



# End-Term Comprehensive External Review of the Ghana National Tuberculosis Health Sector Strategic Plan 2009–2013

## NATIONAL TB CONTROL PROGRAMME REVIEW REPORT Ghana Ministry of Health

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March 2013



TUBERCULOSEFONDS



TB CARE I

The review was jointly conducted by the following organisations in collaboration with the Ghana Health Service (GHS) and Ministry of Health (MOH) of Ghana:

- The World Health Organisation (WHO)
- The US Agency for International Development (USAID)
- USAID–TB CARE I
- Management Sciences for Health (MSH)
- The Royal Dutch Tuberculosis Foundation (KNCV)
- Noguchi Memorial Institute for Medical Research (NMIMR)
- The Global Fund to Fight AIDS, TB and Malaria (Global Fund)

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## ACRONYMS AND ABBREVIATIONS

ACSM	advocacy, communication, and social mobilization
AIDS	acquired immune deficiency syndrome
ART	antiretroviral therapy
ARVs	antiretroviral [medicines]
BSL	biosafety laboratory
CBC	community TB care
CBO	community-based organisation
CCM	Country Coordinating Mechanism
CHPS	community Health Planning Services
CIDA	Canadian International Development Agency
CMS	Central Medical Stores
CPT	co-trimoxazole preventive therapy
CSO	civil society organizations
CTBC	community TB care
DOT	directly observed treatment
DOTS	directly observed treatment, short course
DRS	drug resistance survey
DR-TB	drug-resistant TB
DST	drug susceptibility testing
EQA	external quality assurance
FDC	fixed-dose combination
FEFO	first expiring first out
FLD	first-line [anti-TB] drug
GHS	Ghana Health Service
GLC	Green Light Committee
Global Fund	The Global Fund to Fight AIDS, TB and Malaria
GOG	Government of the Republic of Ghana
HIV	human immunodeficiency virus
HRE	isoniazid, rifampicin and ethambutol
IEC	information, education and communication
IPC	infection prevention and control
IPT	isoniazid preventive therapy
KNCV	Royal Dutch Tuberculosis Foundation
LJ	Löwenstein-Jensen
M&E	monitoring and evaluation
MDGs	Millennium Development Goals
MDR-TB	multidrug-resistant TB
MGIT	mycobacteria growth indicator tube
MOH	Ministry of Health
MSH	Management Sciences for Health
MTB	mycobacterium tuberculosis
NACP	National AIDS Control Programme
NGO	nongovernmental organisation
NMIMR	Noguchi Memorial Institute of Medical Research
NTP	National Tuberculosis Control Programme
NTRL	National TB Reference Laboratory
OPD	outpatient department

ORIO	Facility for Infrastructure Development [Netherlands]
PAL	practical approaches to lung health
PCR	polymerase chain reaction
PEPFAR	[United States] President’s Emergency Plan for AIDS Relief
PLHIV	People living with HIV
PMDT	programmatic management of drug-resistant TB
PPM	public/private mix
SLD	second-line [anti-TB] drug
SNRL	supra national reference laboratory
SOP	standard operating procedure
SSM	sputum smear microscopy
TB	tuberculosis
TB CAP	TB Control Assistance Program
TB CARE I and II	USAID-funded TB programs
TB/HIV	human immunodeficiency virus–related TB
USAID	United States Agency for International Development
USD	US dollars
WCO	WHO Country Office
WHO	World Health Organisation
XDR-TB	extensively drug-resistant TB

## **ACKNOWLEDGEMENTS**

The review team acknowledges the following persons and institutions whose individual and collective contributions facilitated the smooth conduct of the review and provided the rich information that constitutes the substance of this report.

- The Minister of Health of Ghana, the Honourable Sherry Ayitey
- Senior MOH of Ghana staff
- The Director General, senior management and staff of GHS
- National Tuberculosis Control Programme (NTP) manager and staff
- Country Representative, USAID Mission to Ghana
- WHO representative and staff, WHO Country Office, Ghana
- Unit heads and other senior Staff, GHS
- Head, Ghana Central Medical Stores (CMS)
- Head, NMIMR
- Head, MSH Country Representative–Ghana and Country Director of TB CARE I, Ghana
- Other donor partner representatives
- Regional and District Health Officers and staff in all the five regions visited
- Medical superintendents and staff at hospitals visited
- Facility in-charges and staff
- Review teams' drivers
- All other collaborators towards the review



## **EXECUTIVE SUMMARY**

### **Introduction**

In 2007, the Government of the Republic of Ghana (GOG), through the Ministry of Health (MOH), and in collaboration with the MOH's key development and technical partners, conducted an independent comprehensive review of the Ghana National TB Control Programme to establish evidence-based baselines for the development of a new National TB Control Medium-Term Strategic Plan towards the Millennium Development Goal (MDG) targets and in line with the new WHO Stop TB Strategy for TB Control.

Subsequent to this review, a new Stop TB Strategy plan covering the 2009–13 period was developed to address the challenges identified in the 2007 review, as well to incorporate emerging national, regional and global TB-related health issues. The plan had two main outcome indicators (i.e., TB case detection and treatment success rate for both new and previously treated patients) and the following six strategies framed in line with the Stop TB Strategy:

- Pursuing high-quality DOTS expansion and enhancement
- Addressing TB/HIV, multidrug-resistant TB (MDR-TB) and other challenges
- Contributing to health system strengthening
- Engaging all care providers
- Empowering both communities and people with TB
- Enabling and promoting research

### **Specific Objectives of the 2009–2013 Plan**

The specific objectives are to—

- Expand the TB laboratory network for sputum smear microscopy (SSM) from 257 to 661 by 2013
- Establish 60 new microscopy centres in 60 newly created districts by 2011
- Start implementing DOTS Plus from 2009 forward
- Introduce isoniazid preventive therapy (IPT) in 75 support groups for people living with HIV/AIDS (PLHIV) by 2013
- Increase the proportion of HIV-positive TB patients on antiretroviral therapy (ART) from 20 per cent to at least 75 per cent by 2013
- Support transport, procurement and human resources capacity development in the health system to enhance TB care and control
- Introduce practical approaches to lung health (PAL) in three regions by 2012

- Develop programme management capacity to monitor, supervise and coordinate other care providers
- Implement sustained advocacy, communication and social mobilization (ACSM) activities, among others, to reduce stigma over the 2009–13 period
- Increase the number of health facilities working with community volunteers in TB care from 132 in 2009 to 1,329 by 2013
- Increase the number of health facilities or congregate settings implementing TB infection prevention and control (IPC) from 124 in 2008 to 1,000 in 2011 and achieve 80 percent coverage by 2013
- Develop the capacity to conduct research; implement a programme research agenda
- Conduct TB prevalence studies to determine the TB burden by 2011

The two major outcomes indicators of interest are identified as case detection and treatment success rate. In addition, the plan also identifies secondary indicators and sets targets for each of them

### **Justification for the Review**

Because the plan period is coming to an end, Government of Ghana (GOG) through its NTP elected to conduct a comprehensive external review to assess the extent to which the plan had been implemented and set targets had been achieved. The findings of the review are expected to partially inform the development of the successor National TB Control Medium-Term Strategic Plan as well as identify high-impact interventions for scale-up.

### **Terms of Reference and Objectives for the Review**

The aim of the review was to assess the status of implementation of the expiring five-year plan, identify what worked well and what did not work well, and make recommendations to feed into the development of a new five-year strategic plan (2014–18). It was also meant to identify high-impact interventions for targeted funding in phase 2 grant renewal of the Global Fund grant. Its specific objectives were the following:

- To review the implementation of NTP interventions within an integrated health system setting in the context of the Stop TB Strategy and the emerging post-2015 TB consultations
- To review the contribution of the Global Fund round 5 grant and the first phase of the Global Fund round 10 to the overall TB control services based on set goals and objectives
- To identify gaps and interventions to focus on or target in the short, medium and long terms

- To provide recommendations to all stakeholders for improving the overall TB programme and to inform the development of the National TB Control Medium-Term Strategic Plan (2014–18)
- Within the framework of the integrated health services, to make recommendations on future funding for TB control services in concert with the Global Fund’s new funding mechanism and any anticipated need for a strategic approach for diversification of funding sources that include the GOG after 2015

## **Key Findings and Recommendations**

### ***Status of TB Burden in Ghana***

#### *Notifications*

Information from routine notification data as well as estimates of TB burden (i.e., prevalence, incidence and mortality) published routinely by the NTP and in the annual WHO global TB reports indicates the following:

- Rising total notifications since 1996 with relative dip since 2011
- A gradual but steady decline in notified new smear-positive and extrapulmonary TB cases, particularly over the 2009–12 period
- A low and steady proportion of previously treated TB cases during the life of the plan
- A marginal increase and eventual plateauing in smear-negative TB cases during the same period

Conversely, TB notification rates show the following:

- Steady declines in total, smear-positive and extrapulmonary cases
- Low and steady proportion of previously treated TB notifications
- Continuing rises in smear-negative TB cases

#### ***Estimated Incidence, Prevalence and Mortality***

According to the WHO global TB report (2012)<sup>1</sup>, estimated TB incidence, prevalence and mortality in Ghana have all been declining steadily since mid-1990s, but more rapidly since early 2000. At the time of the review, Ghana had already achieved the core MDG target of halting and beginning to reverse the incidence of TB, as well as the expanded Stop TB Partnership targets of cutting TB prevalence and mortality by 50 percent relative to 1990 rates. Although the Stop TB incidence target has not yet been achieved, at the current trend, Ghana is on track to achieve this target as well by 2015.

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<sup>1</sup> WHO. 2012. *Global Tuberculosis Report 2012*. Geneva: WHO.

## **Status of Major and Secondary Strategic Plan Outcome Indicators**

From national notification trends and global WHO reports over time, estimated TB incidence is seen to be declining. This finding will be better informed by results of an on-going nationwide survey of the prevalence of pulmonary TB disease.

The review confirmed that treatment success rate for new smear-positive cases has remained above 80 percent since 2007 cohort and reached and exceeded the global 85 percent rate since the 2008 cohort. Related to this improved performance, default rates have declined from 11.3 percent in 2005 to 3 percent in 2011, and the proportion not evaluated has also dropped significantly since the early 2000s and remained below 3 percent during the plan period. Similarly, treatment completion rates for other types of TB have been increasing exponentially during the plan period, with the exception of TB/HIV dually infected patients, whose treatment success rate has been declining and remained below 70 percent during the plan period

## **Review Conclusions on Treatment Success**

### **Strengths**

It is the informed conclusion of the review team that the highly favourable treatment outcomes are a function of the following:

- Participation of civil society, especially the undeniable good work of treatment supporters at the community level
- Implementation by the NTP of operational and performance-based incentives for patients, health care providers and facilities known as the “enablers package”
- Community-based TB care

### **Areas for Further Action**

The review noted that although the other outcome indicators are progressing well, death rates have remained unacceptably and unexpectedly higher since 1996 and throughout the plan period. From quick analysis in patient and laboratory registers, as well as from findings of an earlier TB mortality audit (unpublished) conducted in five regions by the USAID-funded Tuberculosis Control Assistance Program (TB CAP) in collaboration with the NTP, it is observed that—

- The unusually high positive rates, suggesting late patient presentation for diagnosis and treatment relative to start of symptoms, are likely related to both patient and provider delays.
- TB patients who died were predominantly those who were older, who had smear-negative and extrapulmonary TB and who were HIV coinfecting (18 percent among coinfecting patients compared to 8 percent among those not co-infected) suggesting HIV-related mortality in a high-risk population who are accessing antiretroviral medicines (ARVs) late.

- The median time from the start of TB treatment to time of death was 45 days, with 60 percent of deaths occurring during the first two months of treatment.
- ART access for dually infected patients remains between 30 and 50 percent, and often started after the initial intensive phase of anti-TB treatment.
- Funding for treatment supporters and the enablers package is fully dependent on Global Fund resources, thus making it vulnerable in the event of budget cuts by the Global Fund.

### **Recommendations**

- The role played by treatment supporters and volunteers should be protected and sustained by mainstreaming it into government funding.
- NTP and the National AIDS Control Programme (NACP) should develop a strategy for supporting early initiation of ART among dually infected TB patients as well as addressing the concerns of care providers regarding potential medicine interactions.
- An Advocacy, Communication and Social Mobilization (ACSM) strategy aimed at reducing health care workers and community-related diagnostic and treatment delays, among other control aspects, should be developed and implemented.
- The results of the TB CAP TB mortality audit should be published and used to further inform interventions targeted at identified causative factors.

### **Status of TB/HIV-Related Secondary Outcome Indicators**

Ghana is a low HIV-prevalence country with a general HIV prevalence rate of below 5 percent. Since 2006 and throughout the plan period, the proportion of notified TB patients who were tested for HIV has remained above 70 percent but has been swinging every year with no defined trend of direction. As a case in point, it has fluctuated three times since the plan was launched and stood at approximately 78 percent by the end of 2012. The proportion TB/HIV coinfecting has remained just above 20 percent since 2008 and during the plan period.

### **Strengths**

- The proportion of notified TB patients tested for HIV has been increasing over time.
- The proportion of dually infected TB patients started on CPT has been increasing since the plan was launched in 2009.
- The proportion of dually infected patients started on ART has been increasing steadily, especially since 2010.

### **Areas for Improvement**

- Although the proportion tested for HIV has been rising over time, the trend fluctuated downwards for 2011 and 2012.

- Even though increasing over the years, the portion of dually infected patients accessing ART remains below 50 percent.
- Widespread reports of recent stock-outs and low stocks of both HIV testing kits and ARVs led to the rationing of available resources. The stock-outs were associated with the Global Fund's discontinuation of these supplies for new clients because Ghana has attained lower middle-income status.
- Although national ART guidelines have been revised in favour of early initiation of ART among dually infected TB patients, those guidelines are not yet widely available.

### **Recommendations**

- NTP should implement strategies to sustain high levels of HIV testing including accelerating provider-initiated testing and counselling.
- NTP and NACP should widely disseminate the new national ART guidelines and support their implementation among dually infected TB patients.
- GOG should allocate additional financial resources and mobilize more resources from other partners in addition to the Global Fund to sustain scale-up of HIV testing and ART services towards universal access targets.

### **Combating Drug-Resistant TB**

#### **Strengths**

- A mature and functional local quality-assured laboratory capacity for mycobacterium tuberculosis (MTB) culture and first-line drug (FLD) susceptibility testing (DST) using both solid and liquid media technologies
- Introduction of rapid molecular diagnostic tests in some areas in the regions visited
- Existence of a national PMDT strategic plan and guidelines
- A Green Light Committee (GLC) approval for initiation of PMDT using concessionary priced medicines procured with support from the Global Fund since 2011
- Some health care workers trained at international PMDT courses to form the core for in-country initiation of a drug-resistant TB (DR-TB) treatment programme
- Availability of quality assured second-line anti-TB drugs (SLDs)

#### **Areas for Improvement**

- No recent information on anti-TB drug resistance profile. Information from a recently conducted drug resistance survey (DRS) (2006–08) lacks enough sample size and power.

- Grossly underdeveloped treatment programme. Despite an increasing number of confirmed DR-TB cases, availability of requisite SLDs and the existence of a core team of trained health care workers, no visible structured treatment programme exists.
- Gross diagnosis treatment gap. Out of 38 confirmed MDR-TB cases in 2012, only two cases have been started on treatment.
- The national TB reference laboratory designation within the National Public Health Reference Laboratory (NPHRL) is not clearly defined. The overall hierarchy of laboratory network responsible for DR-TB diagnosis and treatment monitoring is equally undefined.
- Space challenges for inpatient care of DR-TB cases especially those with complications
- Inadequate infection control measures and policies
- Limited knowledge of the existence and potential utility of rapid diagnostic technologies in the early identification of drug-resistant cases
- SLDs DST among confirmed MDR-TB cases scarcely practiced
- Lack of recording and reporting tools for DR-TB at facility levels
- Inactive national MDR-TB coordinating body
- Lack of a national expert panel to advise on DR-TB policies and practices in the management of DR-TB cases in the country

### **Recommendations**

- NTP in collaboration with relevant directorate in GHS should urgently identify and confirm a national TB reference laboratory with a clear link to a supra national reference laboratory (SNRL) for quality assurance.
- The NTP should develop a costed national MDR-TB operational plan.
- The NTP, in collaboration with regional hospitals and the designated reference laboratory, should map all known confirmed MDR-TB cases and move with speed to set up a community-based model of PMDT developed around regional or zonal MDR-TB treatment hubs or centres of excellence to clear the backlog of diagnosed MDR-TB patients currently on waiting list.
- As suggested by the Director of Public Health of GHS, the NTP should designate an MDR-TB focal person at the central level to coordinate and monitor full introduction and scale-up of PMDT in Ghana.
- NTP should coordinate the establishment of a national clinical advisory panel of experts to act as a think tank for case management in the country and for the set-up of regional or zonal PMDT expert support teams.

- The NTP should work with collaborating partners to develop and implement an MDR-TB curriculum and training plan for PMDT that will build the capacity of core teams at each of the proposed regional treatment hubs.
- The NTP, in collaboration with the NPHRL, should put in place a laboratory-based surveillance system for DR-TB.
- The designated NPHRL in collaboration with the NTP, should establish routine SLD DST for all confirmed MDR-TB cases.
- The NTP in collaboration with the designated NTRL should plan for and conduct a nationwide DRS during 2015.

## **Political Commitment and Programme Management**

### **Strengths**

TB control is among the priority communicable diseases for Ghana as reflected in key GOG strategic health sector documents. A TB control programme central unit exists at the central level for policy formulation, strategic planning, national M&E and capacity building of lower levels. Related positive political and programme management elements include the following:

- Regular creation of strategic plans (2009–13), guidance documents and tools
- Successful mobilisation of operational funding for control interventions both from government and from bilateral and multilateral partners, including the enablers package concept to enhance performance and outcomes
- Increasing government contribution to health services that benefit TB control in general terms
- Effectively mainstreamed free TB control services in an integrated health care system, with coordinators or focal persons at all levels of the system
- Wide-scale involvement of Civil Society Organizations (CSOs) and community-based organisations (CBOs) that has culminated in the formation of a national Stop TB Partnership, which is housed within the NTP premises for easy collaboration
- Basic service provision (e.g., laboratory and DOTS centre staff salaries) being supported by GOG
- Sustained support from development partners to fund TB control services (i.e., the Global Fund, USAID and WHO/Canadian National Development Agency [CIDA])

### **Areas for Improvement**

- *The level of government financing of TB control activities is very low. During the life of the expiring plan, the programme has notably depended on donor and partner financial inflows, especially from the Global Fund and USAID, to meet its ever-*

increasing obligations. Even core aspects of TB control such as FLDs and SLDs have relied on non-state funding

- *The human resources base for coordinating TB control efforts in the country is inadequate.* The staff complement at the central level is insufficient to meet the national and global demands of all aspects of the Stop TB Strategy as outlined in the current plan and as can be projected for the future including post-2015. For the current plan, PMDT and laboratory oversight have suffered adversely because of this gap. The technical deficit will widen even more because the GOG has embarked on a process to decentralise delivery of social services, including health services, to district levels under district assemblies, a process that will create increased needs for central-level strategic guidance, technical mentorship and M&E of programme implementation and impact.

### **Recommendations**

- GOG should allocate additional financial and material resources for the control of TB in the country and especially should take full financial responsibility for core aspects of TB control such as first line drugs (FLDs) and Second Line Drugs (SLDs).
- GOG should mobilize additional financial resources from diverse collaborating partners to complement government allocations for TB control over and above the Global Fund, hitherto the principal supplier of funds for TB control efforts in Ghana.
- The GHS should increase, as committed during the review debriefing, the number of experts at the NTP central unit to cover oversight for critical elements of TB control, especially basic DOTS implementation and enhancement, PMDT, TB/HIV and laboratory services. The emerging post-2015 development agenda will introduce new areas of focus and will benefit directly from this enhanced technical capacity.

### ***Impact of Global Fund Grants and USAID-Funded TB CAP and TB CARE Projects on TB Control in Ghana***

Ghana has so far benefited from three TB Global Fund grants in round 1, round 5 and round 10. Rounds 1 and 5 ended successfully, but at the time of the review, the GOG was coming to the end of phase 1 of a round 10 single-stream funding grant.

Since 2007, the NTP has received technical assistance through a resident TB technical advisor and periodic external consultants made available through the TB CAP and TB CARE I projects funded by the USAID. Through these USAID-funded projects, the five-year health sector strategy plan, standard operating procedures (SOPs) for TB case detection and TB infection control and the handbook on PPM were developed. USAID through TB CAP supported the procurement of 10 light microscopes and five LED microscopes. Through TB CAP and TB CARE I, various operational research activities were conducted including a TB mortality audit, assessment of reasons for low TB case detection and evaluation of the enablers package. Various cadres of health care workers were supported to attend in-service training and external TB courses, including courses on MDR-TB, TB-HIV, laboratory and M&E. Currently, TB CARE I is supporting the NTP to demonstrate the best practices in implementing hospital-based intensified TB case-detection activities.

### *Key Achievements from Combined Partner Support*

- Ghana has managed to significantly scale up basic TB DOTS services and improve on treatment outcomes and impacts towards attainment of global targets.
- New smear-positive TB cases have gradually declined, as have estimated incidence mortality and prevalence rates. Assuming the current trends continue, and we found no reason not to believe they will, Ghana is firmly on track to fully meet the MDG target of halting and beginning to reverse TB incidence rate by 2015, as well as to meet the Stop TB Partnership targets of 50 percent reduction in TB prevalence and death rates between 1990 and 2015.

Furthermore, ample evidence shows that increased funding for TB control over the last decade, from both domestic and international sources, notably the Global Fund and USAID, has been associated with these developments:

- DOTS expansion and improvements in case detection coupled with treatment success rates for both new and re-treatment cases
- Marked increase in HIV testing among notified TB cases, and increased proportion of dually infected TB patients who are accessing CPT

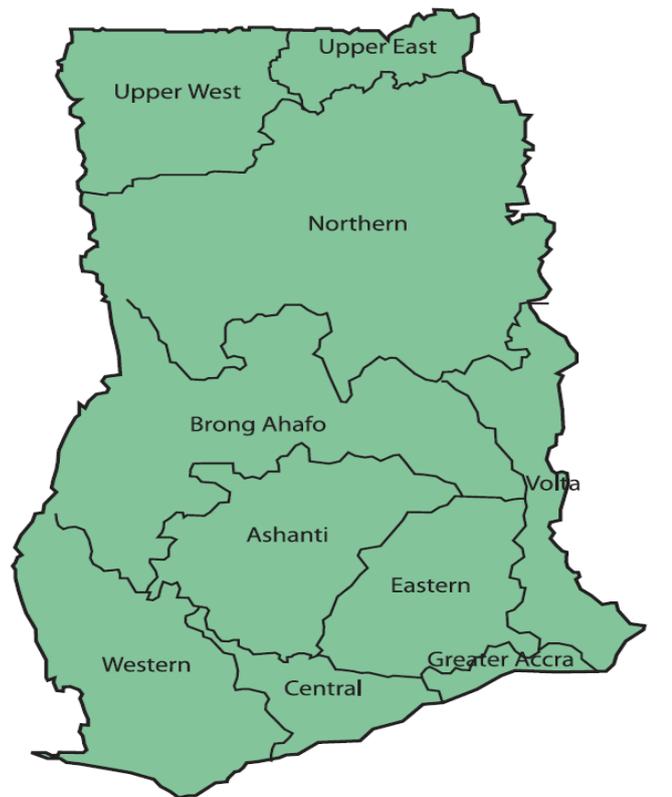
### *Remaining Challenges and Areas for Continuing Intensified Action*

- Intransigent TB fatality rates
- Low ART coverage of dually infected TB cases
- Underdeveloped efforts and structures for combating DR-TB
- The need to maintain health care worker capacity in a decentralised health care delivery system, especially since GOG is in the process of decentralising health and other social services down to district assembly levels as part of a decentralisation policy

## BACKGROUND: COUNTRY PROFILE

### Geographic and Demographic Information

Ghana, a vast African country located on the Gulf of Guinea, has a total land area of 238,538 square kilometres (92,100 square miles), a south-to-north distance of approximately 840 kilometres (522 miles) and an Atlantic Ocean coastline spanning approximately 554 kilometres (344 miles). It borders Burkina Faso to the north, the Republic of Togo to the east and Côte d'Ivoire to the west. The country is divided into 10 administrative regions; from north to south the regions are Upper West, Upper East, Northern, Brong Ahafo, Ashanti, Eastern, Volta, Western, Central and Greater Accra (figure 1); 213 administrative districts and over 600 subdistricts. Ghana has about 240,000 households and over 45,000 communities.



**Figure 1. Ghana's 10 administrative regions**

The 2010 population census showed a population of 25.37 million and population growth rate of 2 percent in 2012; half the population (51 percent) lives in urban areas. Females constituted 51.2 percent of the population, 38 percent of whom were children under 15 years of age. The highest population densities are found in the urban areas. Life expectancy at birth increased to 65.5 years as of 2011, an increase over the previous 57 years.

## Socioeconomic Conditions

The country has a mixed economy, consisting of a dominant agricultural sector. About 60 percent of the adult labour force is involved in small-scale peasant farming. Ghana also has a relatively small, capital-intensive modern sector dominated by mining and other industrial activities and a rapidly expanding informal sector. In 2011, gross national income per capita was 1,830 US dollars (USD).

Ghana is currently classified as a lower middle-income country with an ever-increasing economic growth. By improving policies and institutions and by investing in infrastructure and basic services, Ghana—with the assistance of many development partners—has brought down poverty levels and is likely to surpass the MDG of halving poverty by 2015. Gross domestic product annual growth was 15 percent in 2011. The private sector employs only about 10 percent of Ghana’s total health workforce. Table 2 shows trends in some of the major socioeconomic indicators for Ghana for the period 2000–2012.

**Table 2. Trends in Major Socioeconomic Indicators 2000–12**

Indicators	2000	2012
Population (total)	19.9 million	25.37 million
Populations growth	2.2	2.0
Life expectancy at birth	56.7	64 (2011)
Infant mortality rate (per 1,000 live births)	68.0	53 deaths per 1,000 live births (2011)
The maternal mortality rate	— <sup>a</sup>	485.2 per 100,000 live births (2010)
Prevalence of HIV	2.3	1.37(2012)
School enrolment in primary education	80.5	88.4
School enrolment in secondary education	37.4	43.6
Ratio of boys to girls in primary and secondary education	89.4	92.6
Literacy rate, youth female (percentage of females ages 15–24)		65.5
Doctors-to-population ratio	1: 8,288	1: 14,732 (2009)

<sup>a</sup> Data not available.

*Sources:*

- World Bank. 2013. [World Databank](#). Washington, DC: World Bank.
- Facts and Figures. Policy Planning, Monitoring and Evaluation Policy, Planning, Monitoring and Evaluation (PPME): 2005, Ghana Health Service
- Ghana 2010 Population and Housing Census Report. Ghana Statistical Services

## Health Services in Ghana

GHS is organized into a three-tiered administrative system—national, regional and district levels—but is five tiered in terms of service delivery—national, regional, district, subdistrict and Community Health Planning and Services (CHPS) zones. At the national level, GHS is responsible for the delivery of all health services in the country. It is subdivided into 10 main divisions, each with departments that have responsibilities for carrying out the functions of the division. The NTP is a programme within the Disease Control and Prevention Department of the Public Health Division.

Since 1995, health sector reforms have led to the development of three five-year programmes of work: the first covering 1997–2001, the second covering 2002–06, and the third covering 2007–11. The 2007–11 programme of work and the current Medium-Term Health Strategic Plan added objectives aimed at—

- Ensuring that people live long, healthy and productive lives
- Reducing the excess risk and burden of morbidity, mortality and disability, especially in the poor and marginalized groups
- Reducing inequities in access to health, population and nutrition services and health outcomes

One priority has been to implement interventions that 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 (i.e., CHPS) has been the main system for service delivery.

### **Institutional Capacity for Health Services Delivery**

MOH and its agencies, particularly GHS, are endowed with a countrywide network of health facilities (e.g., hospitals, health centres, clinics and maternity homes) scattered throughout all the 10 regions and 170 districts of the country.

Ghana has 321 hospitals, 760 health centres and 1,124 clinics manned by a total workforce of 49,138. About 83 percent of all health facilities in Ghana belong to the public sector, 9 percent to faith-based institutions and 7 percent to the private sector. As of January 2010, there were 2,064 doctors (1 per 10,000 population), 13,564 nurses (6 per 10,000 population), 1,798 pharmacists or technicians and 15,549 allied health professionals and 558 medical assistants working in Ghana.

Health management in Ghana is fairly decentralized within the MOH involving district health management teams, regional health management teams and headquarters. Complementing this arrangement are institutional or health facility management teams. Each of these management levels is a budget and management centre (i.e., a group responsible for a defined programme of work supported by a defined operational budget). The NTP delivers its services within the general health services structures.

### **Laboratory Services**

Ghana has a three-tiered laboratory network: national, intermediate and peripheral laboratories. SSM has been the main tool for TB diagnosis. As of the end of 2012, 292 centres performed SSM. Three laboratories (including two teaching hospital laboratories), one regional hospital and one research institute have the capacity to perform TB cultures.

Four laboratories are equipped to perform liquid culture. Line probe assays (LPAs) for DST are available at the Noguchi Memorial Institute for Medical Research (NMIMR), Korle-Bu Teaching Hospital Chest Clinic in Accra and the regional hospital laboratory in the Eastern region. Four Xpert MTB/RIF machines have been introduced at the Korle-Bu Teaching Hospital Chest Clinic laboratory in Accra, the Komfo-Anokye Teaching Hospital Chest Clinic laboratory in Kumasi in the Ashanti region, the Ridge Regional Hospital laboratory in the Greater Accra region and the Atua Government Hospital in the Eastern region.

Quality assurance systems for TB microscopy have been introduced. Site assessment and blind re-checking are practiced widely, whereas panel testing has only recently been introduced with assistance from WHO through the Borstel Laboratory in Germany. The regional laboratories' capacities and implementation of external quality assurance (EQA) activities in support of peripheral laboratories is supervised by the National Public Health Laboratory led by the NTP laboratory focal person

The National Public Health Reference Laboratory and the NMIMR are jointly charged with responsibility as national TB reference laboratories, and they engage in EQA, culture and DST. Formal links with the external international laboratories (i.e., the Research Institute of Tuberculosis in Japan and the Borstel National Reference Center for Mycobacteria in Germany) have been established.

### **Health Services Financing**

The main financial sources for the health sector are the GOG, the Health Fund or Donor Pooled Fund, earmarked funds from some donors, internally generated funds and the National Health Insurance Scheme. Furthermore, some health partners (such as the European Union, the United Kingdom's Department for International Development, and the World Bank) are moving from direct health sector support to multi-donor budget support, which is pooled at the level of the Ministry of Finance to support the national budget. There has also been an unprecedented increase of funds to the health sector, particularly from the Global Fund through rounds 1, 5 and 10 grants. By the end of December 2008, the Global Fund had disbursed USD 187,230,047 to Ghana to combat TB, AIDS, and malaria. During the life of the current plan, the NTP is moving towards the end of phase 1 of the round 10 grant.

# THE GHANA TB CONTROL PROGRAMME

## **Mandate**

The NTP falls under the Disease Control and Prevention Department of the Public Health Division of GHS. Its mandate is to provide leadership for the health sector response to TB in Ghana. To this end, Ghana adopted the WHO recommended TB DOTS strategy in 1994 and achieved 100 percent DOTS coverage in 2000. Presently, Ghana is in the maintenance phase of DOTS expansion.

The programme is focused on three goals: to correct deficiencies that have hampered achievement of set national and global TB control targets; to implement innovations that will improve quality of care and access to core DOTS services such as PPM DOTS, TB in prisons, TB/HIV collaborative activities and community TB care activities (CBTC); and to advocate for increased human, material and financial resources for fighting the TB epidemic.

## **Structure of the NTP**

TB control in Ghana 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. The team is led by a TB coordinator and is responsible for coordinating the delivery of TB control services in both the public and quasi-private sector such as faith-based health facilities.

The programme is made up of a central unit whose responsibilities include ensuring strategic leadership for the fight against TB in the country through the development and publication of programme policies and guidelines, and advocating for political commitment for TB to remain a national priority.

Since 2008, MSH, through TB CAP and with financial support from USAID, has provided a TB technical advisor to the central unit whose main responsibility is to provide resident strategic and technical assistance to the NTP central unit in an effort to improve the quality of DOTS and related services in the public and private sectors. The WHO national professional officer works closely with the NTP. Beginning in 2011, USAID through the TB CARE I Project provided 50 percent salary support for the national professional officer.

At the regional level, there are 10 regional directorates plus three teaching hospitals that are treated as independent regions in their own right. Each of the regions maintains a TB team made up variously of a TB coordinator, laboratory biomedical scientists, pharmacists, doctors, nurses and disease control or surveillance officers. The team is charged with data management, planning and budgeting, commodity distribution (e.g., 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 SSM. Each region has one trained doctor (i.e., the referral clinician) to provide support in the management of treatment failures, chronic cases and other clinical problems that require assistance. Conversely, the regional hospitals (i.e., Komfo-Anokye Teaching Hospital, Korle-Bu Teaching Hospital and Tamale Teaching Hospital) provide inpatient and outpatient specialized services without supervisory responsibilities outside their domain.

At district level, the district director of health services has primary responsibility for TB control, supported by 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 programme monitoring. District TB coordinators assume various other responsibilities outside of TB control.

At the facility and community levels, TB services are accessible at both public and private accredited sites. More than 1,500 facilities provide TB DOTS, of which more than 130 are private facilities. At the facility level, a designated public health nurse (or other health worker) is responsible for TB control activities, and community health workers and community volunteers are involved in TB control through their participation as treatment supporters within the enablers package programme, as well as assisting in defaulter prevention and tracing. A community-based TB care policy is in place that promotes mainstreaming of TB services into a CHPS initiative of GOG to improve geographical access to TB diagnosis and treatment and reduce the financial burden of care seeking for patients and families.

In delivering these services through the health system hierarchy, the NTP collaborates with stakeholders such as the NACP, the Country Coordinating Mechanism (CCM,) TB CARE I, the Stop TB Partnership of Ghana, the NMIMR, Christian Association of Ghana the School of Public Health, medical schools, other research institutes such as Dodowa, private practitioners, CBOs and CSOs. In a special collaborative initiative to improve access, treatment adherence, case detection and treatment success rates, the Ghana NTP with Global Fund support is implementing a PPM DOTS expansion initiative involving the six major cities (including Accra, Kumasi and Takoradi). It is planned that the interventions highlighted in the Public Private Mix (PPM) handbook will be rolled to other cities in a phased manner.

Korle-Bu Teaching Hospital in Accra and Komfo-Anokye Teaching Hospital in Kumasi play particularly important functions as TB care providers in the two major metropolitan cities in Ghana and in teaching and promotion of DOTS to medical and paramedical students. In addition, these institutions are partners in TB research.

Since the establishment of the NTP in 1994, many international partners have provided and continue to provide financial and technical support to the Ghana NTP. These international partners include the Global Fund, USAID (through the TB CAP and TB CARE Projects), the Danish Agency for Development Assistance (Danida), WHO, the International Union Against Tuberculosis and Lung Disease, the United Kingdom's Department for International Development, the World Bank and the Dutch Government through the Facility for Infrastructure Development (ORIO).

## THE 2013 EXTERNAL PROGRAMME REVIEW

### The Ghana National TB Control Strategic Plan 2009–13

The Ghana NTP is implementing a five-year strategic plan that builds on a second plan which covered the period 2002–06 and was developed with support from the USAID–TB CAP and through a consultative process following the findings and recommendations of an NTP comprehensive review as well as various technical missions. The present plan has six strategies framed in line with the Stop TB Strategy:

- Pursuing high-quality DOTS expansion and enhancement
- Addressing TB/HIV, MDR-TB, and other challenges
- Contributing to health system strengthening
- Engaging all care providers
- Empowering communities and people with TB
- Enabling and promoting research

Because the current plan is coming to the end of its life span, the programme decided to commission a comprehensive external review to assess implementation of planned interventions and their outcomes and impacts and generate recommendations as inputs to the development of a successor plan towards 2015 and beyond. Furthermore, the review was expected to help identify high-impact interventions for phase 2 of the round 10 Global Fund grant.

### Terms of Reference for the Review

#### *Purpose of the Review*

The purpose was given as, “To feed into the development of a new post-2015, five-year strategic plan (2014–18) and to identify high-impact interventions for targeted funding in phase 2 grant renewal of the Global Fund.”

#### *Specific Objectives*

The specific objectives were the following:

- To review NTP interventions within an integrated health system setting in the context of the Stop TB Strategy and the emerging post-2015 TB consultations
- To review the contribution of the Global Fund round 5 grant and the first phase of the Global Fund round 10 grant to the overall TB control services based on set goals and objectives
- To identify gaps and interventions to focus or target on in the short, medium and longer terms
- To provide recommendations to all stakeholders for improving the overall TB programme and to inform the development of the National NTP Strategy 2014–18

- Within the framework of the integrated health services, to make recommendations on future funding for TB control services in concert with the Global Fund's new funding mechanism and any anticipated need for a strategic approach for diversification of funding sources that include GOG after 2015

### **Review Methodology**

The review was conducted using standard data collection tools, direct observations, interviews and record reviews.

Two teams composed of at least one international reviewer and a minimum of two independent internal reviewers were constituted and deployed to cover five both randomly and purposely selected sites and facilities in five regions of the country (Greater Accra, Eastern, Western, Upper East and Ashanti) as well as central level offices, institutions and directorates.

In each region, the regional public hospital was purposely sampled and reviewed; a minimum of two districts per region were randomly selected and in each district, a minimum of one public hospital was sampled. All public hospitals were purposely selected or, if there was more than one public hospital, randomly sampled. Furthermore, at least two public health centres and clinics were randomly selected, stratified by urban and rural location. If an area had religious health centres or clinics, one of each was added purposely or sampled randomly if there was more than one such facilities.

In the field, each team prepared a report for each region (narrowed down to districts in detail) in text as well as in PowerPoint® slides by service delivery area as specified in the strategic plan. These reports and slides were used as feedback for the expanded review team at the end of fieldwork.

Key review activities encompassed the following:

- Desk reviews of various policy or technical documents, programme technical reports and data
- Interviews with key stakeholders and partners within the MOH and GHS
- Discussions with representatives of donor and technical partners
- Interviews and discussions with civil society organizations (CSOs)
- Site visits to both randomly and purposely selected sites and facilities in five regions of the country (Greater Accra, Eastern, Western, Upper East and Ashanti) where onsite interviews were conducted with key informants, especially members of regional, district and subdistrict management teams and staff in hospitals and peripheral health units
- Interviews and focus groups with TB treatment supporters, selected cured patients, patients on TB treatment and community members

- Debriefing of stakeholders on the key findings of the review

### **Key deliverables**

The key deliverables are a full GLC monitoring report and this narrative review report.



## MAJOR REVIEW FINDINGS

### Objectives and Major Outcome Indicators of the Strategic Plan

The 2009–13 Strategic Plan has 13 specific objectives and two major outcome indicators. The specific objectives were to—

- Expand the TB laboratory network for SSM from 257 to 661 by 2013
- Establish 60 new microscopy centres in 60 newly created districts by 2011
- Start implementing DOTS Plus from 2009
- Introduce IPT in 75 support groups for PLHIV by 2013
- Increase the proportion of HIV-positive TB patients on ART from 20 percent to at least 75 percent by 2013
- Support transport, procurement and human resources capacity development in the health system to enhance TB care and control
- Introduce PAL in three regions by 2012
- Develop programme management capacity to monitor, supervise and coordinate other care providers
- Implement sustained ACSM activities, among others, to reduce stigma over the 2009–13 period
- Increase the number of health facilities working with community volunteers in TB care from 132 in 2009 to 1,329 by 2013
- Increase the number of health facilities or congregate settings implementing TB IPC from 124 in 2008 to 1,000 in 2011 and achieve 80 percent coverage by 2013
- Develop the capacity to conduct research and implement a programme research agenda
- Conduct TB prevalence studies to establish the TB burden by 2011

### Major outcome indicators were—

- *Case detection coverage.* The number or 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
- *TB treatment success.* The number or percentage of new smear-positive TB cases successfully treated (i.e., cured plus completed TB treatment) among new smear-positive TB patients registered during a specified period

The secondary indicators in table 3 were also identified.

**Table 3. Secondary Indicators for the Ghana NTP 2009–13 Strategic Plan**

<b>Secondary Indicator</b>	<b>2013 Target, %</b>
TB patients routinely offered HIV testing	90
HIV-positive TB patients started on CPT	95
HIV-positive TB patients started on ART	75
Prevalence of MDR-TB among new TB patients	<2
Smear conversion at two months	>90
Smear conversion at five months	>90
Cases not evaluated	0
Defaulter rate	<4
Failure rate	<2

This report takes into consideration the extent to which set objectives and indicators have been achieved at the material time of the review as well as the extent to which planned programme elements are reaching intended targets and the degree of congruence between the plan for providing services elements and the ways they are actually being provided. The report then makes recommendations on the basis of the major findings presented, discussed, or inferred.

## **Major Findings by Strategic Areas**

### ***Status of TB Burden in Ghana***

#### *Notifications*

#### **Key Achievements**

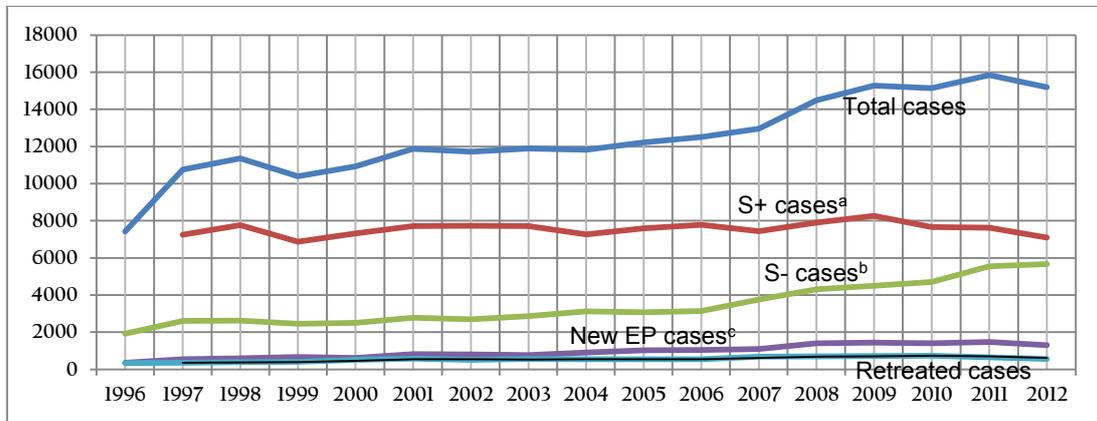
- Routine notification data as well as estimates of TB burden (e.g., prevalence, incidence, and mortality) published routinely by the NTP and in the annual WHO Global TB reports indicate gradual but steady declines in absolute and notification rates for notified new smear-positive and extrapulmonary TB cases, particularly over the 2009–12 period.
- The absolute and notification rates of previously treated cases has remained low and steady over the same period.
- By the time of the review, Ghana was in final stages of commissioning a nationwide TB disease prevalence survey to determine the true burden of pulmonary TB among adults.

#### **Remaining Challenges**

- There has been continuing rise in total TB notifications since 1996 with only a relative dip since 2011.

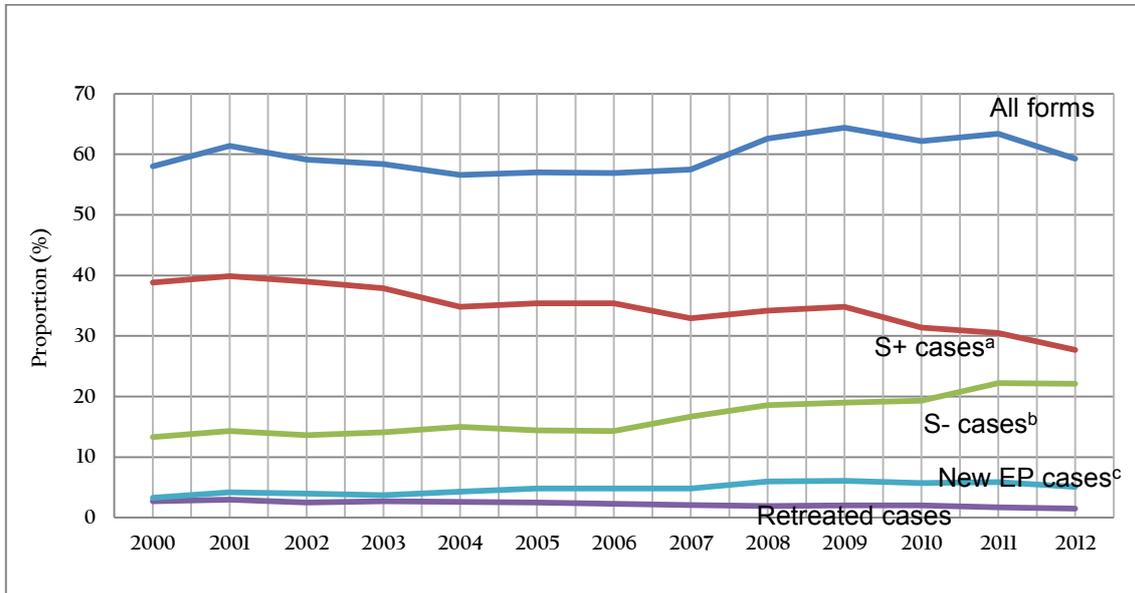
- Marginal increase and eventual plateauing in smear-negative TB cases has occurred during the same period.

Using data compiled for the NTP annual reports, figures 2 and 3 show the trend of various types of TB over the 1996–2012 period.



- a = sputum smear positive
- b = sputum smear negative
- c = extrapulmonary

Figure 2. Notified absolute TB cases by type in Ghana, 1996–2012



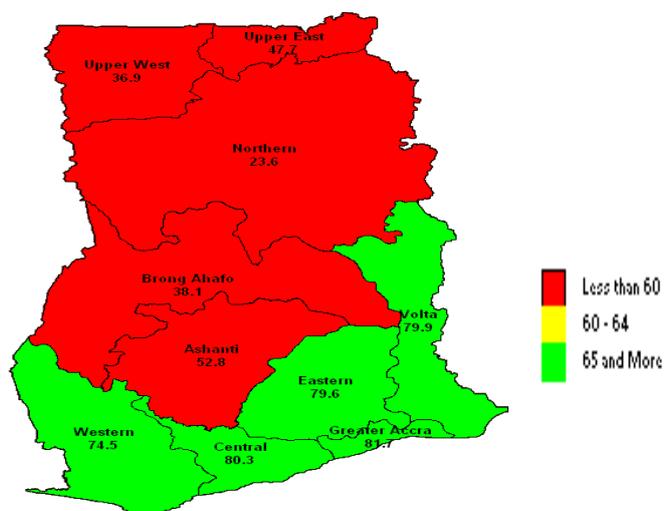
- a = sputum smear positive
- b = sputum smear negative
- c = extrapulmonary

Figure 3. TB Notification rates (per 100,000 population) by type, Ghana 2000–12

### *Notifications by Region*

Available routine programme information indicates variations in the distribution of TB burden by region with higher rates noted in the southern belt regions of Volta, Eastern, Greater Accra, Central and Western. Data from 2009 notifications demonstrated this geographical distribution stratifying the regions into those reporting fewer than 60 cases per 100,000 population in the middle and northern regions and those reporting 60 and more cases per 100,000 population in the more southern regions and the Western region (figure 4). The 2009 distribution seems to hold for subsequent strategic plan years.

TB Case notification per 100,000 population 2009.  
source: NTP Ghana



**Figure 4. Regional distribution of TB notification rates in Ghana, 2009 NTP annual report data**

### *Notifications by Gender and Age Group*

The overall male-female ratio of TB patients is calculated to be 2:1, and as in the rest of the region, those most affected are in the younger economically productive years of life. In Ghana, however, the peak age groups are beginning to exhibit an unmistakable shift towards older patients for both males and females. As a case in point, for new smear-positive cases in the 2008 cohort, the peak affected age group for women is 25 to 34 years and for men, 35 to 44 years (figure 5). This finding seems to be consistent with trends being seen in other countries with low HIV prevalence in the general population.

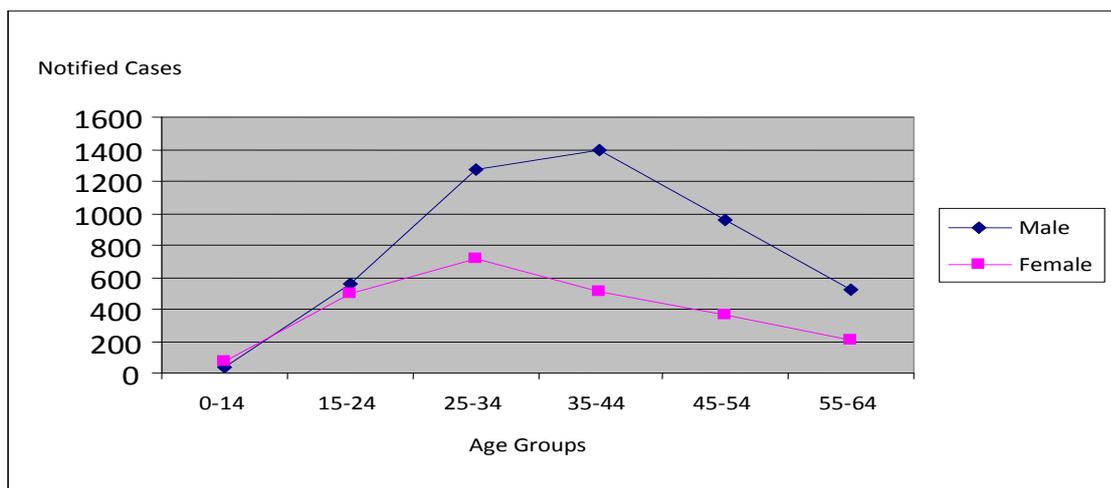


Figure 5. Notified cases by age group and gender, Ghana 2008 smear-positive TB cohort

Estimated Incidence, Prevalence, and Mortality

Key Achievements

- Estimated TB incidence, prevalence and mortality have all been declining steadily since mid-1990s, but more rapidly since early 2000.<sup>2</sup>
- At the time of the review, Ghana had already achieved the core MDG targets of halting and beginning to reverse the incidence of TB, as well as the expanded Stop TB targets of cutting TB incidence, prevalence and mortality by 50 percent relative to 1990 rates.
- As indicated by WHO’s *Global Tuberculosis Report 2012*, the TB incidence target has not yet been achieved but appears achievable by 2015 at the current trend of decline (figures 6–8).

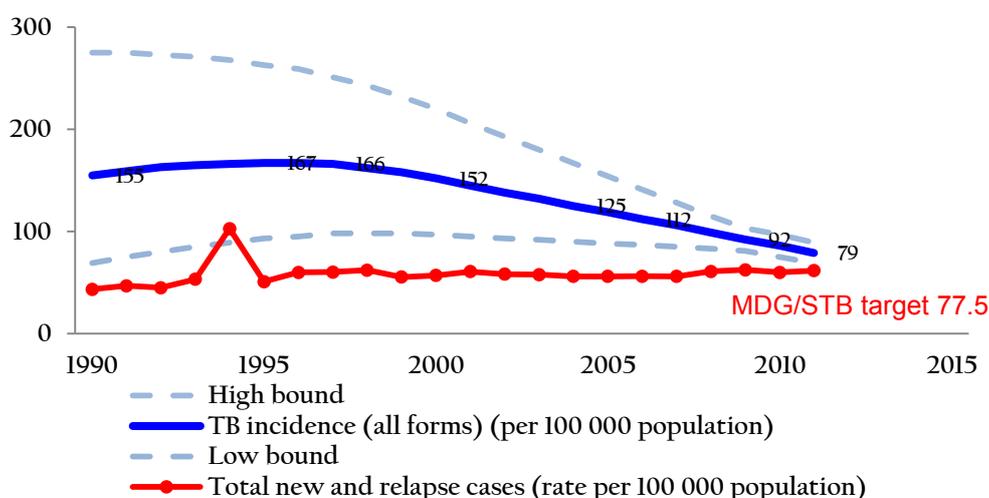
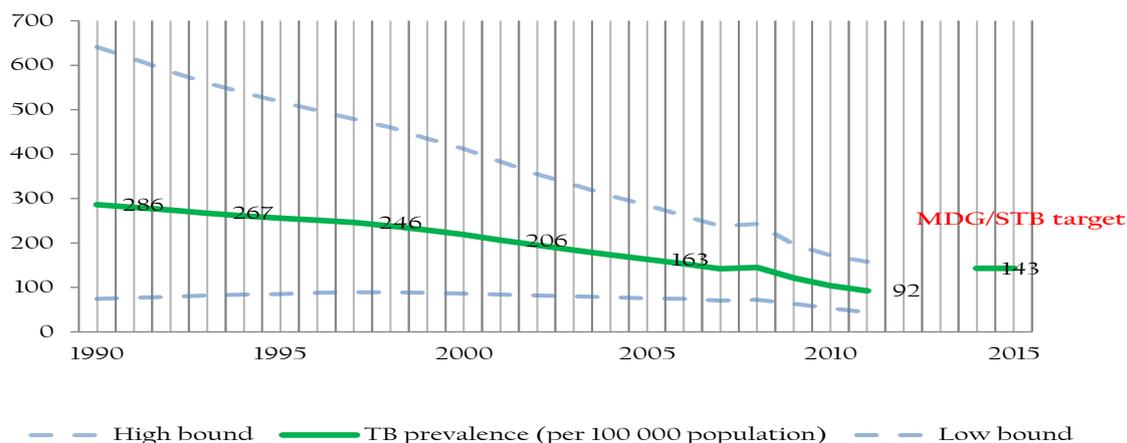


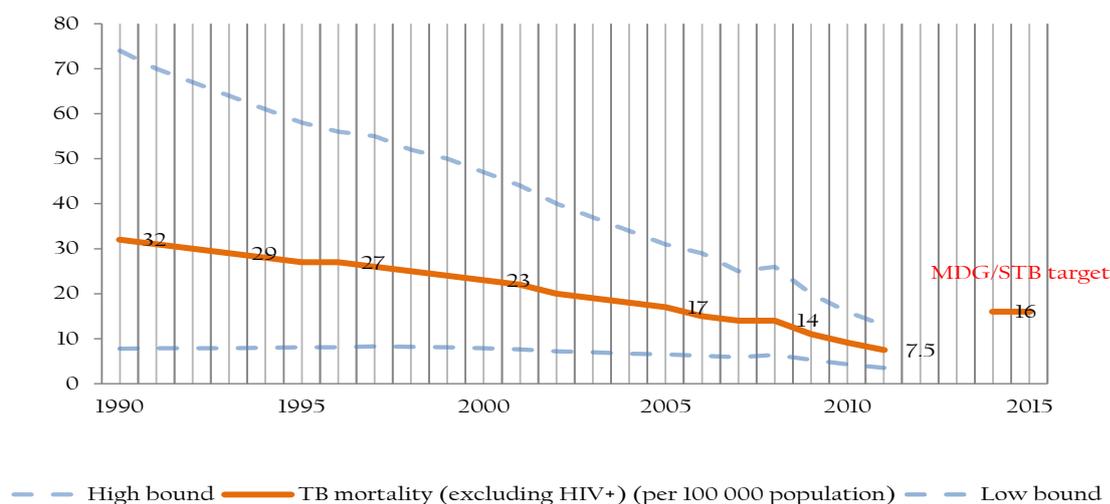
Figure 6. Estimated TB incidence (all forms) per 100,000 population in Ghana

<sup>2</sup> WHO. 2012. *Global Tuberculosis Report 2012*. Geneva: WHO.



Source: WHO. Global Tuberculosis Report 2012. 2012. Geneva: WHO

**Figure 7. Estimated TB prevalence (all forms) per 100,000 population in Ghana**



Source: WHO. Global Tuberculosis Report 2012. 2012. Geneva: WHO

**Figure 8. Estimated TB mortality (all forms) per 100,000 population in Ghana**

## **Summary Status of Major and Secondary Outcome Indicators**

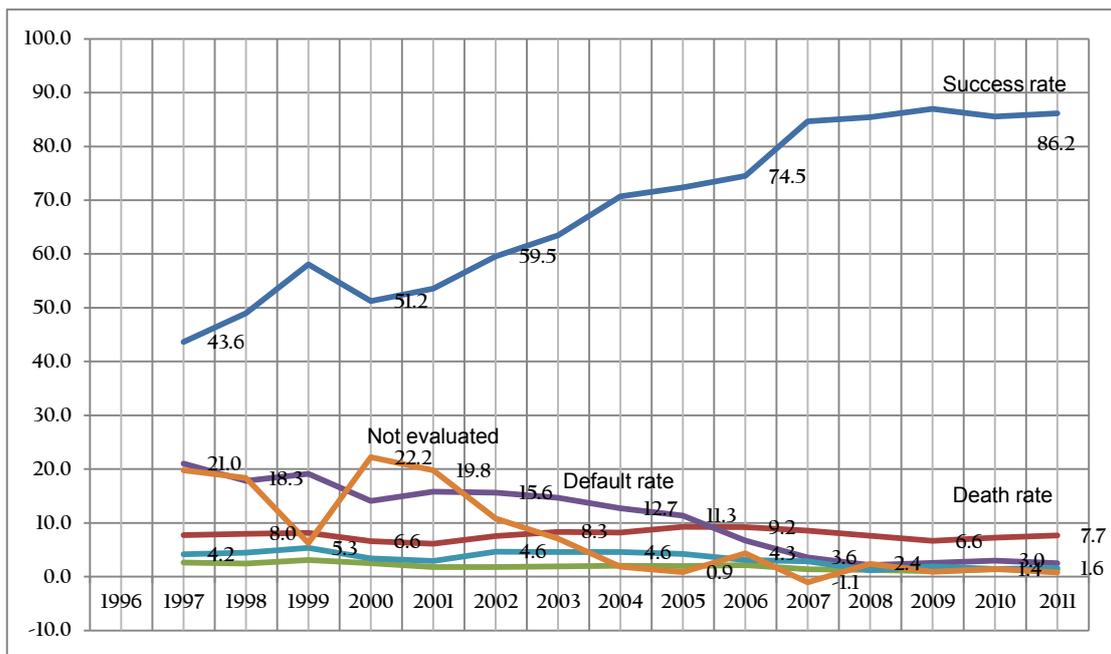
### **Case Detection Rate**

- This indicator has been achieved as of the 2012 cohort, but case detection rate is no longer of international interest due to the difficulty of its derivation in the absence of special surveys for estimating true prevalence of smear-positive TB in the wider community.

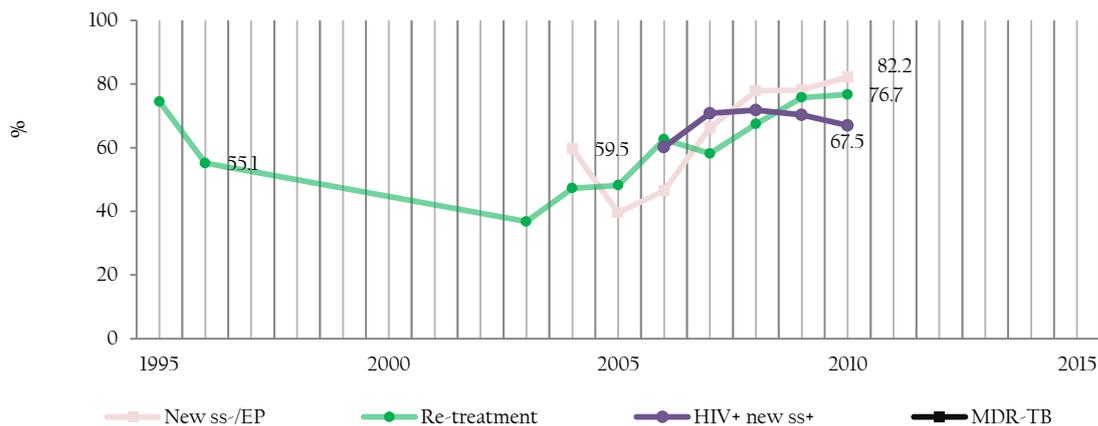
- The review, therefore, recommends that Ghana use findings from a planned nationwide survey of the prevalence of pulmonary TB disease to arrive at a more informed estimate of this indicator in subsequent years.

**Treatment Success Rate**

- Treatment success rate for new smear-positive cases has remained above 80 percent since the 2007 cohort and reached and exceeded the global 85 percent rate since the 2008 cohort.
- Default rates have declined from 11.3 percent in 2005 to 3 percent in 2011, and the proportion not evaluated has also dropped significantly since the early 2000s and remained below 3 percent during the plan period (figure 9).
- Treatment completion rates for other types of TB have been increasing exponentially during the plan period, with the exception of HIV dually infected patients whose treatment success rate has been declining and remained below 70 percent during the plan period (figure 10).



**Figure 9. Treatment success rate for new smear-positive cases, 1996–2011 cohorts**



**Figure 10. Treatment completion rate for other forms of TB**

### *Conclusions on Major Outcome Indicators*

- The review team concludes that the participation of the private sector and civil society, especially a so-called treatment supporters cadre at the community level, is contributing positively to the impressive performance in case holding.
- The reduction in defaulter rates and proportion lost to follow-up cases appears to be associated with the implementation by the NTP of operational and performance-based incentives for patients, health care providers and facilities known as the enablers package and CTBC.
- Treatment supporters and volunteers have no doubt been successfully used to support patients and to achieve sustained improvement in treatment success rates. Although other outcome indicators are progressing well, death rates have remained unacceptably and unexpectedly higher since 1996 and throughout the plan period. From quick analysis in patient and laboratory registers, as well as from findings of an earlier TB mortality audit conducted in five regions by the USAID-funded TB CAP in collaboration with the NTP, it is observed that—
  - The level of positive rates is unusually high suggesting late patient presentation for diagnosis and treatment relative to the start of symptoms, which is likely related to both patient and provider delays.
  - Patients who died were predominantly older, had smear-negative and extrapulmonary TB and who were HIV coinfecting (the mortality rate was 18 percent among coinfecting compared to 8 percent among those not coinfecting) suggesting HIV-related mortality in a high-risk population who are not accessing ARVs until late in the disease.
  - The median time from start of TB treatment to time of death was 45 days, with 60 percent of deaths occurring during the first two months of treatment.
  - ART access for dually infected patients remains between 30 and 50 percent, and often started after the initial intensive phase of anti-TB treatment

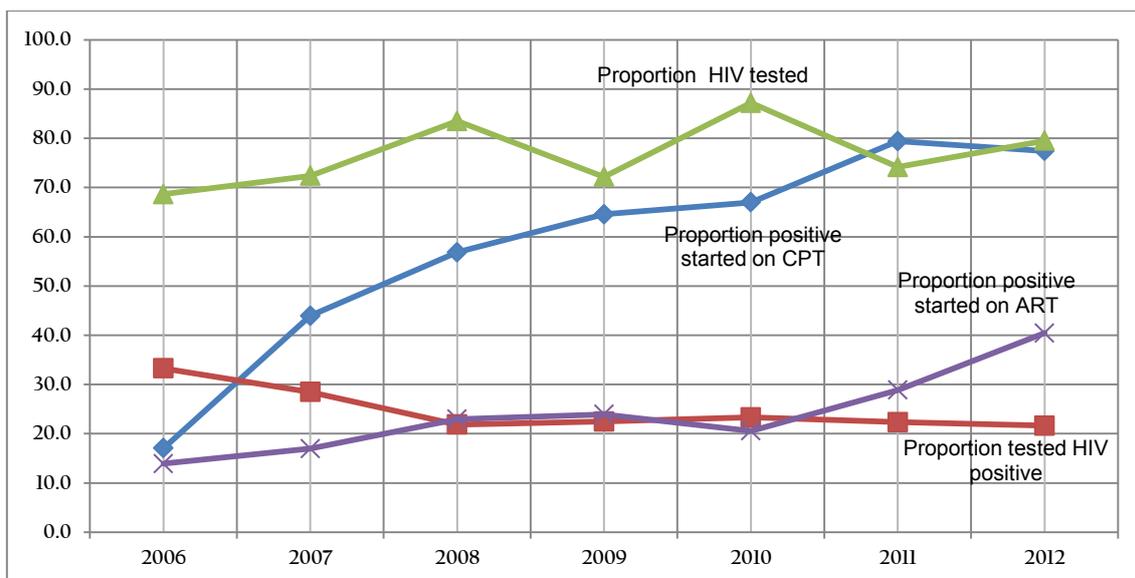
- Funding for treatment supporters and the enablers package is fully dependent on Global Fund resources, thus making it vulnerable in the event of budget cuts by the Global Fund.
- Furthermore, the high death rates among HIV dually infected smear-positive patients largely suggests HIV-related mortality in a high-risk population who are not accessing ARVs until late in their otherwise recommended timely anti-TB and anti-HIV treatment combination regime. From records and data review, the proportion of dually infected TB patients being started on ART while still on TB treatment is still below 50 percent.
- Although the ART guidelines in Ghana have been revised in line with the new WHO ART guidelines for early initiation of ART among dually infected patients, in practice, ART is still being started after the initial intensive phase of anti-TB treatment on account of health workers' lack of confidence to manage potential medicine interactions.

### *Recommendations on Major Outcome Indicators*

- The NTP should use the findings from the planned TB prevalence survey to inform the true burden of TB in the country and to estimate future trends in case detection rates.
- The role played by treatment supporters and volunteers should be protected and sustained by mainstreaming it into government funding.
- NTP and NACP should develop a strategy for supporting early initiation of ART among dually infected TB patients as well as addressing the concerns of care providers regarding potential medicine interactions.
- An ACSM strategy aimed at reducing health care worker and community-related diagnostic and treatment delays, among other control aspects, should be developed and implemented.
- The results of the TB CAP mortality audit should be published and used to further inform interventions targeted at identified causative factors.
- NTP to enhance childhood TB control initiatives, including review of paediatric dosages, taking advantage of recent WHO rapid advice for childhood TB control.

### *Status of TB/HIV-Related Secondary Outcome Indicators*

Ghana is a low HIV prevalence country with a general HIV prevalence rate of below 1.5 percent (2011). The proportion TB/HIV coinfection has remained just above 20 percent since 2008 and during the plan period. (See figure 11 and table 4.)



**Figure 11. Status of key TB/HIV coinfection indicators, 2006–12**

### Key Achievements

- Since 2006, and throughout the plan period, the proportion of notified TB patients who were tested for HIV has remained above 70 percent.
- The proportion who tested positive and started on CPT has been increasing since the plan was launched in 2009.
- The proportion of HIV-positive TB patients started on ART has increased steadily since 2010.

### Areas for Improvement

- Although tending to rise overtime, the proportion of patients tested for HIV has been swinging every year with no defined trend of direction and has fluctuated three times since the plan was launched. It stood at approximately 78 percent by the end of 2012.
- The proportion of dually infected TB patients started on CPT has not yet settled; it declined again between 2011 and 2012.
- Although rising overtime, the proportion of dually infected patients started on ART remains below 50 percent.

Table 4. Summary Score Card on Major and Secondary Outcome Indicators

Indicator	Baseline (Year and Source)	Target for 2012/2013	Current Performance Level	Status Rating or Comment
Case detection rate	27% (2008, NTP)	60%/72%	Declining incidence consistent with achieving MDG and Stop TB Partnership targets according to WHO estimates	Case detection rate is no longer an indicator of international interest in the absence of more reliable means of measuring TB incidence. NTP should await findings of on-going TB prevalence survey to inform more realistic estimate of case detection rates.
TB prevalence rate per 100,000 population	353 (2008, WHO)	160 (2013)	92 (2011)	The set target has been achieved.
Treatment success rate for smear-positive cases	83% (2007 cohort, NTP)	90% (2012 and 2013)	86.2%	The set target was not achieved, but MDG target has been achieved.
Fatality rate	9% (2007, NTP)	5.5%	7.7% (2011 cohort)	The set target has not been achieved and is unlikely to be achieved by the end of the plan period at the current trend.
Percentage tested for HIV	53.6% (2008, NTP)	90%	78% (2011 cohort)	The set target has not been achieved. More effort is needed.
Percentage HIV positive started on CPT	82.6% (2008 – NTP)	95%	78% (2011 cohort)	The set target has not been achieved.
Percentage HIV positive started on ART	No data	75%	40% (2011 cohort)	The set target not been achieved and is unlikely to be achieved by the end of the plan period at the current trend.
Prevalence of MDR-TB among new TB patients	1.9% (2006, WHO)	<2%	Unknown	The latest DRS data have not yet been fully analysed, but a combined MDR-TB rate of 1.4% has been found. A repeat DRS is recommended by end of 2015.
Smear conversion at two months	N/A	>90%	Nationwide data not routinely aggregated	Reviews at facility levels indicate high levels of monitoring at two months with a small proportion of nonconverters and treatment failures.
Smear conversion at five months	N/A	>90%	>80%	Reviews at facility levels indicate high levels of monitoring at five months with a small proportion of non-converters and treatment failures.
Case not evaluated	N/A	0%	0.8%	The set target has not yet achieved, but the rate is steadily declining overtime. The set target is not realistic for any programme. The current achievement of less than 1% is acceptable.
Defaulter rate	N/A	<4%	2.5%	The set target has been achieved.
Failure rate	N/A	<2%	<1.3%	The set target has been achieved

## **Political Commitment and Programme Management**

Under this area, the review sought to accomplish the following—

- Raise the level of awareness of key senior MOH, GHS, and other government staff at national and regional levels regarding the TB epidemic in the country
- Establish an NTP staff that is capable of achieving the targets in the strategic plan
- Outline current and planned government funding for TB control activities
- Establish NTP structures at national and subnational levels that are capable of addressing TB in the country
- Improve programme performance towards set national, regional, and global targets
- Determine epidemiological trends and patterns of disease in the country
- Integrate TB activities in regional and district activities and budgets
- Determine the overall level of adherence to the national TB control guidelines
- Implement initiatives for special populations and congregate settings
- Determine short- and long-term technical assistance needs for the programme

For the programmatic level, the review focused on the following—

- Programme structure and coordination
- Human resources for TB control at various levels
- Health worker knowledge and skills
- Programme funding and trends since 2010
- Supervision structure and coordination
- Logistic support structures
- The extent of TB data mainstreaming within general health information systems
- Pharmaceuticals supply chain management situation (e.g., quantification, ordering, storage, distribution, quality assurance, pharmacovigilance, current stocks)

## **Strengths**

TB control is among the priority communicable diseases for the GOG as reflected in key GOG strategic health sector documents. A TB control programme central unit exists at the central level for policy formulation, strategic planning, national M&E and capacity building

of lower levels. Related positive political and programme management elements include the following:

- Regular creation of strategic plans (2009–13), guidance documents, and tools
- Successful mobilisation of operational funding for control interventions from both government, bilateral and multilateral partners (e.g., the Global Fund, USAID and WHO), including the enablers package concept to enhance performance and outcomes
- A government loan of 16 million euro to enhance TB control related activities in the country as a leverage for a Dutch Government ORIO grant
- Effectively mainstreamed TB control services in an integrated health care system, with coordinators or focal persons at all levels of the system
- Free TB diagnosis and treatment services at the point of care
- Wide-scale involvement of CSOs and CBOs that has culminated in the formation of a national Stop TB Partnership that is housed within the NTP premises for easy collaboration
- Existence of a TB advisory committee made up of various stakeholders that meet to discuss technical issues and advise the NTP
- High-level stakeholders participate in World TB Day
- Basic service provisions (e.g., laboratory and DOTS centre staff salaries) being supported by GOG



Minister of Health of Ghana, the Honorable Sherry Ayitey with health officials, traditional and political leadership, and representatives of partner organisations at the commemoration of World TB Day March 25, 2013, in Kumasi, Ghana

### **Areas for Improvement**

- Government financing of TB control activities—
  - Even though funding for TB control has increased over the last decade from both domestic and international sources, the programme has depended on donor and partner financial inflows, especially from the Global Fund and USAID, to meet its ever-increasing obligations. The review found that even core aspects of TB

control such as FLDs and SLDs, health care worker training, monitoring and supervision, and the important enablers package are all being supported by exogenous financial resources.

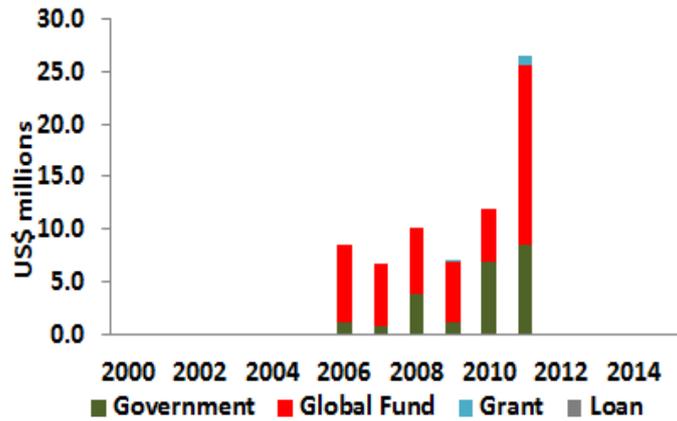
- In the last two years, government has allocated increasing amounts for FLDs and SLDs, but little of this funding seems to have been released upfront. Rather, it was reserved as a contingency fund in case of need. Table 5, an indicative breakdown of government and donor funding for anti-TB medicines for 2012 and 2013 fiscal years, shows that although the government budget for 2012 and 2013 includes support for anti-TB medicines, little funding was released. Instead, costs were all carried by the Global Fund. Figures 12–16 show the TB programme funding trends and projections by source.

### Recommendations

- The need is urgent for the GOG to begin to co-fund the basic DOTS interventions and elements, especially now that Ghana has been classified as a lower middle-income country from whom key donor partners such as the Global Fund will expect at least 25 percent counterpart financing of such activities according to the new funding mechanism.
- GOG should diversify sources of funding for TB control from donor partners over and beyond what it is mobilizing from the Global Fund.

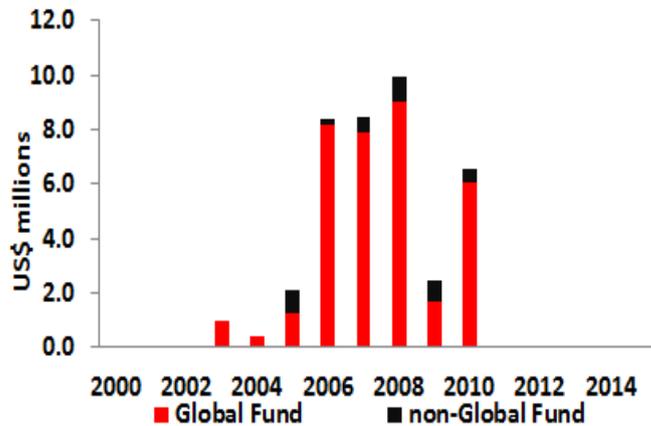
**Table 5. Indicative Budget, Expenditure and Funding Source for FDL and SDL, Ghana NTP, 2011–13**

Expenditure or Budget (Expenditure for last year, budget for current and next year)		Year 2011 (amount in USD)			Year 2012 (amount in USD)		
		FLD	SLD	FLD	SLD	FLN	SLD
A. Government total TB budget (nondonor funds and interest-bearing loans)	Budgeted	NA	NA	1,711,014	525,000	2,040,346	1,363,500
	Released	NA	NA	0	0	0	0
B. Other sources of TB budget							
• Grants (specify donor)		NA	NA	NA	NA	NA	NA
• Global Fund		NA	NA	960,052	58,990	1,981,375	545,400
• Loans (non-interest bearing)		NA	NA	NA	NA	NA	NA
Subtotal (loans and grants)		NA	NA	960,052	58,990	1,981,375	545,400
C. Total TB budget (A+B)		NA	NA	2,671,066	583,990	4,021,721	1,908,900



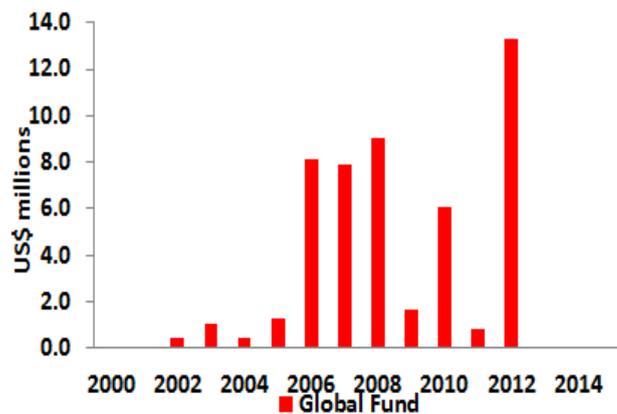
Source: WHO, Stop TB

Figure 12. Projected TB programme spending trends by source



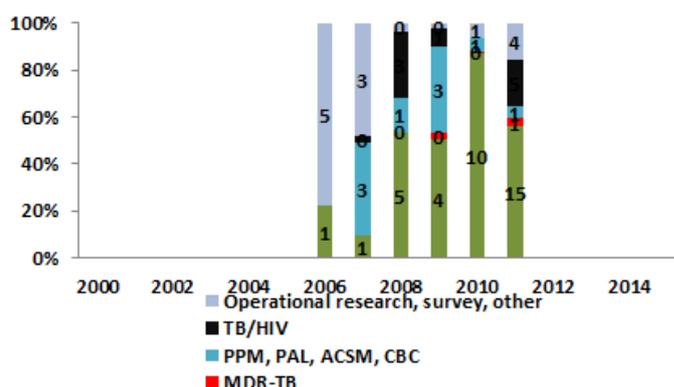
Source: Organisation for Economic Co-operation and Development

Figure 13. Annual funding by source



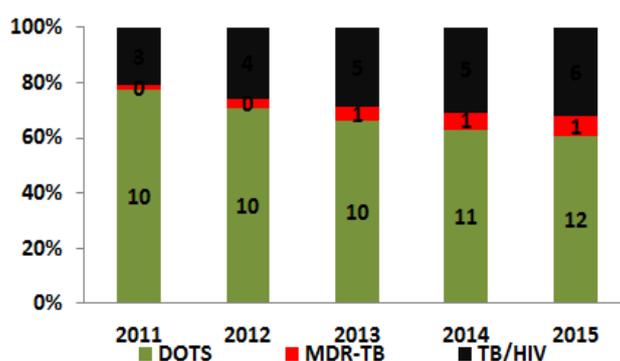
Source: Global Fund

Figure 14. Global Fund contributions to programme funding



Source: WHO. Global Tuberculosis Report 2012. 2012. Geneva: WHO

**Figure 15. Trend spending areas (USD)**



Source: WHO. Global Tuberculosis Report 2012. 2012. Geneva: WHO

**Figure 16. Projected future funding need (USD)**

- Human resources base for coordinating TB control efforts in the country:
  - The staff complement at the central level is not sufficient to meet the national and global demands of all aspects of the Stop TB Strategy as outlined in the current plan and as can be projected for the future including post-2015. The review found that up to 80 percent of the staff at the NTP central unit is not on the government payroll. They are supported through the Global Fund and may leave at the end of the Global Fund grant.
  - For the current plan, PMDT and laboratory oversight have suffered adversely because of lack of focal points to coordinate requisite responses. Furthermore, the GOG has embarked on a process to decentralise delivery of social services including health services to district levels under district assemblies, a process that will increase the requirement for strategic directions, technical mentorship and support from the central levels.

## **Recommendations**

- The complement of technical staff (e.g., MDR-TB, TB-HIV, paediatric TB, ACSM, social determinants of TB) at central and regional levels is inadequate to effectively address all components of the Stop TB Strategy. The GHS should provide for focal persons to take charge of critical Stop TB Strategy areas of work, especially PMDT (as indicated by the Director of Disease Control and Prevention Department of the Public Health Division of GHS), TB/HIV, laboratory services, ACSM and the social determinants aspects of TB control that are being developed as part of the post-2015 health development agenda.
- GHS should put in place a strategy for retaining central unit and other TB programme staff who are currently supported by the Global Fund.

## **Findings by Strategic Plan Strategies**

### ***Strategy 1: Pursue High-Quality DOTS Expansion and Enhancement***

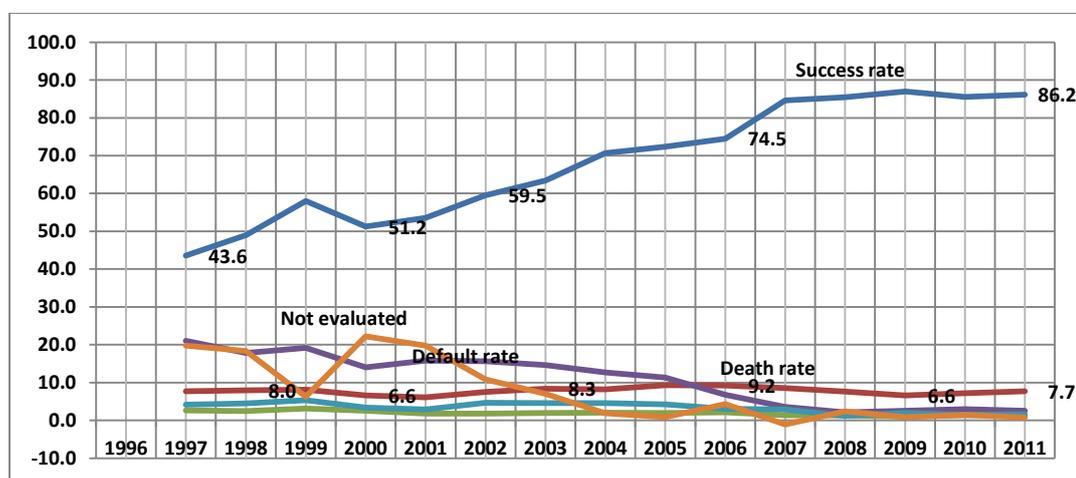
Under this strategy, by the end of the plan period, the programme envisions doing the following:

- Advocating for political commitment with increased and sustained financing
- Improving TB diagnosis through quality-assured bacteriology
- Improving clinical care of TB patients
- Providing patient support and treatment
- Ensuring effective logistics management systems for TB medicines and laboratories supplies
- Strengthening M&E, routine programme management, and supervision activities
- Ensuring that the critical staff required are in place, motivated, and have the capacity to meet operational challenges militating against optimum TB control performance

## **Strengths**

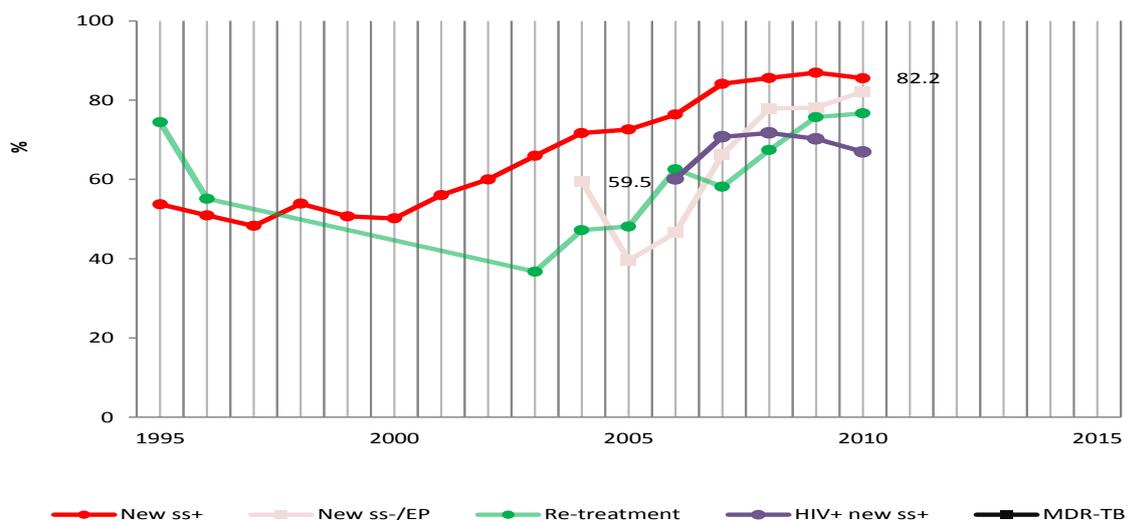
- TB services have been fully mainstreamed into the general health services at all levels of service delivery.
- Focal points have been designated for programme implementation at regional, district and facility levels.
- The enablers package has been implemented. The package allows patients to be supported for transport and social needs and for health care workers to conduct patient follow-up and contact tracing. It also allows the facility to strengthen logistical aspects of the programme.

- Care providers have a satisfactory knowledge base on the basic aspects of DOTS.
- The system for defaulter tracing shows evidence of being effective.
- The data validation scores are above average in most facilities.
- An extensive network of community health workers and DOTS supporters or volunteers is in place, including opportunities offered by the CHPS system.
- TB diagnostic and treatment services are widely accessible throughout the country.
- Special initiatives exist to increase case detection in target areas.
- There is an obvious narrowing of the gap between estimated incidence and case notifications.<sup>3</sup>
- There is a reliable supply of quality assured and internationally recommended FLDs (in patient kit packaging) that are free at the point of service delivery.
- The private sector shows interest in TB control activities.
- Treatment guidelines are being regularly updated.
- Favourable treatment outcomes, especially for new smear-positive TB cases with very low levels of default and treatment abandonment, are evident (figures 17 and 18).



**Figure 17. Smear-positive TB treatment outcomes, 1995–2011**

<sup>3</sup> WHO. 2012. *Global Tuberculosis Report 2012*. Geneva: WHO.



**Figure 18. Treatment outcomes by type of TB: 1995–2010**

### Areas for Improvements

- *Maintaining health worker knowledge and skills.* The integrated nature of TB services within the general health system is associated with a high turnover of trained or oriented health care workers especially at peripheral facilities.
- *Timeliness and administrative application of the enablers package (more correctly called “the performance enhancing package”).* The review found, and was advised at the operational level of, bottlenecks in the implementation of the enablers package especially in the areas of content, application and eligibility.
- *Availability of educational materials.* TB-related information, education and communication (IEC) materials are not readily available at the DOTS centres, although there were many other posters on facility walls.
- *Intransigent high TB fatality rates.* The rates are presumed to be high because of health care worker and patient diagnostic delays and low and late access to ART by dually infected patients. There are no structured facility TB infection control initiatives despite the existence of SOPs for TB infection control that were developed with support from TB CAP.
- *Suboptimal utilization of opportunities offered by the CHPS system to scale-up community-based TB care.* Current linkages with the system for diagnosis and treatment of TB patients are not proactive and not exploitive enough of the potential that exists. The footprint of the TB and other programmes is still mostly invisible at CHPS facilities.

### Key Recommendations

- The NTP in collaboration with regional and district levels should develop and implement a training plan that provides for continuing education, refresher courses or replenishment of trained care providers.

- The NTP should develop an ACSM strategy to enhance community and health worker awareness and level of suspicion for TB suspects.
- NTP should work with relevant departments of the GHS to build on previous work by TB CAP to review the cost-effectiveness of the enablers package and come up with informed policy options for its content and application.
- In view of the undoubted catalytic role being played by the performance-enhancing enablers package in improving programme performance and intervention outcomes, and bearing in mind the uncertainty of donor funding, the GHS should protect and sustain the package by mainstreaming it into GOG funding as proposed by the GHS Director General during the debriefing of the review findings and key recommendations.
- The NTP should commission a mortality audit and facilitate implementation of recommendations arising from this and an earlier mortality audit supported by USAID through TB CAP to address the unexpectedly high TB mortality rates. The TB CAP mortality audit tool can be used as an entry point for such an enquiry.
- The opportunities offered by the CHPS system for patient diagnosis and treatment adherence should be further exploited through active linkages between CTBC systems and the CHPS system at operational levels.
- NTP in collaboration with TB CARE and other collaborating care providers should continue to scale up initiatives to increase timely identification of TB suspects and cases, including the adoption and scale-up of new diagnostic technologies.

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

Under this strategy, by the end of the plan period, the programme envisaged doing the following:

- Providing TB/HIV collaborative services
- Implementing interventions for the prevention and control of MDR-TB
- Implementing interventions for TB control high-risk groups in TB control

#### ***TB/HIV Collaborative Activities***

#### **Strengths**

- The review found evidence of cross referral between service units and elements of integrated support supervision at regional and district health management team levels.
- Nutritional support provisions initially targeting HIV clients are now also serving TB patients.
- Interventions to reduce the burden of HIV on TB patients are being implemented widely. (figure 19)

- HIV testing is being decentralized and is available at most facilities including some DOTS units.
- The proportion of TB patients tested for HIV is very high (>80 percent).
- The proportion of HIV dually infected TB patients started on CPT in 2011 and 2012 remained 80 percent

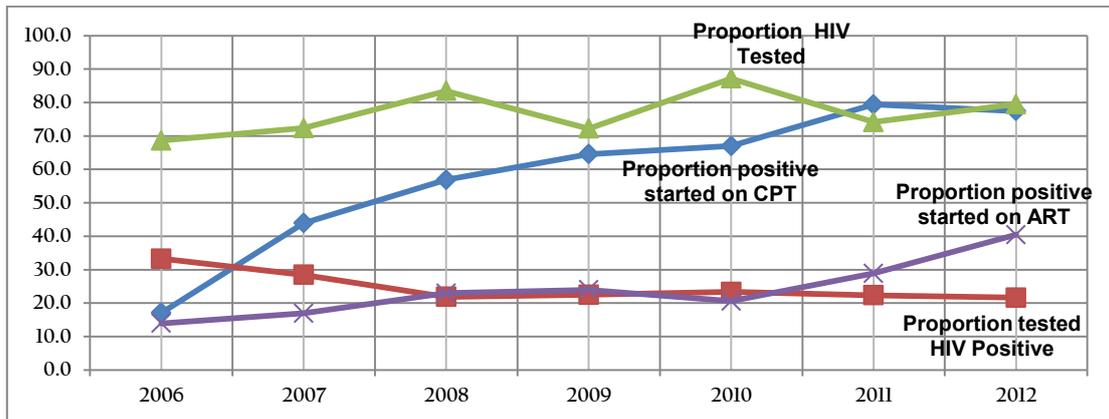
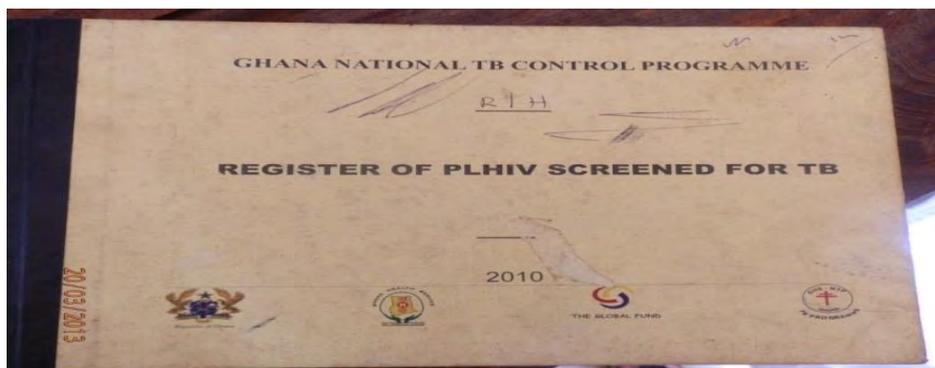


Figure 19. Status of key TB-HIV interventions, Ghana 2006–12

- Registered PLHIV are routinely screened for TB as part of pre-ART medical work-up. To facilitate this process, a TB programme developed a register for PLHIV screened for TB, which is being used widely at ART clinics.



Register of PLHIV screened for TB

### Areas for Improvement

- The national and regional TB/HIV coordinating committees do not function well.
- Widespread shortages of HIV test kits were reported during the preceding year at a number of health facilities. These shortages occurred because the Global Fund, hitherto the source of HIV testing kits, had removed ART and test kits for new clients now that Ghana is classified as a lower middle-income country. Although increasingly

being decentralized, HIV testing is still too centralized relative to TB diagnostic and treatment services.

- TB control interventions carried out at HIV clinics, other than pre-ART screening, are generally poorly documented across the board. Furthermore, no provision exists for documenting periodic screening of PLHIV for TB during the course of their HIV care cycle.
- Although increasing over time, the proportion of HIV dually infected TB patients who are started on ART is still below 50 percent (40 percent for 2012 patient cohort), despite the existence of revised national ART guidelines that make all such patients eligible for ART. This policy change does not seem to have trickled down to facility levels yet.
- The uptake and awareness of the potential utility of rapid TB molecular tests (line probe assay and Xpert MTB/RIF) for TB diagnosis is minimal.
- A national algorithm for the use of Xpert MTB/RIF has not yet been released for common use, and there is as yet no plan for scaling up the technology.
- IPT uptake for PLHIV is not in the HIV guidelines.

### **Key Recommendations**

- The universal establishment of TB/HIV coordinating committees or forums, especially at the national and regional levels, should be revived or promoted.
- Regions and districts need to implement the recently advocated non-clinician-led NACP policy on ART initiation including early initiation of ART in TB-HIV coinfecting TB patients.
- NTP needs to pursue universal access to HIV testing for notified TB patients.
- NTP and NACP should—
  - Ensure that clinical staff are aware of, and implement the new guidelines for, ART among HIV dually infected TB patients
  - Promote and support operational research on the performance-improving aspects of TB/HIV collaborative interventions
  - Facilitate further consultation on national policy for the use of IPT among PLHIV in line with recent global recommendations
- NTP in collaboration with the Laboratory Directorate should—
  - Develop and implement a scale-up plan for Xpert MTB/RIF technology that includes all regional hospitals at a minimum
  - Print and disseminate the GeneXpert algorithm

### *Programmatic Management of DR-TB*

The review sought to determine the following—

- The trend and burden of DR-TB from 2009 through December 2012
- If case finding strategies were in place
- If up-to-date DR-TB guidelines were available
- The status of TB culture and DST services, including SLD DST
- What treatment programmes were in use and what cases were currently in treatment in districts or regions
- Case management practices, including treatment regimens and models
- If DOT and social support systems were in place
- What infection control measures were in place: policy, plans, equipment and commodities
- Treatment outcomes for 2010 cohorts
- Recording and reporting systems for DR-TB, including laboratory-based surveillance

### **Key Findings**

Information sourced from the NTP indicates that DR-TB cases, including MDR-TB cases, have emerged in the country during the life of the expiring strategic plan as shown in table 6. Furthermore, table 7 shows the projected number of cases expected to occur based on available prevalence of MDR-TB among new and previously treated TB cases. Available information also shows that few organized treatment efforts are in place despite the existence of a GLC approval for concessionary priced SLDs from 2010.

**Table 6. DR-TB Cases in Ghana**

<b>DR-TB Cases</b>	<b>2008</b>	<b>2009<sup>a</sup></b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Number of suspects tested for MDR	100		58	293	254
Number of known confirmed MDR-TB cases	2		4	7	38
Number of confirmed MDR-TB cases started on treatment	0		0	2	2

<sup>a</sup> No data were available for 2009.

**Table 7. Expected MDR-TB Cases in Ghana**

<b>Types of Cases</b>	<b>Risk of MDR-TB</b>	<b>Average</b>	<b>Estimated Number to Test</b>	<b>Estimated Number of MDR-TB</b>
Chronic cases (backlog)	24%	Last 4 years re-treatment	1,767	424
Re-treatment cases (failure, relapse, retreatment after default (RAD))	15%	2012 report	1,141	171
Symptomatic contacts MDR-TB cases	60%	1 case per new MDR case	10	6
Nonconverters 2/3 months category 1	2%	5% of new sputum smear-positive cases	7	0
HIV-positive TB cases	2%	22% among new cases	31	1
Total needed to test (Xpert)	—	—	2,956	—
Total estimated MDR-TB cases in 2013	—	—		602

— Does not apply

### **Strengths**

- Mature and functional local quality-assured laboratory capacity for MTB culture and first-line DST using solid media (Löwenstein-Jensen [LJ]) and liquid media (mycobacteria growth indicator tube [MGIT]) technologies
- Recently introduced rapid molecular diagnostic testing (Xpert MTB/RIF)
- Availability of data from a recent (2007–08) nationwide DRS
- National PMDT strategic plan and guidelines available
- A GLC approval for initiation of PMDT using concessionary priced medicines procured with support from Global Fund
- Some health care workers trained at international PMDT courses to form the core for in country initiation of a DR-TB treatment programme

### **Challenges and Areas for Improvement**

On balance, PMDT is the least developed element of the Stop TB Strategy in Ghana. It is easily an area where despite an increasing number of confirmed DR-TB cases, availability of requisite SLDs and existence of a team of trained health care workers who can form a nucleus of a treatment effort, no visible structured treatment programme exists. Nationally, out of 38 confirmed MDR-TB cases in 2012, only two cases have been started on treatment. The following gaps or challenges are particularly noted—

- Clarity is lacking on which institution is the national TB reference laboratory and the overall laboratory network responsible for DR-TB diagnosis and follow-up.
- Space for inpatient care of DR-TB cases is inadequate.
- The infection control measures and policies in place are inadequate.

- Knowledge of the existence and potential utility of rapid diagnostic technologies is still available to only a few.
- The number of clinicians trained in PMDT remains small.
- SLD DST among confirmed MDR-TB cases is not being routinely practiced.
- MDR-TB guidelines are not universally available at health facilities.
- No PMDR-TB operational plan exists.
- No evidence of systematic culture among high-risk patient groups exists.
- The diagnosis-treatment gap is high. Only two of existing confirmed 38 MDR-TB patients have been started on treatment.
- There are no recording and reporting tools for DR-TB at the facility.
- There is no national database for MDR-TB.

### **Recommendations**

- The NTP in collaboration with the Laboratory Directorate should identify and confirm a substantive National TB Reference Laboratory (NTRL) with a clear link to a Supranational Laboratory (SRL) for quality assurance.
- NTP should develop a costed national PMDR-TB operational plan.
- NTP in collaboration with regional hospitals and the NTRL should set up a community-based model of PMDT developed around regional or zonal MDR-TB treatment hubs or centres of excellence to clear the backlog of diagnosed MDR-TB patients on a waiting list.
- NTP should—
  - Designate an MDR focal person at the central level to coordinate and monitor earnest introduction and scale-up of PMDT in Ghana as recognised and committed by the Director of Communicable Diseases at the GHS during the review debriefing
  - Set up a national clinical advisory panel to act as a think tank for case management in the country
  - Develop core regional or zonal PMDT expert support teams
  - Develop a training curriculum for PMDT
  - Develop and implement in-country training courses on PMDT
  - Initiate phased implementation of an earnest PMDT programme based on a community model developed around regional or zonal MDR-TB treatment hubs to

first clear the backlog of existing laboratory confirmed MDR-TB patients on a waiting list and then to absorb new cases as they are diagnosed

- Put in place mechanisms for the provision of laboratory-based surveillance reports for DR-TB and ensure routine and on-going surveillance
- Put in place a mechanism for routinely providing for SLD DST for all confirmed MDR-TB cases
- Make respiratory infection control as part of the phased implementation of the PMDT programme
- Finalise data analysis and publish findings from the last DRS
- Plan and implement a follow-up nationwide DRS in 2014–15

### **Strategy 3: Contribute to Health System Strengthening**

Under this strategy, by the end of the plan period, the programme envisaged doing the following:

- Implementing PAL interventions in three specified regions in the country
- Providing quality, efficient and effective laboratory services for smear microscopy and other diagnostic methods including developing capacity to detect levels of primary and secondary resistance to anti-TB medicines
- Enhancing human resource capacity to deliver quality TB control services
- Ensuring an efficient and effective medicines and supplies management system
- Strengthening TB M&E systems
- Enhancing collaboration of the NTP with other public health programmes such as HIV/AIDS, malaria and the Expanded Programme on Immunisation programs

### **Findings**

- **PAL Strategy.** The NTP has implemented a pilot project on PAL in selected regions.
- **Anti-TB Medicines**

### **Strengths**

- CMS has a huge facility with ample space and a cooling system in place (figure 22).
- Anti-TB medicine and other boxes are well stacked, labelled and secured.
- CMS has a system (verified during the review) in which all medicines received first have to be cleared by the Food and Drugs Authority before they can be distributed to facilities.

- Stocks that had just been received and were waiting for clearance by the Food and Drugs Authority had not yet been shelved but kept away from all the other supplies.
- At the time of visit, there were sufficient stocks of category I and III FLDs to cover four months average consumption.
- The stock of isoniazid, rifampicin and ethambutol (HRE) packs and streptomycin injection that were being used to construct category II treatment for eligible patients were adequate.



The CMS facility has ample space and a cooling system

### **Areas for Improvement and Recommendations**

- There was no stock of complete packages of category II FLDs, and repackaging of category II anti-TB medicines from loose preparations is proving a challenge for effective storage, first expiring first out (FEFO) control and stock control at CMS and facility levels.
- Even though the warehouse temperature reading was 26° Celsius at the time of the visit, there was no temperature control chart to show daily trends of temperature fluctuation inside the store.
- Supply management software in use at the CMS does not allow tracking of medicines and commodities by batch.
- Storage depots need robust cooling facilities.
- Pharmaceutical staff need training and orientation on evolving TB products such as new medicines and products.
- In some health facilities, the review found poor storage conditions for anti-TB medicines.
- Some patient kits expired before the end of treatment.
- Paediatric kit dosages were not in line with new WHO guidelines.

### **Key Recommendations**

- CMS should introduce a temperature trend tracking system in the warehouse for holistic appreciation of the effectiveness of the cooling system.

- CMS should revisit the information system software to facilitate batch tracking after distribution has taken place.
- NTP in collaboration with CMS should review the sourcing and packaging of category II anti-TB medicines and come up with a more user-friendly strategy to implement at lower and use levels. The review confirmed the existence of category II patient kits with the Global Drug Facility.

### **Laboratory Services**

#### **Strengths**

- Overall widespread availability of diagnostic services is provided by district laboratories.
- Functional EQA of SSM reports were available and mostly showed good concordance.
- Ad hoc TB reference laboratory functions are in place with linkage to SNRL for external EQA for sputum microscopy, culture and DST. Available reports from SNRL show good concordance.
- Case load at most microscopy centres is generally low, and staffing is adequate for the work load.
- Microscopes are mostly in good condition.
- Most laboratories have well ventilated space for preparing slides.
- A paper record-keeping system exists and is functioning acceptably.

#### **Weaknesses and Areas for Improvement**

- Utilization and training on new technologies, such as GeneXpert, is low.
- In some pilot zones, the quality of smears was poor due to front loading.
- EQA feedback report is given to the laboratory without discussion with management and laboratory staff.
- Results of cultures do not always come back to the laboratory, but go only to the ordering physician.
- Panel testing is not part of current EQA practice.

#### **Recommendations**

- Develop and implement a scale-up plan for Xpert MTB/RIF technology that includes all regional hospitals at a minimum.
- Make the new laboratory manual available at all levels.
- Ensure the panel testing is part of EQA.

## *M&E System*

### **Strengths**

- Standard recording and reporting systems exist at all levels.
- TB recording and reporting being mainstreamed into general district health management information system (DHMIS).
- Review meetings are conducted as part of data review and verification.

### **Areas for Improvement**

- Supportive supervision to DOTS centres is erratic and written feedback mostly not available.
- Evidence or recording of contact tracing is not universally available at facilities.
- Treatment outcomes, especially “treatment completed” and “cured” are not always correctly classified as per national and global guidelines.
- Review meetings have become irregular due to financial shortages.

### **Recommendations**

- The NTP central unit in collaboration with regional coordinators should ensure that care providers are kept up to date on classification of treatment outcomes as defined in the national treatment guidelines.
- The NTP should fully exploit the opportunities brought by the DHMIS to move towards real time individual patient-based databases.
- The NTP should endeavour to mobilize adequate funding to support regular review meetings with regional, district and facility focal points.

### ***Strategy 4: Engage All Care Providers***

Under this strategy, the programme envisaged implementing PPM DOTS interventions and implementing PPM DOTS services in the mines.

The review confirmed that there has been active engagement of non-health sectors, especially the prison services, in TB control during the plan period. Of special note is that the TB rates in the prison population are much higher than other programme data. The review also accessed documentation that confirmed ongoing collaboration of CBOs in TB control activities before and during the plan period (tables 8 and 9, which were compiled with NTP data).

**Table 8. TB Cases Registered by Ghana Prison Health Services**

Year	Prison Population	Number of TB Cases	TB Deaths	Case Notification Rate/100,000 Population	Fatality	Percentage of TB among Inmates
2007	13,335	94	12	705	12.8%	0.7%
2008	14,128	127	23	899	18.1%	0.9%
2009	14,171	182	19	1,284	10.4%	1.3%
2010	13,500	185	17	1,370	9.2%	1.4%
2011	14,671	192	15	1,309	7.8%	1.3%
2012	15,171	205	14	1,351	6.8%	1.4%

**Table 9. Indicative Data on Participation of CSO in TB Control**

Year	Eligible and Screened for TB	Confirmed Cases
2007	5,601	355
2008	18,970	735
2009	9,413	285
2010 <sup>a</sup>	195	13
2011	5,185	142
2012 <sup>b</sup>	—	—

<sup>a</sup> Data not fully collected in 2010

<sup>b</sup> No data in 2012

### **Strategy 5: Empower People with TB and Communities**

Under this strategy, the programme envisaged implementing ACSM activities, intensifying community participation in TB care and developing and promoting a patient charter.

#### **Strengths**

- The review confirmed the existence of an extensive network of community health workers and DOTS supporters or volunteers, including a robust opportunity of the government-instituted CHPS system for service delivery at community level. At most facilities, community outreach happens through the nurse and auxiliary staff.
- There are scheduled outreaches to prayer camps (i.e., holding camps where the chronically ill are admitted for prayer healing sessions), some of which turn out to be active TB cases. The story of a prayer camp owner who contracted TB from clients and was later diagnosed and treated at the nearest health facility highlighted the efforts that are being taken to engage these institutions in positive health programmes.

#### **Challenges and Areas for Improvement**

- The all-important DOTS supporters, a backbone to the satisfactory performance of the Ghana TB control programme, are almost exclusively sustained through donor partner financing.
- The opportunity provided by the CHPS system for diagnosis and treatment of TB patients is not yet being exploited sufficiently.

## **Major Recommendations**

- GHS should mainstream the remuneration of DOTS supporters within GOG funding schemes for sustainability of the important role they are playing in achieving good programme performance.
- The NTP at all levels should establish active functional linkages with the CHPS systems in TB diagnosis, patient adherence and contact tracing.

## **Strategy 6: Enable and Promote Research**

Under this strategy, the programme envisaged conducting programme-driven research activities. Consequently, the review sought to document evidence of this occurrence.

## **Major Findings**

- Preparations for a national TB prevalence survey were at a highly advanced stage by the time of the review. This survey would be an undertaking of huge importance towards improving the appreciation of the burden of adult TB in Ghana as well as a basis for future estimates of that burden.
- In recent months, the programme participated with WHO in an exercise to assess the performance of the TB surveillance system in the country.
- In collaboration with TB CAP and TB CARE I, a TB mortality audit had been conducted in selected sites to assess reasons for high TB fatality rates being recorded in the programme.
- In collaboration with the NMIMR, the NTP conducted a DRS from 2007 to 2008 to determine the profile of FLD resistance in the country.

## **Challenges and Areas for Improvement**

Results of the 2006–08 DRS have not yet been published. Furthermore, examination of the sample size indicates that the survey has no power to detect the level of resistance with any credible precision.

## **Recommendations**

The NTP should—

- Plan for and conduct a credible DRS with a sufficient sample size by the end of 2015 at the latest to monitor the anti-TB medicines resistance profile.
- Plan for and conduct an extended study to assess the cause of high and unrelenting TB case fatality building on the TB CAP/TB CARE mortality audit initiative.

## **Towards and Beyond 2015**

In May 2012, the 65th World Health Assembly requested WHO to provide a progress report on the TB situation in 2014 and a strategy for post-2015. The post-2015 concept consultations have taken place and are being used to evolve a new post-2015 TB control strategy that will be anchored in the lapsing Stop TB Strategy and driven by the good global progress made on TB prevalence, incidence and mortality.

### ***The Three Pillars of the Developing Strategy***

Preliminary versions of the strategy are being developed around three related pillars.

- *Pillar 1: Innovative TB Care.* Under this pillar, NTPs will be expected to build on progress made in scaling up quality TB DOTS services and to promote innovation for the following:
  - Early and rapid diagnosis and screening of high-risk populations
  - Treatment of all forms of TB with appropriate patient support
  - Management of DR-TB
  - Management of TB/HIV and other co-morbidities
  - Preventive treatment for high-risk populations such as PLHIV
  
- *Pillar 2: Bold Policies and Supportive Systems.* Under this pillar, NTPs will be expected to embrace and promote the following:
  - Policies pursuing full integration of TB care in general primary health care services
  - Universal health coverage with free TB care and social protection
  - Regulatory frameworks including vital registration, mandatory case notification, infection control and rational use of quality-assured medicines
  - Policies on social determinants of TB
  
- *Pillar 3: Intensified Research and Innovation.* Under this final pillar, NTPs will be expected to embrace and promote the following:
  - Development and rapid uptake of new diagnostics, medicines and vaccines
  - Research to optimize adoption and implementation of innovations in support of effective quality TB control interventions

### ***Strategic Outcome Indicators***

Two outcome indicators have been proposed:

- Reduction of TB case fatality by 90 percent by 2035
- Elimination of catastrophic health expenditures for TB-affected families by 2035

On the basis of these pillars and outcome indicators and the states of TB and TB control in Ghana according to the major findings of the review, the following strategic directions bring themselves to the fore for implementation or enhancement:

- Consolidating the emerging positive basic DOTS impacts on disease burden through universal access to enhanced and quality DOTS services and evaluation and adoption of new diagnostic technologies, treatment regimens, preventive strategies and operations research aimed at quality improvement, especially the existing high TB fatality rates
- Planning for and implementing strategies that lend themselves to attainment of universal health coverage for the early diagnosis and treatment of TB and related conditions
- Fully embracing and operationalising PMDT, including evaluating new treatment regimens, through a community-based model supported by national centre of excellence oversight and regional or zonal implementation hubs
- Combating TB-HIV coinfection, especially through early and timely initiation of ART among the dually infected, and evaluation and implementation of emerging preventive treatments
- Ensuring strengthened programme policy management capacity that responds to all aspects of the post-2015 Stop TB Strategy and the context of impending decentralised administrative structure of government
- Advocating for increased government allocation of public financial resources for core TB control interventions and mobilisation of additional resources to scale up innovative high-impact interventions and new strategies
- Expanding and strengthening childhood TB control strategies and initiatives
- Embracing strategies to address TB co-morbidities
- Strengthening capacity for TB surveillance and impact measurement using the findings of the planned national TB prevalence survey as baseline for future projections of disease burden and impact of interventions



## ANNEX A. LIST AND AFFILIATION OF REVIEWERS

The review team was made up of external and local experts drawn from USAID/Washington, the Global Fund, KNCV, NMIMR, WHO, MSH, TB CARE I, GHS and NTP. The competences of the team covered general DOTS (including TB ACSM, community DOTS and PPM), TB laboratory services, PMDT, TB-HIV, TB infection control, health system strengthening, TB medicines supply and management, M&E, operational research and surveillance. Table A1 provides a list of reviewers, designations and their affiliations.

**Table A1. Names, Designations and Affiliations of Reviewers**

Name	Designation and Affiliation
Dr. Andre Ndongosieme	<b>TB Focal Point</b> WHO Office for the African Region Inter-country Support Team for West Africa Ouagadougou, Burkina Faso
Dr. Wilfred Nkhoma	<b>Review Team leader</b> Regional Drug Resistant TB Focal Point and TB Programme Focal Point for Inter-country Support Team for East and Southern Africa (IST/ESA), Harare, Zimbabwe WHO Office for the African Region Member Regional Green Light Committee for AFRO
Dr. Janet Phillips	USAID Washington DC United States of America
Dr. Jacque Van den Broek	Senior TB Consultant KNCV Tuberculosis Foundation Member Regional Green Light Committee for WPRO
Dr. Estifanos Shargie	Senior M&E Specialist Global Fund Geneva, Switzerland
Dr. Felicia Owusu-Antwi	AIDS, TB and Malaria (ATM) Medical Officer WHO Country Office Accra, Ghana
Dr. Rhehab Chimzizi	MSH/TB CARE1 Country Director MSH Country Representative Ghana
Dr. Kwasi Addoh	Noguchi Memorial Institute for Medical Research Accra, Ghana
Gertrude Avortri	Institutional Care Division Ghana Health Service Accra, Ghana
Felix Afutu	Head of M&E Ghana NTP GHS Accra, Ghana



## ANNEX B. REVIEW WORK PROGRAMME

DATE/DAY	ACTIVITY								
Tuesday, March 19, 2013	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Brief Director General and Directors, GHS 9:00 a.m.</td> <td style="width: 15%;">Briefing of Minister of Health 10:00 a.m.</td> <td style="width: 15%;">Courtesy call on USAID Country Rep. 10:45 a.m.</td> <td style="width: 15%;">Courtesy call on WHO Country Rep. 11:30am</td> <td style="width: 10%;">Lunch</td> <td style="width: 10%;">Briefing CCM 1:30 p.m.</td> <td style="width: 10%;">Briefing NACP 2:30 p.m.</td> <td style="width: 10%;">Briefing Stop TB Partnership 3:00 p.m.</td> </tr> </table>	Brief Director General and Directors, GHS 9:00 a.m.	Briefing of Minister of Health 10:00 a.m.	Courtesy call on USAID Country Rep. 10:45 a.m.	Courtesy call on WHO Country Rep. 11:30am	Lunch	Briefing CCM 1:30 p.m.	Briefing NACP 2:30 p.m.	Briefing Stop TB Partnership 3:00 p.m.
Brief Director General and Directors, GHS 9:00 a.m.	Briefing of Minister of Health 10:00 a.m.	Courtesy call on USAID Country Rep. 10:45 a.m.	Courtesy call on WHO Country Rep. 11:30am	Lunch	Briefing CCM 1:30 p.m.	Briefing NACP 2:30 p.m.	Briefing Stop TB Partnership 3:00 p.m.		
Wednesday, March 20, 2013	<p>Field visits:</p> <ol style="list-style-type: none"> <li>1. Korle-Bu Teaching Hospital</li> <li>2. National Public Health Reference Laboratory</li> <li>3. Ridge Hospital</li> <li>4. LA General Hospital</li> <li>5. Kaneshi Polyclinic</li> <li>6. Noguchi Memorial Institute for Medical Research Laboratory</li> <li>7. Central Medical Stores</li> </ol> <p>Evening: Team travels to Eastern and Ashanti Regions</p>								
Friday March 22, 2013	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Eastern and Ashanti Regions: Meetings with Regional Directors, Deputy Director of Public Health and Regional TB Coordinators</td> <td style="width: 30%;">Ashanti Region: Komfo Anokye Teaching Hospital, District Health and Health Centre</td> <td style="width: 40%;">Eastern Region: Koforidua Regional Health, Atua Government Hospital, 1 health centre, 1 prayer camp at LMK</td> </tr> </table>	Eastern and Ashanti Regions: Meetings with Regional Directors, Deputy Director of Public Health and Regional TB Coordinators	Ashanti Region: Komfo Anokye Teaching Hospital, District Health and Health Centre	Eastern Region: Koforidua Regional Health, Atua Government Hospital, 1 health centre, 1 prayer camp at LMK					
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Saturday, March 23, 2013	Review team in Kumasi participates in World TB Day Lunch and National Prevalence Survey								
Sunday, March 24, 2013	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">One team leaves for Tamale to visit the Northern Region</td> <td style="width: 50%;">Another team leaves to visit Western Region</td> </tr> </table>	One team leaves for Tamale to visit the Northern Region	Another team leaves to visit Western Region						
One team leaves for Tamale to visit the Northern Region	Another team leaves to visit Western Region								
Monday, March 25, 2013	Teams prepare draft report								
Tuesday, March 26, 2013	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Northern and Western Regions Meetings with Regional Director, Deputy Directors and TB Coordinators</td> <td style="width: 30%;">Northern Region Tamale Teaching Hospital, 1 district health facility, 1 health centre and the community</td> <td style="width: 40%;">Western Region Effia Nkwanta Regional Hospital, CDH, District Hospital and 1 health centre</td> </tr> </table>	Northern and Western Regions Meetings with Regional Director, Deputy Directors and TB Coordinators	Northern Region Tamale Teaching Hospital, 1 district health facility, 1 health centre and the community	Western Region Effia Nkwanta Regional Hospital, CDH, District Hospital and 1 health centre					
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Wednesday, March 27, 2013	Teams fly back to Accra								
Thursday, March 28, 2013	Drafting of report in Accra at NTP Office								
Friday, March 29, 2013	Debrief Stakeholders at Ministry of Health Conference Room								
Saturday, March 30, 2013	DEPARTURE								
Sunday, March 31, 2013									



## ANNEX C. SELECTED REFERENCE MATERIALS

- Ministry of Health (MOH), Ghana. *The National Tuberculosis Health Sector Strategic Plan for Ghana, 2009–2013*. Ghana: MOH 2009.
- Management Sciences for Health and Tuberculosis Control Assistance Program (TB CAP). *A Report on the Evaluation of Enablers Package in Ghana. April–May 2009*. 2010 (unpublished).
- National AIDS / STI Control Programme. *National HIV Prevalence and AIDS Estimates Report 2009-2015*. Accra: National AIDS Control Programme, Ghana Health Service, Department for International Health, World Health Organisation; 2010.
- Ministry of Health, Ghana. *Ghana National TB Data 1996–2012*. NTP-Ghana Annual Report 1996-2012.
- Noguchi Memorial Institute for Medical Research. *Nationwide Survey on the Resistance to First-Line Anti-Tuberculosis Drugs in Ghana*. NMIMR and NTP; 2008 (unpublished).
- National Tuberculosis Programme. Ministry of Health. *Guidelines for the Management of Multi-Drug Resistant Tuberculosis in Ghana*. Ghana; 2012 (unpublished).
- Ministry of Health. *SOPs for TB Case Detection*. Ghana: National Tuberculosis Program and Management Sciences for Health; 2009 (unpublished).
- Ministry of Health. *Ghana TB Infection Control Guidelines*. Ghana Health Service (GHS) and Management Sciences for Health, 2010 (unpublished).
- Whalen, C, Uplecar, M, van den Broek J., Kangangi J., Kahenya G., Hazamba, O., Addo K., Hesse A., Sangberdery F. *A Comprehensive Review of the National Tuberculosis Program*. , Ghana. July 2007.



## ANNEX D. FIELD TEAM REPORTS

### Preparatory Work for the Two Teams

#### *Day 1: February 19, 2013*

#### *Programme Overview with NTP Manager and Staff*

- **NTP and Health Services Set-up**

- Ghana's national population is estimated at 25 million.
- Public health services are delivered by GHS on behalf of the MOH.
- Ten regional health service directorates delivered health services in 2012 in their respective administrative districts.

- **TB Services**

TB services, like all other control programmes, are fully mainstreamed into the general health services, as opposed to a vertical programme. At the central unit, there are four core staff and about 10 other programme officers hired to support specific tasks under Global Fund support. No area of work focal points exist.

Under the regional and district health services, designated rather than substantive TB coordinators take responsibility for TB services, over and above other responsibilities that they may have. There are also institutional TB coordinators at the health facilities. Beyond district levels, CHPS structures serve the needs of the community, and beyond the CHPS structures, DOTS supporters exist in some areas.

Routinely, public health and institutional care divisions place deputy directors to supervise and coordinate programme activities. Other members of a regional TB team include nursing, pharmaceutical and laboratory professionals. The Directorate of Clinical Services has now appointed a specific TB focal point within its structure to help institutionalise TB service interests in the work of the directorate with health institutions.

- **Funding for TB Services**

GOG, bilateral donor partners and multilateral donors, especially the Global Fund and USAID, are the main sources of funding for TB control activities. Under the government purse, there are internally generated funds and national health insurance. From the Global Fund, the programme has benefited from round 1, 5 and currently round 10 grants. Phase 1 of round 10 is coming to an end and application and negotiations for phase 2 are imminent.

Global Fund round 1 grant covering the 2000–05 period focused on CHPS and community TB care, urban TB control in the two cities of Greater Accra and Kumasi, private sector involvement in TB control and development of a communication

strategy for TB control. Round 5 focused on enhancing public sector DOTS in the whole country, scale-up of private sector participation in TB control activities, laboratory strengthening and TB/HIV collaborative activities. Conversely, round 10 is focussing on scaling up high-impact interventions such as diagnosis and treatment, TB infection control, community-based DOTS, DR-TB, TB control in vulnerable populations (e.g., prisons, PLHIV, childhood TB), urban TB control, operational research and M&E.

- **Access to TB Services**

TB services are free at point of care by law. Currently, the Global Fund is supporting the purchase of the bulk of anti-TB medicines, with GOG coming in to fill gaps and provide emergency supplies as required.

In addition to TB coordinators at the district and facility levels, the programme is establishing referral clinicians who act as specialised experts on TB at the various levels. These positions are usually based at big health facilities and can serve more than one programme at a time.

Private hospitals and laboratories link with the NTP as part of the public-private partnership by which the NTP provides them with anti-TB supplies (e.g., microscopes, medicines, commodities, recording and reporting tools) and the entities provide patients care and data to the NTP. Round 10 is expected to help scale up this initiative.

- **Issues**

- DR-TB treatment still limited.
- Death rates among TB patients remain high. The rates have stagnated at around 6–8 percent for several years even though all other unfavourable outcomes have improved over time.
- The uptake of new diagnostic technologies is slow.
- Government financing of TB control activities, including anti-TB medicines, which are being supported through the Global Fund grant, is minimal.

## **Day 2: March 19, 2013**

### *Audience with World Health Organization Country Representative Ghana— Highlights*

- **Political Commitment and Coordination**

TB control, together with AIDS and malaria control, is placed high on the political agenda of the GOG. Control efforts are coordinated by a central unit, but service delivery takes place within an integrated health services.

WHO is one of the key partners providing technical assistance for the implementation of various TB control initiatives. Consequently, WHO participates in several TB control related technical working groups. At the top MOH level, WHO participates in a Health Sector Working Group that brings together development partners monthly to deliberate and share progress with shared government priorities.

The GOG is currently engaged in discussions and a process to decentralise political authority to district assemblies that will become the target of central government funding, priority setting, implementation and accountability. Thus, the capacity of district health management teams to deal with priority conditions including TB must be deliberately strengthened. For TB control purposes, strengthening should include capacity in terms of planning, infrastructure development, staffing, availability of core medicines and laboratory reagents, M&E, logistical support, and patient care and support.

- **Programme Implementation and Performance**

Based on latest WHO estimates, the Ghana NTP has performed well on key MDG-related TB control indicators, namely, prevalence, incidence, mortality and treatment success rate. In this respect, Ghana is one of a few countries in the region that appears to be on track to achieve these TB control performance targets by 2015. Case detection rate, however, has not been consistent and requires confirmation through an ongoing nationwide TB prevalence survey.

- **Programme Financing**

GOG has shown commitment to take responsibility for financing the health sector, and preliminary findings from an ongoing WHO and other partner analysis of health accounts show an increasing trend of government contribution to the health sector.

Current levels of government funding to the TB programme, however, have not benefited adequately from this trend. TB services for the past five years have relied substantially on the Global Fund and other partner funding even for core TB control activities such as FLDs and health worker training. These core functions and elements would need to be sustained through GOG funding in the event the donor partner financial flows came to an end or dwindled. Considering the prevailing uncertain global economic environment and trends, including at the Global Fund, GOG must begin to wean the programme from this potentially risky dependence.

- **WHO Contribution to TB Control**

WHO has remained and remains one of the key technical partners for the development and implementation of TB control strategies in the country. In addition to participation in strategic plan development and review, WHO has provided support for capacity building of programme management teams at various levels.

For the future, WHO is poised to continue providing technical and capacity building support to the programme, including ongoing initiatives such as a nationwide TB prevalence survey and renewal and implementation of the next strategic plan in the context of the post-2015 Stop TB Control Strategy when it is finalised and endorsed

by the World Health Assembly in 2014. WHO will also continue to partner with GOG in monitoring and evaluating the impact of control interventions towards and beyond the MDG deadline of 2015.

*Audience with the Minister of Health, the Honourable Mrs. Shelly Ayitey, in the Presence of Dr. Frank Bonsu, NTP Manager—Highlights*

- **Political Commitment to TB Control**

GOG is committed to TB control and is willing to take steps to sustain the gains the programme has made over the past decade. Towards this goal, GOG is in advanced discussions for a co-financed initiative to scale up diagnosis of TB in which GOG will contribute 55 percent (16 million euro) and the Government of the Netherlands will contribute 45 percent.

- **Government Funding of Health Services**

Despite increasing government funding of health services, GOG has not yet attained the recommended minimum target of 15–20 percent of gross domestic product for health services. This remains a goal to be achieved.

- **Constraints and Medium-Term Government Priority Issues of TB Control Interest**

- *Developing phase 2 of an ongoing round 10 Global Fund grant.* The current comprehensive review should, therefore, help to identify gaps and priority areas to include in new or ongoing control efforts
- *Ensuring universal access to quality TB control services.* Universal access includes securing uninterrupted supply of FDLs and SDLs, outreach programmes and mobile units, linking peripheral units to specialist services through telemedicine and targeting vulnerable groups.
- *Addressing effects of increasing urbanisation through investing in the social sector*
- *Enacting cross-border disease control initiatives*
- *Maintaining efforts to reduce high death rates among TB patients.* Advocacy, increased community awareness, scaled up public private partnerships and working with councils of religious bodies advances this cause.
- *Building capacity and providing basic logistical support at all levels*

*Audience with USAID/Ghana*

- **People Met**
  - Ms. Laurel Fain, Health Office Director
  - Dr. Felix Osei-Sarpong, TB CARE I Activity Manager

- **Background**

- USAID has worked in Ghana for 51 years. The Mission has developed a new strategy to assist Ghana in its new status as a lower middle-income country by working to create a strong, sustainable system to allow for the country to be independent of foreign aid. This assistance involves direct funding of GOG and a focus on technical assistance to allow the country to implement its own strategy.
- USAID/Ghana funding for TB has historically been small, although it has increased in the last two years. Since 2008, USAID has provided about 5 million USD in TB and TB/HIV funding through TB CAP and TB CARE . With this funding, USAID supports filling gaps and providing technical assistance to the country. In the future, the areas of support will be around DR-TB and overall systems strengthening. The Mission is also supporting the decentralization strategy and providing funding directly to the regions and districts in preparation.
- USAID sits on the Health Sector Working Group and the CCM. Although there is a group with oversight of TB/HIV, there is no subcommittee or stakeholder group specific to TB.
- The government funding available for TB is of concern. Although GOG has a commitment to the quality of the programme and to implementing good policies, it has no funding for TB-specific activities. A majority of the health funding that GOG provides (90–95 percent) goes to cover salaries of health care workers.

**Day 3: March 20, 2013**

*Audience with Regional Director of Health Services, Greater Accra Region*

- **People Met**

- Dr. Linda Vanooto, Regional Director of Health Services, Greater Accra Region
- Mr. Boamah, Deputy Director for Administration
- Sister Helen Mary Benson, Deputy Director of Nursing Services
- Dorothy Abudey, Regional TB Coordinator
- Dr. George Mensah, Accra Metropolitan Health Directorate

- **Highlights.** The TB programme is considered to have done well overall, and it is seen as a priority for the region. Areas that remain and deserve continuing or new attention include the following:

- Improved facility management is needed to implement the enablers package. The portion of funding that comes to the facility does not often benefit those who are not as directly involved in managing the patient (e.g., laboratory staff). The overall amount for the enablers package appears inadequate.
- Involvement of clinical teams in TB management is needed. Current organization and viewpoint in facilities puts TB in the public health arena, but it sits at the intersection of the two.
- Management of TB is seen as the realm of one or two people in the facility and with staff often rotating, there can be a gap in support for TB in the facility.

- Strengthening EQA of SSM services is needed.
- TB services are not part of Ghana’s health insurance system because diagnosis and treatment are free at point of care. Patients may need care over and above TB treatment, however, and those costs need to be covered under some scheme.
- Laboratory staff, pharmacy and others do not feel as though they are part of a complete system, but are often seen as specific to TB, malaria or HIV.
- In the opinion of those interviewed, sustained radio spots on TB have a positive impact on educating the public and combating the stigma of TB.

● **Future Perspectives**

- More advocacy is needed to address still rampant stigma, including among health care workers. Top management will have TB control in the facility as part of their appraisal in the future.
- Laboratory services must be strengthened, including mainstreaming microscopy technicians who are being trained and retained under Global Fund cover outside the mainstream.
- The CHPS strategy to enhance community care and improve treatment adherence should be scaled up.
- The clinical specialist initiative to support and capacitate district levels on the management of all forms of TB and co-morbidities should also be scaled up.
- In addition to a coordinator for TB, a team approach should be ensured.

**Team 1 Field Report, Ghana NTP Review, 2013**

Table D1 lists the members of team 1, and table D2 lists the places the team visited for this report.

**Table D1. Team 1 Composition**

<b>Name</b>	<b>Affiliation</b>
Janet Phillips	USAID, Washington DC
Estifanos Shargie	Global Fund, Geneva, Switzerland
Kwasi Addoh	NMIMR, Accra, Ghana
Wilfred Nkhoma	WHO/AFRO, Harare, Zimbabwe
Rhehab Chimzizi	MSH/TB CARE I, Ghana
Felicia Owusu-Antwi	WHO Country Office, Accra, Ghana

**Table D2. Places Visited by Team 1**

<b>Greater Accra Region</b>	<b>Eastern Region</b>	<b>Western Region</b>
Ridge Regional Hospital and units	Yilo Krobo District	Effia Nkwanta Regional Hospital and units
LA General Hospital and units	Somanya Polyclinic	Dixcove District Hospital and units
Central Medical Stores	Atua District Hospital, Lower Manya District and units	Agona Nkwanta Health Centre and units
	Prayer Deliverance Church of Christ Prayer Camp, Odumase	New Amanfi and Funkoe CHPS Compound
	Koforidua Regional Hospital and units	Twin City Clinic (private clinic)

### **Site Visits in the Greater Accra Region**

#### *Ridge Regional Hospital*

- **Person Met:** Dr. Apori, Hospital Medical Director
- **Overview**
  - Management indicated that the TB programme is seen to be performing well, and in an era when the prevalence of non-communicable diseases is increasing, the communicable diseases model being used for TB, AIDS and malaria control could and should be utilized to design strategies for addressing non-communicable diseases.
  - The hospital has a designated TB coordinator, but she was unavailable the day of the visit.
- **The DOTS Centre at Ridge Regional Hospital**
  - **People met:** staff nurses—Ruth Anna Eshun, Abigail Fianu and Catherine Amuzu
  - **Overview of the DOTS Centre**

TB patients are managed in the TB DOTS centre, which is run by six staff nurses who rotate monthly. The team interviewed the three working in the DOTS centre this month. Two of the three staff had received TB-specific training, and the third had received only on-the-job training. All of the nurses expressed interest in a more TB-specific, advanced course due to their interest in the subject. The staff members interviewed were dedicated, personable, and seemed to be doing a good job educating patients about TB and treatment (based on the patient interview). One nurse goes each morning to visit an alcoholic patient and to ensure that he continues to take treatment.

The hospital has no TB ward or beds dedicated to TB patients. The nurses said there is an isolated shed where they can keep a patient if needed.

○ **Screening and Diagnosis**

Staff explained that all clients at the hospital are screened for cough upon registration. Suspects are screened at the outpatient department (OPD), and sputum is sent to the laboratory. Because this facility was part of a CIDA-funded project to improve case detection, the screening tool used is cough for 24 hours. Results come back from the laboratory in a day or less. The CIDA project also supported the laboratory in this quick turnaround of samples. Sputum-negative and extrapulmonary TB are diagnosed by clinicians.

HIV counselling is given to all patients. Testing can be done at the DOTS centre, but the staff cited as a challenge the frequent lack of test kits.

○ **Treatment and Outreach**

Treatment is done through the DOTS centre and with support of volunteers. The DOTS centre sees about 15 clients per day. Patients must come for medication weekly during the intensive phase and biweekly during continuation. At times medication is picked up by treatment supporters, and depending on the patient, sometimes medication may be given for a longer period. The nurses are charged with contact investigations. Home visits are done at the start of every patient's treatment. Nurses go to the house to establish correct residence, examine close contacts and educate the family. Because of stigma towards TB, the nurses go to the home in street clothes and not uniforms, and they park away from the home. Evidence of contact investigations were in the treatment cards for the patients. Based on the patient interview and clinic records, IPT for children under 5 is being done.

Some patients were receiving the enablers package. The staff members adjust support according to the patients' needs and type of patient receiving support. Although the package is available, the nurses cited nutrition and transportation funding as the major challenges for patients.

The staff nurses also work with eight community volunteer treatment supporters. They meet with them monthly to go over any issues. The volunteers assist with ensuring treatment adherence for those who choose not to or for patients who do not have easy access to the health facility to pick up medications.

○ **Stigma**

The staff nurses explained that stigma was still an issue within the community in general, but more specifically among the health facility staff. Other facility staff will often not want to tend to a suspected TB patient or handle sputum containers. Although continuous morning messages are sent to the staff, the education efforts have not seemed to remove the stigma.

○ **Patient Interview**

During the visit, a patient came in with her son. She recalled that she was coughing for five months before seeking care at the hospital. The staff said she

was very emaciated and in quite poor health when she started. Now in her fifth month of treatment, she looks healthy and feels much better. Stigma seems to still be an issue because she was comfortable in telling only her husband. She did not tell her twin sister with whom she is very close. The patient said the staff came to her home at the beginning of the treatment to educate and do contact investigations. Her son, who is under 5, is receiving IPT and has had no problems with the medicine.

○ **Review of TB Data Management**

TB data for the hospital is managed by staff at the hospital TB DOTS centre that is manned by focal nurses who support each other. The review found that standard NTP data collection tools and registers (e.g., facility TB register, TB treatment cards and a TB suspect register) were in use at the centre. The staff had a positive attitude towards their work. All core TB documents were being completed well, and minimum procedures for individual patients according to the period in the treatment cycle were being adhered to.

○ **Strengths**

- The staff at the DOTS centre had a positive and constructive attitude to their work (figure D1).
- Based on the patient interview and the knowledge of the staff, it appears that the staff are doing a good job educating clients and close contacts on TB.
- IPT for children under 5 is being practiced.
- Home visits and follow-up on any possible defaulters is being done regularly. They have had no defaulters in the past year.
- Individual and facility data tools and registers were mostly complete.
- Pre-treatment smear examinations were being done systematically and entered and stored in the correct places.
- Almost all patients who were still alive at the end of intensive phase had their pre-continuation phase smear results done and recorded in both the individual patient treatment card and facility register.
- Ample evidence shows that routine HIV testing and counselling is being performed since the majority of patients in the facility register had known HIV status. As expected in a country where population HIV prevalence is low, prevalence of HIV among patients registered at the centre is also still low.
- CPT was being administered to all HIV dually infected TB patients.



**Figure D1. Nurses at the DOTS Centre, Ridge Regional Hospital**

○ **Areas for Improvement and Recommendations**

- *Enhance facility practice for the management of nonconverters.* A random sampling of entries in the facility register and treatment cards turned up a patient who was now in his seventh month of category I treatment after initially failing to convert at two months of intensive phase (Registration 021/ACC/2012/89). Smear and culture came back positive with resistance to rifampicin, but no isoniazid susceptibility test result was available on file. It is recommended that staff at the hospital be oriented on strategies for identification and management of DR-TB cases. In particular, the pharmaceutical management of this and similar cases (who are potentially monoresistant or even MDR-TB cases) needs to be reviewed in the light of complete bacteriological culture and DST results.
- *Provide more staff education TB.* The DOTS centre staff noted that there is still stigma among health facility staff. In addition to more education, support from management on encouraging all staff to support TB is needed. TB suspects and patients should not be seen as belonging only to a few staff. This education might also encourage other areas, such as prenatal care clinics, to also be aware and screen for TB.
- *Ensure that HIV test kits are available in the DOTS centre.* Although the ART clinic is close to the DOTS centre, it is still important that the test be available to the patients at the DOTS centre.
- *Improve supervision and monitoring.* Although supervision visits seem to take place, it is unclear whether these are formal or informal visits. The staff mentioned that many people come to visit, but it seems that most visits are informal. Regular, formal supervision visits should take place in which the staff receive oral and written feedback.

- *Support staff motivation.* The DOTS centre staff face stigma within the facility. It is important to ensure that they remain motivated. Staff currently use their own funding for calling patients and purchasing fuel for home visits. These tasks could perhaps be funded through the enablers package. In addition, all should receive at least basic training, but they are also interested in getting more advanced TB training. This desire should be supported and encouraged.
- **The Pharmacy at Ridge Regional Hospital**
  - **Overview.** TB medicines are stored together with ARVs and other programme commodities in an old but secure building. Anti-TB medicines for all categories of TB patients including paediatric formulations are stocked and were in stock at time of visit. Supplies needed for current patients on treatment are dispensed to the hospital TB DOTS centre where the patients are attended to. No direct dispensing to individual patients takes place from the pharmacy. The room also contains ARVs and other important commodities.
  - **Strength.** Medicines covering all patient categories were in sufficient stock for the hospital's patient load, and none were expired or about to expire.
  - **Areas for Improvement and Recommendations**
    - *Improve the storage environment for anti-TB (and ARVs and other products) medicines.* Although the storage room is secure and solid, the storage environment within the room (i.e., no temperature control, no water and dust proofing of the main entrance door, no storage shelves, no pellets to raise the cartons from the floor) potentially compromises the long-term potency of the medicines. (See figure D2.)
    - *Review the packaging of category II anti-TB medicines.* The NTP in collaboration with the Central Medical Stores (CMS) network should review the sourcing and packaging of category II medicines to enhance their storage and dispensing within pharmacies.

On inspection, the storage room was found to have no shelves, no pellets to lift the medicine cartons from the floor, no temperature control facility and is not water or dust proofed. Consequently, dust seeps through easily and was covering most of the cartons in the room. As a result of this predicament, medicines are dispensed from their original cartons, which are lying on the floor.

Category II medicines were received from the Regional Medical Stores in black make-shift plastic bags and had been reconstituted from various sources with the result that the combination has different expiry dates. This situation was seen as a FEFO, routine monitoring and dispensing challenge by the pharmacy staff.



**Figure D2. The pharmacy at Ridge Regional Hospital**

- **The ART Clinic at Ridge Regional Hospital**
  - **Person Met:** Mercy Acquah-Hayford
  - **Preamble:** The 2012 WHO Policy on TB/HIV collaboration and the new WHO ART guidelines of 2011 recommend that PLHIV should be accessing periodic screening for TB, and IPT should be administered to those without active TB. The Ghana NTP treatment guidelines support this position. In this context, the ART Clinic at Ridge Regional Hospital was visited to establish procedure and practice.
  - **Overview.** See figure D3.

<p>A symptom- and sputum-smear-based TB screening tool is part of pre-ART screening for all PLHIV, and a TB screening register is maintained at the clinic. The review team used this register to determine that new clients are screened on entry and then every 6 months thereafter. Between October and December 2012, 359 clients had been registered, of whom 350 (97.5 percent) had been screened for TB. None were positive for active TB.</p>	<p>Sputum request forms were available in the clinic, and it was reported that sputum specimens are sent directly from the ART clinic to the laboratory and results generally received back the same day. Those who turn out to be positive for active TB are referred to a nearby DOTS centre for initiation of intensive phase of treatment. ART tends to be started only after the initial intensive phase of TB treatment. In general, IPT is not part of routine practice for those who test TB negative.</p>
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**Figure D3. Overview of the ART Clinic, Ridge Regional Hospital**

- **Strengths**
  - Active practice and documentation of TB screening among PLHIV was in evidence.
  - The organisation of specimen collection and referral between TB and ART clinics is effective.
- **Areas for Improvement and Recommendations**
  - *Improve access to ART by HIV dually infected TB patients.* The proportion of dually infected TB patients accessing ART during the course of their TB treatment remains small at this and other centres visited. Criteria for accessing ART remains one based on CD 4 count. It is recommended that the NTP in collaboration with the NACP review the criteria for starting ART in HIV dually infected TB patients in line with the new WHO recommended criteria that invalidates a cut-off point based on CD4 count for such patients.
  - *Implement an IPT policy among PLHIV.* Uncertainty lingers regarding exclusion of active TB among PLHIV and, therefore, implementation of the IPT policy. It is recommended that the NTP champion a strategy to evaluate and pilot the IPT strategy taking advantage of the availability of Xpert MTB/RIF technology (Gene Expert) that can exclude active TB with high certainty. The pilot can be targeted at PLHIV clients already receiving regular clinic care for a period of not less than the recommended nine-month period such as ART clinics.

### *LA General Hospital and Units*

- **People Met**
  - Mrs. Georgina Nortey, Deputy Director Nursing Services
  - Dr. Beatrice Nyann
- **Overview**

The hospital provides all aspects of TB management from diagnosis and treatment to follow-up. It also offers paediatric TB services and TB/HIV services. HIV counselling and testing is routinely offered to all registered TB patients, and ART for dually

infected TB patients is usually started after the intensive phase of TB treatment. The hospital has no TB ward in the hospital or beds dedicated to TB patients.

Expressed main areas of interest and challenges include diagnosis of childhood TB, including DR-TB because culture results are not readily accessible. In addition, the hospital does not have an isolation ward to manage MDR-TB cases should the need arise.

- **The DOTS Centre**

- **People Met:** Staff nurses

- **Overview**

TB patients are managed in the TB DOTS centre, which is run by five staff nurses who work on TB activities, with one nurse in the OPD to do screening. The team interviewed the three working in the DOTS centre. Two of the three staff had received TB-specific training, and the third nurse had received only on-the-job training. The staff interviewed were very dedicated and personable, and they seemed to be doing a good job educating patients about TB and treatment. The hospital also works closely with three other facilities, all of which provide TB treatment and two of which have diagnostic services.

- **Screening and Diagnosis**

Staff explained that all clients at the hospital are screened for cough upon registration. Suspects are screened at OPD, and sputum is sent to the laboratory. About 80 percent of the suspects come from the OPD with the other 20 percent going directly to the DOTS centre. Because this facility was part of a CIDA-funded project to increase case detection (the same as at Ridge Regional Hospital), the screening tool used is cough for 24 hours. Results come back from the laboratory in a day or less. The CIDA project also supported the laboratory in this quick turnaround of samples. Sputum-negative and extrapulmonary TB are diagnosed by clinicians. All smear-positive cases are also seen by a doctor after diagnosis.

- **Treatment and Outreach**

Treatment is done through the DOTS centre and with support of volunteers. The DOTS centre sees about two to four clients per day. Patients must come for medication weekly during the intensive phase and biweekly during continuation. At times medication is picked up by treatment supporters, and depending on the patient, sometimes medication may be given for a longer period. The nurses are charged with contact investigations. Home visits are done at the start of every patient's treatment. Nurses go to the house to establish correct residence, examine close contacts and educate the family. Contact investigations are also done near the end of treatment for all patients.

The DOTS centre does not do HIV testing, although it is offered in the hospital.

IPT for children is not being done. The nurses knew of the policy, but said they did not have access to IPT.

Almost all patients were receiving the enablers package. The staff are adjusting support according to the patients' needs and type of patient receiving support. This means that for some patients, they will cook a meal, and for others, they might give funding for them to purchase food. Although the package is available, the nurses cited nutrition and transportation funding as the major challenges for patients. The funding from the package that comes to the facility is distributed to the laboratory as well as the DOTS centre.

The staff nurses also work with community volunteer treatment supporters. They meet with them quarterly to go over any issues. The volunteers assist with ensuring treatment adherence for those who choose not to go to, or do not have easy access to, the health facility to pick up medications. The initial training for volunteers was conducted at the district level, and the hospital staff are charged with providing refresher training to volunteers. The staff said they have seen the volunteers change frequently. Two nongovernmental organisations (NGOs) work with the hospital and support health education activities.

The staff nurses explained that stigma was still an issue within the community in general, but it is getting better. One nurse has worked in TB care since 2003 and sees a big difference from 10 years ago. The nurses feel that household education and messages are reaching people. The centre staff have done some ad hoc education to the community through the prayer camps, but this activity is not a regular one.

○ **Observations on Data Management and Validation**

- Standard NTP recording and reporting tools are in use and well maintained.
- Pre-treatment and follow-up sputum smear results are routinely being accessed, recorded in relevant registers and forms, and original results are also attached to patient notes
- The contact tracing form is routinely used and attached to patient treatment cards.
- All 29 patients registered in a sampled quarter (January to March 2012) were tested for HIV, seven (24.2 percent) tested positive and six were on CPT. None, however, was on ART.

○ **Strengths**

- TB documentation is well maintained.
- Core TB diagnosis and treatment practices are consistent with national guidelines.
- Contact tracing is happening regularly and is documented.

- Universal HIV counselling and testing are evidently in practice, and CPT is being applied.
- Supervision is occurring, and staff are also attending quarterly district meetings.
- Home visits and follow-ups are being done for all patients with few defaulters found in the reports.
- IEC materials are on the walls and available for clients.
- **Areas for Improvement and Recommendations**
  - *Minimal application of ART for HIV dually infected patients.* NTP and NACP should ensure implementation of recently revised national guidelines on the eligibility criteria for dually infected TB patients to access ART in line with current WHO recommendations.
  - *Engagement of the prayer camps and traditional healers.* Although this effort was made, it was more on an ad hoc basis. As part of routine work, more engagement with the surrounding community should be done to provide TB education is needed.

### *Central Medical Stores*

- **Person Met:** Mr. Peter Ekow Gyimah, Head of Central Medical Stores
- **Overview**
  - **Mandate of CMS towards Anti-TB Medicines**

The CMS is charged with the responsibility to receive, store and distribute medicines throughout the public health sector in the country. This responsibility includes anti-TB medicines whatever the source. CMS has a central office with approximately 50 employees and one regional centre in each of the country's 10 regions manned by 10–20 staff.

- **Quality Control of Medicines**

After commodities are received, irrespective of their source or accompanying documentation from source, CMS sends samples of each newly received medicine for quality analysis by the Food and Drugs Authority within the country (see figure D4 for a sample communication on anti-TB medicines to this effect). Only when clearance is received are the medicines distributed.

Following distribution, CMS does not play a part in any postmarketing quality control activities for anti-TB or any other medicines. This role and that of pharmacovigilance is for the Food and Drugs Authority.

REPUBLIC OF GHANA

The Chief Executive  
Food and Drugs Board  
Accra

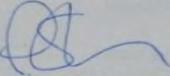
***Submission of Pharmaceuticals/Health Supplies for Quality Analysis***  
We wish to submit the following pharmaceuticals/health supplies for quality testing at the Food and Drugs Board.

**TB**

<u>Product</u>	<u>Manufacturer</u>	<u>BatchNum</u>	<u>MDate</u>	<u>EDate</u>
Ethambutol Tablet, 400 mg	Cadila Pharm Ltd	ETA0011	Feb-10	Jan-14
Isoniazid Tablet, 300mg	Svizera Labs, India	SL89	Oct-10	Sep-15
R-150 / H-75 / Z-400 / E-275 mg Tablet	Sandoz Private Ltd	WR94AOB	Jan-10	Dec-11
Rifampicin+Isoniazid Tablet, 150mg + 75mg	Sandoz Private Ltd	WF02AOB	Jan-10	Dec-11

Please in your report do indicate the batch numbers quoted above.

We submit for further action.

  
Peter Ekow Gyimah  
Head, CMS

**20/03/2013**

**Figure D4. Sample communication on anti-TB medicines**

○ **Distribution**

Medicines are distributed either directly to facilities or delivered by CMS trucks that take the medicines to Regional Medical Stores, from which medicines are distributed to respective regional health offices, districts and eventually facilities. Teaching hospitals are treated like regional centres and are among those supplied directly. CMS also serves facilities in crisis outside the usual channel.

Except where facilities send their own transport to collect their order, recipients are expected to meet the cost of fuel and driver allowances for such deliveries.

○ **Quantification of Anti-TB Medicines Needs**

Monthly, CMS prepares and shares with the NTP logistic data on current stocks status. Using this information, the NTP quantifies its needs. A multidisciplinary national quantification team meets to analyse the situation of medicines in the country, including anti-TB medicines. The CMS is represented on this team and conveys their discussions with programme managers on their needs.

○ **CMS and Laboratory Reagents**

CMS plays no role in the procurement, storage or distribution of TB-related or any other laboratory reagents and equipment. The public health laboratory at Korle-Bu takes care of this.

○ **Information System.** A computerised information system is in place, but it cannot track medicines by batch.

- **Expressed Challenges and Recommendations**
  - Software does not allow tracking of medicines and commodities by batch.
  - Robust cooling facilities is needed at storage depots.
  - Training and orientation of pharmaceutical staff on evolving TB products such as new medicines and products is needed.
- **Observations in the Warehouse**
  - CMS has a huge facility with ample space and a cooling system in place. The temperature reading was 26° Celsius at the time of the visit, but the facility had no temperature control chart to monitor daily trends of temperature fluctuation inside the store.
  - Anti-TB medicines and other boxes are well stacked, labelled and secured. Stocks that had just been received and were waiting for clearance by the Food and Drugs Authority had not yet been shelved but kept away from all the other supplies.



**Figure D5. Site visit to the warehouse at CMS**

- **Current Stocks of Anti-TB Medicines**

At the time of the site visit, there were sufficient stocks of category I and III FLDs to cover four months average consumption. The team found no stock of complete packages of category II FLDs but did find enough stock of HRE packs and streptomycin injections.
- **Areas for Improvement and Recommendations**
  - Repackaging of category II anti-TB medicines is proving to be a challenge for effective storage, FEFO control and stock control. NTP in collaboration with CMS should review the sourcing and packaging of category II anti-TB medicines and come up with a more user-friendly strategy to implement at lower and use levels.

- CMS should introduce a temperature monitoring system in the warehouse for holistic appreciation of the effectiveness of the cooling system.
- CMS should to revisit the information system software to facilitate batch tracking after distribution has taken place.

### **Site Visits to the Eastern Region (March 21, 2013)**

#### *Yilo Krobo District, Audience with the District Health Management Team*

- **People Met**
  - Dr. Akosua Owusu, District Director of Health
  - District TB Coordinator

- **Overview**

This district does not have a district hospital, but it runs a polyclinic and has health facilities that provide TB services. TB is considered a priority in the district and performance of the national programme over the years has been above average. Within the district, the TB epidemic is fuelled by the relatively higher prevalence of HIV in the general community (approximately 8 percent) compared to the rest of the country.

Despite the high HIV prevalence, until the time of the visit, the district had no ART clinic because it was considered too close to another clinic in the neighbouring district of Lower Manya. The initial institutional policy of government in the provision of ART was another factor in this decision. In the absence of a district hospital, Yilo Krobo was ineligible. A CD4 machine recently had been brought to one health centre in the district, however, with a view to establishing ART services soon.

The district health management team faced challenges in managing the district health activities. The amount of general health funding was small, with the majority coming for specific areas (e.g., TB, HIV, malaria). The funding did not come at regular intervals making it difficult to plan and budget since they were not given an overall budget figure. The enablers package was seen as a good programme that motivated people to continue treatment, but the district health management team still had concerns related to the timing of the funding and how much funding patients receive.

- **Interview with District Health Coordinator**

The coordinator has a formal job description and describes her main activities as organizing focal persons in the facilities and taking them through refresher training, supervising and updating registers, report writing and attending review meetings. She received her last TB-specific training over a year ago.

The coordinator was able to accurately describe the TB regimens, had copies of diagnostic algorithms and knew the screening tool well. She was able to describe the overall TB programme and how it functions in the district. She makes monthly visits to health facilities as part of integrated supervision.

The coordinator described some of the achievements in the district such as providing funds to volunteers for transportation and to assist in sputum collection and the general community surveillance of TB through volunteers. Challenges remain, however, in the area of funding for focal persons to conduct reviews and to transport sputum. In addition, behaviour change and poverty are issues in the community. The coordinator recommends that the enablers package be strengthened.

### ***Somanya Polyclinic—Review of the DOTS Centre and Data Management***

- **People Met:** Nyumuah Gladys and auxiliary staff

One auxiliary staff member and one nurse manage the DOTS centre. The auxiliary staff member was interviewed. She has been working in TB since 2009 and has received only on-the-job training.

- **Screening and Diagnosis**

The OPD has a talk with all of the patients at the beginning of the day when many have arrived. They try to screen clients for cough at that time. The definition of a TB suspect is a cough for more than two weeks. The TB suspects come from both the OPD and directly from the community to the DOTS centre. Two sputum samples are collected either at the laboratory or by DOTS centre staff. It generally takes one or two days to get results. For smear-negative and extrapulmonary TB, diagnosis is done by the doctor, although X-ray is not available at this facility. If a client has a positive sputum result but does not return for the results, the DOTS centre staff will search for that individual. HIV testing is not done at this facility, but takes place in the next district, Lower Manya; however, HIV test results are recorded in the register.

- **Treatment and Outreach**

No community volunteers are attached to the facility, and treatment supporters are generally always family members. Home verification visits and contact investigations are done at the beginning of treatment, and a treatment supporter must be identified. Medication is given for one week in the intensive phase and then every two weeks; however, this regimen depends on the patient (i.e., whether he or she shows better adherence by being able to pick up more medication). Judging from the information given by staff, IPT is being done for children under 5. Defaulter tracing is done by the facility staff. Many patients are receiving the enabler package, and staff adapts it to the patient. For example, a drug addict will not be given money for food, but rather the money will go to the treatment supporter instead.

Supervision happens at least monthly, with additional visits often in between. Because the polyclinic is close to the district office, the process is easier. They give only oral feedback, not written reports. The posters on the wall in the facility were old, and no IEC material was readily available for clients.

Community outreach happens through the nurse and auxiliary staff. A monthly schedule of household visits is part of the staff visit. Staff visits three or four households at a time and provides education and information on TB. In addition, regular outreach to the prayer camps in the area is ongoing.

Challenges for the staff include a language barrier because the nurse does not speak the local language and cannot go on visits alone. In addition, they have run out of some basic supplies such as patient cards.

- **Strengths**

- The correct recording and reporting tools are in use and are fairly well maintained and filled out. Pre-treatment and follow-up smear testing is being done systematically. The majority of patients on FLDs were seen to be converting.
- HIV testing is being done most of the time, and the results are recorded.

- **Areas for Improvement and Recommendation.** The establishment of ART services in the district is recommended. Although the district is near another district that provides ART services, moving a client from one facility to another increases the chance of losing that client.

*Atua District Hospital, Lower Manya Municipality*

- **People Met**

- Irena Ofei, District Director of Health Services
- Dr. Moses Dokurugu, Clinical Care Coordinator
- Hospital Matron
- Laboratory In-charge
- Michael Owusu, Municipal Nutrition Officer
- District Director of Nursing Services
- Janet Danso, Staff Nurse

- **Overview**

Lower Manya has recently become a municipality, making it eligible for urban development funds from GOG. The hospital serves two other neighbouring districts' needs for health services.

Priority programmes and diseases are mostly those related to the health MDGs, namely, maternal and child health, AIDS, TB and malaria. At 7.8 percent, the HIV prevalence in the district is higher than the national average of less than 2 percent. Furthermore, the TB burden is relatively high owing to the fact that three diagnostic centres are served by the same hospital.

The TB programme has been running well, and financial support from the Global Fund and NTP sources has been received regularly for TB control activities. Another USAID-supported project, TB CARE I, has enhanced TB case detection in the district.

- **Issues and Challenges Cited**

- Supporters need to be maintained to sustain community TB care approaches.
- The enablers package for patients and staff is too little to meet needs.

- Nutritional support for TB patients on treatment is needed.
- Patients without health insurance pose a challenge and are sometimes supported from the enablers package.
- The arrival of the enablers package funds is unpredictable.
- The number of TB cases is high, and the death rates among TB patients is increasing.
- Turnover of staff trained on TB control activities is high, so frequent trainings to replenish dwindling numbers and maintain quality of care are needed.
- Cultural beliefs and stigma towards TB are formidable obstacles.
- The impact of prayer camps in keeping chronically ill patients from medical care while they pray for them is a negative influence. Some of these patients have eventually been found to be suffering from infectious TB. According to the District Director of Health Services, who related the story to the review team, in one case, a prayer camp pastor, who herself unknowingly contracted TB from clients in her camp, came for treatment at the hospital and subsequently assisted in a contact investigation that yielded two infectious index cases from within the camp. The pastor has now become a collaborator with the health system. (See figure D6.)



**Figure D6. The changing role of prayer camps in TB diagnosis and treatment**

- **Review of Data Management**

The correct recording and reporting tools were found to be in routine use, and all were being well maintained and filled out. Data validation between a selected quarterly report and the register entries was closely related. Pre-treatment and follow-up smear testing is being done systematically and the majority of patients on first-line treatment were seen to be converting.

HIV testing is being done most of the time and results recorded. HIV prevalence of 82.6 percent was noted for a selected quarter cohort (October to December 2012). CPT is being offered to the majority of HIV-positive patients (95 percent for October to December 2012 cohort), but ART services are offered to only a few of those who tested positive for HIV (44.4 percent). Again, this deficit was due to the dominant national criteria for ART eligibility that still relies on CD4 count cut-off points of less than 350. Recently, the hospital has experienced a shortage of HIV testing kits leading to rationing for priority clients at the ART clinic at the expense of other patient groups such as TB patients.

- **Review of the DOTS Centre**

The DOTS centre has two staff members, one full time and one part time. The staff interviewed had been trained in TB many years ago, but had received training from TB CARE I recently to help improve case detection.

- **Screening and Diagnosis**

Screening for TB occurs in the OPD and in consultation rooms. At the beginning of the day, OPD staff give a health lesson, and during that time, they observe the clients for those coughing. Those coughing are fast-tracked and sent to the laboratory to give sputum if suspected of TB. As reported by staff, it usually takes three or four days to get the results back from the laboratory. This facility has installed Xpert, but it is not yet routinely used. Two sputum samples (spot and morning) are examined. X-ray facilities are also available at the hospital. Each ward has isolation units where TB patients can be treated.

HIV testing is done at the voluntary counselling and testing clinic located near the TB clinic. Shortages of testing kits have been identified as a major issue for the district.

- **Treatment and Outreach**

If diagnosed, home verification visits are completed before patients can start treatment. This requirement was seen as a challenge. No vehicle is available to the nurses, and many patients come from far away villages, making it time consuming to visit the homes. Some do not return for laboratory results, and if those results are positive, patients are often difficult to find and follow-up, especially since some give incorrect contact information. Nurses are also charged with contact investigations. Medication is given monthly, including for IPT, which is sometimes delivered through a community volunteer. All patients are required to identify a treatment supporter at the start of treatment. Staff in the hospital is also working closely with some of the prayer camps in the area.

The DOTS centre had posters, but IEC material was not readily available. The team was told that the centre gets materials from the central level and gives most material out right away, so it does have shortages at times.

The facility works with 30 community volunteers and meets with them quarterly. Currently, the district health office is in charge of training the volunteers, but the

hospital will take over that activity soon. Supervision from the district is conducted monthly; quarterly visits are made by regional and national and TB CARE. These latter visits seem to be a bit more informal, and the review team was unable to find written reports for the DOTS centre (although a laboratory report was available).

- **Laboratory**

See annex E.

- **Hospital Pharmacy**

Sufficient stocks of category I and III packs were available. Reconstituted category II medicines were also available, but they were found to have various expiry dates and to have been packed in a suboptimal manner (from Regional Medical Stores).

The pharmacy had 100 tablets of levofloxacin but no other second-line medicines in stock.

- **DR-TB**

During 2012, the hospital had nine suspected MDR-TB cases, three of whom were confirmed. None is on treatment as yet. The regional TB focal point has been informed about the existence of these cases. No one at the hospital has been trained on management of DR-TB.

- **Strengths**

- Strong linkages with the community, including work with the prayer camps in the area, were found.
- Regular meetings are held with the community volunteers.
- Data records are well maintained.

- **Key Recommendations and Areas of Improvement**

- NTP and NACP should improve implementation of guidelines on ART eligibility criteria for HIV dually infected TB patients.
- NTP should implement an aggressive ACSM campaign targeted at reducing stigma and improving health-seeking behaviour in light of the threat from a clear and present danger from the “nsamanwa” legacy (Nsamanwa means TB is a Ghost Disease)
- NTP should speedily facilitate an earnest start of PMDT built around regional hubs to mop up accumulating cases of MDR-TB in the country.
- NACP should ensure the stock of HIV test kits for HIV and TB facilities.

- Having community volunteers complete home verification visits as a routine part of their work is worth exploration. Staff do not always have time to complete the home visits.

### *Koforidua Regional Hospital*

- **People Met**

- Acting Regional Director of Health
- Physician specialist and focal point for TB control and care
- Health Services Administrator

- **Overview**

- **The DOTS Centre**

The facility has a focal person for TB. The hospital has around 17 beds available for TB patients, and around seven TB patients were in the ward at the time of the site visit. The general OPD screens for TB with the triage nurse asking about cough of more than two weeks. All staff are responsible for identifying TB suspects. Microscopy, culture, and X-ray are available at the hospital. Two sputum samples are collected and results are returned within 24 hours. Once treatment begins, patients are required to come monthly for medicines and observation. The nurses are responsible for contact and defaulter tracing. The DOTS centre performs HIV testing with the register showing results for all TB patients. CPT is given for all who are eligible. Few patients are getting treatment at the hospital, which serves mainly as a diagnostic facility. Monthly supervision seems to be happening, but no written reports available were available at the time of the visit. Feedback is given orally. As yet, no MDR-TB treatment is available at this facility.

- **Report on the TB Register**

The hospital serves as more of a diagnostic centre with most patients choosing treatment from another facility. As such, few patients were on the register. All of the TB patients had received HIV testing, and those eligible were receiving CPT. Of the five patients registered in the first quarter, two were smear positive. Both smear-positive patients were defaulters. Patient treatment cards appear to be complete and well filled out.

The hospital had several TB patients; however, although they had started TB treatment in the hospital, they were not listed in the register, but rather in a separate, informal record book. Since they will likely move to another facility after being released, the expectation was that they would register in the other facility. In addition, extrapulmonary TB patients were labelled as “no sputum” instead of extrapulmonary. The record-keeping seems to have improved from last year, but areas for improvement remain.

- **ART Clinic**—Interview with Ms. Mary Opare, HIV Counsellor

TB screening is one of the routine screenings undertaken on all newly registered PLHIV from within the ART clinic. A standard screening algorithm exists for this. Those who test TB positive are referred to the TB DOTS centre for treatment. ART is commonly started after the initial intensive phase of TB treatment.

- **Strengths**

- The facility has a strong TB focal person.
- The facility has the capacity to admit TB patients into the hospital.
- HIV testing is done on all TB patients, and results are recorded in the register.

- **Recommendations and Areas of Improvement**

- Ensure that registers are carefully reviewed during supervision visits. The review team found small issues, such as the recording of extrapulmonary TB versus “no sputum,” that should be corrected during supervision visits.
- Improve record-keeping. Patients diagnosed and started on treatment in the hospital need to be recorded in the official register. For example, if someone dies while a patient at the hospital, the TB death would not be reported at a national level using the current method.
- Ensure defaulter tracing and arrival of referrals from the hospital. Although only a small sample, it is concerning that both smear-positive cases defaulted. In addition, at a referral hospital, ensuring that those diagnosed at the facility arrive for treatment at the health clinic is critical.

- **Management of DR-TB—Interview with Physician Specialist and TB Focal Point**

Until the present time, 17 cases of confirmed MDR-TB had been identified from surrounding districts. Four have been started on treatment, and two were reported to have died. Treatment is ambulatory and is delivered in the district where the patient came from in collaboration with respective district TB coordinators. The regional hospital has no isolation facility, but as an interim measure, an old laundry building has been identified as a potential space for temporarily managing such cases. This space, however, lacks financial support to be renovated for such use and is not optimally located relative to other patient wards. The ultimate need is for an independent structure for infectious diseases isolation, including MDR-TB.

- **Laboratory**

See separate annex E.

- **Pharmacy Unit**

- Overview and key observations

All anti-TB medicines are ordered monthly from Regional Medical Stores nearby, according to patient load and consumption patterns.

Category I and III supplies are in adequate supply with no history of stock-outs, but category II supplies are usually in short supply. Furthermore, the available and dispensed category II medications come repackaged with poor packaging and variable expiry dates. By specific compound, the pharmacy is stocking the following medicines:

- Pyridoxine 50 mg, 500 tablets
- Isoniazid 100 mg, 100 tablets
- Category I five packs
- Category III three packs
- Category II zero independent packs
- Rifampin + isoniazid + pyrazinamide + ethambutol, 256 tablets
- Streptomycin, 56 ampoules of 1 gram each

Except for category II supplies, the other medicines are above the one-month supply cut-off zone according to average consumption pattern.

The review team found *no* SLDs in stock, and they have been out of stock for most of the time.

The pharmacy is clean and temperature controlled.

○ **Key Recommendations and Areas of Improvement**

The review team found a huge diagnosis-treatment gap and a glaring lack of infrastructural and technical capacity to manage diagnosed MDR-TB cases in a timely manner.

It is strongly recommended to the NTP to—

- Take an inventory of the number and location of confirmed MDR-TB cases in the country
- Take urgent steps to facilitate set-up of regional MDR-TB treatment initiation hubs with a direct link for continuation of treatment in patients' districts of origin
- Link the confirmed MDR-TB cases for treatment at the regional hubs to mop up the prevalent cases and eliminate the existing diagnosis-treatment gap  
Elaborate a plan for building the clinical capacity of core MDR-TB treatment initiation teams at all regional hospitals through in-country and out-of-country courses on PMDT
- Work with the NTRL to establish rapid diagnostic technology (e.g., Xpert MBT/RIF) for early diagnosis of rifampicin-resistant cases from among high-risk patients groups and facilitating treatment according to national guidelines and universal confirmatory culture testing as appropriate.

## **Site Visits to the Western Region (March 25, 2013)**

### *Regional Medical Office*

- **People Met**

- Dr. Kwaku, Acting Regional Director for Health/Deputy Director for Public Health
- Dr. Atsu Dodor, Deputy Director, Clinical Care

- **Key Highlights**

The NTP is seen as organized and well-functioning. In the region, TB is a major health programme, due in part to the programme funding available through the Global Fund. The reliance on donors to implement TB-specific programmes is total because no funds come from GOG. The programme-specific funds are often used to fill in the gaps in other areas.

The enablers package is viewed positively; however, improvement is needed in a number of areas. None of the other key programmes, such as HIV and malaria, has a package similar to the enablers package for TB. Erratic flow of funding from the central level for support was cited as one of the major concerns. Funding is based on the previous quarter, but if there are more patients the next quarter there is not enough funding available.

If the enablers package stopped suddenly, it would be a detriment to the TB program.

- **Key Challenges and Areas of Improvement**

- The visits and interaction between the national and regional level are irregular. The region would prefer quarterly visits, but they are happening only every six to 12 months.
- The enablers package needs to be enacted. Although an evaluation was done in 2009, a more rigorous study may be needed to look at the effectiveness, cost-effectiveness, management of the funds and the overall elements offered as part of the package. A more uniform way of implementing the enablers package is needed.
- Reliability of data is a challenge. Staff at lower levels do not always understand the registers correctly.
- Staff turnover and identification and training of new staff are difficult, and refresher training is not happening as often as it should.
- The central level does not always provide clear direction, guidelines or information. At times, staff are interested in an area or are required to implement something new, but they lack clear guidelines about what it means or how to do it (e.g., death audits and defining “clinical monitoring”).

- Regional review meetings happen every six months, but there are more struggles at the district level. The region is unsure of the quality of the meetings at the district level, and often the regional staff members are not aware when districts meetings are scheduled.
- PMDT
  - One MDR-TB patient has been successfully treated in the region, but there were many lapses and difficulties.
  - A space has been identified as a possible inpatient treatment facility following renovations. The NTP has sent staff to evaluate the space and determine what will be needed.
  - Capacity of staff is a concern. One physician in the region attended MDR-TB training in Kenya, but the region recently heard that this individual has been asked to assist with the prevalence survey and, thus, would not be available until that is complete. This rumour needs to be confirmed.
  - Logistics were of no concern.
- PPM
  - Participation of the private laboratories and supplying them with reagents has gone well.
  - Training for private physicians was conducted last year, but challenges remain.
  - Some districts have been successful with engaging private providers, but in other areas, the physicians do not show an interest in treating TB patients.
- **Recommendations**
  - The enablers package needs a thorough and rigorous review to look at the impact; the package of services offered; the management of the funds at the regions, districts and facilities; and the cost-effectiveness. With the possibility of less donor support in the future, it is important to look critically at the sustainability and effectiveness of the enablers package.
  - Strong links between the national and regional levels must be ensured. Quarterly reviews and visits should happen as scheduled to help link the regions to the central level and to provide the guidance and tools that regional and district staff need.
  - Training of additional staff for PMDT is critical. With only one staff member able to treat MDR-TB patients, scaling up activities will be impossible.

#### *Visit to Dixcove District Hospital*

- **People Met**
  - Mr. Newton Joseph, Regional TB Coordinator

- Mrs. Emma Ampofo, Deputy Director of Nursing Services
- Ms. Stella Biney, Principal Nursing Officer
- Mr. Msheni, Hospital Administrator
- Disease Control Officer
- Cecilia Ellis, HIV Counsellor
- Sandra Oforu, Storekeeper

- **Overview**

Dixcove District Hospital, a 57-bed, public hospital with mixed male, female and paediatric wards, serves an approximate population of 30,000. It is manned by one medical doctor and 56 nurses of all cadres. Situated close to Takoradi Regional Hospital and another district hospital with which patient referrals take place easily, Dixcove runs community health services for maternal and child health services through community nurses.

The hospital provides TB diagnosis and treatment services, HIV counselling and testing and community follow-up of patients on treatment. There is a DOTS centre on site and a facility TB coordinator. ART services do not yet exist on site. All eligible clients are referred to the Effia Nkwanta Regional Hospital. It is expected, however, that ART services will be established soon under a focus regional project.

- Expressed challenges
  - Training of care providers on TB-related issues is needed; only a few are oriented and able to support TB services.
  - SOPs on core processes and procedures are needed.
  - The enablers package is not well known.
- Data review
  - Standard NTP documentations is in use.
  - The patient load is low.
  - Most patients are highly smear positive; a few cases are of other forms.
  - Complete agreement was found on data validation of selected quarters.
  - Most patients are not sputum checked at the end of treatment (four of five in the January–March 2012 quarter).
  - Evident misclassification was found of end time outcome between “cure” and treatment “completed.”
- TB-HIV
  - A high proportion of TB patients is being tested for HIV.

- Few PLHIV were screened for TB (four of 29 registered June–December 2011).

- **The Medicines Store**

The store is sufficiently spacious, and items are stacked on shelves and pellets. The building is secure, but the room was very hot because the air conditioner had been dysfunctional for at least one month at the time of the review team’s visit. Windows are not positioned well to allow for free air circulation.

The review team found 11 category I and III patients kits to last the hospital another two months. All have good expiry dates. The hospital is able to get emergency supplies in case of need.

No other anti-TB medicines were in stock.

The team found evidence of category I and III stock-outs for at least a month at a time in May, July and November 2012. These stock-outs did not lead to treatment interruption for any patients, however.

- Challenges and areas of improvement

- The temperature control is poor; barred windows and other air circulation outlets inhibit air flow.
- Category II supplies in stock were lacking at the time of the site visit. Supplies are ordered on request from Regional Medical Stores when a centre experiences a category II condition.

- **The TB DOTS Centre**

The TB DOTS centre is staffed by the district disease coordinator and a nurse. The nurse has not received TB-specific training, but has had training on HIV counselling. The DOTS centre does HIV counselling, but no testing is done in the DOTS centre. ART is not provided at the district hospital, so clients must be referred for ART. An HIV clinic is planned for the facility in the future.

TB screening is done at the OPD. The OPD waiting area is outside with good ventilation. The OPD nurses do not specifically screen for TB when they triage clients, but they informed the review team that if they see people coughing those patients are fast-tracked to the consultation rooms. The OPD nurse interviewed did not have TB-specific training, but knew the basic symptoms of TB. If a TB suspect, the client is sent to the laboratory.

Treatment is given in the DOTS centre. Before the start of treatment, home verification visits are supposed to take place and a treatment supporter identified. This is most often a relative. During the home verification visits, the staff said that contact screening was being done. There was no contact screening register or information in the treatment cards, so this screening could not be verified. IPT is not being done at this facility.

Patients are supposed to come monthly for the medication; however, the nurse informed the team that many patients in the area are poor and live in villages far away, so it is often the DOTS centre staff or a community nurse who must deliver the medication. Delivery is generally not a problem, but it may lead to difficulty in getting follow-up smears as was noted during the team's review of the register. The nurse expressed that one of the major challenges was the distance that the nurses must travel and that they do not receive support for fuel or transport.

The DOTS centre staff said they do monthly community educational outreach, including to prayer groups.

- **Recommendations**

- Require documentation of the contact investigations at the household level. The documentation does not have to be a detailed format, but there should be a way of verifying that the household members were screened.
- Consider collecting follow-up sputum at the community level. It seems that collection is done from time to time, but it was not standard, and missing follow-up sputum samples were still in the register. Training to look at quality of samples will be important, but if nurses are delivering medication to the patient's home already, this type of collection could be an additional way of ensuring adequate follow-up.

- **Laboratory**

See annex E.

### *Agona Nkwanta Health Centre*

- **Person Met:** Patience Macduff Attumbu, Physicians' Assistant
- **Overview**

The health centre offers TB diagnosis and treatment services. The facility has a disease control officer who is the focal point for TB services. Although a laboratory facility is onsite, it has been out of use since October 2012 because the last technician retired. A new technician has just been posted, and services are expected to resume soon. Diagnosis is undertaken by the physicians' assistant in collaboration with hospital doctors at Takoradi where necessary, for example when sputum smears are negative and chest X-ray examination is reverted to. The physicians' assistant has never been specifically trained on TB.

HIV testing for TB patients is done onsite in the TB DOTS centre. All diagnosed TB patients are linked to a community supporter, and contact tracing is done routinely. No records, however, are available to confirm this process.

- **Expressed Challenges**

- Logistic and financial capacity for patient follow-ups is poor.

- The operating space for TB services is limited.
- Laboratory services suffered a break in continuity because of the lack of available staff. The laboratory technician left, and the laboratory had to be closed because the health centre had no laboratory staff for several months until recently.
- Awareness of administration of enablers package is lacking.
- No in-service training has been provided to the health centre staff over the last three years on the national TB diagnosis and treatment guidelines.
- Transportation for defaulter and contact tracing visits is lacking.
- **Data Validation**
  - The case load is moderate.
  - Standard NTP tools are in use and are mostly well completed and kept.
  - HIV testing is done on all patients in the quarter selected for review.
  - A high proportion of cases are without end-term sputum smear results.
- **Pharmacy**
  - Enough category I and III anti-TB patient kits are in stock for patients on treatment.
  - The storage facility for all types of medicines is poorly secured.
  - Anti-TB medicines are stored in an open area directly on the floor together with junk and equipment in disused state. (See figure D7.)



**Figure D7. Storage conditions at the pharmacy, Agona Nkwanta Health Centre**

*Private Provider: Twin City Clinic (March 26, 2013)*

- **Person Met:** Dr. Bernard Acquah
- **Highlights**

The practitioner interviewed has been involved in TB issues before this site visit. He had attended regional collaborative meetings with the public sector held as part of

continued medical education. An agreement that the public sector would provide free medicines for private practitioners to diagnose and administer TB treatment has not yet come to fruition.

Currently, the practice refers TB suspects to the regional hospital's DOTS clinic for sputum examination and initiation of treatment. The clinic has no laboratory on site.

For the future, engagement with private practitioners should be kept on the agenda, but the private sector would need to be capacitated beyond medicines only because the task of diagnosis and treatment involves other support services. Therefore an inventive package would enhance the institutional and system capacity of the practitioners to effectively carry out the task involved.

### *Effia Nkwanta Regional Hospital and Units*

- **The DOTS Clinic at Effia Nkwanta Hospital**

- **People Met**

- Olivia Odame-Anim
- Jabina Anaman, Institutional TB Coordinator

- **Overview**

The DOTS clinic, located about a five-minute drive from the main hospital, is a model TB DOTS centre. It receives no NGO support, but the centre implements and documents activities only otherwise seen in pilot areas.

The clinic has six full-time staff as well as 15 community volunteers. The team interviewed two staff who have worked in the DOTS clinic for six and seven years, respectively (figure D8). One has received formal TB training, and the other has received only on-the-job training.



**Figure D8. Interview with staff at Effia Nkwanta Hospital**

○ **Screening and Diagnosis**

About 60 percent of clients are referred from the hospital, 30 percent are from the community volunteers and 10 percent are self-referral. Community volunteers and nurses collect sputum from suspects in the community and take it to the laboratory. Clients either come with results from the laboratory or by referral from physician.

All patients receive counselling for HIV. Testing is done at the hospital. Staff liaise with the ART clinic to get the results of the HIV tests and it was clear from the register that this communication is happening. Those eligible receive CPT from the DOTS centre.

○ **Treatment and Outreach**

Once diagnosed, home verification visits are conducted for each new patient at the start of treatment. The nurses or the volunteers conduct the verification visits. In addition, the staff request that the patient identify a treatment supporter or have a volunteer as the treatment supporter. Contact tracing is conducted for all new patients. A contact tracing book was kept in the facility and names and results for all examined were available (figure D9). For contacts for whom TB is suspected, sputum is collected in the home, or they are encouraged to come to the facility for an exam. If someone refuses, the nurse will continue to remind the TB patient to encourage the suspected case to be screened. There were a few positive contact cases last year, but none have been diagnosed this year.

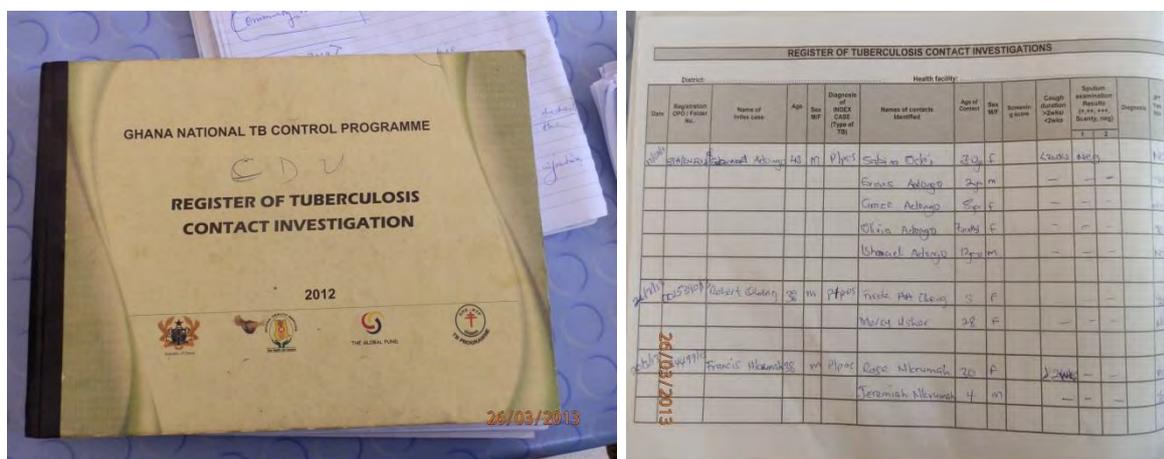


Figure D9. Contact tracing book

All children under 6 in close contact with a positive patient are screened and given IPT if negative. All children given IPT have a treatment card.

Treatment for category II patients is done at the facility. For category I and III patients, treatment is given monthly and may either be picked up at the facility or delivered by a community volunteer or nurse. Patients must come to the facility

for follow-up smears. The staff knows the patients quite well and could speak about individuals when questioned. They clearly knew about the defaulter and had outlined the steps they took to try to get the defaulter back on treatment.

The enablers package is being implemented in the facility. All TB patients receive the enablers package. Nurses meet with patients to determine what the patient needs. Some receive food provisions and others get financial assistance for transport, which can include paying the insurance premiums for a year. Nurses and community volunteers use the enablers package for home visits, for community outreach and to buy food to give to patients. The funding for the enablers package is erratic. Last year there was no funding until close to the end of the year when two batches of funding arrived. In the first half of the year, patients did not receive any assistance, and home visits were paid for by the health workers. No IEC materials were available for the patients at the time of the visit, but the regional office did inform the staff that new materials had recently arrived and would be distributed soon.

Community outreach for TB is done mainly through home visits. A couple of years ago activities were planned, but because of lack of funds, no big events on TB education have been held recently. The nurses continue to try to keep volunteers motivated by reinforcing the idea that their efforts are helping their community. In addition, from time to time incentives such as T-shirts are used to help motivate the volunteers (figures D10 and D11).

One patient was treated for MDR-TB in the region. The staff interviewed had helped start the patient on treatment, although they had not received any formal training on treating MDR-TB patients. They had received a card with the medications and side effects and they said that the management was difficult given the many side effects. He was later moved to another location and successfully completed treatment.



**Figure D10. Shirts are used to motivate volunteers**



Figure D11. Staff and volunteers at Effia Nkwanta Hospital

- **The Pharmacy Store at Effia Nkwanta Hospital**

Medicine packs for patients on intensive and continuation phase treatment are stored in a secure, well-organised cupboard in separate room within the unit. Patient kits are clearly labelled. The same room is used to for storing leftover food supplements that are given to patients as part of the enablers package (figure D12).



Figure D12. Storage for medicine and food supplements at Effia Nkwanta Hospital

- **Data Management Review**
  - Standard NTP tools and registers are in use and are well maintained.
  - Data validation yielded close concordance with selected quarterly reports.
  - HIV testing among TB patients is widely practiced.
  - HIV prevalence is low (just as at other sites visited in the region).
  
- **Strengths**
  - The hospital has an excellent and motivated staff. Clearly, they care about their jobs and the TB patients in the clinic. They are a model TB centre and could serve as a centre of excellence in the region.
  
  - Records are well kept and accurate.
  
  - Medicine stocks are well maintained and organized.
  
- **Challenges and Areas of Improvement**
  - Funding for the enablers package is erratic.
  
  - No vehicle is available for home visits. Staff must take taxis for visits.
  
  - Renovation of the DOTS centre is needed. Although the staff is doing a great job, the setting could use minor renovations. When doing counselling, the staff has no place for privacy. The distance between the hospital and the DOTS centre presents difficulties.
  
  - Category II treatment is not available. Two patients could not start treatment because of the shortage.
  
  - MDR-TB training is needed. The staff would be eager and willing to treat MDR-TB patients if trained.
  
- **The Laboratory at Effia Nkwanta Hospital**

- **Overview**

The hospital has a new, modern TB laboratory building manned by two technologists. The laboratory offers TB smear microscopy services for the hospital and surrounding catchment facilities. It also supports quality assurance, monitoring and supervision, and periodic supportive visits for other facility laboratories in the region. The laboratory is employing LJ technology for smears. No LED or other fluorescent microscopy technology is in use.

An MGIT machine for culture and DST services was procured and delivered over four years ago, but it has not been installed and no culture service exists. Culture specimens are sent to Accra. The laboratory staff does not know the turnaround time for the culture results because the exchanges are made directly between the Accra laboratory and the requesting physicians. A culture register exists that shows between six and eight specimens are sent monthly, but only a few of these

have results entered. Furthermore, the new laboratory building will need structural adjustment if it should be used for culture purposes in the future.

○ **Recommendations**

- LJ microscopy should be augmented by LED or other fluorescent microscopy.
- The quality assurance functions of the laboratory should be enhanced.
- The facility should consider introducing rapid DR-TB test technologies, especially Xpert MTB/RIF for timely identification of MTB and rifampicin resistance among high-risk patient groups
- Establishing Takoradi as a full-fledged MDR-TB centre will required will require the following:
  - Infrastructure adjustment at the new laboratory to make it culture ready
  - Renovation or construction of wards for patient admission and care
  - Installation of culture equipment
  - Training of core staff for PMDT

● **The AIDS Clinic at Effia Nkwanta Hospital**

○ **People Met**

- Dr. R. Sowa, Regional Coordinator (see figure D13)
- Ms. Effie Josiah, Clinic Matron, Comprehensive Care Centre
- Isaac Baba Anagi, Nutrition Officer



**Figure D13. Dr. R. Sowa, Regional Coordinator**

○ **Overview**

Clients attending this clinic are routinely screened for TB using a standard algorithm. Those found to be TB positive are referred to the TB unit for registration and initiation of anti-TB treatment. Soon after or during the intensive phase (between two and eight weeks depending on patient progress and tolerance of anti-TB medicines), they are referred back to the ART clinic for initiation of ART. This to-and-fro referral sometimes results in loss of clients. Consequently, most dually infected TB patients do not access ART in a timely fashion. In

addition, the physical separation between the ART and TB clinics makes collaboration difficult in spite of the strong recognition on both sides for its need. Furthermore, current ART services are medical doctor-based, so people living in peripheral areas where medical doctors are scarce do not easily access the service.

Staff of the clinic is also running a comprehensive care centre that offers innovative interventions in the following areas:

- HIV and nutrition supplementation
- HIV and family planning
- Prevention of mother-to-child transmission of HIV using polymerase chain reaction (PCR) technology for early identification of HIV infection
- Patient education
- TB/HIV services as part of pre-ART screening

The HIV and nutrition programme includes TB/HIV dually infected patients who have been shown to overcome their previously low body-mass indexes significantly (within one month). Currently, the centre has 56 clients who were severely malnourished who are now on Lumpy nut supplementation, 107 with moderate malnutrition who are on another supplementation and 540 clients with normal body-mass indexes.

○ **Recommendations and Areas of Improvement**

- Instil regular interactions between the two units, including cross training of care providers on both sides of the divide.
- Enhance collaboration in provision of interventions through joint planning before implementation—not after, as is presently the case.
- Review physical location of facilities to eliminate distance as barrier for clients.
- Ensure clarity on the NACP policy of clinician-led initiation on ARTs. National guidelines allow for staff other than the medical doctor to provide ARTs; however, the review team could not determine if that guideline is being followed in the facilities.

● **The Pharmacy Warehouse at Effia Nkwanta Hospital**

The room where anti-TB medicines are kept is secure and in a solid building, but temperature control is lacking. Stock cards are in use and are updated. At the time of the visit, the warehouse had only 12 category I and III patient kits in stock, a one-month cover. The review team noted, however, that the DOTS unit had recently been supplied enough kits to cover three months average consumption.

The warehouse has no buffer system, so orders can be made from the Regional Medical Stores nearby at short notice. Soon after the order, which is done on behalf of

the DOTS unit, the stocks are often collected by the DOTS unit for clients on treatment. All anti-TB medicines are procured from Global Fund grant allocation.

The warehouse has no SLDs or DR-TB-related commodities in stock. The storekeeper did not even know what an N95 is; “Please, is that a drug?” he asked!

### *New Amanful Funkoe CHPS Centre*

- **People Met:** CHPS nurses Matilda and Evelyn
- **Overview**

The catchment area of the CHPS clinic is about 3,000, and two full-time nurses were in charge of the centre. In addition, the centre has five volunteers, only two of whom are regular volunteers. The CHPS centre provides a comprehensive list of basic services such as a child welfare package, malaria testing and treatment, and family planning. The staff do home visits as follow-up and also to check for things such as the use of bed nets. In addition, they conduct education and outreach to places such as the prayer camps in the area. They are open Monday through Saturday, but if a need arises on a Sunday, community members will come to the nurses’ homes. The two nurses are provided with a place to live by the chief in the community.

In relation to TB, the CHPS staff is mainly tasked with doing some follow-up and checking to see if patients are adhering to treatment. If a client comes into the centre complaining of cough for more than two weeks, the CHPS nurses will provide a sputum container and referral slip for the client to take to the nearby polyclinic. If there is a TB patient in the community, the nurses will visit the household to follow up on treatment, educate the household on ventilation and nutrition, and provide general information on TB (e.g., “TB is curable”).

The review team observed the CHPS centre to be well utilized by the community, and the community has a sense of ownership of the centre. There has not been a break-in for at least two years. The staff believes that the centre provides a valuable service to the community, and in the evening or at times when it may be difficult to get medication attention quickly, the community knows they are available.

- **Strengths**
  - Staff dedication to the community is remarkably strong.
  - The community feels a sense of ownership of the CHPS centre, and the centre is being used by the community.
- **Recommendation:** Possible linkage of community treatment supporters or volunteers with the CHPS centres, not only health centres, should be established. The CHPS nurses are doing some outreach and patient education. Some kind of link between the volunteers and the CHPS centres needs to be ensured.

*Audience with NACP (March 27, 2013)*

- **Person Met:** Dr. Nii Akwasi Addo, Director, NACP

- **Collaboration and Coordination**

Collaboration between TB and HIV programs at a central and regional level has been active for many years. At a central level there is a technical working group for TB/HIV, and guidelines and policies have been developed. When a TB meeting is held, the HIV representatives are invited and vice versa. There is a push towards integration of annual reviews of AIDS, TB and malaria, having a one-week review to cover all three disease areas since they are often all managed by the same individual at a district level.

Although the collaboration and coordination mechanisms at the central and regional levels are clear, this collaboration could be improved at lower levels.

- **Screening and treatment for TB in HIV-Infected Individuals**

Ghana follows the WHO guidelines on screening HIV-positive individuals. Every newly diagnosed HIV-positive client will be screened for TB. If positive for TB, the client will start treatment for TB before starting on ARVs. In practice, most facilities are waiting until the end of the intensive phase before starting individuals on ARVs.

In 2011, Ghana revised the guidelines for ARV eligibility. Following WHO guidelines, Ghana's national guidelines state that all TB/HIV patients should get ARVs regardless of CD4 count. Although this guideline is available, training has not been provided, and the guideline does not appear to have been implemented at the facilities. Due to delays in the support from the Global Fund, the NACP has not had funding to train staff on the new guidelines.

IPT is still not national policy, so practitioners are hesitant to start and have concerns about monitoring as well as providing monotherapy for undiagnosed TB. Possibly this form of treatment could be piloted in one area.

- **Screening for HIV in TB Patients**

The NACP provides test kits to the facilities to be used where necessary. NACP trains TB programme staff on HIV testing and counselling. In addition, NACP provides CPT to the facilities for those eligible. It is the facility decision concerning where CPT is administered.

- **Funding Issues**

The Global Fund is the major contributor to the HIV/AIDS programme in Ghana. The Ghana Temporary Funding Mechanism proposal was successful and will provide funding for the programme for the next 17 months. PEPFAR also provides funding for equipment and for Most At-Risk Populations, among other things, but does not support routine commodity purchases.

The review team found critical shortages of HIV test kits and concern about ARV availability. The Global Fund will continue to support ARVs only for those who were receiving ARV as of mid-May 2011 (around 49,000 individuals). Those newly enrolled on ARVs will be supported by the GOG (expected to be 15,000 new patients per year). Since the Global Fund will not support any ARVs for any newly enrolled, the funding for test kits from the Global Fund also ended. The GOG must also buy test kits. This transition has led to shortages and stock-outs of test kits. New test kits were expected to arrive on April 1, 2013, but there is a concern about future availability of these commodities.

## **Team 2 Field Report, Ghana NP Review, 2013**

Table D3 lists the members of team 2, and table D4 lists the places the team visited for this report.

**Table D3. Team 2 Composition**

<b>Name</b>	<b>Affiliation</b>
Dr. Jacques Van Den Broek	KNCV, Netherlands
Dr. André Ndongosieme	WHO/AFRO IST WA
Ms. Gertrude Avortri	GHS, Ghana
Felix Afutu	NTP, GHS, Accra, Ghana

**Table D4. Places Visited by Team 2**

<b>Greater Accra Region</b>	<b>Ashanti Region</b>	<b>Northern Region</b>
Regional Health Directorate	Ashanti Regional health directorate	Regional Health Directorate
Kaneshie Polyclinic	Suntreso Government Hospital, Bantama Sub-metropolitan area	Municipal Health Directorate, Savelugu
Korle-Bu Teaching Hospital	Komfo-Anokye Teaching Hospital	Savelugu Hospital
National Public Health Reference Laboratory	Atasemanso Hospital (private facility)	Central Hospital Tamale Tamale Teaching Hospital

### ***Site Visits in the Greater Accra Region***

#### ***Regional Health Directorate***

- **People Met**
  - Dr. Linda Van-Oto, Regional Director of Health Services
  - Dr. George Mensah, Public Health Unit
  - Mr. Boamah, Deputy Director Health Administration Supply and Services
  - Ms. Hellen Mary Benson, Deputy Director of Nursing Services

- Mrs. Dorothy Akpene Abudey, Regional TB Coordinator
- **Issues Discussed**
  - The reshuffling of district TB coordinators shows the need to have a deputy.
  - The stigma of TB is formidable, and staff dealing with TB are ostracized. Therefore, managerial staff should show interest in TB, and their level of interest should be part of the appraisal of managers.
  - The enabler package sometimes works as a disincentive, because staff feel that the ones who get paid should also do all the work. Another issue is the lack of managerial or administrative capacity to handle the cash flow (in some areas, the funds are still unused).
  - Funding for EQA of laboratories is not sufficient. EQA is funded by the Global Fund, but GOG makes no contribution. Since 2012, EQA is no longer conducted by NMIMR, but rather by Korle-Bu laboratory staff. In addition, the National Public Health Reference Laboratory has no role in EQA anymore.
- **Recommendations**
  - A team-based approach to programme implementation needs to be adopted at the health facility level to facilitate better integration and foster ownership.
  - Public and clinical health should be integrated by creating a public health unit (i.e., a DOTS corner) in the hospitals.
  - The mortality of TB deserves greater study, even more so for MDR-TB. Such investigations should have an institutional responsibility.
  - TB should be more visible, and TB care should also actively be promoted by the managers, through advocacy and health education.
  - Promoting occupational health for staff working with TB patients is another institutional strengthening issue.
  - PPM should be revitalized, and links should be strengthened between regional level GHS and pharmacies, on the one hand, and NGOs working in the community, on the other.
  - The real costs of TB control (diagnosis and treatment) should be mapped and linked with the national health insurance scheme as are other chronic diseases. GOG should contribute to this effort.
  - Development of a regional centre of excellence to deal with complicated TB cases (e.g., childhood TB, co-morbidities, MDR-TB) is supported. A regional referral clinician should be appointed and trained, heading a team of experts dealing also with other complicated diseases (integration).
  - For sustainability reasons, TB staff should remain part of the GHS instead of feeling they are part of a vertical program.

### *Kaneshie Polyclinic*

- **People Met**
  - Ms. Esther Doku, Drug and Therapeutics Committee and Institutional TB Coordinator
  - Ms. Esther Yeboah, Assistant TB Coordinator
  - Theodora Lamptey, Senior Biomedical Scientist
  
- **Background and General Observations**
  - Health facility is located in the Okai Koi South sub-metropolitan area of the Accra Metropolitan Assembly. The TB coordinator is not a member of the facility management team. The polyclinic offers only outpatient services. TB issues are addressed by the TB coordinator or referred to the hospital administrator or head of facility.
  
  - In the first quarter 2012, 36 TB patients were notified and among them were the following:
    - 16 new pulmonary smear positive
    - 16 new pulmonary smear negative
    - 3 new extrapulmonary
    - 1 relapse
  
  - Treatment success rate first quarter 2012 was 62.5 percent. The number of TB patients who—
    - Have a known HIV status (i.e., tested for HIV): 9
    - Tested positive for HIV: 5
    - Tested positive for HIV and are on CPT: 5
    - Tested positive for HIV and are on ARVs: 2
  
- **Strengths**
  - Human resources
    - The district TB coordinator and the institutional TB coordinators and support staff are available for day-to-day activities.
    - Staff are knowledgeable about TB issues. Community health nurses and volunteers are available as treatment supporters.
  
  - Basic DOTS
    - Services are provided daily.
    - The nursing and auxiliary staff for treatment services are knowledgeable and dedicated.
    - Case detection is also done in the wards (e.g., child health, diabetic).

- The turnaround time for sputum samples is 24–48 hours; laboratory services are available onsite.
- The district TB register and patient treatment cards are available and generally well maintained.
- Follow-up sputum at 2/3, 5 and 6/8 months is mostly done and documented in register and treatment cards.
- TB/HIV collaborative activities include HIV counselling and testing for TB patients.
- MDR-TB and IC
  - At the OPD general waiting room, coughing patients are directed to the DOTS area. There is a well-ventilated waiting room on the veranda.
  - In the laboratory, specimen collection is done in a remote toilet, and there is ample opportunity to do it in the open air. Smears are made in the open air.
- Current stock levels of medicines are adequate. No stock-outs were reported.
- **Weaknesses and Challenges**
  - Basic TB DOTS
    - No cough register exists.
    - Contact tracing is not done.
    - The capacity for diagnosing childhood and extrapulmonary TB is low.
    - Monthly or quarterly reports are not well archived.
    - Documentation on referral is poor.
    - Laboratory reagents are out of stock for more than a week. EQA is now nonexistent. The latest report is from first quarter 2012, but with 100 percent concordance and reasonably good smear quality.
  - TB/HIV collaborative activities show no documentary evidence in the district or facility registers of CPT provision or entries on proportion of HIV positive TB patients referred on to ART.
  - Human resources development
    - The TB coordinator is not doing TB work full time.
    - No training report was observed.
  - IPC
    - The IPC monitoring system is weak.

- No places for sputum samples collection have been designated.
  - Only staff who provide direct TB care receive annual TB screening.
  - In the TB consultation room, the windows and curtains are closed, precluding proper ventilation.
  - Both environmental ventilation and cleanliness need improvement.
  - Supplies for coughing patients are not available.
- **Recommendations**
    - Clinic management should review the physical set-up of the DOTS area to improve ventilation and the IPC environment.
    - The documentation needs to be improved, and the responsible staff or the administrator should keep copies of monthly and quarterly reports.
    - Supportive supervision and the monitoring system should both be improved.
    - Staff needs refresher training.
    - Systems for regular review or clinical audits should be institutionalised. Guidelines should be developed, and the staff should be trained in their use.
    - More collaboration between the TB and HIV programme is required.

### *Korle-Bu Teaching Hospital*

- **People Met**
  - Dr. Danso, Head of Department
  - Dr. N. Akosua, Baddoo Public Health Physician
  - Millicent A. Annor, Deputy Director of Nursing Services
  - Winfred Amoako-Assian, Nursing Officer-Public Health
  - Francisca Zigah Pharmacist
  - Regina Lumo, Principal Nursing Officer-Public Health
  - Samuel Kudzawu, Senior Biomedical Scientist
- **Background and General Observations**
  - Korle-Bu Teaching Hospital has a bed capacity of 2,000. The chest clinic, which takes care of TB clients, has 63 beds. It is a referral hospital and has no defined population that it serves. The clinic is managed as one of the budget management units of the hospital with its own plan and budget. The number of TB admissions October to December 2012 was 69.
  - In the first quarter 2012, 121 TB patients were notified and among them were the following:
    - 45 new pulmonary smear positive
    - 31 new pulmonary smear negative

- 43 new extrapulmonary
- 2 treatment after default
- Treatment success rate first quarter 2012 was 53 percent. The number of patients who—
  - Have a known HIV status (i.e., tested for HIV): 142
  - Tested positive for HIV: 25
  - Tested positive for HIV and are on CPT: 54
  - Tested positive for HIV and are on ARVs: 22
- **Strengths**
  - Human resources
    - A team of health professionals (doctors, nurses, support staff) is available for service delivery.
    - Staff are knowledgeable about TB issues.
    - Departmental staff do TB work full time.
  - Basic DOTS
    - The facility has dedicated TB DOTS services and a DOTS focal point.
    - Standard TB facility registers and patient cards are in use.
    - Paediatric formulations for FLDs are available, and there have been no stock-outs in the recent past.
    - Capacity and admission facilities are available to deal with complicated TB cases.
  - Laboratory
    - The Korle-Bu laboratory is now the interim (but de facto) national reference laboratory for DR-TB. It has biosafety level 2, uses BSL 2B cabinet, serviced once in 2012 (but no evidence). There are six technical staff and a receptionist.
    - It performs EQA for SSM for Greater Accra. Is linked with National Institute for Communicable Disease in Johannesburg for EQA of microscopy. The latest report (from first quarter 2012) showed 100 percent concordance.
    - It is also linked with medical research centre in The Gambia, and isolates for SLD on FLD have been sent there.
    - The SNRL is the Forschungszentrum Borstel, the National Reference Centre for Mycobacteria in Borstel, Germany. This link has recently been re-established and the latest EQA result from January 2013 showed successful proficiency testing of MTB DST: out of 40 results (20 rifampicin and 20 isoniazid), all were correct.

- MGIT is used for Culture and DST for FLD. Hain test was started in 2012, Xpert in 2013. Hain tests performed so far are Hain: 250, and Xpert: 50. Turnaround time is reportedly three weeks for MGIT, two days for Hain (but due to pooling of samples actually one week) and 12 hours for Xpert MTB/RIF.

○ Pharmacy

The Korle-Bu pharmacy stores FLDs and SLDs. Ordering of new supplies is based on stock levels reaching a minimum level. (See table D5.)

**Table D5. Stock at the Korle-Bu Teaching Hospital Pharmacy**

Type of Medicine	Stock at Hand	Date of Expiry	Projected Cover of Current Stock According to Average Consumption	Days out of Stock in Past 6 Months and Reason for Stock-out	Expired Stock on Shelves (Yes/No)
Isoniazid 100 mg tablet	9 x 100	10/2013	2 years	—	—
Ethambutol 400 mg tablet	5 x 672	03/2014	1 year	—	—
Isoniazid 300 mg tablet	4 x 672	11/2015	9 months	—	—
Pyrazinamide 500 mg tablet	17 x 1,000	03/2015	2 years	—	—
Streptomycin 1g injection	10 x 50	09/2015	3 months	—	—
Rifampicin 150 mg tablet	—	—	—	—	—
4 FDCs (kit)	24	06/2013	2 months	—	—
3 FDC (adult)	24 x 672	06/2013	1 month	—	—
3 FDC (paediatric)					
2 FDCs (adult)					
2 FDCs (paediatric)					
Protionamide tablet					
Kanamycin injection	2,504	05/2017			
Amikacin injection					
Cycloserine tablet	10,390	03/2013			
Levofloxacin 250	4,180	10/2014			
Levofloxacin 500	5,300	02/2014			
PAS granules					
Clofazimine tablet					
Amoxicillin/ clavulanic acid tablet					
Capreomycin ampoules					

Note: FDC = fixed-dose combination

- **Weaknesses and Challenges**

- Basic TB DOTS
  - Contact tracing is not done.
  - Monthly or quarterly reports are not well archived.
  - Documentation on referral is poor.
- IPC
  - The IPC monitoring system is weak.
  - No places have been designated for sputum samples collection.
  - Environmental ventilation and cleanliness both need improvement.
  - Supplies for coughing patients are not available.

- **Recommendations**

- The infrastructure should be improved to address IPC issues.
- Both support supervision and monitoring need to be improved.
- Systems for regular review or clinical audits and mortality audits should be formally institutionalised.
- The working area of the NPHRL needs more space, and the following equipment is needed: an additional biosafety cabinet, additional centrifuge and a minus 70°C deep freezer.

### *National Public Health Reference Laboratory*

- **People Met**

- Dr. David Opare, Director
- William Wireko Ansah, Principal Biomedical Scientist

- **Background and General Observations**

- No TB laboratory activities have been conducted since 2012. Until midway through 2012, the laboratory still received panels from South Africa. The broken MGIT has been removed, repaired and installed at Korle-Bu.
- One BSL2 cabinet was wrongly ducted to an external exhaust system and stopped working properly. Old slopes and isolates (from 2009 and 2010) are stored in nonfunctioning incubators. The high ceilings have unshielded UV lights.
- Discussions are still ongoing about constructing a completely new NTRL on the premises of the National Public Health Reference Laboratory.

## **Site Visits in the Ashanti Region**

### *Regional Health Directorate*

- **People Met**
  - Dr. Aron Ofei, Regional Director of Health Services
  - Mr. Kofi Sroda, Regional TB Coordinator
  - Dr. Joseph Oduro, Deputy Director of Public Health
  - Dr. Patrick Oppong, Referral Clinician, Komfo-Anokye Teaching Hospital
  
- **Issues and Concerns**
  - Regional and district teams are dealing with TB control. The regional team consists of the Director of GHS, the Regional TB Coordinator, the Deputy Director of Clinical Care and the Regional Disease Control Officer. The district team consists of the District Director, the Regional TB Coordinator, the public health nurse and the medical superintendent or representative. They have monthly meetings with TB always on the agenda, focussing on case detection and treatment success.
  
  - More integration with clinical care is needed.
  
  - Funding is inadequate, because there are no special funds for TB in the public health budget. Issues are discussed in the District Assembly and also with representation of traditional sector, and Regional Coordinating Council.
  
  - Stigma remains a challenge. TB patients face solicitation by herbalists, fetishists and also churches. These forces are influential through the media (especially radio). The GHS is not able to compete quantitatively with them. Some hospitals don't do sputum microscopy due to stigma, but were called on in a meeting to start doing so.
  
- **Recommendation**
  - Continue to fight against stigma.
  - Continue training and retraining staff to maintain interest in TB and commitment.

### *Suntreso Government Hospital*

- **People Met**
  - Cynthia Cecilia Sackey, Drug and Therapeutics Committee, Disease Control Officer, Bantama Sub-metropolitan area
  - Joseph Oduro, Deputy Director of Public Health, Kumasi
  - Stephen Ayinabom, Disease Control Officer (Technical Officer)
  - Daniel Dampsey, Biomedical Scientist
  
- **Background and General Observations**
  - Suntreso Hospital, located in the Bantama sub-metropolitan area in the Ashanti region, has a catchment population of 533,464 as per the 2010 census. Though the hospital has inpatient facilities, it does not admit pulmonary TB cases.

Occasionally patients with extrapulmonary TB are admitted. Data on the number of TB admission in the last quarter of 2012 were not available. TB service delivery issues are managed by the institutional TB coordinator and supporting staff with supervision from the medical superintendent.

- In the first quarter 2012, 28 TB patients were notified and among them were the following:
  - 17 new pulmonary smear positive
  - 10 new pulmonary smear negative
  - 1 relapse
- Treatment success rate first quarter 2012 was 100 percent. The number of patients who—
  - Have a known HIV status (i.e., tested for HIV): 28
  - Tested positive for HIV: 4
  - Tested positive for HIV and are on CPT: 2
  - Tested positive for HIV and are on ARVs: Unknown

- **Laboratory**

Three staff deal with sputum microscopy; none of them had received any training the last two years. About four slides are examined daily. A laboratory manual and SOPs are present. There is daily collection and same day processing. The last 10 entries (negative and positive) have two specimens examined. No red ink is used, and there is no evidence that the TB coordinator reconciles with the TB register. EQA was reportedly done last in fourth quarter 2012. No reports could be shown, because only oral feedback is provided.

- **Pharmacy:** not assessed.

- **Strengths**

- Human resources
  - The district TB coordinator, institutional TB coordinators, and support staff are available.
  - Community health nurses and volunteers are available as treatment supporters.
- Basic DOTS
  - The facility has dedicated TB DOTS services and a DOTS focal point.
  - It has the ability to diagnose and treat childhood TB.
  - Standard TB facility registers or district register and patient cards are fully completed.
  - The treatment success rate is high.
  - Community DOTS is functional.

- Defaulter tracing is good.
- **Weaknesses and Challenges**
  - Basic TB DOTS
    - No cough register is used.
    - Contact tracing is not done.
    - The capacity for diagnosing childhood and extrapulmonary TB is low.
    - Monthly or quarterly reports are not well archived.
    - Documentation on referral is poor.
  - TB/HIV collaborative activities
    - Counselling and testing is often not done.
    - There is no documentary evidence in the district or facility registers of CPT provision or entries on the proportion of HIV-positive TB patients referred to ART.
  - Human resources development
    - The TB coordinator is not doing TB work full time.
    - No training report was observed.
    - No training manual was observed.
  - IPC
    - No places for sputum samples collection have been designated.
    - Supplies for coughing patients are not available.
    - IPC supplies for patient are not available.
- **Recommendations**
  - Refresher training for staff should be provided.
  - Support supervision and monitoring should be improved.
  - TB/HIV collaboration should be improved.

### *Komfo-Anokye Teaching Hospital*

- **People Met**
  - Dr. Opare, Head of Department
  - Mr. Salia Alhassan, TB Coordinator
  - Ishmael Tetteh, Biomedical Scientist
- **Background and General Observations**
  - Komfo-Anokye Teaching Hospital is located in Kumasi, the regional capital of Ashanti Region. It is *the* main referral hospital for the northern sector of the country. The bed capacity is 1,200 of which 35 are dedicated for TB patients at the chest clinic. Though the head of the clinic is not a member of the hospital management team, the clinic is manned by a team of health professions, including three doctors, two pharmacists, a number of nurses and supporting staff. Data on

the number of patients admitted in the last quarter of 2012 were not readily available.

- Number of TB admissions in the last 3 months: Unknown
- In the first quarter 2012, 236 TB patients were notified and among them were the following:
  - 33 new pulmonary smear positive
  - 111 new pulmonary smear negative
  - 55 new extrapulmonary
  - 9 relapses
  - 5 new pulmonary with results unknown
  - 23 other
- Treatment success rate first quarter 2012 was 36 percent. The number of patients who—
  - Have a known HIV status (i.e., tested for HIV): 89
  - Tested positive for HIV: 68
  - Tested positive for HIV and are on CPT: 68
  - Tested positive for HIV and are on ARVs: 68
- Treatment numbers for PLHIV was as follows:
  - Registered July–December 2012: 575
  - Registered July–December 2012 screened for TB: 575
  - Screened for TB July–December 2012 diagnosed with active TB: 44
  - Diagnosed with active TB started on TB treatment: 44
- **Findings**
  - The TB wards, one for female and one for male, have cross ventilation, but only when all windows are kept open, which is not always the case. All cases are mixed (i.e., smear positive and smear negative, HIV positive and negative). There are apparently no proper beds for MDR-TB cases.
  - The OPD, which is in a separate part of the facility and partially below grade, was about to be renovated the next week at the time of the site visit.
  - Pharmacy

Bin cards are used but are not up to date (3 months behind), because they are updated only every quarter. The store has air conditioning and is protected from sunlight. No stock-outs were reported. Supervisory visits are done by NTP staff every six months, and the last visit was in September 2012. See table D6 for a list of the stock on hand at the pharmacy.

Table D6. Stock at the Komfo-Anokye Teaching Hospital Pharmacy

Type of Medicine	Stock at Hand	Date of Expiry	Projected Cover of Current Stock According to Average Consumption	Days out of Stock in Past 6 Months and Reason for Stock-out	Expired Stock on Shelves (Yes/No)
Isoniazid 100 mg tablet	400				
Ethambutol 400 mg tablet	3,688	11/2014			
Isoniazid 300 mg tablet	4,000				
Pyrazinamide 500 mg tablet					
Streptomycin 1 g injection	2,400				
Rifampicin 150 mg tablet					
4 FDCs (kit)					
3 FDC (adult)	8,064				
3 FDC (paediatric)	6,300				
2 FDCs (adult)					
2 FDCs (60/30)	11,340	06/2013			
2 FDCs 60/60	15,792	04/2014			
FDC kit A	120				
Protionamide tablet					
Kanamycin injection					
Amikacin injection					
Cycloserine tablet					
Levofloxacin 250					
Levofloxacin 500					
PAS granules					
Clofazimine tablet					
Amoxicillin/ clavulanic acid tablet					
Capreomycin ampoules					

- Laboratory

- Four staff deal with sputum microscopy; all of them had received additional training in the last two years. About 30 slides are examined daily. A laboratory manual and SOPs are present. There is daily collection and same-day processing. The last 10 entries (negative and positive) have two specimens examined. Red ink is used to indicate smear-positive results, and there is evidence that the TB coordinator reconciles with the TB register. EQA was reportedly done as recently as January 2013, after a lapse in 2012, when the

Regional Public Health Laboratory in Accra was renovated. No reports could be shown because only oral feedback was provided.

- There are two BSL2 safety cabinets with HEPA filters from 2007 that have not yet been ducted. Plans exist to do so and also to create an anteroom. There is a MGIT machine (from the Regional Public Health Laboratory) and a new Xpert MTB/RIF, not yet in use (recently delivered). Both will start to be used soon.

- **Strengths**

- Human resources

- A team of health professionals (doctors, nurses, support staff) is available for service delivery.
- Staff is knowledgeable of TB issues.
- Departmental staff do TB work full time.

- Basic DOTS

- The facility has dedicated TB DOTS services and a DOTS focal point.
- Case detection is done in most clinics and wards (e.g., child health, diabetic, obstetrics and gynaecology).
- Diagnostic facilities are available.
- Admission facilities for critically ill patients are available.

- TB/HIV

- The same staff provides TB/HIV services thus fostering collaboration. Clinics are on alternating days for PLHIV and TB.
- All TB/HIV patients get CPT.
- Data on screening of PLHIV on TB screening are available.

- MDR-TB

- Nine MDR-TB cases are on the waiting list.
- A chest physician is trained for one week on MDR-TB and PMDT in the Philippines.

- **Weaknesses and Challenges**

- Basic TB DOTS

- No cough register is available in the hospital.
- The TB treatment register was only partially completed after one year.

- The death rate is high.
- Documentation of all activities is poor.
- Support supervision and monitoring: The review team did not see a supervision report.
- MDR-TB
  - Nine MDR-TB cases are on the waiting list.
  - There are no SLDs, no beds to admit them and no arrangements for follow-up.
- IPC
  - All categories of patients are put together in the same ward.
  - Logistics for patient use is inadequate.
- **Recommendations**
  - Responsible staff should fully complete all fields as provided for in the registers.
  - Systems for regular review or clinical audits and mortality audits should be formally institutionalised. Guidelines should be developed, and staff should be trained in their use.
  - Key staff requires specialized training to be able to provide support to lower level facilities.

#### *Atasemanso Hospital (Private Facility)*

- **People Met**
  - Cecilia Jackson, Nurse Manager
  - Rebecca Darko, TB Coordinator
  - Bright Essaw, Assistant Laboratory Technician
- **Background and General Observations**
  - This is a 54-bed hospital located in the Bantama Sub-metropolitan area in the Ashanti region. Besides occasional admission of extrapulmonary TB cases, TB care is provided on outpatient basis. Data on the number of TB admissions in the last quarter of 2012 were not available. TB service delivery issues are managed by the institutional TB coordinator and under the supervision of the hospital matron.
  - In the first quarter 2012, one TB patient was notified. That patient was a new pulmonary smear-negative TB case. Treatment success rate for the first quarter was 100 percent.
- **Findings**
  - *Hospital.* The hospital is very neat, in beautiful surrounding with flowers and trees.
  - *Pharmacy.* There are three patient kits expiring in 2014 and one expiring in 2013. There are three old kits that expired in 2012.

- *Laboratory.* NTP request forms are used, and photocopied when out of stock. The laboratory technician was trained more than five years ago. He examines fewer than one suspect per month. In 2012 only three acid-fast bacilli positive cases were on treatment. There is no TB laboratory register, and no data were available. A new digital health management information system was recently installed, but it has no records yet. Two microscopes are in good condition.
- **Strengths**
  - Institutional TB coordinators and supportive nurse manager are available.
  - Basic DOTS
    - The facility has a DOTS focal point.
    - The treatment success rate is high.
    - Defaulter tracing is good.
- **Weaknesses and Challenges**
  - Staff has an inadequate knowledge on TB issues.
  - Basic DOTS
    - The area used for services delivery is not appropriate.
    - The area used also for services such as ECGs and scans.
  - TB/HIV
    - Coordination of services is poor.
    - Patients are not being tested because of a lack of kits.
  - No records on supportive supervision were available.
- **Recommendations**
  - Staff requires refresher training.
  - A dedicated DOTS area is needed.

## **Site Visits in the Northern Region**

### **Regional Health Directorate**

- **People Met**
  - Dr. Akwesi Twumasi, Regional Director Health Services
  - Dr. Abu Akrachi, Regional TB Coordinator
  - Dr. Jacob Mahama, Deputy Director of Public Health
- **Issues and Concerns**
  - The Northern Region comprises one-third the size of the country but has only one-tenth of the population. Distances are huge and villages are small and scattered. This low density leads to high indirect costs for TB suspects and TB patients to

reach diagnostic and treatment centres. Mortality rates are high, probably due to diagnostic delays, long distances and diagnostic capacity. Trans-border migration issues were discussed.

- Human resources problems are a major concern because of the reluctance of health staff to take a post in Northern Region. Even when posted, some don't report. Several remedies have been attempted, including providing a car as well as benefits through the enabler package. Recently the University for Development Studies began offering the full package of training, including local internships and four weeks attachment to local communities, which may contribute to solving the human resource problem.
  - The GOG budget is too small to assist the TB programme in beefing up enabler package. Funds also arrive too late.
  - The situation in prisons is a challenge because inmates exceed three times the capacity. TB cases are referred to other centres in the prison system. Plans for decentralization of TB services exist.
- **Recommendations**
    - Continue increasing diagnostic capacity, both in terms of human resources as equipment such as microscopes.
    - Make working in Northern Region in some way compulsory.

#### *Savelugu Municipal Health Directorate*

- **People Met**
  - Rashid Hussein, Drug and Therapeutics Committee, Disease Control Officer
  - Ebrahim Said Idris, Deputy Disease Control Officer
- **Background and General Observations**
  - In the first quarter 2012, four TB patients were notified and among them were the following:
    - 3 new pulmonary smear positive
    - 1 new pulmonary smear negative
  - Treatment success rate first quarter 2012 was 33 percent.
- **Strengths**
  - Human resources
    - A Drug and Therapeutics Committee and one other Disease Control Officer oversee TB activities in the municipality.
    - Their activities include coordination, training, logistics management, reporting, M&E and resource mobilization.

- The Drug and Therapeutics Committee has been at post for more than 12 months and does other disease control activities (i.e., malaria, HIV, and immunization).
- The last training was more than 12 months ago.
- Basic DOTS
  - Case detection is done in clinics and community.
  - Acid-fast bacilli diagnostic facilities are available two facilities in the district.
  - Standardized treatment is given according to national guidelines.
- **Weaknesses and Challenges**
  - Incorrect addresses made contact tracing difficult.
  - Basic TB DOTS
    - Supervision is not properly coordinated.
    - Registers are not updated regularly.
  - TB/HIV collaborative activities are not very effective.

### *Savelugu Hospital*

- **People Met**
  - Billah Kombian, Matron and Institutional TB/HIV Coordinator
  - Albertina Ninnau, District Public Health Nurse and HIV Coordinator
  - Tahira, Medical Assistant
  - Dr. S. Y. Bosomtwe, Medical Officer In-charge
  - Danladi Karim, Pharmacy Technologist
  - Dakurah Ernest Kojo, Biomedical Scientist
  - Abdulahi Abdul Razak, Biomedical Scientist
- **Background and General Observations**
  - Health facility is located in the Savelugu Municipal in the Northern Region. The catchment area population is 151,755. The TB coordinator is a member of the facility management team. The bed capacity is 64. No beds are dedicated for TB care; TB patients are treated as any other patient. Only one TB
  - patient was admitted in the last quarter of 2012.
  - In the first quarter 2012, four TB patients were notified and among them were the following:
    - 3 new pulmonary smear positive
    - 1 new pulmonary smear negative
  - Treatment success rate first quarter 2012 was 33 percent.
- **Findings**

- *Pharmacy.* Only four patient kits were available, all expiring in May 2013. Supplies can be ordered from Regional Medical Stores and issued the same day. Stores have air conditioning and shelves. The TB coordinator visits daily because the medicines are issued to patients from here (and also from a nearby health centre).
- *Laboratory.* Four staff members are available for sputum microscopy. They have received no training in the last two years. The condition of the laboratory is reasonable. The laboratory has one binocular microscope (German brand) in good condition. The staff processes 20–30 slides per month. SOPs are available. Turnaround time is one day. The laboratory register is well kept; 9/10 smear negatives and 9/10 of smear positives have two specimens examined. The review team found evidence that the district TB coordinator reconciles the district register (signature).
- *Quality control.* EQA was reportedly last done in fourth quarter 2012. No reports could be shown because only oral feedback is provided. The review team checked in the Regional Public Health Laboratory and found that this is correct: they have the report and concordance was 100 percent in the third quarter.
- *OPD.* The interviewed medical assistant was very knowledgeable about TB control. After diagnosis, the case is managed by the TB team in the hospital.
- *Infection control.* General infection control training was conducted three years ago, but neither an infection control team nor infection control SOPs are in place. The waiting area has good natural ventilation, but there is no triage or prioritization of coughing patients. Coughing patients are given instructions about cough hygiene by the medical assistant. Natural ventilation in the consultation rooms is hampered by blocked vents and curtains, and air conditioning is favoured over outside air ventilation. The position of the desk is correct. The medical assistant received training on infection control in 2010 in Kumasi.
- **Strengths**
  - The dedicated institutional TB coordinator does not work full time on TB.
  - Basic DOTS
    - The facility has dedicated TB DOTS services and a DOTS focal point.
    - Case detection is done at OPD and in the wards.
    - Diagnostic facilities are available.
    - Admission facilities are available for critically ill patients.
    - Standardised treatment is given according to national guidelines.
- **Weaknesses and Challenges**
  - Basic TB DOTS
    - Case detection is not done routinely. The suspicion index is very low.
    - No suspects register is kept.
    - Coordination of activities is ineffective.
    - No evidence of having had supervision was found.

- Coordination of activities is poor; no evidence was found.
- No training and learning materials are available.
- **Recommendations**
  - Supervision and coordination of activities should be improved.
  - Regular refresher training for staff should be provided.
  - The windows and curtains should be opened, and the air conditioning should be switched off when having consultations with patients.

### *Central Hospital Tamale*

- **People Met**
  - Bibata Alhassan, Senior Nursing Officer–Institutional TB Coordinator
  - Abu L. Andaratu, Superintendent Community Health Nurse
  - Morris Zaazie, Pharmacist
  - Samuel Acquah, Biomedical Scientist
- **Background and General Observations**
  - The hospital is located in the Tamale Metropolis. It is a referral hospital and has no defined catchment population. The DOT clinic is managed by two nurses with supervision from the medical superintendent. None of the hospital beds is dedicated for TB patients, but when required TB patients are admitted. The number of TB admission for the October–December 2012 period was not readily available.
  - In the first quarter 2012, five TB patients were notified and among them were the following:
    - 4 new pulmonary smear positive
    - 1 new pulmonary smear negative
  - Treatment success rate first quarter 2012 was 75 percent. The number of patients who—
    - Have a known HIV status (i.e., tested for HIV): 4
    - Tested positive for HIV: 2
    - Tested positive for HIV and are on CPT: 2
    - Tested positive for HIV and are on ARVs: 2
- **Findings**
  - *Pharmacy.* There are no loose TB medicines in the store, except a few patient kits. The patient kits present were paediatric TB kits, prepared and packaged in Ghana (rifampin/isoniazid/pyrazinamide 60/30/150 + ethambutol 100, and rifampin/isoniazid 60/30), which were expiring in June 2013 (intensive phase medicines) and in 2016 (continuation phase medicines). The adult patient kits are

in the DOTS corner. New supplies are ordered from the Regional Medical Stores in Tamale and are issued the same day. The stores are air-conditioned and dark, and storage is neat on the shelves. The review team found no bin card of the paediatric kits.

- *DOTS clinic.* The review team saw 14 kits, nine of which were expiring in May or June 2013, the remaining in 2014. The TB coordinator is aware of this. Some kits belong to patients about to finish treatment.
- *Laboratory.* Conditions in the laboratory are good, including from an infection control point of view.
  - The laboratory has a BSL2 cabinet with HEPA filter and no ducting to outside. The Regional Public Health Laboratory sent the cabinet to the laboratory last year, but it has not (yet) been serviced. The laboratory has one good binocular microscope.
  - Eight staff members are doing smear microscopy on a rotation basis.
  - Workload is 10 slides per day: eight for diagnosis and two for follow-up.
  - SOPs are present, including posters.
  - The laboratory register is well kept; 9/10 smear negatives and 10/10 of smear positives have two specimens examined. The TB coordinator rarely comes to reconcile the registers.
  - EQA is reportedly done every quarter by Tamale Teaching Hospital and the Regional Public Health Laboratory; the last EQA was done in the third quarter of 2012. Only oral feedback is provided. The review team checked in the Regional Public Health Laboratory and found that this is correct. They have the report and concordance was 100 percent in the third quarter.
- *Infection control.* The OPD is spacious with natural cross ventilation. The consultation rooms have louvers and are properly positioned, but the door is kept closed, precluding cross ventilation. Laboratory practices are safe. Collection is done outside and smear preparation is done in a well-ventilated area; reading is done in another place.
- **Strengths**
  - Human resources
    - The facility has a dedicated institutional TB coordinator and assistant who do TB work full time.
    - The same staff are responsible for HIV activities.
    - The staff are knowledgeable about TB issues.
  - Basic DOTS

- Case detection activities are done in the OPD, wards and TB clinic.
- The site has smear microscopy diagnosis facilities.
- The facility provides standardised treatment with supervision and patient support.
- The facility shows some evidence of supportive supervision.
- TB/HIV services are available and well-coordinated; evidence of minutes was found.
- **Weaknesses and Challenges**
  - TB/HIV collaborative activities
    - Documentation of care is not complete.
    - Enables (incentive package) for TB patients are not adequate to support clients.
- **Recommendation:** Strengthen supportive supervision.

#### *Tamale Teaching Hospital*

- **People Met**
  - Dr. Ken Sagoe, Chief Executive Officer
  - Dr. Abdallah Lahaya Iddrisu, Referral Chest Physician
  - Adiza Mohammed, Superintendent Enrolled Nurse
  - Habiba Lawal, Senior Nursing Officer
  - Yakubu Siddique, Senior State Registered Nurse
  - Victoria Puopila, Senior State Registered Nurse
- **Background and General Observations**
  - The hospital is located in the Tamale Metropolis serving a total population of about 2.1 million. It is a 400-bed hospital. The chest clinic has 11 beds. The clinic is managed by a team of health professionals with a chest physician as the head. Twenty-one TB admissions were made in the last quarter of 2012.
  - In the first quarter 2012, 57 TB patients were notified and among them were the following:
    - 12 new pulmonary smear positive
    - 29 new pulmonary smear negative
    - 12 new extrapulmonary
    - 2 relapses
    - 2 treatment after default
  - Treatment success rate first quarter 2012 was 92 percent. The number of patients who—
    - Have a known HIV status (i.e., tested for HIV): 1
    - Tested positive for HIV: 1
    - Tested positive for HIV and are on CPT: 0

- Tested positive for HIV and are on ARVs: 0
- **Findings**
  - The hospital is still under construction and now has 400 beds. In 2015, it will have 800 and ultimately 1,000 beds. The infectious diseases (i.e., TB) ward is ready but temporarily is being used as a children's ward.
  - At present, the hospital has 120 doctors and 60 laboratory staff, who all receive incentives from the hospital in terms of free accommodation and a \$100 salary topping up monthly. In addition, medical professionals consider working in a conducive environment and with state-of-the-art equipment attractive.
  - At the University of Development Studies, students in basic health studies can do internships in the hospital. Laboratory scientists are now only recruited from the university and Korle-Bu. In 2012, 30 medical students graduated, in 2013, 47 are expected to graduate. Opportunities are available for some of them to join the services in the Northern Districts
  - The laboratory is housed in a temporary space and has an MGIT and a BSL2 cabinet (not functioning), both from the Regional Public Health Laboratory. The MGIT has not yet started, and the state of the repair is not known. No culture and DST tests done are done here.
  - The old ward has six beds for male and three for female patients, with good possibility for cross ventilation. In the same building, at the entrance is the office of the TB coordinator, but it is in poor physical condition.
  - The new infectious diseases ward looks very modern. It has the doctors' and nurses' offices and rooms at the central entrance. In the corridor at both ends are two patient rooms each, a small one (four beds) with no possibility for natural ventilation and two large ones (12 beds total) at the end of the corridor with cross ventilation, but only when the aluminium and glass windows are opened. There is one isolation room, with an anteroom and separate ventilation outlet in the anteroom, but no washroom. From the standpoint of infection control for TB (i.e., aerosols), the ward is not useful, except for the two large rooms on each end. Perhaps mechanical ventilation with negative pressure in each of the patient rooms, including the isolation room, could be a solution.
  - The pharmacy could not be visited because of the team's late arrival: it was already closed. The pharmacy has had no stock-outs.
  - According to the referral chest physician, 20 MDR-TB suspects were identified, but still need to be confirmed.
- **Strengths**
  - Human resources
    - The chest clinic is manned by 17 full-time staff.
    - The facility has a dedicated referral clinician.
    - Staff is committed to quality TB care.

- Basic DOTS
  - Case detection activities are done at the OPD, other clinics and wards,
  - Smear microscopy and culture facilities are available.
  - Standardised treatment is provided with supervision and patient support.
- TB/HIV: Some eligible patients given CPT and ART.
- **Weaknesses and Challenges**
  - Overall, the clinic's infrastructure is poor.
  - Basic TB DOTS
    - Staff TB suspicion index seems low.
    - The review team found no evidence of supportive supervision.
    - There is no suspects register.
    - There is no data manager.
    - There is no performance review.
    - Very little support for patients is provided; even inpatients are not fed.
  - TB/HIV collaborative activities are not well-coordinated, and documentation is inadequate.
  - IPC
    - No policy and guidelines are available.
    - The level of TB knowledge is low.
    - Environmental cleanliness is inadequate.
    - Supplies for patients and staff protection are not available.
- **Recommendations**
  - Relocate or renovate the chest clinic.
  - Improve coordination of activities between service providers.
  - Recruit a data managers.
  - Provide enablers to support patient care.
  - Improve supportive supervision and communication.

### *Regional Public Health Laboratory*

- **Person Met:** Steven Danuor, Principal Biomedical Scientist
- **Background:** This laboratory is actively involved in EQA for sputum microscopy. They could show digital reports of EQA on visits and rechecking and training, up to the third quarter 2012. Thereafter, no EQA activities took place, due to inadequate budget and the fact that Northern is a huge region. The policy is to visit every microscopy centre (20 in all) every quarter, but this level of coverage was not possible.
- **Recommendation:** Do the onsite visits to all microscopy centres at least once per year. Train the district TB coordinators to do onsite visits and pick randomly 10 slides

and take or send these to the Regional Public Health Laboratory for blind rechecking and slide appraisal.

*Noguchi Memorial Institute for Medical Research, Bacteriology Department (March 25, 2013)*

- **People Met**
  - Adwo Asante Poku
  - Christian Bonsu, Biomedical Scientist
  - Samuel Ofori Ado, Biomedical Scientist, Biochemistry

- **Background**

This laboratory was recently renovated (2012) and is well equipped with culture on solid media, two MGITs, two BSL class 2/3 safety cabinets (one that is working well, properly ducted and serviced by technicians from Japan and England in 2012), many microscopes and one LED fluorescent microscope. They have PCR testing equipment including Hain test. They are now preparing for the prevalence survey.

In the past (2009–11), the laboratory has been doing culture and DST for FSD and SLD and have identified about 20 MDR-TB cases. The PCR/Hain continues to receive samples for testing from hospitals from Accra, and other places, including Tamale. They have also identified about 20 MDR-TB cases. When the team asked for documentation about these patients, it could not be produced.

The laboratory is not participating in an EQA. In the past, the laboratory had links with the Research Institute of Tuberculosis Japan, but only during a research project in 2009.

In the past, the laboratory received panels from Johannesburg, but has not since 2012.

- **Recommendation:** Improve the documentation about all samples tested for DR-TB with Hain and MGIT for FLD and SLD, at least broken down to new and re-treatment cases.

*Ghana Stop TB Partnership*

- **Person Met:** George Kunagah, Executive Secretary
- **Background**

Members of the Ghana Stop TB Partnership are the NTP, 150 CSOs and academia. Board Chair is Kwasi Ado and Vice Chair is Cecilia Senoo (representative of CSOs). The meetings are held quarterly or more frequently if the need arises. The organisation has had a constitution since June 2012. The partnership is represented in the CCM through Chief Austin Obiefuna, who is now a member, but was the founding father and former coordinator of the partnership.

The aims of the Ghana Stop TB Partnership are to—

- Strengthen the partners network
- Mobilize resources not only from the donor community but also from businesses that have corporate social responsibility budgets
- Support the NTP, particularly with ACSM, and with improving case detection and case management.

View is to—

- Develop a better office, from which work can be done more effectively
- Decentralize offices to the regions
- Foster the relationship with NTP and with the GHS

The partnership use USD160,000 from NTP (Global Fund) to channel to the CSOs, who sign contract agreements with targets and produce financial and technical reports. These funds are perceived as not sufficient.

## ANNEX E. SUMMARY LABORATORY REPORT

**Table E1. Summary Laboratory Report**

Facility and Location	Strengths	Challenges	Recommendations	People Met
Ridge Regional Hospital, Greater Accra Region	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional light microscope</li> <li>• Good biosafety procedures</li> <li>• EQA in place</li> <li>• No false results</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• Retired old contract staff in charge of SSM</li> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing of slides in place</li> <li>• No laboratory manual available</li> <li>• Xpert MTB/RIF equipment underused (only one sample has been processed since installation in February 2013)</li> <li>• No algorithm Xpert equipment</li> <li>• Poor quality of specimens due to front loading</li> <li>• Fluorescent microscope not in use due to lack of reagents</li> </ul>	<ul style="list-style-type: none"> <li>• Young laboratory staff should show interest in SSM</li> <li>• Quality assurance assessors should fully discuss the EQA feedback report with the laboratory staff</li> <li>• The new laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> <li>• Algorithm for Xpert urgently needed to be displayed at the facility</li> <li>• Auramine staining reagents should be made available to the facility</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Samuel Nordzi, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Mr. Charles Anfu, Biomedical Scientist, Medical Laboratory</li> <li>• Mr. John Blankson, Higher National Diploma</li> <li>• Mr. G. A. Sedjro, Principal Laboratory Technician</li> </ul>

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<b>Facility and Location</b>	<b>Strengths</b>	<b>Challenges</b>	<b>Recommendations</b>	<b>People Met</b>
LA General Hospital, Greater Accra Region	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional microscope</li> <li>• Good biosafety procedures</li> <li>• EQA in place</li> <li>• No false results</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing</li> <li>• No laboratory manual available</li> <li>• Poor quality of specimens due to front loading</li> </ul>	<ul style="list-style-type: none"> <li>• Quality assurance assessors should fully discuss EQA feedback report with laboratory staff</li> <li>• New laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Geoffrey Atelu, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Mr. Gokeh Esuah Kwasi, Biomedical Scientist, Medical Laboratory</li> <li>• Mr. Roland Srigboh, Biomedical Scientists, Medical Laboratory</li> <li>• Mr. Jerry Mireku, Technical Officer</li> <li>• Ms. Dinah Rabbles, Technical Officer</li> <li>• Mr. Joshua, Technical Assistant</li> </ul>
Somanya Polyclinic, Yilo Krobo District (Eastern Region)	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional microscope</li> <li>• Good biosafety procedures</li> <li>• EQA in place</li> <li>• No false results</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing</li> <li>• No laboratory manual available</li> <li>• Poor quality of specimens due to front loading</li> </ul>	<ul style="list-style-type: none"> <li>• Quality assurance assessors should fully discuss EQA feedback report with laboratory staff</li> <li>• New laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Patrick Narkotey, Senior Laboratory Assistant (Laboratory In-charge)</li> <li>• Mr. George Quansah, Laboratory Assistant</li> </ul>

<b>Facility and Location</b>	<b>Strengths</b>	<b>Challenges</b>	<b>Recommendations</b>	<b>People Met</b>
Atua Government Hospital, Lower Manya District (Eastern Region)	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional light microscope</li> <li>• Good biosafety procedures</li> <li>• EQA in place</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing of slides in place</li> <li>• Two false positives from third quarter 2012 EQA report</li> <li>• No laboratory manual available</li> <li>• Xpert MTB/RIF equipment underused (only 15 samples processed since installation in February 2013: four positive results with no rifampicin resistant)</li> <li>• No algorithm Xpert equipment</li> <li>• Poor quality of specimens due to front loading</li> </ul>	<ul style="list-style-type: none"> <li>• Young laboratory staff should show interest in SSM</li> <li>• Quality assurance assessors should fully discuss EQA feedback report with laboratory staff</li> <li>• New laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> <li>• Algorithm for Xpert urgently needed to be displayed at the facility</li> <li>• Auramine staining reagents should be made available to the facility</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Peter Owusu Agyemang, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Mr. Benedict Addo Adams, Biomedical Scientist, Medical Laboratory</li> <li>• Mr. Stephen Tetteh, Higher National Diploma</li> <li>• Mr. Sebastian Okyere, Health Aide</li> <li>• Mr. Jonathan Matey, Health Aide</li> <li>• Mr. Seth Antwi, Senior Research Officer</li> </ul>

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<b>Facility and Location</b>	<b>Strengths</b>	<b>Challenges</b>	<b>Recommendations</b>	<b>People Met</b>
Koforidua Regional Hospital, New-Juaben District (Eastern Region)	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional light microscope</li> <li>• Good biosafety procedures</li> <li>• Biosafety cabinet class 2 in place</li> <li>• No false report</li> <li>• EQA in place</li> <li>• Liquid culture and line probe assay in place</li> <li>• No heavy workload</li> <li>• Panel testing with National Institute for Communicable Disease South Africa in place</li> </ul>	<ul style="list-style-type: none"> <li>• No laboratory manual available</li> <li>• Biosafety cabinet last serviced on October 16, 2011</li> </ul>	<ul style="list-style-type: none"> <li>• New laboratory manual should be made available to the facility</li> <li>• Biosafety cabinet should be serviced regularly</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Stephen Ofori Yirenkyi, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Ms. Georgina Tetteh-Ocloo, Biomedical Scientist, Medical Laboratory</li> <li>• Ms. Joyce Der, Mphil Public Health</li> <li>• Mr. Emmanuel Opoku-Otchere, Biomedical Scientist, Biological Science</li> </ul>
Effia Nkwanta Regional Hospital, Sekondi-Takoradi District (Western Region)	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional light microscope</li> <li>• Good biosafety procedures</li> <li>• No false results</li> <li>• EQA in place</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing of slides in place</li> <li>• No laboratory manual available</li> <li>• New laboratory building not suitable for TB culture</li> </ul>	<ul style="list-style-type: none"> <li>• Quality assurance assessors should fully discuss EQA feedback report with laboratory staff</li> <li>• New laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> <li>• Room should be created in the new laboratory for TB culture work</li> </ul>	<ul style="list-style-type: none"> <li>• Mr. Simon Attobrah, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Mr. Ebenezer Kofi Mensah, Biomedical Scientist, Medical Laboratory</li> <li>• Mr. Emmanuel Danso, Principal Laboratory Assistant</li> </ul>

<b>Facility and Location</b>	<b>Strengths</b>	<b>Challenges</b>	<b>Recommendations</b>	<b>People Met</b>
Dixcove District Hospital, Ahanta West District (Western Region)	<ul style="list-style-type: none"> <li>• Good documentation</li> <li>• Good functional light microscope</li> <li>• Good biosafety procedures</li> <li>• No false results</li> <li>• EQA in place</li> <li>• No heavy workload</li> </ul>	<ul style="list-style-type: none"> <li>• EQA feedback report not well discussed with staff</li> <li>• No panel testing of slides in place</li> <li>• No laboratory manual available</li> </ul>	<ul style="list-style-type: none"> <li>• Quality assurance assessors should fully discuss EQA feedback report with laboratory staff</li> <li>• New laboratory manual should be made available to the facility</li> <li>• Panel testing should be initiated from the regional level</li> </ul>	<ul style="list-style-type: none"> <li>• Ms. Patience Tanson, Biomedical Scientist, Medical Laboratory (Laboratory In-charge)</li> <li>• Mr. Benjamin Acquah, Biomedical Scientist, Medical Laboratory</li> <li>• Mr. George Brace, Laboratory Assistant</li> </ul>