the inspected ambulances was maintained according to the national standards, and no problems were noticed in the management technology in each center. It is considered that there is no particular problem in the technical level of the emergency personnel as well.

3.5.3 Financial Aspects of Operation and Maintenance

The financial management systems of the facilities involved in this project are as follows. CDCs and emergency centers operate with a budget funded 100% by the government. Regarding hospitals, there are non-profit health care facilities such as the infectious disease hospitals (operating with 100% financial funding from the government) and for-profit medical facilities such as the hospitals that are run with operating revenues as well as government budget. In relation with the financial condition of these facilities, the common trends shared by the provinces as well as the results confirmed by the sample survey are presented below.

(1) CDC/emergency centers: the sample survey found that there were many cases in which the budget that is nearly the same as the amount initially applied for was obtained, and the responses received from each facility indicated that “funds required to fulfil the functions determined by law were secured”, and there are no major problems in the current state.

(2) Hospitals: the sample survey found that a budget that is slightly above the amount applied for was actually obtained in many cases, and a budget size that is required in fulfilling the functions of an infectious disease hospital was secured. However, among the hospitals in which the equipment have reached an advanced stage of aging, there are many that still rely on government budget to cover the additional costs required for equipment upgrading and repair, indicating that they have not yet accomplished a fully independent management.

The current financial situations and challenges specific to each province other than the ones mentioned above are as follows.

Table 16: Financial challenges confirmed in each province

Province	Specific challenges and current state
Hunan: Minor concern	• The Provincial CDC answered that "the funding shortage has an impact on the development of disease prevention and control project" and its impact is cause of concern. • The number of CDCs that answered that "funds required in fulfilling the functions that are determined by law are secured" was three out of the six cases included in the sample survey.
Jiangxi: Minor concern	• The Provincial CDC answered that "the funding shortage has an impact on the development of disease prevention and control project" and its impact is cause of concern. • Hospitals: Three out of five samples mentioned that the actual budget allocated is significantly below the amount that was applied for.
Anhui: No major problems	Hospitals: two out of five samples responded that the operating funds are not insufficient. (detailed confirmation was not possible because the information was not disclosed)
Shanxi: No major problems	In general, required budget is nearly secured and it is thought that there are no particular concerns.
Jilin: No major problems	Emergency centers: according to interviews to the persons involved, a budget enough to avoid hindrances on the day-to-day operation has been secured. However, there are concerns about the breakdown of ambulances due to over-running and they recognize that the amount is insufficient to update the equipment with the adequate frequency and scale.
Heilongjiang: Minor concern	Hospitals: the targets of the sample survey responded that in comparison with the budget amount applied for (i.e. the desirable budget amount from the operational point of view) the amount that was actually secured was just above 70% which is considered slightly low. In particular, in the Jiamusi City Infectious Disease Clinic, the actual allocated money was limited to a little below 40% of the budget applied for, and this is having an impact in operational aspects. Problems of lack of budget are occurring also in remote regions of the province.
Liaoning: No major problems	Hospitals: most of the targets of the sample survey actually obtained budgets that were slightly above the amounts applied for, and responded that a budget size that is required in fulfilling the function of an infectious disease hospital was secured. However, among the hospitals in which the equipment have reached an advanced stage of aging, there are many that still rely on government budget to cover the additional costs required for equipment upgrading and repair.

Source: prepared by the evaluators based on questionnaire responses of each province

Although some facilities indicated the existence of a budget shortfall in their answers, no serious concerns have arisen in the overall situation on securing the budget necessary to maintain the basic functions of the public health system. Considering the magnitude of the policy needs of

the Chinese government concerning the public health system that was mentioned also in the "Relevance" section, it can be assumed that a stable budget allocation will continue. However, attention is needed because, as mentioned above, insufficient budget of provincial CDCs has become a problem in some regions.

3.5.4 Current Status of Operation and Maintenance

The overall trend of the operation and maintenance is as follows.

(1) Equipment breakdown and maintenance problems have practically not occurred in provincial CDCs and CDCs that are located in big cities and the current overall utilization state continues to be satisfactory.

(2) Regarding hospital equipment, some of the ones procured by this project have reached a stage in which updating or replacement is required, and opinions pointing out to this problem were also confirmed. CDCs and hospitals of smaller scale cities, especially the small scale hospitals specialized in infectious diseases are experiencing breakdown and aging of equipment, and there were cases in which the handling of these problems was not sufficient. However, the current overall maintenance state itself has not led to concerns that would compromise the general function of the hospitals because replacing and updating are in progress.

(3) Concerning the emergency centers, the problem of an increased risk of breakdown of ambulances due to over-running was pointed out. At this time no major problems have been observed operatively, but it is thought that regular updating is required in the future.

Current maintenance states and challenges specific to each province other than above are as follows. As previously indicated, the operation and maintenance status that was confirmed during the ex-post evaluation can be evaluated as appropriate in general terms. However, problems that need attention are likely to occur in the future, and in those provinces where the capacity to deal with such problems were considered as insufficient have been assessed as having "Minor concerns".

Table 17: Maintenance issues confirmed in each province

Province	Specific challenges and current state
Hunan: Minor concerns	• **CDC:** no major problems have occurred in the equipment that constitutes the core of the CDC functions. However, because the procurement of equipment was not done by direct purchase from the manufacturer, but conducted through a representative, facilities have not been able to receive the after-sales services and repairs that would have been able to receive originally. In addition, many of the equipment procured by this project have reached the time for an upgrade. CDCs that answered that they have "no problems" when asked about the current state of the equipment were only two out of six samples. In these CDCs replacement with new equipment is being conducted. • **Hospitals:** regarding the overall function, equipment update and replacement is ongoing and there are no major problems. However, in the majority of the hospitals (four out of five) some therapeutic equipment and sample analysis equipment do not fulfill their functions anymore, and they answered that the current maintenance state "has problems". The main reason is that spare parts are not produced anymore and therefore repair is not possible. In addition, in some hospitals the equipment that they originally expected to be purchased was replaced instead with less expensive equipment without guarantee of after-sales service. There were several cases in which, due to this, the required time for repair is much longer than normal. • **Emergency centers**: some ambulances already reached the time for an update and, although gradual upgrading is in process, they have not been able to keep up due to lack of budget. In addition, in reference to the ambulances' spare parts, some are difficult to obtain and/or it takes too long to obtain them. Insufficiencies of basic equipment such as stretchers, etc., are also occurring.
Jiangxi: Nearly no problems	• **CDC**: they are subject to and have passed regular inspections by the technical supervision bureau, and there are no problems in the current maintenance state. There are no spare parts problems because an emphasis was put on the manufacturer's after-sales service at the procurement stage. • **Emergency centers:** accessories such as brake linings and clutch are failing in some ambulances and replacement is required. Problems such as low performance of the sealing and the resultant low degree of vacuum are occurring due to the aging of the vehicles. Some vehicles have reached the time for an update which is already being conducted as needed.
Anhui: Nearly no problems	• **CDC:** although they are mostly functioning normally, some of the equipment is having the following problems: (1) in 2008 when the PCR was purchased, there was already a new model available and they had purchased this new model using state budget. (2) The purchase of a fully-automated microbiological analysis machine was expected originally, but a semi-automated one was received instead due to procurement list restrictions. The usage of the semi-automated machine decreased because a fully-automated one was purchased later. (3) The freeze-dryer could not be used without a filter because the environmental standards changed, but the selected freeze-dryer was an old model for which filters were not manufactured and as a result the machine has not been used at all.

Shanxi: Nearly no problems	• **CDC:** although they are mostly functioning normally, in some of the facilities (Taiyuan City CDC) the equipment is having the following problems: (1) PCR: it was already an obsolete model in the year when it was purchased and it cannot be repaired because there is no stock of spare parts. A new machine that was purchased around the same time using other resources is being used. (2) The options of the procurement list were limited and the equipment of the level and usage that was really necessary could not be purchased. As a result, equipment equivalent to 20% of the total budget is not being used.
Jilin: Nearly no problems	• **CDC:** the failure rate of some equipment is increasing in every CDC due to aging. No major problems have occurred in the equipment that constitutes the core of the functions of the CDC such as the PCR laboratories. • **Hospitals:** there are no major problems in the overall function. However, the sample survey corroborated that some facilities, especially the ones in the countryside, responded that the current maintenance state "has problems". This has been caused mainly by the fact that testing and treatment equipment have overpassed their useful life while updating is not progressing. Procurement of equipment using own funds is planned for the future. • **Emergency centers**: it has been pointed out that main equipment such as defibrillators and ambulances has deteriorated over time due to over-running among other causes, but this has not resulted in major operational problems so far. Some equipment used in first-aid treatment such as oxygen tanks and stretchers are still being used after their useful life.
Heilongjiang: Minor concerns	• **Emergency centers:** problems such as aging of equipment were confirmed in four out of five samples. These consist mainly of breakdowns caused by the operation of over-runned ambulances and concerns over the risk of these failures occurring during an actual emergency event were pointed out. Some vehicles have overpassed a mileage of 400,000 kilometers. In the Harbin City Emergency Center that was actually visited, it was mentioned that breakdowns in the middle of transporting patients is prone to occur especially in the winter and that they operate a system in which a spare vehicle can be dispatched at any time.
Liaoning: No major problems	• **Hospitals:** three out of seven responded in the sample survey that the current maintenance state "has problems". They mainly indicated that the useful life of some testing and treatment equipment has passed and updating is not progressing. Procurement of equipment using own funds is planned in the future.

Source: made by the evaluators based on interviews conducted during the field study

As seen from the above, the financial aspects and current maintenance state of each CDCs and hospitals vary slightly, and there are some facilities in the countryside that have not reached the desirable standard. However, currently, there are no major concerns in the financial aspect as well as the overall maintenance level to preserve the function of the entire public health system. Also, as mentioned in the "Relevance" section, from the present situation in which the Chinese government has clearly indicated the importance of public health in their policies, it is thought that the

probability of the capacity of the public health system decreasing in the future is low.

No major problems have been observed in the operation and maintenance system, therefore sustainability of the project effect is high.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed at procuring equipment and developing human resources in order to reinforce China's weak public health system that was exposed during the outbreak of SARS. A high relevance of the planning and design of this project is recognized based on the timely execution of the required equipment procurement and training, and the consistency with the Chinese government's policy as well as the need to strengthen the public health system at that time. The project's effectiveness is high as the development of an appropriate project plan led to raising the levels of prevention, testing and therapeutic capabilities of the Centers for Disease Control and Prevention (CDC), infectious disease hospitals and emergency centers that are the core of the public health system. This effect is also reflected in the improvement of the response to infectious diseases such as the novel avian influenza that broke out after the implementation of the project. With the exception of the human resources development, the project was carried out within a period that was nearly according to the plan and the total cost was also kept within the plan, therefore the efficiency of the project is considered fair. Many of the distributed equipment were still being effectively utilized at the moment of the ex-post evaluation under an appropriate management system. Furthermore, judging from the Chinese government's policy that emphasizes the strengthening of the public health system, there are no major concerns in the institutional and financial sustainability as well.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None.

4.2.2 Recommendations to JICA

None.

4.3 Lessons Learned

This project can be evaluated as one that made considerable achievements. As mentioned in "Relevance", the fact that the project implementation process was planned in line with both timing and project content is thought to have led to high effects of the project as a whole. In order to achieve such effects, it is important to incorporate an appropriate assessment of the needs of the persons that are responsible for the practical operations of the partner country and to develop a procurement and

project implementation plan that are suitable for both timing and project content. The specific lessons learned from the experience of this project are the following:

(1) Although this project was planned and implemented during the course of the strengthening of the inspection standards after the SARS outbreak, selection of procured equipment that matched the medium to long-term equipment needs was possible by reflecting the consistency of the project with the policies on a real-time basis. In addition, the execution of the procurement based on the actual situation of each region and facility level including the assessment of needs made by the persons in charge of the practical operations into this process proved to be effective.

(2) Similarly, in terms of efficiency, it can be evaluated that an appropriate procurement method that matched the purpose of the project was selected. In this project, a standardized procurement package was elaborated according to the facility level. It also streamlined the concurrence process usually required for procurements in Japanese ODA loan projects by granting certain discretion in the decision making of the procurement content to each provincial executing agency. This resulted in the streamlining of the time required for procurement, while maintaining the consistency with the needs. The choice of this procurement method was appropriate given the significance that a timely input had on the project objective.

(3) Although an appropriate project design was made in general terms, differences in the procurement and operation policies at the provincial level affected the degree of manifestation of the effects. It is considered that in Liaoning and Jiangxi provinces where procurement proceeded efficiently and the current equipment utilization status is particularly good compared with other provinces, the involvement of public health experts in the procurement process made it possible to understand the actual situation of each facility incorporating technical perspectives as well, and the elaboration of a procurement policy that assumed future medical needs and maintenance management instead of focusing only on low procurement prices were appropriate decisions that lead to a sustained manifestation of the project effects. An adequate allocation of personnel with such practical experience levels is crucial to further improve the appropriateness of the project design described above.

(4) This project was planned and implemented to deal with the rapid strengthening of public health measures. One of the factors that contributed to its success is the fact that the above mentioned project design was planned anticipating medium- and long-term strengthening of the public health policy. In China, the reforms of initiatives considered as national policies such as the strengthening of environmental quality standards and public health countermeasures occur at a very high speed. Therefore in the assessment and design of projects, it is important to give more emphasis on future trends rather than focusing only on short-term needs in order to avoid

discrepancies with the project’s needs.

End

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	(Total 7 provinces)	(Total 7 provinces)
CDC	91 sites	89 sites
(Infectious disease) Hospitals	85 sites	84 sites
Emergency centers	19 sites	According to plan
2. Project Period	March 2004 - December 2007 (58 months)	March 2004 - December 2010 (82 months)
3. Project Cost		
Amount paid in Foreign currency	16,969 million yen	16,021 million yen
Amount paid in Local currency	19,598 million yen (1,370 million yuan)	16,379 million yen (1,169 million yuan)
Total	36,567 million yen	32,400 million yen
Japanese ODA loan portion	16,900 million yen	16,021 million yen
Exchange rate	1 yuan = 14.3 yen (As of August 2003)	1 yuan = 14.01 yen (Average between March 2004 and October 2010)