No.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

"THE TUBERCULOSIS CONTROL PROJECT (PHASE III) IN THE REPUBLIC OF YEMEN"

EX-POST EVALUATION STUDY ON

THE TUBERCULOSIS CONTROL PROJECT (PHASE III) IN THE REPUBLIC OF YEMEN

(MAIN REPORT)

JANUARY 31, 2007

SUBMITTED BY:

SHARON BEATTY, MPH
TEAM LEADER, INDEPENDENT CONSULTANCY TEAM

WITH

DR. ABDUL SALAM AL-ARIFI
DR. MOHAMMED SUHAIL

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ACRONYMS

AIDS	Acquired ImmunoDeficiency Syndrome
ARI	Acute Respiratory Infection
CCA	Common Country Analysis
CF	Case Finding
CSF	CerebroSpinal Fluid
CSSW	Charitable Society for Social Welfare
DG	Director General
DOTS	Directly Observed Therapy, short course
DTC	District Tuberculosis Coordinator
Dx	Diagnosis
EOP	End of Project
EPI	Expanded Program on Immunization
EU	European Union
DAC	Development Assistance Committee
GDF	Global Drug Facility
GF	Global Fund
GLS	Governorate Laboratory Supervisor
GOY	Government of Yemen
GTC	Governorate Tuberculosis Supervisor
HC	Health Center
HDI	Human Development Index
HF	Health Facility
HO	Health Office
HIV	Human Immunodeficiency Virus
LDC	Less Developed Country
MCH	Maternal Child Health
MDG	Millennium Development Goal
MoF	Ministry of Finance
MoPHP	Ministry of Public Health and Population
NA	Not available (or not applicable)
NGO	Non-Governmental Organization
NPSS	New Positive Sputum Smear
NSS	New Sputum Smear
NTP	National Tuberculosis Program
NTI	National Tuberculosis Institute
ODA	Overseas Development Assistance
PDM	Project Design Matrix
PHCU	Primary Health Care Unit
PHCW	Primary Health Care Worker
PPM	Public Private Methodology
PRS	Poverty Reduction Strategy
Q	Quarter
QC	Quality control
ROY	Republic of Yemen
RTC	Regional Tuberculosis Center
Rx	Treatment
SS+	Sputum Smear Positive
SS-	Sputum Smear Negative
TOR	Terms of Reference
TB	Tuberculosis
UN	United Nations
WB	World Bank
WHO	World Health Organization
YR	Yemeni Rial

EX-POST EVALUATION OF "THE TUBERCULOSIS CONTROL PROJECT (PHASE III) IN THE REPUBLIC OF YEMEN"

I. SCOPE OF EVALUATION STUDY

This ex-post evaluation study assesses ***Phase III of the JICA Tuberculosis Control Project***, in the Republic of Yemen, which was implemented between August 1999 and August 2004. The evaluation study took place between November 2006 and January 2007, approximately twenty eight months after the project ended. In keeping with JICA guidelines, the evaluation focused primarily on issues of impact and sustainability, and attempted to draw lessons useful for future programming. It attempted to answer four main questions. These are: 1) Has the overall goal of reducing the mortality, morbidity, and transmission of tuberculosis (TB) in ROY been achieved; 2) has the project purpose for DOTS (directly observed Therapy, short course) coverage and treatment been achieved; 3) what is the overall impact of the program and what are the reasons behind this; and 4) is the National Tuberculosis Program (NTP) sustainable?

II. PROJECT OVERVIEW

Since 1983, the Japanese Government has supported the National Tuberculosis Program in the Republic of Yemen, by offering technical assistance through the Tuberculosis Control Project (Phase I and II). As a result of this cooperation, the central institutions for TB control such as the Central Unit of the NTP, the National Tuberculosis Institute (NTI), and the TB Control Centers in Taiz and al Hodeidah were established, which brought about improvement in NTP activities. However, the tuberculosis problem of the Republic of Yemen still remained a serious health issue. Therefore the Government of Yemen (GOY) requested Phase III of the Tuberculosis Control Project, with the purpose of expanding DOTS throughout the country and strengthening the management of TB control.

Phase III of the JICA Tuberculosis Control Project took place between August 1999 and August 2004. The counterpart organization for the project was the National Tuberculosis Control Program. The overall goal of this project was "to reduce mortality, morbidity, and transmission of tuberculosis in the Republic of Yemen." The project purpose was "to expand the quality service of the National Tuberculosis Control Program all over the country of the Republic of Yemen." The following outputs were expected.

(1) Improvement of case-finding and diagnosis of tuberculosis by strengthening the laboratory network;
(2) Improvement of treatment of tuberculosis based on a proper case management system;
(3) Improvement of the supply system of drugs and other materials with special emphasis on establishment of a good reserve stock system;
(4) Improvement of a program monitoring system based on a standardized recording and reporting system;
(5) Re-evaluation of the size and nature of the tuberculosis problem of the Republic of Yemen.

The main project inputs to the NTP were technical support by long and short term experts, counterpart training in Japan and Egypt, equipment donation, in-country training, and financial and management support for implementation of activities. A final evaluation was carried out in February 2004, and a final report was delivered by the end of the project (EOP) on July 28, 2004. According to the final evaluation and the final project report, sound progress was made in achieving the project outputs and outcomes. Coverage was greatly expanded, and quality of services, case finding, diagnosis and treatment were improved (see Annex A). According to the final evaluation, the project was considered to have produced remarkable outcomes in general, but with a few low performing governorates and districts. The project was judged to be relevant, highly effective, efficient (though with some gaps such as conduct of operational research), and having a positive impact. Institutional sustainability was considered to be improved but with

a need for further improvement. Financial sustianability was unclear, and technical sustainability was considered adequate but with further training at the primary health care unit (PHCU) level needed.

III. OVERVIEW OF THE HEALTH AND DEVELOPMENT SITUATION IN YEMEN

Yemen has made significant development progress over the last three decades, the result of government effort, donor involvement, and the industry and initiative of the population. Improvements between 1975 and today have been significant. Life expectancy has increased from about 40 to 60 years, adult literacy has risen from 10 to 49%, primary school enrolment rates increased from 57% to 72%, female illiteracy rates dropped from 94.5% to 69%, fertility rates declined form 7.9 births to 6.2 per woman, and infrastructure has been greatly expanded.[1]

However, Yemen faces major development challenges. Yemen's Human development index (HDI) remains at 149 (out of 177 countries), a ranking unchanged since 1990 despite improvement on many indices. In addition, the pace of improvement of the HDI has declined from an annual rate of 2.2% between 1990 and1995, to 1.6% in the 1995-2000 period and to only 1.3% per year in the 2000-2003 period. Food poverty, a critical human development indicator, almost doubled from 9% to 17.5% between 1992 and 1998, and child malnutrition has steadily increased over the past two decades. Population growth rates remain very high at 3% pa, and the water crisis is worsening. According to the UN Common Country Analysis (CCA), and based on the Millennium Development Goals (MDG) Report and Poverty Reduction Strategy (PRS) progress report, "the country is not on track to reach most MDGs by 2015 without substantial redirection of policies, injection of additional funds and institutional and human capacity building."[2] It blames poor performance on inappropriate policy choices, including allocation of insufficient resources, and inefficiency of public action, among other things.

Financial constraints to achieving Yemen's development goals are daunting. The MDG Needs Assessment Report calculates that it will cost $57.6 billion between 2006 and 2015 to pay for the programs necessary to reach the MDGs. According to this report, "Assuming national resources can cover at least $20 billion, total funding gap goes down to $37.6 billion or around $160 per capita on an annual basis, which is the upper range of ODA receipts for an LDC. Given the very low current levels of ODA per capita received by Yemen and the unwillingness or inability of donors to meet the pledges of just over $2 billion for a three year period made in Paris in 2002, realization of the needed funding support would be contingent upon concerted national effort, including painful policy reforms. However, the policy environment would have to improve radically and measures taken to increase domestic resource mobilization in a sustainable and socially equitable manner, as well as a more efficient manner. Thus the picture looks bleak for realizing the MDGs."[3]

Yemen has committed itself to realizing the MDGs, and is an MDG pilot country. These goals and the GoY's assessment of its ability to reach these goals by the year 2015 are as follows:

Table 1: Yemen's Likelihood of Meeting the MDGs

MDG	Will MDGs be reached?	Indicators
Halve the proportion of people living below the poverty line	Unlikely	10% live on less than $1
Halve the proportion of underweight children under-five years old	Potentially	46% of children under-five are under weight

[1] World Bank, Water, Environment, Social and Rural Development Department, Middle East and North Africa Region, *Republic of Yemen, Country Social Analysis*, Report No.: 34008-YE

[2] United Nations, *United Nations Common Country Assessment, Republic of Yemen*, Yemen, August 23 2005.

[3] As quoted in: UN, *Common Country Assessment, Republic of Yemen*, January 16, 2006, Yemen

MDG	Will MDGs be reached?	Indicators
Universal primary education	Potentially	59% primary enrolment rates
Equal access for boys and girls to primary and secondary schools	Unlikely	
Reduce under-five mortality by two-thirds	Potentially	Mortality for children under-five: 94 per 1,000 live births
Reduce maternal mortality ratio by three quarters	Unlikely	Maternal Mortality rates: 351 per 100,000 live births
Halt and reverse the spread of HIV/AIDS	No data[4]	
Halt and reverse the spread of malaria and other major diseases	Unlikely	35% of all reported diseases are malarial infections
Reverse loss of environmental resources	Unlikely	---------
Halve the proportion of people without access to safe drinking water	Unlikely	64% of population is without sustainable access to safe drinking water

Source: Ministry of Planning: MDG Progress Report, 2003

The health sector, similar to other sectors in the country, has made significant progress, but recent analyses point to the fact that the Ministry of Public Health and Population (MoPHP) has a long distance to go in order to provide accessible and quality services. Unequal distribution of health staff, poor motivation, conflict between staff's private and public roles, poor skills and gender mix per facility, low performance, weak management, poorly functioning district system, lack of an accurate health information system (HIS), non-sustainable supply of drugs, bypassing of government facilities by the population, lack of rational planning criteria for distribution of facilities, etc. are all issues that need to be solved before the system functions effectively. A MDG needs assessment concluded that the main constraints to improvement are inadequate financing, centralization, weak institutional capacity, poor human resource capacity to deal with the magnitude of change, and no suitable instruments for implementation of institutional changes. Other problems are poor targeting, lack of a poverty focus, and the need to revise the 1998 Health Sector Reform (HSR) strategy to focus on priority setting and consensus building.[5] A joint health sector review to be carried out as a mutual exercise between the majority of donors to the health sector and the Ministry began in 2006, in order to support improved planning and functioning of the Ministry as well as the donor harmonization process.

Coverage of the population by government health services has inched forward very slowly. At present, it is estimated that health care access is 50%.[6] This figure has barely changed since 1992, when access was estimated by the MoPHP to be 45%.[7] Coverage is not necessarily synonymous with number of health facilities (HF) built. While government statistics show a 130% increase of HFs between 1990 and 2004, with 3176 in place in 2004[8], an unknown number of these are staffed and functioning, and their non-rational distribution means that each new facility built does not necessarily have an additive effect on coverage. In addition, the catchments areas are largely unmapped, with many people who live officially within these catchments areas are, in reality, without effective access to their facilities. Private non-

[4] No HIV prevalence surveys have been conducted. UNAIDS, however, estimates that 11,227 persons were infected as of the end of 2003. See also, USAID. March 2005. "Assessment of the HIV/AIDS Situation in the Republic of Yemen: A Framework for USAID Assistance." Washington, D.C.

[5] See, for example, Toonen, Jurrien, *Health Sector Development in Yemen, Making Choices: Towards a Strategic Planning for the DPRP, final draft report*, Royal Tropical Institute, Amsterdam, 2005.

[6] Compernolle, Phil, with MoPHP inputs, *Estimating the Costs of Addressing the Health MDGs in Yemen (draft*), Royal Tropical Institute (KIT), WHO, March 2005.

[7] GoY, UNICEF, World Bank, and Radda Barnen, *Children and Women and Yemen; A Situation Analysis – Health and Nutrition*, Yemen, 1998.

[8] MoPHP, *Annual Health Statistical Report for 2003-2004*, Yemen, 2005; al Mansoob, Dr. Muhammed, and al Awg, Dr. Adul Karim, Children and Women in Yemen: A Situation Analysis 2004, UNICEF, Yemen, September 2004.

specialized health facilities numbered 2956 in 2003, according to MoPHP statistics[9] , with their numbers growing rapidly.

Some improvement in real coverage has taken place, especially regarding maternal health services, as verified by the 2003 Yemen Family Health Survey (YFHS). The percentage of women receiving antenatal care has doubled since 1991/92 and is currently at 45%, and the percentage of women receiving trained assistance at birth has more than tripled since then to reach 33%.[10] This success is most likely attributable to the emphasis the MoPHP and donors have put on the training and deployment of community midwives over the past decade. However, other service indicators such as immunization coverage show an actual decline over time, with only 37.2% of children fully immunized in 2003 compared to 41.9% in 1991/92. Others are stagnant, such as oral rehydration (ORS/RHS) usage for diarrhea (31.2)[11]. Access to Emergency obstetric care (EmOC) is estimated at 16%, and Integrated Management of Childhood Illnesses (IMCI) coverage was estimated at 40% of hospitals and 30% of PHC facilities, with no comparative statistics available from earlier dates.[12] The demise of the Drug Fund, which operated on a cost recovery basis, and which was one of the reform strategies to improve access to drugs, may further decrease real health care access. There was some evidence that the Drug Fund did result in greater access to drugs at the rural health facility level, and its replacement by the more traditional "National Drug Program" in June 2005 will need to be watched for its sustainability and its short term effect on drug supplies to government health facilities.

A key reason behind the poor functioning of the health sector is that of under-funding. According to the 2005 World Health Report[13] total expenditure on health as percentage of GDP actually fell between 1998 and 2002, with external sources for health as a percentage of total expenditures for health also falling from 7.7 to 3%. Total per capita expenditure on health at average exchange rate was $18 in 1998, rising to $23 in 2002, with per capita government expenditure holding steady at only $6. Government expenditure on health as a total expenditure on health was 34.7% in 1998, and fell to 27.2% in 2002, with private out-of-pocket expenditures on health rising from 65.3% to 72.2% over those same years. Thus, health care has become more expensive within the last decade, government is paying a lower share, and Yemeni consumers are paying a higher share, a share many can ill afford given the current levels of poverty.

IV. EVALUATION METHODS USED

Six basic principles were applied to this evaluation exercise. First, it utilized the DAC evaluation methodology and criteria (relevance, effectiveness, efficiency, impact, and sustainability), highlighting those points in the evaluation terms of reference (TOR). Second, it adhered to standard best practice in relation to DOTS, and TB control in general. Third, it was based on the log frame of the project, and on the findings documented in the "Final Report for the Tuberculosis Control Project Phase III in the Republic of Yemen" and the "Joint Evaluation Report on the Japanese Technical Cooperation for the Tuberculosis Control Project", and as such utilized indicators and methods which allow comparison with indicators and findings set forth in these documents. Fourth, the analysis utilized verifiable quantitative data, as well as qualititative data, which was verified using multiple vefification methods, and using reasonable sampling techniques. Fifth, the analysis paid special attention to those Yemen-specific factors known to affect project outcomes. Finally, it used a gender approach, examining service and treatment data in light of the needs of both men and women. Utilizing the above principles, an evaluation grid was designed which acted as a framework for the evaluation content and methodology. It can be found in Annex B.

The evaluation made use of multiple qualitative and quantitative methodologies. The starting point was the collection of statistical data related to key project outputs and objectives. Data were collected and analyzed

[9] MoPHP, *Annual Health Statistical Report for 2003-2004*, Yemen, 2005.
[10] 1991/92DHS, 2003YFHS.
[11] ibid
[12] Compernolle, Phil, with MoPHP inputs, *Estimating the Costs of Addressing the Health MDGs in Yemen (draft*), Royal Tropical Institute (KIT), WHO, March 2005.
[13] WHO, *The World Health Report 2005, Statistical Annex*, 2005.

on quality and administrative systems related to DOTS coverage, supervision systems, case finding and diagnosis, supply and stock of drugs and other necessary materials, treatment outcomes, health education, and TB laboratory activities and quality control. Following verification and cross referencing, these data were then compared to those from the final evaluation.

Semi-stuctured interviews and open ended discussions were carried out with MoPHP officials, relevant donor organizations such as WHO, staff of the NTP at national and regional levels (especially those former counterparts who worked with or were trained by the project), NGO partners, health workers and laboratory technicians from the HC and PHCU level, and other stakeholders as necessary. Interviews were held with patients, as well as defaulters, and observation of relevant diagnosis, treatment and laboratory techniques and facilities took place. Budgetary and resource analysis at central, regional and facility level were carried out, as was an institutional analysis of the scope and functioning of the NTP, making use of official as well as informal documents, observation, and interviews with key stakeholders. A review of statistical and data collection/monitoring capability took place, and written reports and references were consulted. Cross referencing between data sources was carried out in order to ensure the greatest accuracy of the data and conclusions, and data were analysed along gender and poverty dimensions, to the extent the data would allow. A list of written sources consulted for the analysis can be found in Annex C, and a list of individuals interviewed can be found in Annex D.

At the national level, 22 semi-structured interviews took place with donors, MoPHP officials, NTP staff, and NGO partners. In addition, a field survey was carried out, which constituted a main source of data, and data verification. The field survey was carried out in nine different governorates throughout the country, including those four governorates in which the main national and regional centers are located; the capital of Sana'a, Aden, Hodeidah, and Taiz. The field survey covered 17 districts in all, and was carried out at all levels at which the NTP operates, including national, regional, semi-regional, governorate, district, health center, and primary health care unit (PHCU) level. Four different categories of stakeholders were surveyed in the field survey: NTP management staff, NTP clinical staff, patients, and defaulters. Four separate field survey instruments were utilized. A total of 59 field interviews took place at 26 sites, including 18 management, 17 clinical, 22 patient, and 2 defaulter interviews. In a number of sites, the management and clinical staff were one and the same, in which case both types of interviews were held with the same individual. A total of 44 principal informants were interviewed in the field survey, in addition to supplementary informants. Please see Annex E for a copy of field instruments used. The field survey sample is as follows:

Table 2: Field survey sample

Governorate	**Governorate level**			**District and HF level**		
	clinical	management	patients	clinical	management	patients/ defaulters
Sana'a City	1	1	2	0	0	0
Al-Hodeidah	1	1	1	1	1	1
Taiz	1	1	2	1	1	2
Aden	0	1 regional	0	1	1	1
	0	1 governorate				
Hajjah	1	1	2	1	1	0
Lahj	1	1	2	1	1	2
Al-Daleh	1	1	0	2	1	2
Al-Baidah	1	1	2	1	1	1
Dhamar	1	1	2	1	1	1/1
Grand total: 59 (51m/8f)	8	10	13 (10m,3f)	9	8	9/2 (7m, 2f/ 0 m, 2f)

NTP staff were interviewed from the following sites and levels:

NTI	1
Aden Regional Center	2
Subcenters	3
Governorate HO (GTC, GLS)	5
Governorate HF	5
District HO (DTC/HF)	8
PHCU (one at district level, one inactive)	2
Total number of sites covered	26

17 interviews for clinical practice took place, but only 16 of these interviewees were active, with the 17th carrying out almost no NTP activities for his PHCU. Therefore this interview is not relevant for all questions, and only appears in some of the calculations, depending on the question, Of the 18 management staff interviewed, 15 also had direct clinical or clinical supervision responsibilities. Only one clinical/management interview took place with a female because of the small number of existing female NTP staff. Of the 22 patients interviewed, 19 were DOTS patients, and 3 were non-DOTS. A total of 18 patients were interviewed directly, and information about four more was obtained through their official 'observers'. A total of 17 patients were male and 5 were female, and both defaulters were female. Patients interviewed had been undergoing treatment between 1 and 8 months, with a mean of 3 months. The 22 patients were from 9 governorates, and 15 districts. This sample best represents those patients who live close to a district or governorate center. It can be expected that a sample of those living farther away would have had a somewhat different experience and different circumstances.

V. RESULTS OF EVALUATION

A. Description of the NTP

The NTP exists as a 'program' under the General Directorate (GD) of Infectious Diseases and Surveillance, within the Primary Health Care (PHC) Sector of the Ministry of Public Health and Population (MoPHP). The NTP consists of 1) the Central Unit, located in Sana'a, which is responsible for management of the TB program nationally, 2) the Aden Regional TB Center (Aden RTC), located in Aden, which supervises, trains, carries out quality control, and generally supports eight of the southernmost governorates but which does not carry out clinical activities, 3) three sub-centers, located in Sana'a, Taiz and al-Hodeidah, which carry out governorate level supervisory and quality control functions, as well as diagnosis and treatment. (The Sana'a sub-Center, also known as the National TB Institute, or NTI, is housed in the same building as the Central Unit, and accepts patients from throughout the country.); 4) governorate level management, carried out by one Governorate TB Coordinator (GTC) per governorate who is responsible for planning and for supervision of all TB control activities within his governorate, and a Governorate Laboratory Supervisor (GLS) who is responsible for quality control of TB laboratories in the governorate; 5) district level management, carried out by a District TB Coordinator (DTC), who is responsible for all TB control activities within his district (diagnosis, treatment, follow up, training, supervision, logistics, etc…..); and 6) the peripheral, or primary health care unit (PHCU) level, where direct observation of DOTS patients takes place. See Annex F for an organogram of the NTP.

DOTS (directly observed therapy, short course) was introduced into Yemen in September 1995, and by the end of December 2006, the NTP states that it had covered 290 districts among 334 in the country, with DOTS population coverage estimated at 98%. The NTP implements the international DOTS strategy, with its five point package of

- Government commitment to the National Tuberculosis Control Program;
- Case detection by sputum smear microscopy examination of TB suspects in health centers at district level;
- Standardized short course chemotherapy to at least all smear positive all smear positive TB cases under proper case management conditions with the initial phase of treatment fully supervised;
- Regular uninterrupted supply of all essential anti-TB drugs;

- Monitoring system for program supervision and evaluation.

B. Current status of TB control in Yemen, in comparison to the JICA project period

In this section, a comparison is made between the activities and outputs of the NTP at the end of the project (EOP) in 2004, and those of 2005 and 2006. This analysis uses, to the extent possible, the same indicators as those utilized in the JICA Tuberculosis Control Project design matrix (PDM). Alternative indicators are used in those cases where comparable data are not available. EOP data are those reported as of mid-2004, in both the final project report (July 2004) and the final evaluation (February 2004). Data used for the 2005/2006 analysis are i) statistics produced by the NTP, ii) results of the field survey carried out in the course of the evaluation, and iii) other sources, such as technical reports by WHO. Where particular data are not specially referenced, their source is the NTP. The data were sometimes inconsistent, but great efforts were made by the evaluation team to resolve such inconsistencies in order to achieve the greatest accuracy possible. Where inconsistencies could not be resolved, or data could not be verified adequately, this is noted in the text.[14] The table below summarizes NTP results at EOP (2003 and 2004), and post project (2005 and 2006).

Table 3: NTP results at EOP (2003 and 2004), and post project (2005 and 2006)

Goals/Purposes/Outputs	Indicators	EOP Achievements	Current Status
Overall Goal: Mortality, morbidity and transmission of TB in ROY are reduced.	(1) estimated annual incidence of TB (2) Annual Risk of Infection (ARI)	Achievement of (1) and (2) assumed, given the high treatment success rate and increasing trend of DOTS enrollment, though never documented by a survey.	UNKNOWN Achievement of (1) and (2) continues to be assumed though never documented by a survey. A tuberculin survey is planned to take place in 2007.
Project Purpose: The quality NTCP is expanded to all over the ROY	All of the below mentioned are achieved: (1) All the districts of ROY are covered by DOTS. (2) 80% of the new SS+ cases are treated byDOTS. (3) 85% of the new SS cases under DOTS are successfully treated.	(1) 90% of districts of ROY covered by DOTS since 2002, which covers 98% of the population. (2) **95%** of the new SS+ cases treated by DOTS by 2003. (3) 81.1% of the new SS cases under DOTS successfully treated by 2002.	IMPROVED (1) 97% of districts of ROY officially covered by DOTS by 2006, with official coverage at 64%. (2) **98%** of the new SS+ cases treated by DOTS by Q 2, 2006. (3) 84.9% of the new SS cases under DOTS successfully treated by Q3, 2005.
Output 1: Case finding and diagnosis of TB are	1.1 Regular implementation of the slide	1.1 17 GLSs submit reports regularly. And carry out QC. Number of QC slides increase	IMPROVED 1.1 20 GLSs submit reports regularly and

[14] Explanations: a. Population data are derived by the evaluation team from the 2004 census, and are not the same as those used by NTP in their calculations. b. There are 21 governorates in Yemen, but the NTP splits Hadramaut Governorate into two – Sayun and al-Mukalla - for administrative purposes. c. The evaluation team uses 332 as the number of districts in Yemen in 2005 and 2006. This number has now risen to 334, and different sources quote 333. d. It was not always clear how the EOP report data were calculated, but it is always shown as is. Where there are obvious discrepancies with later calculations, both sets of data are shown.

improved.	checking is made at least quarterly for QC by GLSs. 1.2 Regular supervisory visits to rural labs are made by GLSs at least twice a year. 1.3 False positives and false negatives by QC checking do not esceed 5%. 1.4 Proportion of SS+ cases among newly detected pulmonary TB exceed 50% in each governorate.	every year, and trained GLSs have increased. *[Achieved in 5 governorates and partially achieved in 9 governorates.]** 1.2 16 GLSs visit rural labs regularly 4 times a year. *[Achieved in 7 governorates and partially achieved in 8 governorates.]* 1.3 Achieved. False positive 3.3% and false negative 1.3% so far in 2003. *[False positive 2.9% and false negative 1.1% in 2003.]* 1.4 Achieved nation-wide but only 8 governorates have achieved this level. *[Achieved in 7 governorates and at the national level. Proportion of SS+ cases among newly detected pulmonary TB was 52.5% (3793/7228), among all new TB cases was 38% (3793/9987) in 2003.]*	carry out QC. Number of trained GLSs have increased. 1.2 20 GLSs visit rural labs regularly 4 times a year. 1.3 Achieved. False positive 1.3% and false negative 0.6% by so far by Q 2, 2006 1.4 Achieved nation-wide but only 15 governorates have achieved this level. Proportion of SS+ cases among newly detected pulmonary TB was 55.3% (3793/7228), among all new TB cases was 38.8% in 2006, Q 1-3.
Output 2: Treatment of TB is improved based on proper case management system.	2. Proportion of the defaulters does not exceed 10% in new SS+ cases under DOTS.	2. Achieved as of Q3, 2003. *[Achieved in 10 governorates and at the national level. Proportion of the defaulters was 9.4% (358/3790) in new SS+ cases under DOTS in 2002.]*	<u>IMPROVED</u> 2. Achieved. Proportion of the defaulters was 6.7% in new SS+ cases under DOTS Q 1-3 in 2005.
Output 3: The supply system of the drugs/materials is improved with special emphasis on establishment of a good reserve stock system.	3. More than 95% of districts are free from lack of drugs/materials.	3. Unconfirmed. *[Achieved]*	<u>DECLINED</u> 3. Weaknesses remain, especially lack of non-DOTS drugs.
Output 4: A program monitoring system is improved based on a standardized recording and repoting system.	4. Regular quarterly reporting is made by more than 95% of districts, and by 100% of governorates throughout the year.	4. Not fully achieved. 18/21 GTCs reported quarterly, and 230/259 of DTCs reported at lease once in 2003 Q 1-3. *[Number of reportings districts is 211 (80.8% of 261) and that of governorates is 19 (90.5% of 21).]*	<u>SAME/DECLINED</u> 4. 100% of GTCs but only 58.9% of DTCs reporting through Q 3, 2006. Supervision takes place to level of district, but checklists not followed, and little supervision below level of district.
Output 5: The size and nature of the TB problem of the ROY are studied.	5. Reporting of the survey/ research is issued.	5. Drug Resistancve Survey has just been started, and other research activities remain to be implemented. *[Achieved.]*	<u>SAME</u> NTP continues to carry out operational research and is planning a tuberculin survey.

** The data in italics and brackets are from the final report 7/28/2004[15]. They differ somewhat from those of the final evaluation, which was carried out five months earlier, on 2/18/2004[16], and which are shown in normal script. Where they differ, both sets of results are shown.*

1. DOTS coverage

a) DOTS coverage by district and by population

The NTP reports that it currently covers 322 out of Yemen's 332 districts, and estimates population coverage at 98%. This compares with 259 districts, and an estimated 98%[17] of the population covered at project end. A district is considered covered if NTP TB control activities are present in at least the district facility. Population coverage is calculated by adding together the entire population of each district in which the DOTS program exists.

Table 4: DOTS coverage by district and population

Year	Governorates	Districts w/DOTS[18]	Population (million) [19]	DOTS coverage by districts [20]	DOTS coverage by population	Source of population coverage data
2004,Q2 EOP	21	259	19.2	90%	98% since 2002*	JICA EOP
2005	22**	291	19.8	88%	93%	NTP[21]
2006	22	322	20.4	97%	98%	NTP[22]

** Derivation of this percentage is obscure, given the fact that only 259 districts were covered EOP.*
*** There are 21 governorates in Yemen, but the NTP splits Hadramaut Governorate into two – Sayun and Mukalla - for administrative purposes.*

These data suggest that the NTP has been able to maintain and even improve its coverage since JICA support ended, as measured by number of districts covered. However, not all of the districts reported as covered are fully operational. According to the NTP training and other departments, 37 of the 322 districts are currently in the process of being readied for DOTS, only 249 are officially scheduled for regular supervision, and only 213 are actually supervised, due to security and other problems Since this level of detail about *actual* coverage was not available in the JICA final evaluation, it is not possible to say whether these figures on coverage represent a deterioration or an improvement of the real coverage situation since JICA EOP.

In comparison, the most recent data on DOTS population coverage for the Eastern Mediterranean Region show a rate of 95% for the region as a whole, in the third quarter of 2005, an improvement from a coverage

[15] Final Report for the Tuberculosis Control Project Phase III in the Republic of Yemen, Tsuneo Masui, Takaju Date (Tuberculosis Control Project, Phase III, JICA) and Amin Noman Saeed al-Absi (National TB Control Program, MoPHP, ROY), July 28, 2004
[16] Joint Evaluation Report on the Japanese Technical Cooperation for the Tuberculosis Control Project (Phase III), JICA and the MoPHP, Republic of Yemen, February 18, 2004
[17] This percentage, quoted in the JICA EOP report, does not fit the fact that only 259 districts were covered by EOP.
[18] All data calculated by the evaluation team uses 332 as the number of districts in 2005 and 2006. This number has now risen to 334, and different sources quote 333.
[19] Population data are derived by the evaluation team from the 2004 census, and are not the same as those used by NTP in their calculations.
[20] Figure for 2004 taken from JICA EOP report. For 2005 and 2006, percentage calculated by evaluation team from number of districts.
[21] Yemen Experience in TB Control, DOTS Progress Report, 1995 - Q1,2/2006, Slide Show Presentation by Dr. Amin Noman, African Home Health Conference, Djibouti 27-30 Nov. 2006.
[22] ibid

rate of 90% in the first quarter of 2005. Out of 22 countries in the region, four have not reached 100% coverage, Yemen being among them.[23]

b) DOTS expansion to PHCUs

The NTP reports that it has expanded DOTS activities to 1563 PHCUs throughout the country. This compares with 777 by 2004, which would indicate a major expansion of DOTS to the PHCU level over the past two years. The majority of the health workers in these PHCUs were trained by 2004, before EOP. The NTP describes the role of PHCUs in TB control to be case identification, direct observation/follow up of the patient, and health education.

Table 5: PHCUs providing TB control services from 2003 to 2006

Year	Data source	Governorates	PHCU
2003	Musai[24]	21	537
2004	" "	22	777
Nov. 2005	NTP	22	1375[25]
mid-2006	NTP	22	1563[26]

A. breakdown of all health facilities reported to be engaging in TB related activities can be found in the following table, and breakdown by governorate can be found in Annex G.1, with supplemental information in G.2.

Table 6: HFs engaging in TB related activities, by the first quarter of 2006

Health facilities in the public sector[27]						HFs with TB control activities					HWs in HUs who received TB training		
TB center	Gov. hospital	Rural hospital	HC	HU	MCH	Hos-pital	HC	HU	MCH	NGO	Male	Female	Total
4	60	151	715	2659	74	62	150	1563	3	2	1648 (74%)	594 (26%)	2246

Numbers of HFs actually carrying out TB control activities appear to be many fewer than the official numbers, however. The NTP does not keep data on *active* PHCUs, but the following data, taken from 15 governorates, shows that only 700 cases, or about 10% of DOTS patients nation-wide were being followed up in PHCUs vs. district or governorate level facilities, It is unknown how many were referred from or are being directly observed at these units.

Table 7: SS+ cases under DOTS in HUs by Quarter 3, 2006 for 15 governorates*

Cases already under DOTS	New case detected under DOTS	Total
342	358	700

** Two governorates not reporting and five others not included in statistics.*

The field survey revealed that some PHCUs in some districts are involved in TB control, but support and supervision to this level of the system by district and governorate TB control coordinators remains weak. In addition, health education at all levels is nearly nonexistent, and will need to be addressed if PHCWs are

[23] EMR Quarterly Fax, First Round 2006, General and Country-Specific Results and Recommendations, WHO, Regional Office of the Eastern Mediterranean, Division of Communicable Diseases, Stop Tuberculosis Unit. Also, Third Round, 2005

[24] Mission Report: Tuberculosis Control in the Republic of Yemen (16 February – 4 March 2005), Dr. Tsuneo Masui, JICA short term expert

[25] NTP data sheet, Demographic and health information, Dr. Amin Noman, Director, NTP

[26] NTP data sheet, NTP data, first half of 2006 (from Dr. Ahmed Zubeir, Deputy Director, NTP)

[27] Statistical Year Book for 2005, CSO, Ministry of Planning and International Cooperation, 2006

to make a meaningful contribution to awareness raising of TB patients and their communities. Issues of health education and supervision will be addressed more fully in section V.B.3.d and V.B.5

The intention of the NTP to expand to rural PHCUs is very important, and will potentially facilitate improved access to TB services. However, according to the most recent MoPHP statistics, [28] public health facilities in Yemen (PHCUs, HCs, hospitals) are estimated to cover only 25% of the rural, and 80% of the urban population. Thus the DOTS expansion program, while increasing access to the geographic areas immediately surrounding health facilities, will not necessarily create informational and service access to the majority of the rural population. This situation will limit the NTP's ability to reach the entire population, even if it succeeds in expanding to all existing health facilities in the public sector. Adequate coverage will require outreach and other innovative strategies, in addition to facility based efforts. The MoPHP also states, in its most recent Five Year Development Plan (2006-2010), that for the period 2001-2005, less than 22% of all health facilities operated as TB control facilities. Support services important for TB control, such as health education and laboratory services, were also judged to be functioning in only a portion of health facilities i.e. less than 200 each.

c) DOTS coverage (%) among new sputum smear positive TB cases

DOTS coverage among new sputum smear positive TB cases continues to improve, and is estimated at 98% by mid-2006, as compared to 95% by the end of 2003.

Table 8: DOTS coverage (%) among new sputum smear positive TB cases

2003	2004	2005	2006 (Q1-2)
95%[29]	94.2% [30]	94%[31]	98%[32]

2. Case finding, diagnosis, and strengthening the laboratory network

Case finding and diagnosis are carried out passively as recommended by WHO, and for cost considerations, and there is no surveillance for close contacts. The process of case finding and diagnosis has not changed since the JICA project was in place.

a) Trend in case finding of all cases (DOTS + non-DOTS)

Case finding results supplied by the NTP show a recent trend of declining rates of new sputum smear positive cases per population per year, and a fluctuating but approximately stable percentage of positive sputum smears for new cases and for new pulmonary cases.

Table 9: Trend of case finding of all cases (DOTS + non-DOTS) [33]

Year	NSS+	Relapse	NSS-	EP	Total	SS+	NSS+/pop 100,000	%SS+ in new cases	%SS+ in new pulmonary cases
2003	3787	426	3289	2748	10,250	4213	20.1	38.0%	52.5%
2004	3434	377	3473	2732	10,016	3811	17.4	35.6%	49.7%
2005	3379	351	2780	2553	9,063	3730	17.1	38.8%	54.9%
2006 Q1-3	2501	237	2023	1914	6675	2738	(12.7)	38.8%	55.3%

[28] Third Five-Year Plan for Health Development and Poverty Reduction (2006 - 2010), MoPHP, 2006
[29] Mission Report: Tuberculosis Control in the Republic of Yemen (16 February – 4 March 2005), Dr. Tsuneo Masui, JICA short term expert. Also EOP report
[30] ibid
[31] Yemen Experience in TB Control DOTS Progress Report 1995-Q1,2/2006, Slide Show Presentation, by Dr. Amin Noman, African Home Health Conference, Djibouti 27-30 Nov. 2006
[32] ibid
[33] NTP data sheets, Case notification by governorate, 2004-2006 (Q1-3), and final report JICA

In computing case finding rates (NSS+/per 100,000 population), the NTP has used the same population figures for 2004 through 2006, rather than adjusting for the 3.1% annual population growth rate. This has the result of artificially improving the case detection rate in the most recent years. If such an adjustment had been made, the decline between 2004 and 2006 rate would be sharper.

Please see table 11 below, for a breakdown of case finding by governorate for the first three quarters of 2006, and Annexes H.1 and H.2 for a breakdown by governorate for 2004 and 2005. Proportion of SS+ cases among newly detected pulmonary TB exceeds or equals 50% in 15 governorates as of the third quarter of 2006, compared to only 8 governorates by EOP. This indicates important quality improvements during the post-project period. There is also wider *variability* among governorates in the % SS+ in new cases and new pulmonary cases than was the case in 2003. This may reflect more variable quality of implementation of DOTS across governorates. According to the NTP, weak governorate level management is responsible for some of the variability e.g. al Baidah and al Mahrah.

Table 10: Case finding in 1st, 2nd, 3rd quarters 2006 (DOTS and Non DOTS)[34]

Governorate	NSS+	Relapse	NSS-	EP	Total	Population 2004	NSS+/ pop 100,000	%SS+ in new cases	%SS+ in new pulmonary cases
Abyan	106	10	75	19	210	438656	24.2	53.0%	58.6%
Aden	171	34	143	142	490	590413	29.0	37.5%	54.5%
Al Baidah	40	15	238	64	357	571778	7.0	11.7%	14.4%
Al Daleh	58	2	38	40	138	470460	12.3	42.6%	60.4%
Al-Hodeidah	537	39	187	216	979	2161379	24.8	57.1%	74.2%
Al-Jawf	41	5	34	18	98	451426	9.1	44.1%	54.7%
Al Mahrah	12	0	26	2	40	89093	13.5	30.0%	31.6%
Al Mahweet	47	2	57	45	151	495865	9.5	31.5%	45.2%
Al Mukalla	76	9	9	16	110	562290	13.5	75.2%	89.4%
Amran	48	6	61	79	194	872789	5.5	25.5%	44.0%
Dhamar	136	10	156	91	393	1339229	10.2	35.5%	46.6%
Hajjah	216	26	351	109	702	1480897	14.6	32.0%	38.1%
Ibb	97	9	46	75	227	2137546	4.5	44.5%	67.8%
Lahj	108	6	97	55	266	727203	14.9	41.5%	52.7%
Mareb	45	0	29	13	87	241690	18.6	51.7%	60.8%
Saadah	49	1	24	19	93	693217	7.1	53.3%	67.1%
Sana'a City	241	22	153	465	881	1747627	13.8	28.1%	61.2%
Sana'a Gov.	50	3	39	58	150	918379	5.4	34.0%	56.2%
Sayun	18	2	18	20	58	467172	3.9	32.1%	50.0%
Shabwah	33	2	40	11	86	466889	7.1	39.3%	45.2%
Taiz	348	33	196	343	920	2402569	14.5	39.2%	64.0%
Raimah	24	1	6	14	45	395076	6.1	54.5%	80.0%
Total	2501	237	2023	1914	6675	19721643	12.7	38.8%	55.3%

[34] ibid

b) Age and sex distribution of cases

Distribution of cases by age and sex shows that in all age groups but the youngest, male cases outnumber female. This trend was present during the years of JICA support, but the divergence in detection between the sexes is growing somewhat, with 59% of detected cases in 2006 male, as compared to 56% in 2003.

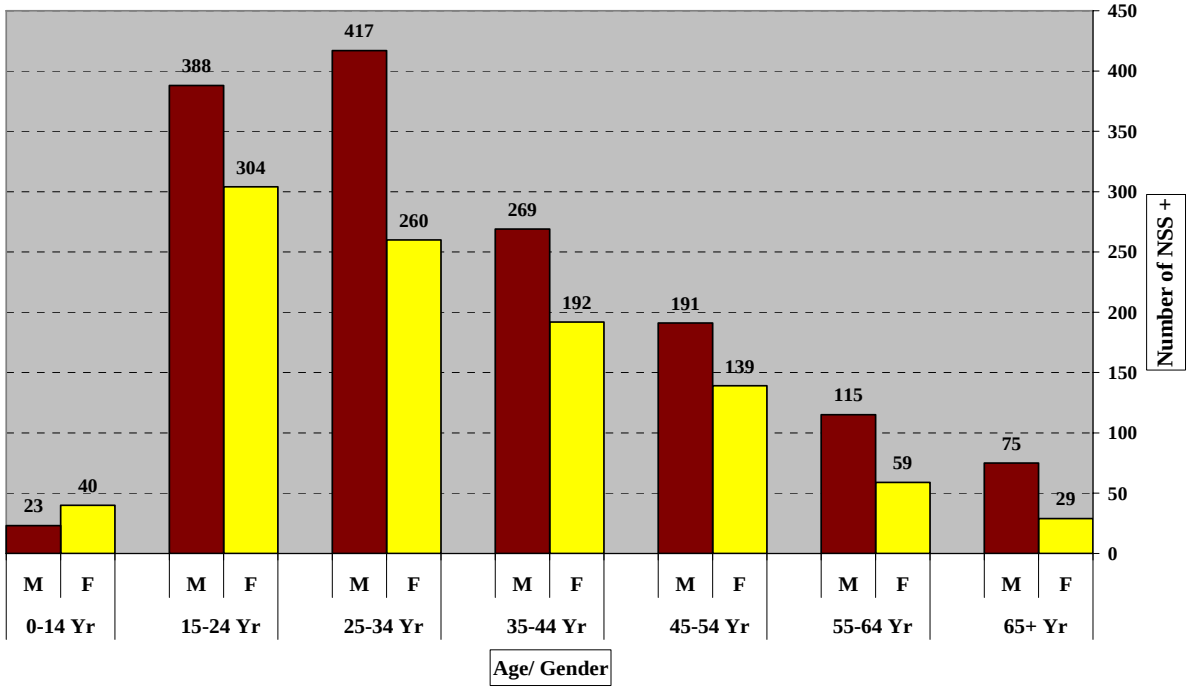
Table 11: Distribution of new sputum smear positive cases by sex[35]

Year	DOTS cases		Non-DOTS cases		DOTS + non-DOTS		Source
	M	F	M	F	M	F	
2003	NA	NA	NA	NA	56%	44%	JICA
2004	58%	42%	66%	34%	58%	42%	NTP
2005	58%	42%	58%	42%	58%	42%	NTP
2006 (Q1-3)	59%	41%	62%	38%	59%	41%	NTP

The reasons for capturing a smaller number of female TB cases has not been studied by the NTP, but it can be expected that the same cultural, geographic and financial obstacles that prevent Yemeni women from accessing other types of health care services operate in relation to access to TB services. In fact there is good reason to believe the obstacles are even greater in the case of TB treatment, given the stigma attached to TB. NTP field staff agree with this assessment. Out of 20 clinical and management staff interviewed in nine governorates in the field survey, all 20 stated that women face special obstacles of access. It was stated that stigma and poverty affect women more than men. For example, a female patient is less likely to be considered 'marriagable', and a female from a poor family is less likely to be taken for TB treatment than a male from the same family, due to issues of expense. Age distribution is similar to that at EOP. Please see Annex I for a more detailed age breakdown.

[35] NTP data sheets, Age group for new positive cases registered under DOTS and non-DOTS 2004- 2006 (Q1-3)

Distribution of NSS+ by Age and Gender in Q 1,2,3- 2006.



c) TB laboratory activities and quality control

TB laboratory quality control has expanded to 20 (out of 22) governorates and to 236 laboratories as of the second quarter of 2006, as compared to 144 laboratories at EOP. Laboratory quality has steadily improved in the post-project period, as judged by the false positive and false negative results.

Table 12: TB Laboratory quality control

Indicators	2003 (EOP data)	2004	2005	Q1-Q2 2006
No. of governorate performing QC	16*	16*	19	20
No. of laboratories performing QC	144	165	188	236
No. of total slides for QC	8401	8501	9731	7719
False negative (%)	1.1%	0.3%	0.7%	0.6%
False positive (%)	2.9%	1.8%	1.7%	1.3%

** Hadramout was counted as one governorate in 2004, but as two in later years, for management reasons.*

Laboratory activities have decreased somewhat since 2003, with total slides numbering only 62,410 in 2005, compared to 65,694 in 2003, reflecting decreased case finding. Table 13:

Table 13: TB laboratory Activities

	2003 (JICA EOP)	2004	2005	Q1-Q2 / 2006
Diagnostic slides	54520	52046	52897	33903
Diagnostic cases	29948	27090	26500	15603
Positive diagnosis slides	5006	5359	5756	3311
Positive diagnosis cases	3266	3128	3098	1779
Positive diag. slides/cases	1.5	1.7	1.86	1.86
Total slides	65694	61821	62410	38593
No. of reporting laboratories	157	165	188	236

The field survey for the case detection/laboratory aspect of TB control showed that laboratory staff were generally competent, knowledgable, and demonstrated good practice. In 14 out of the 16 sites sampled where laboratory diagnosis took place, a protocol was in evidence. In all 16 sites the knowledge and practice of the laboratory technician showed consistency with the NTP standards, and most had attended either a training or a meeting in the last two years. A total of 13 out of 16 had been supervised within the previous three months, with two more supervised within the past six months, although laboratory technicians note that supervision is sometimes restricted to collection of slides and data, and is not truly comprehensive, according to the standards of the supervision checklist guidelines. Equipment was found to be in accordance with standards, with the exception of two sites, where diagnostic solutions and forms were not available. The NTI and the Aden Regional TB Center both were found to carry out governorate level laboratory supervision, ID[36] and drug sensitivity tests, training, as well as quality control, with the NTI also carrying out primary cultures. The two sub-centers in Taiz and Hodeidah were found to carry out supervision of diagnostic labs in their governorates, primary cultures, and routine sputum exams. Other governorate and district level facilities visited carried out direct smear examination, and kept slides for quality control.

Quality control was found to be carried out at all locations surveyed, with slides kept at all relevant sites for basic quality control. At the governorate level, the GLSs carry out quality control for all slides from the district level, fill out the general and district level quality control reports, and calculate statistics quarterly. Special files are kept for the serial numbers of slides examined at the district level to enable them to locate slides for follow up if needed. At the district level, the tasks of the lab technicians are sputum examination, recording results in the register and keeping slides for QC. They have no reporting or statistical responsibilities. All laboratories except for the NTI were found to keep their positive and negative slides in an organized and accessible way, with records showing good cross-consistency with the slides. The NTI slides and records, in contrast, were poorly organized. At the level of the governorate and in sub-centers where the patient load is relatively high, all the positive and 30% of the negative slides are retained for quality control. GLSs are collecting laboratory statistics during their quarterly supervision visits, as well as DTCs in some districts. At the level of districts, there are no written reports or summaries related to lab results kept with lab technicians. According to some GLSs, districts are given feedback reports about QC when they came to the governorate level for drug supplies, meetings, or any other related health activities. However, there is usually no written feedback to the district level on laboratory quality issues. According to staff at the district level, feedback on QC is either not provided, is verbal, or takes place in meetings.

In summary, laboratory activities appeared to be of overall high quality and to be carried out according to protocol, with only occasional problems detected such as forms or unavailability of laboratory supplies. Quality control was seen at all levels and at all sites. Laboratory supervision was in place and covered all districts surveyed, although it did not necessarily conform to all the standards of the supervision checklist.

[36] ID is an identification test used to differentiate between the typical and the atypical mycobacterium strains when there is a resistance to treatment.

3. Case management and treatment outcomes

a) Treatment outcomes

The NTP provides the following statistics on treatment outcomes for 2002 through the third quarter of 2005. Data for patients diagnosed in 2006 will be available at the end of 2007. The TO/CF ratio shows high levels for the last three years measured.

Table 14: Trend of Treatment Outcome among new SS+ cases (DOTS)

Year	Cured	Completed	Died	Failure	Defaulted	T/O.	Total	NSS+ in CF	TO/CF (%)
2002*	2725	315	131	45	326	129	3671	3870	94.9
2003	2556	402	124	35	329	117	3563	3602	99.0
2004	2292	373	88	22	264	127	3166	3239	98.0
2005, Q 1-3	1811	288	81	17	165	111	2473	2473	100.0

** JICA Final Report. The remainder of the data are from NTP records.*

Comparing treatment outcomes by year, the data show a slow but steady trend of improvement between 2003 and 2005 for both DOTS and non-DOTS success rates, with the percentage of defaulters decreasing for both categories over time.

Table 15: Treatment outcome of NSS+ cases in Yemen, 2002 - 2005 [37]

Year	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
2002 non-DOTS	95	165	5	2	51	16	334	15.3%	77.8%
2003 non-DOTS	76	50	3	3	36	8	176	20.5%	71.6%
2004 non-DOTS	90	110	3	1	42	16	262	16.0%	76.3%
2005 non-DOTS (Q 1-3)	107	42	5	0	21	9	184	11.4%	81.0%
2002	2769	343	139	45	358	136	3790	9.4%	81.2%
2003 DOTS	2556	402	124	35	329	117	3563	9.2%	83.0%
2004 DOTS	2292	373	88	22	264	127	3166	8.3%	84.2%
2005 DOTS (Q1-3)	1811	288	81	17	165	111	2473	6.7%	84.9%

Analysis of treatment outcomes by governorate in 2005 reveals that success rates vary between 69 and 100% for DOTS, and between 64 and 100% for non-DOTS (with the exception of Lahj, which has a success rate of only 20%). The NTP attributes the lower success rates of some governorates to local social and administrative issues largely outside the control of the NTP. Please find treatment outcomes by governorate for 2005 in the table below, and for 2004 and 2003 in Annexes J.1-8.

[37] NTP data on conversion rate for 2003-2005.

Table 16: Treatment outcome of NSS+ cases in Yemen, Q1, 2, 3 of 2005: (DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	73	15	5	1	12	3	109	11.0%	80.7%
Aden	138	33	6	4	16	13	210	7.6%	81.4%
Al Baidah	49	2	2	0	5	1	59	8.5%	86.4%
Al Daleh	42	0	0	0	0	0	42	0.0%	100.0%
Al-Hodeidah	149	4	8	1	10	5	177	5.6%	86.4%
Al-Jawf	242	12	12	1	17	7	291	5.8%	87.3%
Al-Mahrah	49	7	0	0	4	1	61	6.6%	91.8%
Al Mahweet	21	5	3	0	2	4	35	5.7%	74.3%
Al Mukalla	45	13	2	2	6	5	73	8.2%	79.5%
Amran	58	17	1	1	6	2	85	7.1%	88.2%
Dhamar	120	22	4	0	11	6	163	6.7%	87.1%
Hajjah	161	14	4	2	4	1	186	2.2%	94.1%
Ibb	84	4	2	1	8	3	102	7.8%	86.3%
Lahj	72	29	6	2	11	16	136	8.1%	74.3%
Mareb	19	1	0	0	4	2	26	15.4%	76.9%
Saadah	27	6	1	0	2	8	44	4.5%	75.0%
Sana'a City	144	74	7	0	10	16	251	4.0%	86.9%
Sana'a Gov.	47	9	1	1	7	1	66	10.6%	84.8%
Sayun	3	2	0	0	2	0	7	28.6%	71.4%
Shabwah	20	9	0	0	8	5	42	19.0%	69.0%
Taiz	235	8	16	1	20	11	291	6.9%	83.5%
Raimah	13	2	1	0	0	1	17	0.0%	88.2%
Total	1811	288	81	17	165	111	2473	6.7%	84.9%

Table 17: Treatment outcome of NSS+ cases in Yemen, Q1, 2, 3 of 2005: (Non-DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	3	2	0	0	0	0	5	0.0%	100.0%
Aden	7	1	1	0	1	1	11	9.1%	72.7%
Al Baidah	2	0	0	0	0	0	2	0.0%	100.0%
Al Daleh	0	25	0	0	0	1	26	0.0%	96.2%
Al-Hodeidah	14	0	0	0	6	2	22	27.3%	63.6%
Al-Jawf	24	2	2	0	1	2	31	3.2%	83.9%
Al-Mahrah	19	1	0	0	1	0	21	4.8%	95.2%
Al Mahweet	0	0	0	0	0	0	0	0.0%	0.0%

Al Mukalla	0	0	0	0	0	0	0	0.0%	0.0%
Amran	1	0	0	0	0	0	1	0.0%	100.0%
Dhamar	0	0	0	0	0	0	0	0.0%	0.0%
Hajjah	36	10	1	0	9	1	57	15.8%	80.7%
Ibb	0	0	0	0	0	0	0	0.0%	0.0%
Lahj	1	0	1	0	3	0	5	60.0%	20.0%
Mareb	0	0	0	0	0	0	0	0.0%	0.0%
Saadah	0	0	0	0	0	0	0	0.0%	0.0%
Sana'a City	0	0	0	0	0	0	0	0.0%	0.0%
Sana'a Gov.	0	1	0	0	0	0	1	0.0%	100.0%
Sayun	0	0	0	0	0	0	0	0.0%	0.0%
Shabwah	0	0	0	0	0	1	1	0.0%	0.0%
Taiz	0	0	0	0	0	0	0	0.0%	0.0%
Raimah	0	0	0	0	0	1	1	0.0%	0.0%
Total	107	42	5	0	21	9	184	11.4%	81.0%

b) Sputum smear conversion rate

The sputum smear conversion rate has decreased slightly since 2003, at which time a rate of 88.8% was achieved, according to EOP statistics. A rate of 85% was achieved in 2004, which then dipped to below the WHO standard of 85% to 84% in 2005. WHO reports that Yemen is among 6 countries in the region with sputum conversion rates less than 85% as of the 2nd quarter of 2005[38]. More recent data are not yet available from WHO, but those of the NTP show an improvement in 2006.

Table 18: Sputum smear conversion rate among new sputum smear positive cases 2003-2006

Period	Conversion rate[39]	Regional conversion rate	Source
2003, annual	(88.8%) JICA 86% NTP	NA	JICA Final Report NTP records (DOTS only)
2004, annual	85%	NA	NTP records (DOTS only)
2004, 4th Q	86%	87%	WHO Quarterly Fax
2005, 1st Q	88%	86%	WHO Quarterly Fax
2005, 2nd Q	83%	86%	WHO Quarterly Fax
2005, annual	84%	NA	NTP records (DOTS only)
2006, Q 1, 2	88%	NA	NTP records (DOTS only)

c) Implementation of DOTS and non-DOTS case management

NTP is responsible for case management of both DOTS and non-DOTS patients. Treatment and proper case management of TB is decided according to the history, clinical features, laboratory results, and chest x-ray results, and follows the WHO protocol. The process of treatment and proper case management has not changed since the JICA project. The treatment regimens have been revised, however, based on WHO guidance. The NTP currently uses 3 different drug regimens for DOTS, all of which are daily dosages, which they feel results in better compliance than the previous system of every third day dosages. In most,

[38] WHO Quarterly fax.

[39] NTP data from the Yemen Experience in TB Control, DOTS Progress Report, 1995 - Q1,2/2006, Slide Show Presentation by Dr. Amin Noman, African Home Health Conference, Djibouti 27-30 Nov. 2006. see Djibouti health care conference. JICA statistics are from the final report.

but not all facilities where DOTS is carried out, physicians and (in some districts) medical assistants and nurses have been trained in DOTS. The NTP receives adequate supplies of DOTS drugs from the GDF, but the non-DOTS drugs, which are the responsibility of the MoPHP, are not available because of procurement issues. Consequently, non-DOTS patients need to purchase their own drugs. The DOTS drugs are supplied free of charge to patients, as are the MoPHP non-DOTS drugs, when available.

The field survey showed that of the staff interviewed for the clinical aspects of TB control, the majority were well experienced. All but three had been working for over two years, with a range between 3 months and 17 years. At least 14 sites had been in existence for over two years, with a range between 3 months and 20 years. In the faciliteis visited, between 1 and 19 staff members per facility were carrying out diagnosis and treatment related to TB, with most having over 5 clinical staff. All were trained for their positions within 6 months of taking responsibility, were trained according to NTP protocol, and with length of training varying between 7 days and 6 months.

Of the 16 sites where case management was carried out, a protocol was in evidence in 14. Altogether, 14 out of 16 staff observed appeared to use the protocol and to carry out case management accurately. Of those two in which some deficiencies were noted, one placed all TB patients in category I, and the other was not a health worker, and thus did not have the background to carry out case management About three quarters had attended either a training or a meeting in the last two years. 13 sites had been supervised within the last three months , with two more supervised within the last six months. The great majority i.e. 13 out of 16 health workers were judged by the evaluation team to be competent and well selected and to be carrying out their functions well. Three were judged to be deficient in some aspect.

The majority off the 22 patients interviewed in the course of the field survey were diagnosed at one of the four major centers (7), or at the governorate level (8), with 5 diagnosed at the district level. In contrast, only 4 were treated at the major centers, with eight at the governorate and 10 at the district level, demonstrating a reasonably good referral system, at least down to the level of the district.

No reliable data are available to the NTP or to the evaluation team on the percentage of DOTS patients observed by a volunteer vs. a healthworker, because the space on the treatment card in which the identify of the observer should be specified is not usually filled out. The health workers interviewed defined 'direct observation' as meaning, variously, that the patient may be seen daily, weekly, or semi-weekly by the health worker, with a family member carrying out the daily observation. Reasons given by the health worker to not observe a patient him/herself were distance from a health facility, high transportation costs for the patient, or the patient being elderly or a child, in which case it was easier for the family or someone else from their community to carry out direct observation themselves. However, observations by the evaluation team in the field and interviews with patients revealed that other reasons for non-observation by health workers were sometimes brought to bear, such as the patient being a female, a friend of the health worker, a family member of someone who has been previously treated for TB, or the patient was educated or a VIP, in which case patient preference determined that the health worker did not observe him/her. The health workers state that an insistence on daily observation at the HF would lead to greater default rates. Supervision records reviewed by the evaluation team did not make mention of the fact that type of observers were not tabulated by health workers, and there was no apparent system employed by supervisors to double check the health workers' decisions on choice of observer.

The NTP has carried out two pilot programs to explore the possibility of engaging civil society and the private sector in TB control. During the JICA project support period, the NTP initiated a pilot program in Sana'a city, which used volunteers from the Charitable Society for Social Welfare (CSSW) as observers of TB patients. An agreement was signed between CSSW and the NTP in April 2001, and training was carried out in August 2002 for 40 volunteers, followed by 20 more in September 2005. The NTP defined the districts in Sana'a city to be covered, and the needed number of volunteers for implementation of TB control activities, and the program was commenced. The role of the volunteers was to follow up and supervise TB patients using DOTS, educate patients about the importance of adherence to treatment, and inform the DTC about defaulters and reasons for default. This local NGO has nation-wide reach, and has a signed agreement with the MoPHP to assist in controlling endemic diseases. It has programs in malaria control, onchocerciasis and other health issues. A strength of this program is the number of female

volunteers involved, 37% of the total. The CSSW representative felt that the program began well, but became weaker, because of high turnover of NTP staff, a high turnover of female volunteers, lack of referral of patients to the HFs, lack of incentives for bright or committed volunteers, lack of sufficient supervision and support, and insufficient communication. The CSSW records on the activity did not provide a clear idea of the number of volunteers still actively involved nor how many patients were being followed. The evaluation showed that this type of program had potential, but that a number of management issues will need to be addressed before it can have real impact. [40]

The second pilot program explored the possibility of engaging the private sector in TB control. An initial pilot in Sana'a city showed that it had high potential, training of the private sector has taken place in Hodeidah recently, a WHO expert on the public-private mix methodology (PPM) has worked with the NTP to carry out a situation analysis, and the NTP plans to expand this program.

d) Health education as a special aspect of case management

The field review revealed that health education and awareness raising was one of the weakest aspects of the TB program. Of the 16 clinical staff involved in case management and interviewed about health education, only five were judged by the evaluation team to carry out adequate health education, and 11 to be deficient either in their knowledge, their practice, or both. All 16 stated that they have never been trained specifically in health education for TB, and had only been given brief 'flashes' about the importance of carrying out health education during their case management training. None keep records related to health education. In 13 out of the 16 sites visited, no health education materials were in evidence, only one had brochures on hand, and the two sub-centers had video tapes and/or casettes which they played for patients on Saturdays and Sundays. Only one poster was in evidence, which was related to national TB day. Three facilities had received new cassettes from the Central Unit within one week of the field visits, but two of these did not have the equipment to use them. The health workers do not hold specific education sessions. Rather, they carry out health education during the first visit of the patient once he/she has been diagnosed. This is the only visit at which health education is carried out. Health workers report that during these sessions they focus on the importance of adherence to treatment, and how to prevent spread of the disease to others. They rely on the written patient guide to act as an educational reference for the patient and his family, but this booklet has not been available in most facilites for over a year.

Twenty two patients were interviewed in the course of the field work, and asked about TB. These patients showed incomplete knowledge, scoring poorly on knowledge about the cause of TB, but better on how not to spread TB. The two defaulters interviewed had similar levels of knowledge about TB as the patients.

Table 19: Knowledge of TB patients about TB

Question	At least 1 correct answer	Incorrect	Don't know	Total
1. What causes TB?	7	11	4	22
2. How can you prevent spreading TB to others?	18	2	2	22

The NTP is currently preparing or has already released new health education materials, which should help address this deficit. These include CDs with TV flashes, audio casettes, posters, and leaflets. These materials were reviewed by the evaluation team, and were found to be of generally excellent quality. The audiocasette featured a dialogue between a physician and defaulters, which used well known actors, and was very effective. The message was clear, it was convincing, and the language was easily understood. The posters were also of good quality. Five TV 'flashes' (plays) were also reviewed, and were found to be of good quality. Using professional actors playing a variety of characters, they addressed the following issues.

1- The way in which TB is spread;

[40] Information from Dr Isam Addean Ali Hussein, Technical Advisor for Health Sector, CSSW, interviewed on 20/12/2006

2- Symptoms and signs of TB;
3- How others can be protected from contacting TB;
4- The importance of adherence to the treatment vs. defaulting (it can lead to death);
5- The existence of free medications;
6- Providing health education to patients;
7- How the cured patients can educate the community.

The development of these materials is very important, and has the potential to help address the present weakness of staff in teaching patients and communities about TB. Two weaknesses of the messages, however, is that there were no female actors addressing the special access issues of women, and the very important issue of stigma was not addressed. Field results as well as the NTP's own documents have revealed these issues to be of high relevance.

4. Drug supply system

The NTP reports that it continues to achieve over 95% coverage of districts with a regular supply of DOTS drugs. A full 100% of these drugs are supplied by the Global Drug Facility (GDF). Responsibility to fund non-DOTS drugs rests with the MoPHP. While a budget of YR47 million has been allocated to purchase these drugs for 2006, lengthy Ministry of Finance (MoF) procurement procedures have created delays, and they have not yet been purchased. Similar problems occurred in 2005, with the total delay in the purchase of non-DOTS drugs now one and one half years. Such severe delays in the procurement of essential drugs create a crucial sustainability issue, which reflects local financial/administrative constraints. This constraint rests largely with the MoF, and is outside the control of the MoPHP and the NTP. Both the deputy minister and NTP manager spoke of a very long delay in the 2006 procurement for non-DOTS drugs.

Drugs are supplied to each HF based on their TB case records, and with an additional 25% provided as stock. Drugs were distributed quarterly in 2004 and 2005, but beginning in 2006, the drug distribution schedule was changed to every 6 months, which the NTP reports is working well. Laboratory supplies such as slides, dyes, etc. are distributed at the same time.

The field survey confirmed that the supply of drugs to governorates occurs every six months. Health workers state they receive DOTS drugs regularly, but that non-DOTS drugs are irregular. Out of 16 relevant clinical sites surveyed during the field evaluation, 15 were found to have adequate DOTS drugs on hand, and one showed deficiencies in some categories of drugs. In contrast, only 6 sites had adequate stocks of all non-DOTS drugs, with streptomycin and ethambutol intermittantly unavailable due to the national procurement problems described above, especially during the past year. At some sites, JICA-supplied drugs are still being used. Stocks were found to be adequate in all but three sites for non-DOTS drugs, and at all but one sites for DOTS drugs, not counting the deficiencies in streptomycin and ethambutol, which were usually purchased by the patient, and were deficient in the majority of sites visited The deficiency of non-DOTS drugs occasionally affects the supply of DOTS drugs, as HWs sometimes use DOTS continuation phase drugs (e.g. ethambutol-INH combination) for the non-DOTS patients.

In 11 of the 16 sites visited, staff had been trained on drug management in the past two years, while in five sites the responsible health workers stated they had not been trained in this aspect of TB control. In 10 sites out of 16, supervision and supply of drugs to lower levels took place. Those who did not carry out these essential tasks were usually district level coordinators, their stated reasons not to carry out this task being lack of a supervision budget, or because there were no TB cases being managed in their district at the sub-district or PHCU level. Of the 10 who did carry out drug supervision and supply, eight kept adequate records, and these same eight were also judged to be knowledgeable and performing their tasks adequately.

The field survey revealed well organized drug storage facilities at the Aden RTC, the Hodeidah and Taiz sub-centers, and the Hajjah TB center. Other sites visited, such as al-Daleh, al Baidah, Lahj and Dhamar, do not have adequate space to organize and store drugs effectively. At these sites, the organization of drugs is deficient. At the level of the district and sub-district, the drugs are usually kept with DTCs, and organized by patient. Distribution of drugs from the governorate to the district or PHCU level is not always

according to policy. It should be distributed through coordinators from the governorate level to those at the district level, and then to the PHCU/patient. In practice, it is handled in several different ways:

1- The HW or DTC himself collects the drugs;
2- The HW or DTC sends a representative, friend or relative to collect the drugs;
3- The GTC supplies the drugs to the district DTC during his regular supervisory visits;
4- The GTC supplies the drugs to nearby HFs himself, rather than through the DTC;
5- The patient himself collects the drugs from the governorate level if the deficiency is urgent;
6- Agreements are made with taxis or qat distributors to transport the drugs to the HF.

An EMRO/GDF mission carried out in March 2006, which looked at drugs management, included visits to four different governorates, and reported reasonable good performance in the use of drugs supplied by the GDF. They found that the concerntration of training and supervision was on the use of treatment regimens, with less attention given to managing ATBM, which is consistent with the findings of this field review. The TB drug management system was found to be insufficient, particularly with regard to stock management at all levels. Training courses on stock management, recruitment of a qualified pharmacist at the central level, and better coordination with the DG of Pharmacy and Medical Supply was recommended.[41]

5. Program monitoring system

The NTP states that that at present, 58.9% of districts and 100% of governorates that are within the DOTS program report quarterly, with similar figures for 2004 and 2005. The district monitoring figure compares unfavorably with the EOP figure of 95%, but favorably with the 90.5% EOP figure for the governorate level.

Program monitoring is carried out through the reporting and compilation of statistics at different levels, through quarterly supervision and laboratory quality control at governorate, district and HF levels, and through bi-annual meetings at the national, governorate, and district levels.

Collection of statistics The NTP provides standard data to WHO quarterly, who then compiles a report for the region as a whole. The data appear to be of good quality. Neither technical nor management data, however, are centrally archived and readily retrieved or available for inspection. Data tend to be scattered among various NTP staff members and different levels of the system, and with some degree of inconsistency among departments. Essential basic data such as a master list of health facilities involved in DOTS is not available at the Central Unit, nor is a master distribution list of equipment. This situation makes it difficult for the NTP to track its resources and to carry out strategic planning and self-monitoring.

The field survey assessed the availability and utilization of the forms and registers upon which the collection of statistics rely. Out of 16 sites in which the availability of forms and registers were assessed, the following were available, although sometimes as photocopied rather than original forms.

❖ Tuberculosis register	available in 16	utilized in 16
❖ Tuberculosis treatment card	available in 16	utilized in 16
❖ Tuberculosis identity card/patient guide	available in 7	utilized in 6
❖ Referral form	available in 10	utilized in 10
❖ Tuberculosis laboratory register	available in 16	utilized in 16
❖ Sputum examination request form	available in 13	utilized in 12
❖ Quarterly report on case finding form	available in 11	utilized in 10
❖ Quarterly report form on smear conversion	available in 11	utilized in 9
❖ Quarterly report form on treatment result	available in 10	utilized in 10

[41] Report on Mission to the National TB Control Programme in Yemen, by Mohamed Bin Shahna, STP/TO/EDB-WHO/EMRO, and Khaled Sultan, GDF Focal Point, STB/EMRO/WHO, March 2006

It is clear that the tuberculosis identification card/patient guide, and the referral forms were those forms that were the least available, with other forms mostly available to those facilities that needed to use them

Supervision from the central level Supervision is scheduled to be carried out quarterly by supervisory teams. The cost of this activity was previously covered by JICA, and is now covered by GFD and WHO. According to the NTP central unit, out of the 322 districts currently listed as included in the DOTS program, 37 are currently in the process of being readied for DOTS, only 249 are officially scheduled for regular supervision, and only 213 (66%) are actually supervised, due to security and other problems. During the past year, three supervisory visits were conducted, and covered around 89% of governorates. The Aden RTC is responsible for supervising the eight southern governorates, and the central supervisory team covers the remaining 14 governorates. The Central Unit supervisory team is comprised of staff from the supervision, drug supply, health education, and training departments. They divide the country into 8 zones with 8 supervisory teams composed of three members each. Each team covers three governorates, which takes five to six days to cover.

Reports of the supervisory visits carried out by the Central Unit are filed in the Supervision Department. The health education and drug supply departments do not keep their own files on those aspects of supervision relevant to their departments. Review of a sample of these reports showed that reports from most of those visits carried out were available, although no supervision plan was available for comparison with intended sites. These reports are compiled by governorate, with all districts visited in that governorate included in one report. While teams consist of three or four individuals of different specialties such as drugs, laboratory control etc., usually only one member signs the report. Reports ranged from three to ten pages, and included the objectives of the visit (usually between 3 and 6), a list of the districts visited, the supervision results for each of the districts visited, summary tables of quarterly results such as treatment outcomes, and recommendations. Separate signed reports on the drug supply and laboratory situation were sometimes attached. In summary, an adequate filing system for supervision reports exists, and most reports can be found back. The reports are reasonably complete and of good quality.

In contrast, copies of the checklists used for collecting information during the supervision visits were not kept with the supervision department, but rather with the financial department, as they were retained for financial clearance rather than technical monitoring and follow up. This use of technical and management documents for financial clearance rather than management follow up was common across departments e.g. the training department routinely handed their training reports to the finance department and did not keep copies for their own management needs. Members interviewed from the different departments acknowledged that standard checklists were utilized for supervision, but that there was no system in place for filing and retrieving these checklists for the purpose of analysis and follow up. A random review of these checklists revealed a wide variation in quality, with some being completely filled out, some partially, and some with almost empty. Information was rarely filled out regarding health education (requires 4 patients to be interviewed), training background of the HW responsible for TB at the HF level, information on the contacts of TB patients. Comparison of supervision reports with checklists reveals that the reports do not systematically analyze and report all the information in the checklists. During their supervision visits to the governorate, central level supervisors do not check for the availability or use of checklists by the governorate or district level supervisors. Some members of the supervision team feel that the checklists are unnecessarily long, requiring at least one hour to complete. They have been recently revised by WHO experts, who have advised the NTP to use them as they are.

Supervision from the governorate and district level Out of the 18 management/supervisory sites surveyed in the field survey, supervison was carried out by only 11. Supervisory staff at the other eight sites, most of whom were district level coordinators, did not carry out supervision, either because they did not receive a supervisory budget, or because there were no patients diagnosed at the PHCUs they were responsible for. At the governorate level, the reasons given for not carrying out supervision every three months is that their budgets sometimes arrive late. The following criteria were used to ascertain the presence and quality of supervision, with the following results.

Table 20: Presence and quality of supervision by governorate and district level coordinators

Criteria	yes	No	No supervison taking place, so indicator could not be assessed	Total
1. Supervision carried out	11	7	0	18
2. Supervisor has list of facilities available	7	4	7	18
3. Has carried out supervision in last 3 months.	6	5	7	18
4. Supervision checklists available	8	3	7	18
5. Supervisor used this checklist	4	7	7	18
6. Supervisor report written	5	6	7	18
7. Follow up for weak facilities	0	11	7	18
8. Visits integrated with other programs	0	11	7	18
9. Supervision vehicle available (car/motorcycle)	17	1	0	18
10. Is the vehicle a JICA vehicle?	17	1	0	18

** Two had small number of HFs, so list unnecessary.*

These results indicate deficiencies in the scope and quality of supervision, with only a third of the supervisors carrying out supervision visits in the last three months, and only about a fourth using the supervision checklist or writing reports. Checklists were often incompletely filled out, and reports were brief, and bore little relationship to the checklists. Many GTCs and GLSs (as well as central staff) kept their reports in their computers, and replaced the previous ones with the current one, thus keeping no record of past performance of the facilities they supervised. Of particular interest, none of the coordinators carried out follow up for weak facilities, and none integrated their visits with other public health programs such as malaria, etc. All sites had a supervision vehicle available for their use, all of them being JICA vehicles, even where supervision did not take place. The coordinators explain some of these deficiencies e.g. the reason that they do not carry out follow up visits of weak facilities is that the central unit takes the responsibility for this task and the reason they do not coordinate visits with other disease programs such as malaria is that there is not a system in place for such integration, although they believe it would be useful idea. Like some of the staff at the central level, some of the governorate and district level supervisors consider the checklist impractical and time consuming, and feel it should be revised.

The field survey to clinical sites found that out of 15 sites for which supervision was meant to take place, just 11 had been supervised in the past three months, with two more supervised in the past six months. The number of members of the supervision team ranged between 2 and 4, which is in line with the NTP policy. According to some of the respondents, supervision is most likely to consist of collecting slides and statistics and checking records, rather than reviewing the accuracy of case detection, checking knowledge, and reviewing issues and problems, as intended in the supervision policy.

10 out of 19 staff members interviewed at governorate, district and HF level (clinical and management) were satisfied with the supervison they received, and 9 were not. In general, district levels were less satisfied than governorate levels with the support they received, citing lack of supervison budgets for the last 9 months, perfunctory visits, and lack of incentives. The punitive nature of supervision was also mentioned by staff at different levels. Governorates under the supervision of the new Aden RTC were noted to be as satisfied as those under the supervision of the more established supervision teams, which indicates good progress in this center taking on their supervision role.

The central supervision department feels that the governorate and district level supervision remains weak in some governorates. Sana'a city and al Jawf are considered especially weak, as are al Baidah and Abyan. Weaknesses are considered to be due to the difficult social and administrative environment in some areas, especially tribal areas, and are not always within the control of the NTP. Lack of commitment by some health offices is considered another issue, as is the large number of physicians and private facilities in Sana'a city to be covered, and the use by some physicians of DOTS drugs as a trial therapy. In other governorates and districts, weaknesses are related to lack of or delay in allocation of supervision budgets.

Weaknesses of some governorates have persisted from the time of the JICA project (e.g. Sana'a city), some issues have been solved (e.g. in Saadah), and some are new.

Meetings Meetings, a third method used to monitor progress and to improve the functioning of the NTP, are conducted on a semi-annual basis at three levels: the central level, the governorate level, and most recently the district level. The purpose of these meetings is to problem solve, share information, and plan among NTP staff. Similarly, at the governorate level, meetings are held twice a year, and if there are problems, the governor, secretary general, GTC staff, and local councils and representatives from the problem districts will take part. NTP staff feel that these meetings are crucial and helpful. Minutes of these meetings were found to reside with the financial department, and were not well organized or informative. Most of those reports seen from the governorate and district level contained no meeting agenda, and no results and recommendations for follow up. They tended to show only data on how many HF s were carrying out TB control activities and the names of attendees. Thus while they may have been useful, no proper documentation exists to enable the NTP to monitor the success of these meetings. Unfortunately, no minutes or reports for meetings held at the central level were available for review.

6. Research on the size and nature of the tuberculosis problem in Yemen

The NTP has planned or has already carried out a number of surveys, some of which were initiated during the time of JICA support, with results finalized after EOP. Among them are the following:

- A Multiple Drug Resistance Survey was carried out in cooperation with the Japanese Research Institute of Tuberculosis. The data is now with WHO. The NTP expects to receive these data shortly, at which time they will analyze it and use it for policy and strategy decisions.

- A tuberculin survey will take place in 2007. It has already been designed in cooperation with WHO, and it will take place in 19 governorates, 30 districts, and 132 schools, and will target 30,000 students age 7 to 12. It is funded by GF and is expected to cost $150,000.

- A prevalence survey of HIV among TB patients took place, which was coordinated with the HIV/AIDS program. They screened 900 patients and found 6 to be HIV positive.

- Other research studies or analyses include a case study of TB in Yemen presented at a regional WHO meeting, a pilot study for the private public mix (PPM) strategy for detection and treatment of TB, and a study on diagnostic and treatment delays and their determinants.

Research is the responsibility of the Central Unit, although the regional centers and sub-centers also take part in research headed by the Central Unit. The Aden RTC and the Hodeida TB sub-center stated they participated in research on the prevalence of HIV among TB patient in cooperation with the national HIV/AID program. The Taiz sub-center also participated in research about MDR and patient delay.

7. Mortality, morbidity, and transmission of tuberculosis

No studies have been carried out to track mortality, morbidity and transmission since the last tuberculin survey 14 years ago, which calculated prevalence to be 39/100,000 population, with an 0.86 annual risk of infection. During implementation of the JICA support project, both JICA and the NTP worked under the assumption that prevalence was decreasing due to improving DOTS coverage, case detection and treatment success rates. By EOP, no survey had been carried out to test this assumption. As noted in a previous section, there continues to be a wide gap between notification and estimated prevalence, based on the survey of 14 years ago. Using prevalence rates from the previous tuberculin survey, detection rates of DOTS and non-DOTS cases[42] are estimated to be as follows:

2004	45%
2005	44%
2006 (Q1-3)	43%

[42] NTP DOTS/non-DOTS case finding summary sheets. (2004-2006)

These rates show an apparent decline in case detection, which would be sharper still if the population figures used by NTP were adjusted for the population growth rate, which they were not. Unlike the JICA period, in which the number of cases detected and treated every year was on the increase, post-JICA, the number of cases detected per year has declined, despite an increase in population.

Until the tuberculin survey is carried out, it will not be possible to know whether prevalence is increasing or decreasing. The NTP believes prevalence to be decreasing, based on their high treatment success rate since 2000 (81% +), the declining number of detected cases, and the particular age pattern of detected cases. While this may be true, it is also necessary to consider the converse; that prevalence remains high and that the NTP is not detecting existing TB cases. This possibility is strengthened by the fact that many fewer female TB patients are detected than male, indicating lack of access, and that until the last year, few rural areas were covered by NTP services below the level of the district, creating access and informational issues, especially for the poor. Some program weaknesses related to supervision, health education and observation of DOTS patients, and the special access issues of women (to be discussed in sections V.G.3and V.G.4) also suggest that a large number of TB patients are not being reached.

C. Activity level of NTP

The NTP has conducted numerous activities that contribute to its ongoing ability to meet international technical standards. Numerous routine and special activities for quality control, supervision, supply, development of materials, etc. have been carried out in relation to each of the five outputs of the JICA TB Control Project. A partial list of these activities, organized by output, can be found in Annex K. These activities are carried out almost exclusively by NTP staff, with occasional technical support by WHO, and other organizations. Funding for most of these activities is by Global Fund and other donors. Such heavy dependency on donors raises the issue of financial sustainability of such activities, which will be dealt with in the section on sustainability. Among the non-routine activities carried out in the past two and a half years are the following:

- Acquisition of new technology for the Central Unit for sputum cultures, BACKET, funded by GFD. BACKET reduces culture time from 6 weeks to 3 days. NTP awaiting a 'refrigerated' centrifuge, necessary in order to use BACKET;
- Development of 3 TV 'flashes' for TB awareness, funded by GDF, to be used on national television and in health facilities, as well as audiotapes for radio and for health facilities. These were developed recently by the MoPHP Health Education Center, and are due for distribution shortly;
- Reprinting of JICA TB health education pamphlets;
- Use of new simplified treatment regimens, which utilize 4 in 1, 3 in 1, and 2 in 1 drug combinations, funded by GDF;
- Engagement of 60 volunteers from the Islah Charitable Society in a volunteer program in urban Sana'a. It is scheduled to be evaluated by a consultant from the Japanese Research Institute of Tuberculosis, and may expand;
- Review and design of a new supervisory check list;
- Utilization of a new diagnostic system for cross checking results and quality assurance. In this system, a percentage of slides from all NTP sites are analyzed quarterly, and if weaknesses are detected, emergency supervision to correct the problem takes place at all problem sites.

The NTP has devised a plan for 2006 – 2010 which reveals a high level of activities planned for this five year period. The main outlines of the plan for 2006 are as follows:

1- Cure 85% of NPSS+ cases with 3 mains activities:
   - Expansion of DOTS strategy (with 2 sub-activities)
   - Improve the quality of services (with 1 sub-activity)
   - Promoting and strengthening of health education (with 5 sub-activities)

2- Increase the detection rate of SS+ cases to 70% by 2010 with 6 main activities:
   - Improve the quality of services (with 2 sub-activities)
   - Provision of drug and material supply (with 1 sub-activity)
   - Maintenance for vehicles and equipment (with 1 sub-activity)

- Strengthen the recording and reporting system (with 1 sub-activity)
- Regular evaluation for TB activities (with 9 sub-activities)
- Improve the TB control procedures.(with 1 sub-activity)

D. Implementation of recommendations in final report

The final JICA project report of July 2004 included 11 recommendations for the National TB Program, mutually agreed upon between the NTP and JICA. One measure of the effectiveness of the NTP is its ability to implement these recommendations. The table below lists the recommendations, and progress made in implementing them over the last two and one half years.

Table 21: Implementation of recommendations post-JICA

Recommendation	Current situation
1) Regarding increasing the DOTS Detection Rate, effort should be made to locate patients currently not covered by DOTS, such as involvement of private sectors, public institutions not practicing DOTS.	The NTP is planning to introduce a new program with the support of the Global Fund, called "Public Private Mix' in order to bring more private sector providers on board. In addition, a pilot program involving the NGO sector has taken place in Sana'a city, and it is being evaluated for expansion. However, the number of cases of TB detected has declined annually, and the male/female gap has increased, perhaps indicating ongoing problems with case detection.
2) DOTS implementation involving PHC units should be expanded under adequate supervision at the District level. Possibility should be sought to promote community participation in DOTS expansion.	DOTS implementation at the PHCU level has not changed. While more PHCUs are nominally involved in TB control, many appear to be inactive, the tools to help them carry out TB control such as supervision/support and health education materials are lacking, and there is no community participation, other than community volunteers sometimes carrying out direct observation.
3) Operational research should be carried out in order to plan better programs for quality DOTS expansion. Investigation into the causes of the recent trend of decline of case notification rate is one of the most urgent subjects for such researches.	Three different operational research studies have been carried out. They are: a. Yemen's experience in TB Control: CASE-STUDY NTP/Yemen about case notification NTCP/YEMEN by Dr Amin N Al-Absi, NTCP's Manager. b. Tuberculosis: Public Private Mix, Mr. Abdulbary al Hammadi, NTP, November 2003- April 2005; c. Tuberculosis Control: Case finding in Tuberculosis patients: Diagnostic and treatment delays and their determinants. These three useful and promising studies are planned to lead to programming that would improve case detection, but such programming has not yet taken place, and case notification rates continue to decline.
4) Maximum use of such funding mechanisms as Global Drug Facility and Global Fund to Fight AIDS, TB and Malaria, should be made with proper external technical assistance.	The NTP has been successful at gaining technical and financial assistance from both Global Fund and the Global Drug Facility, and WHO has continued to provide assistance to the NTP through GF funding. Funding is expected for Phase II.
5) Newly established Regional Tuberculosis Control Center, Aden, should be optimally managed as a technical and administrative body for quality DOTS in the	Delegation of authority for quality DOTS administration in the eight Southern governorates to the Regional Tuberculosis Center in Aden has taken place as of 2005, (It began in December, 2003) and the Center is active and carrying out its role. The Center, at the time of the evaluation carries out supervision for 8 governorates every 3 months, Since April 2006, the Aden RTC has taken over training responsibilities for these 8 governorates, and has carried out training courses since then, completing

southern and eastern Governorates.	seven courses in all, including courses for the HMI and Medical Faculty in Aden. They also do QC, drug distribution, and participate in research, and have a staff of 16. The Center is well organized, and is made available to other programs to carry out training there. It carries out no clinical cases and handles no referrals.
6) The referral system including tracing of referred cases should be established.	The referral system does not appear to have changed since the time of JICA, and still needs strengthening. The NTI tracks referrals, but the Hodeidah and Taiz sub centers do not. The field survey showed referral forms to be available in only 10 out of 16 facilities surveyed, and that supervisors do not track the use of this system in the facilities they supervise.
7) Sputum microscopy services and its quality control should be strengthened through regular supervision and appropriate corrective actions.	NTP states that the number of governorates with laboratories performing quality control increased from 16 to 20 (2004-2006) with a 43% increase in the number of working labs. The supervision visits revealed the need to carry out training for laboratory technicians (refresher for 155/236 and new for 39) and to replace 12. 37 new lab techs were trained in 2005, and an emergency supervision system for labs has been initiated. The number of false positives and false negatives is decreasing, demonstrating quality improvements.
8) NTP activities especially supervision and training should be carefully planned and implemented with effort to secure governmental budget in the most cost-effective way.	In 2006, 4.5 M YR of the government budget was utilized for training purposes, which represents an increase from 2005, when 3.5 M YR of the government budget was utilized for this purpose. Supervision, however, is still almost exclusively covered by GF. The government budget for TB as a whole decreased in 2006 as compared to 2003.
9) The National Tuberculosis Control Guidelines should be revised incorporating the past experience of DOTS expansion by NTP and new international standards.	The new TB guide of the NTP is updated and is awaiting approval from WHO.
10) The report describing the experience of DOTS expansion by NTP should be developed and disseminated for the purpose of advocacy as well as reinforcing institutional sustainability.	Not yet done, but is in the planning stages.
11) Every effort should be made in order to secure regular supply of anti-tuberculosis drugs and consumable goods.	DOTS drugs funding secured for 2005-2006 through GDF. A request was submitted to the MoPHP for non-DOTS drugs for 2005, and it was approved, but due to the lengthy procurement procedures, this funding was not utilized. A similar situation existed in 2006.

The above account reveals that important progress has been made on the majority of these recommendations, showing a positive level of activity. Five out of 11 have made only slight or no progress.

E. Utilization by NTP of JICA inputs

The JICA TB Control Project trained a large number of technical staff in Japan, Egypt, and Yemen. The training component is considered one of the strengths of the JICA project, as staff trained under this project have gained good technical knowledge which they have utilized to independently manage the NTP. Evaluation of staff remaining with NTP reveals that all six counterparts who trained in Egypt remain in their positions, but that 5 out of 22 counterparts who trained in Japan are no longer with the NTP. These staff had previously served in the positions of GTCs and deputy GTCs, lab technicians and logistics officers. Reasons for leaving the program were various e.g. transfer by the MoPHP to a different position, desire to continue studied, etc. This is a relative modest attrition rate, and one which has been compensated for by further training in-country.

The four buildings constructed through JICA support (1986 and 2004) continue to be utilized for TB control. All are in good repair, with the exception of the Hodeidah sub-center, which is in need of painting and other minor repairs. The Aden Regional TB Center, the newest of the buildings to be constructed, is currently functioning in the supervision of TB control in the eight southern Governorates, and for laboratory quality control, the main purpose for which the facility was built. It also serves as a site for training in non-TB topics, thus being well utilized. The field assessment revealed that it is not being utilized to full capacity yet, but that progress has been good.

JICA contributed a large amount of equipment and a large number of vehicles during the last project cycle and before. It was not possible for the evaluation team to track this equipment, as the NTP does not keep a centralized list of its equipment, nor a list by site and by donor (although some partial lists were seen). Neither is a set of standards for distribution of equipment available. In the last two years, a list of equipment for the four main TB centers has been drawn up, which is a good start, but its age, condition and source was not available. Responsibility for the management of equipment is given to the governorate level, which was found to keep equipment lists. During the field survey, 19 clinical and management sites were assessed for a basic set of equipment. The number of sites that retained specific JICA equipment are as follows.

- Microscope 19
- Scale 10
- Car 11
- Motorcycle 15
- Bus 1
- Photocopier 11
- Computer 7
- Printer 2
- Fax/telephone 5
- TV and video 2
- Incubabors 2
- X-ray machine 2
- Other 13

The vast majority of these were in use and in good repair. In general, there was good evidence of JICA equipment still in place. There was also evidence of equipment donated by JICA still in the warehouse, especially motorcycles, which are expected to be distributed shortly. A list of quipment purchased post JICA can be found in Annex L.

F. Attitudes towards JICA support for TB control

There is strong appreciation of JICA support within the MoPHP, at the NTP, among field staff, and by donors who are familiar with the project. The sentiment most commonly expressed was that the long term support of JICA in establishing and strengthening the NTP is the reason that the program is so strong today. The comprehensive nature of JICA support, from clinical and supervision activities, to training, to equipment, to construction, to running costs, to technical support, allowed the NTP to build its effectiveness and capability, and thus to attract other donors when JICA support ended. The step by step

building up of a national administrative and treatment system in which DOTS functioned nationwide created program sustainability. This sentiment was expressed by numerous NTP staff, as well as the Deputy Minister for PHC, and WHO. Rather than creating dependency, they felt that long term support has created a competence which has led to independence.

Similarly, nearly all staff in the field who were asked about the JICA project during the field survey were positive, citing JICA's establishment of a good service structure, good supervision, good training, regular supply of drugs, good technical support, an adequate budget, adequate supplies, vehicles maintenanced regularly, equipment and health education materials available, ease of communication, and regular meetings. In the four sites where there was some criticism of JICA support, there was the perception of insufficient support to particular geographic areas, insufficient training, and the perception that the presence of JICA prevented other donors from providing needed support.

G. Special performance issues of the NTP

1. Training

The NTP continues to train large numbers of staff in TB control. The three main types of training are initial training, refresher training, and replacement training (e.g. if someone leaves their position, a replacement will be trained in his/her place). NTP conducts training on DOTS according to the WHO model. Using this model, doctors, CTCs, DTCs, and laboratory staff are trained for 6 days, and PHC workers are trained for 3 days about DOTS. Refresher training takes place over a two or three day period. Meetings are also used as opportunities to train and upgrade the knowledge of staff. Trainers are usually NTP staff. The most recent statistics, shown in the table below, demonstrate the distribution of training across health care cadres. It is clear from these lists that there has been some decrease in the momentum of training during 2005, as compared to the three previous years when JICA supported the NTP. Training figures for 2006 were not available, except for the number of PHCWs trained, 105, which was less than the previous year. Unfortunately no data are available on the gender distribution of trainees as a whole. Of the PHCWs it has trained, the NTP estimates that about a quarter are female.

Table 22: Local training between 1995 and 2005[43]

Year	GTC	DTC	Physician	Medical ass.	Lab tech.	PHCWs	Total
2005	0	0	63	0	37	145	401
2004	2	0	32	10	26	755	891
2003	1	8	74	2	60	422	608
2002	1	3	34	0	43	669	801
2001	0	5	27	0	42	150	286
Total 2001-2005	4	16	230	12	208	2141	2987
1995-2000	25	8	334	8	281	828	1701

Data on external training shows that only one person has been trained in TB control outside the country since JICA support ended.

Table 23: External training between 1997 and 2005 [44]

[43] NTP Annual Report 2005, report on achievements in year one of GF project

Year	2005	2004	2003	2002	2001	97-00	Total	Duration in week	Finance	Country
Diploma in TB control	0	0	0	7	3	0	10	16	JICA	Japan
Advanced course in TB	0	0	1	6	1	2	10	6	JICA	Japan
Laboratory training	0	0	1	3	1	1	6	16	JICA	Japan
Laboratory training	1	0	1	1	0	0	3	3	JICA	Ethiopia
Regional course on TB	0	0	0	5	4	0	9	3	WHO	Iran
Short course on TB	0	0	0	4	1	0	5	1	WHO	Syria
Advanced course in lab.	0	0	2	1	0	0	3	1	WHO	Algeria
Course in research	0	0	0	0	0	2	2	3	WHO	Egypt
Course on TB	0	6	0	0	0	0	6	3	JICA	Egypt
Total	1	6	5	27	10	5	54	52		

Other types of training are governorate and district meetings, the training of volunteers, and special events such as TB Day

Table 24: Other training courses

Year	Governorate meetings/ governorate	Districts meeting per participating district	Work-shops	International TB Day	Finance	Volunteers	Finance
2005	1	0	0	1	GF	40	JICA
2004	1	1	0	1	JICA	0	-
2003	2	1	1	1	JICA	0	-
2002	2	2	1	1	JICA,WHO	21	JICA
2001	2	2	1	1	JICA,WHO	0	-
Total 2001-2005	8	6	3	5	JICA,WHO	61	-
1996-2000	10	15	3	5			

While almost all training courses for governorates are conducted by the central trainers of the NTP training department, some governorates will conduct their own replacement training. In addition, the Aden Regional TB Center has taken on an important training role in the last two years. During this time they have conducted 12 training courses from 3-7 days each. Their training records are well organized. This is in contrast to that of the Central Unit which has very limited records of training, usually only a one page training plan. No list of participants, course evaluations, pre-tests and post-tests, training materials etc. were found in the training records. The director of the training department explains that the lists of participants are sent to the finance department to facilitate payment for the courses, as are most other activity records. He does not carry out participant evaluations, nor pre and post tests, and does not write reports, due to time constraints and a heavy work load. Similarly, no training records were found at the

[44] Semi-annual meeting for GTSs and GLSs, NTP, al-Jarda'a, November, 2006

level of the governorate and the district. The field survey showed that four field sites claimed they carried out training, but only one, the Aden RTC, kept training records.

The field survey demonstrated that all 17 clinical staff interviwed on training had been trained for their positions, all within 6 months of taking over their NTP responsibilities. Their description of the training they had received was appropriate to their tasks and consistent with the training standards of the NTP. Laboratory technicians, physicians and coordinators received a seven day initial training course, and health unit staff received a three day course, with refresher courses 3 days and 1 day respectively. The most recent training of the laboratory staff for the 16 eligible staff interviwed was less than two years ago for 12 staff, and between two and five years for two others, while two had not received training for more than five years. Most of these staff had received refresher training during the semi-annual meetings, rather than through a special training. The most recent training of the staff involved in case management was less than two years ago for 14 out of 17, and less than 5 for two others.

2. Morale of NTP staff and their evaluations of the NTP

The national NTP staff showed enthusiasm and pride in their work. The morale of field clinical and management staff also appeared to be good, despite some complaints, with all but one of those visited exhibiting good attitudes towards his/her work.

Opinions of field staff were elicited about the NTP. In answer to the question about whether TB services had improved, declined, or stayed the same in the last two years as compared to the previous (JICA) years, an approximately equal number chose each response i.e. five, seven and seven respectively. This indicates that on average, the level of quality has remained constant. The perception of individual staff members appeared to be dependent on where they worked. Those who felt the NTP has improved cited the opening of new HFs for TB management, increased level of training, improvement of the Aden Regional TB Center, and an improved supervision budget. Those who felt it worsened cited deficiencies in drugs, decreased work efficiency, declining supervision/emergency supervision visits, and a decline in the availability of forms, vehicle maintenance, and nutriton support.

The strengths of the NTP, in the opinion of 15 staff from 20 field sites were listed as following: the availability of free drugs (3), the central and regional supervisory visits (3), financial incentives for the governorate level supervisory staff (2), regular bi-annual meetings since 2006 (2), sustainable training, technical decentralization, delegation of authority to the Aden RTC, nutritional support for patients, a large NTP budget, success in controlling TB, well trained staff, cooperation from higher levels, the vertical system, provision of humanitarian assistance, the use by NTP of nonspecialized health workers which facilitate integration at lower levels (1 each). Five staff felt that the NTP had no strengths.

The staff had many suggestions about what could be improved in the NTP, a much larger number of responses than the list of strengths. Issues of highest importance to these staff were the regular provision of non-DOTS drugs, and increasing and extending the budget. Individual suggestions were as follows:

a) Drugs, equipment and supplies: provision of regular supply of drugs (4) especially non-DOTS category III drugs (5), stationary (2), laboratory supplies, vitamin B-6, patient booklets, health education materials, motorcycles for the district level, provision of all supplies on a quarterly basis, and improvement of the quality of the drugs (1 each)
b) Budget: provision of incentives to the district level (3), sufficient transportation and supply budget for HFs (3), sufficient vehicle maintenance budgets (3), sufficient quarterly budget to the governorate level (4), district level budget, incentives to non-GHO staff, increased/regular budget (1 each)
c) Training: Provision of support for training abroad (2), at more appropriate sites, new refresher courses, improved training methods, increased frequency of courses, and promotion of experiences between governorates (1 each)
d) Administration: Suggestions included less bureaucracy, stricter control, regular and well organized meetings, improved coordination with the GHO, establishment of new department for GTCs, improved financial clearance, standardized and uniform NTP policy between governorates, increasing the number of technical staff to the Aden Regional TB Center (1 each)

e) Service improvement: Extension of laboratroy services to district HFs, more nutritional support to TB patients (1 each)
f) Health education: Improve health education at all levels, use media promotion and clarify that TB services are free (1 each)

3. Patient access and satisfaction

A total of 16 field staff involved in clinical care were asked to assess the financial cost that patients incurred in order to gain TB care, and whether cost constituted an access issue for TB patients. The results of this exercise, which show total cost per patient are as follows:

Table 25: Cost of accessing TB services

Category of cost	Average (YR)	Range (YR)	No. of informants
Costs prior to NTP access	15,294	1500-60,000	16
Transportation costs	1888	300-6200	16
HF registration fee	106	0-100	16
Laboratory testing	105	0-200	16
Other diagnostics e.g. x-ray	250	0-800	16
Drug costs	412	0-7000	16
Other (e.g. hospital admission)	-	0-1200	16
Total	21,236	2160-72,050	16

Three management staff reported the same pattern of costs, as did TB patients themselves. It is clear that once a patient reaches a TB facility, he or she generally pays little, with the exception of those, primarily non-DOTS patients, who do not find drugs available at NTP facilities. The major cost incurred by patients is prior to finding their way to the TB centers. Lack of awareness of the symptoms of TB among the public, and lack of knowledge by both providers and the patient about the availability of free TB care in the public health sector results in patients searching for appropriate treatment for a long time, before they are put in contact with the appropriate TB services. They will usually consult the nearest pharmacy, an experienced relative, traditional healer, private clinic of public health facility first. Transportation costs are the second highest cost they incur. These costs are likely to have deterred many TB cases from seeking care, especially the poor.

Besides the issue of cost, these findings indicate that patients experience a significant treatment delay before they receive appropriate diagnosis and treatment. This is consistent with the NTP's own findings from a study it carried out between 2002 and 2004. This study showed that among newly diagnosed TB patients, the mean delay between onset of symtoms and initiation of treatment was 59 days, with a mean duration of 39 days delay between onset of symptoms and care seeking, and another 20 days of delay within the health system. As with the present field survey, the majority of patients surveyed could reach the TB Center in less than a half hour[45], indicating that patients who reach treatment are those who live relatively close to a TB center. Those who live farther away from treatment centers may have no effective access to TB services, given issues of cost and lack of information.

Feedback from health workers and patients reveals that besides the initial difficulty in accessing TB centers due to the informational, cost, and distance barriers addressed above, the attendence of a patient at a TB center depends on the social and family attitude towards the disease (stigma). The stigma of the disease causes families to bypass close facilities and seek treatment at the governorate level, where they are not known, thus effectively increasing the cost of treatment. This phenomenon was very clear in al Baidah, Lahj, al Daleh, and Dhamar, but exists in other governorates as well to a lesser extent. Stigma causes some patients to give false names to the TB center, the male relatives of females may choose not to accompany them, women will hide their faces, some attend private clinics, some never seek treatment, and others attend TB clinics far from their home, or they move. Stigma affects women more than men, and

[45] *Tuberculosis Control: Case finding in tuberculosis patients: Diagnostic and treatment delays and their determinants*, by Dr. Amin Noman al-Absi.

female TB patients are less likely to be married than male TB patients. A study of treatment delay in the region showed that in Yemen about one third of patients were ashamed of their diagnosis, and one quarter had to hide their diagnosis.[46] According to the WHO, "sstigma and discrimination associated with TB are among the greatest barriers to preventing further infections, providing adequate care, support, and treatment". [47]

Ten of the NTP clinical staff interviewed believed that the poor had special issues of access to TB services, while 7 believed they did not. Transportation to access services is costly, the poor often come late for services, and there are few services available in the rural areas. Those who felt the poor had no special access issues cited the fact that the drugs are free, and that NTP staff make special efforts to waive service fees and to admit to hospital poor patients, so that they do not have to pay frequent transportation costs. There have also been some efforts to target high need groups, such as Somali refugees. NTP staff suggested that admission to the hospital and provision of nutritional support would be very helpful for poor patients. In some areas, especially Dhamar and Lahj, patients who come from far districts prefer to be admitted to hospital to defer transportation costs, at least for the first two months.

The majority of patients interviewed (17) were satisfied with the treatment they received, because they found they improved within 1-4 weeks, were eating well, because of the correct and early diagnosis, and because of the regular free drugs, and good care. For those five who were not entirely satisfied, the reasons were because of side effects of the drugs, incomplete recovery, long duration of treatment, and being sent to a private clinic for investigations (by the TB staff). When asked what they thought could be improved about NTP services, 11 felt that no improvement was needed, two didn't know, and others suggested nutrition programs (2), respect for the patient, more health education, separating TB treatment to outside the HF, better quality x-rays, diagnostics at the level of the governorate, and insecticide spray (1 each). Of the five women interviewed, four felt comfortable receiving care from the NTP, because they lived close to the HF, and/or they received nutritional supplements. These findings demonstrate that care is of a reasonable quality, although there is some room for improvement, especialy related to health education, and that there is an urgent need for awareness raising to inform the public and health care providers about TB and TB services.

4. Gender

Whereas NTP staff were divided on whether the poor faced special access issues to TB services, *all* health workers and management staff interviewed (20 out of 20) stated that women faced special barriers - cultural, financial and geographic - which make it especially difficult for them to access TB services. It was stated that stigma and financial constraints affected women more than men. For example, a female patient is less likely to marry, and a female from a poor family is less likely to be taken for treatment because of the expense. Males in a household may be treated before females.

Given the special issues women face accessing services, it is quite important that the NTP takes a gendered aproach to TB service case finding and service provision. This requires, at a minimum, sufficient numbers of female staff. The field review showed that out of a clinical staff of 108 in the facilities visited in the field survey, only 7 were female. Similar ratios were apparent for management staff, with the exception of Aden, where a third of the staff were women. Some reasons given by NTP field staff for such a low ratio of female to male staff is that fewer women are recruited, women cannot travel as easily as men (e.g. to carry out supervision visits), and some female HWs or their families fear they are more vulnerable to contracting TB. According to some management staff, implementation of DOTS using female HWs will be more effective than using male HWs, because women are generally more honest, they are more respected by patients, and health education by female staff to female patients is more acceptable and effective.

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[46] *Diagnostic and treatment delay in tuberculosis*, EMRO, WHO, 2006

[47] Advocacy communication and social mobilization to fight TB, a 10-year framework for action, ACSM subgroup at country level, © World Health Organization 2006.

Table 26: Breakdown of selected NTP clinical and management staff by sex

	Total staff (professional)	male	female
NTP central unit (management)	10	9	1
NTI (clinical mainly)	13	12	1
Aden regional center (management)	16	9	7
Taiz sub-center (clinical)	13	11	2
Hodeidah sub-center (clinical)	9	9	0
GTL, GTCs, DTC (clinical + management)	17	16	1
Total **clinica**l staff at field sites visited	108	101	7

The training of female staff at PHCUs is an important step that will help to correct this imbalance. If they are activated to take an active part in TB control, female staff have a good potential to improve the case finding and management of female TB patients.

H. Sustainability of NTP

Sustainability of the TB control program in Yemen depends on its prioritization by decision makers, the technical and management capacity of the NTP, adequate financial support, and efficiency in the use of resources.

1. Priority of TB control within the MoPHP

The NTP exists under the General Directorate (GD) of Infectious Diseases and Surveillance, which is one of two GDs making up the recently created PHC Sector of the MoPHP. The NTP's status as a program and its level within the Ministry remains unchanged from the period of JICA support, although with the reorganization of the MoPHP, it has changed sectors. Overall this change of sectors is positive, as it promotes the potential for integration of the TB program within the PHC service structure.

The Third Five Year Plan for Health Development and Poverty Reduction states that communicable disease is its most important disease priority. Using criteria of severity, incidence, complications, treatability, and international and national perspectives, TB is regarded as one of the 11 most important of Yemen's communicable and endemic diseases. The control of TB through the DOTS strategy was listed as one of the priority actions of the MoPHP. There have been no policy or legal changes in the MoPHP which have affected the NTP, and the MoPHP continues to support TB programming as before. Both MoPHP officials and the NTP state that the NTP has strong legitimacy and effectiveness, and enjoys strong local and donor support because the program has been well established through years of JICA support. In addition, the ongoing financial support by donors such as Global Fund for training, equipment, drugs and activities, the technical support and monitoring by WHO, and the international perception of TB as a high priority disease, has contributed to the legitimacy and support the NTP gains from the Ministry.

2. Technical and management capacity

The description of the NTP, as detailed above, reveals it to have strong technical and management capacity. Although it continues to have some weaknesses, it has managed to maintain and even improve the level of most of the indicators from the time of the JICA support project. It has done this almost entirely with local staff. Donors such as WHO, one of the NTP's longest term partners, considers the NTP to be doing a good job, especially in comparison to many other programs in Yemen. As stated earlier, JICA support is widely regarded as the reason the NTP is in such a strong position today.

Of the three diseases targeted by GF, TB is the only one that does not require a long term international advisor to support, a significant measure of local technical sustainability. The Deputy Minister for PHC believes that the NTP's technical support needs can be handled by short term experts, given the strong local management. Dr. Amin Noman, Director of the NTP, is an important source of stability of the program, having continued to head it for over 10 years. As seen in an earlier section, turnover at the national and

governorate levels has been modest, and the majority of the staff trained by JICA remain with the program. While the program has not yet reached all the international targets set by WHO, it continues to make good progress.

The major tasks ahead for the NTP are considered by this evaluation team to be management rather than technical tasks. As is clear from the evaluation results in the above section, issues of documentation, resource tracking, self monitoring (e.g. of training activities), supervision, efficiency in use of funding, and integration will need to be addressed in order to improve sustainability further.

3. Efficiency, decentralization, and integration

The NTP has taken important steps towards decentralization, with the establishment of the Aden Regional TB Center, which is now responsible for TB control management in eight of the southern and eastern governorates. However, the other two semi-regional centers in Taiz and al-Hodeidah remain primarily responsible for their own governorates only, and do not share a regional role. Their long experience would make these centers logical ones to take on regional supervisory responsibilities. The NTP would like them to take on such responsibilities, but progress in this regard has been slow. The Central Unit continues to directly supervise, carry out quality control, and supply drugs and supplies to 14 governorates, which is both a heavy load on their limited staff, and inefficient in terms of distance to reach these 14 governorates. The continued training of PHCWs and the addition of districts to the program creates the potential for improved decentralization and efficiency, once the supervision system at these levels is strengthened.

The NTP exists solidly within the MoPHP structure, and thus coordinates with the governorate health offices and other administrative units in implementing its training and service provision programs. For example, the HO decides with the NTP who will be trained in the various training courses at the governorate and district level. NTP meetings at these levels also often include HO staff as well as other local authorities. While the program is vertical at the national and governorate levels, integration of services occurs at the district and lower levels, with TB control carried out by 'generalist' health workers, such as PHCWs, who are also responsible for diarrhea, malaria, vaccinations, ARI etc. Even DTCs carry out health service provision roles other than TB control. Coordination with other programs such as EPI and HIV/AIDS for special activities such as surveys also takes place. However, a remaining major source of inefficiency is the lack of integration of the different vertical programs in terms of logistics, supply and supervision activities, vehicle usage etc. Each vertical program carries out supervision and supply activities independent of the other, often visiting the same health facilities and health workers, which creates major inefficiencies in the use of vehicles, running cost budgets etc. and thus increasing dependence on external assistance for vehicles and supervision costs. This issue of lack of integration is one shared by all vertical programs within the MoPHP, and is not solvable by the NTP alone. Integration will require the MoPHP to reorganize the way it manages vertical programs. The possibility of doing so has been discussed for many years in the MoPHP, and the topic is currently under discussion again. It is recognized success in integration of the different vertical programs will require the cooperation and sustained effort among the MoPHP, the vertical programs themselves, and the donors supporting these programs.

Efficiency is also affected by budgetary issues. Management sites at governorate and district levels are meant to receive their MoPHP and donor-funded budgets from the NTP quarterly. Of the 15 clinical sites visited during the field survey which were slated to receive supervisory and running cost budgets, only two reported that they receive their budget on time, with five stating it is not received on time, and eight (at the district level) stating they do not receive budgets at all. Most of those who received a budget did so every six months rather than every three. Health workers state that the delay in the budget negatively affects their ability to supervise and supply HUs. Of three additional management sites visited, only one reported receiving his budget every three months, with the others receiving both their MoPHP and NTP budget every six months, much like the clinical sites.

4. Financial sustainability

The NTP presently receives support from the MoPHP, GF, the GDF, and WHO. The largest amount of budgetary support is from GF, which has taken over many of the categories of cost previously supported by

JICA. The GF provides equipment, and funds running costs and activities such as supervision, training, incentives and meetings. Global Fund began support in July 2005, with a total budget of 2.5 million USD for this two year phase of support. The NTP states it has used 87.7% of the budget allocated by GF through October 2006, demonstrating sound absorptive capacity.

GDF supplies 100% of DOTS drugs, and the MoPHP is meant to provide 100% of all non-DOTS drugs, but as described above, delays in procurement have effectively reduced the governmental support for drugs to nearly zero. Other categories of MOPHP support is provided for investment, and for running costs such as supplies, repair of vehicles, maintenance, fuel etc., some of which were previously supported by JICA The NTP is satisfied with the financial support it gains from the MoPHP.

WHO budgets according to a bi-annual system, and has budgeted $60,000 during the current biennium of 2006/2007. During this two year period, the budget was used for per diems for supervisors, revision and printing of a multi-year guideline for TB control, and training for laboratory and HF staff, and for private practitioners, much of this training being carried out in the JICA-built Aden Regional TB Center. Of the $60,000 budgeted for these two years, WHO records show that approximately $29,000 is remaining, with expenditure slightly above target. WHO provided four short term experts a year for laboratory, quality control, logistics/drug supply, and research and monitoring. WHO has no program officer for TB stationed in Yemen, but rather provides short term experts. The technical support they provide is paid for by GF, as part of its 2.5 M award for TB control in Yemen. GF provided $390,000 to WHO for TB control in its first phase, of which all but $28,984 has been spent.[48] This amount was utilized almost entirely for purchase of equipment, with a small amount used for technical assistance. Extra budgetary funds are also available from the Regional WHO Office for priority programs that use up their regular budget. It is expected that the NTP will qualify for additional funds in 2007.

In the past, WFP provided food support for all smear positive cases. This support has now decreased, and is partially made up by GDF, which provides a supplement (rice and milk), which is used to encourage compliance by defaulters in Hodeidah and Sana'a. The NTP is also supported by a research link with the Japanese Research Institute of Tuberculosis. Support from other international organizations, such as World Bank and EU is also intermittently available for the districts they are supporting.

According to the NTP director, the funding it receives is adequate to reach its goals. The NTP describes close coordination among WHO, GF and itself in order that there is not repetition or cross-funding for the same activity. The following table shows the amount of funding provided to the NTP from various sources since 2003. While there are some discrepancies between these data, provided by the NTP, and other sources, the estimates appear to be reasonably accurate.

Table 27: NTP expenditures between 2003 and 2006,[49]

Year	MoPHP TB Control	MoPHP Drugs	MoPHP Invest-ment	GF	GDF	WHO	EU/ WB	JICA	Total
2003	122,891	118,239	-	0	0	50,000	-	104,909	394,649
2004	127,826	75,870	26,178	0	75,000	47,676	15,199 EU	32,115	399,864
2005	124,860	0	115183	480,224	173,000	16,781	044,551 WB	2,618	957,217
2006	164,343	0	0	445,035	202,000	50,227	020,71 7 WB	0	882,322

** Amounts in dollars. Exchange rate from YR to USD: 184 in 2004, 191 in 2005, and 198 in 2006. 2003 amounts are budgeted amounts. Amounts for other years are actual expenditures.*

[48] Dr. Moona al Madhwahi, program officer, WHO
[49] NTP expenditure data, finance department

It is clear that total expenditures by the NTP have doubled during the last two years. Available budget information did not allow the evaluation team to understand the reason for that increase. Activity levels have stayed at approximately the same level as during the years of JICA support, but technical support costs will have increased. Equipment costs make up approximately 43% of GF support so far; thus equipment is a significant cost in these last two years, as well.

The NTP has a good track record in expending the funding provided both by the Ministry and by external donors. This makes it more likely that it will continue to receive funding from these sources if such funding remains available, thus guaranteeing access to financial resources. However, the level and pattern of funding by the MoPHP does not bode well for local sustainability. While the MoPHP running cost budget for TB control increased significantly between 2005 and 2006, no budget for drugs could be expended for either of these two years, and no investment budget was available in 2006, which resulted in an actual decrease in national expenditures related to TB in 2006 as compared to 2003. Other sustainability issues are the high incentives provided by GF to key staff at the governorate and national level, which ranges between $300 and $1550 per quarter for most staff, the high dependence on the GF for certain categories of cost such as supervision, training, and equipment, and the lack of a supervision budget from the MoPHP. For the next three years, it is expected that Global Fund Phase II will continue to support the NTP. The NTP will be applying shortly.

I. Other aspects of impact

Because TB affects the reproductive age, success in detecting and treating TB can be expected to have a positive effect on the economy. There is no evidence of environmental impacts of the program, nor of other ripple effects outside the area of TB control.

VI. CONCLUSIONS

A. Current status

The JICA Tuberculosis Control Project, Phase III has succeeded in creating a strong national tuberculosis control program in Yemen that has managed to continue to improve on many of the gains made during the period of JICA support. Two and one half years after JICA support ended, coverage of governorates and districts by DOTS continues to expand, a higher percentage of new sputum smear positive cases are treated by DOTS than previously, and the success rate of treatment of DOTS cases has improved, thus solidifying the project purpose of expanding quality NTP services throughout Yemen. Despite being one of the poorest countries in the region, Yemen has managed to meet the majority of the WHO standards for TB control. The NTP has been especially successful in improving its diagnosis and treatment objectives. Laboratory activities and quality control are functioning well in 20 out of Yemen's 22 governorates, and false positives and false negatives of diagnostic slides continue to decline, as have the proportion of defaulters. In addition, the level of activity of the NTP is high, it has made good use of the resources it has received from JICA, it has the confidence of the Ministry, most TB patients are satisfied with the treatment they have received, and the NTP's good performance has resulted in attracting international funding, notably that of the Global Fund and the Global Drug Facility. TB remains one of the MoPHP's infectious disease priorities, as laid out in its most recent five year development plan. These results indicate a technically competent NTP.

Despite the many positive gains made by the NTP, this program demonstrates some weaknesses. The non-DOTS drugs, which are meant to be supplied through the MoPHP, are not available, there is yet little TB control activity below the level of district centers, supervision systems are weak and sometimes nonexistent, especially at the district level, budgets do not appear to reach many of the peripheral areas and/or are irregular, health education is minimal (although new initiatives are expected to help correct this), and information systems that promote good management are deficient. Regarding this last point, no evaluations of quality of training activities are carried out, supervision checklists are often incomplete and not all data on them are tracked (especially related to patients, contacts, and observers), there are no master equipment and other lists which would allow the tracking of resources, and most management data are not organized

for monitoring and follow up. Also of concern is the fact that detected cases have been declining in recent years, and the proportion of females being diagnosed as compared to males is low.

The current status of TB control in Yemen, utilizing the JICA project indicators, is as follows:

Table 28: Current status of TB control activities in Yemen

Overall Goal: Mortality, morbidity and transmission of TB in ROY are reduced.	UNKNOWN Achievement continues to be assumed though never documented by a survey. A tuberculin survey is planned to take place in 2007.
Project Purpose: The quality NTCP is expanded to all over the ROY	IMPROVED (1) 97% of districts of ROY officially covered by DOTS by 2006, with official coverage at 64%. (2) **98%** of the new SS+ cases treated by DOTS by Q 2, 2006. (3) 84.9% of the new SS cases under DOTS successfully treated by Q3, 2005.
Output 1: Case finding and diagnosis of TB are improved.	IMPROVED 1.1 20 GLSs submit reports regularly and carry out QC. Number of trained GLSs have increased. 1.2 20 GLSs visit rural labs regularly 4 times a year. 1.3 Achieved. False positive 1.3% and false negative 0.6% by so far by Q 2, 2006 1.4 Achieved nation-wide but only 15 governorates have achieved this level. Proportion of SS+ cases among newly detected pulmonary TB was 55.3% (3793/7228), among all new TB cases was 38.8% in 2006, Q 1-3.
Output 2: Treatment of TB is improved based on proper case management system.	IMPROVED 2. Achieved. Proportion of the defaulters was 6.7% in new SS+ cases under DOTS Q 1-3 in 2005.
Output 3: The supply system of the drugs/materials is improved with special emphasis on establishment of a good reserve stock system.	DECLINED 3. Weaknesses remain, especially lack of non-DOTS drugs.
Output 4: A program monitoring system is improved based on a standardized recording and repoting system.	SAME/DECLINED 4. 100% of GTCs but only 58.9% of DTCs reporting through Q 3, 2006. Supervision takes place to level of district, but checklists not followed, and little supervision below level of district.
Output 5: The size and nature of the TB problem of the ROY are studied.	SAME NTP continues to carry out operational research and is planning a tuberculin survey.

B. Impact

1. Achievement level of the overall goal

Achievement of the overall goal of the JICA TB project, "Reduction of mortality, morbidity, and transmission of TB in the ROY", remains unconfirmed, and has never been documented by a survey. The NTP believes that its improved performance in terms of coverage and quality of services has translated into reduction of TB disease load in Yemen. However, as noted in the above section, the number of detected cases has been declining in recent years, and the proportion of females being diagnosed as compared to males is low. The NTP explains the decline in detected cases post-JICA as due to the declining prevalence of TB in Yemen. It is equally possible, however, that prevalence has remained high in Yemen, but that fewer cases are being detected due to weaknesses in supervision at lower levels, and due to known access issues, especially for women, the poor, and those without geographic access. A tuberculin survey planned for 2007 is expected to shed more light on this issue.

2. Causal Relationships

While achievement of the overall goal of the project remains unconfirmed, it is clear that the NTP has been very successful in achieving many of the outputs previously supported by JICA. The relative success of the NTP is widely believed to be due to the manner in which JICA provided support. The MoPHP, NTP management, WHO, and NTP field staff were unanimous in their belief that the long term support of JICA in establishing and strengthening the NTP is the principle reason that the program is so strong today. The comprehensive nature of JICA support, from clinical and supervision activities, to training, to equipment, to construction, to running costs, to technical support, allowed the NTP to build its effectiveness and capability, and thus to attract other donors when JICA support ended. The step by step building of a national system in which DOTS became nationwide, and a treatment and administrative network was systematically built, created program sustainability. Rather than creating dependency, they felt that JICA's long term support has created a competence which has led to autonomy. This manner of support i.e. long term, comprehensive, and focused on the building of national systems, is relatively rare in the health sector in Yemen, and is considered a model.

In addition, the ability of the NTP to carry out its present level of activities is dependent on the high level of international interest in TB control, as well as the high level of dedicated funding (GFD, GF and WHO). Due to this international prioritization of TB, more funding is available for this disease than many other health issues in Yemen. This support has also enabled the NTP to retain most of its trained staff at national and governorate levels, with little attrition out. Attrition at lower levels remains a problem. Another very important positive factor has been the long term presence and commitment of the NTP director, who has guided the program for over ten years.

Weaknesses of the program are, by and large, not technical, but rather strategic or administrative in nature, and are related to factors both inside and outside the NTP. The lack of non-DOTS drugs, a crucial issue for TB control, lies outside the control of the NTP or indeed the MoPHP, and is due to lengthy MoF procurement procedures. The relatively slow pace of the program in reaching below the district level is affected by overall administrative issues within the MoPHP related to the quality and functioning of the HFs upon which the NTP relies. The lack of a MoPHP strategy to integrate its different vertical programs has led to inefficiencies, and it is likely that some of the supervision problems at the level of the district could have been solved if a policy of integration of vertical programs existed. Increasing levels of poverty will have had an impact on the ability of patients to reach health facilities, and is perhaps partially responsible for the decline in the TB detection rate. Some of the other weaknesses such as insufficient targeting of women and the poor, and insufficient emphasis on health education and issues related to stigma, are gaps that it is well within the NTP's control to close, and will only require strategic planning and the prioritization in the use of resources to deal with. Putting in place a more comprehensive management information system to track equipment and other resources, and to monitor the quality of training and supervision are also well within the control of the NTP to institute. The overall impression is that there has been a very strong focus by the program on *technical* management rather than strategic

management or the putting in place of administrative and information systems in order to facilitate informed and well focused decision making. Lack of resources has not been an important constraint.

3. Ripple effects

Other potential impacts of the program are on the economy. Because TB affects the reproductive age, success in detecting and treating TB can be expected to have a positive effect on the economy. This has not been documented, however. There is no evidence of other ripple effects.

C. Sustainability

Sustainability of the TB control program can be measured by its prioritization by decision makers, the technical and management capacity of the NTP to continue project activities, adequacy of financial support, and efficiency in the use of its resources.

1. Continuation of project activities

The NTP has achieved strong technical sustainability, which has been essential to its ability to continue the project activities post-JICA. Although it continues to demonstrate some weaknesses, it has managed to maintain and even improve the level of many of the indicators from the time of the JICA support project, as described in the previous section. It has done this almost entirely with local staff. Of the three diseases targeted by GF, TB is the only one that does not require a long term international advisor, a significant measure of technical sustainability. The Deputy Minister for PHC believes that the NTP's technical support needs can be handled by short term experts, given the strong local technical management.

JICA support is considered to be the major factor behind the present competence of the NTP, which has allowed it to gain the strong local and donor support it now enjoys, which has been so crucial for its sustainability. In addition, the ongoing financial support by donors, such as Global Fund, the technical support and monitoring by WHO, and the international perception of TB as a high priority disease, has contributed to the legitimacy and support the NTP gains from the Ministry. Other important factors that have promoted project sustainability are the low attrition of NTP management staff, and partial decentralization (resulting in greater efficiency). Factors that have inhibited project sustainability are i. lack of integration of vertical programs, ii. delayed regionalization, iii. weak financial monitoring and support at district levels, iv. lack of a sustainability strategy by the NTP and the MoPHP for the program, and v. overdependence on international funding.

2. Policies and systems

Ministry commitment and political support to the TB Control Program is strong. TB is among the 11 infectious diseases listed as being of the highest priority in The Third Five Year Plan for Health Development and Poverty Reduction. The control of TB through the DOTS strategy was listed in this document as one of the priority actions of the MoPHP. Also positive is the fact that the NTP maintains the same status as a program as it did during the years of JICA support, there have been no policy or legal changes in the MoPHP which have negatively affected the NTP, and the MoPHP continues to support TB programming as before. In addition, with the reorganization of the MoPHP, the NTP now exists within the PHC sector. This is a positive development, as it promotes the potential for integration of the TB program within the PHC service structure.

3. Organizational and financial aspects

The morale and commitment of the NTP staff at different levels of the system is strong. Turnover at the higher levels of the program has been modest, and the majority of the staff that was trained by JICA remain with the program.

Yemen has very limited resources to be spent on health care, and tuberculosis is only one of the many health problems competing for the health service budget. As such, efficiency in the use of resources is

crucial for sustainability. Two important ways of achieving efficiency are through decentralization of services and responsibilities, and integration with other health services. The NTP has taken important steps to decentralize, with the establishment of the Aden Regional Center, which is now responsible for TB control management in eight of the southern and eastern governorates. However, the other two semi-regional centers in Taiz and Hodeidah remain primarily responsible for their own governorates only, and do not yet share a regional role, despite the desire by the NTP management that they do so. The Sana'a NTI continues to directly supervise and supply 14 governorates, which is inefficient in terms of time and costs. The incorporation of PHCUs into the TB control structure creates a new potential for improved decentralization and efficiency, if the supervision system at these levels can be strengthened. Irregular receipt of running cost budgets is another issue which contributes to inefficiency and cost in-effectiveness.

The NTP exists solidly within the MoPHP structure, and thus coordinates with the governorate health offices and other administrative units in implementing its training and service provision programs. While the program is vertical at the national and governorate levels, integration of services occur at the district and lower levels, with TB control carried out by 'generalist' health workers, such as PHCWs, who are also responsible for diarrhea, malaria, vaccinations, ARI etc. However, a remaining major source of inefficiency is the lack of integration of the different vertical programs in terms of logistics, supply and supervision activities, vehicles etc. Each program carries out supervision and supply activities independent of the other, often visiting the same health facilities and health workers, creating major inefficiencies in the use of vehicles, running cost budgets etc. and thus increasing dependence on external assistance for vehicles and supervision costs. This issue of lack of integration is one shared by all vertical programs within the MoPHP, and is not solvable by the NTP alone.

Financial sustainability of the NTP is one of the most serious issues the MoPHP will face, once donor support for tuberculosis wanes. Currently, the NTP receives budgetary and technical support from the MoPHP, GF, GDF, and WHO, at a rate more than double the level provided during the JICA years. The increase in costs associated with implementing the program can not be attributed to greatly increased activity levels or to greatly expanded geographic coverage, as such increases have been modest. Whatever the reason, the current rate of spending is unaffordable for the MoPHP to be able to cover in the future. International support covers the majority of cost categories, such as DOTS drugs, equipment, vehicles, supplies, technical advice, and running costs and activities such as supervision, training, incentives and meetings. While the MoPHP budget now contributes to covering some categories of costs previously covered by JICA, its share of total costs was only 19% in 2006, as compared to 61% in 2003, with the real amount decreasing during that time. In addition, it has completely failed to provide the non-DOTS drugs it had the responsibility to procure during the last two years. Other sustainability issues are the high incentives provided by GF to key staff at the governorate and national level, which ranges between $300 and $1550 per quarter for most staff, the high dependence on the GF for certain categories of cost such as supervision, training, and equipment, and the lack of a supervision budget from the MoPHP.

The NTP has a good track record in expending the funding it is provided both by the Ministry and by external donors. This demonstration of absorption capacity makes it more likely that it will continue to receive funding from these sources if such funding stays available, thus maximizing its access to financial resources. However, the level and pattern of funding by the MoPHP does not bode well for local sustainability. Particularly crucial is the failure of the local procurement system, which has resulted in lack of non-DOTS drugs being supplied for nearly two years. If this same system is relied on to procure DOTS drugs in the future, continued failure will undermine the entire TB control program in Yemen.

4. Techniques

As noted earlier, quality control protocols are utilized by the NTP, and are functioning well in 20 out of Yemen's 22 governorates. As a result, false positives and false negatives of diagnostic slides continue to decline, as have the proportion of defaulters. JICA equipment was found to be available and well maintained at all sites surveyed, and the buildings constructed by JICA were well utilized, with all but one in good repair. However, as noted earlier, there are no master equipment and other lists which would allow the tracking of resources by the NTP, and no central list of JICA equipment is kept.

The NTP continues to train large numbers of staff in TB control. The three main types of training are initial training, refresher training, and replacement training. The field survey demonstrated that training is, in general, appropriate, and leads to good clinical performance. However documentation of training is poor, and evaluation of the quality of training is not carried out. No lists of participants, course evaluations, training materials etc. were found in the central training records. Participant evaluations, pre and post tests, and other measurements of quality are not carried out by the training department.

5. Society, culture and environment

It is clear that women, the poor, geographically isolated populations and populations where stigma is an important issue have significant access issues to TB services. Over 50% of the NTP field staff interviewed felt the poor had lower access to TB services than others, and *all* field staff felt that women faced special barriers to diagnosis and treatment. Stigma is a major issue which affects women more than men, as are poverty and geographic and cultural access. As yet, the efforts of the NTP to address these access issues are insufficient, especially for women. For example, only a very small percentage of TB control staff are women, and the new health education materials being developed do not address stigma, nor feature the special issues women face. There is no evidence of an environmental impact from the program.

VII. RECOMMENDATIONS

A. Recommendations for JICA

In considering future support to Yemen's health sector, the following will be important:

1. Continue to use the model of long term, comprehensive support to national programs in support to Yemen's health sector, as this has been shown to create strong local ownership and management.
2. In the interest of sustainability and efficiency, future support for any vertical programs should be accompanied by simultaneous support to the MoPHP for integration of such programs with other vertical programs. This will necessarily entail working jointly with a Ministry working group set up for this purpose, and will include the heads of the different vertical programs and the donors supporting them.
3. Key sustainability issues should be clearly identified during the project design phase, strategies to combat them be designed, and the project period itself be fully utilized to solve these problems. Many sustainability issues can be predicted in advance and are shared by all donors in the sector. For example, low level of MoPHP funding, the use of incentives, lengthy procurement procedures that lead to delay in attainment of essential resources, and historical rather than rational budgeting processes affect the sustainability of almost all projects. One promising financial sustainability strategy favored by some donor and Ministry officials is to follow the GAVI model. This model requires that an agreement be made with the government prior to project initiation which stipulates that the amount of project support will be reduced annually and will be compensated by an equally increased amount of government support, until the government has taken over 100% of expenses. Such a solution requires strong government commitment.
4. Support to future projects should focus not only on the technical aspects of implementation, but build administrative and strategic planning capacity as well.
5. Since the rural poor and women are those that continue to be affected most heavily by the majority of health problems in Yemen, projects should utilize a strategy which is gendered to take into account the special access issues women face, and which targets the poor and the geographically disadvantaged.
6. Improved donor coordination in the health sector in Yemen has opened up the possibility of joint action on key issues. It is recommended that JICA take advantage of this new potential work to tackle sustainability and effectiveness issues both within and outside the Ministry.

B. Recommendations for NTP and the MoPHP

Technically, the NTP is performing very well. Once people affected by TB reach the system, it takes care of them quite effectively. The two major remaining issues for the TB program are the informational and other barriers that prevent the public from accessing its services in the first place, and its ability to sustain itself financially in the future with primarily local funding. To address these issues will require a switch from a primarily technical to a more strategic approach.

1. Priorities in the use of current donor support It is expected that the NTP will continue to obtain substantial donor funding for the next three years at least. Maximize the use of this funding through prioritizing those program aspects most likely to create the greatest overall impact on decreasing the prevalence of TB in Yemen, and improving sustainability in order to continue doing so in the future. Recommended priorities are as follows: 1) creation of a high level of awareness about TB and TB services among the general public (especially women, the poor and geographically isolated) in order to improve case finding, and to reduce treatment delays and their associated costs, 2) creation of improved access, especially for women, the poor and the geographically isolated, through removing those barriers to access in a targeted manner, 3) dramatically improving the functioning of PHCUs for TB control, through active goal setting, programming, monitoring, and supervision at this level, 4) the design of a sustainability strategy and the putting in place of the needed sustainability mechanisms before donor support ends, and 5) maintenance of the current level of technical excellence. Specific recommendations follow.
2. Tuberculin survey to establish TB prevalence When designing the 2007 tuberculin survey, it is essential to ensure statistical representation of females, the poor and geographically inaccessible populations. Given the strong evidence that it is precisely these populations that have the least access to TB services, and simultaneously are the ones least likely to attend school, the intended methodology of a school survey should be rethought, in favor of a more representative one.
3. Health education and awareness The health education component of the NTP should be strengthened. Now that excellent educational materials have been designed, the NTP should initiate training of clinical staff in the use of these materials, initiate patient and community educational activities, especially at the level of the PHCUs and over national radio, and monitor the quality and impact of these efforts. New education materials should be designed that focus on special issues of women, and on the problem of stigma.
4. Gendered strategies to reach women The NTP should carry out operational research to better understand how to improve the case finding for females, and put in place an effective strategy to reach them. It is likely that such a strategy will include, at a minimum, the recruitment of a larger number of female health workers to the TB control program, and targeted community education on TB and stigma, with a monitoring system in place to track progress.
5. Decentralization of TB control activities Accelerate the engagement of rural PHCUs in TB control activities, and put in place a monitoring system to actively monitor their activity level in terms of referrals out, health education and community awareness, and direct observation and follow up of TB cases. Analysis of these data every six months will allow for timely adjustment of supervision and of the decentralization strategy in order to create greater effectiveness and reach. Also accelerate regionalization through activation of the TB sub-centers to carry on regional roles.
6. Strengthening the supervision system, especially below district level Correct the budgetary and other constraints that are preventing district supervisors from supervising their districts. Ensure that supervisors at all levels are using the checklists, and that neglected issues such as the documentation of the identity of observers, attention to patient contacts, and health education are addressed.
7. Campaigns and outreach Consider a one time campaign strategy, especially for isolated rural areas, which would increase awareness about TB signs and symptoms, how to access services, and which addresses the problem of stigma. Attaching such a campaign to EPI services would be an efficient and low cost strategy. Monitor its impact.
8. Integration of vertical programs The MPHP intention to integrate vertical programs should be implemented. All the relevant stakeholders in this initiative e.g. the involved donors, the vertical programs themselves, and the PHC sector should be involved in a well thought out system that answers the needs of the various stakeholders, that protects the effectiveness of the different programs, and that results in demonstrated efficiency gains.

9. Program documentation and information system Improve the management information systems to include master lists of equipment to allow for the tracking of resources, and an archiving system for training, supervision, and health facility functioning. Design the management information system in order to use these data strategically.
10. Quality of training Put in place an evaluation system for the training program which will, at a minimum, measure post-test knowledge and skills acquisition (as compared to pre-test), and preferably the subsequent use of this knowledge in the field.
11. Budgeting and sustainability The NTP should use the next three years, during which time it is expected that GF funding will continue, to put in place a management system which is sustainable locally, and to lobby for adequate governmental funds to sustain the program. The currently escalating costs and the high dependence on international funding will need to be rationalized, so that at least a minimum effective level can be maintained post external funding. The NTP will need to be supported in this by the MoPHP and by its donors.
12. Referral system Continue to develop the referral system, and monitor the extent to which patients are being referred up and down the system in each governorate, district, and at the HF level, in order to improve efficiency and decrease costs for patients.
13. Expansion of the Aden Regional TB Center Consider the RTC taking on the additional role of a referral center for TB cases.
14. Reduction of attrition Put in place a policy that requires all staff trained abroad through project support to make a written commitment to stay with the program for 3 to five years. Investigate the reasons for higher attrition at lower levels, and put in place mechanisms to reduce this attrition.
15. Evaluation and strengthening of management/administration capacities of staff Evaluate the (non-technical) management capabilities of national and governorate level staff, identify weaknesses, and train staff on these topics. The Health Management Training Center of the MoPHP has been successful in improving the management capacity of health managers at different levels, and should be considered as a resource to both evaluate and train NTP staff.

VIII. LESSONS LEARNED

1. Comprehensive, long term support to national programs is one of the best ways to build sustainable national systems, with competent local staff who can manage the programs long term. A focus on training and system building is especially important.
2. Health programs need to consciously tackle issues of access of disadvantaged population groups, and should not expect a passive system to reach these populations effectively.
3. Technical support should be supplemented by support to build management capacity and the ability to work strategically in solving problems.
4. Sustainability issues should be identified in the design phase of a project, and local and international partners actively engaged during the course of project implementation to solve these sustainability issues.
5. Attrition, while not a big problem of this project, can be decreased by requiring all staff trained abroad to make a written commitment to remain with the program for three to five years.

ANNEX A

ANNEX A: END OF PROJECT RESULTS OF THE JICA TUBERCULOSIS CONTROL PROJECT, PHASE III

Goals/Purposes/Outputs	Indicators	EOP Achievements
Overall Goal: Mortality, morbidity and transmission of TB in ROY are reduced.	(1) estimated annual incidence of TB (2) Annual Risk of Infection (ARI)	Achievement of (1) and (2) assumed, given the high treatment success rate and increasing trend of DOTS enrollment, though never documented by a survey.
Project Purpose: The quality NTCP is expanded to all over the ROY	All of the below mentioned are achieved: (1) All the districts of ROY are covered by DOTS. (2) 80% of the new SS+ cases are treated byDOTS. (3) 85% of the new SS cases under DOTS are successfully treated.	(1) 90% of districts of ROY covered by DOTS since 2002, which covers 98% of the population. (2) **95%** of the new SS+ cases treated by DOTS by 2003. (3) 81.1% of the new SS cases under DOTS successfully treated by 2002.
Output1: Case finding and diagnosis of TB are improved.	1.1 Regular implementation of the slide checking is made at least quarterly for QC by GLSs. 1.2 Regular supervisory visits to rural labs are made by GLSs at least twice a year. 1.3 False positives and false negatives by QC checking do not esceed 5%. 1.4 Proportion of SS+ cases among newly detected pulmonary TB exceed 50% in each governorate.	1.1 17 GLSs submit reports regularly. And carry out QC. Number of QC slides increase every year, and trained GLSs have increased. *[Achieved in 5 governorates and partially achieved in 9 governorates.]** 1.2 16 GLSs visit rural labs regularly 4 times a year. *[Achieved in 7 governorates and partially achieved in 8 governorates.]* 1.3 Achieved. False positive 3.3% and false negative 1.3% so far in 2003. *[False positive 2.9% and false negative 1.1% in 2003.]* 1.4 Achieved nation-wide but only 8 governorates have achieved this level. *[Achieved in 7 governorates and at the national level. Proportion of SS+ cases among newly detected pulmonary TB was 52.5% (3793/7228), among all new TB cases was 38% (3793/9987) in 2003.]*
Output 2: Treatment of TB is improved based on proper case management system.	2. Proportion of the defaulters does not exceed 10% in new SS+ cases under DOTS.	2. Achieved as of Q3, 2003. *[Achieved in 10 governorates and at the national level. Proportion of the defaulters was 9.4% (358/3790) in new SS+ cases under DOTS in 2002.]*
Output 3: The supply system of the drugs/materials is improved with special emphasis on	3. More than 95% of districts are free from lack of drugs/materials.	3. Unconfirmed. *[Achieved]*

establishment of a good reserve stock system.		
Output 4: A program monitoring system is improved based on a standardized recording and repoting system.	4. Regular quarterly reporting is made by more than 95% of districts, and by 100% of governorates throughout the year.	4. Not fully achieved. 18/21 GTCs reported quarterly, and 230/259 of DTCs reported at lease once in 2003 Q 1-3. *[Number of reportings districts is 211 (80.8% of 261) and that of governorates is 19 (90.5% of 21).]*
Output 5: The size and nature of the TB problem of the ROY are studied.	5. Reporting of the survey/ research is issued.	5. Drug Resistancve Survey has just been started, and other research activities remain to be implemented. *[Achieved.]*

** The data in italics and brackets are from the final report 7/28/2004[1]. They differ somewhat from those of the final evaluation, which was carried out five months earlier, on 2/18/2004[2], and which are shown in normal script. Where they differ, both sets of results are shown.*

[1] *Final Report for the Tuberculosis Control Project Phase III in the Republic of Yemen*, Tsuneo Masui, Takaju Date (Tuberculosis Control Project, Phase III, JICA) and Amin Noman Saeed al-Absi (National TB Control Program, MoPHP, ROY), July 28, 2004

[2] *Joint Evaluation Report on the Japanese Technical Cooperation for the Tuberculosis Control Project (Phase III),* JICA and the MoPHP, Republic of Yemen, February 18, 2004

ANNEX B

ANNEX B: EVALUATION GRID

Evaluation Criteria	Evaluation Questions		Criteria and method for judgment	Required Data	Information Source	Data Collection
	Question	Sub-question				
Current status	Overall goal has been achieved?	Mortality, morbidity, and transmission of TB in ROY has been reduced	Comparing with the last result and target	Estimated Annual Incidence of TB Annual Risk of Infection (ARI)	Annual Report of TB Control in Yemen Result of TB in Survey	Review of material Field cross checking
	Project purpose has been achieved?	(1) All the districts of ROY are covered by DOTs.	" "	DOTs coverage data in each district	Supervision data Demographic data (1994 and 2004 census)	Review of material Field cross checking
		(2) 85% of the new SS+ cases under DOTs are successfully treated (cured).	" "	% of the new SS+ cases treated by DOTs	QR by Govs. And cohort analysis by the CU	Review of material Field cross checking
		(3) 80% of the new SS+ cases are treated by DOTs.	" "	% of the new SS+ cases successfully treated		Review of material Field cross checking
	Output 1	1-2 Regular implementation of the slide checking is made at least quarterly for QC by GLSs (reference labs)	" "	Evidence of regular implementation	Quarterly QC reports by GLSs	Review of material Field cross checking
		1-2 Regular supervisory visit to rural labs is made by GLSs at least twice a year.	" "	Evidence of regular supervisory visits	Supervision schedules and reports	Review of material Field cross checking

		1-3 False positive and false negative by QC checking do not exceed 5%.	" "	QC data on false positives and false negatives	Quarterly by GLS's	Review of material Field cross checking
		1-4 Proportion of SS+ cases among newly detected pulmonary TB exceed 50% in each Gov.	" "	Proportion of SS+ cases among newly detected pulmonary cases	QR of case finding by GTCs	Review of material Field cross checking
	Output 2	2 Proportion of the defaulters does not exceed 10% in new SS+ cases under DOTs	" "	Proportion of the defaulters	QR on treatment results	Review of material Field cross checking
	Output 3	3 More than 95% of districts are free from lack of drugs/ materials.	" "	Proportion of drugs/ materials available per district	Supply records of governorates and districts	Review of material Field cross checking
	Output 4	4 Regular quarterly reporting is made by more than 95% of districts and by 100% of governorates throughout the year.	" "	Proportion of districts and governorates reporting quarterly	CU: Receiving status of QR. Gov confirmation by GTCs.	Review of material Field cross checking
	Output 5	5 Reporting of the survey/ research are issued	" "	New research published	Reports by NTP-CU/NTI	Review of material Field cross checking

Evaluation Criteria	Evaluation questions	Evaluation sub-questions	Criteria and method for judgment	Required Data	Information Source	Data Collection
Impact	Achievement level of the overall goal?	Is the overall goal achieved (compared with targets)?	Comparing with the last result and target	Mortality, morbidity and transmission of TB	Annual reports	Review of NTP stats, field cross checking
		What influence does the achievement of the overall goal have on the development plan of Yemen	TB is a priority for MoPHP	A new action plan for TB control Running cost budget for NTP	5 years Plan of Health A new policy and strategy paper of TB Control Budgetary data	Review of materials
		What are the impeding and contributing factors for the achievement of the overall goal?	Open	Open	C/P, Ex-project members, training participants, etc Report	Interview Review of material
	Causal relationships (to confirm whether the achievement was due to the result of the project's effort)	Is the overall goal an impact that was produced through the implementation of the project?	JICA inputs used by NTP, Trained staff in position	NTP staff and equipment lists	NTP documents, NTP staff all levels	Review of NTP materials, Interviews, Field checks
		Are the important assumptions from the project purpose to the overall goal correct? Is there no influence from important assumption?	TB control policy is unchanged, NTP remains MoPHP priority	TB control policy MoPHP 5 year plan	NTP documents MoPHP 5 year plan	Review of materials, Interviews
	Ripple effects? (to confirm whether unexpected effect was seen or not)	Are there any positive or negative impacts beside the overall goal?	Open	Open	NTP staff, WHO and GFD staff, MoPHP	Interviews, Review of documents
		Are there different impacts	Data on these	NTP, CSO and MoPHP	Clients,	Interviews,

		depending on differences between gender, ethnic groups, or social layer (particularly negative impact)?	issues collected, Policies in place for social protection	data on health care accessibility	MoPHP staff different levels, NTP documents	observation, review of statistics
Sustainability	Sustainability?	Is NTP continuing the project (program) activities? Is the overall goal being achieved by the project effect ?	Comparing with the last result and target	Activities accomplished, Achievement of objectives in plan, Quality maintained	NTP documents, NTP staff all levels	Reviews of reports, Interviews, Field verification
		What are the impeding and contributing factors for sustainability?	MoPHP maintains funding and commitment	MoPHP support systems in place Funding maintained, JICA resources maintained for NTP	NTP budgetary documents, program documents, MoPHP/NTP staff	Review of documents, Interviews
	Policies and systems?	Continuality of political support?	Ministry supports NTP policies/plans	Action plan of TB control Development Policy, Involvement of high level officials	MoPHP staff, Policies, MoPHP website, NTP staff, donor agencies	Interviews, Review of policies
		Development of related regulations and legal systems?	New regulations positive for NTP	MoPHP and NTP regulations	NTP staff, Donor agencies MoPHP staff, Review of regulations	Interviews, Review of documents
		For projects targeting pilot sites, are there reliable efforts to support spreading the out comes afterwards?	Progress in spread of DOTS to PHCUs and new staff	Number of PHCUs included in DOTS, new MoPHP staff trained	NTP documents, Functioning at field level	Review of documents, Field verification

	Organizational and financial aspects	Is there sufficient organizational capacity to implement activities to produce effects?	Comparison of staff, systems, and equipment with the last project result and target	Capability of institutional operation at the levels of central, governorate and district. Condition of personnel disposition and numbers Resignation of trained personnel	NTP documents, State of documentation, Field implementation and quality of DOTS	Review of documents, Interviews, Field verification
		Is there a sense of ownership towards the project at the implementing agencies?	Pride and care is evident, low attrition	State of data, offices, and equipment, Attrition rate	NTP documents, NTP and regional staff and offices,	Interviews, Observation
		Budget secured (including operating expenses)	Budget same or higher than end of project, and is utilized at all levels	Budgetary status for TB control Sustainability of budgetary support by the Government or other donors	Budget documents, including utilization, Donor agencies	Review of documents, Interviews at all levels and other agencies
	Techniques	Establishment of transferred techniques?	Protocols up to data and utilized	Level of technique Use of transferred technique	Protocols Admin system documents and reports	Review of documents, Interviews, Observation
		Maintenance and management of equipment?	Equipment list maintained and majority of equipment maintained and used	Maintenance condition of donated equipment, Equipment lists updated, List of newly purchased equipment	Equipment lists, Equipment in place in facilities and offices	Review of documents, Observation
		Is there a dissemination mechanism?	Dissemination mechanism in place, utilized	Training program, Training lists Quality of training	Trainers, Trainees, Training documents	Interviews, Review of documents

	Society, culture, environment	Are there impeding factors due to a lack of consideration for women, the poor and the socially vulnerable?	Impeding factors identified, and policies in place and effective	Policies, Socioeconomic situation, Evidence of policy effectiveness	Clients, Field and NTP staff, Documents of client lists, Policy documents	Review of documents, Interviews
		Are there impeding factors due to a lack of consideration for environment?	Lack of waste of resources, and proper disposal of waste	Policies and memos regarding environment,	NTP documents, State of offices and facilities	Observation, Interviews, Review of documents,

ANNEX C

ANNEX C: INTERVIEWS AT NATIONAL LEVEL

1- Dr. Majid al-Jonaid, Deputy Minister for PHC Sector, MoPHP
2- Dr. Ghulam R. Popal, Representative, WHO, Yemen
3- Abdul Hakeem Ali al Kohlani, DG, Disease Control and Surveillance, MoPHP
4- Dr. Amin Noman Saeed, Director, NTP, MoPHP
5- Dr. Mohammad Ali Khalifa, Medical Officer, Malariologist, WHO
6- Ahmad Abdulla Al-Zubair, Deputy Director, NTP
7- Dr. Abdul Bari Al-Hamadi, Head of Statistical Section, NTP
8- Nasser al Absi, Health Education, NTP
9- Dr. Hammod Mahyoob, Director of NTI
10- Dr. Adnan Hamood Akhali, Head of Reference Laboratory, NTP
11- Dr. Sadek al Hakemi, Head of Supervision Section, NTP
12- Dr. Abdul Malik al Kibssi, Consultant for the MoPHP
13- Dr. Sabri al Katheri, Supervision Section, NTP
14- Abdul Rahamn al Hamadi, Head of financial section, NTP
15- Ahmad al Asbahi, Head of supply section, NTP
16- Dr. Balkees Yehia Jahaf, Pharmacy, NTI
17- Othman Hasosah, Head of education section, NTP
18- Ameen Taher Mohamad, store responsible, NTP
19- Mahmood Sabahi, responsible of patients' record and referral, NTI
20- Dr Isam Addean Ali Hussein, Technical Advisor for Health Sector, CSSW
21- Fadiah abdul Ra'oof, secretary, NTP
22- Dr. Moona al Madhwahi, Program officer, WHO
23- Najala'a Refa'at, secretary for CCM, MoPHP.

ANNEX D

ANNEX D: BIBLIOGRAPHY (SUPPLEMENTAL TO ANNEXES)

1- Manual of NTP in the Republic of Yemen, MoPHP, Central Unit, 1996
2- Tuberculosis Control Guide of the NTP, MoPHP, 2006 (under revision by WHO)
3- Treatment of Tuberculosis: Guidelines for National Programs, third edition, WHO, 2003
4- Treatment Procedures for TB at the Level of Health Areas, WHO, 1996
5- Final Report for TB Control Project Phase III in Republic of Yemen, July 2004
6- Third Five Year Development and Poverty Reduction Plan (2006-2010), MoPHP
7- Notes on TB Control for Health Workers at HU Level, prepared by Abdul Bari Al-Hamadi, NTP
8- Quarterly Supervisory visit report to Amana Govornorate, 3-8 December 2005
9- Quarterly Supervisory visit report to Dhamar Govornorate, 25 March – 5 April 2006.
10- Quarterly Laboratory Supervisory visit report to Amana Govornorate, 16-21 September -December 2006
11- Quarterly Supervisory visit report to Amana Govornorate, 16-22 September 2006
12- Annual Meeting Report for DTCs and Laboratory Technicians of Al-Dale'e Governorate, November 2006
13- Cooperative Agreement between NTP, MoPHP and health sector, CSSW to control TB in Yemen, November 2002
14- Report of first training course for CSSW's Volunteers working on TB DOTS program, Maeen district, Sana'a city, August 2002
15- Supervisory Visit Report to CSSW's Volunteers working on TB DOTS program, March 2005
16- First Quarterly Supervisory Visit Report to CSSW's Volunteers working on TB DOTS program, 2006
17- Various NTP statistical, program, and financial data sheets
18- Advocacy communication and social mobilization to fight TB, a 10-year framework for action, ACSM subgroup at country level, © World Health Organization 2006.
19- Summary of the progress annual reports for NTP years 2004, 2005.
20- NTP statistical reports for DOTS and non-DOTS case finding, sputum conversion among new sputum smear positive (NSS+) cases, treatment out comes of NSS+, TB laboratory activities and distribution new positive cases by age and gender for years 2004, 2005, Q1,2,3 2006 by governorates.
21- NTP Annual Plan 2006
22- Meeting minutes of CCM , MoPHP, 10th May 2006
23- Guideline of the Decrees and Decisions issued related to the health sector, Legislation Affairs Department, MoPHP, November 2005
24- Annual report, 2005. Achievements for year one of the GF project, biannual meeting for GTCs and GLSs, NTP, al Jarda'a, November 14-15, 2006

ANNEX E

ANNEX E: INTERVIEW SCHEDULES FOR FIELD SURVEY

1: CLINICAL INTERVIEW SCHEDULE - Field Assessment of NTP

ADMINISTER TO SENIOR TB MANAGER AT ALL FACILITIES CARRYING OUT DIAGNOSIS AND TREATMENT. USE SUPPLEMENTARY INFORMANTS AS NECESSARY.

We are carrying out an evaluation of the JICA Tuberculosis Control Project which ended in August 2004. As part of this evaluation, we are looking at the work of the NTP, since this is the program the JICA project supported. The purpose of this evaluation is to help JICA learn lessons that it can use in designing programs in the future. We would like to speak with you about your work and your experiences with TB control. Your answers will remain anonymous.

ID No. _____ Name of interviewer:_____

A. BACKGROUND INTERVIEWER: fill in 1- 7 in advance of the interview

1. Name of principle informant:_____ 2. Sex: a. M __ b. F __
3. Level: a. Reg/sub office __ b. Gov.__ c. Dis___ d. sub-HC__ e. HU__
4. Position. a) DTC__ b) HW__ :category_____ c) other: _____
5. Facility _____ 6. District _____ 7. Governorate _____
8. Official catchments area:_____
9. Date informant began working with NTP: _____
10 Were you trained for this position? a. yes__ b. no___
11 Date of initial training: _____ 12: Length of training _____
13 Topic(s) of training: _____
14 Year this facility began NTP activities: _____ or DK___
15. Date of last supervision visit to this facility: _____
16. Number of supervisors in last supervisory team: _____
17. Staff in this facility assigned to TB diagnosis and treatment:
    a. Laboratory testing: _____ a. interviewee___ b. other ___
    b. Diagnosis and Treatment: _____ a. interviewee___ b. other ___
    c. Direct Daily Observation: _____ a. interviewee___ b. other ___
    d. Total number: _____a. interviewee___ b. other ___

B. ASSESSMENT OF CASE DETECTION/LABORATORY TESTING (use primarily observation, supplemented by questions)

*If supplementary informant, name here:*_____ *Position:*_____

1. Is protocol available in facility? a. yes__ b. no___
2. Does HW follow protocol, and able to apply it accurately? a. yes__ b. deficiencies__ c. no___
3. Month and year HW was last trained in this aspect of TB management: _____
4. Month and year HW was last supervised for this aspect of TB management: _____
5. Are essential laboratory equipment and supplies available? a. yes__ b. some deficiencies ___
6. Are slides kept for basic quality control ? a. yes__ b. no___
7. Comments:_____
   _____

C. ASSESSMENT OF CASE MANAGEMENT(use primarily observation, supplemented by questions)

*If supplementary informant, name here:*_____ *Position:*_____

1. Is protocol available in facility? a. yes__ b. no___
2. Does HW follow protocol, and able to apply it accurately? a. yes__ b. some deficiencies ___
3. Year and month HW was last trained in this aspect of TB: _____
4. Month and year HW was last supervised for this aspect of TB management: _____
5. What percentage of new cases in past year were directly and daily observed by HW? _____%
6. For those not directly observed by HW, what is the reason? _____
7. What % of new cases in past year are DOTS? _____?
8. Comments:_____
   _____

D. ASSESSMENT OF HEALTH EDUCATION (use primarily observation, supplemented by questions)

*If supplementary informant, name here:*_____ *Position:*_____

1. Does HW carry out adequate HE? a. yes__ b. some deficiencies__
2. Year and month HW was last trained in this aspect of TB management: _____
3. Month and year HW was last supervised for this aspect of TB management: _____
4. Are records kept of HE carried out? a. yes__ b. no__
5. Describe: _____
6. Are health education materials available? a. yes: brochures__ posters__ other_____ b. no___
7. Comments:_____
   _____

E. ASSESSMENT OF DRUG SUPPLY (DOTS AND NON-DOTS) (use observation for 1-3)

*If supplementary informant, name here:*_____ *Position:* _____

1. Are all DOTS drugs in protocol present/not expired? a. yes__ b. no___
2. Are all non-DOTS drugs present/not expired? a. yes__ b. no___
3. Is there adequate stock ? a. yes__ b. no___
4. Year and month HW was last trained in this aspect of TB: _____
5. Comments:_____
   _____

F. ASSESSMENT OF PRESENCE OF FORMS AND REGISTERS (use observation)

*If supplementary informant, name here:*_____ *Position:* _____

Are the following forms and registers available and properly filled out?

Forms and Registers	Available?	Properly utilized?
1. HF/District/Governorate Tuberculosis register	a. yes__ b. no___	a. yes__ b. no___
2. Tuberculosis treatment card	a. yes__ b. no___	a. yes__ b. no___
3. Tuberculosis identity card or patients guide booklet	a. yes__ b. no___	a. yes__ b. no___
4. Referral form.	a. yes__ b. no___	a. yes__ b. no___
5. Tuberculosis Laboratory register	a. yes__ b. no___	a. yes__ b. no___
6. Sputum examination request form	a. yes__ b. no___	a. yes__ b. no___
7. Quarterly report on case finding form	a. yes__ b. no___	a. yes__ b. no___
8. Quarterly report form on smear conversion .	a. yes__ b. no___	a. yes__ b. no___
9. Quarterly report form on treatment result	a. yes__ b. no___	a. yes__ b. no___
10 Other	a. yes__ b. no___	a. yes__ b. no___

G. BUDGET AND EQUIPMENT

*If supplementary informant, name here:*_____ *Position:* _____

1. Do you receive your budget (for TB control) at least quarterly?
   a. always/usually__ b. no__ c. No NTP budget allocated for this facility ____
2. If 'no', explain _____
3. Equipment provided by JICA in place and in good repair? (observe sticker, compare to NTP list)

Item of equipment	Available?	In good repair?
a. microscope	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
b. scale	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
c. motorcycle	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
d. computer	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
e. car	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
f. other_(name all)_____	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
g.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
h.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
i.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__

H. OPINIONS AND 'OTHER'

1. What is your opinion about the 1999-2004 JICA TB control project? _____
   _____ DK_____
2. What do you think the strengths of the NTP are? _____
   _____
3. What aspects of the NTP do you think should be improved? _____
   _____
4. How is the TB program working compared to 2 years ago? a. same_ b. better_ c. worse_ d. DK_
5. Explain_____
6. Are you satisfied with the support from your (NTP) supervisors? a. yes, usually__ b. no___
7. Explain _____
8. Do women have greater problems of access (financial, cultural, geographic) to the TB program than men? a. yes__ b. no___
9. Explain _____
10. Do the poor have greater problems of access to the TB program than non-poor? a. yes__ b. no___
11. Explain _____
12. What is the range of costs patients incur for TB diagnosis and full course of treatment?

Cost item	Each visit	Number of visits	Total
a. Costs prior to NTP services			
b. Transportation			
c. Health facility registration fee			
d. Laboratory testing			
e. Other diagnostics e.g. xray			
e. Drug costs			
f. Other			
g. Total			

13. CONCLUSION: TB staff knowledge level and performance: a. adequate__ b. deficient___
14. CONCLUSION: Morale among NTP staff: a. good ___ b. adequate or mixed ___ c. poor ___

2: ADMIN/SUPERVISION INTERVIEW SCHEDULE - Field Assessment of NTP

ADMINISTER TO NTP HEAD **AT ALL FACILITIES CARRYING OUT ADMIN/SUPPORT/SUPERVISION. USE SUPPLEMENTARY INFORMANTS AS NECESSARY.**

(If informant is same as that for Schedule 1 - e.g. DTC - do not complete I. 1-7, 14 nor N and O again.)

We are carrying out an evaluation of the JICA Tuberculosis Control Project which ended in 2004. As part of this evaluation, we are looking at the work of the NTP, since this is the program the JICA project supported. The purpose of this evaluation is to help JICA learn lessons that it can use in designing programs in the future. We would like to speak with you about your work and your experiences with TB control. Your answers will remain anonymous.

I. BACKGROUND INTERVIEWER: fill in 1- 6 in advance of the interview

ID No. _____ Name of interviewer:_____

1. Name of principle informant: _____ 2.Sex: a. M __ b. F __
3. Level: a. Reg/sub office __ b. Governorate__ c. District___
4. Position. a) Director __ b) GTC.__ c) GLS___ d) DTC__ e) other: _____
5. District _____ 6. Governorate _____
7. Official catchments area:_____ 8. No. of HF supervised by facility: ____
9. Month and year informant began working with NTP: _____
10 Were you trained for this position: a. yes__ b. no___
11 Date of initial training: _____ 12: Length of training _____
13 Topic(s) of training: _____
14 Year this facility began NTP activities: _____ or DK___

J. ASSESSMENT OF TASKS CARRIED OUT BY FACILITY

Which of the following tasks are carried out by this facility?

Assessment Question	Assessment	If 'yes' complete:
1. Supervision and support	a. yes__ b. no___	K, M
2. Supply of drugs and dx. materials	a. yes__ b. no___	Observe facility, records, complete M
3. Quality Control (e.g. laboratory)	a. yes__ b. no___	L, M
4. Training	a. yes__ b. no___	Observe facility, records, complete M
5. Research	a. yes__ b. no___	Observe facility, records, complete M
6. Other:_____	a. yes__ b. no___	Observe facility, records, complete M

K. ASSESSMENT OF SUPERVISION AND MONITORING (Examine documents to evaluate)
If supplementary informant, name here:_____ Position:_____

Assessment Question	Assessment
1. Is a list of all facilities/offices under the authority of the supervisor readily available?	a. yes__ b. no___
2. Have all these facilities/offices been supervised within the last three months?	a. yes__ b. no___
3. Are copies of the supervision checklists available?	a. yes__ b. no___
4. Has the supervisor used this checklist when supervising? Examine a copy of last supervision visit for a **random** sample of **your** choosing of these facilities. (e.g. every 5th facility from list, question #1) Look at at least two facilities	a. yes__ b. no___
5. Has a supervision report for all facilities been written during the last quarter?	a. yes__ b. no___
6. Has there been follow up for weak facilities?	a. yes__ b. no___
7. Were the last supervision visits integrated with supervision visit of other infectious disease or PHC programs?	a. yes__ b. no___
8. Is there a vehicle available for supervision?	a. yes__ b. no___

	c. motorcycle ___ d. car___
9. Is it a JICA vehicle?	a. yes__ b. no___

L. **ASSESSMENT OF LABORATORY QUALITY CONTROL** (check records to verify)
If supplementary informant, name here:_____ Position:_____

(1) National Reference Laboratory and Aden Regional TB Center

Assessment Checkpoint	Assessment
a. Supervises the Intermediate Laboratories at the governorate level	a. yes__ b. no___
b. Carries out primary cultures	a. yes__ b. no___
c. Identification and drug sensitivity test	a. yes__ b. no___
d. Conducting and participating in research and surveys	a. yes__ b. no___
e. Training	a. yes__ b. no___
f. Quality control	a. yes__ b. no___

(2) The Laboratories in Hodeidah and Taiz sub-Centers

Assessment Checkpoint	Assessment
a. Research	a. yes__ b. no___
b. Supervising activities in the diagnostic laboratories of catchments area	a. yes__ b. no___
c. Primary culture	a. yes__ b. no___
d. Identification test in addition to the routine sputum examination.	a. yes__ b. no___

(3) Governorates, District

Assessment Checkpoint	Assessment
a. Conducting direct smear examination for pulmonary suspected TB cases and for follow up examination for the patients under treatment	a. yes__ b. no___
b. Keeping examined slides for quality control for supervisors.	a. yes__ b. no___

M. GENERAL ASSESSEMENT AND NOTES ON J. 1-6

Assessment Question	Not applic. ('No" in J)	Records available and organized	Staff knowledgeable and performing well
1. Supervision and support	NA	a. yes__ b. no___	a. yes__ b. no___
2. Supply of drugs and dx materials	NA	a. yes__ b. no___	a. yes__ b. no___
3. Quality Control (e.g. laboratory)	NA	a. yes__ b. no___	a. yes__ b. no___
4. Training	NA	a. yes__ b. no___	a. yes__ b. no___
5. Research	NA	a. yes__ b. no___	a. yes__ b. no___
6. Other:_____	NA	a. yes__ b. no___	a. yes__ b. no___

1.Supervision and support
_____
_____
_____
_____
_____

2. Supply of drugs and dx materials
_____
_____
_____
_____

3. Quality Control (e.g. laboratory)

_____
_____
_____
_____

4. Training

_____
_____
_____
_____

5. Research

_____
_____
_____
_____

6.Other

_____
_____
_____
_____

N. BUDGET AND EQUIPMENT

*If supplementary informant, name here:*_____ *Position:* _____

1. Do you receive your budget (for TB control) at least quarterly?
   a. always/usually__ b. no__ c. No NTP budget allocated for this facility ____
2. If 'no', explain _____
3. Equipment provided by JICA in place and in good repair? (observe sticker, compare to NTP list)

Item of equipment	Available?	In good repair?
a. microscope	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
b. scale	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
c. motorcycle	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
d. computer	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
e. car	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
f. other_(name all)_____	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
g.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
h.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__
i.	a. yes__ b. no___ c. N/A__	a. yes__ b. no___ c. N/A__

O. OPINIONS AND 'OTHER'

1. What is your opinion about the 1999-2004 JICA TB control project? _____
2. _____ DK_____
3. What do you think the strengths of the NTP are?____ _____
4. _____
5. What aspects of the NTP do you think should be improved? _____
6. _____
7. How is the TB program working compared to 2 years ago? a. same_ b. better_ c. worse_ d. DK_
8. Explain_____
9. Are you satisfied with the support from your (NTP) supervisors? a. yes, usually__ b. no___
10. Explain _____

11. Do women have greater problems of access (financial, cultural, geographic) to the TB program than men? a. yes__ b. no___
12. Explain _____
13. Do the poor have greater problems of access to the TB program than non-poor? a. yes__ b. no___
14. Explain _____
15. What is the range of costs patients incur for TB diagnosis and full course of treatment?

Cost item	Each visit	Number of visits	Total
a. Costs prior to NTP services			
b. Transportation			
c. Health facility registration fee			
d. Laboratory testing			
e. Other diagnostics e.g. xray			
e. Drug costs			
f. Other			
g. Total			

16. CONCLUSION: Supervisor knowledge level and performance: a. adequate__ b. deficient___
17. CONCLUSION: Morale among NTP staff: a. good ___ b. adequate or mixed ___ c. poor ___

3: PATIENT INTERVIEW SCHEDULE - Field Assessment of NTP

ADMINISTER TO PATIENTS AT ALL LEVELS OF FACILITIES

We are carrying out an evaluation of the JICA Tuberculosis Control Project which ended in 2004. As part of this evaluation, we are looking at the work of the NTP, since this is the program the JICA project supported. The purpose of this evaluation is to help JICA learn lessons that it can use in designing programs in the future. We would like to speak with you about your experiences with TB services. Your answers will remain anonymous.

ID No. _____ Name of interviewer:_____

P. BACKGROUND INTERVIEWER: fill in 1-7 in advance of the interview

1. Name of patient:_____ 2. Sex: a. M __ b. F __
3. Relationship of interviewee to patient: a. patient___ b. Volunteer (family) direct observer ___
4. Level: a. Reg/sub office __ b. Gov.__ c. Dis___ d. HC__ e. HU__
5. Facility _____ 6. District _____ 7. Governorate _____
8. Travel time from patient's home to the HF: _____ hours

Q. PATIENT ASSESSMENT

1. How did you find out you had TB?_____
_____
2. Where were you diagnosed? _____
_____
3. Where are you now/were being treated? _____
_____
4. How many months have you been under treatment for TB? _____months

5. Are you satisfied with the services (dx and rx) you received? a. yes__ b. no___
6. Explain _____

7. Who observes your treatment? a. HW___ b. family __ c. other__(_____) d. no one __

8. (If not a health worker, why not?) _____

9. Do you take your medicine daily? a. yes__ b. no___ If no, explain _____

10. What causes TB? _____

11. How does a person keep from spreading TB to others?_____
_____

12. If the services for TB could be improved, what would you suggest? _____
_____

13. (If a woman) As a woman, are you comfortable getting services at this facility? a. yes__ b. no___
14. Explain_____
_____

15. What did it cost you for diagnosis and treatment of TB?

Cost item	Each visit	Number of visits	Total
a. Costs prior to NTP services			
b. Transportation			
c. Health facility registration fee			
d. Laboratory testing			
e. Other diagnostics e.g. xray			
e. Drug costs			
f. Other			
g. Total			

4: DEFAULTER INTERVIEW SCHEDULE - Field Assessment of NTP

ADMINISTER TO DEFAULTERS AT ALL LEVELS OF FACILITIES

We are carrying out an evaluation of the JICA Tuberculosis Control Project which ended in 2004. As part of this evaluation, we are looking at the work of the NTP, since this is the program the JICA project supported. The purpose of this evaluation is to help JICA learn lessons that it can use in designing programs in the future. We would like to speak with you about your experiences with TB services. Your answers will remain anonymous.

ID No. _____ Name of interviewer:_____

R. BACKGROUND INTERVIEWER: fill in 1-7 in advance of the interview

1. Name of patient:_____ 2. Sex: a. M __ b. F __
3. Relationship of interviewee to patient: a. patient___ b. Volunteer (family) direct observer ___
4. Level: a. Reg/sub office __ b. Gov.__ c. Dis___ d. HC__ e. HU__
5. Facility _____ 6. District _____ 7. Governorate _____
8. Travel time from patient's home to the HF: _____ hours

S. PATIENT ASSESSMENT

1. How did you find out you had TB?_____
_____
2. Where were you diagnosed? _____
_____
3. Where were you being treated? ___ _____
_____
4. How many months had you been under treatment for TB? _____months

5. Were you satisfied with the services (dx and rx) you received? a. yes__ b. no___
6. Explain _____

7. Who observed your treatment? a. HW___ b. family __ c. other__(_____) d. no one __
8. (If not a health worker, why not?) _____

9. What was your reason for stopping treatment? _____

10. What causes TB? _____

11. How does a person keep from spreading TB to others?_____
_____

12. If the services for TB could be improved, what would you suggest? _____
_____

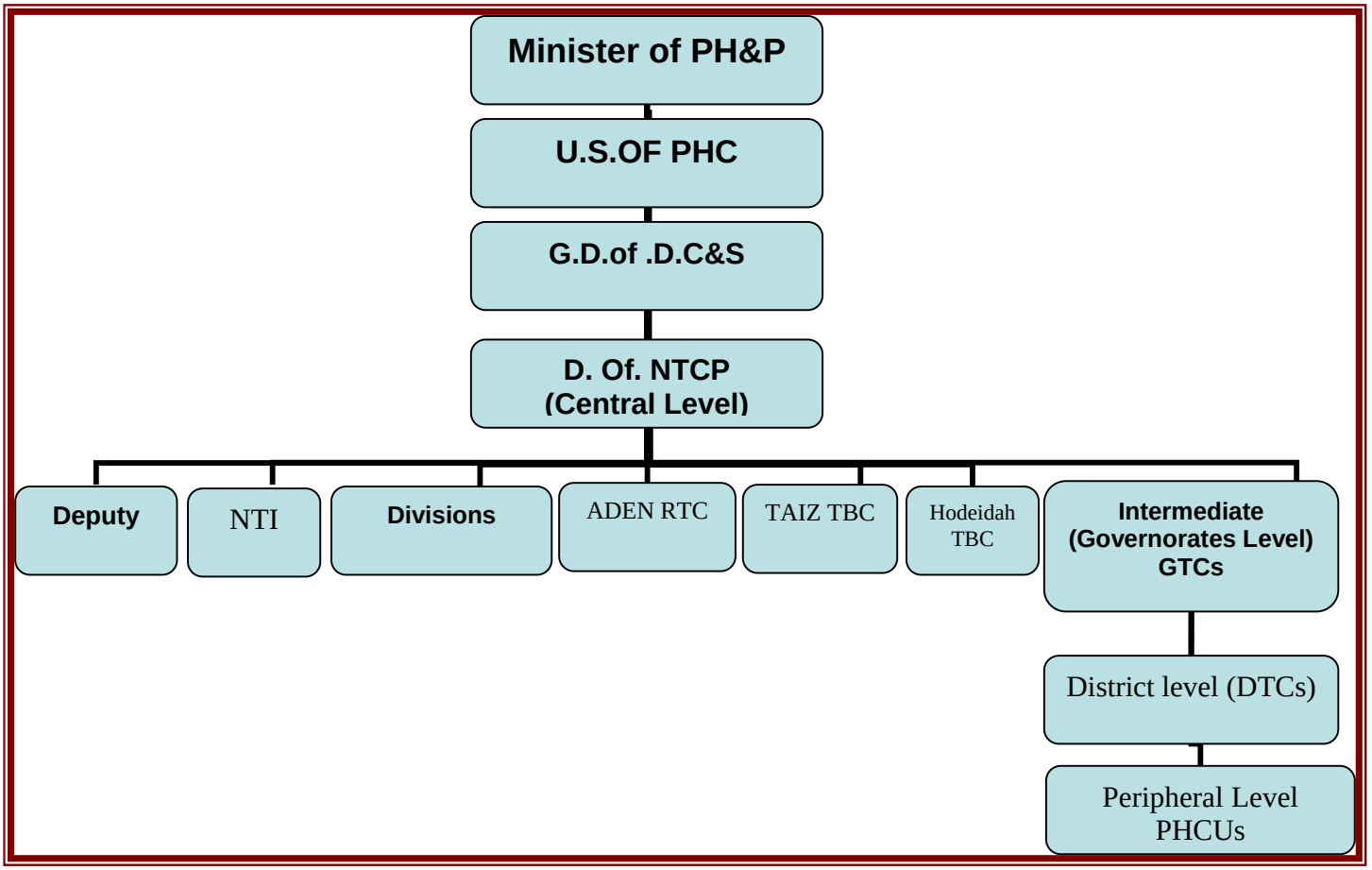
13. (If a woman) As a woman, were you comfortable getting services at (x) facility? a. yes_ b. no_
14. Explain_____
_____

15. What did it cost you for diagnosis and treatment?

Cost item	Each visit	Number of visits	Total
a. Costs prior to NTP services			
b. Transportation			
c. Health facility registration fee			
d. Laboratory testing			
e. Other diagnostics e.g. xray			
e. Drug costs			
f. Other			
g. Total			

ANNEX F

ANNEX F: ORGANOGRAM OF THE NTP



ANNEX G

ANNEX G.1: DOTS EXPANSION TO PHCUS BY 2006

Governorate	Districts*	Health facilities providing TB services					
		TB center	Gov. hospital	Rural hospital	HC	HU	MCH
Abyan	NA		1	7	11	106	6
Aden	NA	1	5	0	23	3	5
Al Baidah	NA		3	7	32	85	2
Al Daleh	NA		3	2	19	102	4
Al-Hodeidah	NA	1	8	10	59	261	0
Al-Jawf	NA		1	1	19	91	0
AlMahrah	NA		1	8	11	76	0
Al Mahweet	NA		1	4	10	150	1
Al Mukalla	NA		1	7	17	126	6
Amran	NA		1	7	30	157	0
Dhamar	NA		3	10	51	168	1
Hajjah	NA		3	4	18	225	1
Ibb	NA		6	10	107	160	4
Lahj	NA		3	14	17	156	7
Mareb	NA		1	7	22	89	0
Sada'a	NA		1	11	22	116	0
Sana'a City	NA	1	4	2	2	4	29
Sana'a Gov.	NA		2	7	82	139	0
Sayun	NA		1	4	6	108	3
Shabwah	NA		1	14	17	79	0
Taiz	NA	1	8	15	106	186	5
Raimah	NA		2	0	34	72	0
Total	NA	4	60	151	715	2659	74

* *NA: Not Available from source (NTP)*

ANNEX G.2: NTP HEALTH FACILITY COVERAGE

Governorate	Dist.	Available HFs from official statistics for 2005						HFs with TB activities					HWs in HUs who received TB training		
		TB center	Gov. hospital	Rural hospital	HC	HU	MCH	Hos.	HC	HU	MCH	HF (Red crescent)	Male	Female	Total
Abyan	NA		1	7	11	106	6	1	0	108	0	0	120 (85%)	21 (15%)	141
Aden	NA	1	5	0	23	3	5	2	17	3	0	0	9 (29%)	22 (71%)	31
Al Baidah	NA		3	7	32	85	2	5	12	36	0	0	47 (72%)	18 (28%)	65
Al Daleh	NA		3	2	19	102	4	1	7	99	0	0	163 (82%)	35 (18%)	198
Al-Hodeidah	NA	1	8	10	59	261	0	8	6	180	0	0	148 (80%)	38 (20%)	186
Al-Jawf	NA		1	1	19	91	0	0	0	33	0	0	32 (91%)	3 (9%)	35
AlMahrah	NA		1	8	11	76	0	0	1	6	0	0	7 (87%)	1 (13%)	8
Al Mahweet	NA		1	4	10	150	1	2	1	120	1	0	169 (76%)	53 (24%)	222
Al Mukalla	NA		1	7	17	126	6	2	1	29	0	0	27 (90%)	3 (10%)	30
Amran	NA		1	7	30	157	0	5	18	124	0	0	125 (61%)	80 (39%)	205
Dhamar	NA		3	10	51	168	1	6	23	107	1	1	95 (67%)	43 (33%)	142
Hajjah	NA		3	4	18	225	1	0	0	124	0	0	102 (63%)	59 (37%)	161
Ibb	NA		6	10	107	160	4	4	18	86	1	1	66 (73%)	25 (27%)	91
Lahj	NA		3	14	17	156	7	1	0	110	0	0	108 (92)	10 (8%)	118
Mareb	NA		1	7	22	89	0	2	5	32	0	0	51 (93%)	4 (7%)	55
Sada'a	NA		1	11	22	116	0	1	9	19	0	0	24 (89%)	3 (11%)	27
Sana'a City	NA	1	4	2	2	4	29	7	15	22	0	0	11 (34%)	21 (66%)	32
Sana'a Gov.	NA		2	7	82	139	0	3	5	113	0	0	119 (74%)	42 (26%)	161
Sayun	NA		1	4	6	108	3	0	0	16	0	0	16 (100%)	0 (0%)	16
Shabwah	NA		1	14	17	79	0	4	4	15	0	0	47 (92%)	4 (8%)	51
Taiz	NA	1	8	15	106	186	5	4	2	120	0	0	140 (75%)	47 (25%)	187
Raimah	NA		2	0	34	72	0	4	6	61	0	0	63 (75%)	21 (25%)	84
Total	NA	4	60	151	715	2659	74	62	150	1563	3	2	1648 (74%)	594 (26%)	2246

ANNEX H

ANNEX H.1:CASE FINDING IN 2005 (DOTS AND NON DOTS)

Governorate	NSS+	Relapse	NSS-	EP	Total	Population -2004	NSS+/ Pop 100,000	%SS+ in New Cases	%SS+ in New Pulmonary Cases
Abyan	151	11	151	56	369	438656	34.4	42.2%	50.0%
Aden	274	53	263	178	768	590413	46.4	38.3%	51.0%
Al Baidah	58	6	102	34	200	571778	10.1	29.9%	36.3%
Al Daleh	75	6	80	56	217	470460	15.9	35.5%	48.4%
Al-Hodeidah	604	49	257	283	1193	2161379	27.9	52.8%	70.2%
Al-Jawf	124	11	74	43	252	451426	27.5	51.5%	62.6%
AlMahrah	32	5	31	2	70	89093	35.9	49.2%	50.8%
Al Mahweet	68	5	100	56	229	495865	13.7	30.4%	40.5%
Al Mukalla	105	24	21	26	176	562290	18.7	69.1%	83.3%
Amran	116	9	73	100	298	872789	13.3	40.1%	61.4%
Dhamar	203	7	273	240	723	1339229	15.2	28.4%	42.6%
Hajjah	308	39	466	144	957	1480897	20.8	33.6%	39.8%
Ibb	135	7	54	121	317	2137546	6.3	43.5%	71.4%
Lahj	180	15	171	53	419	727203	24.8	44.6%	51.3%
Mareb	30	18	51	31	130	241690	12.4	26.8%	37.0%
Saadah	40	4	18	10	72	693217	5.8	58.8%	69.0%
Sana'a City	298	32	288	575	1193	1747627	17.1	25.7%	50.9%
Sana'a Gov.	81	6	70	75	232	918379	8.8	35.8%	53.6%
Sayun	10	1	10	15	36	467172	2.1	28.6%	50.0%
Shabwah	56	5	65	1	127	466889	12.0	45.9%	46.3%
Taiz	401	38	157	431	1027	2402569	16.7	40.5%	71.9%
Raimah	30	0	5	23	58	395076	7.6	51.7%	85.7%
Total	3379	351	2780	2553	9063	19721643	17.1	38.8%	54.9%

ANNEX H.2: CASE FINDING IN 2004 (DOTS AND NON DOTS)

Governorate	NSS+	Relapse	NSS-	EP	Total	Population -2004	NSS+/ Pop 100,000	%SS+ in New Cases	%SS+ in New Pulmonary Cases
Abyan	161	19	185	81	446	438656	36.7	37.7%	46.5%
Aden	276	75	298	180	829	590413	46.7	36.6%	48.1%
Al Baidah	26	9	67	41	143	571778	4.5	19.4%	28.0%
Al Daleh	71	3	96	53	223	470460	15.1	32.3%	42.5%
Al-Hodeidah	621	42	278	255	1196	2161379	28.7	53.8%	69.1%
Al-Jawf	15	0	16	9	40	451426	3.3	37.5%	48.4%
AlMahrah	3	0	11	0	14	89093	3.4	21.4%	21.4%
Al Mahweet	53	4	101	40	198	495865	10.7	27.3%	34.4%
Al Mukalla	111	23	22	32	188	562290	19.7	67.3%	83.5%
Amran	131	12	103	86	332	872789	15.0	40.9%	56.0%
Dhamar	156	14	381	205	756	1339229	11.6	21.0%	29.1%
Hajjah	318	45	604	220	1187	1480897	21.5	27.8%	34.5%
Ibb	156	13	42	98	309	2137546	7.3	52.7%	78.8%
Lahj	206	19	267	64	556	727203	28.3	38.4%	43.6%
Mareb	40	5	100	26	171	241690	16.6	24.1%	28.6%
Sada'a	44	15	53	38	150	693217	6.3	32.6%	45.4%
Sana'a City	355	33	378	660	1426	1747627	20.3	25.5%	48.4%
Sana'a Gov.	88	6	117	89	300	1313455	6.7	29.9%	42.9%
Sayun	31	0	23	33	87	467172	6.6	35.6%	57.4%
Shabwah	27	5	93	31	156	466889	5.8	17.9%	22.5%
Taiz	545	35	238	491	1309	2402569	22.7	42.8%	69.6%
Total	3434	377	3473	2732	10016	19721643	17.4	35.6%	49.7%

ANNEX I

ANNEX I: DISTRIBUTION OF DOTS AND NON-DOTS CASES BY AGE AND GENDER IN YEMEN YEAR 2004, 2005, 2006*

Year	Item	0-14 Y				14-24 Y				25-34 Y				35-44 Y				45-54 Y				55-64 Y				65+ Y				Grand-total			
		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS		DOTS		Non DOTS	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
2004	Total	38	69	4	2	532	417	40	16	538	355	30	22	352	259	27	11	205	150	14	7	127	82	7	6	72	43	7	2	1864	1375	129	66
	Sub-total	107		6		949		56		893		52		611		38		355		21		209		13		115		9		3239		195	
	G. total	113				1005				945				649				376				222				124				3434			
	% of sex	2	5	3	3	29	30	31	24	29	26	23	33	19	19	2	17	11	11	11	11	7	6	5	9	4	3	5	3	100	100	100	100
	% of age	3		3		29		29		28		27		19		19		11		11		6		7		4		5		100		100	
2005	Total	44	39	1	4	501	401	23	18	537	381	34	22	345	245	21	13	220	163	12	11	135	74	15	7	76	31	4	2	1858	1334	110	77
	Sub-total	83		5		902		41		918		56		590		34		383		23		209		22		107		6		3192		187	
	G. total	88				943				974				624				406				231				113				3379			
	% of sex	2	3	1	5	27	30	21	23	29	29	31	29	19	18	19	17	12	12	11	14	7	6	14	9	4	2	4	3	100	100	100	100
	% of age	3		3		28		22		29		30		18		18		12		12		7		12		3		3		100		100	
2006 Q1,2,3	Total	22	40	1	0	383	298	5	6	409	253	8	7	262	190	7	2	186	138	5	1	111	57	4	2	73	27	2	2	1446	1003	32	20
	Sub-total	62		1		681		11		662		15		452		9		324		6		168		6		100		4		2449		52	
	G. total	63				692				677				461				330				174				104				2501			
	% of sex	2	4	3	0	26	30	16	30	28	25	25	35	18	19	22	10	13	14	16	5	8	7	13	10	5	3	6	10	100	100	100	100
	% of age	3		2		28		21		27		29		18		17		13		12		7		12		4		8		100		100	

* This table was collected and summarized from 9 NTP tables of the 22 governorates

ANNEX J

ANNEX J.1: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, Q1,2,3 OF 2005 (DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default %	Success%
Abyan	73	15	5	1	12	3	109	11.0%	80.7%
Aden	138	33	6	4	16	13	210	7.6%	81.4%
Al Baidah	49	2	2	0	5	1	59	8.5%	86.4%
Al Daleh	42	0	0	0	0	0	42	0.0%	100.0%
Al-Hodeidah	149	4	8	1	10	5	177	5.6%	86.4%
Al-Jawf	242	12	12	1	17	7	291	5.8%	87.3%
AlMahrah	49	7	0	0	4	1	61	6.6%	91.8%
Al Mahweet	21	5	3	0	2	4	35	5.7%	74.3%
Al Mukalla	45	13	2	2	6	5	73	8.2%	79.5%
Amran	58	17	1	1	6	2	85	7.1%	88.2%
Dhamar	120	22	4	0	11	6	163	6.7%	87.1%
Hajjah	161	14	4	2	4	1	186	2.2%	94.1%
Ibb	84	4	2	1	8	3	102	7.8%	86.3%
Lahj	72	29	6	2	11	16	136	8.1%	74.3%
Mareb	19	1	0	0	4	2	26	15.4%	76.9%
Saadah	27	6	1	0	2	8	44	4.5%	75.0%
Sana’a City	144	74	7	0	10	16	251	4.0%	86.9%
Sana’a Gov.	47	9	1	1	7	1	66	10.6%	84.8%
Sayun	3	2	0	0	2	0	7	28.6%	71.4%
Shabwah	20	9	0	0	8	5	42	19.0%	69.0%
Taiz	235	8	16	1	20	11	291	6.9%	83.5%
Raimah	13	2	1	0	0	1	17	0.0%	88.2%
Total	1811	288	81	17	165	111	2473	6.7%	84.9%

ANNEX J.2: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, Q1-3 OF 2005 (NON-DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	3	2	0	0	0	0	5	0.0%	100.0%
Aden	7	1	1	0	1	1	11	9.1%	72.7%
Al Baidah	2	0	0	0	0	0	2	0.0%	100.0%
Al Daleh	0	25	0	0	0	1	26	0.0%	96.2%
Al-Hodeidah	14	0	0	0	6	2	22	27.3%	63.6%
Al-Jawf	24	2	2	0	1	2	31	3.2%	83.9%
AlMahrah	19	1	0	0	1	0	21	4.8%	95.2%
Al Mahweet	0	0	0	0	0	0	0	0.0%	0.0%
Al Mukalla	0	0	0	0	0	0	0	0.0%	0.0%
Amran	1	0	0	0	0	0	1	0.0%	100.0%
Dhamar	0	0	0	0	0	0	0	0.0%	0.0%
Hajjah	36	10	1	0	9	1	57	15.8%	80.7%
Ibb	0	0	0	0	0	0	0	0.0%	0.0%
Lahj	1	0	1	0	3	0	5	60.0%	20.0%
Mareb	0	0	0	0	0	0	0	0.0%	0.0%
Saadah	0	0	0	0	0	0	0	0.0%	0.0%
Sana’a City	0	0	0	0	0	0	0	0.0%	0.0%
Sana’a Gov.	0	1	0	0	0	0	1	0.0%	100.0%
Sayun	0	0	0	0	0	0	0	0.0%	0.0%
Shabwah	0	0	0	0	0	1	1	0.0%	0.0%
Taiz	0	0	0	0	0	0	0	0.0%	0.0%
Raimah	0	0	0	0	0	1	1	0.0%	0.0%
Total	107	42	5	0	21	9	184	11.4%	81.0%

ANNEX J.3: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, 2004 (DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	102	23	4	1	15	6	151	9.9%	82.8%
Aden	191	40	1	3	17	14	266	6.4%	86.8%
Al Baidah	34	0	0	0	1	0	35	2.9%	97.1%
Al Daleh	64	0	0	1	4	0	69	5.8%	92.8%
Al-Hodeidah	487	19	24	6	46	15	597	7.7%	84.8%
Al-Jawf	0	0	0	0	0	0	0	0.0%	0.0%
AlMahrah	0	0	0	0	0	0	0	0.0%	0.0%
Al Mahweet	38	9	2	0	3	4	56	0.0%	0.0%
Al Mukalla	84	8	2	3	15	12	124	0.0%	0.0%
Amran	95	23	4	3	8	0	133	6.0%	88.7%
Dhamar	105	33	4	0	19	6	167	0.0%	0.0%
Hajjah	229	27	4	0	17	3	280	6.1%	91.4%
Ibb	99	7	3	0	18	5	132	0.0%	0.0%
Lahj	102	31	5	3	22	13	176	12.5%	75.6%
Mareb	29	4	0	0	3	3	39	0.0%	0.0%
Saadah	14	0	0	0	3	2	19	0.0%	0.0%
Sana’a City	183	79	5	2	30	20	319	0.0%	0.0%
Sana’a Gov.	42	15	5	0	8	1	71	11.3%	80.3%
Sayun	15	8	2	0	3	2	30	0.0%	0.0%
Shabwah	3	11	0	0	3	5	22	13.6%	63.6%
Taiz	365	30	23	0	28	15	461	0.0%	0.0%
Raimah	11	6	0	0	1	1	19	5.3%	89.5%
Total	2292	373	88	22	264	127	3166	8.3%	84.2%

ANNEX J.4: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, 2004 (NON DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	1	6	0	0	7	0	14	50.0%	50.0%
Aden	0	0	0	0	0	0	0	0.0%	0.0%
Al Baidah	0	0	0	0	0	0	0	0.0%	0.0%
Al Daleh	0	0	0	0	0	0	0	0.0%	0.0%
Al-Hodeidah	30	14	2	0	8	6	60	13.3%	0.0%
Al-Jawf	5	44	0	0	2	1	52	0.0%	0.0%
AlMahrah	0	0	0	0	0	0	0	0.0%	0.0%
Al Mahweet	0	0	0	0	0	0	0	0.0%	0.0%
Al Mukalla	0	0	0	0	0	0	0	0.0%	0.0%
Amran	0	0	0	0	0	0	0	0.0%	0.0%
Dhamar	0	0	0	0	0	0	0	0.0%	0.0%
Hajjah	41	22	0	1	9	7	80	11.3%	78.8%
Ibb	2	4	0	0	6	0	12	0.0%	0.0%
Lahj	0	19	0	0	5	0	24	20.8%	79.2%
Mareb	0	0	0	0	0	0	0	0.0%	0.0%
Saadah	11	1	1	0	5	2	20	0.0%	0.0%
Sana’a City	0	0	0	0	0	0	0	0.0%	0.0%
Sana’a Gov.	0	0	0	0	0	0	0	0.0%	0.0%
Sayun	0	0	0	0	0	0	0	0.0%	0.0%
Shabwah	0	0	0	0	0	0	0	0.0%	0.0%
Taiz	0	0	0	0	0	0	0	0.0%	0.0%
Raimah	0	0	0	0	0	0	0	0.0%	0.0%
Total	90	110	3	1	42	16	262	16.0%	76.3%

ANNEX J.5: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, 2003 (DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	97	25	4	2	19	6	153	12.4%	79.7%
Aden	228	50	8	4	44	23	357	12.3%	77.9%
Al Baidah	46	0	1	0	0	0	47	0.0%	97.9%
Al Daleh	56	5	0	0	1	0	62	1.6%	98.4%
Al-Hodeidah	466	26	34	10	40	29	605	6.6%	81.3%
Al-Jawf	0	0	0	0	0	0	0	0.0%	0.0%
AlMahrah	0	0	0	0	0	0	0	0.0%	0.0%
Al Mahweet	26	10	1	1	6	0	44	13.6%	81.8%
Al Mukalla	84	13	6	2	15	12	132	11.4%	73.5%
Amran	77	23	5	1	8	0	114	7.0%	87.7%
Dhamar	116	32	8	0	34	6	196	17.3%	75.5%
Hajjah	378	42	3	2	23	0	448	5.1%	93.8%
Ibb	116	6	3	0	21	5	151	13.9%	80.8%
Lahj	135	24	8	5	15	13	200	7.5%	79.5%
Mareb	31	11	0	0	12	3	57	21.1%	73.7%
Saadah	18	4	0	1	5	3	31	16.1%	71.0%
Sana’a City	175	48	11	0	28	7	269	10.4%	82.9%
Sana’a Gov.	76	25	5	1	9	2	118	7.6%	85.6%
Sayun	13	2	4	1	0	0	20	0.0%	75.0%
Shabwah	5	10	1	2	0	2	20	0.0%	75.0%
Taiz	413	46	22	3	49	6	539	9.1%	85.2%
Total	2556	402	124	35	329	117	3563	9.2%	83.0%

ANNEX J.6: TREATMENT OUTCOME OF NSS+ CASES IN YEMEN, 2003 (NON DOTS)

Governorate	Cured	Completed	Died	Failure	Default	T/O	Total	Default%	Success%
Abyan	0	3	0	0	1	0	4	25.0%	75.0%
Aden	0	0	0	0	0	0	0	0.0%	0.0%
Al Baidah	0	30	0	0	0	0	30	0.0%	0.0%
Al Daleh	0	0	0	0	0	0	0	0.0%	0.0%
Al-Hodeidah	45	4	2	1	19	6	77	24.7%	0.0%
Al-Jawf	0	0	0	0	0	0	0	0.0%	0.0%
AlMahrah	0	0	0	0	0	0	0	0.0%	0.0%
Al Mahweet	0	0	0	0	0	0	0	0.0%	0.0%
Al Mukalla	1	0	0	0	0	0	1	0.0%	0.0%
Amran	0	1	0	0	2	0	3	0.0%	0.0%
Dhamar	0	0	0	0	0	0	0	0.0%	0.0%
Hajjah	16	8	0	1	9	1	35	25.7%	68.6%
Ibb	0	2	1	0	3	0	6	0.0%	0.0%
Lahj	0	0	0	0	0	0	0	0.0%	0.0%
Mareb	0	0	0	0	0	0	0	0.0%	0.0%
Saadah	14	1	0	1	2	1	19	0.0%	0.0%
Sana’a City	0	0	0	0	0	0	0	0.0%	0.0%
Sana’a Gov.	0	0	0	0	0	0	0	0.0%	0.0%
Sayun	0	0	0	0	0	0	0	0.0%	0.0%
Shabwah	0	1	0	0	0	0	0	0.0%	0.0%
Taiz	0	0	0	0	0	0	0	0.0%	0.0%
Raimah	0	0	0	0	0	0	0	0.0%	0.0%
Total	76	50	3	3	36	8	176	20.5%	71.6%

ANNEX K

ANNEX K: LEVEL OF IMPLEMENTATION OF NATIONAL TB ACTIVITIES

OP1: Case finding and Dx of TB improved	Year	Source of fund
Conduct 18 central supervisory visits	2006	GF
Conduct governorate supervisory visits for 179 districts	2006	GF
Conduct district supervisory visits for 341 HFs.	2006	GF
Conduct central supervisory visits for 12 governorates	2006	GF
Conduct governorate supervisory visits for 22 governorates	2006	GF
Conduct district supervisory visits for 12 governorates	2006	GF
Implementation of QA for labs. For 3000 slides (re-examining of slides from districts)	2006	GF
Conduct technical support by 1 international experts for referring laboratory	2006	GF
Conduct emergency supervision visits for weak labs in 3 governorates	2006	GF
Conduct emergency supervision visits for weak labs in 1 governorates	2006	GF
Preparation for emergency supervision and QC for labs.	2006	GF
Conduct central supervisory visits for 12 governorates	2005	GF
Conduct governorate supervisory visits for 22 governorates	2005	GF
Conduct district supervisory visits for 12 governorates	2005	GF
Collecting slides for QC from 21 Governorates.	2005	GF
Conduct emergency supervision visits for weak labs in some governorates	2005	GF
OP2: Rx of TB is improved based on proper case management system.	Year	Source of fund
Conduct training for DOTS expansion for PHCW for 228 HU in 3 governorates.	2006	GF
Conduct continuation training in for PHCW in 6 governorates	2006	GF
Provide equipments and diagnostic material.	2006	GF /WHO
? Hold advocacy meeting with key persons in 4 governorates.	2006	GF
? Hold advocacy meeting with key persons (LC and health officials) in some governorates and districts.	2006	GF
Conduct training in DOTS expansion for PHCW in 4 governorates.	2006	GF
Preparation for community medicine training plan (4).	2006	GF
Preparation for refreshment training plan for all NTP staff	2006	GF
Conduct training for HWs in 12 governorates.	2005	GF
OP4: Program monitoring system is improved based on standardized recording and reporting system.	Year	Source of fund
Conduct half yearly meeting for GTCs and supervisors.	2006	GF
Conduct half yearly evaluating meeting for GTCs and districts lab. technicians for 332 person.	2006	GF
Conduct half yearly evaluating meeting for PHCWs and districts lab. technicians for 1564 person.	2006	GF
Conduct meetings for GLSs and lab technicians for 3 governorates.	2006	GF
Plan preparation to improve quarterly reporting for GTCs and DTCs in 8 governorates.	2006	GF
?? Different plan preparation (Meetings and maintenance)	2006	GF
Conduct half yearly meeting for GTCs and supervisors.	2005	GF
OP5: The size and nature of TB problem of ROY are studied.	Year	Source of fund
Conduct a survey for the prevalence of HIV/AIDS among TB cases (84% achieved)	2006	GF
supervision visit during the survey	2006	GF
Conduct a TB survey among HIV/AIDS	2006	GF
Conduct a research for the prevalence of TB cases among HIV/AIDS (under execution)	2005	GF

Report to Dr. Majid al Juneid, Deputy Minister for PHC, on Global **Fund Activities**

ANNEX L

ANNEX L: EQUIPMENT PURCHASED FOR NTP IN 2006

Item	Qu. No.	budget	Source	Equipment Plan
2006				
Computer Desktop	5	4650	GF	Distributed
Computer Notebook	2	3620	GF	Distributed
Microscope Olmps	30	27330	GF	Distributed
Printer	14	6365	GF	Distributed
Monitor	5	675	GF	Distributed
Baktec Lab. Appar	1	66200	GF	Distributed
Vehicle Hailux	2	31500	GF	Distributed
Vehicle Suzuki	4		GF	Distributed
Air condition	1	1058	GF	Distributed
Stabilizer	1	11570 ?	GF	Distributed
Microscope (Nikon)	?	?	Gov	?
Incubators	3	5100	Gov	?
Sterilizer	3	12000	Gov	?
Stabilizer ultrason	2	114	Gov	?
Lamps for XR stabilizer?	3	5400	Gov	?
Suction for fluid	2	2300	Gov	?
Incubator sedimentation	3	5400	Gov	?
Bactec Mgit 960	1			?
Mycoprep Specimen 10x150ml	22		WHO	?
Bbl Mgit 7ml	30		WHO	?
Bactec Mgit 960 Supplkit	30		WHO	?
Bbl Mgit 7ml	15		WHO	?
Mgit 960 Start . Gr	7		WHO	?
Mgit 960 Strep 4.0 Kit	6		WHO	?
Bactec Mgit 960 Start .Gr.	1		WHO	?
Printer Hp 1160 Laser Jet	1		WHO	?
Ups Ace 1500 I	1		WHO	?
Conditioner Abc 1500 - 22 In	1		WHO	?
Sputum Cup,30 ml,plastic with lid, pack of 100 pcs	100		WHO	?
Spirit Lamp,30 - 40 ml glass with cup	150		WHO	?
Stand rack ,glass, capacity of slide, heating resistance	200		WHO	?
Staining jar, glass 80*30 cm	100		WHO	?
Slide storage box, woody, capacity of 100 slides, back of 10 each	200		WHO	?
Wire loop, nickel-chromium were, 1mm diameter, back of 10 each	30		WHO	?
Timer 0 -60 min, mechanical with alarm	200		WHO	?
Loop Holder, 20 cm high (the hold should be covered by thick rubber)	400		WHO	?
Diamond pens to write on slide glass 300	300		WHO	?
Methylene Blue, 25 gm	20		WHO	?
Basic fuchsin, 25 g	50		WHO	?
Immersion oil, 100 ml each bottle 250 each	250		WHO	?
Forceps, stainless steel 14 cm 400 each	400		WHO	?
Filter paper, 15 cm diameter pack of 100	100		WHO	?
Ethanol 96 %, technical grade , 0ne L. each	50		WHO	?
Xylene, technical grade 2.5L	160		WHO	?
100 X Objective lenses, (1.25 oil) for	25		WHO	?
Sulphuric acid one liter each bottle	1000		WHO	?

Halogen lamp, 6V, 20W (Philips)	100		WHO	?
X-ray large film packet of 100 film 35 X 35	20		WHO	?
X-ray large film packet of 100 film 24 X 30	21		WHO	?
Developer powder	21		WHO	?
Developer powder	21		WHO	?
Kimax Media storage bottle	1		WHO	?
Microscope slidse 3*1000	1		WHO	?
Biological Microscopes with wooden box & lamps	30		WHO	?

Above: Chest clinic in Dhmar general hospital where TB patients are diagnosed and treated. Dhamar deputy GTC is responding to the assessment.
Below: Inpatient of TB case at general hospital of Dhamar.

Top left: Laboratory technician at TB control unit in the health center of Al-Hada district. **Top right:** Slides kept for quality control are shown.
Bottom: FPHCW (Murshidah) at the same center is taking care of TB patients, with TB register indicating proper recording.

Top left: The evaluator is interviewing the GTC and DTC of Hajja governorate and city.
Top right: A well-organized Haja'a drug and supply store is shown, with the person on charge.
Down: Vehicles (car and motorbike) from JICA projects which are used for supervision and distribution of drugs and laboratory materials to other districts of Hajja governorate are shown.

Health worker of Aman HU in Najrah district of Hajjah gov. is working in detecting and managing TB cases.

Laboratory equipments and instruments at Hodiedah TB sub-center.

Top left: DTC of Al-Marawa'a, Hodiedah gov. is responding to the evaluator. **Top right**: Motorbike for DTC is shown.
Down: A TB patient in Al-Marawa'a is explaining his view about TB to the evaluator.

Top left: DTC of Almusaimeer, Lahaj gov. is explaining to the evaluator the activities of TB in the district.
Top right: A TB patient from the same district is responding to the evaluator questions.
Bottom left: GLS of Lahaj gov. in Al-Hottah city is showing the tuberculosis laboratory register with the slides kept for quality control. **Bottom right:** One of the quarterly report forms is indicating TB results in one of the districts.

Recording, reporting and filing system for TB activities in Taiz TB sub-center

Above: Drug and supply store of Taiz TB sub-center.
Below: Some of laboratory and training equipment in Taiz TB sub-center.

Summary

(English)

Summary

Evaluation conducted by: JICA Overseas Office

<table>
<tr><td colspan="3">1. Outline of the Project</td></tr>
<tr><td colspan="2">Country : Republic of Yemen</td><td>Project title : The Tuberculosis Control Project (Phase III) in the Republic of Yemen</td></tr>
<tr><td colspan="2">Issue/Sector : TB control/Health Sector</td><td>Cooperation scheme : Technical Cooperation</td></tr>
<tr><td colspan="2">Division in charge : Human Development Dept.
Infectious Diseases Control Group</td><td>Total cost : 67,976,915 Yen for running costs + 144,940,711 Yen for equipment. Total of 212,917,626 Yen</td></tr>
<tr><td rowspan="2">Period of Cooperation</td><td rowspan="2">August 6, 1999 – August 5, 2004</td><td>Partner Country's Implementing Organization : National Tuberculosis Control Program of the Ministry of Public Health and Population</td></tr>
<tr><td>Supporting Organization in Japan : 1. Research Institute for Tuberculosis, Japan Anti-Tuberculosis Association,
2. International Medical Center of Japan</td></tr>
<tr><td>Related Cooperation</td><td colspan="2">Grant Aid by the Government of Japan for construction of the Aden Regional TB Control Center (589,000,000 Yen), and X-ray and other medical equipment for three sub-Centers, Grant Aid for Debt Relief (300,000 USD)</td></tr>
</table>

1-1. Background of the Project Since 1983, the Japanese Government has supported the National Tuberculosis Program in the Republic of Yemen, by offering technical assistance through the Tuberculosis Control Project (Phase I and II). As a result of this cooperation, the central institutions for TB control such as the Central Unit of the NTP, the National Tuberculosis Institute (NTI), and the TB Control Centers in Taiz and al Hodeidah were established, which brought about improvement in NTP activities. However, the tuberculosis problem of the Republic of Yemen still remained a serious health issue. Therefore the Government of Yemen (GOY) requested Phase III of the Tuberculosis Control Project, with the purpose of expanding DOTS throughout the country and strengthening the management of TB control.

1-2. Project Overview

The main project inputs to the NTP were technical support by long and short term experts, counterpart training in Japan and Egypt, equipment donation, in-country training, and financial and management support for implementation of activities. A final evaluation was carried out in February 2004, and a final report was delivered by the end of the project on July 28, 2004. According to the final evaluation, the project was considered to have produced remarkable outcomes in general, but with a few low performing governorates and districts. The project was judged to be relevant, highly effective, efficient (though with some gaps such as conduct of operational research), and having a positive impact. Institutional sustainability was considered to be improved but with a need for further improvement. Financial sustianability was unclear, and technical sustainability was considered adequate but with further training at the primary health care unit (PHCU) level needed.

（1）**Overall Goal** **T**o reduce mortality, morbidity, and transmission of tuberculosis in the Republic of Yemen.

（2）**Project Purpose** To expand the quality service of the National Tuberculosis Control Program all over the country of the Republic of Yemen.

（3）**Outputs**

(1) Improvement of case-finding and diagnosis of tuberculosis by strengthening the laboratory network;

(2) Improvement of treatment of tuberculosis based on a proper case management system;

(3) Improvement of the supply system of drugs and other materials with special emphasis on establishment of a good reserve stock system;

(4) Improvement of a program monitoring system based on a standardized recording and reporting system;

(5) Re-evaluation of the size and nature of the tuberculosis problem of the Republic of Yemen.

（4）**Inputs** (as of the Project's termination)

Japanese side：

Long-term Expert	**2**	**Equipment**	144,940,711 **Yen**
Short-term Expert	**22**	**Local cost**	67,976,915 **Yen**
Trainees received	**21**	**Others**	**-** **Yen**

Yemeni's Side：

Counterpart 27 **Equipment 0 YR (0 Yen)**

Land and Facilities: Office space (not costed out) **Local Cost: Operational funds YR 64 million (46,682,353 Yen)**

Others: 0 YR (0Yen)

2. Evaluation Team

Members of Evaluation Team	Sharon E. Beatty, MPH Dr. Abdul Salam Al-Arifi Dr. Mohammed Suhail

Period of Evaluation	**Day/ month/ Year - Day/ month/ Year** **21/11/ 2006 – 31/1/2007**	**Type of Evaluation：Ex-post**
3. Results of Evaluation		

3-1. Summary of Evaluation Results

(1) Impact

The JICA Tuberculosis Control Project, Phase III has succeeded in creating a technically competent national tuberculosis control program in Yemen. Twenty months after JICA support has ended, coverage of governorates and districts by DOTS continues to expand, a higher percentage of new sputum smear positive cases are treated by DOTS than previously, and the success rate of treatment of DOTS cases has improved, thus solidifying the project purpose of expanding quality NTP services throughout Yemen. Laboratory activities and quality control are functioning well in 20 out of Yemen's 22 governorates, and false positives and false negatives of diagnostic slides continue to decline, as has the proportion of defaulters. In addition, the level of activity of the NTP is high, it has made good use of the resources it has received from JICA, it has the confidence of the Ministry, most TB patients are satisfied with the treatment they have received, and the NTP's good performance has resulted in attracting international funding, notably that of the Global Fund and the Global Drug Facility. The NTP has been especially successful in improving its diagnosis and treatment objectives. However, there remain some weaknesses. The non-DOTS drugs, which are meant to be supplied through the MoPHP, are not available, there is yet little TB control activity below the level of district centers, supervision systems are weak and sometimes nonexistent, especially at the district level, budgets do not appear to reach many of the peripheral areas and/or are irregular, health education is minimal (although new initiatives are expected to help correct this), and information systems that promote good management are deficient. Also of concern is the fact that detected cases have been declining in recent years, and the proportion of females being diagnosed as compared to males is low. Access of the poor, women, and geographically isolated populations remains problematic, as does the issue of stigma.

(2) Sustainability

Sustainability, as measured by MoPHP commitment, is high. TB is among the 11 infectious diseases listed as being of the highest priority of the MoPHP, and the control of TB through the DOTS strategy is one of the priority actions of the MoPHP. There have been no policy nor legal changes in the MoPHP that have negatively affected the NTP, and the MoPHP continues to support TB programming as before. The NTP has also achieved strong technical sustainability Although it continues to demonstrate some weaknesses, it has managed to maintain and even improve the level of many of the indicators from the time of the JICA support project, using local staff almost entirely. The morale and commitment of the NTP staff at different levels of the system is strong, and local NTP staff have proven that they no longer require a long term international advisor, a significant measure of technical sustainability. Turnover at the higher management levels of the program has been modest, and the majority of the staff that were trained by JICA remain with the program. JICA equipment was found to be available and well maintained at all sites surveyed, and the buildings constructed by JICA were well utilized, with all but one in good repair. Financial sustainability of the NTP, however, is a serious issue. The MoPHP's contribution to meeting the NTP's costs was only 19% in 2006, as compared to 61% in 2003, with the real amount decreasing over that period. In addition, it has completely failed to provide the non-DOTS drugs that was its responsibility to procure during the last two years, due to the complicated MoF procurement procedures Other sustainability issues are the high incentives provided by GF to key staff at the governorate and national level, the high dependence on the GF for many categories of cost such as supervision, training, and equipment, and the lack of a supervision budget from the MoPHP.

3-2. Factors that have promoted project

(1) Impact 1. JICA's manner of support ,which was long term, comprehensive, and focused on the building of a national system, 2. the high level of international interest in TB control as well as dedicated funding (GFD, GF and WHO), and
3. the long term presence and commitment of the NTP director, who has guided the program for over ten years.

(2) Sustainability 1. The long term, comprehensive and systems oriented manner of JICA support, which created strong technical competence of the NTP, allowing it to gain the strong local and donor support it now enjoys, which has been so crucial for its sustainability, 2. high level of donor interest in TB, 3.low attrition of NTP management staff., and 4. partial decentralization (resulting in greater efficiency).

3-3. Factors that have inhibited project

(1) Impact 1. Failure of the MoPHP to supply non-DOTS drugs, 2. overall financial, administrative and management weaknesses within the MoPHP, 3. the lack of an MoPHP strategy to integrate the different vertical programs, 4. increasing levels of poverty, 5. an insufficiently strategic approach to TB control by the NTP, which failed to target low access groups adequately, and 6. weaknesses of administrative systems and follow up.

(2) Sustainability 1. Lack of integration of vertical programs, 2. delayed regionalization, 3. weak financial monitoring and support at district levels, 4. lack of a sustainability strategy by the NTP and the MoPHP for the program,and 5. overdependence on international funding.

3-4. Conclusions The JICA Tuberculosis Control Project (Phase III) has succeeded in creating a strong national tuberculosis control program in Yemen that has managed to continue to improve on many of the gains made during the period of JICA support. The NTP has also achieved high technical sustainability, and national commitment to TB is strong. The success of the NTP is widely believed to be due to the manner in which JICA support was provided. However, despite the many positive gains made by the NTP, this program demonstrates some weaknesses related to efficiency, health education, access to services by the disadvantaged, transparency and organization of administrative systems, and financial sustainability. Financial sustainability of the NTP is the most serious issues the MoPHP will face, once donor support for tuberculosis wanes.

3-5. Recommendations

Recommendations when considering future support to Yemen's health sector are as follows: 1. Continue to use the model of long term, comprehensive support to national programs. 2. Future support for any vertical program should be accompanied by simultaneous support to the MoPHP for integration of such programs with other vertical programs. 3. Key sustainability issues should be clearly identified during the project design phase, strategies to combat them designed, and the project period itself be fully utilized to solve these problems. 4. Support should focus on building administrative and strategic planning capacity as well as technical capacity. 5. Projects should utilize a strategy which is gendered, to take into account the special access issues women face, and which also targets the poor and the geographically disadvantaged. 6. Take advantage of the new potential of donor coordination in Yemen to tackle sustainability and effectiveness issues. 15 additional recommendations for the NTP have been included in the report.

3-6. Lessons Learned

1.Comprehensive, long term support to national programs is one of the best ways to build sustainable national systems that can be managed long term by competent local staff. A focus on training and system building is especially important. 2. Health programs need to consciously tackle issues of access of disadvantaged population groups, and should not expect a passive system to reach these populations effectively. 3. Technical support should be supplemented by support to build management capacity and the ability to work strategically in solving problems. 4. Sustainability issues should be identified in the design phase of a project, and local and international partners actively engaged during the course of project implementation to solve these issues. 5. Attrition, while not a big problem in this project, can be decreased by requiring all staff trained abroad to make a written commitment to remain with the program for three to five years.

3-7. Follow-up Situation

The NTP is now receiving technical support by WHO, and it is expected, although not certain, that external financial support by GF, GDF will continue for the next three years. The MoPHP is considering integration of vertical programs. Support by JICA to the NTP in the near future is not necessary, although the health sector as a whole is in need of sustainable support.

Summary

(Japanese)

評価調査結果要約表

評価実施部署：エジプト事務所

１．案件の概要		
国　名　：イエメン共和国		案件名　：「イエメン結核対策プロジェクト（フェーズ　III）」
分　野　：保健・医療		援助形態：技術協力プロジェクト
所轄部署：人間開発部第四グループ感染症対策チーム		協力金額：合計 212,917,626 円
協力期間	(R/D) : 1999 年 8 月 6 日 ～ 2004 年 8 月 5 日	先方関係機関：保健人口省国家結核コントロールプロジェクト局
		日本側協力機関： １．財団法人結核予防会結核研究所 ２．厚生労働省国立国際医療センター
他の関係協力： （無償）アデン州結核対策センター建設（589,000,000 円） （債務救済無償）Ｘ線等の医療器材供与（US $ 300,000）		

１－１　プロジェクトの背景

日本政府は、１９８３年から JICA 技術協力「結核対策プロジェクト（第一期、第二期）」実施を通じてイエメン国家結核対策に協力している。この協力の結果、国家結核対策プログラム（NTP）中央局、国家結核研究所（NTI）、タイズ州とホデイダ州の結核対策センター、という結核対策に対応するための国家機関が設立されることとなり、これらの機関運営に伴って、国家結核対策プログラム（NTP）の活動の改善につながっている。

しかしながら、イエメンにおける結核問題は、その後も深刻な医療問題として存在している。よって、イエメン政府は、国家の結核対策プログラム運営と DOTS 手法拡大を目的として、日本政府に対して「結核対策プロジェクト（第三期）」の実施を要請することとなった。

１－２　プロジェクトの概要

国家結核対策プログラム（NTP）に対する、本プロジェクトの主な投入は、短期及び長期専門家、プロジェクトカウンターパートの日本とエジプトでの研修、機材供与、国内研修、活動実施に対する資金面、運営面での協力であった。２００４年２月には、プロジェクト終了時評価が実施され、終了時評価報告書は、プロジェクト終了前の２００４年７月２８日に提出された。終了時評価報告書によると、プロジェクトは総体的に顕著な成果を収めたとしているが、成果の低い州、郡もある。プロジェクトは妥当性があり、有効性は高く、効率性もあり（プロジェクト実施調査によるギャップはあるが）明確なインパクトが出ていると判断されている。組織的な自立発展性はより高まっているものの、さらに高い自立発展性が必要。経済面での自立性に関しては明確でないが、技術的な自立性は充分にある。しかし、プライマリヘルスケアユニットのレベルでは、さらに進んだ研修が必要である。

（１）　上位目標

イエメンにおける結核の罹患率、死亡率、感染率が減る。

（２）　プロジェクト目標

国家結核対策プログラム（NTP）実施がイエメン全域に拡大される。

（３）　成果

１．結核患者発見・診断機能が改善された。
２．適切な患者管理により結核の治療機能が改善された。
３．在庫管理システム確立により、薬剤及び資機材の供給システムが改善された。
４．記録・報告システムの標準化による結核対策のモニタリングシステムが向上した。
５．イエメンの結核問題の規模とその特徴についての再評価がなされた。

（４） 投入（プロジェクト終了時）

（日本側）

長期専門家	２名	機材供与	144,940,711 円
短期専門家	２２名	ローカルコスト負担	67,976,915 円
研修員受入	２１名		

（相手国・イエメン側）

カウンターパート配置	２７名		
土地施設提供：	事務所スペース	ローカルコスト負担	（運営経常費）約 6,400 万イエメンリアル（46,682,353 円）

２．評価調査チームの概要

評価調査チームメンバー	Sharon E. Beatty, MPH （チームリーダー） Dr. Abdul Salam Al-Arifi Dr. Mohammed Suhail	
評価調査期間	2006 年 11 月 21 日 ~ 2007 年 1 月 31 日	評価種類：事後評価

３．評価結果の概要

３－１ 評価結果の要約

（1） インパクト

JICA「結核対策プロジェクト（第三期）」は、イエメンにおいて技術的に高いレベルの国家結核対策プログラムの確立に成功したといえる。JICA の協力終了２０ヶ月後、DOTS を活用する州・郡は拡大しており、以前に比べて、新規喀痰塗沫陽性患者の DOTS 治療率が格段に増加している。これは、イエメン全土で**国家結核対策プログラム（NTP）**のサービスの質向上というプロジェクト目標達成が確立されつつあることを示している。

結核ラボの活動と質の管理ついては、イエメン国内２２州のうち２０州において良好に機能している。また、誤診や不履行者のケースも減っている。加えて、JICA の協力で得られたリソースの活用状況が良くなっていることからも、NTP の活動レベルが高くなっているといえる。NTP のプログラム実施能力の高まりが、他ドナーからの協力の牽引となっており、資金投入、特にグローバルファンド（GF / 世界結核・マラリア・エイズ対策基金）とグローバルドラッグファシリティー（GFD）からの援助受け入れの成功につながっている。NTP は特に診断と治療能力向上の目的達成を成し遂げているが、まだ未達成の点も見られる。保健人口省から提供されるべき DOTS 使用以外の薬品は提供できておらず、郡の中心地域よりも下部レベルにおける結核対策活動は、まだ低レベルに留まっている。

NPT 実施における監督制度については、ほとんど機能していないか、存在しない。郡の中心地域から離れた多くの地域では、資金が届かない、あるいは届いても不定期であり、保健教育についても最低限でしかない。（保健分野の新イニシアチブでは、この部分の向上が期待されているが）保健分野での運営マネジメント制度の向上のために必要な情報システムも不足している。

近年、結核患者のケースが減少しており、男性に対して女性患者の発見率が少なくなってきている。しかしながら、現在まで残っている NTP の課題は、貧困層、女性、孤立地域の住民への対応であり、これがイエメン結核対策プログラムの特徴とも言える。

（２） 自立発展性

保健人口省のコミットメントレベルでも測れるように、自立発展性は高いといえる。「結核」は保健人口省内で、１１の最優先で取り組む感染症疾患の中のひとつであり、DOTS の戦略を活用した結核対策は、保健人口省の優先的実施課題のひとつでもある。保健人口省では、NTP に負の影響を与えるような政策や法律の変更は行われておらず、以前と同じように結核プログラムを継続してサポートしている。NTP は、弱点もあるものの、技術的な自立発展性については達成している。自立発展性を測る多くの指標において、結核プログラムは、JICA 技術協力プロジェクト実施中よりもレベルアップしており、現在では、完全にローカルスタッフだけでプログラムの運営実施を行っている。NTP 運営と実施の各レベルにおいて、スタッフのモラルもコミットメントレベルも高く、これは長期の外国人アドバイザー無しでもローカルスタッフ自身で技術的な自立発展性が可能であることを証明するものである。

プログラムの上層管理者レベルの離職・移動率も適当であり、JICA によって研修を受けたほとんどのスタッフは当プログラムに残って働いている。

また、JICA から提供された機材は確かに利用されており、調査した全てのサイトで良い状態に保たれている。JICA によって建設された建物も、充分に活用されており、全体のうち、一ヶ所のみ改修が必要である。反面、NTP の財政的自立は重大な課題である。２００３年に６１％であった保健人口省から NTP への資金提供は、２００６年には１９％にとどまっている。加えて、イエメン財務省の複雑な手続きが影響し、過去２年間の間、保健人口省から DOTS 以外の薬品提供は全くない。

自立発展性に関するもうひとつの課題は、中央政府および州レベルにおけるシニアレベル職員に対し、グローバルファンドからの高いインセンティブ（資金その他）が提供されていることである。管理者手当て、研修、機材など、NTP を実施するうえで必要な多くのカテゴリーに対して、保健人口省からの管理者（監督）手当てなどの資金が不足していることから、これらの点では、グローバルファンドに高く依存している。

３－２ プロジェクトの効果促進に貢献した要因

（１） インパクト

１． JICA の協力体制は、長期的、包括的であり、国家の制度構築に貢献する。
２． 結核対策に対する国際的な関心の高さと国際的な資金源（GFD/GF/WHO）の存在。
３． NTP ディレクターの長期的な存在とコミットメントが１０年以上のプログラム実施を支えた。

（２） 自立発展性

１． JICA の協力体制が長期的、包括的で制度構築へのサポートであることが、NTP の技術水準を高くし、現在の国内海外からのサポートをひきつけたといえる。これが自立発展性には欠かせない要素である。
２． 結核対策に対するドナーの高い関心度。
３． NTP 幹部スタッフの低い離職率。
４． プログラムの効率の良さに裨益する部分的な（プログラムの）地方分権化。

３－３ プロジェクトの効果促進を阻止した要因

（１） インパクト

１． 保健人口省による DOTS 以外の医薬品提供の欠如。
２． 保健人口省内の総合的な財政上および運営上の脆弱さ。
３． 保健人口省で実施されている垂直横断的な別々のプログラムを統一する戦略の欠如。
４． 貧困レベルの高まり。
５． NTP による結核対策に対する戦略的アプローチの欠如。
６． 運営システムとフォローアップシステムの脆弱さ。

（２） 自立発展性

１． 垂直横断的なプログラムの統一性の欠如。

２．プログラムの地域化の遅れ。
３．州レベルでの財政モニタリングとサポートの脆弱さ。
４．プログラムに対する NTP と保健人口省による自立発展性を高めるための戦略の欠如。
５．海外ドナーからの資金に依存しすぎている。

３－４　結　論

JICA 結核対策プロジェクト（フェーズ III）は、イエメンにおける国家結核対策プログラムの確立を成功に導いた。JICA の協力実施中に得られた多くの教訓は、継続的なプログラムの改善につながっている。NTP の成功は、JICA の協力手法に帰結しているということは、広く知れ渡っている。NTP 実施によって、多くの良い教訓が得られたが、一方で、このプログラムは、効率性、保健教育、不利な立場にある住民サービスへのアクセス、透明性、運営制度の組織、財政的自立発展性などの点で脆弱であると言える。NTP の財政的な自立発展性は、保健人口省が今後直面する最も深刻な問題であり、一ドナーの結核対策支援という形は、今後先細りとなる。

３－５　提　言

将来的なイエメン保健セクターへの協力に対する提言は、以下のとおり：
１．長期的で包括的な協力モデル（手法）を今後も継続して活用する。
２．今後の垂直横断的プログラムへの協力は、保健人口省が同時に実施する別のプログラムとの相関性をも考慮し、両方への協力ができるようにする。
３．JICA が支援するプロジェクトデザインの際、自立発展につながる課題も明確にし、プロジェクト実施期間中に国家の課題に対応できるようなデザインとする。
４．技術的なレベル向上とともにプログラム運営および戦略計画の能力向上支援もサポートする。
５．プロジェクトは、社会的弱者である、女性、貧困層、地理的条件の悪い地域の住民への配慮を持つ戦略を活用するべきである。
６．自立発展性と効率性を高めることを考え、イエメンにおけるドナー協調を活用する。
７．NTP に対するその他の提言は、報告書内に記載した。

３－６　教　訓

１．国家プログラムに対し包括的で長期的な協力は、優秀な国内の人材を活用し長期的に運営できる自立発展的な国家制度の構築のためには、最も優れた手法のひとつである。研修と制度構築に焦点をあてた協力は特に重要である。
２．保健分野のプログラムは、不利な立場にある人々の保健サービスへのアクセス向上という課題に継続的に対応していくことが必要であり、受動的な制度では、効果的にそのような人々に対応できない。
３．技術支援は、事業実施運営キャパシティ向上と戦略的な問題解決能力向上も相関的にサポートすべきものである。
４．自立発展性という課題は、プロジェクトのデザイン時に確認し、プロジェクト実施中に、国内（ローカル）と海外のスタッフが一緒に問題解決に取り組めるようなプロジェクトデザインとする。
５．このプロジェクトにおいては、大きな問題となっていないが、スタッフの減少（離職）の問題への対応策として、海外で研修を受けた全スタッフが、帰国後３～４年間は所属プログラムで継続して働くというコミットメントを文章で残すようにする。

３－７　フォローアップ

イエメン結核対策プログラムは、NTP は現在 WHO（世界保健機構）によって、技術支援を受けており、現状では明確になっていないが、GF と GDF からの資金援助も今後３年間は継続して受けることとなっている。保健人口省は、省内で実施中の垂直横断的プログラムの統一を考慮している。NTP に対する JICA からのサポートは、近い将来は必要とされていないが、保健セクター全体に対して、自立発展性のある協力は今後も必要である。