MINISTRY OF HEALTH

THE NATIONAL TUBERCULOSIS HEALTH SECTOR STRATEGIC PLAN FOR GHANA

2009–2013

GHANA HEALTH SERVICE
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World Health Organization

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Management Sciences for Health

TB CTA
The Tuberculosis Coalition for Technical Assistance

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content

acronyms & abbreviations

A	**ACSM**	Advocacy, communication, and social mobilization
	ART	Antiretroviral therapy
C	**CAT I, CAT II, CAT III**	Category I, Category II, Category III [treatment regimens]
	CB-DOTS	Community-based DOTS
	CCM	Country Coordinating Mechanism [Global Fund]
	CDR	Case detection rate
	CFR	Case fatality rate
	CHAG	Christian Health Association of Ghana
	CNR	Case Notification Rate
	CPT	Co-trimoxazole preventive therapy
	CRS	Catholic Relief Services
	CSO	Civil society organization
D	**DANIDA**	Danish International Development Agency
	DFID	Department for International Development [UK]
	DOT	Directly observed treatment
	DOTS	Directly observed treatment, short course
	DST	Drug susceptibility testing
E	**E**	Ethambutol
F	**FBO**	Faith-based organisation
	FDC	Fixed-dose combination
G	**GDF**	Global Drug Facility
	GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
	GHS	Ghana Health Service
	Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
	GLC	Green Light Committee
	GOG	Government of Ghana
H	**H**	Isoniazid
	HIV	Human immunodeficiency virus
	HMIS	Health management information system
	HRD	Human resources development
	HRZE	Isoniazid/rifampicin/pyrazinamide/ethambutol
	HT	Isoniazid/thiacetazone

I	**ICF**	Intensified case finding
	IEC	Information, education, and communication
	IMCI	Integrated Management of Child Illness
	INH	Isoniazid
	IPC	Infection prevention and control
	IPT	Isoniazid preventive therapy
	ISTC	International Standards for TB Care
K	**KAP**	Knowledge, Attitude, and Practice
	KATH	Komfo Anokye Teaching Hospital
	KBTH	Korle-Bu Teaching Hospital
	KNCV	KNCV Tuberculosis Foundation
M	**MDG**	Millennium Development Goal
	MDR-TB	Multidrug-resistant TB
	M&E	Monitoring and evaluation
	MGIT	Mycobacterium growth indicator tube
	MOH	Ministry of Health
	MRC	Medical Research Council
	MSH	Management Sciences for Health
N	**NACP**	National AIDS Control Programme
	NGO	Non governmental organization
	NHIS	National Health Insurance Scheme
	NMIMR	Noguchi Memorial Institute for Medical Research
	NPHRL	National Public Health Reference Laboratory
	NTP	National Tuberculosis Control Programme
P	**PAL**	Practical Approach to Lung Health
	PHC	Primary health care
	PLHIV	People living with HIV/AIDS
	PMTCT	Prevention of mother-to-child transmission [of HIV]
	POW	Programme of Work
	PPD	Purified protein derivative
	PPM	Public-private mix
	PPME	Policy Planning and Monitoring and Evaluation [Unit]
Q	**QA**	Quality assurance
	QHP	Quality Health Partners

R	**R**	Rifampicin
S	**S**	Streptomycin
	SOP	Standard operating procedure
	SS+	Sputum smear-positive
	SS-	Sputum smear-negative
	SWAp	Sector-wide approach
T	**T**	Thiacetazone
	TA	Technical assistance
	TB	Tuberculosis
	TB CAP	Tuberculosis Control Assistance Project
	TBTCA	Tuberculosis Coalition for Technical Assistance
U	**UNHCR**	UN High Commission for Refugees
	USAID	US Agency for International Development
V	**VCT**	Voluntary counselling and testing [for HIV]
W	**WHO**	World Health Organization
X	**XDR-TB**	Extremely-drug-resistant TB

acknowledgments

The National TB Control Programme has once successfully provided the framework on which various stakeholders have worked to produce a comprehensive TB control strategic plan as the national response to this epidemic. Let me express my sincere appreciation and gratitude to all.

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The following individuals, committees, workshop participants, and organizations deserve special mention.

Task team:
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Dr. Frank Adae Bonsu
Chairman, Task Team for Strategic Plan Development

foreword

Tuberculosis control is important not only to individuals afflicted with the disease and those affected by it, but also to society as a whole.

Over the years, Ministry of Health has maintained TB among its top priority disease because the effect of inaction against this silent Killer could be devastating. Presently, new and emerging forms of disease MDR\XDR-TB are threatening global security and health. The country has made progress in treatment success rate, but this has been very slow. Our case detection still remains a major challenge. The health infrastructure base needs more improvements, and we ought to expand laboratory network and intensify Advocacy communication and social mobilization activities.

Scaling up our priority intervention require heavy capital injection if we are to meet the target set for Tuberculosis control under MDG 6 by 2015.

Recent Funding from the Global Fund to fight AIDS, TB and Malaria has been of tremendous assistance.

We, however, plan scaling up towards accelerated universal access to tuberculosis control. I, therefore, welcome this comprehensive strategic plan developed with the support and active involvement of all stakeholders as the national response to the ravaging epidemic.

The Government of Ghana will provide support amounting to about 60% of the implementation cost in the long term, and will require assistance from interested partners and collaborators to make up for the short fall.

Let all partners contribute to stop TB, and let all of us work together to create wealth through health.

Dr. George Sipa-Adjah Yankey
Minister of Health

executive summary

The mandate of the National Tuberculosis Control Programme (NTP) is to provide leadership for the health sector response to fight tuberculosis in Ghana.

The goal is to reduce the burden of tuberculosis in Ghana until it is no longer a disease of public health importance.

The overall objective of the National TB Control Programme (NTP) is to achieve the World Health Assembly (WHA), STOP TB Partnership and the Millennium Development Goal (MDG) targets by detecting at least 70% of incident smear positive TB cases and to have TB deaths halved by 2015 compared with the level in 1990

This strategic plan builds on the second plan, which covered 2002–2006. The current plan was developed under the leadership of the Ministry of Health/Ghana Health Service (MOH/GHS) using an informed consultative process based on findings and recommendations from the comprehensive review conducted by the NTP as well as various technical reviews and mission reports by both external and local consultants. The process culminated with final stakeholder review and endorsement of the plan, including the Country Coordinating Mechanism (CCM). Partners and consultants in the process include the US Agency for International Development (USAID), Management Sciences for Health (MSH) through the Tuberculosis Control Assistance Project (TB CAP), WHO, KNCV, Quality Health Partners (QHP), John Snow, Inc. (JSI)/Deliver, the Global Drug Facility (GDF), local consultants, the Ghana TB Advisory Board, and academic and research institutions.

The plan takes into consideration various implementing partners public agencies, private civil society organizations (CSOs), nongovernmental organizations (NGO, faith-based organizations (FBOs), and communities in contributing to achieving TB related health-sector goals.

The technical management, implementation, coordination, and monitoring of various activities highlighted in the plan will be centered at the NTP, in collaboration with other partners that bring capacity in specific areas.

The plan focuses on achieving universal access to key TB control interventions and addressing emerging issues that have received very little attention in the past. Technical assistance would be required in certain key areas defined in the plan: DOTS expansion, monitoring and evaluation (M&E), multidrug-resistant TB (MDR-TB), human resources development, laboratory services, and drug management, among others.

The key outcomes are to attain MDG and Stop TB Partnerships targets of case detection and treatment success rates and to achieve the MDG impact targets by reducing prevalence of TB disease, morbidity, and mortality by 50 percent by 2015.

Building on the health system's strengths as well as supporting the system to meet operational challenges, the six components of the Global Stop TB strategy will be implemented.

Advocacy, communication, and social mobilization will play a critical role in this plan in all areas, to ensure long-term sustainability of government financing once fundamental infrastructure for TB control are in place. In the short to medium term, external funding will be crucial for successful implementation of planned activities.

The total funding for implementation of National TB Control Strategy for the next five years (2009–2013) is 523,455,702.00 US dollars (USD). The estimated external funding is USD 199,440,907. The Government of Ghana is expected to fund USD 324, 014, 795 (60 percent).
The costing of the strategic plan was done using the WHO planning and budgeting tool framework.

The successful implementation of the plan will depend on a continuous stable political climate in the country.

Ghana Country Profile

Geographic and Demographic Information

Ghana, originally known as the Gold Coast, is located on the Gulf of Guinea. Its seacoast spans 554 kilometers (334 miles), and it is bordered on the north by Burkina Faso, on the east by the Republic of Togo, and on the west by Côte d'Ivoire. The total land area of Ghana is 238,538 square kilometers (92,100 square miles), with a south-to-north distance of 840 kilometers (522 miles).

Ghana's population is estimated at 23.5 million people (2006), 46 percent of whom are under the age of 15 years. The life expectancy is a little over 57 years (see Table 1). The highest population densities are in the urban areas. There are two principal linguistic groups: the Gur in the north, and the Kwa in the south.

Figure 1: *Ghana's 10 administrative regions*

Table 1: Demographics of Ghana

General Indicators	2000	2006
Population total	19.9 million	22.5 million
Population growth (%)	2.2	2.0
Life expectancy at birth (years)	56.7	59.7
Infant mortality rate (per 1000 live births)	68.0	71
Under-five mortality rate (per 1000 live births)	112.0	111
Measles immunization (% aged 12 - 23 months)	84	77.7
Prevalence of HIV (%)	—	2.22
School enrollment - primary (%)	80.5	88.4
School enrollment - secondary (%)	37.4	43.6
Ratio of boys to girls in primary and secondary education	89.4	92.6
Literacy rate (% of females aged 15 - 24 years)	—	65.5
Doctor-to - population ratio	(2001)	(2004)
• Highest - Greater Accra	8,288	6,550
• Lowest - Upper West	45,107	68,534
Nurse-to- population ratio	1,280	969
• Highest -Greater Accra	2,180	2,241
• Lowest - Western		

Sources: *World Development Indicators database, April 2006 Facts and Figures, PPME GHS, 2005.*

Ghana has a centralized government with a multiparty parliamentary system and is headed by a democratically elected president who is both Chief of the Executive Branch and Head of State. There are 10 regions (see Figure 1), 170 administrative districts, and approximately 600 subdistricts. It is estimated that there are slightly more than 45,000 communities and 240,000 households.

Ghana was the first country in sub-Saharan Africa to gain independence from colonial rule, and 2007 marked its 50-year anniversary as an independent nation.

Economy and Development

The country has a varied economy consisting of a dominant agricultural sector (small-scale peasant farming), which absorbs about 60 percent of the total adult labor force. It has a relatively small capital-intensive modern sector dominated by mining and a few other industrial activities, and a rapidly expanding informal sector dominated by petty traders, small artisans, technicians, and small-business owners. Ghanaians' access to electricity is the highest in sub-Saharan Africa outside of South Africa.

Currently, Ghana has one of the best-performing economies in Africa. The economy continues to grow, from an average of 4.5 percent in 1983 to 6 percent in 2005. By 2015 Ghana is expected to achieve middle-income-country status. By improving its policies and institutions and investing in infrastructure and basic services, Ghana, with the assistance of many development partners, has reduced its poverty levels. It is likely to surpass the Millennium Development Goal of cutting poverty in half by 2015.

Although the combination of growth and macroeconomic stability has led to poverty reduction over the past few years, chronic poverty persists in parts of the country. For instance, a report by the International Development Agency of the World Bank noted that although less than 10 percent of the population in the cities of Accra and Kumasi are living in poverty, in 9 of the 170 districts in the country, more than 80 percent are living in poverty. Moreover, while rural poverty is decreasing, urban poverty is increasing and posing new challenges.

Health Sector

Although Ghana made remarkable progress in the 1990s, particularly in comparison with the rest of Africa, many reports suggest that the health status of Ghanaians are still poor. The epidemiological situation is similar to that in other sub-Saharan countries; that is, a predominance of communicable diseases, undernutrition, and poor reproductive health, with noncommunicable diseases emerging as an important public health issue. This dual burden of communicable and noncommunicable diseases, a state of "epidemiological transition," may be an important determinant in Ghana's ability to improve performance and respond to the changing health needs of its population.

The top 10 causes of outpatient-reported morbidity are malaria, upper respiratory infection, diarrheal diseases, skin disease, hypertension, home and occupational injuries, eye infection, pregnancy and related complications, rheumatic and joint diseases, and anemia. The top 10 causes of hospital-reported mortality are malaria, anemia, pneumonia, cerebrovascular accident, typhoid fever, diarrhea, hypertension, hepatitis, meningitis, and sepsis.

Health Sector Reforms

Ghana has one of Africa's most advanced health care systems, but coverage is far from adequate to meet the population's needs. To avoid the fragmentation caused by multiple projects, the Government of Ghana (GOG), along with its development partners, focused on "big picture" issues such as reorganizing the MOH, comprehensive public health planning, and capacity building at both the central and local levels.

Since 1995, health sector reforms have led to the development of three five-year programmes of work (POWs): the first covering 1997–2001, the second covering 2002–2006, and the third covering 2007–2011. The 2007–2011 health sector objectives are to ensure that people live long, healthy, and productive lives and reproduce without risk of injuries or death; to reduce the excess risk and burden of morbidity, mortality, and disability, especially in the poor and marginalized groups; and to reduce inequities in access to health, population, and nutrition services and health outcomes. One priority is to implement a package of interventions to address the major health concerns of the general population of Ghana, with special emphasis

on HIV/AIDS and sexually transmitted diseases, malaria, TB, guinea worm, and reproductive and child health services. In addition, services that address the needs of the poor and vulnerable have been emphasized, and the community-based approach (Community-Based Health and Planning Services [CHPS]) has been the main system for service delivery.

Health Services Financing

An increasing gross domestic product (GDP), declining inflation rate (to about 10 percent in 2006), and growth in tax revenue from 17 percent of GDP in 2001 to 22 percent in 2005 have all contributed to a nearly 400 percent increase in the total financial resources earmarked for health services since 2001.

In addition, the GOG has increased the proportion of government expenditures allocated to health. This increase made the health sector the third-largest recipient of government funds in 2005, after the Ministries of Education and Economics.

The changing sources of financing for the health sector are notable. Presently, the main financial sources are the GOG, the Health Fund (HF) or Donor Pooled Fund, earmarked funds from some donors, internally generated funds (IGF), and the National Health Insurance Scheme (NHIS). The proportion of funds from the NHIS is increasing and is designed to replace the IGF. Furthermore, some health partners (such as the European Union [EU], the UK's Department for International Development [DFID], and the World Bank) are moving from direct health sector support to multidonor budget support, which is pooled at the level of the Ministry of Finance to support the national budget. With this latter arrangement, there is concern that GOG resources allocated to health may fall, and the disbursement from the Ministry of Finance may be more cumbersome, less flexible, and less predictable than the current Health Fund arrangement. In addition, this new arrangement may result in less sectoral dialogue among partners, which could lead to less commitment and therefore less funding from them. World Bank funds intended for Heavily Indebted Poor Countries were withdrawn from Ghana's health sector in 2005 because of the positive accumulation of the NHIS.

There has been an unprecedented increase of funds to the health sector, particularly from the Global Fund to Fight AIDS, Tuberculosis and Malaria. By the end of December 2008, the Global Fund had so far disbursed USD 187,230,047 to Ghana to combat TB, AIDS, and malaria. Currently a total of USD 14,547,546 has been approved by the Global Fund to support Round 1 and Round 5 program implementation of the NTP.

Health Facilities and Staffing in Ghana

Facts and figures from the Policy Planning and Monitoring and Evaluation (PPME) Unit of the Ghana Health Service indicate that in 2005 there were a total of 3,045 health facilities, of which 187 were hospitals, including those owned by the Christian Health Association of Ghana (CHAG) and private hospitals. It was also reported that in 2005 there were about 1,514 doctors and 14,507 nurses working in both the public and private sectors. Annex 1 shows the number of health facilities in each of the ten regions of Ghana.

National Tuberculosis Control Programme

History of the NTP

Ghana's National Tuberculosis Programme (NTP) was formalized in 1994 following the launch of the WHO DOTS strategy. The central Tuberculosis Unit, under the Disease Control Unit of the Public Health Directorate of Ghana Health Service (GHS), plans and coordinates program activities. Prior to 1999 the NTP was supported by the Danish Government (DANIDA), and many improvements were made.

Between its formal creation in 1994 and 1998, the NTP was lifted from a state of neglect and many of its problems were addressed. This resulted in important achievements such as strengthening of the Central Unit; standardization of diagnosis, case definitions, and treatment protocols; improved availability of drugs; and training for health staff. By the end of this period, TB services had been integrated into primary health care, and DOTS coverage at the district level was estimated at 98 percent. However, the program still faced some challenges: there were significant budgetary constraints, and despite improved policies and structures, there had been no reduction in the burden of TB, as evidenced by standard program indicators. The MOH decided to reformulate its control strategy, with an emphasis on the diagnosis of smear-positive patients and fully supervised short-course chemotherapy for those patients.

After 1999 tuberculosis control was supported through the "common pot" or sector-wide approach (SWAp), leading to new challenges. Since 2002 funding has gradually increased from the GOG and the Global Fund, growing significantly in 2006 with the acquisition of Round 5 funds from the Global Fund.

After the NTP was established in 1994, a critical mass of health personnel encompassing all categories, from teaching hospitals to district hospitals, was trained in TB control. However, in 1999 the responsibility for training was delegated to the Unit of Human Resource Division, under the common management arrangement. Regions and districts continued to fund vital TB control activities from an increased budgetary allocation under the "common pot" arrangement. These changes slowed down TB control activities and interest, hindering the rapid achievement of targets.

In 2004 Tuberculosis Control Technical Assistance (TBCTA) also provided various recommendations pertaining to human resource development, as follows:

- Evaluate basic TB training materials and task descriptions.
- Relate TB training to HIV/AIDS and counselling skills.
- Include job descriptions for all staff levels in the new TB program manual and use these as a baseline for course curricula.
- Use WHO's "Management of Tuberculosis Training for Health Facility Staff" as a baseline for amending the training manual.

- Develop simple guidelines for the lowest level of health care: the patient and the patient's caregiver.

Current Structure of the NTP

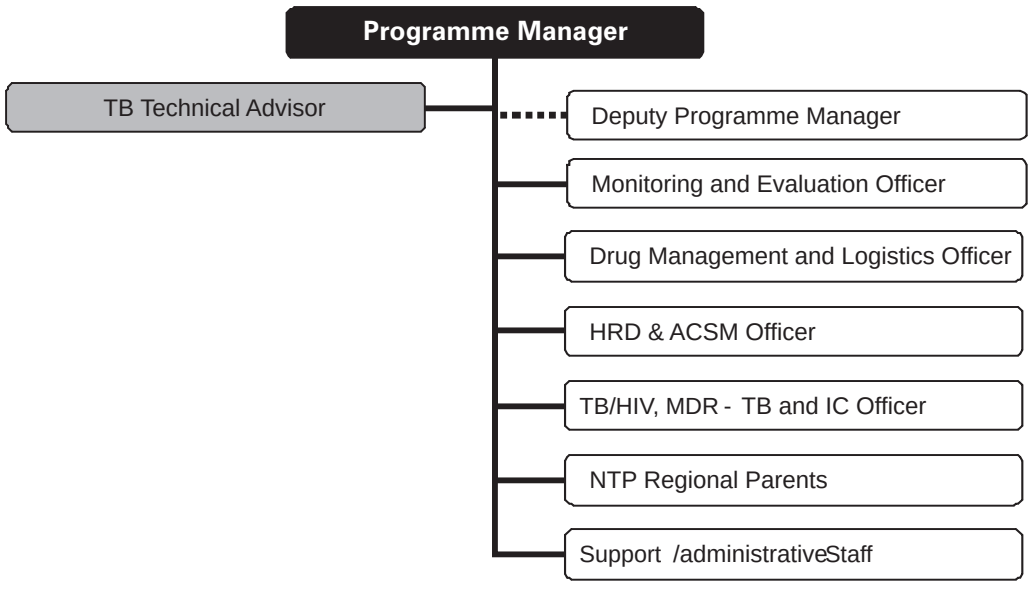
TB control is seamlessly integrated into the GHS structure at the primary, secondary, and tertiary levels of care, and each region, district, and health facility has a team of health workers led by a TB coordinator, who is also responsible to other public health program activities. This team is also responsible for ensuring the success of the public-private partnership (PPP) DOTS program, which is part of the integrated essential health package in all public health institutions and faith-based health facilities.

Central Level

The responsibilities of the NTP's Central Unit include ensuring political commitment to the programme as well as resource mobilization. This entails liaising with various departments in the MOH and GHS and numerous implementing partners and lobbying for TB to remain a national priority. The Central Unit also provides overall technical leadership through the development and publication of program policies and guidelines. The NTP works closely with the Chief Pharmacist in the MOH Department of Pharmacy to ensure a regular supply of quality-assured drugs, supervises the regional levels, and participates in training at various levels. The NTP is the technical arm for the implementation of TB-specific GFATM grants and is responsible for the planning, budgeting, and technical oversight of these activities.

One national-level meeting is held annually to present program information covering the past year, to plan for the next year, and to evaluate the implementation of Global Fund–supported activities. Information about upcoming initiatives is also disseminated at this meeting.

Figure 2: *Organogram for the NTP*



Resident TB Technical Advisor

Since 2008, Management Sciences for Health (MSH), through TB CAP and with financial support from USAID, has provided a TB Technical Advisor, who is attached to the NTP Central Unit. The TB Technical Advisor's main responsibility is to provide strategic and technical assistance to the NTP in Ghana, primarily supporting activities to improve the quality of DOTS in the public and private sectors as well as TB/HIV management.

Regional Level

There are 10 regions plus three teaching hospital facilities that are effectively treated as separate, independent regions, in that they do not report to the regional directorates. Komfo Anokye Teaching Hospital (KATH), Korle Bu Teaching Hospital (KBTH), and Tamale Teaching Hospital are major referral hospitals that provide inpatient and outpatient specialized services. The only thing that distinguishes the hospitals from regional health directorates is that they do not have supervisory responsibilities outside of the services they provide.

NTP management differs among regions. In some regions the TB team is made up of various professionals: regional laboratory biomedical scientist, pharmacist, doctor in charge of the TB clinic, district director of nursing services, and regional disease control/surveillance officer. In other regions the team consists of only the TB coordinator supported by the deputy director of public health. The functions of the regional team include data management and report writing, planning and budgeting, commodity distribution (anti-TB medicines, laboratory supplies, and materials), training of district managers, monitoring and supervision at the district level, and organizing regular quality assurance visits for sputum smear microscopy. Each region has one trained doctor (the referral clinician) to provide support in the management of treatment failures, chronic cases, and other clinical problems that require assistance.

District Level

In each district, the district director of health services has primary responsibility for TB control, with one technical person who is appointed as the district TB coordinator to assist in coordinating TB control activities. These activities include planning and budgeting, training and supervision of health staff, and program monitoring through supportive supervision. As health services are integrated, all district TB coordinators assume various other responsibilities outside of TB control. Those districts that have public-private mix (PPM) activities are also responsible for monitoring, supervising, and reporting on such activities undertaken in their jurisdiction.

Facility and Community Level

TB treatment can be accessed at both public (including mission health facilities) and private accredited sites. More than 1,600 facilities provide TB DOTS, of which more than 75 are private facilities. As health services are integrated, a designated public health nurse (or any other health worker) will be responsible for TB control activities such as TB registration, follow-up of TB patients, and compiling quarterly reports through cohort analysis.

Community health workers and community volunteers are involved in TB control through their participation as treatment supporters within the Enablers Package program, as well as assisting in defaulter prevention and tracing. The NTP is also supporting some NGOs in efforts to enhance public awareness about TB with the goal of increasing TB case detection.

Local Partners of the NTP

The NTP has worked and continues to work closely with various stakeholders in planning and implementing TB control activities. Key stakeholders include the National AIDS Control Programme (NACP), the CCM, QHP, the STOP TB Partnership of Ghana, the Noguchi Memorial Institute of Medical Research (NMIMR), CHAG, School of Public Health, Medical Schools, private practitioners, community-based organizations, and civil society organizations.

International Partners of the NTP

Since the establishment of the NTP in 1994, a number of international partners have provided and continue to provide financial and technical support to the Ghana NTP. These international partners include USAID, MSH (through the TB CAP), DANIDA, KNCV Tuberculosis Foundation, WHO, IUATLD, DFID, and the Global Fund.

The second TB strategic plan was produced in 2002 and focused on the following strategies:

- improve TB case management and control;
- improve TB case detection;
- forge partnerships to expand DOTS;
- conduct focused research.

A comprehensive review of the NTP was undertaken in 2007, particularly to assess the implementation of the second strategic plan (2002–2006). The review identified a number of achievements and challenges, discussed below.

Achievements

- Since the establishment of the NTP in 1994, Ghana has achieved 100 percent DOTS coverage.
- A network of TB microscopy laboratories has been established.
- Laboratory services (such as sputum-smear microscopy) have expanded, and the ratio of microscopy centers to population is 1 per 90,000 population, which is acceptable by DOTS standards.
- Over the past four years, the number of patients evaluated at the end of treatment has increased remarkably: treatment outcome is now reported for 99.7 percent of sputum smear–positive patients.
- Case management and holding has also improved, and the treatment success rate continues to increase (84.1% for the 2007 cohort).
- The NTP has since achieved countrywide rollout of the WHO-recommended fixed-dose combination (FDC) regimen provided in patient kits.
- There has also been an effort to enhance awareness of TB control among health workers and the public. There is an apparent high level of awareness of recent initiatives, including the new treatment regimen, community-based DOTS (CB-DOTS), TB/HIV coordination, and TB control in prisons.
- The Korle Bu Teaching Hospital has improved its readiness to manage MDR-TB patients.
- The staffing level at the Central Unit has improved, and in April 2008 a pharmacist joined the programmme.
- TB is cited as a priority in the major national policy documents, such as the Programme of Work (POW).
- GOG funding to support TB control has been stable in recent years.

- A TB/HIV focal person was appointed to the Central Unit.

- A TB/HIV Technical Working Group was established and is functional.

- The NTP has demonstrated its overall capacity and has been able to attract funding from the Global Fund in two separate rounds. The infusion of GFATM funds in 2003 and 2005 contributed to the activities undertaken by the NTP and will continue to do so for the next two years.

- Although the NTP was cautious at first, the vision of expanding TB control into the private sector and implementing an Enablers Package to benefit patients, health workers, and health clinics in both the public and private sectors was innovative and not without risks. This strategic approach, based on mutual respect, has resulted in improved links between the public and private sectors and can serve as a model for the African region.

- The NTP seems well positioned to begin expanding TB-DOTS into communities. Between the first and fifth rounds of GFATM funding, the NTP also provided leadership to regional efforts, so that other initiatives could be piloted (without extra finances), and the lessons learned will facilitate plans to expand community-based DOTS.

- With GFATM funding, expansion of TB-DOTS into the prisons services is well under way, and more than 100 nongovernmental organizations are engaged in advocacy, communication, and social mobilization (ACSM) activities.

- The introduction of mycobacterium growth indicator tube (MGIT) equipment in the two National Public Health Reference Laboratories has made culture much easier and faster than previously.

- Since 2007 MSH, through TB CAP, started supporting the NTP, particularly in DOTS expansion and enhancement and TB/HIV management. The support is provided through the Resident TB Technical Advisor and external technical assistance.

Challenges

- Although the infrastructure and basic support for TB control are in place, and TB is high on the political agenda, the NTP operated under important financial constraints prior to and between GFATM Rounds 1 and 5. The past decade has been characterized by limited funding from external sources, a slower-than-expected pace of expansion.

- The second intervention defined in the second strategic plan (2002–2006) was to improve case detection. Although many interventions were undertaken, case detection is still far below the global targets (27 percent for all forms of TB and 38 percent for smear-positive TB cases).

- Initiatives such as public-private mix have provided patients with alternatives for diagnosis and treatment, but the absolute number of cases increased only slightly, TB case detection rates were not improved. The increased caseload in the private sector may very well represent patients who previously attended the public clinics. The same situation is observed at some of the pilot sites, where the number of clinics providing TB-DOTS increased but the absolute number of patients remained the same.

- With regard to various aspects of programme management, monitoring and supervision from the central level are limited and remain weak at the decentralized levels as well.

- The delay in the timely release of funds for the procurement of drugs led to the nationwide stock-out experienced in 2006.

- Quality assurance (QA) measures within the laboratory network are implemented unevenly, and there is limited application of internal quality control at this time.

- Although many ACSM activities have been undertaken, there is no ACSM plan (other than that defined in the GFATM proposal), nor are there any guidelines or specific tools. To improve performance and achieve program sustainability, the engagement of regional and district authorities and communities is required. Church groups seem to play an important role in how and where people access services. Ensuring that these groups acquire the necessary skills in advocacy may be difficult without a well-defined plan that delineates goals, objectives, activities, specific tools, and training.

- Forging partnerships to expand DOTS has yet to be implemented in full.

- Close monitoring and supervision for TB/HIV collaborative activities will be required, but how these duties will be divided between the two programme has yet to be clearly defined.

- Perhaps the most important weakness of the NTP is its capacity to undertake operational research. The technical capacity for operational research is centralized and limited to a select group of researchers.

- Many new national initiatives have begun or are about to begin, yet there has been a delay in collecting key information to determine the outcomes of these innovative programmes. For example, the lack of critical analysis of the Enablers Package and other initiatives may have implications for their sustainability.

- Ghana is a country in epidemiological transition, with an increasing disease burden from chronic illnesses; therefore, research-related evidence must be presented to ensure that TB remains high on the political agenda at all levels and that investment in TB control continues.

- Data quality at all levels remains inadequate.

current tuberculosis situation 3.0

The burden of TB in Ghana is not exactly known. The last WHO-sponsored survey, carried out in 1957, estimated an annual risk of infection between 3 and 4 percent in gold-mining towns. In 2001, the annual risk of infection was estimated between 1 and 2 percent, corresponding with 100 to 200 new TB cases per 100,000 populations per year, of which 50 to 100 are smear-positive. A more recent tuberculin survey, conducted in 2004 - 2005, did not provide definite estimates but it was clear that the annual risk of infection remains around 1 to 2 percent. Thus, at this time, the best estimates of TB incidence come from the annual WHO Global TB Report, which showed that Ghana is only detecting 27 percent of all forms of TB and 38 percent of smear-positive TB cases.

Case Notifications

In 1996, the number of people diagnosed with TB was 6,982; this number sharply increased, to 10,749, in 1997. Since then, TB case notifications have gradually increased, reaching 12,964 in 2007. In 2008, the NTP reported the highest number of TB patients (14,022) in a single year. Similarly, the number of people diagnosed with new smear-positive cases sharply increased from 4,366 in 1996 to 7,784 in 2008. The case detection rate in 2008 for smear-positive cases was 34 per 100,000 population, down from 43 in 1998. Notification rate for all forms of TB stagnated at 57 per 100,000 population for four years, and moved up to 61 per 100,000 population in 2008. The reported case notification rate has fluctuated since the establishment of the NTP in 1994 but has remained stable in the past three years.

Figure 3: *Trends of notified TB cases (1996–2008)*

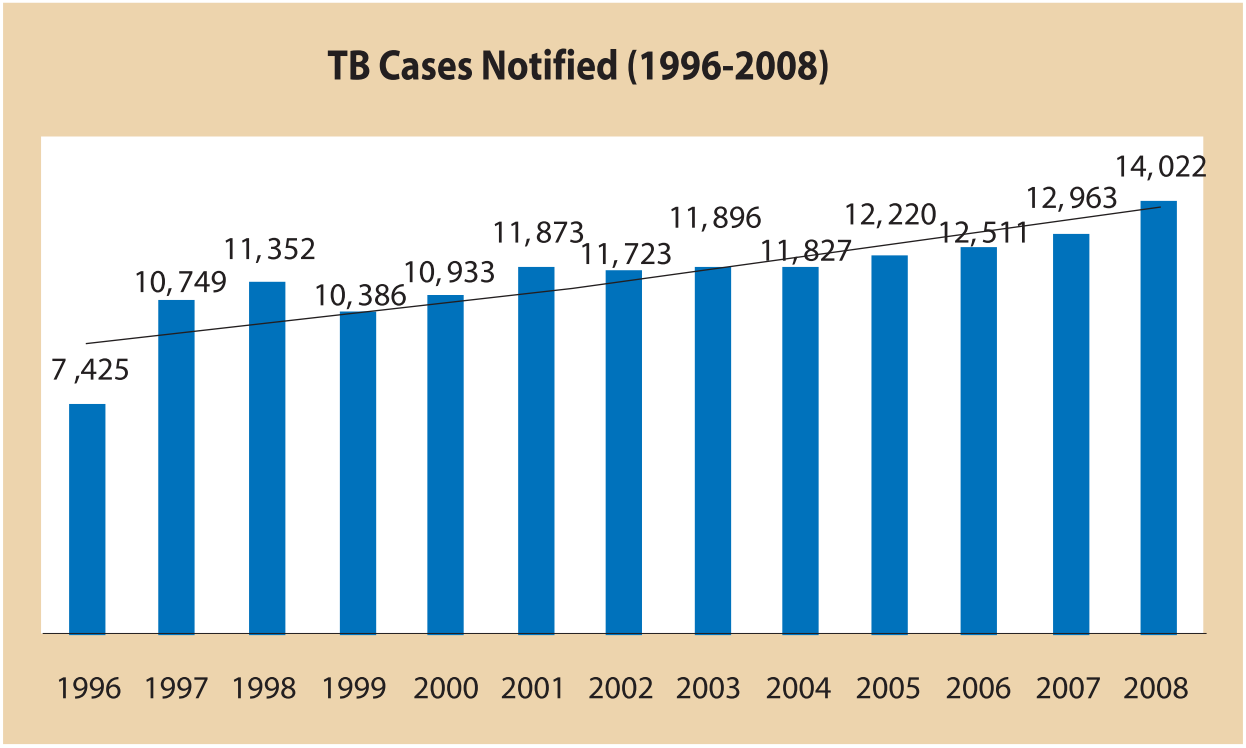
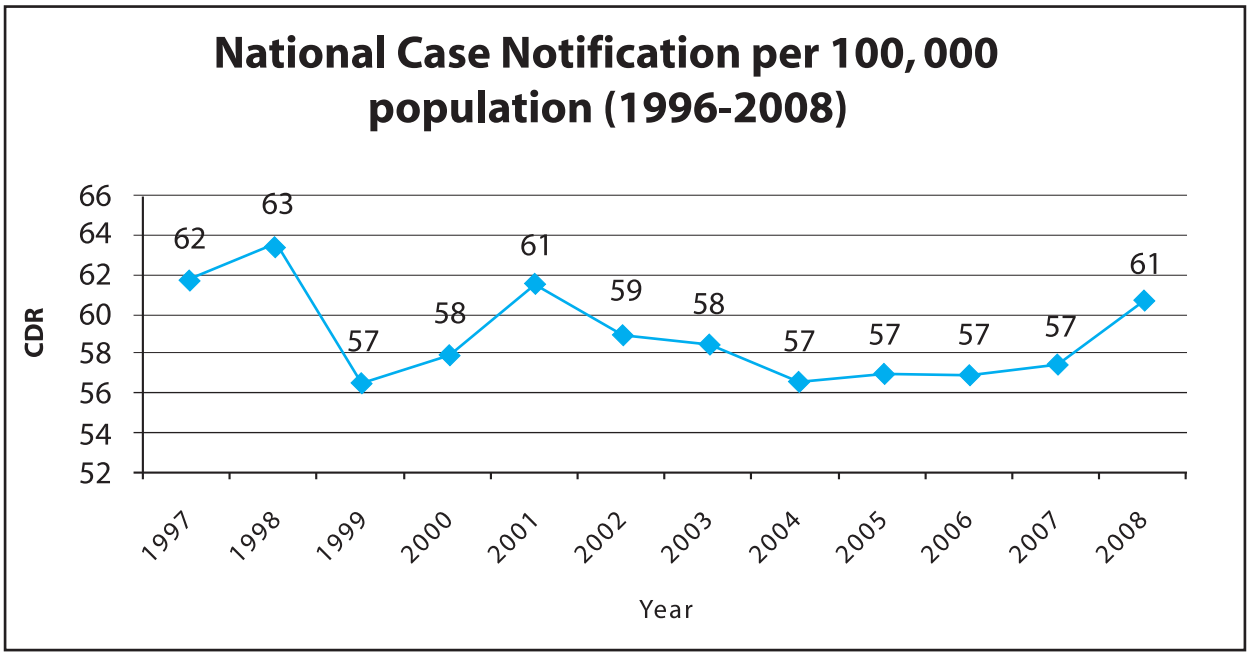
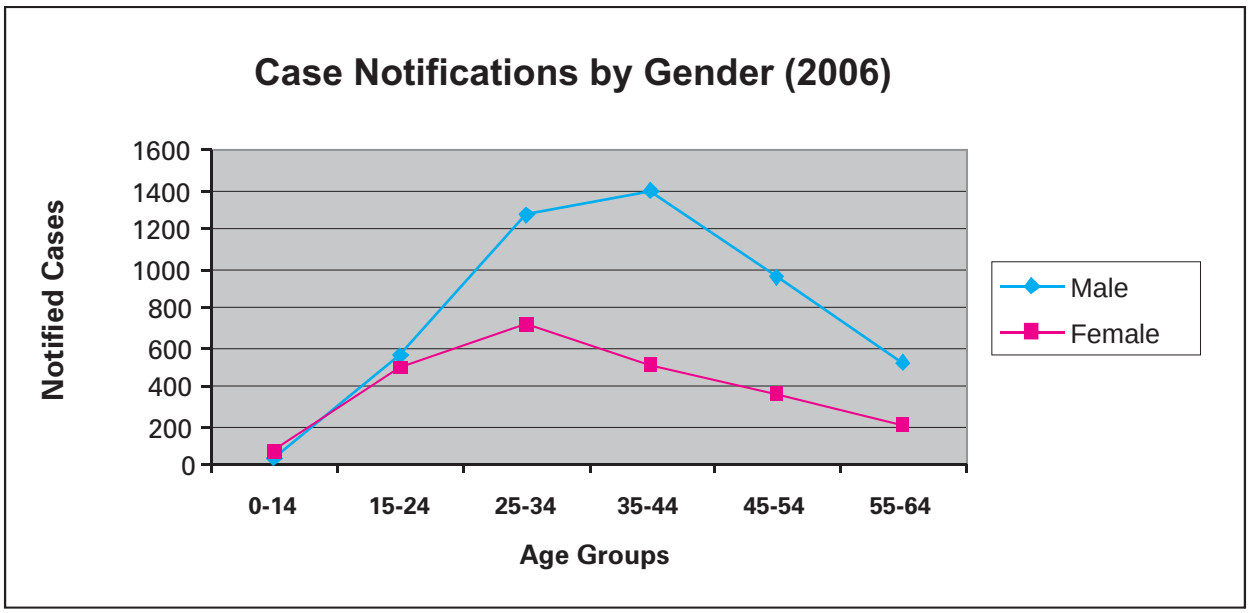


Figure 4: *National case notification per 100,000 population (1996–2008)*



The overall male-female ratio of TB patients is 2:1. This is why this plan will ensure that all strategies and activities are implemented in a manner that ensures gender disparities are addressed, in line with MOH policy. As in most resource-limited settings and in the literature in general, the majority of those most affected are in the most productive years of life. In Ghana, the peak age group for women is 25 to 34 years; for men it is 35 to 44 years.

Figure 5: *TB case notification by gender (2006)*



Ziehl-Neelsen (ZN) stains should detect 60 percent of culture-positive pulmonary cases of TB; the rest of pulmonary cases would be expected to be smear-negative. From 1996 to 2006, about 73 percent of the new pulmonary cases detected and reported each year were smear-positive (range, 60–75 percent). This is slightly higher than expected. Relapses and extrapulmonary cases accounted for less than 10 percent of all cases over the past 10 years.

While the number of persons diagnosed with smear-positive TB cases shows there has been a plateau, extrapulmonary TB cases have increased from 355 in 1996 to 1,372 in 2008. Annex 3 show categories of TB patients reported in Ghana from 1996 to 2007.

Trends in CNR by Region

In 2008, 5 of the 10 regions had CNRs higher than the national average. Greater Accra was highest, with 79 per 100,000 population (36 percent), but that was still only half of the target of 70 percent (see Table 2). On closer examination, the increase in the number of cases detected in Greater Accra is notable, with more than 500 additional cases reported between 2007 and 2008 (for a total of 3,256). Ashanti, the second-most populous region and one of the PPM DOTS cities, reported a marginal increase in number of cases over the same period.

Table 1: TB case notification by region (2006 and 2008)

	Incidence per 100,000 Population		
Region	**2006**	**2007**	**2008**
Greater Accra	79	69	79
Ashanti	50	51	53
Eastern	72	71	70
Western	75	73	74
Central	61	69	67
Volta	62	58	68
Northern	20	25	31
Upper East	32	51	48
Upper West	29	28	35
Brong Ahafo	31	36	30
National	57	57	61

Although many of the reasons for low CDRs cited in earlier reports have been addressed to varying degrees, the CDR remains far below the target, with little or no improvement. The quality of the data has improved in all the regions but still needs further improvement, with almost all cases being evaluated. Treatment outcomes have improved, which should attract TB suspects into the programme earlier - however, this seems not to be the case.

In an effort to answer other reasons for the low CDR, three questions are being asked:

1. Are TB cases missed?
2. How many TB cases are missed?
3. Why are they missed?

A recent data analysis exercise done to investigate the reasons for low CDR revealed the following factors that may also have a role:

- No standard operating procedure (SOP) is in place for TB case detection for health facilities and the communities.
- Reporting is not 100 percent accurate, with discrepancies in data magnitude.
- Recording and tracing of referrals is not routinely done.
- Some patients diagnosed with TB do not come for their results (these include patients with smear-positive results).
- Not all TB suspects (cough $\geq$ 2 weeks) are sent for sputum-smear examination.
- Within the Ghana population there is a sect that does not take medication (probably $<$ 5 percent); others go to healing camps.
- The first the point of contact of some TB suspects may be chemical shops, where they seek cough drugs/syrups.
- Contact tracing of household with smear-positive index patients is not routinely conducted.
- Intensified TB case finding in HIV care and prevention settings is not consistently practiced.
- TB control targeting "hot spots" such as prisons, refugee camps, and urban slums is inadequate.
- Community sputum collection points are not available in areas lacking an established TB microscopy centre.
- Some regions have little involvement of NGOs in TB control.
- The role of churches/mosques in ACSM activities for TB has not been adequately explored.
- In some parts of the country TB still remains a stigmatised disease.
- The true magnitude of the TB problem in Ghana is not known and needs to be determined through a national TB prevalence survey.

Case Management

Default rates have been high over the past years, but data for 2007 show that the default rate has been reduced from 11 percent in 2005 to 3 percent. According to the NTP Central Unit, most defaults occur in the continuation phase, especially after month five, when sputum is negative. For those who default in the first phase, the type of treatment may play a role. Until June 2007, most patients treated with CAT I and II regimens were undergoing two months of streptomycin injections. Now that the NTP has introduced the FDCs, it remains to be evaluated whether there will be a change in defaulter trends.

The reduction in defaulter rate is attributable to NTP initiatives, particularly the Enablers Package. Treatment supporters and volunteers supported through the Enablers Package have been trained to conduct visits to TB patients' homes and supervise them taking anti-TB drugs. This strategy is primarily meant to prevent default, as regular interaction with the patient will ensure their challenges are identified and addressed before resulting in default.

The NTP implements a policy of checking smears at the end of the intensive phase (two months) and at five months. However, data on smear conversion is not collected from registers - thus, there is lack of clarity about the proportion of smear-positive patients who remain positive at the end of two months and five months. The good thing is that the failure rate is maintained at 2 percent or below.

Treatment Results

Figures 6 and 7 show the treatment outcomes for new smear-positive TB patients from 1996 to 2007. Treatment success has increased from 31.9 percent in 1996 to 84.1 percent in 2007.

The case fatality rate remains high at 9 percent, despite the low HIV prevalence (1.9 percent) in the general population. The number of cases evaluated has improved markedly, rising from 38 percent in 1996 to 99.7 percent in 2007.

Figure 6: *Treatment outcomes for sputum smear–positive PTB cases, 1996–2007*

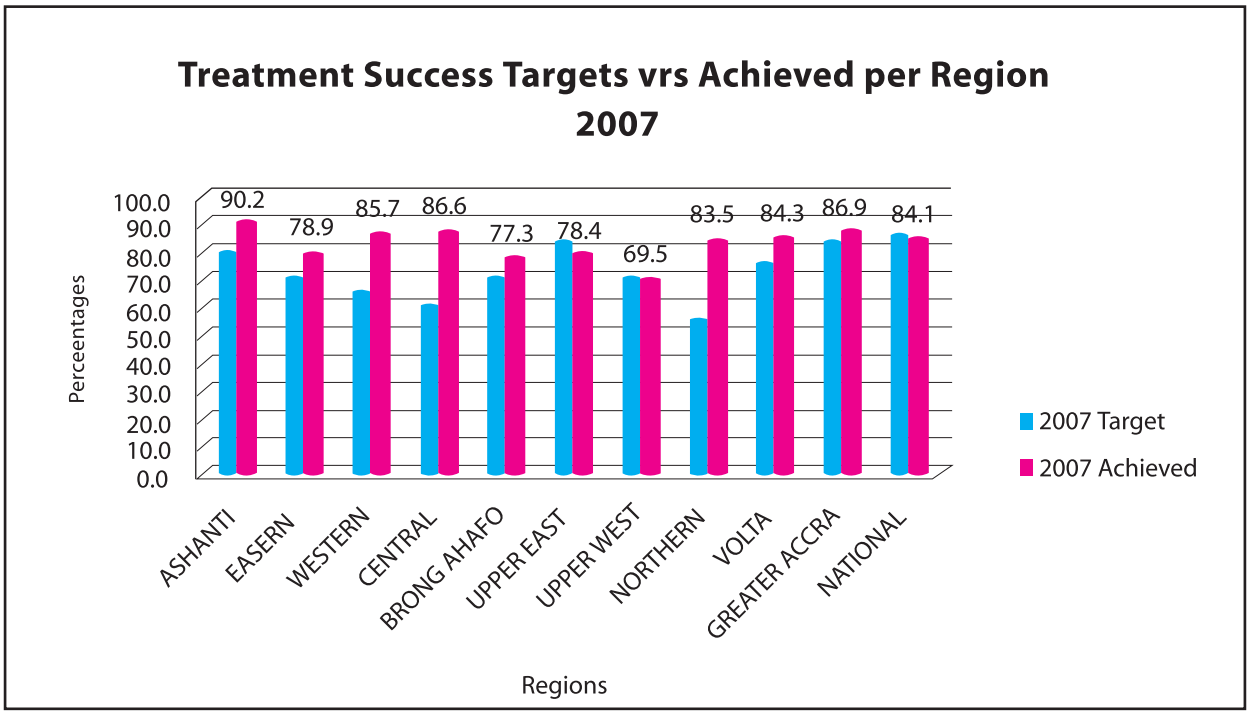
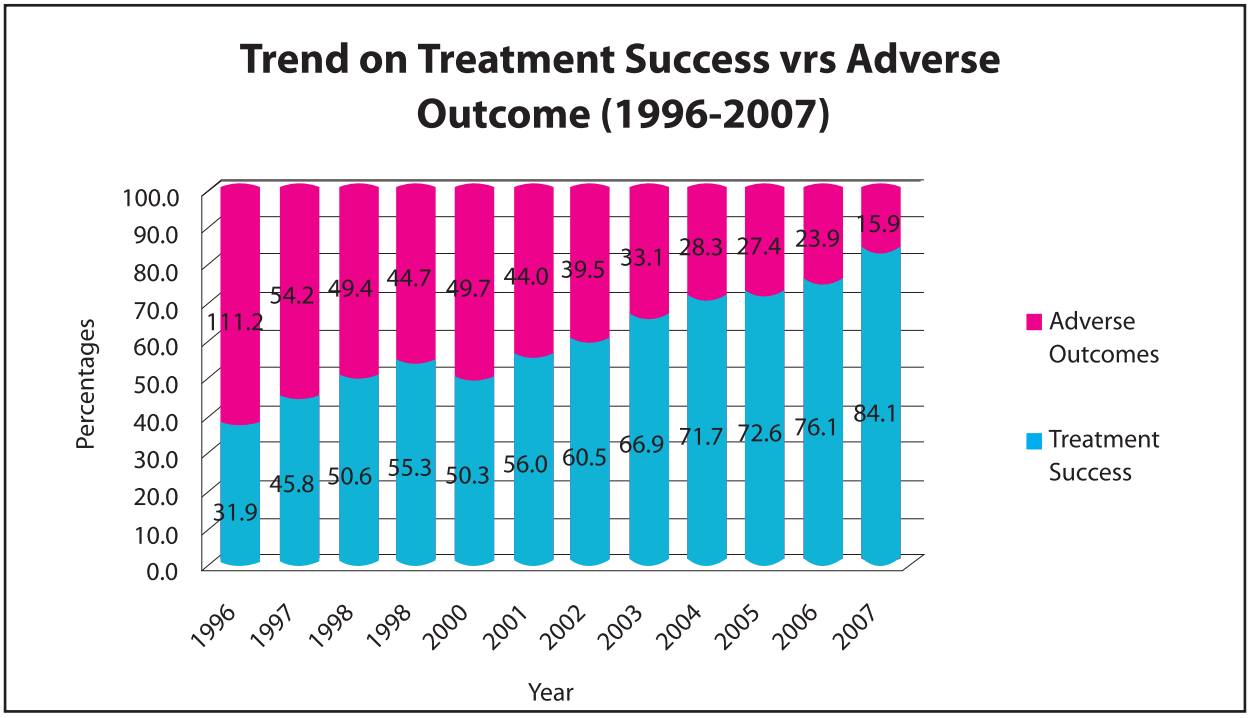


Figure 7.: *Treatment success and adverse outcome trends (1996–2007)*



goal, objectives, strategies and activities
of the strategic plan

4.0

Mandate of the NTP

To provide leadership for the health sector response to fight tuberculosis in Ghana

Goal

To reduce the burden of tuberculosis in Ghana until it is no longer a disease of public health importance

Overall Objective

To achieve the World Health Assembly (WHA) and the MDG targets by increasing the proportions of cases detected and cured and reducing prevalence of TB deaths rates by 2015

Specific Objectives

1. To expand the TB laboratory network for sputum smear microscopy from 257 to 661
2. To establish 60 new microscopy centres in 60 newly created districts by 2011
3. To start implementing DOTS Plus from 2009
4. To introduce IPT in 75 support groups for people living with HIV/AIDS (PLHIV) by 2013
5. To increase proportion of HIV-positive TB patients on antiretroviral therapy (ART) from 20 percent to at least 75 percent by 2013
6. To support transport, procurement and human resource capacity development in the health system to enhance TB care and control
7. To introduce PAL in three regions by 2012
8. To develop programme management capacity to monitor, supervise, and coordinate other care providers
9. To implement sustained ACSM activities, among others, to reduce stigma over the 2009–2013 period
10. To increase the number of health facilities working with community volunteers in TB care from 132 in 2009 to 1329 by 2013

11. To increase the number of health facilities or congregate settings implementing TB infection control and prevention from 124 in 2008 to 1,000 in 2011 and achieve 80 percent coverage by 2013

12. To develop capacity to conduct research and implement programme research agenda

13. To conduct TB prevalence studies to establish TB burden by 2011

Monitoring and Evaluation Plan

The plan will be monitored through key inputs, process, output, and outcome and impact indicators in the course of implementation.

The overall responsibility for monitoring and evaluation will rest with the National TB Control programme M&E Unit under the leadership of the programme manager. At the Central TB Unit, an M&E focal person will be assigned or an M&E expert will be recruited for the duties of the day-to-day coordination and monitoring of TB activities in both the public and private sectors.

At the regional and district levels, TB coordinators will be trained to assume additional skills to extend their monitoring activities to cover other health care providers. They will be provided with personnel recruited to assist in handling and managing data.

Regional TB coordinators will work closely with focal persons for TB in the districts and subdistricts. The Regional Health Directorates and District Health Management Teams will support in monitoring activities as part of health systems strengthening.

Monitoring will be carried out monthly at the regional and district levels and quarterly at the national level. This is to ensure that problems are identified quickly and corrective actions taken. The NTP Central Unit will lead an initial TB prevalence survey in collaboration with the NMIMR. A baseline Knowledge, Attitude, and Practice (KAP) survey to assess health care–seeking behaviour and stigma-related issues will be led by the central TB unit and the universities.

Quarterly reports from participating institutions and monthly supervisory reports from TB coordinators or designated M&E focal persons will be submitted to districts, regions, and the central TB unit. The Regional Health Directorates will produce and submit biannual reports to the Central TB Unit. The Central Unit will produce a coordinated programme report annually. A feedback system will be established to make the results of the programme clear to all.

A midterm evaluation will be conducted to adjust timetable and implementation strategies by both external and internal evaluators. A process evaluation will assess the efficiency of the project in terms of the quantifiable achievement of the output Indicators. Process evaluation will be based on the information received and synthesised from the monitoring system. This will be the responsibility of the Regional and District Health Directorates, with the active involvement of the Regional and District TB Coordinators. The Central TB Unit and other care providers will hold a biannual stakeholders' meeting.

An outcome evaluation will assess the effectiveness of the project and client satisfaction with the quality of services at the facilities on an annual basis. Special studies to evaluate impact will be conducted at the beginning and at the end.

Key Indicators for the Strategic Plan

Inputs	Process	Output	Outcomes	Areas of Impact
Percentage of core funding for program activities received	Proportion of TB service delivery point that reports no stock out of TB drugs	Number of treatment centres providing TB services		
Provision of infrastructure to support management to prevent drug resistance	Number of TB diagnostic centres established	Number of functional diagnostic centres	Case detection Treatment success	TB mortality Prevalence of TB disease

Logical Framework for the Programme of Work, 2009–2013

Key Strategic Area	Objectively Verifiable Outcome Indicators	Means of Verification	Important Assumptions
Implementing the DOTS strategy for TB control	1. Improve TB treatment success from 84.1% - 90% by 2013	TB surveillance system	That anti- TB drugs and other supplies will be procured in adequate amounts and in a timely manner
	2. Improve case detection rates from 27 to 72% by 2013	TB surveillance system	That a quality assurance programme is established, and laboratory equipment and supplies are provided
			That TB patients report early
			That the overage of population with diagnostic and treatment services will be increased
			That the system is staffed with highly motivated and adequately trained health personnel
			That funding for TB control is adequate

Key National Targets

Key outcome indicators of the plan will include:

1. Case detection coverage: Number/percentage of new smear-positive TB patients reported to the NTP among the new smear-positive TB patients estimated to occur in Ghana each year

2. TB treatment success: Number/percentage of new smear-positive TB cases successfully treated (cured plus completed TB treatment) among new smear-positive TB patients registered during a specified period

Key targets over the five year period of the Strategic Plan

Impact Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target	Source and Comments
	Value	Year	Source						
TB case detection rate	27%	2008	NTP: Central TB Unit	40%	45%	55%	60%	72%	TB management information system
TB treatment success rate	83%	2007	NTP: Central TB Unit	84.1%	85%	87%	90%	90%	TB cohort analysis reports
TB case fatality rate	9%	2007	NTP: Central Unit	8%	7%	6%	5.5%	5%	NTP routinely collects case fatality data and calculates this indicator annually.
TB prevalence	353 per 100,000 population	2008	WHO					160 per 100,000	NTP will conduct a TB prevalence survey.

Regions are expected to achieve the targets set in Table 2 to maintain a higher national average.

Table 2: Regional TB Treatment Success Targets (Percentage)

Region	Year						
	2007	2008	2009	2010	2011	2012	2013
Great Accra	83	85	85	85	85	90	90
Ashanti	79	85	85	85	85	90	90
Eastern	70	80	85	85	85	90	90
Western	65	70	75	80	85	90	90
Central	60	65	70	75	80	85	90
Volta	75	80	85	85	85	90	90
Northern	55	60	65	70	75	80	85
Brong Ahafo	70	75	80	85	85	90	90
Upper West	70	73	75	80	85	90	90
Upper East	83	85	85	85	85	90	90

Secondary Indicators and Targets for 2013

The secondary indicators and targets are set out in the table below.

Secondary Indicators and Targets

Secondary Indicator	2013 Target (%)
TB patients routinely offered HIV testing	90
HIV - positive TB patients treated with CPT	95
HIV-positive TB patients started on ART	75
Prevalence of MDR - TB new TB patients	< 2
Smear conversion at 2 months	> 90
Smear conversion at 5 months	> 90
Case not evaluated	0
Defaulter rate	< 4
Failure rate	< 2

Key Strategies, 2009–2013

Strategy 1: Pursue High-Quality DOTS Expansion and Enhancement

1. Advocate for political commitment with increased and sustained financing
2. Improve diagnosis: case detection through quality-assured bacteriology
3. Improve clinical care of TB patients
4. Provide patient support and treatment
5. Ensure effective logistics management systems for TB medicines and laboratories supplies
6. Strengthen monitoring and evaluation, routine programme management, and supervision activities
7. Ensure that critical staff required are in place, motivated, and have the capacity to meet operational challenges militating against optimum TB control performance

Strategy 2: Address TB/HIV, MDR-TB, and Other Challenges

1. Provide TB/HIV collaborative services
2. Implement prevention and control of MDR-TB
3. Consider high-risk groups in TB control

Strategy 3: Contribute to Health System Strengthening

1. Implement Practical Approach to Lung Health (PAL)

Strategy 4: Engage All Care Providers

1. Implement PPM DOTS
2. Implement PPM DOTS in the mines

Strategy 5: Empower People with TB and Communities

1. Advocacy, communication, and social mobilization (ACSM)
2. Intensify community participation in TB care
3. Patient charter

Strategy 6: Enable and Promote Research

1. Conduct programme research

Priority Interventions, 2009–2013

The following level-specific activities are the minimum to be implemented by various stakeholders. These priorities were arrived at through consensus of stakeholders.

National-Level Activities

- Organize and/or support training for:
  a. Regional TB coordinators
  b. Regional laboratory technicians
  c. Teaching hospitals
  d. Prisons, military, and police institutions

- Procure anti-TB drugs and laboratory supplies

- Organize and coordinate
  e. National TB review meetings
  f. National TB advisory board meetings

g. Technical working group meetings

- Promote understanding of TB among health staff and communities
- Conduct surveys
- Conduct HIV prevalence studies among TB patients
- Conduct internal review of programme activities
- Review TB Control Manual
- Provide technical support visits to the regions
- Review TB Training Manual
- Develop a policy on MDR-TB
- Review TB surveillance forms
- Commission technical assistance in various areas

Regional-Level Activities
Regional Coordinators will coordinate tuberculosis control activities in the region. The Regional Coordinator works closely with the Senior Medical Officer for Public Health, and is directly responsible to the Regional Director of Health Services. Responsibilities of the Regional Coordinator include the following:

1. Train:
   a. District TB Coordinators in cohort analysis and M&E

   b. Hospital staff (regional and district) in TB management and control

   c. TB laboratory focal persons in each district to implement TB microscopy quality assurance programme

2. Organize quarterly district and institutional TB coordinators review/update meetings.

3. Intensify technical support and monitoring visits to the District TB coordinators

4. Promote ACSM activities, including World TB Day activities on 24th March.

5. Procure TB drugs and other logistics regularly.

6. Develop region-specific plans to improve case detection and treatment outcomes.

District-Level Activities
District Directors of Health, whose duties include TB control, will support and supervise District TB Coordinators.

1. Set up DOTS centres in all health facilities (at least two functioning microscopes for 100,000 population)

2. Train health personnel to support TB control in each subdistrict

3. Establish a system of transporting sputum specimens to diagnostic centres

4. Link hospital level TB activities with District Health Management Team (DHMT) activities

5. Establish mechanism to prevent, detect, and to trace defaulters

6. Undertake ACSM, including World TB Day activities

7. Involve community-based NGOs and others in TB treatment supervision, at least in the continuation phase

8. Link TB and HIV activities where appropriate, especially in the field of HIV counselling, testing and patient care

9. Develop district-specific plans for improving case detection and treatment outcomes

NGO/Civil Society Activities
NGOs are expected to contribute to national goals and objectives. They are essential partners of treatment and diagnostic facilities. Their responsibilities include the following:

1. Collaborate to support district TB control activities

2. Undertake community-based TB control activities, namely patient and community education, advocacy, social mobilization, and defaulter tracing

3. Provide support to home-based supervised treatment, including contact tracing

4. Refer suspected cases of TB from the community to diagnostic centres

5. Take part in district TB review meetings

6. Participate in World TB Day celebrations

Priority Areas and Strategies

The plan will address all specific objectives as priority areas while continuing to implement the six key components of the Global Stop TB Strategy, to consolidate and maintain the progress attained so far under preceding strategic plan.

detailed key elements
of the strategic plan

5.0

This section is organized according to the elements of the Stop TB Strategy.

Strategy 1: Pursue High-Quality DOTS Expansion and Enhancement

The first component - DOTS expansion and enhancement - is the cornerstone of the DOTS strategy and provides the foundation for the remaining five elements of the Stop TB Strategy.

Political commitment is needed to foster national and international partnerships, and should be linked to long-term strategic action plans. Adequate funding is essential. Funding the gaps requires the mobilization of additional resources from domestic and international sources, with a progressive increase in domestic funding.

Case detection is accomplished through quality-assured bacteriology (the recommended method), first using sputum-smear microscopy and then culture and drug susceptibility testing (DST). Other factors that influence case detection, such as policies and the organization of services are also addressed.

Standard treatment, supervision, and patient support address factors that may cause patients to interrupt or stop treatment. These barriers to treatment may be physical, financial, social, or cultural, as well as health system–related. Particular attention should be given to the poorest and most vulnerable population groups.

Pursue High-Quality DOTS Expansion and Enhancement

- *Political commitment with increased and sustained financing*
- *Case detection through quality-assured bacteriology*
- *Standardized treatment, with supervision and patient support*
- *Effective drug supply and management system*
- *Monitoring and evaluation system, and impact measurement*

Effective drug supply, consisting of an uninterrupted and sustained supply of quality-assured anti-TB drugs, is fundamental to TB control. An effective drug management system ensures the appropriate selection, procurement, distribution, and use of these essential commodities.

Monitoring, evaluation, and impact measurement include a recording and reporting system that links central and peripheral levels and contains standardized data on individual patients. Enhanced recording and reporting should include data on culture and DST, TB/HIV, MDR-TB, and TB infection control. Staff must have the requisite knowledge and skills to interpret these data and take appropriate action.

Intervention 1.1: Political Commitment with Increased and Sustained Financing

Activities

- Register TB patients into the National Health Insurance Scheme (NHIS) for them to benefit from the comprehensive clinical care
- Advocate for increased government funding to TB control activities such as procurement of anti-TB drugs and laboratory consumables and supplies
- Establish strong partnerships for TB control with both local and international organizations
- Introduce performance-based incentives for Central Unit staff
- Mobilize resources from both local and international sources
- Increase advocacy for political leaders to raise awareness about TB control

Expected Outputs

Resources from both local and international agencies mobilized as follows:

- NHIS premiums for TB patients who are registered for anti-TB treatment secured
- Yearly advocacy programme for TB control targeting policymakers established
- Awareness about TB control created
- Partnerships for TB control between non-MOH institutions and the public sector built
- NTP review reports disseminated at all levels, including national and international collaborating and funding agencies
- All key components of the NTP financed through core government funding, including drugs, laboratory consumables and equipment, as well as NTP staff salaries and benefits
- A dedicated budget line for TB control in Ministry of Finance and Economic Planning (MoFEP) established
- Funding to TB control from international donor agencies such as the Global Fund, USAID, and the US President's Emergency Plan for AIDS Relief (PEPFAR) to bridge funding gaps increased.

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Percentage of core government funding to the NTP	55%	2008	NTP budget/ PPME MOH	55%	57%	60%	65%	70%

Intervention 1.2: Improving Diagnosis: Case Detection Through Quality-Assured Bacteriology

Situation Analysis

Low TB case detection has been well documented through annual TB Global Reports produced by the World Health Organization. However, there have been limited effective strategies to address this challenge. Facilities and communities have no proper procedures to detect TB suspects, and contact tracing is rarely practiced.

The problem of initial defaulters persists, particularly in teaching and regional hospitals, where patients who submit their sputum samples do not return for their results. TB patients referred from one treatment centre to another before starting TB treatment are not followed up to ascertain that they have actually started TB treatment.

Currently there are about 257 public and private health facility laboratories performing sputum smear microscopy out of the 661 laboratories countrywide. This translates into one microscopy centre per about 90,000 population, with the Northern Region having an average of one per 239,000 population. Accessibility in rural areas is an issue that needs to be addressed. The quality of the smears has greatly improved, but quantities need to be increased by improving access.

Ghana has a policy in place to culture the TB specimens and perform DST on the isolates for retreatment cases. Most regional laboratories, including the teaching hospital laboratories, have the capacity to perform conventional manual culture and DST. However, only three are currently doing so. Furthermore, the National Public Health Reference Laboratory (NPHRL) in Greater Accra and Kumasi Hospital Laboratory recently received the MGIT to enhance the culture and DST. Three other hospital laboratories have been earmarked to receive the MGITs as well. To curb the emergency and confirm the existence of MDR-TB, culture and DST need to be routinely performed on all smear-positive retreatment cases besides carrying out the MDR-TB surveillance.

Quality assurance systems for TB microscopy using blind re-checking have been introduced and partly implemented. Panel testing; however, has not been initiated due to poor performance in blinded rechecking for the past six years. The regional laboratories were tasked to conduct the rechecking of the peripheral laboratories while the NMIMR supervised the work of the regional laboratories once a year. With this setup, quality improvement is not expected to be achieved to allow for implementation of panel testing. The reports from the regions show that rechecking is done on a quarterly basis but follow-up quality assurance is not monitored.

Quality assurance implementation was vested in the NMIMR, which has done commendable work. Capacity is now being built at the NPHRL to take charge of the process eventually. QA is synonymous with quality improvement, and supervision is key to this. NMIMR is being assessed by WHO for possible upgrading to Supranational Reference Laboratory status.

Ghana has a well-organised, three-tiered laboratory network comprising national, intermediate, and peripheral laboratories. Rehabilitation of laboratories to provide a well-ventilated working environment with continuous running water and availability of electricity is advocated for quality work and protection of the laboratory staff. A functional microscope devoted for sputum smear microscopy is necessary to improve quality and accuracy. Type II biosafety cabinets will be available in all laboratories performing culture and DST, but they are not really necessary at the lower-level laboratories that exclusively perform sputum smear microscopy. A functional microscope devoted for sputum microscopy is a prerequisite for quality and accurate work.

Activities

- Establish new microscopy centres for 60 newly created districts
- Upgrade/repair existing microscopy centres
- Procure and distribute laboratory supplies and reagents for microscopy centres
- Transport sputum samples for retreatment cases from DOTS centres to the NPHRL
- Transport samples from communities to nearby laboratories for diagnosis
- Establish new culture and DST laboratories and provide standard equipment
- Provide maintenance cost for equipments, including microscopes and biosafety cabinets
- Provide and distribute laboratory supplies and reagents for culture
- Upgrade/repair existing culture and DST laboratories
- Distribute laboratory supplies and equipment
- Upgrade/repair existing laboratory to include molecular tests
- Provide standard equipment for one laboratory performing molecular tests (Line Probe Assay [LPA])
- Procure and distribute laboratory supplies and reagents for molecular tests
- Provide other equipment and consumables (including X-rays)
- Implement quality assurance programme
- Develop laboratory supervision plans

- Conduct supervision for sputum smear microscopy
- Transport sputum samples for microscopy sites to a superior laboratory for blind rechecking
- Introduce panel testing: sending laboratory samples from the superior laboratories to the district or intermediary laboratories to train workers
- Organise leadership and management capacity-building for laboratory supervisors
- Establish a preventive maintenance program so that all microscopes used for TB microscopy through the country are professionally cleaned once a year and bulbs and spare parts are regularly available
- Train laboratory managers in TB laboratory commodity management to ensure effective ordering or managing of laboratory supplies
- Revise and print the TB laboratory manuals and SOP using blind rechecking in line with the international guidelines and recommended practices
- Perform follow-up sputum microscopy at the end of the intensive treatment phase and at five months of TB treatment among smear-positive TB patients

Expected Outputs

- The existing microscopy centres strengthened in terms of provision of diagnostic equipment and supplies
- Referral system between treatment and diagnostic centres established
- Samples from all smear-positive retreatment TB cases cultured and DST conducted for first-line TB drugs
- New molecular methods for quick identification of MDR-TB cases introduced
- Liquid culture (MGIT) introduced in phases
- A network for quality assured TB microscopy, culture, and DST established
- The National Public Health Reference Laboratory affiliated to the Supranational Laboratory in South Africa (MRC)
- All laboratory personnel in all public health laboratories equipped with the knowledge and skills in performing QA for TB microscopy
- Follow-up smears performed at two and five months
- Existing laboratory infrastructure rehabilitated to conform to the set standards for TB sputum smear microscopy room space, including infection control

- Functional microscopes provided for use in all TB sputum smear microscopy centres
- Fluorescence microscopes introduced in all regional and teaching hospital laboratories
- Functional preventive maintenance programme established and operational
- All TB laboratories performing culture and DST equipped with biohazard safety cabinets

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Number of new TB microscopy sites established	5	2008	NTP	5	35	20	10	10
Number of functional diagnostic centres	220	2007	NTP	257	230	400	450	661

Intervention 1.3: Improve Clinical Care of TB Patients

Rationale
To improve the level of clinical care provided to TB patients

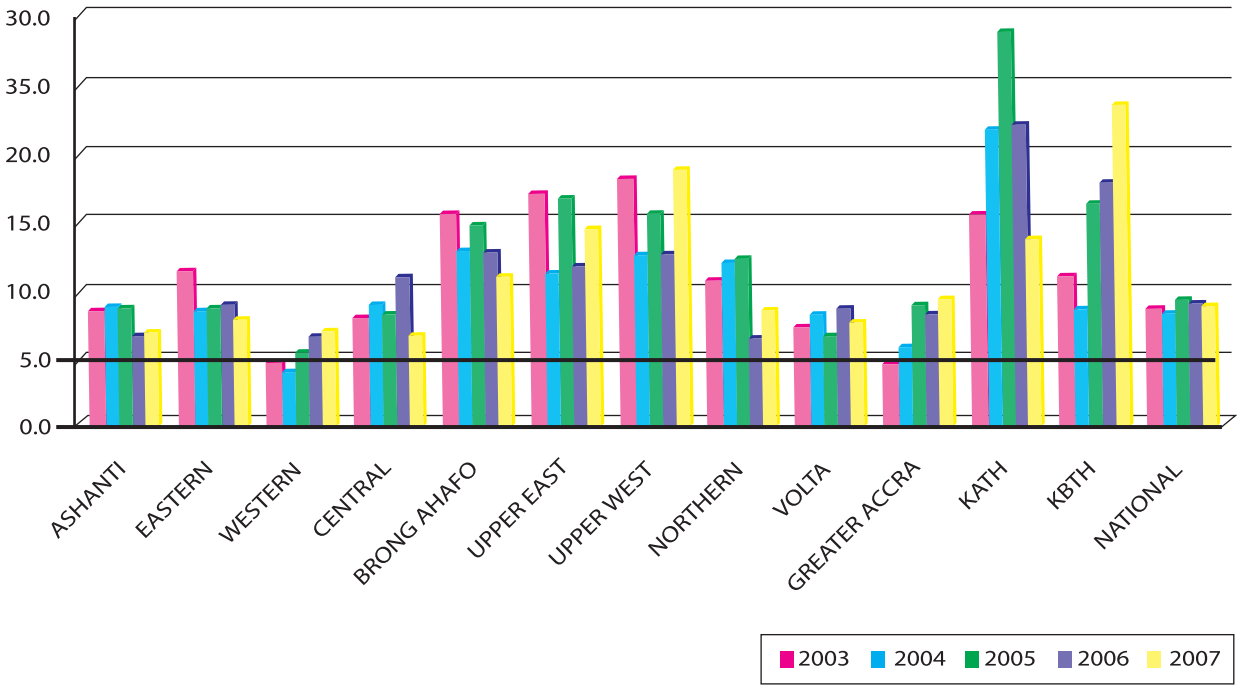
Aims:
To decentralize capacity to attend TB complications in all hospitals

Improve capacity of clinicians to determine the initial risk of dying of TB and attention to complications

Situation Analysis
Results of treatment have been considerably improving over the past years. The percentage of patients not evaluated is at its minimum and treatment success was 84.1 percent in 2007, well on its way to the 85 percent target. The TB case fatality rate (CFR) is a concern, especially because Ghana has a relatively low prevalence (1.9 percent) of HIV infection. In 2007, 99.7 percent of sputum smear-positive cases were evaluated, with a CFR of 9 percent.

The Ministry of Health described TB as the most common cause of premature death in adults. The number of patients who die in the community is unknown. There is, however, a marked difference among regions, as shown in Figure 8 below. In 2007, the Central, Brong Ahafo, Upper and Upper East Regions had the highest mortality rates, more than the national average. The TB CFRs are high at both KATH and KBTH, reaching as high as 15 percent in 2007, largely because they are major reference centers; it is likely that a significant number of patients at these facilities are also co-infected with HIV.

Figure 8: *Mortality rate by region, 1996–2007*



The high mortality among TB patients is partly due to the fact that clinical care of TB patients is largely provided by a lower cadre of health workers. Ability to diagnose and manage other co-morbidities like anemia and malnutrition, therefore, is limited and this leads to high case fatality among TB patients. Furthermore, the environment in which TB patients are cared for is poor and TB wards are always away from other hospital departments. Many hospitals do not have the capacity to manage TB patients, and they depend on referring TB patients with other medical conditions to teaching hospitals.

Activities

- Train 12 doctors at the masters degree level in respiratory medicine to serve as referral clinicians
- Empower chest specialists to oversee management of TB patients at the district level
- Develop and implement guidelines for determination of the initial risk of dying of TB patients and attention to complications
- Decentralize the capacity to attend to TB complications in all hospitals
- Procure laboratory equipments to investigate other clinical conditions
- Support teaching hospitals to provide clinical management supervision to regional and district hospitals

- Pay for the management of other clinical conditions among TB patients
- Empower teaching hospital chest specialists to conduct clinical supervision visits to regional hospitals

Expected Outputs

- Treatment success (cure plus completion of treatment) rate increased from 84.1 percent to 90 percent or more in 2013
- The death rate reduced from 9 percent to below 5 percent in 2013
- Health care staff trained in DOTS
- All DOTS providers (including doctors) trained to recognize and manage TB co-morbidity
- Health systems strengthened through provision of laboratory equipment to investigate other clinical conditions
- All TB patients treated with quality-assured anti-TB drugs using FDC regimen
- Treatment outcomes in regions with poor TB treatment outcomes improved
- Management of TB at district levels monitored by chest specialists from teaching hospitals

Key Indicators and Targets

Impact Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target	Source and Comments
	Value	Year	Source						
Number of doctors trained to managed co-morbidities	20	2008	NTP	20	40	60	80	100	Cumulative
Number of clinical supervision visits to the regional hospitals by chest specialist per year	0	2008	NTP	4%	7	8	10	10	

Intervention 1.4: Patient Support and Treatment

Aim

To improve case holding and encourage early case reporting

Situation Analysis

Provision of the enablers' package is designed to improve early case detection and adherence to treatment, in response to the various barriers to diagnosis and care that TB suspects and TB patients face. This initiative is a carefully formulated system designed to provide financial or material incentives to vulnerable populations such as food, transport vouchers, money, and material goods, which will reduce the cost of seeking TB diagnosis and treatment.

The value of the enablers' package is presently USD 40 per patient for a six-month period. The distribution is 50 percent for the patient, 30 percent for the health staff, and 20 percent for the participating health facility. The enablers' package is an integral component of TB control in Ghana.

In some settings, carefully designed provision of incentives and/or enablers to vulnerable populations has yielded improved tuberculosis treatment outcomes. Nationally, since the implementation of the enablers' package began, the default rate has decreased from 11 percent in 2005 to 3.1 percent in 2007. Consulting with such vulnerable groups to understand what obstacles they face and what incentives/enablers may contribute to better design of a patient support scheme.

Staff from the participating health facilities undertook several tasks to ensure patients' successful treatment completion. The collaborating health facilities were responsible for staff supervision, distribution of supplies, and advocacy. Table 3 summarizes the components of the enablers' package.

For districts and sub-districts it is essential to bring on board the NGOs and CBOs working in the communities to help disseminate TB messages, patients' education, and counseling, as well as to trace contacts of smear-positive index TB patients and defaulters.

Table 3. : Components of the Enablers Package

Patient Components (50%)	Health Staff/Community Volunteer Components (30%)	Health Facility Components (20%)
	Address verification	Monitoring and supervision
	Contact tracing	Training
Transportation	Home visits	Meetings
Food	Early -warning visits	Advocacy
Inter - current illness care	Community education	Supplies
	Defaulter prevention/ tracing	Maintenance and overhead

Activities

- Conduct situation analysis of enablers
- Conduct dissemination meetings of the Enablers Package evaluation report
- Provide the Enablers Package to TB patients and treatment supporters
- Provide enablers to health workers and health facilities
- Train TB treatment supporters in supervision of TB patients and defaulter prevention and tracing

Expected Outputs

- Enablers Package used throughout the country, in public and private health care settings, and including special packages for MDR-TB cases
- The effectiveness (including cost-effectiveness) of the Enablers Package, both the processes and the outcomes of implementation evaluated and disseminated
- TB treatment supporters trained

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Proportion of TB patients receiving enablers	70%	2008	TB MIS	75%	80%	90%	100%	100%

Intervention 1.5: Effective Logistics Management Systems for TB Medicines

Rationale

To establish uninterrupted supply of quality-assured first- and second-line TB drugs

Situation Analysis

The NTP's TB medicines and laboratory supplies is guided by the National Drug Policy, the Food and Drugs Law, and the Ghana Health Service Act. The major objective of the statutes and policies is to ensure access to medicines for public health diseases. Hence, systematic planning, implementation, and monitoring and evaluation of TB services have both strategic and operational impact.

The selection process for the anti-TB drugs is guided by the mycobacterium sensitivity pattern, pathology, and drug and dosage formulations (Table 4). The Ghana NTP selected five anti-TB drugs available as FDC, as shown. In June 2007, the NTP rolled out the FDC countrywide for effective management of TB. The FDC rollout and implementation has not been evaluated. There is currently no paediatric formulation in Ghana. The various regimens given to the different categories of patients are shown in Table 5.

Table 4: List of Anti-TB Drugs

Product for Adults	Strength
■ Rifampicin/isoniazid/pyrazinamide/ethambutol (RHZE)	150/75/400/275mg tablets
■ Rifampicin/isoniazid/ethambutol (RHE)	150/75/275mg tablets
■ Isoniazid/Rifampicin (HR)	300/150mg tablets
■ Pyrazinamide (Z)	400mg tablets
■ Ethambutol (E)	400mg tablets
■ Isoniazid (H)	300mg tablets
■ Streptomycin (S)	1 g injection
■ Products for Children	Strength
■ Rifampicin/Isoniazid/pryrazinamide (RHZ)	60/30/150
■ Isoniazid/rifampicin (HR)	30/60mg tablets
■ Pyrazinamide (Z)	150mg tablets
■ Ethambutol (E)	100mg tablets
■ Isoniazid (H)	100mg tablets

Table 5: Treatment Regimen for Categories I, II.

Category	Initial Phase	Continuation Phase
Categories I	2 HRZE	4 HR
Category II	2 HRZES and 1HRE	5 HRE
Children's anti-TB drugs	2 HRZ	4 HR

The NTP established an annual Procurement and Supply Management (PSM) plan for accessing the medicines through the GDF. PSM effectively utilises a WHO certification scheme for quality assurance, verified by the Food and Drugs Board (FDB).

The existing supply management framework shall be strengthened. On arrival in the country the medicines shall continue to be cleared by the Ghana Supply Company and centrally warehoused at the Central Medical Stores in Tema.

Health facilities will access TB medicines through strengthened supply chain management systems. Health facilities will use the report, requisition, issues and receipt vouchers to report on stock status at the facility as well as place orders from the Regional Medical Stores. The Regional Medical Stores would also use a similar process to place orders from the central level. At all health facilities, and in the Regional and Central Medical Stores, standard inventory control systems will be used to ensure accountability and effective service delivery.

NTP adapted WHO treatment guidelines to ensure rational use and standard therapeutic plans for intensive and continuation phases according to the category of the TB patient for assured treatment outcomes.

MDR-TB in Ghana has been estimated at 1.9 percent among new TB cases (WHO Global TB Report 2008). The Ghana NTP is making positive moves towards managing MDR-TB by using quality-assured second-line drugs procured through the Green Light Committee (GLC). The WHO-recommended regimen for second-line treatment consists of an initial phase (six months) of kanamycin, ofloxacin, ethionamide, cycloserine, and pyrazinamide, followed by an 18-month continuation phase of ofloxacin, ethionamide, and cycloserine but it is currently not available in Ghana for treatment of MDR-TB patients. Ghana is now developing guidelines for programmatic management of MDR-TB.

Activities

- Procure first-line TB drugs for children
- Acquire buffer stock of TB drugs for all categories of patients
- Support effective drug management processes for procurement, storage, distribution, and quality control in-country
- Procure pyridoxine for patients
- Procure first- and second-line anti-TB drugs through the Global Drug Facility and Green Light Committee
- Perform quantification of anti-TB drugs
- Train health workers at levels in Logistics Management Information System for TB commodities
- Renovate the 12 Regional Medical Stores warehouses
- Evaluate the introduction and implementation of the FDC
- Procure technical assistance (TA) in TB drug management
- Sensitize DOTS corner staff on pharmacovigilance for TB medicines
- Assess the logistics system every two years
- Print and disseminate an SOPs for the Logistics Management Information System for TB medicines
- Disseminate the findings and recommendations of the FDC evaluation
- Establish TB medicine subgroup

- Incorporate TB treatment in all relevant documents
  Expected Outputs

- First- and second-line drugs for all categories of patients and children, buffer stock and pyridoxine procured

- Effective drug management for procurement, storage, distribution, and quality control supported

- SOPs for logistics management systems for TB medicines disseminated

- TB treatment strategies incorporated in all relevant national documents such as Standard Treatment Guidelines, National Essential Medicines List, Integrated Management of Childhood Illness, and training curricula of health training institutions

- Innovative initiatives to increase adherence through increased involvement of pharmacy personnel in dispensing and medication counselling, and monitoring of adverse drug events to TB patients established

- The introduction and implementation of FDC evaluated

- TB medicines subgroup established with key NTP stakeholders as members

- Regional medical stores renovated

- External TA on TB drug management procured

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Proportion of TB service delivery points with no stock-out of first-line TB drugs in a year	90%	2008	TB HMIS	95%	96%	99%	100%	100%

Intervention 1.6: Monitoring and Evaluation, Routine Program Management and Supervision Activities

Rationale

To facilitate the most effective and efficient use of human and financial resources to achieve the maximum health benefit for the population

Aims:

- To ensure routine recording and reporting are used to monitor closely the implementation of TB control activities, to identify problems, and suggest solutions
- To ensure that budgeting, financing, and expenditure of TB control are properly monitored
- To assess the impact of TB control activities on the burden of TB, in particular with reference to the Millennium Development Goals
- Provide effective routine programme management at all levels

Situation Analysis

The Ghana NTP has sufficient funds for supervision at all levels. Supervisory checklists have been developed but are not religiously used. Recording and reporting forms have been revised to incorporate HIV parameters and are currently being used. In the face of the strengths stated above, gaps exist, particularly due to:

- Inadequate technical support to ensure good-quality supervision mainly from the Central Unit to the regions, the districts, and sub-districts
- Discrepancies of data submitted at the national level, as the data are not disaggregated according to district and facility
- Inadequate use of checklists at the regional and district levels
- Inappropriate filing system-information collected during monitoring, evaluation, and supervisory visits are kept on loose sheets of paper making that get mislaid and are therefore not available for examination
- Supervisory visits limited in either in number or quality, especially in areas not fully benefiting from the Enablers Package
- TB registers and TB treatment card not filled in completely or containing inaccurate information, resulting in some patients having no unique district numbers
- Limited external technical assistance by partners

Activities

- Conduct periodic surveys for TB prevalence, drug resistance, and KAP studies
- Undertake routine surveillance for TB:
  - Review data management system
  - Establish a database at the national-level for an electronic TB data information and management system
  - Train health staff at the subnational level to use data management system
  - Review recording and reporting forms
- Undertake recruitment processes to fill human resources gaps
- Conduct meetings at national, region and district levels
- Support the activities of the TB Advisory Board and other technical working groups
- Develop, produce, and distribute NTP guidelines
- Conduct supervision visits at all levels
- Improve supervision capacity at all levels
- Procure vehicles to support supervision, and monitoring and evaluation
- Support programme management at the national and sub-national levels
- Support infrastructure (upgrade/renovate medical stores, wards, and DOTS centres)
- Recruit an M&E specialist to be based at the NTP Central Unit
- Maintain the position of the TB Technical Advisor (supported by development partners)
- Procure biannual external TA on monitoring and evaluation

Expected Outputs

- Periodic and routine surveys conducted
- Supervision and monitored conducted at all levels
- Data collection and analysis for public health action strengthened at all levels
- Performance review meetings conducted at the national, regional, and district levels
- NTP manuals and guidelines developed, printed, and disseminated

- An electronic TB data information and management system introduced
- Infrastructure improved
- Various technical working groups and review meetings held
- The position of a TB Technical Advisor maintained at the NTP Central Unit (supported by development partners)
- External TA to address monitoring and evaluation are commissioned

Key Indicators and Targets

Impact Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target	Source and Comments
	Value	Year	Source						
Number of planned supervisory visits completed according to annual work plan	10	2008	TB HMIS	12	14	20	20	20	Additional technical support visit is also implemented as needed

Intervention 1.7: Human Resources Development

Rationale

The rationale of human resource development in this plan is to ensure that critical personnel required are in place, motivated, and have the capacity to meet operational challenges militating against optimum TB control performance.

There is the need to meet the human resource gap to optimize performance for TB control. The right mix of personnel, trained, motivated, and with sufficient time is required to augment service personnel in the general health service.

Aim

To meet the HR gap for all the key intervention areas

Situation Analysis

TB control in Ghana is completely integrated into the Ghana health system. All staff and facilities that are concerned with TB are serving also other diseases. The NTP manager is sometimes asked to oversee other disease control areas and actively seeks opportunities to ensure efficiency and relevance. In addition, the NTP manager is involved in preparing the districts to meet the challenges of further decentralization of health services. With expansion and scope of TB interventions, there is the need to ensure at least dedicated staff or staff that allocate 90 percent or more of their time to TB control.

The NTP is headed by an experienced programme manager, supported by one medical officer as a deputy, who doubles as a focal person for TB/HIV activities. The NTP has 12 programme officers, some of whom are focal persons for the different components of the TB control programme.

The programme officers are responsible for supporting the regions on the implementation of their TB programme activities, but most of them are new staff with minimal competence and experience in the TB program and not fully employed by the GHS.

A GHS human resources plan for 2003–2006 was in place and used by the NTP, though one specifically for the NTP is needed, specifying working hours, staff placements, training measures, and so on. For the purpose of developing an NTP-specific plan, existing HR gaps need to be identified. Most sites have sufficient human resources to carry out the functions of the NTP. Recently, staffing of the Central Unit was increased to cope with its management responsibilities. Management functions such as planning, monitoring and supervision, and communication are carried out in an integrated fashion. With regard to integrated supervision, team members often have insufficient time for their supervisory tasks. The result has been somewhat incomplete reporting and a lack of feedback. As the systems that support TB control are improved, the quality of other disease control programs will likely improve as well. At the district level, office space to carry out duties and capacity to manage program information, especially reports, could be improved.

There are generic in-service training materials for health facilities based on the WHO manuals and a pool of 20 facilitators at the national level. At the regional level there is a training team responsible for conducting trainings, with the supervision of one national facilitator to ensure standardization of delivery. To support comprehensive training planning and implementation, there is a need for an HR database and a comprehensive training package based on need assessment.

The NTP has been training general health staff in TB control activities. In addition, laboratory personnel are trained not only in sputum microscopy but also in general laboratory procedures and care of microscopes, thus strengthening the laboratories in general. In fact, the NTP is the only programme in the GHS that regularly trains laboratory personnel.

Peripheral staff members with NTP managerial roles are exposed to international courses, study tours, and conferences. The enablers' package and the numerous training opportunities for health workers have improved their motivation. TB control is included in the training at medical and paramedical schools.

The record of the Veterinary Services Directorate points to at least 10 bovine TB cases reported from each region each year. There is a need to strengthen the capacity of the personnel of the veterinary services to detect bovine TB.

Strengths

- Focal human resources development (HRD) person at the NTP Central Unit
- Pool of 20 national facilitators
- Supervision systems in place
- A clear NTP organogram
- Training log for all health staff
- Performance management system at the regional and district levels

Gaps

- No database of the trained personnel
- Current supervision checklist does not address performance
- Lack of competence in supervision among staff at all levels
- Need for additional staff to ensure quality of programme and timely reporting
- Inadequate TA support from international agencies

Activities

- Build human resources capacity at all levels
- Build capacity of veterinary services to undertake inspection of meat and dairy products
- Support international technical assistance missions
- Support country-based staff from international agencies providing technical assistance to NTP
- Undertake initial and refresher training for various aspects of TB patient care and programme management at all levels
- Support initial and refresher training for MDR-TB at all levels
- Undertake initial and refresher training for PAL at all levels
- Conduct initial and refresher training for PPM at all levels
- Support initial and refresher training for community involvement in TB care
- Hold initial and refresher training for ACSM activities and civil society
- Conduct initial and refresher training for infection control at all levels
- Support international training for health staff
- Conduct initial and refresher training of medical doctors for TB care
- Support coordination activities for TB control
- Support other aspects of human resources development
- Develop or revise the TB training curriculum for health training institutions
- Pay subscription fees for the International Journal of TB and Lung Diseases (IJTLD) and another journal such as AIDS or The Lancet
- Support two doctors/nurses each year to undertake a masters degree course in respiratory medicine, epidemiology, and public health

- Orient lectures to teach undergraduates about TB
- Recruit graduates to meet staff shortages and assist current TB focal persons
- Develop an HRD strategy for TB control (based on the MOH HRD strategy)
- Procure TA on HRD for TB control

Expected Outputs

- Human resources capacity built
- Capacity of veterinary personnel to detect bovine TB built
- External technical assistance commissioned
- Resident technical assistance for TB control supported
- TB control technical and management capabilities for the various categories of health personnel at all levels built
- Communities trained in TB control
- TB training curriculum for TB control revised
- A human resources development strategy for TB control developed and disseminated
- Continuous medical education for NTP staff in place
- Subscription to the IJTLD and one more journal secured
- External technical assistance for various aspects of TB control commissioned

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Number of health personnel trained according to National guidelines	2,839	2008	TB HMIS	3,636	4,2424	4,848	5,454	6.060

Strategy 2: Address TB/HIV, MDR-TB, and Other Challenges

The HIV epidemic fuels the TB epidemic. In patients with HIV, recent or latent Mycobacterium tuberculosis infection is more likely to progress to active TB disease; HIV infection also increases the rate of recurrent TB. In the long term, only effective control of the HIV epidemic will reverse the associated increase in the incidence of TB. In the meantime, interventions to reduce HIV-related TB morbidity and mortality should be implemented.

Evidence shows that MDR-TB is a threat to global TB control. The problem is aggravated by inadequate treatment of those already infected with TB, the rise in drug resistance resulting from the widespread misuse of first-line anti-TB drugs, and the lack of effective new drugs to treat TB.

TB control programmes must address certain special population groups and special situations that are associated with a higher TB risk. In health care and congregate settings, where people with TB and HIV are frequently crowded together, the risk of contracting TB is increased. At-risk groups that need special attention include prison populations, refugees and other displaced people, migratory workers, illegal immigrants, cross-border populations, orphans, the homeless, ethnic minorities, other marginalized groups, alcohol abusers, and injecting drug users.

Address TB/HIV, MDR-TB, and other challenges

- *Implement collaborative TB/HIV activities*
- *Prevent and control multidrug-resistant TB*
- *Address prisoners, refugees, and other high-risk groups and special situations*

Intervention 2.1: Provide TB/HIV Collaborative Services

Aim

To reduce the burden of HIV in TB patients
To reduce the burden of TB among people living with HIV and AIDS (PLHIV)

Situation Analysis

Reducing the Burden of HIV Among TB Patients

The HIV prevalence in the general population in Ghana is estimated at 1.9 percent (HIV Sentinel Report 2007). It is estimated that 268,134 Ghanaians are living with HIV (NACP 2007).

HIV prevalence among TB patients in Ghana is 14.8 percent. Routine programme data from TB/HIV sites show that in 2005, 40 percent of TB patients who were tested for HIV were HIV-positive and in 2006 this went down to 33 percent (NTP Annual Report 2005, 2006). In 2008, a total of 14,002 TB patients were registered, and 6,976 (49 percent) of them were tested for HIV,

of whom 1,612 (23 percent) were HIV-positive (NTP Information System). It is worth noting that data on TB/HIV are not coming from all the 1,600 TB treatment sites, because these activities are yet to be expanded countrywide. Currently, data sent to the national level from the regions is not segregated to reflect TB/HIV case reports for each facility; therefore, it is difficult to know how many facilities are implementing TB/HIV collaborative activities. The other challenge is that even in those sites that are implementing TB/HIV collaborative activities documentation is inadequate. Therefore, there is a possibility of gross underreporting.

In responding to the twin TB and HIV epidemic, in 2005 Ghana established a national coordinating body for implementing TB/HIV collaborative activities, which resulted in the development of two key documents, (1) TB/HIV policy and guidelines for the implementation of TB/HIV collaborative activities and (2) guidelines for clinical management of TB and HIV co-infected patients, which have been disseminated countrywide. The advantage is that the TB/HIV coordinating body is present at the national level. The lower levels are expected to use existing structure to coordinate activities. There is a common joint implementation plan. Sharing of data between the TB and AIDS programmes could be improved.

Effective provision of TB/HIV collaborative services largely depends on what the health systems can offer, such as having centres that provide high-quality HIV testing and counselling services to the general public, including TB patients. As of the end of 2007, Ghana had 422 functioning voluntary counselling and testing (VCT) centres and 114 antiretroviral therapy (ART) centres. These VCT centres are fewer than the 1,600 centres where TB patients are able to receive TB treatment. Therefore, many TB patients still have no easy access to HIV counselling and testing services and those who are able to access HIV testing and are found to be HIV-positive may not easily access ART.

By the end of December 2007, a total of 13,429 children and adults were reported to have ever started on ART, of whom 12,315 (91.7 percent) were known to be continuing with ART and 511 (3.8 percent) had died (NACP Report 2007).

Reports from the NTP show that in 2005, of the 340 TB patients who tested HIV-positive, 125 (37 percent) were offered ART, and in 2006, of the 711 HIV co-infected patients 99 (14 percent) were started on ART (WHO Global TB Report 2008). In 2008, 367 HIV-positive TB patients were started on ART (of the total 1,612 HIV-positive TB patients).

Recording and reporting for HIV-positive TB patients who are offered co-trimoxazole preventive therapy (CPT) is generally poor because CPT is only offered at HIV care clinics and not at DOTS centres. Of the 1,612 HIV-positive TB patients reported in 2008, a total of 1, 371 (85percent) were offered CPT (WHO Global TB Report). The percentage of HIV-positive TB patients who were offered CPT increased from 72 percent in 2007 to 85 percent in 2008. In many facilities HIV-positive patients often face stock-outs of co-trimoxazole tablets for HIV-positive clients.

In 2007, the Ghana NTP incorporated HIV parameters in the recording and reporting tools, which has enabled the programme to collect data for TB/HIV collaborative activities. The National AIDS Control Programme is working towards updating its data collection tools to include TB variables.

Although HIV-positive patients with TB are all potentially eligible for ART - as they fall either in the WHO clinical stage 3 or 4 - the current eligibility criteria for starting HIV-positive TB patients on ART is primarily based on CD4 count. Patients with a CD4 count of 350 or below are started on ART after they are stabilized on TB treatment. The eligibility criteria also give doctors discretion to decide when to start the patient on ART based on patients' clinical conditions in relation to the CD4 level. Some eligible TB patients may not be accessing ART as expected.

Activities

- Scale up sites that provide TB/HIV collaborative activities
- Provide HIV counselling and testing to TB patients
- Provide HIV care and support to co-infected TB patients
- Provide CPT to HIV-positive TB patients
- Provide ART to eligible TB patients
- Conduct various meetings on TB/HIV activities at all levels
- Conduct training (including refresher) to health care workers and the community on TB/HIV
- Conduct surveillance of HIV among TB patients
- Train DOTS corner staff in HIV counselling and testing
- Reproduce information, education, and communication (IEC) materials for HIV prevention
- Conduct biannual TB/HIV technical group meetings at the national level
- Conduct TB/HIV situational analysis to assess expansion of TB/HIV collaborative activities
- Advocate for revision of the national ART guidelines to allow early initiation of ART among eligible HIV-positive TB patients
- Procure condoms for TB patients
- Establish effective referral networks between HIV and TB clinics
- Procure external technical assistance in TB/HIV

Reducing the Burden of TB Among PLHIV: The Three 'I's (ICF, IPC, and IPT)

Prevention and treatment of TB in PLHIV is an urgent priority for both HIV/AIDS and TB programmes. The Three 'I's - isoniazid preventive treatment (IPT), intensified case finding (ICF) for active TB, and TB infection prevention and control (IPC)- are key public health strategies to decrease the burden of TB for people living with HIV and AIDS. Below are some of the key points on the Three 'I's:

- TB preventive therapy with isoniazid (INH) is safe and effective in PLHIV, reducing the risk of TB by 33 percent to 62 percent.

- Screening and diagnosing TB in people living with HIV can be challenging, but TB is curable in people living with HIV.

- TB infection control is essential to keep vulnerable patients, health care workers, and their communities safe from getting TB.

Therefore:

- The Three 'I"s should be a central part of HIV care and treatment and are critical for the continued success of ART scale-up.

- All people living with or at risk of HIV in areas of high HIV and TB prevalence should be screened for TB and either confirmed and treated for active TB or placed on IPT.

- Rapid culture, such as MGIT facilities, should be provided to exclude TB in all HIV patients prior to initiating IPT.

■ Intensified TB Case Finding (ICF)

ICF for TB means regularly screening all people with or at high risk of HIV or in congregate settings (such as mines, prisons, military barracks) for the symptoms and signs of TB, followed promptly with diagnosis and treatment, and then doing the same for household contacts. Simple questionnaires to screen for TB should be performed when people seek HIV services (e.g., ART, prevention of mother-to-child transmission [PMTCT], VCT) and/or by community-based organizations supporting people with HIV. ICF will serve as the important gatekeeper for the two other 'I's (IPC and IPT), facilitating rapid identification of TB suspects (allowing for triage and other steps to reduce TB transmission), and acting as the necessary first step for health care providers to confidently prescribe IPT to PLHIV who do not have active TB.

The NTP shall therefore continue working with the National AIDS Control Programme, civil society organizations, and communities in establishing quality-assured, systematic TB screening at each encounter with the HIV-infected persons using a minimum, simple set of signs and symptoms for early identification and evaluation of TB patients per the national algorithm in all HIV testing and counselling centres, ART, PMTCT, and STI clinics, and congregate settings such as prisons. This practice should be able to identify a significant number of TB suspects in such settings, and thus TB patients.

■ TB Infection Prevention and Control (IPC))

Within the past three years, the National TB Programme has sought to address infection control measures to prevent TB infection in hospitals and congregate settings within the Ghana Health Service and MOH context. The programme has made resources available and has fully participated in the development of policy and guidelines for infection control in health care facilities.

On its own, the programme has implemented infection control guidelines for laboratories.
The NTP will therefore implement key activities to address the following challenges in the next five years.

Programmatic Measures:

- Advocate, and in collaboration with relevant MOH departments, conduct sensitization meetings and provide training on a yearly basis on the developed infection control policy and guidelines
- Support the production of training and educational materials
- Promote cough etiquette in all health care facilities and among community volunteers in TB care

Administrative Measures:
The programme will focus specifically on TB treatment facilities and will:

- Support upgrades or renovations for existing structures
- Ensure safe sputum collection.

Environmental Measures:
The programme will carry out these measures:

- Contract technical assistance to conduct situational analysis for two teaching hospitals' environmental measures
- Procure equipment for ventilation and irradiation

Personal Protection Measures:

- The programme has acquired limited quantities of respirators and will continue to procure other supplies to protect health workers.

■ Isoniazid Preventive Therapy (IPT)

Isoniazid preventive therapy for TB can safely be given to people living with HIV/AIDS without TB disease, reducing the risk of developing TB by 33 percent to 67 percent for up to 48 months. It is currently recommended for all PLHIV in areas with a prevalence of latent TB infection over 30 percent, and for all PLHIV with documented latent TB infection or exposure to an infectious TB case, regardless of where they live. More recently, evidence has shown that the combined use of IPT and antiretroviral therapy among people living with HIV/AIDS significantly reduces

the incidence of TB; and the use of IPT in patients who have successfully completed a course of TB therapy has been shown to markedly reduce the risk of subsequent TB cases.

The Ghana Technical Policy and Guidelines for TB/HIV Services propose the implementation of operational research to investigate the feasibility and effectiveness of IPT. The key issue in Ghana will be to pilot the feasibility of implementation, because the effectiveness of IPT has been widely documented in various studies. Considering that completion rates have been low in some pilot sites, it will be ideal to pilot this activity among PLHIV registered with support groups because they can easily be monitored as they attend monthly group therapy meetings.

The World Health Organization and other technical agencies engaged in global TB control have recently reemphasized the need to scale up IPT.

Ruling out active TB in PLHIV is a challenge. It is suggested that before an individual is placed on IPT, clinical examination, sputum smears, culture, and chest X-ray be performed.

Activities:

- Offer TB screening among PLHIV and other congregate settings
- Procure X-rays for TB screening and diagnosis
- Train PLHIV support group members in referring TB suspects for TB diagnosis
- Print and disseminate infection control policy and guidelines
- Procure personal protection equipment and supplies
- Upgrade health facilities to be consistent with TB infection control
- Train health facility staff in TB infection control
- Provide IPT to PLHIV registered with support groups without active TB
- Procure additional INH tablets for the IPT programme

Expected Outputs:

- HIV counselling and testing offered routinely to TB patients
- All DOTS centres providing on-site HIV testing for TB patients
- All HIV-positive TB patients offered CPT, unless there are contraindications
- All HIV-positive TB patients offered ART according to the national ART guidelines
- NTP advocating for early introduction of ART in HIV-positive TB patients

- Where TB and ART clinics are not integrated, mechanisms to ensure effective referral from TB treatment to ART clinics and vice versa developed
- IEC materials addressing management of co-infected TB patients and behaviour change developed and disseminated
- Condom education and distribution to TB clients in all DOTS centres provided
- All staff in CT centres and HIV treatment and care clinics trained on the use of TB screening tools
- Referral networks between HIV clinics, VCT centres, and TB clinics fully functional, with good feedback mechanisms
- VCT registers and other HIV recording and reporting forms incorporating TB screening variables
- National infection control policy and framework developed, printed, and disseminated countrywide
- Health facilities upgraded or renovated
- Personal protection equipment acquired
- Phased implementation of IPT with periodic assessment conducted

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Percentage of TB patients counselled and tested for HIV	53.6%	2008	TB HMIS	60%	66%	70%	80%	90%
Proportion of HIV positive TB patients who receive CPT during their TB treatment	82.6%	2008	TB HMIS	84%	85%	90%	90%	95%

Intervention 2.2: Implement Prevention and Control of MDR-TB

This is relatively neglected area in previous implementation of strategic plans. It is a priority for this current implementation.

Aims

- To integrate the management of drug-resistant TB and drug resistance surveillance as part of routine TB control in Ghana

- To prevent deaths and continued transmission of drug-resistant strains and creation of XDR-TB

Situation Analysis

Until the middle of 2007, NTP had been using a drug regimen with HT in the continuation phase. Because of this, the creation of drug resistance has probably been minimal, and few cases of MDR-TB are expected. A WHO Global TB Report for 2008 estimates that the incidence of MDR-TB in Ghana is 1.9 percent of all new cases. The Ghana NTP successfully rolled out FDCs countrywide in June 2007. The introduction of the new drug regimen, containing RH in the continuation phase, will necessitate DOTS throughout the treatment to minimize the risk of developing MDR-TB.

The defaulter rates have been consistently dropping and were at an all-time low in 2007 of 3.1 percent; the failure rate has been at 2 percent. These data point to improvement of the quality of DOTS in Ghana.

Ghana has a policy of performing routine culture and DST, but this activity is not being conducted according to the NTP policy. In 2005–2006, a TB drug resistance survey was conducted by the NPHRL and NMIMR using the WHO generic protocol. There has been a considerable delay in completing data analysis. There is currently no second-line TB drug to manage MDR-TB patients, but there was a proposal to secure quality-assured second-line drugs through the Green Light Committee (GLC). An application submitted to the GLC was not successful because Ghana was not linked to a Supranational Reference Laboratory. With technical assistance from WHO, Ghana has established a link to the MRC in South Africa.

Few MDR-TB patients have been reported and the NTP is making necessary steps to start treating these patients. The NTP is preparing to start programmatic management of MDR-TB patients in 2009. It is expected that the GFATM will provide funding for the next two years to support the upgrading of two teaching institutions, enabling them to develop and manage MDR-TB patients. Korle Bu Teaching Hospital has been identified to be the MDR-TB Cases Management Centre.

Some physicians have been sent to international courses to be trained in managing MDR-TB patients. As part of this preparation, the NTP started the process of developing national guidelines for management of MDR-TB. A draft guideline is currently available. Based on experiences from countries that are already managing MDR-TB patients, Ghana will use a mix of strategies in managing MDR-TB patients. Depending on circumstances, MDR-TB patients may be managed at hospitals or at the community level. There is no a single isolation ward available in the entire country if an XDR-TB is diagnosed. The NTP has acquired a plot of land to construct a small, 12-bed special isolation ward for such special cases.

Steps have been taken to revise the current TB forms to capture treatment outcomes of smear-positive retreatment cases, but data are only available for relapse cases, as shown in Table 6. Other retreatment outcomes become available for the 2007 cohort.

Table 6. *Treatment Outcomes for Relapse Cases (Percentage), 2005–2007*

Year	Relapses	Cured	Treatment Completed	Died	Failure	Default	Transfer Out	Treatment Success
2005	452	55.3	11.3	9.7	3.8	14.4	5.5	66.6
2006	430	53.3	20.0	11.4	3.3	8.4	3.7	73.3
2007	463	59.6	22.6	12.6	2.9	1.0	1.2	82.4

Activities

- Develop and disseminate MDR-TB guidelines
- Hold MDR-TB technical working group meetings
- Train doctors and nurses in the management of MDR-TB patients
- Train health workers in MDR-TB
- Identify MDR-TB cases
- Sensitize the community about MDR-TB
- Conduct a drug resistance survey
- Procure second line anti-TB drugs
- Build a national MDR-TB /XDR-TB management centre
- Develop a monitoring and evaluation plan for MDR-TB management
- Provide nutritional support for MDR-TB patients
- Establish mechanisms for transportation of sputum samples from DOTS centres (from retreatment TB cases) to the National Public Health Reference Laboratory
- Procure two PCR machines
- Train laboratory biomedical scientists in the new diagnostic methods
- Conduct contact tracing in households of MDR-TB patients
- Send suspected MDR-TB isolates to the Supranational Reference Laboratory in South Africa

- Rehabilitate three laboratories to Level 3 status
- Procure technical assistance on MDR-TB
- Provide incentives to MDR-TB patients
- Renovate wards to manage MDR-TB

Expected Outputs

- MDR-TB programme established
- Drug resistance survey (DRS) data among a representative sample of new and retreatment cases are known
- Referral networks for MDR-TB suspects in place
- National guidelines to manage MDR-TB cases in line with international standards developed and disseminated
- Health workers trained to manage MDR-TB cases, both at health facilities and the community level
- An MDR/XDR TB ward built
- A system to monitor management of MDR-TB patients, including treatment outcomes, is established
- A system for psychosocial support for MDR-TB patients and their families including nutritional support and incentives is established
- A GLC-approved plan with access to quality-assured second-line drugs developed
- A strong MDR-TB technical working group that meets regularly to plan and monitor the management of MDR-TB patients supported
- PCR machines procured
- TAs on MDR-TB issues commissioned
- Wards to manage MDR-TB cases renovated
- PCR machine procured
- Incentives for MDR-TB patients provided
- Contact tracing in households with an MDR-TB case performed

Impact Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target	Source and Comments
	Value	Year	Source						
MDR - TB prevalence rate	1.9%	2006	WHO					0.9%	Recent drug resistance survey is at analysis stage

Note: *The targets from 2009 to 2012 have not included because treatment for MDR-TB treatment has not yet commenced.*

Intervention 2.3: Other High-Risk Groups

2.3.1 Prisoners

Aim

To have effective policies addressing prevention and management of TB cases among prison inmates, including supervision, monitoring and evaluation, according to the DOTS strategy

Situation Analysis

Ghana has a total of 42 prison establishments and correctional facilities, which include one maximum-security prison and medium-security prisons that are used for persons serving sentences of one to two years. Open prisons house less dangerous offenders. The penal system staff numbers approximately 3,800, with an estimated 12,000 inmates.

Collaboration between the prison service and the NTP began in 2004. With the support of the Round 5 GFATM grant, the Ghana Prisons Authority is the lead implementing agency and is responsible for overseeing activities intended to reduce TB transmission in 12 prisons within the Ghana penal system. Several activities have since been undertaken. During 2006, all commanders of the prison service were sensitized to TB by the NTP. In addition, two separate three-day workshops were held for 70 prison health staff. The aim was to increase their capacity to refer, diagnose, treat, and report on TB cases in the prison community. Other issues dealt with included how prison staff could network with general health services to ensure that inmates completed their treatment and how to monitor the treatment outcomes of inmates discharged before completing their treatment regimens. Finally, the importance of counselling TB patients before starting treatment and having a positive attitude towards TB/HIV patients was discussed.

The risk of both TB and HIV transmission is increased in prisons due to serious overcrowding and poor ventilation (e.g., more than 50 individuals sleeping in one room with only one door and no window), stress, and poor nutrition. HIV testing is not routine, despite the high risk of transmission, nor are condoms provided to prisoners. The TB register showed 43 new cases among the 2,752 inmates in 2006: 17 were smear-positive, 8 smear negative, 11 without smear examinations, and 7 extrapulmonary cases.

The 2005 cohort analysis showed a cure rate of only 13 percent and a high death rate, at 31 percent. Fifty-six percent of the TB patients were lost to follow-up and ran the risk of developing and transmitting drug-resistant TB; these included patients sent to the police station (where they spent days or weeks before being returned to prison), those transferred to other prisons, and those released from prison after serving their sentences.

Activities

- Establish strong partnership between the NTP, GHS, prison, and police service
- Conduct biannual review meetings for TB for prison commanders
- Establish effective referral network between prisons and public health facilities
- Conduct TB screening among inmates
- Conduct biannual review meetings for TB control in prison
- Train prison officers about TB control
- Conduct supervision and monitoring in all prisons
- Conduct research to determine the true magnitude of TB in prison
- Renovate the model prison cell to conform to TB infection control standards

Expected Outputs

- Strong partnerships with the Ghana prison and police services continued to be consolidated
- TB screening performed on arrival at prisons and regularly for all inmates
- Effective plans are in place to deal with management of TB cases among prisoners, including the ones of uncertain duration of stay (remand custody)
- TB-DOTS available in all prisons
- Prison staff trained in DOTS
- Collaboration between prison authorities and both public and private health facilities improved
- Prisons included in regular quarterly reviews and regular monitoring and supervision
- Operational research to determine the extent of tuberculosis problem in prisons conducted
- Provision of resources for management of tuberculosis ensured

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Number of prisoners screened for TB annually	Unknown	2008	Prison TB team	300	2,000	4,000	5,000	7,000

Intervention 2.3.2: Refugees and Contacts of Smear-Positive TB Cases

Aim

To increase awareness of the need for screening for TB among refugees

Situation Analysis

There are two refugee camps in Ghana, one in the Western Region and the other in Central Region, with a population of 20,000 and 56,000, respectively. The population consists mostly of refugees from Liberia and most of the refugees have been at the camps for more than 15 years. These camps are administered by the UN High Commission on Refugees (UNHCR) and Catholic Relief Services (CRS). There is one clinic in the Central Region camp. In 2007, 179 new TB cases were notified, corresponding to approximately 350 per 100,000 population. Case finding is passive, based on symptoms. There is a DOTS programme, linked with the NTP. The policy direction of UNHCR in collaboration with the GOG is to integrate them into the general population and break up the camps. But while the refugees are still kept in the camps, specific TB control interventions are needed.

Activities

- Conduct contact tracing in households with an index smear-positive TB case
- Develop a specific plan to manage TB in refugee camps

Expected Outputs

- A plan for prevention and management of TB among the population in refugee camps developed and implemented, in line with the Stop TB Strategy and in collaboration with the UNHCR and CRS
- Partnership between GHS, UNHCR, and CRS forged

Intervention 2.3.3: Address Childhood TB

This area, which has received little attention, will be prioritized in the implementation of the current strategic plan.

Childhood TB often presents nonspecifically and is a common differential diagnosis in high-prevalence areas. Current diagnostic tools have poor sensitivity and cannot reliably exclude TB, making overdiagnosis and underdiagnosis common. HIV co-infection exacerbates this problem and counts for an increasing problem of pediatric TB worldwide.

In Ghana about 2.5 percent of TB patients registered for TB treatment are children (age below 15). Contacts of smear-positive cases are at high risk of contracting the TB disease. This especially concerns children under five years of age and particularly those living with HIV. Contact tracing of smear-positive TB cases shall be conducted and household members found with TB will be treated according to the national TB treatment protocol; children under five years who do not have active TB will be offered INH at a dose of 5 mg/kg body weight. The Mantoux/purified protein derivative (PPD) test should be reintroduced for TB screening in children.

Specific guidelines on the diagnosis and treatment of TB in children will be developed, printed and disseminated. TB recording and reporting forms to document TB case finding and treatment outcomes will be revised in line with WHO recommendations.

Activities

- Conduct situational analysis about practice in managing paediatric TB cases
- National sensitization meetings (with health authorities to mainstream childhood TB interventions as part of routine NTP activities)
- Development of training materials
- Producing IEC materials for target groups such as health workers, mothers, and community members
- Procure PPD test kits

Expected Outputs

- Situation analysis conducted
- Sensitization meetings conducted
- IEC materials developed
- PPD test kits procured

Strategy 3: Contribute to Health System Strengthening

Health system strengthening is defined as "improving capacity in some critical components of health systems, in order to achieve more equitable and sustained improvement across health services and outcomes."

Objective
To actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery, and information systems

Share Innovations That Strengthen Systems

The NTP will actively participate in efforts to improve service delivery; the health workforce; information systems; medical products, vaccines and technology; financing; and leadership and governance.

Contribute to health system strengthening

Actively participate in efforts to improve system-wide policy, human resources, financing, management, and service delivery and information systems

Share innovations that strengthen systems, including the Practical Approach to Lung Health

Adapt innovations from other fields

Intervention 3.1: Practical Approach to Lung Health (PAL)

This is one of the priority areas to be considered in current plan.

Aim
To contribute to health system strengthening through implementation of PAL strategy, aiming to improve the quality of care for every patient who seeks care for respiratory symptoms and the efficiency of health care delivery services for respiratory illnesses in general

Situation Analysis
PAL is a minimum package of care provisions that should be offered to any respiratory patient in a primary health care (PHC) setting.

WHO states that up to one-third of patients aged 5 years and above attend primary health care settings seek care for respiratory symptoms. Ideally, a significant proportion of TB cases should be detected among patients presenting with respiratory symptoms in the primary health care settings. PAL strategy includes two components:

- Standardization of clinical care through the adaptation and development of clinical practice guidelines focusing on priority respiratory diseases and targeting, particularly, the improvement of TB case detection as well as the quality of TB diagnosis within PHC system. These guidelines are based on the principle of using key symptoms and signs that lead to diagnostic classification, determination of degree of severity, and the appropriate decision of management.

- Coordination based on the collaboration among health workers at the same and different levels of the health system, as well as within and among the various categories of health workers in order to make the most efficient use of available resources. Coordination also implies a clear definition of the role of each health worker category and each health care level in providing respiratory care services. This contributes to establishing efficient a referral system for respiratory cases in general and for TB suspects and TB cases in particular. In addition, coordination is needed among TB and HIV/AIDS control programmes, general health services, PHC departments, the Essential Drugs Programme, the health management information system (HMIS), the existing training network, and others programmes.

The NTP has rolled out and is implementing several national initiatives, including FDCs, CB-DOTS, TB/HIV collaboration, and PPM. PAL offers yet another concept and a slightly different approach to improving case detection and the management of TB while also addressing other respiratory conditions. Ghana is currently not implementing PAL, but during the next five years PAL will be given priority as an aid in improving case detection rates.

Activities

- Conduct situational analysis in three regions
- Conduct consultative meeting with PAL experts
- Establish a national working group and assess PAL needs in the country
- Produce/develop guidelines and training materials
- Train health workers
- Establish good collaboration with the IMCI programme
- Procure an external TA on PAL

Expected Outputs

- TA procured through WHO and other key international partners to conduct situation analysis
- Collaboration established with existing programmes that provide primary health care, such as IMCI and noncommunicable diseases, such as asthma.
- PAL initiative established in the three regions.
- Monitoring and evaluation system for patients for PAL developed

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Number of districts trained for PAL	0	2008	TB HMIS				60	80

Note: *Targets from 2009 to 2011 have not been indicated because PAL implementation will only start 2011*

Strategy 4: Engage All Care Providers

Intervention 4.1: Implement PPM DOTS

Aims

- To improve TB case detection and access to TB care services for the general population by engaging health care providers used by them
- To increase the involvement of private practitioners in DOTS implementation
- To assist NTP in reaching the global TB control targets by actively involving private and public sector care providers in DOTS implementation

Situation Analysis

The PPM DOTS programme in Ghana has brought the public and private health sectors together for the purpose of achieving a common public health goal. As a result, some (but not all) of the potential benefits of the collaboration have been realized in the first two years of implementation. PPM has improved access to laboratory services; the ratio of laboratories to the population has greatly improved in the pilot centres. The sequence of local implementation of PPM-DOTS has been clear and logical. Priority is given to private sector facilities in areas where public-sector facilities are difficult to access (Table 7). Public sector staff are oriented and trained in PPM-DOTS implementation. The referral system between public- and private-sector providers is in place and seems to be functioning well. TB diagnosis and treatment have been standardized, treatment success rates have improved, and an increasing number of cases are being detected by private providers. However, 2008 for the first time recorded the highest number of reported TB cases. This in part is being attributed to increased participation from NGOs, civil society organizations, and the private sector. Under GFATM Round 5, the number of cities implementing PPM-DOTS has increased from two to six.

Table 7: *PPM-DOTS Coverage in Private Health Facilities in Accra, Kumasi, and Tema*

District	Total Public Facilities	Total Private Facilities(Hospitals & Clinics)	Total Private Labs	Private Facilities with Trained Staff	Private Labs with Trained Staff	Private Facilities Reporting Cases	Private Labs Reporting Cases
Accra	16	250	54	35	18	32	16
Kumasi	8	203	20	33	13	31	11
Tema	3	20	10	10	2	6	1
Total	27	473	84	78	33	69	28

Source: *PPM Review, May 2006.*

The policies and practices of the NTP are consistent with the International Standards of TB Care (ISTC), which might be useful as an advocacy tool to endorse and legitimatize NTP guidelines and training materials. Operational guidelines for PPM-DOTS will be developed to guide the scale-up of PPM-DOTS activities.

Activities

- Develop operation guidelines for scaling up PPM-DOTS
- Conduct national-level advocacy meetings
- Accredit additional private clinics to start diagnosing and treating TB patients
- Train doctors and health staff working in the private clinics on DOTS
- Conduct supervision and monitoring at the district level
- Develop training materials for PPM-DOTS
- Conduct operational research to assess the involvement of chemical shop owners in TB control
- Support patient care in the private sector
- Conduct national-level advocacy meetings
- Develop and print guidelines, IEC materials, and tools for PPM
- Provide Enablers Package to private clinics
- Conduct local consultative and advocacy meetings
- Provide laboratory equipment to private clinics

Expected Outcomes

- Operational guidelines for the scale-up of PPM-DOTS developed and disseminated
- The public and TB patients informed about the availability PPM-DOTS through relevant ACMS activities
- National stakeholders meetings conducted to discuss the involvement of chemical shop owners in TB control
- Quality assurance plan for private laboratories developed and implemented
- New opportunities to apply ISTC in the public and the private sector identified
- PPM-DOTS expanded beyond the six cities

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Percentage of TB patients notified or referred by the private sector/all cases notified	4%	2008	TB HMIS	4%	6%	8%	9%	10%

Intervention 4.2: Implement PPM-DOTS in the Mines

Aim

To improve TB case detection in the workplace

Situation Analysis

Ghana has a considerable gold-mining industry. Experiences from South Africa show that workers at mines are at a comparatively higher risk for TB and tend to have higher HIV prevalence rates than the general population as well. Opportunities for increased case finding through workplace program/public-private cooperation with Ghanaian gold mines may be explored. Currently, mine workers are cared for by hospitals that are linked to the Ghana Health System. Effective low-cost measures for active case finding may include sending a nurse from the hospital to the mines once a month for screening and training a representative of the mine in DOTS. The German Organization for Technical Cooperation (GTZ) is training big companies (but not the mines) in Ghana in screening, referral, and DOTS. Cooperation with GTZ could be extended to the gold mines.

Activities

- Establish TB workplace programmes in the mines
- Train miners' health staff in TB
- Perform regular TB screening among miners
- Conduct contact tracing in households with an index smear-positive miner

Expected Outputs

- TB workplace programme established in big mines
- TB screening conducted among miners

Strategy 5: Empower People with TB and Communities

ACSM encompasses advocacy to influence policy change and sustain political and financial commitment; two-way communication between care providers and people with TB, as well as communities, to improve knowledge of TB control policies, programme, and services; and social mobilization to engage society, especially the poor, and all allies and partners in the campaign to stop TB. ACSM strategy is a multipronged approach to impart the right knowledge to the right people at the right time and right place.

Community participation in TB care implies establishing a working partnership between the health sector and the community - the local population, especially the poor, and TB patients both current and cured.

The patient's charter outlines the rights and responsibilities of people with TB and complements the ISTC for health care providers. It is based on the principles of various international and national charters and conventions on health and human rights. Its purpose is to empower people with TB and communities and to make the patient-provider relationship mutually beneficial.

Intervention 5.1: Advocacy, Communication, and Social Mobilization

Aim

To bring global and local attention to TB and mobilize action to get TB treatment to every person who needs it:

- To place TB high on the political agenda, foster political will, and increase and sustain financial and other resources for ACSM activities
- To create and improve knowledge among the general public about TB
- Mobilize communities for engagement in TB activities

Situation Analysis

Different partners have been engaged to promote various aspects of the programme, based on their respective strengths. GFATM Round 5 is supporting a major portion of the ACSM initiative. The strategy involves a phased approach, with emphasis on mass media (radio, TV, print), interpersonal communication, civil society engagement, and community outreach services. The programme is set to run for two years and address stigma and incorrect beliefs and practices, DOTS, and treatment-seeking behaviour. The partners include the Ghana Society for Prevention of Tuberculosis, the Centre for Development of People, the Ghana Social Marketing Foundation, and the Ghana Postal Service. World TB Day has ACSM activities every year. NGO activities began in the third quarter of 2006. Stop TB Partnership/Ghana has developed an independently funded website.

There is no comprehensive plan, other than the Round 5 GFATM proposals that summarize all activities in ACSM. Operational research to evaluate the impact of ACSM activities needs to be undertaken. ACSM is not sufficiently integrated in training plans. There has been no deliberate

policy to engage churches and mosques as a channel for passing TB messages. ACSM activities need to be scaled up in a targeted manner to support efforts towards improved case detection.

The NTP reported good experiences with supporting local football matches with Stop TB T-shirts and IEC about TB in settings where the population is likely to be at higher risk. An expansion of these activities may be considered. In connection with PPM, the NTP expressed the wish to sensitize big companies, especially gold-mining companies, about TB with the aim of increased case detection and destigmatization.

The objective of the advocacy component is to place TB and TB HIV high on political and development agendas. The communication component's objective is to increase knowledge among the general public about TB and TB/HIV. The social mobilization component aims at mobilising communities for action to fight stigma and eliminate TB and TB/HIV as public health threats

The programme will provide a supportive environment for sustainable growth of ACSM to TB/HIV control services. It will be implemented nationwide, with the public sector providing leadership and NGOs and civil societies as lead partners.

Professional associations such as medical, nursing, and laboratory groups, as well as colleges of health sciences, will be engaged and provided support. All existing communication and advocacy materials will be reviewed, and produced in sufficient quantities to support both public and private and civil societal needs.

Activities

These generally will be gender-sensitive. Special focus on addressing women in accessing services will be addressed.

General Management

- Involve other stakeholders and develop a comprehensive work plan to coordinate and synchronised all TB and related ACSM activities monitor and evaluate progress
- Undertake operational research to evaluate previous ACSM activities
- Conduct or review KAP studies to understand knowledge, attitudes, and stigma-related issues

Advocacy

- Build capacity for media/journalists to disseminate information on TB and TB/HIV
- Engage and provide support to professional groups such as medical, nursing, and laboratory societies, as well as colleges of health Sciences to organize seminars and CME's for their memberships
- Create awareness for chiefs and parliamentarians every year, climaxing with World TB Day activities in March
- Organize and support high-profile field visits to regions and districts

- Support activities of national advocacy organisations such as the Stop TB Partnership and the Ghana Society for Prevention of Tuberculosis

- Produce advocacy materials

- Conduct World TB Day activities at the national, regional, and district levels

Communication

- Produce IEC materials to improve knowledge of TB in the general population, including social mobilization in targeted audiences

- Develop broadcast materials and launch airtime spot for radio and television for the ACSM antistigma campaign

- Launch and commemorate World TB Day at the national, regional, and districts levels

- Organize press conferences

Social Mobilization

- Engage civil society organisations, and support professional associations to organise seminars and continuous medical education for TB

- Undertake community educational programmes for leaders in all districts

- Undertake community outreach through contracts with NGOs and civil society groups

Other Activities

- Train health care workers in TB patient-centred care
- Conduct supervision, monitoring, and evaluation of ACSM activities
- Establish an ACSM technical working group at the national level
- Develop a constitution for the Stop TB Partnership in Ghana
- Involve corporate partners (e.g., industries, banks) in the Ghana Stop TB Partnership
- Procure external technical assistance for ACSM activities
- Conduct KAP study to assess health-seeking behaviour and stigma-related issues

Expected Outputs

- TB/HIV placed high on political agenda

- Educational and advocacy materials reviewed developed, produced, and disseminated

- At least 85 percent of adults reached with behavioural change communication

- Knowledge about TB in the general public increased

- ACSM campaigns developed and launched

- A framework for documenting, monitoring, and evaluating ACSM activities in place

- KAP study conducted
- World TB Day activities well planned and implemented at the national, regional, and district levels
- Ghana Stop TB Partnership remains a key player in ACSM activities

Key Indicators and Targets

Indicator	Baseline			2009 Target	2010 Target	2011 Target	2012 Target	2013 Target
	Value	Year	Source					
Number of people reached with BCC community outreach and mass media education	8.6million	2008	TB HMIS	8.6million	9 million	10 million	12 million	14 million
Number of advocacy materials produced	120,000	2008	NTP	991,000	1,006,000	1,001,000	1,001,300	1,001,300

Intervention 5.2: Community Participation in TB Care: Community-Based DOTS

Aim

To increase the involvement of communities in TB control

Situation Analysis

Community-based DOTS (CB-DOTS) in Ghana seeks to provide an operational partnership between the health service and civil society (e.g., motivated individuals, existing community volunteers, NGOs, CSOs, FBOs) for TB control. This is particularly relevant in areas with poor geographic and economic access to health care. Presently, 130 NGOs are engaged in various activities and care for TB patients. For ease of management this number will not be expanded, as most of the field of operation is limited to one district. Evidence from pilot programmes in the Bosomtwi-Atwima-Kwawonma district in the Ashanti region (2002–2007) shows reduced diagnostic delay, improved case detection rates, and reduced defaulting and improved treatment success. The cost-effectiveness for both health services and TB patients has been demonstrated.

Presently, the NTP has no national specific guidelines for CB-DOTS, although its role in improving TB control is very much recognised and CB-DOTS is expected to play a greater role in case management with the introduction of FDCs. Many volunteers have expressed the opinion that materials are lacking, especially for illiterate clients, and the present guide for peripheral health staff may be too complicated for volunteers.

Although an important aspect of CB-DOTS is impact assessment, this is not routinely monitored, probably because the CB-DOTS initiative is still in the pilot stage and has yet to be implemented nationally.

The concept of Community-Based Health Planning and Services (CHPS), which is providing health care services to the community, is a major backbone on which community-based TB care will work in Ghana. However, the coverage of CHPS zones is still limited to approximately 5 percent of the communities in Ghana. Because CHPS is a phased process that requires buy-in from the community, the major reason for the slow adoption of the last phase is the expensive prerequisite of a suitable house with sufficient amenities.

Although CHPS is focused on rural areas, because more TB suspects and potential cases may reside in the urban slum areas the programme will have to be rolled out in those areas.

Activities

- Consolidate partnership between the NTP and NGOs in TB control
- Train NGOs, CBOs, and FBOs in DOTS
- Conduct an evaluation of the NGO contribution towards achieving TB targets
- Involve healing camps in DOTS activities
- Conduct supervision and monitoring of community TB care activities
- Provide incentives to treatment supporters

Expected Outputs

- NGOs, CBOs, and FBOs trained in DOTS
- NGOs' contribution to achieving TB targets evaluated
- Partnership between the NTP and NGOs consolidated
- Traditional healers and healing camps actively involved in identifying TB suspects and promoting treatment adherence
- Enablers Package to support patient care and follow-up to prevent default in the community expanded

Intervention 5.3: Patient's Charter

The Patients' Charter for Tuberculosis Care identifies ways in which all stakeholders can work together in an open and positive relationship. It can further help patients to learn about their rights and obligations and may stimulate demand-side driven developments to improve quality of service.

Ghana has a patient's charter; it is a bill of rights that health institutions are expected to adopt "to ensure that service personnel themselves as well as patients/clients and their families understand their rights and responsibilities." This charter is not TB-specific. The NTP should investigate the degree to which it is understood by either the institutions or the patients.

Activity

- Disseminate patients' charter

Expected Output

- Patients' charter disseminated

Strategy 6: Enable and Promote Research

The Stop TB Strategy consolidates DOTS implementation and involves several new approaches for tackling the challenges faced by the National TB Control Programme. Programme-based operational research is needed to put these approaches into practice, and is considered a core component of the NTP's work. Designing and conducting locally relevant operational research can help identify problems and workable solutions, which can be tested in the field. For this purpose, collaboration between programme managers and researchers is essential.

Enable and promote research

Program-based operational research

Research to develop new diagnostics, drugs, and vaccines

Intervention 6.1: Conduct Programme Research

Aims

- To improve programme implementation by evaluating interventions, monitoring activities, and adjusting policy in line with evidence-based decisions
- To address unanswered questions in respect to case detection and case fatality rates

Situation Analysis

Research partners of the NTP and NMIMR (technicaland financial) have included USAID, TB CAP WHO, the US Centers for Disease Control and Prevention (CDC), Japan International Cooperation Agency (JICA), the Ghanaian-Dutch Collaboration for Health Research for Development, the International Atomic Energy Commission, and the KNCV Tuberculosis Foundation. Setting the agenda for new basic and operational research and monitoring the progress of ongoing research are accomplished during stakeholder meetings. Regional and district directors are encouraged to select research topics within the already-established agenda. However, due to the heavy workload, the lack of research capacity, and the lack of funding, little has been done to date. Every year there is meeting at the College of Health Sciences of Ghana, where some of the research findings are presented.

The capacity to carry out research and opportunities to access funding at the decentralized levels have been limited to date. In 2007, the KNCV Tuberculosis Foundation research unit assisted with analysis of data of a tuberculin survey conducted in 2005, the results of which were reported to the NTP. In 2008, in the framework of TB CAP, the KNCV Tuberculosis Foundation provided technical assistance in setting an operational research agenda and further building research capacity.

Operational research responding to fundamental questions, such as why the CDR remains consistently low and why the case fatality rate is so high in some regions, is not being conducted. Another area that requires urgent attention is evaluation of the effectiveness of the enablers' package and of ACSM activities in stigma reduction, access to care and health-seeking behaviour. Other operational research topics may include an investigation on the sizeable difference of notifications between men and women (twice as many men as women) and differences in HIV/TB between men and women.

Priority research questions:

1. Are patients satisfied with our services? To conduct patient satisfaction studies (Quality of TB Care in the Eyes of the Patient [QUOTE])

2. Why is TB mortality high?

3. Why does poor documentation or unacceptable data quality persist in some regions?

4. Why is the case detection rate in hospitals and clinics low?

Activities

- Disseminate priority TB research agenda
- Conduct priority research questions studies
- Publish research findings
- Conduct national TB prevalence survey
- Procure TA on research issues

Expected Outputs

- Priority TB research agenda disseminated
- Research findings published
- Various research studies conducted

Other TB research priority areas are shown in Annex 2.

Components of the GHS

The IT Unit of Ghana Health Service disseminates information on TB control activities on their website. This facilitates sharing of information of best practices within the service. The programme will provide support to maintain the website. The IT Unit also provides support services to all programme computers and Internet connectivity.

The Accounting Department ensures prudent financial management for the programme. Timely release of funds facilitates programme activities. The programme will support and also pay some of the auditor's fees

The Transport Maintenance Unit of MOH is meant to provide preventive maintenance services for all programme vehicles and motorbikes. The capacity of the unit needs to be improved, however, to avoid private garages' that charges astronomically.

Barriers to Strong Performance

The key challenges facing the Ministry of Health and its agencies in the effort to scale up priority interventions to achieve its health goals include poor access to quality basic health services; lack of health infrastructure and equipment for emergency management of the sick; limited human resources capacity worsened by exodus of key technical staff in the formal sector; inadequate harnessing of potential of other human resources, especially in the informal and other non-health sectors; large funding gaps for massive investment required to achieve MDGs; and weak management capacity, including poorly developed health management information and M&E systems.

An analysis of the human resources gap has recently been carried out as part of an investment plan of the Macroeconomics and Health Initiative to achieve the MDGs in Ghana. Using the WHO human resources scenario model, the report indicated a need for additional funding for human resources to facilitate the scaling-up exercise equivalent to about 30 percent of total incremental costs of scaling-up health interventions during the period 2002–2015.

With the emergence of pandemic diseases and the cross-border transmission of communicable disease, Ghana is just like many other developing countries faced with the fight to reduce and eliminate diseases. On the global front, unstable economic conditions, especially in the prices of commodities like oil, are undermining progress made and pose a major threat. Although Ghana has benefited immensely from global health initiatives like Global Fund support to fight HIV/AIDS, TB, and malaria, it nevertheless faces competing economies in accessing development funds.

Deficiencies in human resources for health and poor access to health services to most of the rural communities have negative effects on the achievement of expected outcomes of the national TB control strategy. These deficiencies impinge strongly on important TB control interventions. This is what we seek to address with this plan.

Budgeting for this plan was done with the WHO Planning and Budgeting Tool and covers the five-year period. Funding will come from GOG, with gaps filled by bilateral and multilateral agencies, particularly the GFATM. The Central Unit and regions will develop annual costed work plans based on the disease burden and the level of infrastructure development, as well as human resource needs.

Expenditure Framework

Summary of Total Costs (in USD)						
	2009	2010	2011	2012	2013	Total
1.2 Improving diagnosis	3,203,238	5,590,535	4,597,956	3,799,715	3,840,373	21,031,817
1.3 Patient support	1,379,034	1,619,890	1,628,667	1,639,243	1,630,523	7,897,358
1.4 First - line drugs procurement and management	1,492,448	2,626,585	1,741,737	2,688,305	1,770,545	10,319,621
1.5.1 M&E	279,155	4,102,535	222,155	1,000,058	315,855	5,919,758
1.5.2 Programme management and supervision	5,143,643	7,359,556	5,882,366	4,815,942	5,410,942	28,612,448
1.5.3.1 HRD: Staff	4,677,840	4,677,840	4,677,840	4,677,840	4,677,840	23,389,200
1.5.3.2 HRD: International TA	287,000	239,000	219,000	239,000	221,000	1,205,000
1.5.3.3 HRD: Training	3,302,115	3,472,790	3,341,980	3,744,125	3,632,390	17,493,400
2.1 Collaborative TB/HIV activities	4,357,258	4,188,566	5,193,777	5,685,785	6,003,950	25,429,337
2.2 MDR - TB	57,450	601,990	2,599,200	610,996	831,400	4,701,036
2.3.1 High - risk groups	26,240	26,240	26,240	26,240	26,240	131,200
2.3.2 Infection control	576,120	772,920	580,600	846,670	716,100	3,492,410
2.3.3 Childhood TB	8,450	33,650	18,450	18,452	28,450	117,452
3.2 PAL	—	28,940	63,580	2,368	2,368	97,256
4.1/4.2 PPM/ISTC	50,598	50,598	50,598	50,598	50,598	252,990
5.1 ACSM	6,361,830	6,414,679	6,406,330	6,392,620	6,328,330	31,903,789
5.2 Community involvement	1,105,000	1,105,000	1,105,000	1,105,000	1,105,000	5,525,000
6.1 Operational research	43,000	81,000	82,000	43,000	43,000	292,000
Other	82,000	82,000	82,000	82,000	82,000	410,000
General use of health services						
Hospitalization	3,513,585	34,895,268	69,757,897	69,758,016	87,189,146	265,113,912
Outpatient visits	1,208,509	9,376,846	18,379,480	18,380,845	22,880,038	70,225,718
Total costs for TB control	37,164,514	87,346,428	126,656,853	125,606,819	146,786,088	523,560,702

Summary of funding sources and funding gap (in USD)

	2009	2010	2011	2012	2013	Total
Government, central/national	4,875,120	36,251,280	71,133,680	71,113,680	88,544,880	271,918,640
Government, intermediate/provincial	1,478,345	1,118,868	1,119,097	769,216	1,169,146	5,654,672
Government, local/district	8,664,962	8,452,088	9,411,477	9,860,656	10,052,300	46,441,483
Loans	—	—		—	—	—
GFATM	5,457,008	5,241,799	—	—	—	10,698,807
TB CAP	224,267	—	—	—	—	224,267
Funding gap	16,409,812	36,227,393	44,937,599	43,808,267	46,964,762	188,347,833
Summary of total costs by generic cost categories						
Human resources	6,058,070	6,061,320	6,058,520	6,058,020	6,058,020	30,293,950
Technical and management assistance	293,030	358,520	238,700	257,230	231,200	1,378,680
Training	7,370,831	8,286,622	7,427,326	8,485,947	7,740,232	39,310,958
Health products and health equipment	3,748,077	5,174,555	4,578,478	4,319,755	4,214,463	22,035,328
Medicines and pharmaceutical products	4,303,057	5,200,881	5,513,153	6,573,966	6,272,751	27,863,808
Procurement and supply management costs	1,167,006	1,456,645	1,228,514	1,490,894	1,371,398	6,714,457
Infrastructure and other equipment	1,165,000	4,636,587	4,677,273	1,379,273	1,847,273	13,705,405
Communication materials	3,355,490	3,538,439	3,575,990	3,587,282	3,534,990	17,592,191
Monitoring and evaluation	1,194,975	4,326,975	1,176,975	1,266,498	1,231,675	9,197,098
Living support to clients	1,008,384	1,255,270	1,264,047	1,268,593	1,265,903	6,062,197
Planning and administration	—	—	—	—	—	—
Overheads	2,612,000	2,612,000	2,614,000	2,614,000	2,659,000	13,111,000
Other	156,500	156,500	156,500	156,500	175,000	801,000
Total costs for TB control	32,432,420	43,064,314	38,509,475	37,457,958	36,601,905	188,066,072

Detailed costing of activities is also available per programme area on request.

Funds Allocation

The costed strategy is based on activities defined and agreed on by various stakeholders during the development of the strategic plan. The activities of various stakeholders complement each other, and will be coordinated, monitored, and supported by the central programme Management Unit of the NTP.

Stakeholders access funds through a common mechanism already established and working extremely well.

All public, private, and NGO implementing partners submit activity proposals through the programme Management Unit. It is discussed and milestones set for the stakeholders to achieve within a specified time frame. The Central TB Unit signs a contract with the stakeholder on the agreed milestones and recommends approval for the Principal Recipient (PR) to release funds directly to the stakeholder. The PR, after consideration, also signs the contract or not, and directs the Financial Department to release funds directly to the stakeholder or request additional information where necessary before signing. Nonperforming stakeholders naturally are unable to request the further release of funds until milestones are attained and reports presented. New entrants are assessed continually to participate in TB control activities in areas where they have comparative advantage.

A copy of the signed contract is kept at the Central TB Unit. This is used by the unit to monitor both programmatic and financial activities.

Reports from stakeholders are submitted to the Central TB Unit, while another request is made for continuity. A comprehensive report on the various players is written by the Central TB Unit and sent to the Ministry of Health or the interested partner (e.g the Global Fund.).

Therefore, the amount of funds each stakeholder receives is linked to the scope of activities. The cost of each activity is freely available to all.

Financial Management System

In the public sector, the budget cycle follows the standard calendar year, running from January 1 to December 31. As such, financial reports are prepared on a quarterly basis and are usually complete and ready for circulation one quarter in arrears, though cash book and bank reconciliation statements must be prepared on a monthly basis. It will therefore be ideal to start at the beginning of the fiscal year, since the budget is activity-related and can conveniently be assessed at the end of each quarter.

The implementation of the plan, in line with the country's fiscal year, is being harmonized with grant planning, implementation, and reporting.

Financial Management and Partnership Capacity

The annual budget of the MOH for 2008 is USD 846,142,000. The MOH has a long history of working with partners. Since 1997, a sector-wide approach (SWAp) to health development has been pursued. The principles underlying the SWAp in Ghana include an agreement between the Government of Ghana and health partners on a common and coordinated programme of work, an integrated approach to funding and common implementation and evaluation arrangements. Under this arrangement, the MOH prepares an annual programme of work covering the entire health sector, which is then funded with collective resources from the GOG, internally generated, and pooled or earmarked donor funds.

Through the SWAp, the health system has developed a robust financial management system that ensures transparency and accountability for all funds irrespective of their source and use. In addition, the SWAp has strengthened the health sector's capacity in donor relations and coordination. The Ghana health sector, as part of the SWAp process, ensures an independent assessment of service delivery and financial performance of the sector. The current trend, however, is that development partners are moving towards sectoral budget support.

There are monthly stakeholder meetings bringing together the Ministry of Health and its agencies on one hand and development partners on the other. These meetings are used to inform all stakeholders on the performance status and upcoming events. The policy dialogue with health partners culminates in two semi-annual health summits, focusing alternately on review and planning. The review summit is based on an independent assessment of the sector's previous year's performance. These assessments cover all the areas of the sector, including GFATM-funded projects. On an annual basis, financial and procurement audits are conducted by an independent institution. These audits cover all sources of funds. The results of these reviews and the audits are discussed at an annual summit meeting of all stakeholders in health. The planning summit is held to agree on priority health interventions to be implemented in the ensuing year. At the end of the summits, an aide memoire reflecting key decisions and actions is signed. The health summits serve as the highest decision-making body of the MOH-Partnership arrangement.

Experience with Global Fund Grants

The Ministry of Health has been assessed by the Local Funding Agent (LFA) and found to be capable and efficient to handle a total of six Global Fund grants (Rounds 1 and 5 for HIV and TB; Rounds 2 and 4 for malaria). Incidentally, Ghana was the first country ever to sign a grant agreement and receive GF grants due to the successful assessment of MOH/GHS as Principal Recipient for Round 1 in the areas of institutional capacity, financial management, procurement and supply management systems, and monitoring and evaluation.

During implementation of the grants, the two malaria grants, and one each of HIV/AIDS and TB grants, were all assessed as category AA and the Round 2 malaria grant has qualified for Rolling Continuation Channel (RCC). The other HIV/AIDS and TB grants were assessed as category B1. The Global Fund has recognized Ghana's performance with MOH/GHS as the PR

as among the best-managed GF grants worldwide. The GHS/MOH has also been working very closely with NGOs, academic institutions, and other agencies and organizations for many years, including subcontracting as subrecipients for all six GF grants.

Experience with Other Grants

The MOH/GHS has successfully managed funds (earmarked or "pooled") provided through bilateral and multilateral agencies over the years. These include GAVI support for the introduction of new vaccines, the World Bank Nutrition and Malaria Project, the US President's Malaria Initiative, UNICEF/GHS Accelerated Child Survival and Development (ACSD), and High-Impact Rapid Delivery (HIRD).

Costs in USD

	2009	2010	2011	2012	2013
Standard Equipment needed for one NEW microscopy lab, serving around 100 000 pop					
Number of labs needing equipment	8	60	15	15	15
Cost of standard equipment needed for one microscopy lab, serving around 100,000 population	7,651	7,651	7,651	7,651	7,651
Number of microscopes and accessories	60	102	92	98	100
Cost of one microscope	3,500	3,500	3,500	3,500	3,500
Number of slide storage boxes	4,000	4,200	3,500	3,500	4,000
Cost of one storage box	20	20	20	20	20
Number of slide boxes (for 100 slides)	4,191	4,908	4,942	4,960	4,950
Cost of one slide box	20	20	20	20	20
Numbe r of slide rack plastics (for 12 - 25 slides)	349	409	412	413	412
Cost of one plastic slide rack	10	10	10	10	10
Number of glass marker(diamond point)	257	300	441	600	661
Cost of one glass marker	25	25	25	25	25
Number of staining racks	257	200	100	200	600
Cost of one staining rack	10	10	10	10	10
Number of loop holders	349	409	412	413	412
Cost of one loop holder	10	10	10	10	10
Number of transfer safety cabinets	5	5	3	2	5
Cost of one transfer safety cabinet	140	140	140	140	140
Total cost of equipment for microscopy	451,716	1,016,602	626,296	652,516	675,233
Standard Equipment for One Culture Lab					
Solid media:					
Number of culture labs needing equipment for culture	4	4	4	1	1
Cost of standard equipment needed for one culture laboratory	161,150	161,150	161,150	161,150	161,150

	2009	2010	2011	2012	2013
Liquid media:					
Number of culture labs needing equipment for culture	0	1	0	0	0
Cost of standard equipment needed for one culture laboratory	200,250	200,250	200,250	200,250	200,250
Procurement/Distribution of Lab Supplies and Reagents for Culture					
Solid media:					
Estimated number of cultures per year (solid) includes retreatment relapses, TB/HIV co-infection and some SS-ve	2,598	2,600	2,634	2,734	2,800
Estimated number of cultures per year (solid) includes retreatment relapses, TB/HIV co-infection and some SS-ve	2,598	2,600	2,634	2,734	2,800
Cost of culture on solid media, per culture (includes identification)	6.8	6.8	6.8	6.8	6.8
Cost of consumables for culture, per culture	1.2	1.2	1.2	1.2	1.0
Total cost of supplies for cultures (solid media)	20,784	20,800	21,072	21,872	22,400
Liquid media:					
Estimated number of cultures per year (liquid)	598	600	634	734	800
Cost of culture on liquid media, per culture (includes identification)	21.8	21.8	21.8	21.8	21.8
Cost of consumables for culture, per culture	1.2	1.2	1.2	1.2	1.2
Standard Equipment for One DST Lab					
Solid media:					
Number of labs needing equipment for DST	1	0	1	0	0
Cost of standard equipment needed for one DST laboratory	142,050	42,050	142,050	142,050	142,050
Liquid media:					
Number of labs needing equipment for DST	0	1	0	0	0
Cost of standard equipment needed for one DST laboratory	169,000	169,000	169,000	169,000	169,000
Total cost of equipment for DST	142,050	169,000	142,050	—	—

	2009	2010	2011	2012	2013
Procurement/distribution of lab supplies and reagents for DST					
Solid media: first - line drug tests (2 drugs -H, R-, 2 controls)					
Estimated number of DST per year	1,998	2,000	2,034	2,134	2,200
Cost of DST on solid, per DST	18.8	18.8	18.8	18.8	18.8
Cost of consumables, per DST	1.2	1.2	1.2	1.2	1.2
Total cost of supplies for DST (solid media)	39,960	40,000	40,680	42,680	44,000
Liquid media: first - line drug tests (2 drugs -H, R-)					
Estimated number of DST per year	562	564	598	698	764
Cost of DST on liquid, per DST	167.6	167.6	167.6	167.6	167.6
Cost of consumables, per DST	1.2	1.2	1.2	1.2	1.2
Total cost of supplies for DST (liquid media)	94,866	95,203	100,942	117,822	128,963
Liquid Media: Second - Line Drug Tests (2 drugs: fluroquinolone, injectables)					
Estimated number of DST per year	281	282	299	349	382
Cost of DST on liquid, per DST	207.6	207.6	207.6	207.6	207.6
Cost of consumables, per DST	2.0	2.0	2.0	2.0	2.0
Total cost of supplies for DST (liquid media)	58,898	59,107	62,670	73,150	80,067
1.2.3 Total cost for DST laboratories	457,273	484,810	467,843	265,153	284,530
STANDARD EQUIPMENT FOR ONE LAB PERFORMING MOLECULAR TESTS-Line Probe Assay (LPA)					
Molecular tests:					
Number of labs needing equipment for detection of resistance	0	0	1	1	0
Cost of standard equipment needed for one laboratory	42,500	42,500	42,500	42,500	42,500
Total cost of equipment for molecular tests	—	—	42,500	42,500	

	2009	2010	2011	2012	2013
PROCUREMENT/DISTRIBUTION OF LAB SUPPLIES AND REAGENTS FOR MOLECULAR TESTS-Line Probe Assay(LPA)					
MOLECULAR TESTS: Procurement/distribution of lab supplies and reagents for detection of resistance with LPA					
Estimated number of test per year	20	50	100	100	100
Cost of molecular tests, per test (includes consumables)	20	20	20	20	20
Total cost of supplies for molecular test	400	1,000	2,000	2,000	2,000
Other equipment (including X-rays)					
Number of X-ray films	104,784	122,703	123, 561	124,005	123
Cost of one x-ray film(cost of reagent factored in)	6	6	6	6	6
Fluorescent microscope	—	14	3	1	1
Cost of one <…>		6,000	6,000	6,000	6,000
X-ray machine		1	1	1	
Cost of one <…>		20,000	20,000	20,000	
Basic fuschin	505	1,256	505	505	603
Cost of 25g	36	36	36	36	36
Xylene or toluene	84	208	105	208	105
Cost of one 1 L	42	42	42	42	42
Alcohol	430	1,068	538	1,068	538
Cost of 1L	22	22	22	22	22
immersion oil	832	2,072	1,043	2,072	1,045
Cost of 100ml	15	15	15	15	15
Total cost of equipment for other diagnostic methods	682,709	960,707	841,699	863,990	814,315

	2009	2010	2011	2012	2013
Other consumables					
litres needed of Aqueous methylene blue **Cost of one <…>**					
Sputum container, plastic, disposable (45 to 50 ml)	429,137	500,811	504,242	506,020	504,968
Cost of one <…>	0	0	0	0	0
Lens tissue box of 100	200	300	300	300	300
Cost of one box of 100	133	133	133	133	133
Gloves (pair)					
Cost of one <…>					
Filter paper (15cm) (box)					
Cost of one <…>					
Sulphuric acid (for ZN staining)	1,544	722	1,034	722	722
Cost of one 1L	15	15	15	15	15
Phenol crystals	837	2,084	1,056	1,053	2,102
Cost of 250g	55	55	55	55	55
Total cost of equipment for other diagnostic methods	181,622	265,512	214,338	209,849	267,334
1.2.5 Total cost of other equipment (including X-ray)	864,331	1,226,219	1,056,038	1,073,839	1,081,649

TB DRUGS

	2009	2010	2011	2012	2013
Estimated number of total new ss+ cases to be treated in the NTP	11,643	13,634	13,729	13,778	13,749
Estimated number of total new ss-/EP cases to be treated in the NTP	13,567	17,748	17,872	17,936	17,898
1. Name of regimen: 2 (RHZE150/75/400/275)/4(HR150/75)					
Number of patients with this regimen	25,210	31,382	31,601	31,715	31,648
Unit cost per patient of this regimen	22	22	22	22	22
Total cost of regimen	554,611	690,399	695,226	697,726	696,247
1.4.1 Total cost of drugs for Categories I & III	554,611	690,399	695,226	697,726	696,247
1. Name of regimen: <2S(RHZE)1(RHZE)/5RHE) Standard Syringe					
Number of patients with this regimen	1,261	1,569	1,580	1,586	1,582
Unit cost per patient of this regimen	54	54	54	54	54
Total cost of regimen <specify>	68,334	85,024	85,620	85,945	85,729
Total cost of drugs for Category II	68,334	85,024	85,620	85,945	85,729

CHILDREN

	2009	2010	2011	2012	2013
Estimated number of total children to be treated each year	1,261	2,197	2,528	3,171	3,165
1. Name of regimen: <2(RHZ60/30/150)E100)/4RH60/30)					
Number of patients with this regimen	1,260	2,197	2,528	3,171	3,165
Unit cost per patient of this regimen	35	35	35	35	35
Total cost of regimen <	44,100	76,895	88,480	110,985	110,775
BUFFER STOCK					
Estimated number of patients Categories I and III required for buffer stock	0	31,382	0	31,715	0
Average cost per patient of anti - TB drugs		22	22	22	22
Estimated number of patients Cat II required for buffer stock	0	1,569	0	1,586	0
Average cost per patient of anti - TB drugs	54	54	54	54	54
Total cost of buffer stock	—	787,975	—	796,358	—

PROCUREMENT	2009	2010	2011	2012	2013
Costs for quality control	54,171	69,190	70,557	72,588	72,434
Costs for pre - shipment inspection	1,693	4,132	2,205	4,258	2,264
Costs for pre-shipment inspection	1,693	4,132	2,205	4,258	2,264
Handling Charges	23,700	57,850	30,869	59,630	31,690
Costs of transport CIF	74,485	181,814	97,016	187,408	99,596
Costs of insurance	1,354	3,306	1,764	3,407	1,811
1.4.5 Total cost of drug management	805,403	966,292	852,411	977,291	857,795
Pyridoxine tablets 50mg /100mg	20,000	20,000	20,000	20,000	20,000
Total cost of first - line drugs	687,045	1,660,293	889,326	1,711,014	912,750

STANDARD EQUIPMENT FOR ONE DST LAB

Solid media:					
Number of labs needing equipment for DST	1	0	1	0	0
Cost of standard equipment needed for one DST laboratory	142,050	142,050	142,050	142,050	142,050
Liquid media:					
Number of labs needing equipment for DST	0	1	0	0	0
Cost of standard equipment needed for one DST laboratory	169,000	169,000	169,000	169,000	169,000
Total cost of equipment for DST	142,050	169,000	142,050	—	—

PROCUREMENT/DISTRIBUTION OF LAB SUPPLIES AND REAGENTS FOR DST

Solid media: FIRST- LINE DRUG tests (2 drugs- H, R -, 2 controls)					
Es timated number of DST per year	1,998	2,000	2,034	2,134	2,200
Cost of DST on solid, per DST	18.8	18.8	18.8	18.8	18.8
Cost of consumables, per DST	1.2	1.2	1.2	1.2	1.2
Total cost of supplies for DST (solid media)	39,960	40,000	40,680	42,680	44,000

	2009	2010	2011	2012	2013
Liquid media: FIRST-LINE DRUG tests (2 drugs-H,R-)					
Estimated number of DST per year	562	564	598	698	764
Cost of DST on liquid, per DST	167.6	167.6	167.6	167.6	167.6
Cost of consumables, per DST	1.2	1.2	1.2	1.2	1.2
Total cost of supplies for DST (liquid media)	94,866	95,203	100,942	117,822	128,963
Liquid media: SECOND- LINE DRUG tests (2 drugs - fluroquinolone, injectables)					
Estimated number of DST per year	281	282	299	349	382
Cost of DST on liquid, per DST	207.6	207.6	207.6	207.6	207.6
Cost of consumables, per DST	2.0	2.0	2.0	2.0	2.0
Total cost of supplies for DST (liquid media)	58,898	59,107	62,670	73,150	80,067
1.2.3 Total cost for DST laboratories	457, 273	484,810	467,843	265,153	284,530

STANDARD EQUIPMENT FOR ONE LAB PERFORMING MOLECULAR TESTS-Line Probe Assay (LPA)

	2009	2010	2011	2012	2013
Molecular tests:					
Number of labs needing equipment for detection of resistance	0	0	1	1	0
Cost of standard equipment needed for one laboratory	42,500	42,500	42,500	42,500	42,500
Total cost of equipment for molecular tests	—	—	42,500	42,500	—

PROCUREMENT/DISTRIBUTION OF LAB SUPPLIES AND REAGENTS FOR MOLECULAR TESTS-Line Probe Assay (LPA)

MOLECULAR TESTS: Procurement/distribution of lab supplies and reagents for detection of resistance with LPA					
Estimated number of test per year	20	50	100	100	100
Cost of molecular tests, per test (includes consumables)	20	20	20	20	20
Total cost of supplies for molecular test	400	1,000	2,000	2,000	2,000

	2009	2010	2011	2012	2013
Number of patients with this regimen	25,210	31,382	31,601	31,715	31,648
Unit cost per patient of this regimen	22	22	22	22	22
Total cost of regimen	554,611	690,399	695,226	697,726	696,247
1.4.1 Total cost of drugs for categories I and III	554,611	690,399	695,226	697,726	696,247
1. Name of regimen: <2S(RHZE)1(RHZE)/5RHE) standard syringe					
Number of patients with this regimen	1,261	1,569	1,580	1,586	1,582
Unit cost per patient of this regimen	54	54	54	54	54
Total cost of regimen <specify>	68,334	85,024	85,620	85,945	85,729
Total cost of category II drugs	68,334	85,024	85,620	85,945	85,729

CHILDREN

	2009	2010	2011	2012	2013
Estimated number of total children to be treated each year	1,260	2,197	2,528	3,171	3,165
1. Name of regimen: <2(RHZ60/30/150)E100)/4RH60/30)					
Number of patients with this regimen	1,260	2,197	2,528	3,171	3,165
Unit cost per patient of this regimen	35	35	35	35	35
Total cost of regimen <	44,100	76,895	88,480	110,985	110,775

BUFFER STOCK

Estimated number of patients Category I and III required for buffer stock	0	31,382	0	31,715	0
Average cost per patient of anti-TB drugs		22	22	22	22
Estimated number of patients Cat II required for buffer stock	0	1,569	0	1,586	0
Average cost per patient of anti-TB drugs	54	54	54	54	54
Total cost of buffer stock	—	787,975	—	796,358	—

	2009	2010	2011	2012	2013
PROCUREMENT					
Costs for quality control	54,171	69,190	70,557	72,588	72,434
Costs for pre-shipment inspection	1,693	4,132	2,205	4,258	2,264
Handling Charges	23,700	57,850	30,869	59,630	31,690
Costs of transport CIF	74,485	181,814	97,016	187,408	99,596
Costs of insurance	1,354	3,306	1,764	3,407	1,811
	2009	**2010**	**2011**	**2012**	**2013**
1.4.5 Total cost of drug management	805,403	966,292	852,411	977,291	857,795
Pyridoxine tablets 50mg /100mg	20,000	20,000	20,000	20,000	20,000
Total cost of first-line drugs	687,045	1,660,293	889,326	1,711,014	912,750

selected references 9.0

1. *Comprehensive Review of the National Tuberculosis Programme, Ghana. 2007.*

2. *The Ghana Health Sector 5-Year Programme of Work 2007–2011.*

3. *TB Control Strategic Plan for Ghana 2002–2006.* Ghana Health Service, Ministry of Health.

4. "Tuberculosis Case Management Desk Aide." 2006. NTP.

5. *National HIV Prevalence & AIDS Estimates Report, 2007.* NACP, Ghana.

6. HIV Sentinel Survey Report, 2007.

7. NTP Annual Reports, 2005, 2006 ,and 2007.

8. Petter, I. 2004. *TBCTA/KNCV Summary Report* .

9. *World Health Organization (WHO). 2005. Practical Approach to Lung Health: A Primary Health Care Strategy for the Integrated Management of Respiratory Conditions in People of Five Years of Age and Over.* Geneva: WHO.

10. Private Sector Participation in NTP (PPM-DOTS). 2005.

11. *World Health Organization/Stop TB. 2006. Stop TB Strategy: Building on and Enhancing DOTS to Meet the TB-Related Millennium Development Goals.* Geneva: WHO/Stop TB Partnership.

12. World Health Organization. 2008. *Global TB Control, Surveillance, Planning, and Financing* . Geneva: WHO.

13. Managing Tuberculosis in Ghana. A Training Course. 2006

14. USAID/JSI/DELIVER. 2008. Ghana System Design for TB Commodity Distribution. Accra: USAID/JSI/DELIVER.

15. Government of South Africa. 2007. *Tuberculosis Strategic Plan for South Africa 2007–11.*

16. The Stop TB Strategy; 2006, World Health Organization

17. World TB Day 2009 tool kit, STOP TB Partnership

18. Assessing tuberculosis prevalence through population based surveys; World Health organization, Western Pacific Region

annexes

Health Facilities in Ghana, by Region and Type

Region	Teaching Hospitals	Regional Hospitals	District Hospitals	Health Centre Clinics	Poly Clinics	Hospitals Registered with CHAG	Clinics Registered with CHAG	Private Hospitals Registered with GMA	Private Health Centres/Clinics Registered with GMA	Private Maternity Homes Registered	CHPS Gov't	CHPS, Private	Total
Ashanti	1		24	152		17	20	51	163	105	4		537
Brong Ahafo		1	7	130		10	8	7	18	37	11		229
Central		1	9	70		4	7	9	62	34	43		239
Eastern		1	15	173		6	12	5	63	47	44		366
Greater Accra	1	1	13	60	7	3	3	81	233	55	4		461
Northern		1	10	123		5	14	1	5	9	10		178
Upper		1	4	55		4	13		11	2	55		145
Upper West		1	3	60		0	2	3	7	6	39		121
Volta		1	12	192	1	8	8	7	23	24	19		295
Western		1	18	117	2	4	11	2	201	60	56	2	474
Grand Total	2	9	115	1,132	10	61	98	166	786	379	285	2	3,045

annex Two

Research Priority Areas

Number	Key Research Topics	Research Activities
1	**Reasons for Low TB Case Finding**	
		• Extending TB services to the Communities. Determine the involvement of chemical shop owners in TB control. • What is the contribution of NGOs and CBOs in enhancing TB case detection? • Missing smear - positive pulmonary tuberculosis: Where are they? Why do we lose them? • Knowledge about TB among health care workers • National TB prevalence survey to know the true magnitude of the TB problem in Ghana
2	**Clinical Care of TB Patients**	
		• Health-seeking behaviour/delay in seeking TB diagnosis and treatment/misdiagnosis • Quality of TB case management • TB mortality: When do TB patients die? • Drug administration
3	**TB Case Holding**	
		• Why do TB patients default from TB treatment? • The role of health workers in preventing defaulters • When do TB patients default? • The impact of the new FDC regimen on defaulters • Are defaulters really true defaulters? Data validation
4	**TB/HIV**	
		• Prevalence of HIV among TB patients • Barriers to implementation of TB/HIV • Mortality among HIV-positive TB patients • TB in HIV infected individuals • How good is recording and reporting/data quality? • Treatment outcomes of TB/HIV co-infected patients • Are TB screening tools sensitive enough to pick true TB

Number	Key Research Topics	Research Activities
5	**CB - DOTS**	
		• Evaluation of CB-DOTS (versus others) • Barriers to implementation • Treatment outcomes of TB patients diagnosed through community activities • Coverage of CB-DOTS • Participation, stakeholders, linkages • Data quality, recording and reporting
6	**TB Infection Control**	
		• KAP on Infection Control (IC) • Barriers to implementation • Midterm evaluation of TB IC in integrated health systems
7	**MDR -TB**	
		• Drug resistance surveillance • What are the factors contributing to MDR-TB • Treatment outcome of MDR-TB patients • Second-line drug evaluation, adverse effects, drug administration, mortality rates • Community perception • Who is getting MDR-TB? • Institutional versus community management of MDR-TB
8	**Other Research Priority Areas**	
		• TB and MDR-TB among health care workers • TB among vulnerable groups (refugees, prisoners, mining communities, congregate settings) • ACSM evaluation • HRD (sharing of knowledge, HRD link to programme outcome) • FDC evaluation

Categories of TB Patients Reported in Ghana, 1996–2007

Pulmonary TB Smear-Positive Cases												
Year	New Cases		Subtotal	Relapses		Pulmonary Smear - Negative TB		Extra-pulmonary TB		Total Cases		Grand Total
	M	F		M	F	M	F	M	F	M	F	
1996	2,864	1,502	4,366	226	114	1,202	719	233	122	4,525	2,457	**6,982**
1997	4,502	2,752	7,254	231	125	1,586	1,012	331	210	6,650	4,099	**10,749**
1998	4,835	2,922	7,757	237	146	1,620	1,001	343	248	7,035	4,317	**11,352**
1999	4,357	2,520	6,877	288	113	1,502	941	389	276	6,536	3,850	**10,386**
2000	4,749	2,567	7,316	334	168	1,554	946	361	254	6,998	3,935	**10,933**
2001	4,823	2,889	7,712	385	190	1,727	1,043	452	364	7,387	4,486	**11,873**
2002	4,960	2,772	7,732	334	170	1,684	1,046	449	344	7,391	4,332	**11,723**
2003	5,023	2,691	7,714	388	170	1,732	1,132	429	331	7,572	4,324	**11,896**
2004	4,821	2,438	7,259	375	167	1,922	1,200	523	381	7,641	4,186	**11,827**
2005	5,024	2,560	7,584	376	164	1,775	1,301	591	429	7,766	4,454	**12,220**
2006	5,177	2,609	7,786	374	123	1,974	1,165	590	459	8,138	4,373	**12,511**
2007	4,908	2,521	7,429	331	132	2,305	1,454	581	511	8,282	4,682	**12,964**
2008	5,197	2,587	7,784	325	122	2,490	1,685	744	628	8,929	5,093	**14,022**