

**INTEGRATION OF TUBERCULOSIS (TB) AND HIV
SERVICES IN GHANA**

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to the work of others.

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‘Behold! I am the Lord... Is there anything too hard for me?’ (Jeremiah 32:27)

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ABSTRACT

Integration of health services involves managing services to enhance quality for patient needs that cut across multiple services, providers and settings. The rapid growth of human immunodeficiency virus (HIV) has increased tuberculosis (TB) cases, and TB/HIV integration offers a unified strategy for control. This study evaluated TB/HIV integration in Ghana. The three sites evaluated applied varying degrees of integration. A mixed methods approach comprised an uncontrolled before-and-after study involving 1330 TB cases, and qualitative interviews with 29 providers and patients.

TB treatment success was 51% before and 69% after integration [$p < 0.01$; OR(95% CI)=2.17 (1.72 to 2.74)]. Treatment success increased in all sites after integration: 43% to 53% at the one-stop shop (OSS), 69% to 78% at the partially integrated site (PIS), and 46% to 78% at the referral site (RS). The change was significant only at the RS [$X^2=64.54$; $p < 0.01$; OR(95% CI)=4.28 (2.97 to 6.18)]. HIV screening was highest (99%) at the OSS ($X^2=68.26$; $p < 0.01$), HIV-positive cases on CPT were highest (93.8%) at the RS ($X^2=9.29$; $p < 0.01$), and the PIS had the highest number (59.5%) on ART ($X^2=95.00$; $p < 0.01$).

TB/HIV integration may improve TB treatment outcomes but effectiveness is difficult to ascertain due to study design limitations. TB treatment success and TB mortality might be more informative indicators for TB/HIV activities. TB/HIV outputs seemed unrelated to greater integration when compared across sites. This was probably due to existing barriers to integration including missed opportunities, provider fear of loss of influence, financial burden of illness, and stigma. Patient-

provider interactions offered privacy and counselling but patients' illness experiences were not explored, and there was lack of decision-sharing. Patients were also unaware of their right to dignity and respect, or their role in disease management. Facilitators of integration included direct supervision, mutual adjustment and standardisation.

Recommendations include conducting more rigorous evaluation studies, including TB mortality in TB/HIV monitoring, prioritising health system strengthening instead of increasing degrees of integration, and improving patient-centred care through provider communication and patient empowerment.

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ACRONYMS

AFB	Acid-Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
BCC	Behavioural Change Communication
CBO	Community-based Organisation
CD4	Cluster of Differentiation 4
CHAG	Christian Health Association of Ghana
CHPS	Community-based Health Planning and Services
CPT	Co-trimoxazole Preventive Therapy
CTX	Co-trimoxazole
DHMT	District Health Management Team
DOTS	Directly Observed Treatment (Shortcourse)
EPTB	Extra-pulmonary TB
ER	Eastern Region
FBO	Faith-Based Organisation
FDC	Fixed Dose Combination
FGD	Focus Group Discussion
GAC	Ghana AIDS Commission
GDP	Gross Domestic Product
GFATM	Global Fund for AIDS, TB and Malaria
HAART	Highly Active Anti-Retroviral Therapy
HCP	Home Care Programme
HIV	Human Immunodeficiency Virus
IAP	Integrated AIDS Programme
IPT	Isoniazid Preventive Therapy
IRIS	Immune Reconstitution Inflammatory Syndrome
KDA	Kwaebibirem District Assembly
LMKDA	Lower Manya Krobo District Assembly
MDR-TB	Multi-Drug Resistant TB
MOH	Ministry of Health

MRC	Medical Research Council
MSF	Médecin Sans Frontières
MTP	Medium-Term Plan
NACP	National AIDS and STI Control Programme
NGO	Non-Governmental Organisation
NTP	National TB Control Programme
OPD	Outpatient Department
OR	Odds Ratio
OSS	One-Stop Shop
PICT	Provider-Initiated Counselling and Testing
PIS	Partially Integrated Site
PLHIV	People Living with HIV
PMTCT	Preventive Mother-to-Child Transmission
PTB	Pulmonary TB
RS	Referral Site
SSA	Sub-Saharan Africa
STP	Short-Term Plan
TB	Tuberculosis
TQM	Total Quality Management
TST	Tuberculin Skin Test
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation
XDR-TB	Extensively-Drug Resistant TB

1 INTRODUCTION

1.1 INTEGRATION OF HEALTH SERVICES

Integration of health services is the organisation and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money (WHO 2008a). It can also be defined as a coherent set of methods and models of funding, administrative, organisational, service delivery and clinical levels designed to create connectivity, alignment and collaboration between the different units of the health system (Kodner and Spreeuwenberg 2002). The aim is usually to enhance quality of care and life, and to improve consumer satisfaction and system efficiency for patients with problems that cut across multiple services, providers and settings. According to Kodner and Spreeuwenberg (2002) integration is a step in the process of health systems and health care delivery becoming more complete and comprehensive.

Integration as an organisational concept has been successfully applied in management as a post acquisition process after a merger (Schweizer 2005), to achieve process innovation in manufacturing (Ettlie and Reza 1992), and in the market context to achieve better competitive advantage and economic gains (Sobczak 2002). The integration of health services is promoted because it is anticipated to address the need for a comprehensive approach to service delivery in order to address fragmentation (WHO 2008a). Fragmentation is a state of differentiation that results when the integration required to achieve unity of effort in an organisation does not exist, and it results in problems associated with efficiency and quality i.e. duplication, gaps, inconsistencies and discontinuities in

the provision of services. Integration is therefore promoted for reasons including the following:

- Integration bonds the different units or organisations together to ensure achievement of common goals and optimal results (Kodner and Spreeuwenberg 2002),
- It is a means of organising health systems to offer universal access to a broad range of services as proposed through primary health care (WHO 2008a),
- There has been a dramatic increase in the funding for single-disease and population or group-specific programmes leading to concerns that this adversely affects less well-funded health priorities. Integration has the potential to promote efficient use of these resources to strengthen the health system and thus support these less funded health priorities,
- Health services have been faced with resources constraints, especially human resource shortages in low-income countries. Integration is one of the strategies for using resources as efficiently as possible,
- Some of the constraints to effective service delivery are common to several technical programmes, and integration offers a way of tackling some of these challenges and achieving goals together.

Frequently health services integration results in a package of preventive and curative health interventions aimed at providing all appropriate interventions for a particular group of people, multi-purpose service delivery points which offer a range of services for a catchment population at one location and under one manager, or to achieve continuity of care over time between specific stages in the

life cycle of a specific health state or chronic condition. Integration can also be achieved through the organisation of policy-making and management so as to bring together decisions about different parts of the health services at different levels, or working across sectors to enable cross-sectional funding, regulation or service delivery (WHO 2008a). However despite the varying meanings that the word may infer, integration is believed to improve responsiveness, increase efficiency and thereby enhance performance. Introducing integration into TB and HIV services is anticipated to bring these potential efficiencies into their control.

1.2 TB/HIV INTEGRATION

The rapid growth of the HIV epidemic has led to a dramatic rise in the number of TB cases, and HIV-associated TB continues to increase even in countries with well-organised national TB control programmes successfully implementing the WHO DOTS strategy (WHO 2004b). TB has become a major cause of morbidity and mortality in HIV patients, while HIV dramatically increases the risk of acquiring TB disease. This phenomenon suggests that existing control strategies for both conditions are inadequate, and closer collaboration is essential to improve diagnostic, care and prevention services for people living with TB and HIV. Integration of TB and HIV services is therefore intended to enhance collaboration between TB and HIV control programmes to provide a continuum of quality care at service delivery level (WHO 2004c). Integration also provides a unified health sector strategy to control TB and HIV (WHO 2003).

1.3 PURPOSE OF STUDY

The impact of HIV on TB has been increasing steadily in Ghana, a trend similar to that in many African countries (WHO 2010a, b). At the end of 2009, 12% of all new TB cases were HIV positive (WHO 2010b). Although Ghana is not in the top 22 TB endemic countries, and the HIV prevalence of 1.9% among adults of 15 – 49 years (NACP 2010a) is among one of the lowest in Africa (UNAIDS 2010), the national HIV strategy has been to stabilise and then decrease HIV incidence rate (GAC 2005b).

As part of the nation's response to the TB and HIV dilemma, a technical and policy guidelines document was developed. This was in response to the demand for a more holistic approach to a growing tragedy, and in recognition that the existing structures and programmes of the NTP and NACP could not address the challenges associated with TB/HIV and the gaps in the health services delivery. Due to lack of resources for a nationwide implementation, the implementation strategy has therefore been gradual and incremental so that evidence of effective implementation can be acquired to inform upscale of the programme to all districts nationwide and for efficient use of limited resources. This study is therefore intended to generate recommendations to inform the improvement of TB/HIV integration based on lessons learnt from initial implementation sites to improve service delivery to TB/HIV patients, and support better control of both TB and HIV in the country.

1.3.1 AIM OF THE STUDY

The aim of the study is to evaluate TB/HIV services so as to gather evidence for the improvement of the integration of TB and HIV services in Ghana and facilitate

effective implementation and nation-wide scale-up. The objectives and research questions are outlined below.

1.3.2 OBJECTIVES AND RESEARCH QUESTIONS

Objectives	Research Questions
1. To explore the effects of TB/HIV services integration on TB treatment outcomes	<ul style="list-style-type: none"> • Has the integration of TB and HIV services affected TB treatment outcomes ?
2. To compare different service delivery models of TB/HIV activities	<ul style="list-style-type: none"> • Does increasing degrees of integration improve TB/HIV outputs? • What would be the best TB/HIV service delivery model?
3. To explore the influences of provider- and patient-related factors on TB/HIV outputs and outcomes	<ul style="list-style-type: none"> • How does provider behaviour influence TB/HIV outputs and outcomes? • How do patient experiences and behaviours influence TB/HIV outputs and outcomes?

1.4 STUDY BACKGROUND

In 2003 I was recommended by the Director of the University Hospital where I worked as a medical officer to attend a training programme on the management of tuberculosis (TB). This was organised by the National TB Control Programme (NTP) of Ghana aimed at training more health workers as part of measures to expand access to management by the DOTS strategy. Subsequently I was given the responsibility of making up a TB control team and establishing a TB programme in the University Hospital, which was done in January 2004.

As a team we observed that most patients improved significantly by the end of the intensive phase of TB treatment and throughout the continuation phase. However, there were some who did not, while others would improve initially and deteriorate in the continuation phase. Further investigations revealed most of these patients who did not improve or deteriorated after initial improvement were

HIV positive as well. We therefore decided to subsequently screen all TB patients for HIV. This generated a personal interest in the TB and HIV interaction, which eventually led to the desire to do a research programme in the area. My interest in TB/HIV also coincided with the period in Ghana when the TB and HIV control programmes were organising a series of meetings towards formation of a national TB/HIV technical workgroup to develop a national policy.

I developed the proposal for this study in consultation with the National Programme Managers as a way of identifying what the national needs and interests were. This research was therefore done in fulfilment of a personal career objective as well as the desire to contribute to the nation's quest to meet the needs of patients with TB and HIV.

1.5 RELEVANCE OF STUDY

The study will generate timely recommendations for improvement of TB/HIV integration in Ghana based on lessons learnt from initial implementation sites, and this will inform scale-up of collaborative TB and HIV services in all districts in Ghana. The study will examine how indicators approximate to national targets to provide information on how well integration has been achieved. In addition the study will identify barriers of the intervention underlying the observed indicators and that threaten to undermine effective evaluation, as well as components that have facilitated integration.

Due to the limited evidence of effectiveness, the focus of TB/HIV integration research globally has been to generate more evidence in different settings towards more effective control of the dual epidemic (WHO 2004c). This study will provide

information on integration in a context with high TB burden and low HIV incidence with comparison of different service delivery models in sub-Saharan Africa: an area in which there is a paucity of research evidence. Implementation research like this study provides decision-makers with information to identify solutions to problems that limit program quality, efficiency and effectiveness, or to determine which alternative service delivery strategy would yield the best results (Remme et al. 2010; WHO 2008c)

Findings of the study will inform policy formulation, evaluation, and implementation in the area of integration in health services in general and TB/HIV services specifically with respect to the transferable findings that can be applied in similar settings.

1.6 STUDY OUTPUTS

The primary output of this study is a thesis to be submitted towards the award of a PhD. For more effective dissemination and to improve the utility of the research findings academic publications in conferences and journals will be generated, particularly with regard to the comparison of service delivery models and the influences of provider and patient behaviour on integration in sub-Saharan Africa.

In order to enhance the potential for the findings to be embedded in TB/HIV practice in Ghana there has been an on-going partnership with the national programmes. This partnership has involved making presentations at the annual NTP stakeholders' meeting 2010 in Accra and at the biannual NACP stakeholders' conference in August 2009 in Tamale both in Ghana. Other opportunities to sustain

this partnership will be through participation in national workshops where relevant findings will contribute to the review of interventions and guidelines.

The NTP in Ghana has been allocated funding from the GFATM for the strengthening of monitoring and evaluation. The findings of this study will be submitted to facilitate the exploration of strategies to achieve this end.

1.7 THESIS OUTLINE

Below is a brief of each chapter as presented in this thesis after this introductory chapter:

- Chapter 2 is a review of the literature on TB/HIV integration with a focus on sub-Saharan Africa because of the location of the study and the fact that the region bears the biggest burden of both TB and HIV,
- Chapter 3 is the chapter in which the relevant concepts relating to integration and integrated care are reviewed. Subsequently the conceptual framework for the study is developed and used to inform the research questions and methods,
- Chapter 4 is used to describe the specific design and methods of data collection and analysis, including the underlying reasons justifying each choice,
- In Chapter 5, the setting of the study is defined by describing the relevant local context: there is an introduction of the Ghana Health System and the hospitals, which served as study sites. I also used this chapter to describe what TB/HIV in Ghana had involved,

- Chapters 6 and 7 were the first two of three results chapters and were used to summarise the quantitative findings in addressing the first and second study objectives,
- Chapter 8 summarised the findings of the qualitative study as the last of the results chapters, and also used to integrate the qualitative and quantitative results,
- In Chapter 9 there is a summary of all the key findings of the study, the implications of the findings, and recommendations for policy, practice and future research,
- Chapter 10 provides a summary of the study aims and objectives as well as the key findings and recommendations arising from the previous chapter.

2 TUBERCULOSIS (TB) AND HIV INTEGRATION

2.1 INTRODUCTION

The interaction between the tuberculosis (TB) and the HIV pandemics has magnified the disease burden of both TB and HIV especially in sub-Saharan Africa (WHO 2010a, b; Getahun et al. 2007). The implications of this interaction on the clinical presentation, diagnosis and effective treatment of either disease have made their control even more challenging. The need for new approaches and more effective strategies has been the main driving force behind TB and HIV services integration which is anticipated to provide access to seamless comprehensive care for TB/HIV co-infected patients (WHO 2004c). The purposes of this chapter are:

- To explain the rationale for TB and HIV integration,
- To do a comparative analysis of TB/HIV activities and service delivery models in sub-Saharan Africa, and
- To identify barriers and facilitators of TB/HIV integration in sub-Saharan Africa.

The findings of this review will provide a description of TB/HIV practice in sub-Saharan Africa and be used to define and characterise the different service delivery models to be studied.

2.2 TUBERCULOSIS

TB is a disease caused by a bacillus called *Mycobacterium tuberculosis* and is the oldest of the world's current epidemics. TB exposure means an individual has come in contact with the bacilli but the body's responses were sufficient to prevent the bacilli from proliferating. A person is said to have TB infection when they have

viable but dormant bacilli in their body i.e. they are not ill and they do not transmit the disease either. TB disease occurs when the host immune responses are unable to prevent the bacilli from proliferating and spreading in the body. This then progresses to physical symptoms. TB is most commonly found in the lungs (pulmonary), but may occur outside the lungs (extra-pulmonary).

2.2.1 TRANSMISSION

The primary source of TB infection is airborne transmission from a patient with pulmonary TB (PTB). PTB patients with cavitory lesions discharge massive amounts of the bacteria in respiratory secretions when they sing, cough or sneeze. Transmission is direct between human hosts with no intermediary hosts (Iseman 2000). Transmissions from non-pulmonary sources are much less common.

2.2.2 PATHOGENESIS AND IMMUNITY

Once *M. tuberculosis* bacilli get into the lungs they are engulfed by macrophages, and the bacilli proliferate if the macrophages are unable to destroy them. Host defences to TB are mediated by macrophages and T-lymphocytes which work to destroy or prevent the bacilli from proliferating. However the bacilli also primarily multiply in the same macrophages, and therefore if the macrophages fail to prevent bacilli proliferation the macrophages are destroyed as the bacilli multiply and spread, and host immune response is also initiated.

There are two main types of host immune response: acquired cellular resistance by which macrophages inhibit or kill the bacilli, and tissue-damaging immune responses that contain the bacilli. In most cases the body is able to successfully control the TB at this stage, keeping the infection as a latent one for life. For individuals in whom the immune response is not adequate, the primary

infection progresses to TB disease. This commonly occurs in children below 5 years, elderly people and people who are immune-compromised (Iseman 2000). Disease progression leads to cavitations, the patient starts expectorating the bacilli and is capable of transmission. This is primary infection. For individuals with latent infection, circumstances that compromise their immunity can also lead to reactivation of the infection and progress to TB disease and spread (Iseman 2000).

2.2.3 TB CLINICAL PRESENTATION

Most symptoms are related to the lungs and the commonest are cough, chest pain, haemoptysis and shortness of breath. Common constitutional symptoms are malaise, weakness, fever, sweats, and loss of appetite. Extra-pulmonary TB (EPTB) most commonly occurs in infants, the elderly, and in adults with compromised immunity. The clinical presentation of EPTB depends on the site of the disease in addition to subtle or minimal constitutional signs (Iseman 2000).

2.2.4 DIAGNOSIS OF TB

The commonest diagnostic techniques are tuberculin skin test (TST), sputum smear for AFBs or culture, molecular biology techniques, tissue biopsies and radiographic techniques. TST sensitivity is lowered when there is anergy i.e. where a patient fails to mount adequate immune response due to advanced age, extreme wasting, overwhelming or disseminated TB, HIV or debility. TST specificity is also affected by other mycobacterial organisms and is therefore used as a diagnostic aid (Siddiqi, Lambert and Walley 2003; Iseman 2000). Sputum and other specimens are used for smear staining or cultures to identify the bacilli. They are more specific but the cultures are slow (Lawn 2009). Molecular biology techniques are theoretically more sensitive, and are able to distinguish *M. tuberculosis* from other types, and are also

able to identify resistant strains. Chest x-rays pick up characteristic abnormalities and help estimate the probability of TB infection. Typical findings are apical scarring in the lungs, calcified hilar nodes and the primary site of infection. X-rays and ultrasonography studies of other involved body parts may be relevant for EPTB (Iseman 2000).

2.2.5 TREATMENT OF TB

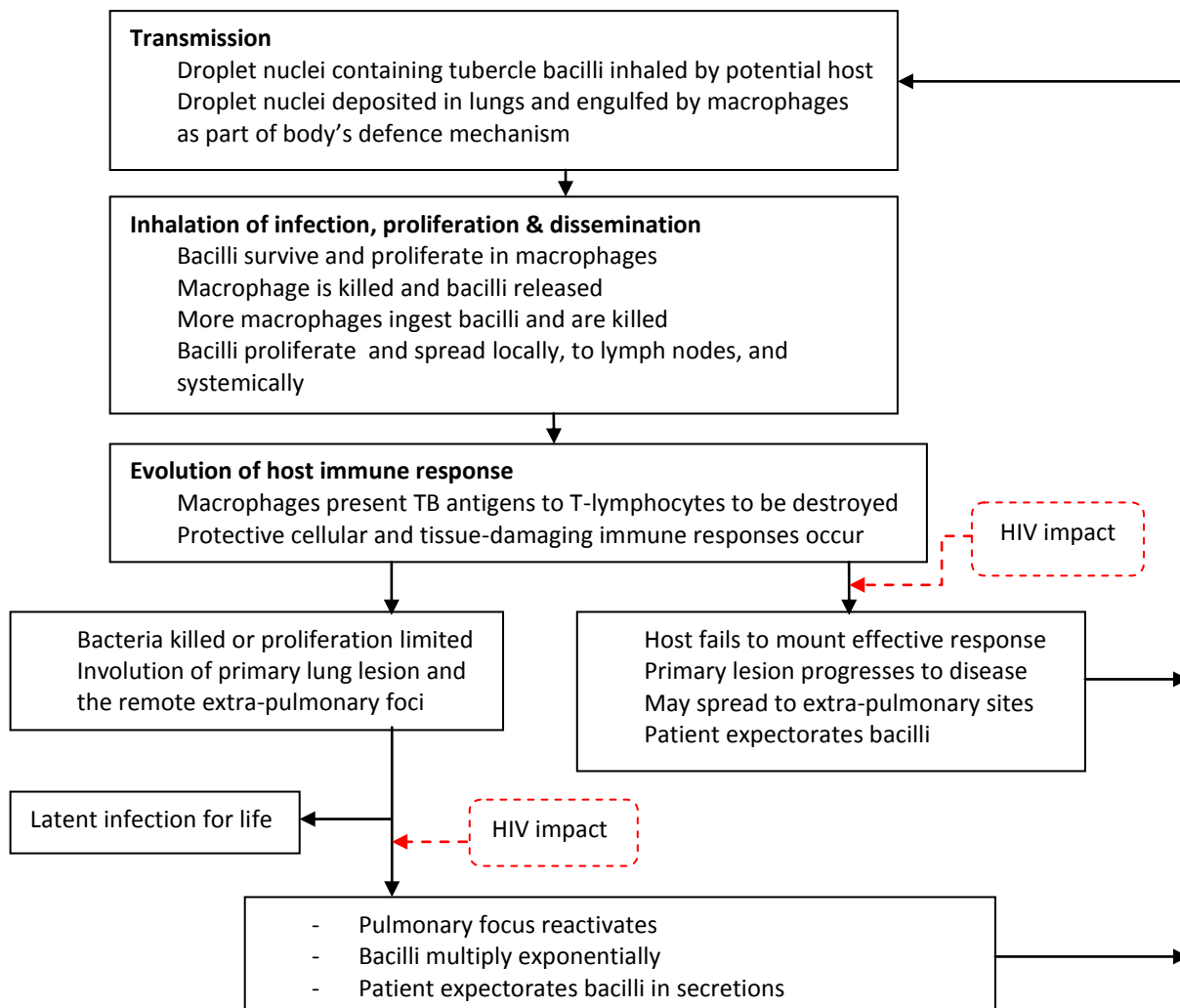
Current WHO recommendations for first-line anti-TB drugs for adults are Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E) and Streptomycin (S). For new patients presumed or known to have drug-susceptible TB, the recommended treatment is a 6-month regimen made up of two months intensive phase with HRZE, followed by 4 months continuation phase with HR (2HRZE/4 HR). Drugs are to be taken daily but could be given three times a week if daily doses are not possible (WHO 2009). The intensive phase of retreatment regimen with first line drugs is made up of two months of SHRZE, followed by another month with HRZE. This initial 3-month treatment is followed by 5 months of HRE. Treatment duration is 8 months (2HRZES/1HRZE/5HRE). Different successful models of treatment for multi-drug resistant (MDR) TB exist: using a standardised regimen for all patients or tailor-made treatments for individuals based on drug susceptibility test patterns (Wells et al. 2007).

2.3 IMPACT OF HIV INFECTION ON TB

HIV is a sexually transmitted infection, but can also be spread through blood and blood products. The virus affects the lymphocytes which mediate immune responses and therefore an infected person progressively loses the capacity to protect the body from pathogens. AIDS occurs when the infection progresses to a

stage where physical symptoms manifest. HIV infection damages the lymphocytes and alveolar macrophages responsible for mediating immunity against TB by progressively depleting them or making them dysfunctional (Iseman 2000). A patient with HIV infection, especially with advancing disease, may therefore not be able to mount adequate immune response to a TB infection so they are more likely to progress to TB disease, or have the reactivation of latent infection.

However, research also suggests that HIV-positive TB patients may be less infectious because they remain infectious for a shorter period, due to rapid progression of the disease and higher mortality (Reid et al. 2006; Corbett et al. 2006). Therefore impact of HIV on TB is mainly on the incidence of TB disease and deaths but much less through increased transmission or new infections (Corbett et al. 2006). As demonstrated in figure 1, HIV infection increases the likelihood of a primary lesion progressing to TB disease or reactivation of a latent infection. The interaction between TB and HIV acts both ways because the immune response to TB bacilli also leads to accelerated HIV replication. It is therefore likely to have increased HIV viral load at anatomical sites of TB and within the systemic circulation (Lawn 2009).

Figure 1: Impact of HIV on TB transmission cycle (adapted from Iseman 2000)

2.3.1 TB/HIV EPIDEMIOLOGY

People living with HIV are about 20 – 40 times more likely to develop TB during their lifetime (WHO 2010a). High HIV prevalence has persistently been associated with high TB prevalence rates in Africa. In 2009, out of 9.4 million new TB cases worldwide, 12% (1.1 million) were also HIV positive, as compared to 37% in the Africa region (WHO 2010a). And within Africa itself, TB incidences are much higher in the countries with high HIV prevalence (WHO 2006).

2.3. 2 PRESENTATION AND DIAGNOSIS OF HIV-ASSOCIATED TB

Clinical presentation of HIV-associated TB is altered because immunity is progressively impaired as the HIV infection advances. Anergy and EPTB are more

frequent in HIV infection. Other signs and symptoms are prominent fever, weight loss and multifocal EPTB. There is also a reduced likelihood of the development of cavitations due to the inadequate tissue-damaging immune response. Sputum smears are therefore increasingly likely to be falsely negative with advancing HIV infection because there will be fewer bacilli in expectoration resulting in increasing numbers of smear negative PTB (Getahun et al. 2007; Iseman 2000). Culture though could be positive where smears are falsely negative but may need a longer incubation period because of lower levels of bacilli (Getahun et al. 2007).

TST becomes even less sensitive due to the diminishing immune response. Chest x-ray findings are also atypical: confluent pneumonia, lower zone infiltration, hilar or paratracheal adenopathy, pleural effusions, miliary shadowing, or even normal x-rays (Lawn 2009). Accurate diagnosis of TB in HIV positive patients is therefore delayed (Havir et al. 2008; Getahun et al. 2007; Iseman 2000).

2.3.3 TREATMENT OF HIV-ASSOCIATED TB

Many uncertainties exist about when to initiate treatment of HIV-associated TB disease because of the interaction between TB and HIV drugs, and the idiopathic immune reconstitution syndrome (IRIS) that may occur. However current recommendations are that newly diagnosed HIV cases should start TB treatment first, followed by antiretroviral therapy (ART) as soon as possible and within the first 8 weeks (WHO 2009). The choice of ART should include those with minimal interactions with TB drugs as recommended. If patients are already on ART, TB treatment should still be as soon as possible, and ART modified (WHO 2009).

For HIV-associated TB the dosing has to be daily and not three times a week, because intermittent TB therapy in HIV-positive patients has been associated

with higher incidence of relapse and failure (Khan et al. 2010). Co-trimoxazole preventive therapy (CPT) is initiated as soon as possible as well, and continued throughout to reduce mortality (WHO 2009). Isoniazid preventive therapy (IPT) is recommended to reduce illness and death among HIV-positive patients (Balcells et al. 2006). HIV-positive TB patients may therefore have a large number of drugs, may experience more side effects, and this may adversely affect compliance.

The impact of HIV on TB is also reflected on the treatment outcomes, and this impact is more prominent in Africa where HIV incidence is high. Although Banu Rekha et al. (2007) suggest that there does not seem to be any significant difference in sputum conversion rates between HIV-positive and HIV-negative TB cases, HIV-positive cases have been associated with increased risk of failure and relapse (Khan et al. 2010). Mortality among HIV-positive TB patients is higher than in HIV-negative ones, but this could even be higher because death may occur before diagnosis or registration (Reid et al. 2006). Elliot et al. (1995) observed that HIV-positive TB patients were 5 times more likely to die than HIV-negative cases.

2.4 RATIONALE FOR TB/HIV INTEGRATION

The interaction between TB and HIV has had a profound impact on the control of both diseases, especially in TB endemic areas with concomitant high HIV prevalence rates as in sub-Saharan Africa (WHO 2010 a, b; Getahun et al. 2007). As described in the preceding sections, this interaction impedes the host's capacity to mount adequate immune response, resulting in more cases of TB disease, atypical clinical presentations, diagnostic challenges, increased likelihood of adverse outcomes, and increased transmission of drug-resistant TB strains among HIV-

positive patients (Johnson and Catherine 2006; Valadas and Antunes 2005; WHO 2004c). Effective control therefore requires more appropriate and effective diagnostic techniques and management strategies.

TB and HIV programmes generally have some structural and philosophical differences (Table 1) that have limited their interaction in the past.

Table 1: Differences in TB and HIV Programmes (Anderson and Maher 2001)

TB	HIV
Structural differences	
<ul style="list-style-type: none"> • Managerially vertical with personnel at national, regional and district levels • TB care accessible in institutional and community health facilities 	<ul style="list-style-type: none"> • Centralised strategic planning departments with fewer but growing staff • Comprehensive HIV care mainly accessible in health institutions and not communities
Cultural and Philosophical differences	
<ul style="list-style-type: none"> • Long history of a well-researched treatable disease • Strong public health focus to deliver medical solutions 	<ul style="list-style-type: none"> • Short history of an emerging disease, preventable but not curable • Stronger focus on human rights, confidentiality, and involvement of infected and affected people. Initially promoted behavioural interventions
Focus	
<ul style="list-style-type: none"> • Implementing DOTS strategy 	<ul style="list-style-type: none"> • Prevention and control

Both programmes had initially focussed on implementing their individual core activities but the changing epidemiologies of both diseases which resulted from their interaction has compelled a broader approach and better interaction between the two programmes. Integration of TB and HIV services has therefore been seen as a mechanism to transcend these programmatic differences to facilitate the changes needed to address current TB and HIV challenges (WHO 2008a).

Integration as an organisational concept is believed to improve responsiveness, increase efficiency and thereby enhance performance through:

- Facilitation of the co-ordination of activities and reduction of errors leading to improved quality, and
- Greater effectiveness through higher innovation, and improved inter-functional communication and synergies (Barki and Pinsonneault 2005).

Integrated care, as detailed in Chapter 3 (p. 62), involves changing care processes and multidisciplinary collaborations that ensure continuity of care, enhanced coordination, and makes care more patient-centred (Grol et al. 2007). The integration of health services has been defined by the WHO as the organisation and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money (WHO 2008a). The integration of TB and HIV care has therefore been promoted for these reasons:

- Integration is a mechanism for identifying those in need of care through screening, especially in low income countries where large-scale screening is not possible due to resource constraints,
- Resources are used more efficiently by using existing infrastructure and staff with improved communication, and the minimisation and possible elimination of duplication, and
- Integration provides entry points and access to comprehensive care which improves quality of care and health outcomes for both TB and HIV (WHO 2008a).

2.5 TB/HIV POLICY FRAMEWORK

The WHO has provided leadership in the development and implementation of TB/HIV policies globally. Globally, the goal of the TB/HIV policy is to decrease the burden of TB and HIV in populations affected by both diseases: the objectives are to establish the mechanisms for collaboration, to decrease the burden of TB in PLHIV and to decrease the burden of HIV in TB patients (WHO 2004c). Policies are therefore intended to be implemented in conjunction with the existing core activities of TB and HIV control, rather than creating an independent control programme. For each policy objective there are recommended collaborative activities and strategies through which the objectives can be achieved, and these are to:

- Establish the mechanisms for collaboration
 - Set up a coordinating body for TB/HIV activities effective at all levels
 - Conduct surveillance of HIV prevalence among TB patients
 - Carry out joint planning
 - Conduct monitoring and evaluation
- Decrease the burden of TB in PLHIV
 - Establish intensified TB case finding
 - Introduce isoniazid preventive therapy
 - Ensure TB infection control in health care and congregate settings
- Decrease the burden of HIV in TB patients
 - Provide HIV testing and counselling
 - Introduce HIV prevention methods
 - Introduce co-trimoxazole preventive therapy
 - Ensure HIV/AIDS care and support
 - Introduce antiretroviral therapy

Individual nations therefore develop their policies and collaborative activities based on WHO guidelines, in order to effectively address TB/HIV challenges. Although a detailed discussion of this policy is beyond this thesis, there have been suggestions for review of the policy to promote aggressive uptake of effective strategies because they have remained below global targets. Secondly the preventive role of ART, and the management of HIV-positive TB suspects have not been adequately addressed (Harries et al. 2010).

2.6 TB/HIV INTEGRATION IN SUB-SAHARAN AFRICA

2.6.1 INTRODUCTION

Sub-Saharan Africa (SSA) bears the greatest burden of both TB and HIV pandemics (WHO 2010a, b; WHO 2006). Of the 33.3 million people living with HIV worldwide, 67% (22.5 million) live in SSA, and 72% of the 1.8 million HIV deaths globally occurred in SSA. The prevalence of HIV in adults aged 15 - 49 years in SSA is 5% as compared to 0.8% worldwide. 2.3 million children below 15 years live with AIDS, and 230,000 children die of AIDS each year in SSA (UNAIDS 2010). Of the 22 countries with the greatest TB burden globally, 9 are in SSA, and therefore many sub-Saharan African countries have embraced the challenge and developed TB/HIV policies based on WHO recommendations.

Southern Africa for instance remains the epicentre of the TB/HIV epidemic: almost 50% of all global cases of HIV-associated TB occur here (WHO 2010b; Harries et al. 2010). However implementation has been challenging and uptake has been low because there is no general research evidence of effectiveness of integrating strategies, and the best delivery models for TB/HIV activities are not known (WHO 2010c; Briggs and Garner 2006). Resources are limited, health

systems are weak, and human resource capacity for health is still a challenge in most countries. Sub-Saharan African countries therefore need to use existing strategies with innovation and more aggressively, and examine potential strategies to curb the TB/HIV. This review is therefore intended to use comparative analysis of TB/HIV practice in SSA to answer the following research questions:

- What are the TB/HIV activities implemented, and the service delivery models used in SSA?
- What are the barriers and facilitators of TB/HIV integration in SSA?

2.6.2 METHODS

A literature search was performed in different databases using different search terms to identify relevant articles (Appendix I, p. 254). Articles identified through the literature search were browsed and relevant ones selected, and further selection was done by reading through the abstracts of papers retrieved. References of selected articles were browsed for more articles and other relevant grey literature. A final selection of articles was made based on these inclusion criteria: articles based in SSA, and involves only TB and HIV integration. Articles reviewing different programmes with no detailed descriptions were not included (Table 2).

Table 2: Literature search inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Based in sub-Saharan Africa	Only participants with XDR- or MDR-TB
Involves only TB and HIV	Specific population groups or ages
Involved general population	Involved only single TB/HIV interventions
Included TB and HIV diagnosis and management	Did not report on TB/HIV indicators

2.6.3 RESULTS

The literature search methods identified 8 articles based on different TB/HIV integration programmes across SSA (Table 3). In all 10774 articles were identified through the various search terms in the different databases, and after looking at the topics and reading abstract this number was reduced to 21. The 21 articles were further reduced after reading through and applying the inclusion criteria, and finally 5 articles were selected. Three more articles were included from references and other unpublished literature, and a final selection of 8 was made (Figure 2). These included one each from Kenya, Mozambique, Rwanda and Uganda, and two each from South Africa and Zambia. The studies included 3 in which HIV services were added to existing TB service, another 3 in which both TB and HIV services were introduced into existing care. The remaining two studies involved the addition of TB service on to existing HIV services.

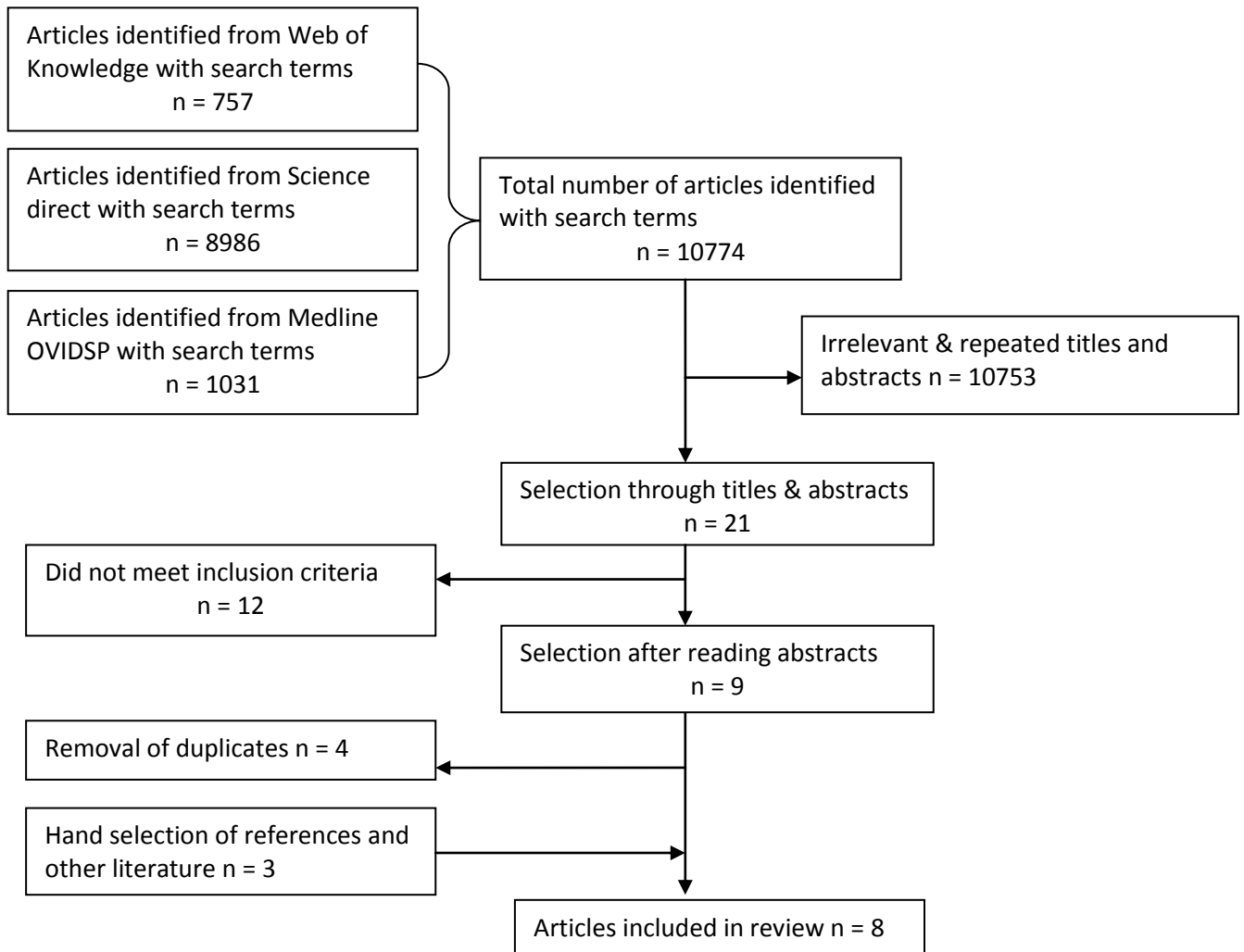
Figure 2: Flow diagram of article selection

Table 3: Reviewed articles

Author (s)	Objective/Title	Design / Methods	Setting/ Participants	Intervention	Findings
S. Miti et al 2003, Zambia	To evaluate implementation of DOTS strategy as part of an existing HIV/AIDS home care programme	Controlled post-intervention study, observational. Data collected over 23 months	Poor, urban townships Introducing TB services into home care HIV programme in health centres. Involved all new TB cases	Taking TB treatment at home for 1 st 2 months in HIV programme HCP providing medical, nursing, welfare, psychological, spiritual & pastoral.	Cure rate higher at intervention site, but not treatment success Better follow up Default lower at intervention site No difference in transfer rates
Micek 2005, Moz'biqwe	To describe a strategy of integrating TB & HIV care	Tuberculosis/HIV case study Descriptive Data collected over 14 months	Beira, provincial capital	Adding TB screening & management to HIV programme	Reduced morbidity and mortality in HIV patients but Low utilisation, Poor referrals by staff, High mortality & High loss to follow up
MSF 2005, S. Africa	Report on the integration of TB and HIV services in Site B Khayelitsha	Case report	Ubuntu clinic in Khayelitsha, a poor, peri-urban, sub-district	Upgrade HIV clinic to one-stop shop.	Integration of services feasible Context-specific flexibility is important. Uptake of services increased
M. Gasana et al 2008, Rwanda	To report on the results of integrated TB and HIV activities at a rural health care site	Case study/report, before-and-after, 1yr before & after, Uncontrolled	Rural district hospital and health centre located adjacent to each other	Introducing strategies to improve referral between TB & HIV centres: TB/HIV focal person, Joint meetings, Staff training, PICT & patient support	Increasing uptake of PICT & TB case detection. TB-HIV focuses services for patient benefit
J.B. Harris et al 2008, Zambia	To report the integration of TB and HIV services in primary care	Uncontrolled before-and-after study Phased implementation	7 Public primary care centres in Lusaka, mainly urban	Introduce strategies to implement TB/HIV integration: TB/HIV coordinating committee, guidelines, modified patient records	Increased case detection, Improved referral, communication & follow-up. Increased access to ART among co-infected patients Improved yet low enrolment at HIV clinic, low utilisation
N.R. Gandhi et al 2009, S. Africa	To demonstrate feasibility, effectiveness & safety of TB/HIV integration in a rural,	Prospective operational research Follow up for 1 year	Rural district hospital with home-based care. Poor rural area	Concomitant TB & ART treatment by modified DOTS With transition to self-administered ART after TB treatment	Median of 67 days to ART initiation after TB treatment started Increased CD4, reduced viral loads. Improved TB treatment outcomes. Integration of TB and HIV treatment is safe

	resource-limited setting				and effective
R. Okot-Chono et al 2009, Uganda	To identify health provider, facility, patient & community barriers affecting implementation of TB/HIV activities	Mixed methods FGDs, in-depth interviews, secondary data. Purposive sampling	5 districts in 3 of 4 regions, peri-urban or rural. Involved TB, HIV & TB/HIV patients, providers & community members.	Referral between services 8 months TB treatment ART started within 2 – 8 weeks of TB treatment	Low utilisation of services No TB/HIV data at HIV clinics Poor uptake of integration Barriers to TB/HIV implementation arise from health system e.g. staff shortages, increasing workload, lack or irregular supply of drugs
H. Huerga et al 2010, Kenya	To evaluate short- & medium- term impact of an integrated TB/HIV programme on patient care and TB outcomes	Retrospective, before – and- after study, uncontrolled, record-based.	Rural area. HIV care integration into a TB clinic,		Increased uptake of services EPTB increased slightly Improved TB outcomes No difference in default or failure No difference in outcomes of HIV ⁻ & HIV ⁺ on ART. Success & death rates worse in HIV ⁺ /no ART & unknown HIV status

The articles involved 1 controlled post-intervention study (Miti et al. 2003), 3 uncontrolled before-and-after studies (Huerga et al. 2010; Harris et al. 2008; Gasana et al. 2008), 1 prospective study (Gandhi et al. 2009), and 3 cross-sectional studies (Okot-Chono et al. 2009; MSF 2005; Micek 2005). The controlled post-intervention study involved 72 patients at the intervention site and 96 at the control site (Miti et al. 2003). The two sites had similar socio-economic backgrounds. The mean age of participants was 32 years at both the intervention and control sites. Sex ratio (male: female) was 1:2 at the intervention site and 1:1 at the control site. The study demonstrated that integrating TB treatment and monitoring into a home-based HIV care programme may improve adherence but not death rates.

The uncontrolled before-and-after studies were record-based evaluations on the impact of integration of different aspects of patient care. The common indicator in all 3 studies was HIV screening among TB patients. Huerga et al. (2010) examined the impact of integration by studying 3 periods: 6 months before implementation (before), 6 - 12 months after (short-term), and 18 - 30 months after implementation (medium term). It involved 1323 TB patients: 409 before, 437 short-term after, and 477 medium-term after. There was no difference in TB treatment success rates between HIV-negative TB patients (82%) and HIV-positive patients on ART (76%) at $p < 0.27$. Death rates were also not different between the two groups: no death in HIV negative patients and a single death in the HIV-positive patients on ART ($p < 0.60$). However treatment success rates in HIV-positive TB patients not on ART (66%) and those with unknown HIV status (52%) were significantly worse ($p < 0.01$). The findings of the study suggest that integration

improves case detection and management of HIV among TB patients, and thereby improve TB treatment outcomes.

Gasana et al. (2008) also studied records 12 months after integration and compared indicators before and after integration. Uptake of provider-initiated counselling and testing (PICT), and case detection of HIV among TB patients as well as TB among HIV patients increased. Harris et al. (2008) on the other hand reported only on HIV screening in TB patients, and how many enrolled in the ART department. There was a phased implementation of integration in 7 primary care centres over 20 months. Data was collected 3 months before and 3 months after implementation. 1983 patients with unknown HIV status were counselled. Although integration increased detection of HIV cases, uptake of PICT and the enrolment for HIV care were relatively low.

There was one prospective evaluation of the feasibility, effectiveness and safety of adding once-daily dose of anti-retroviral (ARV) to a home-based TB treatment programme (Gandhi et al. 2009). 119 patients were enrolled and monitored over 12 months. Median increase in CD4 cell count was 151 cells/mm³ at 6 months and 211 cells/mm³ at 12 months. Patient weight also increased by an average of 6.5 kg at 6 months and 10.5 kg at 12 months. 93% of patients also attended follow up within 1 day of scheduled visits. In this study using existing TB (DOTS) structures to deliver ART was found to be feasible, effective and safe.

The review included 3 retrospective evaluations made up of one mixed methods study (Okot-Chono et al. 2009), and two case reports (MSF 2005; Micek 2005). Okot-Chono et al. (2009) conducted an operational research to identify provider, facility, patient and community barriers to implementation of integration.

Because of lack of efavirenz-based types which can be given with rifamycin-based anti-TB regimens, patients had to wait till intensive phase is completed before starting ART. For patients already on ART, it has to be suspended for the 2 months of intensive phase of TB treatment. If screening referred to health providers using a screening tool to determine which patient to test sputum for AFBs, then patient opinion may not be a valid way of assessing screening.

The first case report (MSF 2005) involved the integration of TB services into an HIV clinic but reported only on HIV screening among TB patients and partially on the impact of ART. There were many missed opportunities for testing TB patients for HIV. There were no results on TB treatment outcome and TB screening among HIV patients. Micek (2005) reported on integration after collecting data covering 14 months after integration. ART was not universally accessible, and capacity to give CPT was limited. There were no comments on HIV screening actually done, and no references to the TB treatment outcomes of other TB patients because the report appears to be restricted to findings from the HIV clinic that introduced TB screening.

Table 4: Quality of evidence

Author (s)	Design	Results	Quality characteristics						Grade of evidence
			A	B	C	D	E	F	
S. Miti et al 2003, Zambia	Controlled post-intervention study	Cure rates 54.1% at intervention site and 20.8% at control site. No difference in treatment success and deaths Lower default rates at intervention site (8.3%) as opposed to 22% in control site	√	√	√	√	X	√	++++
H. Huerga et al 2010, Kenya	Uncontrolled before-and-after study	Changes in indicators seen before to short term and medium term after integration: HIV screening increased from 79% in short term to 91% in the medium term. CPT increased from 49% to 93% and to 86% ART increased from 9% to 46% and to 41% Treatment success increased from 56%, to 58% and to 71%. Death rate changed from 8% to 10% and 3% No difference in outcomes of HIV-negative cases and HIV-positive cases on ART	√	√	X	√	X	√	+++0
M. Gasana et al 2008, Rwanda	Uncontrolled before-and-after study	87% HIV screening, 72% on CPT and 42% on ART. Proportion of TB patients with known HIV status increased from 82% before to 93% after integration. 48% of HIV cases screened for TB, 26.7% tested	√	√	X	√	√	√	+++0
J.B. Harris et al 2008, Zambia	Uncontrolled before-and-after study	77% HIV screening and 59% enrolled at ART unit. Enrolment at ART unit increased by 38%	√	√	X	X	X	√	+++0
N.R. Gandhi et al 2009, S. Africa	Prospective study	Treatment success was 84%, 9% died, 4% defaulted and 3% failed due to MDR and XDR TB. Viral load undetectable in 83% and 88% at 6 and 12 months respectively 2 cases of IRIS at 56 and 63 days after ART initiation, but not severe enough to stop ART.	√	√	X	X	X	√	++00
R. Okot-	Mixed methods:	56% of 333 patients screened for HIV, 52% put on CPT and 12% on ART. 36% not on	√	√	X	X	X	√	++00

Chono et al 2009, Uganda	descriptive quantitative study with focus group discussions and in-depth interviews	CPT or ART. 83% of patients not screened for HIV were not offered VCT CPT and ART shortages. No routine screening of HIV patients for TB. Health system barriers cause poor implementation and low utilisation.							
Micek 2005, Moz'bique	Descriptive study	141 TB cases identified from 1755 clinical visits. 24% died, and 41% defaulted. Only 141 out of expected 1663 co-infected patients seen at the HIV clinic.	√	√	X	√	X	X	+000
MSF 2005, S. Africa	Descriptive study	47% of 770 TB patients screened for HIV, 315 (40.9%) accepted. Viral load suppression in 93% in the 1 st year.	√	√	X	X	√	X	+000

Key:

- A – Clear focus
- B – Appropriate methods (appropriate design, acceptable recruitment, adequate sample size)
- C – Control group
- D – P-values
- E – Confidence intervals (CI)
- F – Valid results

Grades of evidence (Dudley and Garner, 2011):

- ++++ **High:** confident that true effect lies close to that of the estimate of the effect
- +++0 **Moderate:** true effect is likely to be close to that of the estimate of the effect
- ++00 **Low:** true effect may be substantially different from the estimate of the effect
- +000 **Very low:** Any estimate of the effect is very uncertain

2.6.3.1 HIV SCREENING AMONG TB PATIENTS

Five (5) out of the 8 articles reported on this indicator. Three of these (Huerga et al. 2010; Harris et al. 2008; Gasana et al. 2008) reported screening rates between 77% and 91%, only Huerga et al. demonstrated a significant increase above levels before integration. Gasana et al. (2008) however observed a significant increase in proportion of TB patients with known HIV status, which was associated with a 38% increase in number of TB/HIV patient enrolment in the HIV clinic. According to Micek (2005), only 8% of the estimated 1663 HIV-associated TB patients were seen at the HIV clinic. Lower screening levels of 56% (Okot-Chono et al. 2009) and 40.9% (MSF 2005) were also reported, signifying a lot of missed opportunities for screening: as many as 37% of eligible TB patients were offered no counselling and testing services at all, and 36% of those screened were not on CPT or ART (Okot-Chono et al. 2009).

A challenge in comparing these results however is the fact that Gasana et al. (2008), Harris et al. (2008) and MSF (2005) reported on HIV screening among TB patients with unknown HIV status as compared to Heurga et al (2010) and Okot-Chono et al. (2009) who referred to HIV testing among all TB patients. The numerators and denominators for these two groups of patients were therefore different and hence the cases. The first group referred to the proportion of patients with unknown HIV status who are screened, while the second would be the proportion of all registered patients who had a record of evidence of their HIV status.

2.6.3.2 CPT FOR HIV-POSITIVE TB PATIENTS

This indicator was reported on by 3 articles. Huerga et al. (2010) demonstrated a significant increase in the proportion of HIV-positive TB patients put on this prophylaxis from 47% before to 93% after integration. Gasana et al. (2008) reported 72% of patients on CPT but Okot-Chono et al. (2009) reported only 52% due to lack of regular supply and the lack of human capacity.

2.6.3.3 ART FOR HIV-POSITIVE TB PATIENTS

The number of HIV-positive TB patients on ART increased from 9% to over 40% in the study by Huerga et al. (2010), and this was comparable to the 42% observed by Gasana et al. (2008). However the 12% observed by Okot-Chono et al. (2009) was rather comparable to the pre-integration levels in the Huerga et al. (2010) study. Gandhi et al. (2009) observed that ART initiation was around 9 weeks after the start of TB treatment, and that being on ART was associated with significant increases in CD4 counts, viral load suppression, and weight gain. While Gasana et al. (2008) reported that viral load was undetectable in 88% of patients at 12 month, MSF (2005) referred only to viral load suppression in 93% but not the magnitude.

2.6.3.4 TB TREATMENT OUTCOMES

Huerga et al. (2010) demonstrated an increase in TB treatment success rate to 71%, but this was lower than the 84% observed by Gandhi et al. (2009). There was however no difference in success rates between the intervention and control sites in the Miti et al. (2003) study, although default rate was lower at the intervention site. Huerga et al. (2010) also observed no difference in TB treatment outcomes of HIV-negative TB patients and HIV-positive TB patients on ART. Micek (2005) reported on TB treatment outcomes for only the 141 TB patients managed at the HIV clinic: 24% died and 41% were lost to follow up. However no reasons for these

outcomes were available. Resistant TB was responsible for all 3 failed TB treatments and 6 of the 13 deaths in the study by Gandhi et al. (2009). Four of the other 7 deaths were also suspected cases of resistant TB which were not confirmed prior to patient death.

2.6.3.5 TB SCREENING AMONG HIV PATIENTS

Gasana et al. (2008) established that only 48% of HIV patients were screened for TB and 3.7% of the 300 patients screened had active TB; lower than the 8% observed by Micek (2005).

2.6.3.6 BARRIERS TO INTEGRATION

In the TB/HIV programmes included in this review, most barriers described relate to the components of the programmes and implementation of the TB/HIV collaborative activities. Accordingly, these barriers are described here in relation to the health system components, namely leadership and governance, financing, information system, service delivery and barriers from other sources.

Leadership and Governance

Two out of the interventions cited lack of leadership in coordinating and supervising TB/HIV activities as barriers (Okot-Chono et al. 2009; MSF 2005). There was also reference to inadequate knowledge of the policy and the role of the provider. Providers did not display enough knowledge about the TB/HIV policy and seemed not to appreciate their roles and responsibilities in the success or otherwise of the integration. Patients were also not involved in planning (Okot-Chono et al. 2009).

Financing

The initial cost of integration remains high because of the capital required in training, infrastructure, supplies and drugs among other programme monitoring and evaluation systems. The cost of care to patients is also high and resource allocation for TB/HIV activities was not appropriately prioritised (Okot-Chono et al. 2009; Gasana et al. 2008).

Health Information Systems

Difficulties associated with poor or too much documentation due to the separate information systems of the two programmes were the commonest complaints. Okot-Chono et al. (2009) also identified the lack of tools for recording TB/HIV activities in HIV units as a barrier to implementation. Also they observed that data collected was not adequately used in planning or given as feedback to communities to enhance coordination and compliance.

Service delivery

The commonest barriers were inadequate infrastructure and long waiting times due to increasing caseloads (Okot-Chono et al. 2009; Harris et al. 2008; MSF 2005). There is pressure on existing infrastructure, preventing expansion. In Uganda, this lack of infrastructure was the main hindrance to one-stop services (Okot-Chono et al. 2009). There was also the problem of privacy for HIV services, especially where existing TB services are to be used. Some TB services operated in open air spaces, not suitable for HIV services (Harris et al. 2008). Two programmes (Harris et al. 2008; MSF 2005) also alluded to challenges with the diagnosis of TB in HIV patients due to atypical presentations. There were poor inter-clinic referrals, and patients complained of having to make too many visits (Okot-Chono et al. 2009). There were also problems with shortage of staff, and not enough trained staff. Coupled

with high staff attrition rates and increasing caseloads, staff become overburdened and de-motivated (Okot-Chono et al. 2009; Harris et al. 2008; Micek 2005).

Medical Products

In the Ugandan case there were frequent shortages of drugs and other supplies sometimes because procurement estimates were inaccurate or the process was delayed (Okot-Chono et al. 2009). Gandhi et al. (2009) also observed that drug-resistant TB poses a challenge due to increased adverse outcomes.

The above health system challenges presented as barriers to implementing integration irrespective of the degree.

Cultural Beliefs

In the Ndola (Zambia) case there was a high rate of loss to follow up because patients suddenly moved away without informing community volunteers or nurses. It is believed they do so for various cultural reasons. When family members think the patient may not survive the illness, they put pressure on the patient to move to the village where access to alternative care is greater, and funerals are cheaper. And then there was the belief that if an illness is caused by a spell cast by a neighbour, if the patient relocates the spell is broken (Miti et al. 2003). According to Harris et al. (2008), stigma may also pose a challenge for TB patients. Community members described 'old TB' which was believed to be curable, and 'new TB' referring to HIV-associated TB which was believed to be associated with immoral behaviour and incurable. Community members who are therefore perceived to have 'new TB' were more likely to be stigmatised.

2.6.4 DISCUSSION

The articles and reports included in this study are from Eastern and Southern Africa, with none from Central and West Africa. This may be due to the fact that Central and West Africa bear a lower TB and HIV burden relative to the Eastern and Southern Africa (WHO 2010b). HIV prevalence in West and Central Africa range from 1.7% to 5.3% as compared to 5% to 28% in Southern and Eastern Africa. A lot of TB/HIV research has therefore been based in Southern Africa especially. More research from SSA countries with low HIV prevalence are required to provide a more comprehensive view of the burden and control of the twin epidemic.

The studies reported variable increases in key TB/HIV indicators, however the diversity in the study designs and other methodological considerations made it difficult to combine these and draw conclusions on these indicators. One of the sources of diversity was the types of indicators used. More than 12 different indicators were used in reference to different aspects of TB/HIV care, and there was no one indicator used by all studies. The commonest of the indicators used were HIV screening among TB patients (5 studies), death rates (4 studies), proportion of HIV-positive TB patients on ART (4 studies), proportion of HIV-positive TB patients on CPT (3 studies), and TB treatment success rates (3 studies). Other indicators included TB treatment default and cure rates, proportion of TB patients with known HIV status, enrolment at ART units, patient weight gain and viral load.

A second source of heterogeneity was the different samples used in the different studies. Five out of the papers included all cases of TB or HIV registered during the selected period of study while one used only HIV-associated TB cases. Of

the remaining 2 articles, one used all new TB cases while the other included only new smear-positive TB cases. There was also a wide variation in how long after integration the studies occurred and the study periods. The controlled post-intervention study was conducted over 20 months after about 4 years of integration, while the 3 descriptive studies were conducted over 13 months immediately after integration, over 5 months after a year of integration, and over 9 months after 2 years of integration. The 3 un-controlled before-and-after studies were also conducted from 3 - 12 months before integration to 3 - 30 months after integration. These different time periods with different impacts of maturation and statistical regression (p. 122), made the results less comparable across study sites. Therefore multi-site studies with a common group of indicators are needed to facilitate comparison of TB/HIV services, and add to the knowledge to improve policy and practice.

2.6.4.1 TEMPORAL INFLUENCE ON TB/HIV

It was observed that the studies conducted earlier from 2003 to 2005 (MSF 2005; Micek 2005; Miti et al. 2003) generally had poorer indicator values compared to those conducted later. With respect to TB treatment outcomes Miti et al. (2003) reported an average of 55% treatment success rate, 20% deaths and 15% default. Death and default rates observed by Micek (2005) were 24% and 41% respectively. In comparison, treatment success rates for the later studies ranged between 76 – 82% (Huerga et al. 2010; Gandhi et al. 2009, Harris et al., 2008, Gasana et al., 2008), death rates 3 – 9% (Huerga et al. 2010; Gandhi et al. 2009), and default rate of 3% (Gandhi et al. 2009).

HIV screening among TB patients was 41% (MSF 2005) in the earlier years with no record of how many were on CPT or ART. From the later studies on the other hand, HIV screening ranged from 72% to 91% (Huerga et al. 2010; Gasana et al. 2008), and CPT and ART rates were 72 – 93% and 41 - 46% respectively (Huerga et al. 2010; Gasana et al. 2008). Enrolment at HIV clinics was 8.5% (Micek 2005) earlier as compared to 59% (Harris et al. 2008).

The studies span the 8 years from 2003 to 2010 inclusive. This period coincided with a season of global promotion of TB and HIV programmes collaboration through increasing awareness of their interaction, as well as the provision of resources and technical support. This resulted in a heightened level of commitment and goodwill that led to the introduction of many national TB/HIV policies and interventions. Consequently, as observed by the WHO, indicators for TB/HIV activities have steadily improved over these 8 years (WHO 2010a).

The number of countries reporting on HIV screening among TB patients increased from 92 in 2002 to 143 in 2009. And the percentage of notified TB cases with known HIV status also rose from 4.2% to 26% over the same period (WHO 2010a). The number of HIV-associated TB cases on CPT or ART has also risen steadily to 75% and 37% respectively by the end of 2009. In the Africa region 53% of TB patients knew their HIV status by the end of 2009 with 15 countries reporting rates of 75% or more (WHO 2010a). CPT and ART rates among HIV-positive TB patients were 76% and 36% in 2009 in the Africa region.

Therefore the differences in the impact of integration observed between the two groups of studies have also been influenced by these global political and historical activities outside the study settings as well as the effect of maturation.

2.6.4.2 TB/HIV ACTIVITIES

Recognised TB/HIV activities include establishing mechanisms for collaboration between TB and HIV programmes, HIV testing of TB patients with CPT and ART for those who are HIV positive, intensified TB case-finding among HIV patients followed by IPT for those without active TB, and infection control in health care and congregate settings (WHO 2010a, b). These activities are intended to promote early detection, provide access to comprehensive care (WHO 2008a; Ghana Health Service 2007), reduce morbidity, improve survival and reduce transmission (WHO 2010a; WHO 2004c). The TB/HIV programmes included in the review together involved HIV screening for TB patients, CPT for HIV positive TB cases, and ART for eligible TB patients.

Uptake of these activities, although increasing, has however been persistently low globally (WHO 2010a, b). For HIV screening among TB patients, and CPT with or without ART for co-infected patients, uptake has been increasing since 2005: in 2009 26% of TB cases were tested for HIV globally, up from 8.5% in 2005, 75% of HIV-positive TB cases were put on CPT and 37% (140,000 cases) on ART (WHO 2010b). In 2009 143 countries reported on HIV testing among TB patients as compared to 92 in 2003 (ibid). In the Africa region 53% of TB patients were tested for HIV, and 76% and 36% of co-infected cases respectively put on CPT and ART in 2009 (WHO 2010b). These are below global targets which were to test 85% of TB patients for HIV; put 95% of co-infected cases on CPT, and 300,000 HIV-

positive TB cases on ART by 2010 (WHO 2010a). Findings in this review also support this low intervention rates, with just one (Huerga et al. 2010) testing between 86% and 91% of TB cases for HIV after integration.

Major bottlenecks to HIV screening among TB patients have been availability and utilisation (WHO 2010d). PICT is intended to ensure that every TB patient is offered counselling and testing but uptake has been below global targets due to many missed opportunities as a result of health workers not offering the service, patients not accepting to test, lack of trained staff, disconnected services, and poor referral systems leading to high loss to follow-up (WHO 2010c; Tribble et al. 2009; Okot-Chono et al. 2009). These challenges, in addition to drug shortages and the lack of human capacity to deliver and monitor CPT, also affected CPT rates (WHO 2010c; Okot-Chono et al. 2009).

The barriers to ART in SSA include lack of capacity for rapid decentralisation to improve access, determining eligibility for ART, drug-drug interaction and overlapping toxicities with anti-TB agents, and IRIS (TBCTA 2009; Havlir et al. 2008; McIlleron et al. 2007). ART has been proven to reduce morbidity and mortality in HIV patients, and to reduce TB transmission (Howard and El-Sadr 2010; Granich et al. 2009; Corbett et al. 2006). The improvement of survival was corroborated by the Huerga et al. (2010) study that demonstrated that there were no differences in treatment outcomes between HIV-negative TB patients and HIV-positive TB patients on ART. Kwange and Budambula (2010) also demonstrated that there was no significant difference in sputum conversion rates at 2- and 5-months between HIV-negative TB patients and HIV-positive TB patients on ART. Current research suggests that ART should be started early (Howard and El-Sadr 2010; Granich et al.

2009; Corbett et al. 2006), preferably as soon as a person tests positive for HIV (WHO 2010a; Granich et al. 2009), as opposed to current recommendations to use CD4 count of 350 cells/mm³ or less, or clinical staging of disease to determine who was eligible for ART (TBCTA 2009).

Therefore as more and more HIV-positive patients are put on ART, more and more of them are going to have to take ART and anti-TB drugs together. This may mean more cases of IRIS which typically occurs within 6 weeks of ART initiation but may take up to months (McIlleron et al. 2007). On the other hand rifampicin therapy of 6 months or more, with daily therapy in intensive phase has been identified to be associated with lower risk of failure and relapse in HIV-positive patients (Khan et al. 2010). Current research priorities therefore are the need to identify best models to deliver ART in hospitals and community level (WHO 2010c), and how to provide adherence support and monitor adverse reactions (Howard and El-Sadr 2010).

Screening HIV patients for TB was another activity, but in 3 of the studies (Okot-Chono et al. 2009; Harris et al. 2008; Gasana et al. 2008), it was not routinely done for all cases during clinical care but only for those who reported symptoms. This is as opposed to the intensified case finding promoted because early diagnosis and treatment of TB is still an effective control strategy (Havlir et al. 2008). Only about 5% of PLHIV were screened for TB globally in 2009 (WHO 2010b), far below the 100% screening target (WHO 2010a). Challenges include the availability of sensitive screening tools and how often to screen (Howard and El-Sadr 2010). Improving uptake in SSA requires that barriers to these TB/HIV activities are addressed and best practices identified and replicated.

None of the review articles included IPT or reported on infection control as part of TB/HIV integration. IPT has been proven to be a safe, feasible and cheap way of reducing morbidity and mortality in HIV patients (Howard and El-Sadr 2010; Churchyard et al. 2007; Balcells et al. 2006; Grant et al. 2005), but uptake has been low (Howard and El-Sadr 2010; Harries et al. 2010). Combination of IPT and ART results in a significantly greater reduction in TB risk than does either treatment alone (Churchyard et al. 2007), however, globally less than 1% of PLHIV were on IPT by 2009 (WHO 2010b) as compared to the 10% target (WHO 2010a). Many reasons have been given for this low uptake of IPT by national programmes including the difficulty in diagnosing latent TB in PLHIV before IPT initiation (Reid and Shah 2009), and waiting to conduct local research on effectiveness and feasibility (Ghana Health Service 2007). Other concerns have been the fear that this may enhance the development of resistance to Isoniazid, and therefore reduce its effectiveness as a first line drug in treating new TB cases (Howard and El-Sadr 2010). More advocacy and research is needed to improve IPT uptake by national programmes.

Although infection control in congregate settings is an essential component of TB/HIV integration, it has not been accorded the same attention as other activities. Even though SSA bears the greatest burden of both diseases (WHO 2010a, b; WHO 2006), none of the articles made any reference to that. More advocacy and political will is needed to give this activity the required support for uptake. Delays in diagnosis facilitate nosocomial infections (Howard and El-Sadr 2010). Other challenges to infection control include overburdened clinics, crowded OPDs, long waiting times and lack of technological interventions (Howard and El-Sadr 2010, Chamie et al. 2010).

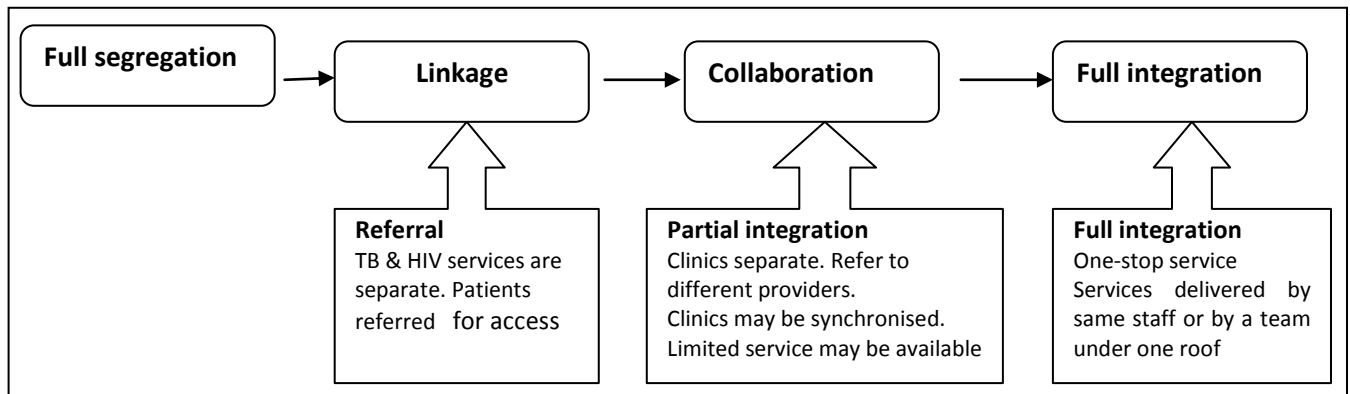
2.6.4.3 SERVICE DELIVERY MODELS

The theory of integrated care proposes that improvement in patient care results from three key strategies namely patient-centred care, organizing the care continuum through multidisciplinary collaboration, and process improvement (Murray 2009; Grol et al. 2007). Care continuum is a reflection of the extent to which services are experienced as part of a coherent, coordinated and uninterrupted succession of events consistent with the patient's medical needs and personal context (Haggerty et al. 2003; Shortell 1976). Continuity of care is achieved by bridging the discrete elements in the care pathway (Haggerty et al. 2003) and it is strongly believed to be essential to high quality care (van Walraven et al. 2010). Although there is strong evidence suggesting that continuity improves utilisation and patient satisfaction, evidence to support improved outcomes is more uncertain (ibid). Integrated services should therefore be organised in order to achieve the three main types of continuity, i.e. informational, management and relational as detailed in the theoretical review chapter (p. 67).

Models of service delivery in TB and HIV integration refer to how collaborative activities are organised around existing services. These models are generally related to the continuum of integration, namely linkage, coordination or collaboration, and full integration [(Ahgren and Axelsson 2005; Glendinning 2003; Leutz 1999), Figure 3]. In this regard three main models of service delivery have been associated with TB and HIV integration based on the level of integration between the two units at the point of service delivery; namely referral, partially integrated or fully integrated (or one-stop shop) [(WHO 2010; Kachiza et al. 2010; Ghana Health Service 2007; Corbett et al. 2006), Figure 3]. On this basis the 8

programmes described in this review includes 2 referral models (Gasana et al. 2008; Miti et al. 2003), 4 partially integrated models (Okot-Chono et al. 2009; Gandhi et al. 2009; Harris et al. 2008; Micek 2005), and 2 fully integrated models (Huerga et al. 2010; MSF 2005).

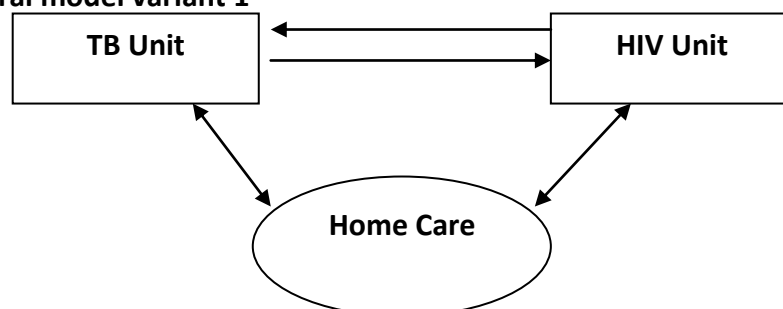
Figure 3: Relation of TB/HIV service delivery models to continuum of integration



Referral Model

In the referral models no HIV activity occurs at the TB unit or vice versa. Patients are simply referred to the other unit to have screening done for either TB or HIV where applicable. The 2 referral programmes in this study used variants of the basic model. In the Zambian case at Ndola, there was a Home Care Programme (HCP) which is a part of the Catholic Church's Integrated AIDS Programme (IAP) [(Fikansa 2005), Figure 4].

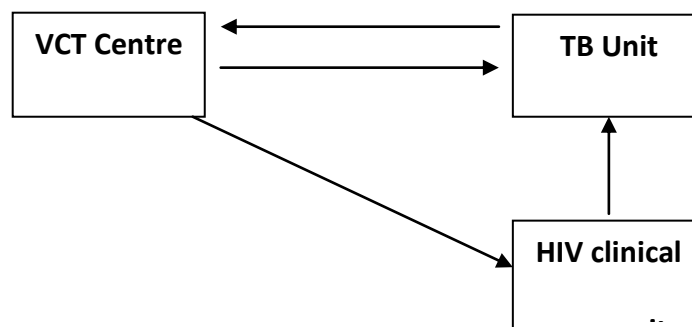
Figure 4: Referral model variant 1



Administration and monitoring of TB treatment and ART was done in the community or patient's home by the many volunteers and few nurses. The HCP also supervised sputum collection and transportation for testing.

The other variant of the referral model was described in the Rwandan study by Gasana et al. (2008). They described a 3-unit referral system where the VCT centre for HIV was separate from the HIV clinical care and management unit (Figure 5). In this modified referral model the TB and HIV clinical care units were located in the District Hospital while the VCT centre was located in the Health Centre adjacent to the District Hospital. VCT is done at the health centre and not at the HIV clinical care unit in the hospital.

Figure 5: Referral model variant 2



TB screening and diagnostic services were also available at the health centre through the VCT centre. Diagnosed cases are therefore referred to the TB and HIV care units for the appropriate care. HIV cases that end up in the HIV clinical care unit from other VCT centres are all referred to the TB unit in the hospital where they can be screened for TB. And also TB suspects and cases from other sources that have not been screened for HIV are sent to the health centre for HIV screening. Referral models use 'linkage' where TB and HIV units relate through a referral system. TB and HIV centres are separate units in different locations or

within the same institution run by different staff referring cases one to the other. Patients have to attend two clinics, probably on different days, increasing both direct and indirect costs of care to patients (Friedland et al. 2007). The Malawi National TB/HIV Plan adopts this model for delivering TB/HIV services through the general health system (Friedland et al. 2007; Chimzizi et al. 2004). Recommendations for overcoming the challenges of this model are to synchronise clinics so they are held on same day for easy access by patients, and to administer anti-TB drugs and ARVs from the same point (Table 5). Other suggestions include decentralisation of ART from hospitals to health centres (Friedland et al. 2007).

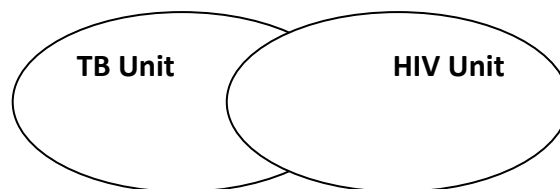
Table 5: Comparison of service delivery models

Model	Advantages	Disadvantages/Barriers
Referral	Relatively low start-up cost and resource requirement Staff specialised in a particular care process Lower risk of infection from open TB cases	Increased cost and inconvenience to patients Numerous visits required for needed care Disconnection of services Higher loss to follow up Higher case fatality rate & delays to ART initiation
Partial Integration	More convenient for patients Strong and effective communication between different units	Discontinuities still exist Loss to follow up Different visits required for needed care
Full Integration	Better access to continuum of care Multi-tasked staff Most convenient to patients Fewer visits to access needed care	Initial set-up very costly Patient overload and overworked staff Cross infection from open TB cases at the OPD

Referral models offer low levels of all the three types of continuity because service experience is more likely to be incoherent and inconsistent due to the above challenges. Effective referral systems are critical to the success of these models. The referral system in the Rwandan model successfully increased TB and HIV case detection, but may have greater challenges for achieving continuity (Gasana et al. 2008).

Partially integrated model

The partially integrated models include all the programmes in which some HIV care activities occur at the TB unit or vice versa (Figure 6). HIV diagnosis and management therefore begins at the TB unit (Okot-Chono et al. 2009; Gandhi et al. 2009), TB diagnosis is also initiated or done at the HIV centre (Micek 2005), or both (Harris et al. 2008). Patients are subsequently referred to the appropriate unit for further management. It therefore represents a wide range of models based on different levels of coordination and collaboration between TB and HIV services.

Figure 6: Partially integrated model

The differences between the partially integrated models are based on how much of HIV care takes place at the TB unit or vice versa. An increasing level of integration is reflected in how much of treatment of one condition occurs at the other unit, or to what extent synchronization of both clinics occur to improve access to both services. Kachiza et al. (2010) also described a partially integrated service as one in which services are separate but synchronized so patients receive services for both conditions on same day. Partially integrated model is expected to be more coherent and offer more continuity than a referral model because establishing informational and management continuity is expected to be relatively easier as compared to the referral model. However the challenges of relational continuity as described in the next chapter (p. 67) persist.

In the Ugandan model only HIV pre-test counselling is integrated into the TB care. Patients are then referred to the HIV unit for testing and care if needed (Okot-Chono et al. 2009). Gandhi et al. (2009) also describe a model where HIV counselling and testing are incorporated into TB care at the TB unit. Another component of this particular programme was the integration of daily ART into the home-based directly observed TB treatment programme. Treatment monitoring was done at home by volunteers or family members. The case from Mozambique involves the integration of TB screening into an existing HIV care programme (Micek 2005). In Zambia, Harris et al. (2008) describe a 'separate but linked' integration programme. HIV counselling and testing is done at the TB centre, and blood samples for CD4 evaluation are forwarded if the patient is HIV positive. At the HIV centre TB screening is also done and positive cases referred for treatment. The more integrated these services are, the more likely they are to achieve continuity, and the more patient-centred care is likely to be.

Fully integrated model

This model is usually called a 'one-stop' service (Kachiza et al. 2010; Ghana Health Service 2007). In this model all TB and HIV services are provided in the same location by a team of providers. The programme from Kenya describes the integration of all HIV care into a TB service. HIV providers were brought in to make up a TB/HIV team which was trained in co-infection management (Huerga et al. 2010). In the Khayelitsha model in South Africa, TB diagnosis and management was integrated into an HIV clinic. Here, existing staff were trained in TB and TB/HIV co-infection management (MSF 2005). It was observed that the most integrated of TB

and HIV services are more commonly found in primary care (Huerga et al. 2010; Harris et al. 2008; MSF 2005).

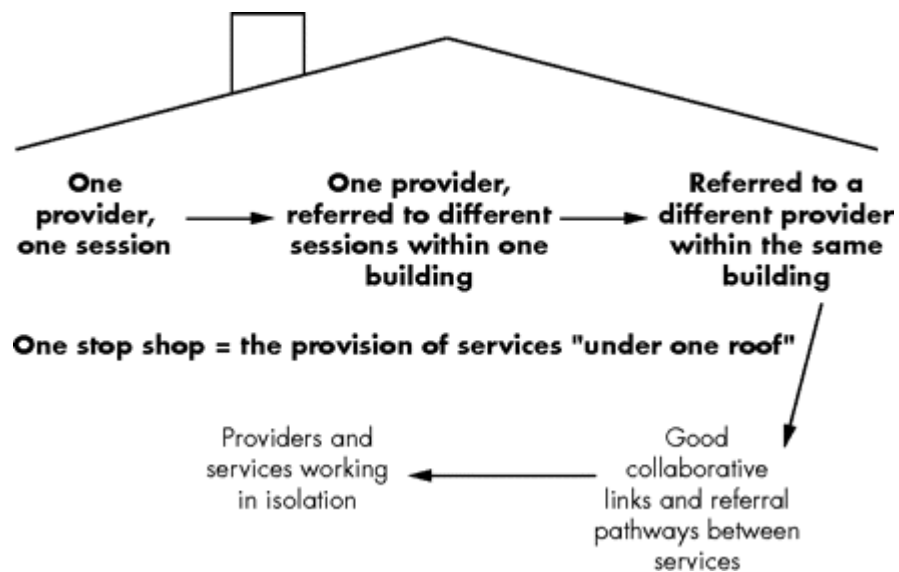
The term 'full integration' of TB/HIV services has been used to describe various service delivery configurations. Leutz (1999) defines full integration as the pooling together of resources from the collaborating units to create new services with a single and common information system, and Shigayeva (2010) also refers to it as a merger of the two programmes. However, integration in TB and HIV is not about creating a new programme out of the two but to identify effective ways of delivering their services together. Full integration in TB/HIV therefore refers to the provision of TB and HIV services under one roof, usually referred to as 'one-stop shop or service' and therefore this model has the greatest potential to provide continuity of care for TB/HIV co-infected patients and be more patient-centred. But it is also not without challenges (Table 5).

The TB/HIV integration in Khayelitsha, South Africa (MSF 2005) and rural Kenya (Huerga et al. 2010) are examples of this and they demonstrated increased case detection and improved outcomes by offering a comprehensive package of care to the patient anytime they visit the facility but indicators were still below targets. Kachiza et al. (2010) suggested that this model was more effective at improving patient outcomes but had not provided adequate information on their methods to evaluate the validity of their findings.

French et al. (2006) describe three variants of this fully integrated service: patient may be seen by one provider for all needs, or same provider but different sessions, or different providers in the same building (Figure 7). In Swaziland

proposed innovations at a regional TB diagnostic and treatment facility to address the risk of TB transmission included physical separation of confirmed and unconfirmed TB cases among HIV patients at the outpatients' (Humphreys et al. 2007). However none of the two articles with the one-stop shop delivery model made any references to how this may impact transmission of TB among patients or infection control.

Figure 7: Variant models of one-stop shop



Some authors suggest that the higher the level of integration, the better the service delivery (Kachiza et al. 2010; Friedland et al. 2007; French et al. 2006), and therefore the one-stop shop has been recommended or identified as the ultimate goal in many national policies (Okot-Chono et al. 2009; Ghana Health Service 2007; WHO 2004c).

However Greenhalgh et al. (2004) propose that the success or otherwise of an intervention like integration is determined not just by the effectiveness of the intervention. Success of integration is influenced also by the multiple interactions

between the context within which it is introduced, and their impact on how the intervention is implemented.

This review does not only demonstrate the paucity of research that compares different service delivery models but also does not provide any evidence to support that greater integration resulted in better indicators and outcomes. The different settings and study periods in the articles make comparison of results impractical: the articles range from 2003 to 2010 and major changes in practice occurred over that period (WHO 2010a, b; WHO 2009). These studies therefore coincided with a time when there was global goodwill in addition to technical and financial support for TB/HIV research. These may therefore have contributed to the improvement in the indicators observed, making it erroneous to attribute the change to the integration itself. Therefore although the articles demonstrated varying degrees of improvement in indicators post-integration, it is not possible to compare findings and identify which model is most effective.

2.6.4.4 BARRIERS OF INTEGRATION

Barriers to integration arise from the differentiation or specialisation that accounts for the structural and cultural differences in the two programmes, and the political aspects of integration that may result in loss of territory, loss of influence and resources (p. 79). Barriers may also be encountered during delivery of service. These implementation barriers arise from operationalising the intervention, and are a reflection on programme components and the general health system. The barriers are mainly staff shortages and high turnover, increasing workload, inadequate infrastructure, lack of or irregular supply of drugs and equipment, poor documentation, lack of resources (Harries et al. 2010). The findings of this review

are in line with general health system barriers, and they mainly affect availability and utilisation, but have no direct relationship with integration itself. Patients also complained of the high cost of accessing services, long waiting times and lack of prescribed drugs. Other barriers included the high adverse outcomes, atypical presentations complicating diagnosis, and stigma.

2.6.4.5 FACILITATORS OF INTEGRATION

Highly differentiated systems require high degrees of integration in order to achieve organisational effectiveness in the face of differentiation (Glouberman and Mintzberg 2001a). Mechanisms of coordination are employed to enhance coordination to reduce the effect of differentiation (Sobczak 2002) and these are direct supervision, standardisation and mutual adjustment. Mutual adjustment is the most direct form of coordination: people involved simply adapt as work progresses through informal meetings, networking and quasi-formal arrangements like teams, task forces and work groups. In direct supervision, a manager or supervisor is appointed to ensure coordination occurs.

Standardisation is used to define common procedures, tasks and results to be used by all collaborating partners. In TB/HIV integration this would be expected to be done by the national programme which develops guidelines and sets national standards. Standardisation of skills and knowledge is achieved by training different people in different skills, but each one knows what to expect from the other. Weingarten et al. (2002) for instance found that provider and patient education, reminders and feedback improved provider adherence to guidelines and protocols, and patient adherence to treatment. Standardisation of norms involves socialising people to work towards common expectations. A common culture is promoted so

that externalized controls are replaced by internalized attitudes. All the participants can therefore co-ordinate their effort because they just know what to do. Some of these mechanisms were identified in the review articles as portrayed in table 6.

Table 6: Facilitators of integration

Facilitating mechanisms	Activities / strategies identified in review
Direct supervision: hierarchy of authority created by appointing a manager /supervisor to ensure coordination occurs	Home Care programme (Miti et al. 2003) Clinic manager (MSF 2005) Electronic monitoring of follow-ups (MSF 2005) Coordinating committees (Harris et al. 2008)
Standardisation of work: common tasks and procedures are specified through joint planning, protocols and guidelines	National guidelines (Harris et al. 2008, Gasana et al. 2008) TB screening tool (Gasana et al. 2008) Modified TB patient cards to include TB/HIV activities (Harris et al. 2008)
Standardisation of output: results or outcomes are standardised by setting performance targets.	National and regional targets
Standardisation of skills and knowledge: training different people in different relevant skills to know what is expected of them and of others	Training of providers (Harris et al. 2008, Miti et al. 2003) Education of patients, volunteers and family members (Miti et al. 2003, Harris et al. 2008, Gandhi et al. 2009, Huerga et al. 2010)
Standardisation of norms: socialization is used to establish common values and beliefs to ensure that people work towards a common expectation	Welfare and psychological support, spiritual and pastoral care (Miti et al. 2003)
Mutual adjustment: involves flexible communication with peers to deal with problems adaptively and collaboratively as they work	Same day HIV results and request of CD4 test for positive cases to reduce number of visits (Harris et al. 2008) Patients escorted by TB staff to enrol at HIV centre, or HIV nurses enrol patients at TB centre to reduce loss to follow-up (Gasana et al. 2008) Travel money to reduce patient costs (Gandhi et al. 2009) Patient participation: Patients choose their supporter. Medication calendar used to facilitate / monitor patient adherence (Gandhi et al. 2009)

2.6.5 LIMITATIONS

The inclusion of only articles that described interventions which involved ART may have excluded other articles which described other innovative models, limiting the findings of this review. Another limitation is the fact that TB/HIV is usually

implemented concurrently with other TB and HIV programme activities and accounting for the effect of these individually can be problematic.

These articles refer to studies conducted in an era where there was global emphasis on TB and HIV interaction and collaboration, leading a surge in political will for TB and HIV collaboration. These events would therefore influence TB/HIV integration and implementation, and serve as confounders to the study findings as these had not been accounted for.

2.7 CONCLUSION

The integration of TB and HIV services globally and in SSA as well is feasible with varying degrees of successes due to variations in policies and other local contexts. The commonest TB/HIV activities include HIV screening among TB patients, CPT and ART for those who are HIV-positive cases, and TB screening among HIV patients. However uptake of these has been low due to missed opportunities, lack of capacity to deliver and monitor interventions, as well as other health system barriers. IPT and infection control are less common activities, although they are feasible and safe.

Three service delivery models of TB/HIV activities with varying degrees of modification and effectiveness are identified. Differences in resources, capacities and other local factors contribute to the adoption of which service delivery model is used and how these can be adapted to suit the local settings. Although many health system barriers to integration exist, training, education and other types of support are used to enhance integration.

2.7.1 LITERATURE AND RESEARCH GAPS

This review identifies some knowledge gaps which present opportunities for more research to expand the frontiers of knowledge in this academic discipline.

- Most TB/HIV studies have been based in Eastern and Southern Africa. However local context is an important determinant of successful integration, and therefore more research from other parts of SSA like West and Central Africa where HIV incidence rates are relatively lower are required. These would give a more balanced outlook of the twin epidemic in the region,
- Research suggests that key TB/HIV interventions should be based on better implementation of existing policies, more widespread implementation of additional effective interventions, and rapid assessment of promising new approaches (Granich et al. 2009; Corbett et al. 2006). In recognition of the above, research is needed to explore the determinants of success or otherwise of TB/HIV integration in different contexts,
- No best service delivery model currently exists, and therefore best strategies and optimal models to integrate and deliver joint TB/HIV activities should be a research priority as well (WHO 2010c),
- This review suggests that innovations and adaptations of existing TB/HIV strategies can be effectively used to deliver TB and HIV services in resource-limited settings. Most research in health service integration and TB/HIV integration in particular have been focussed on the providers with very few conducted to examine service user perspectives and experiences, and therefore there is limited knowledge on user-based factors promoting or

inhibiting integration (Gebrekristos et al. 2009; Corneli et al. 2008; Levin et al. 2006; Briggs and Garner 2006; Porter et al. 2002). It is recommended that operational research should be conducted to understand barriers to accessing services from both user and provider perspectives (WHO 2010c),

- Other areas recommended for research to improve TB/HIV integration are various ways of up-scaling laboratory services, the impact of MDR and XDR on service delivery, and improving monitoring and surveillance (WHO 2010c).

In view of these knowledge gaps and research priorities, a thesis like this aimed at examining the service delivery models and impact of TB/HIV integration in West Africa is very relevant as well as timely. It will not only inform policy and practice in Ghana where the study will be based, but it will also be relevant to other nations with similar contextual factors and will provide new knowledge to add to the existing body of literature.

In the next chapter, there is a discussion of integrated care as a concept and its theoretical underpinnings, as well as other related concepts. These are then used to develop a conceptual framework with which TB/HIV was studied.

3 THEORETICAL REVIEW

3.1 INTRODUCTION

Improving services is an objective of all health systems, and even more so in current times when research and technology, demographic changes and epidemiologic transitions are rapidly transforming health care (WHO 2007b). Service improvement may mean different things to the different types of providers and patients but however it is interpreted it involves change (Maher and Penny 2005). Changing clinical practice is challenging, especially if it involves complex routines, better collaboration or the organisation of care. Theories are useful in understanding the interaction of factors at multiple levels that may influence the success or failure of the change intervention (Grol et al. 2007). The purpose of this chapter is therefore to review the relevant theories of TB and HIV services integration, and to use them to develop a conceptual framework for this study.

This chapter opens with a review of theories on changing health care, and then the theory of integrated care is discussed with reference to the underlying assumptions and the strategies used to achieve its impact. Subsequent sections address the dimensions of integration, and the application of integration in health systems. A conceptual framework used to analyse TB/HIV integration and inform the methodology is then described in the concluding section.

3.2 THEORIES OF CHANGE IN HEALTH CARE

Patient care is a primary function of all health systems. In today's world, rapid technological development, and an overwhelming amount of research evidence, as well as the ever-changing needs of patients demands that patient care also changes

appropriately to match available knowledge and evidence. The effectiveness of any organisation depends on how successfully these change transitions are achieved (Hayes 2007). Change is therefore required to maintain or improve the effectiveness of health systems. There are four main categories of theories of change in health care, with each category made up of different types of theoretical approaches (Table 7). The four main categories are theories on factors related to individuals, theories on social context and social interaction as it relates to change, theories related to change in the organisational context, and theories related to the political and economic context of change.

Table 7: Theories of change in health care (Grol et al. 2007)

Category	Types
Theories on factors related to individual professions that influence change in performance	<ul style="list-style-type: none"> - Cognitive theories - Educational theories - Motivational theories
Theories on influence of the social context and social interaction on the change process	<ul style="list-style-type: none"> - Theories of communication - Social learning theory - Social network and influence theories - Theories related to teamwork - Theories on professional development - Theories on leadership
Theories on factors related to the organisational context	<ul style="list-style-type: none"> - Theories of innovative organisations - Theory of quality management - Theory of integrated care - Complexity theory - Organisational learning theory - Theories of organisational culture
Theories on factors related to the political or economic context	<ul style="list-style-type: none"> - Reimbursement theories - Theory of contracting

The empirical evidence of the effectiveness and feasibility of most theoretical approaches to produce intended change in health care is limited so conclusions about the relative superiority of any theory based on evidence from healthcare is

not easy to come by. However some theories seem to be more suitable and effective for particular changes and innovations (Grol et al. 2007).

The theory of integrated care is an example of the theories related to the organisational context. This group of theories target changing patient care through structural and organisational conditions and reforms e.g. more efficient processes of organising care, different division of tasks and roles, change in culture of work setting or the collaboration among professionals. Other types of theories in this category are identified in table 8 below.

Table 8: Organisational context theories

Types	Underlying assumptions/focus
Theories of innovative organisations	Implementation should take into account the type of organisation; decentralised decision making (teams) about innovation is important
Theory of quality management	Improvement is a continuous cyclic process, with plans for change continually adapted on the basis of previous experience; organisation-wide measures are aimed at improving culture, collaboration, customer focus, and processes
Theory of integrated care	Change multidisciplinary care processes and collaboration instead of individual decision making
Complexity theory	Focus on system as a whole, find patterns in behaviour (attractors) and link change plan to these, and test and improve plan
Theory of organisational learning	The creation or availability of conditions in the organisation for continuous learning at all levels can lead to successful changes
Theories on organisational culture	Changes in the culture can stimulate changes in performance, particularly a culture of teamwork, flexibility, and external orientation

Theories of innovative organisations suggest that some organisations adopt innovations more quickly and easily than others. These theories therefore focus on the characteristics of an organisation that determines whether, and to what extent

they are able to take up innovations. Greenhalgh et al. (2004) suggest that the ability of health service organisations to be innovative depend on the system antecedents (e.g. structure, absorptive capacity for knowledge, and receptive context for change), the readiness for innovation, adoption and assimilation characteristics (e.g. needs, motivation, values and goals, and complex, non-linear processes), and the implementation process.

The emphasis of total quality management (TQM) is the continuous improvement of processes in health care to address patient needs more effectively (Grol et al. 2007). Inadequate performance is attributed to a system failure and not perceived as an individual problem. Basic principles of TQM include comprehensive and organisational efforts to improve quality, a people-centred focus, continuous improvement and re-design of care processes, management by facts and on-going training (Grol et al. 2007).

In complexity theory the underlying assumption is that health care is becoming increasingly complex and therefore improving health systems should involve the whole system as opposed to breaking the system into components. Hospitals, primary care teams and disease management programmes are seen as complex adaptive systems i.e. interconnected individual components whose actions change the context for other agents (Plsek and Greenhalgh 2001). Change is therefore focussed on the system as a unit.

Organisational learning is a critical component of organisational development, which is a long-term process for initiating and implementing planned change (Senior 2002). A learning organisation does not only identify and solve

problems; it emphasises why the problem occurred, and therefore enables the organisation to anticipate change by proactively embedding learning processes into the culture (Hardacre and Peck 2005). Central to organisational learning is individual learning, and therefore favourable conditions for individual learning must exist to improve organisational learning ability (Lähteenmäki, Toivonen and Mattila 2001). Learning organisations are characterised by an experimental mindset, curiosity about trying new things, a climate of openness, acceptance of debate and conflict, an ongoing commitment to education, as well as growth and development at all levels (Lähteenmäki, Toivonen and Mattila 2001). Organisational learning theories are therefore focussed on how health organisations can become learning organisations that are continually and effectively responding to internal and external triggers of change.

The basis of theories about organisational culture is that an organisation's culture can be altered to change performance. Whether it is seen as an attribute or as defining the whole character and experience of organisational life, the culture of an organisation means the group learns to address its challenges, and also successfully transfers their values and underlying assumptions to new members (Grol et al. 2007). Based on this theory, health care organisations seeking to improve quality need to develop a quality culture that emphasises learning, teamwork and customer focus (Ferlie and Shortell 2001).

3.3 THEORY OF INTEGRATED CARE

Integration refers to the coordination of various tasks, functions and divisions so that they work together to achieve organisational goals, or the extent to which

distinct and interdependent organisational components constitute a unified whole (Barki and Pinsonneault 2005). One of the main reasons for integration is the need for coordination that arises from differentiation (Lawrence and Lorsch 1986). Integrated care is a response to modern day health care problems: access concerns, fragmented services, disjointed care, less than optimal quality, system inefficiencies, and difficult-to-control costs. Demographic changes and chronic conditions have resulted in complex needs which health systems seem unable to meet (Kodner 2009).

Integration therefore bonds the different units or organisations together to achieve common goals and optimal results (Kodner and Spreeuwenberg 2002). Integration is believed to improve responsiveness, increase efficiency and thereby enhance performance through greater efficiency, greater productivity and improved competitiveness, strengthening of strategic advantages and greater effectiveness. Integrated care, as a type of theory on factors related to the organisational context, focuses on changing multidisciplinary care processes and collaboration. It encompasses two main concepts which are change of the process of care and multidisciplinary collaboration (Kodner 2009; Grol et al. 2007).

Integrated care involves the radical or gradual redesign of the steps in providing care. Models for changing processes focus on improving the organising and managing of care for specific categories of patients to meet their needs and reduce costs. The mechanism of change therefore is primarily the redesign of multidisciplinary care processes and not by influencing professional decision making (Grol et al. 2007). Changing processes of care include organising new

collaborations of care providers, allocating tasks differently, transferring information more efficiently, and using new types of health professionals (Grol et al. 2007).

Multidisciplinary collaboration is crucial in integrated care. Successful integrated care approaches often use strategies like case management, performance feedback to providers, explicit protocols and pathways, use of disease registers, electronic follow-up systems and reorganisation of services to better meet patient needs (Grol et al. 2007). Multidisciplinary collaborations and coordination are essential to play down traditional boundaries between disciplines and reduce fragmentation. Care is therefore experienced as a series of related actions performed by different professionals (Grol et al. 2007). The impact of these two concepts is to make care more patient-centred, ensure continuity of care, and enhance coordination.

3.3.1 PATIENT-CENTRED CARE

Patient-centred care is a means of focussing care on efforts to optimise patient understanding of, and participation in the care process (Murray 2009). It strengthens the role of patients in managing their health problems i.e. they move from being passive recipients of care to being active decision-makers (WHO 2005). Patient perceptions of patient-centred care have been found to be directly related to improved patient health status, increased efficiency of care (Stewart et al. 2000), and have also been used as a predictor of health outcomes (Stewart 2001).

Pelzang (2010) identifies two models of patient-centred care: the systems approach and the process approach. A systems approach to patient-centred care

focuses on providing a patient-centred environment which is central for providing patient-centred care. Essential components would therefore be providing a structure with healthcare professional attributes like professional competence, interpersonal skills, commitment, and personal characteristics; organisational preparedness in terms of time, the health worker's role, shared decision-making; and patient attributes of perception of care, participation in care, perspectives on illness, cooperation and culture (Pelzang 2010). A process model of patient-centred care on the other hand describes the dimensions of patient-centred care which are a range of activities essential for patient-centred care: respect for patients' values, preferences and needs, coordination of care, information, physical comfort, emotional support and alleviation of fear, involvement of family and friends, and transition and continuity of care (Pelzang 2010).

Effective patient-centred care necessary for successful integration requires the strengthening of the role of patients from being passive recipients to active decision-makers (WHO 2005). Mead and Bower (2000) define five distinct dimensions of patient-centred care. The first dimension reflects the use of the biopsychosocial perspective to explain illness, acknowledging the role of health promotion and help-seeking behaviour modification. The second dimension relates to the management of a patient as a person in order to fully understand the patient's illness experience which differs from person to person. In the third dimension Mead and Bower (2000) refer to the asymmetrical relationship between provider and patient whereby authority lies with the provider. They criticise this as paternalistic, as opposed to the preferred relationship which involves the sharing of power and responsibility in a mutual partnership. The fourth dimension of patient

centred care according to Mead and Bower (ibid), recognises the significance of a therapeutic alliance between provider and patient based not just on the decision-making and procedural issues of diagnosis and treatment alone, but also on the personal relationship. The fifth dimension concerns the influence of the personal qualities of the provider in terms of how these can affect patient behaviour and provide insights for therapeutic purposes (ibid).

Patient-provider communication should therefore be characterised by exploring the disease and illness experience, understanding the whole person, finding common ground, enhancing prevention and health promotion, and enhancing continuity relationship (Stewart 2001; Stewart et al. 2000). As a result of patient-centeredness of care, the provider's understanding of the patient's illness experience is enhanced, and allows providers to offer individualised support for patient needs leading to fewer complications (Holmström and Röing 2010). However the establishment of patient-centred care has to overcome barriers including lack of a clear definition of what it is, inadequate educational emphasis on it, shortage of staff, lack of continuity, absence of good teaching models and curricula on patient-centred care, and the dominance of the biomedical model in healthcare (Pelzang 2010).

Patient empowerment has been acknowledged as an alternative to the compliance-oriented approach which can support patients in dealing with health-related challenges outside the healthcare setting. Unlike patient-centred care which is the goal of an encounter between the patient and the provider, and therefore bound by the context of clinical health care settings, patient empowerment makes patients responsible for their choices and the consequences

of these choices (Holmström and Röing 2010; Aujoulat, D'Hoore, and Deccache 2007). It involves facilitating and supporting patients to reflect on their experiences of living with a chronic illness, think critically and make informed decisions (Anderson and Funnell 2010). Patient empowerment has been shown to facilitate coping and well-being in patients, and increased patient knowledge and personal development. It allows self-management of the disease, treatment, their health and their own life or personal changes (Holmström and Röing 2010). A necessary skill for patients in the empowerment approach is the ability to reflect on the benefits of behaviour change in their lives (Holmström and Röing 2010). Although most of the practice of patient empowerment has been based in resource-rich settings a lot of research has been conducted among medically underserved minority patients to suggest that while the resources available for the management of chronic illnesses may be limited, the ability for patients to assume responsibility and make informed decisions is not (Anderson and Funnell 2010).

3.3.2 CONTINUITY OF CARE

Continuity of care is the degree to which a series of discrete healthcare events is experienced as coherent, connected and consistent with the patient's medical needs and personal context (Haggerty et al. 2003) i.e. patients' experience of the cohesiveness and connectedness of the health system. It is recommended to address fragmented and uncoordinated health and social services systems (Kodner 2009). Continuity of care reflects how individuals experience the coordinated nature of health care, and therefore it is not an attribute of health providers or organisations. Continuity is necessary for better coordination (Haggerty et al. 2003). Although few studies clearly demonstrate that increasing continuity

improves quality, literature suggests that continuity of care improves patient satisfaction, early diagnosis of patient condition, and compliance to medical treatment (van Walraven et al. 2010). However, the effect of continuity on patient satisfaction is variable because although patient perception of it is consistently and significantly improved, quantitative measures were not (Adler, Vasiliadis and Bickell 2010).

Continuity of care is achieved by bridging discrete elements in the care pathway i.e. different episodes, interventions by different providers, or changes in illness status (Haggerty et al. 2003). There are three main types of continuity: informational, management and relational. Informational continuity refers to the use of information on past events and personal circumstances to make current care appropriate for each individual. It links care from one provider or health care event to another (Haggerty et al. 2003). Management continuity represents the consistent and coherent approach to the management of a health condition that is responsive to a patient's changing needs. It is particularly relevant where the management of the disease condition requires multiple providers. Continuity is achieved when services are complementary and timely. Tools used include shared management plans and care protocols. For long term care and chronic conditions, flexibility and consistency are critical for management continuity (Haggerty et al. 2003).

Relational or interpersonal continuity refers to an on-going relationship between a patient and one or more providers (Saultz and Lochner 2005; Haggerty et al. 2003). It bridges the past to the current care, provides a link to future care, and also provides the patient with a sense of predictability and coherence.

Relational continuity improves uptake of preventive care and adherence to treatment, and also improves health utilisation and satisfaction (van Walraven et al. 2010; Gray et al. 2003). The evidence on outcomes of chronic disease is however less clear cut. Relational continuity seems to be associated with improvements in delivery of preventive services, lower hospitalisation rates and lower costs (Saultz and Lochner 2005). Most patients value relational continuity because of the value they place on their relationship with the provider, their physician's knowledge about them, the ability to communicate their concerns, and the development of trust and confidence with the provider (Pandhi and Saultz 2006).

3.3.3 ENHANCED COORDINATION

Coordination of care is the deliberate integration of patient care activities between two or more participants involved in a patient's care to facilitate the appropriate delivery of health care services (McDonald et al. 2007). Care must be coordinated in all aspects: between different providers, and between providers and patients and their families (Bodenheimer 2008). Continuity of care is frequently used interchangeably with coordinated care although they are different: the presence of continuity facilitates better coordination of care (Haggerty et al. 2003). Coordination is the mechanism or operational component of integration. Services are fragmented because there is inadequate coordination in the presence of differentiation. Enhancing coordination therefore is an integral component of integrated care.

Highly differentiated systems like health care systems therefore require high degrees of integration (Glouberman and Mintzberg 2001). Mechanisms of integration are employed to reduce the effect of differentiation (Sobczak 2002).

Glouberman and Mintzberg (2001a) identify a number of mechanisms by which coordination can be strengthened in health care organisations: direct supervision, mutual adjustment and standardisation. Mutual adjustment is the most direct form of coordination. The people involved simply adapt as work progresses through informal communication. It thus involves flexible communication with peers to deal with problems adaptively and collaboratively through informal meetings, networking and quasi-formal arrangements like teams, task forces and work groups. In direct supervision a manager or supervisor is appointed to ensure coordination occurs. This appointee does not actually do the work but issues directives to those doing it. Hierarchy of authority is therefore created (Glouberman and Mintzberg 2001a).

Standardisation of work occurs where common procedures and tasks are clearly specified through the use of protocols and guidelines; coordination therefore takes place in the design of work. This also includes joint planning to establish schedules governing activities of different units (Glouberman and Mintzberg 2001a). Standardisation of output refers to the use of standardised results or outcomes. The focus of coordination is therefore on the interface of services provided by different health providers. This can be done by setting performance or productivity targets. Standardisation of skills and knowledge is achieved by training different people in different skills, but each one knows what to expect from the other. Co-ordination is by specialization. This type of co-ordination is particularly favoured in the health systems because of the ease with which co-ordination is done as long as each participant does what is expected (Glouberman and Mintzberg 2001a).

In standardisation of norms socialization is used to establish common values and beliefs to ensure that people work towards common expectations. A common culture is promoted so that externalized controls are replaced by internalized attitudes (Glouberman and Mintzberg 2001a). All the participants can therefore coordinate their effort because they just know what to do. It is the most powerful way to enhance mutual adjustment. Standardisation of norms and mutual adjustment are the most effective ways for overcoming cultural and political barriers of integration.

Kodner (2009) also identifies a number of strategies for strengthening coordination as shown in table 9. Depending on the target of integration, a number of methods or tools can be used to operationalise integration. Due to the complexity of health systems integrated care interventions like TB/HIV integration usually encompass more than one target and therefore utilise a combination of these tools and methods.

Table 9: Methods and tools of integrated care

Target of integration	Methods/Tools of operation
Funding	Pools of funds Prepaid capitation at various levels
Administrative	Consolidation of responsibilities/functions Inter-sectoral planning Needs assessment/allocation chain Joint purchasing or commissioning
Organisational	Co-location of services Discharge and transfer agreements Inter-agency planning and/or budgeting Service affiliation or contracting Jointly managed programs/services Strategic alliances or care networks Consolidation or common ownership or merger
Service delivery	Joint training Centralised information Intake and referral Case management

	Interdisciplinary teamwork Integrated information systems
Clinical	Standard diagnosing criteria Uniform, comprehensive assessment procedures Joint care planning Shared clinical record(s) Continuous patient monitoring Common decision support tools (guidelines & protocols) Regular patient/family contact On-going support

3.4 DIMENSIONS OF INTEGRATION

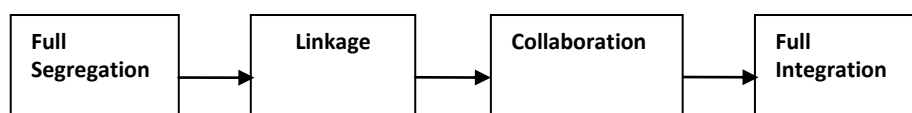
Integration is designed to create coherence and synergy between different parts of healthcare to enhance system efficiency, quality of care, quality of life and consumer satisfaction (Kodner 2009). Integration can be described in terms of what the focus is, the breadth, types, and degree. Integration efforts can be focussed on entire communities or populations irrespective of health status, vulnerable client subgroups, and patients with complex illnesses (Kodner 2009). Linking of organisations to provide clinical and functional services is done in two main ways: horizontal integration occurs when similar organisations/units at the same level of care join, while vertical integration combines different organisations at different levels (Kodner 2009; Criel, Brouwere and Dugas 1997).

Different types of integration have been described. Functional integration is the degree to which back-office and non-clinical support functions are coordinated across all units (Kodner 2009). Organisational integration represents the relationships between health care organisations to address the needs of coordination arising from differentiation (Lawrence and Lorsch 1986). Service and clinical integration on the other hand refer to coordination of services and the integration of care in a single process across time, place and discipline. Kodner

(2009) additionally describes normative integration which refers to the shared mission, work values and organisational or professional culture, and systemic integration that is about the alignment of policies and incentives at the organisational level.

The degrees of integration are often described on a continuum: from full segregation to full integration [(Ahgren and Axelsson 2005; Glendinning 2003; Leutz 1999), Figure 8]. Full segregation exists where there is no form of integration, but complete separation and autonomy of organisations and functions. Segregation develops when differentiation is allowed to progress without the necessary integration. Units become fragmented. Linkage occurs between existing organisational units. Different units and professionals understand and stick to the services they are responsible for. There is good communication between units. In health care it is aimed at effective referral of patients to the right unit at the right time to ensure continuity of care (Leutz 1999).

Figure 8: Continuum of Integration



Collaboration involves integrating existing units in a more structured form. The aim is to coordinate different services or processes, share information and to manage interfaces between these services. In health care, chains of care and other forms of health care networks are included in this form of integration. Integrating units still operate through separate structures but various strategies like appointing individual managers are used to achieve coordination and collaboration (Leutz 1999). Full Integration refers to a degree of collaboration so high that the separate

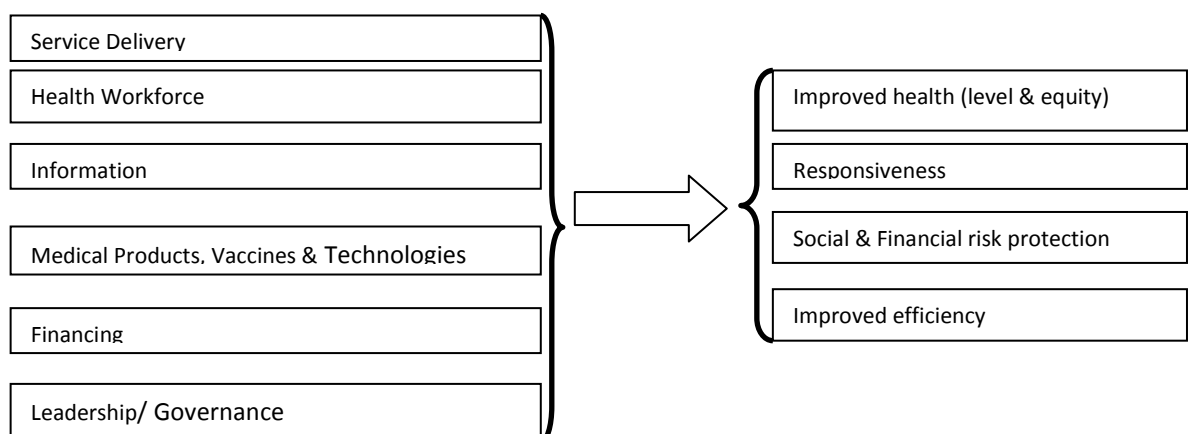
units no longer see their separate identities as significant (Glendinning 2003). Resources of different organisational units are pooled together to create a new organisation with new benefits, processes or services (Leutz 1999). Other characteristics are joint arrangements encompassing strategic and operational issues, shared or single management arrangements and joint commissioning at macro- and micro- levels (Glendinning 2003). In health care this may result in a new organisation which manages the comprehensive services that have been developed to address the needs of a specific patient group.

3.5 INTEGRATION AND HEALTH SYSTEMS

3.5.1 RELEVANCE OF INTEGRATION IN HEALTH CARE

A health system includes all the activities whose primary purpose is to promote, restore and maintain health, and the overall goals are to improve the health of the people served, be responsive to their expectations, and to provide mechanisms for fair health financing [(WHO 2007c; WHO 2000), Figure 9].

Figure 9: The WHO Health System Framework: building blocks and goals/outcomes



Service delivery is the most visible component of the health system because all the functions of the other blocks are towards more effective service delivery: the

packages, delivery models, infrastructure, management, safety and quality, and the demand for care (WHO 2007c). When the Alma-Ata Declaration on Primary Health Care was made (WHO 1978), it was described as an integral part of a nation's health system. The health system was identified as the engine for achieving health for all.

Health for all has been pursued by national health systems, but over the years the different interpretations of the concept have resulted in health services that lack equity and social justice, and have failed to improve health outcomes as expected. Health systems have also been challenged by demographic changes, new epidemics, epidemiologic transitions and escalating costs of health (WHO 2007c). They have thus become characterised by disproportionate emphasis on specialized curative care, fragmented service, and unregulated commercialisation (WHO 2008b). There has subsequently been global discontentment with health systems and what they have evolved into, resulting in calls for sustainable systems that deliver comprehensive care. Most countries are dissatisfied with the current state of their health systems. Different kinds of reforms are being introduced to make the system more responsive to user needs, yet most are really designed to bring its component parts under control—particularly financial control (Glouberman and Mintzberg, 2001). It is in the light of these challenges that the calls for reforms based on primary health care have arisen (WHO 2007c; WHO 2008a).

The integration of health care is promoted because it has the potential to address fragmentation and reduce inequity, making access to that comprehensive essential care a reality (WHO 2008a). There have been calls for a comprehensive, integrated approach to service delivery in order to tackle the impact of

fragmentation (WHO 2007b). This is a call for another look at this not-so-new concept of primary health care for the following reasons (WHO 2008a).

- Rapid technological developments have led to increasing specialisation which in turn leads to fragmentation of services. Integration is used to increase internal coordination to reduce discontinuities,
- There has been a dramatic increase in the funding for single-disease and population or group-specific programmes leading to concerns that this adversely affects less well-funded health priorities,
- Health systems have been faced with resources constraints, especially human resource shortages in low-income countries. Integration is one of the strategies for using resources as efficiently as possible,
- Some of the constraints to effective service delivery are common to several technical programmes and integration offers a way of tackling some of these challenges and achieving goals together,
- Integration is a means of organising health systems to offer universal access to a broad range of services as proposed through primary health care.

3.5.2 INTEGRATION OF HEALTH SERVICES

Integration of health services is defined as *'the organisation and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money'* (WHO 2008a). The aim here is to enhance quality of care and life, improve consumer satisfaction and system efficiency for patients with problems that cut across multiple services, providers and settings. According to Kodner and Spreeuwenger (2002) integration is a step in the process of health systems and

health care delivery becoming more complete and comprehensive. Briggs and Garner (2006) also define integration of health services as a variety of managerial and operational changes to health systems to bring together inputs, delivery, management and organisation of particular service functions. And they suggest that strategies to promote integration would ensure these services are managed together to maximise efficiency, and that they are also delivered together to increase service quality and opportunities for accessing these services.

Although many authors agree that integration in health care holds a great promise, there is a caution against unrealistic expectations (Vondeling 2004), because the complexity of health care systems and the many factors influencing integration make it very difficult to achieve and sustain (Sobczak 2002). Practical issues that need to be considered include the following (WHO 2008a):

- Integration of health services may not be appropriate but rather too risky if it is to change a working vertical programme in a wider health system that does not function well,
- The current streams of funding of health usually focus on specific interests over short time frames. Integration may not be able to demonstrate the reduction in specific diseases to attract funding,
- Integration does not mean everything has to be a part of one package and delivered in one place,
- Integration is not a cure for inadequate resources or a non-functioning system. Underlying health system problems have to be addressed,
- A lot of policies in favour of integration exist, but actual implementation has received less attention.

3.5.3 SCOPE OF INTEGRATION IN HEALTH SERVICES

The scope of integration describes the various elements and components of the integration. It describes the extent and boundaries of the integration within the different targets of integration. The scope of integration can therefore be of service tasks, management and support function, or of organisational components (Table 10).

Table 10: Scope of integration in health services (WHO 1996)

Scope	Description
Integration of service tasks	<ul style="list-style-type: none"> ▪ multipurpose clinics instead of special-purpose clinics ▪ multipurpose staff instead of specialised staff for each function ▪ integration of certain service functions previously confined to specific service facilities or levels.
Integration of management and support functions	<ul style="list-style-type: none"> ▪ intersectoral planning and development of programmes ▪ budgetary and financial processes that allocate resources to multipurpose programmes ▪ information systems which report on all the services delivered, and which are used as management tools ▪ in-service training of staff to upgrade skills in several areas of service responsibility ▪ multipurpose supervisory visits that deal with all elements of the services ▪ research plans that cover the overall health systems needs.
Integration of organisational components	<ul style="list-style-type: none"> ▪ integration of the efforts of different resource providers through coordinating mechanisms ▪ integration of health and other development efforts across several sectors ▪ integration of health care into community and family activities.

3.5.3.1 Integration of services tasks

This refers to the integration at the point of service delivery and it advocates the establishment of multipurpose clinics manned by staff trained with different skills to perform multipurpose functions. The health workers are therefore able to offer a wide range of services but no specialised care in any specific area. Where specialised care is needed, patients are referred to the appropriate places. This

ensures that a comprehensive service is delivered with each visit, especially for patients who need different services. It also maximises the use of health staff, and uses resources more efficiently and effectively because tasks are not duplicated. In the integration of TB and HIV for instance it is mainly of service delivery tasks between the two programmes.

3.5.3.2 Integration of management and support functions

This type of integration refers to the planning and development of inter-sectoral health programmes. It involves designing budgetary and financial processes to allocate resources to multipurpose programmes. It may also be the installation of information systems that would report on all services and not a multitude of systems each reporting on only one service. In this kind of integration staff development planning and supervisory visits targets all the different elements of the services.

3.5.3.3 Integration of organisational components

Here the main focus is integrating health services with other health or non-health services like social care, and the management of this interface. Health care may be integrated with other developmental efforts, or into community or family activities. Care therefore becomes continuous and holistic, especially for people with chronic conditions requiring different services.

3.5.4 BARRIERS TO INTEGRATION IN HEALTH

The barriers to organisational integration may be political or as a result of the level of differentiation and specialisation, and these barriers can be in reference to individual members of the organisation or the organisation itself as an entity [(Barki and Pinsonneault 2005), Table 11].

Table 11: Barriers to integration of health services

Type	Individual	Organisational
Structural	Number of staff or patients Calibre of staff Number of patients / workload Individual resources	Administrative systems, processes and boundaries in the health system Rules and regulations Organisational structure of facilities Organisational processes Available Resources
Cultural	Professional values and interests Individual staff commitments Patient beliefs, attitudes and commitments	Shared cultures, expertise and norms Differing goals among units
Political	Loss of power base Lack of interest Loss of functional territory Perceived exclusion	Loss of resources Loss of power Inequity
Operational	Impact of drug treatment Mode of delivery Process of care	Preparedness of the health system/facility Adequacy of monitoring and feedback systems Guidelines and protocols availability

Differentiation and specialisation, although necessary for the functioning of a health system, result in differences in goals and frames of reference that promote the development of a local focus, shared culture, shared expertise and expectations (Glouberman and Mintzberg 2001). This then leads to disconnection due to unreconciled values, incompatible structures and intransigent attitudes (ibid). The barriers to integration arising from differentiation are often cultural or structural (Axelsson and Axelsson 2006; Barki and Pinsonneault 2005). Structural barriers arise from the differences in administrative boundaries, laws, rules, regulations, budget and financial streams, information systems and databases that develop within the organisation making it difficult for units to coordinate or collaborate (Barki and Pinsonneault 2005). Structural barriers may also be due to the lack of adequate number of qualified staff, especially at the point of service delivery. Structural barriers can be overcome by formal agreements, rules,

regulations and financial support (Glendinning 2003), as well as with standardisation of work, output, skills and knowledge.

Cultural barriers arise from the differences in professional and organisational cultures, values and interests, as well as commitment of individuals and groups within the organisation (Glendinning 2003). Differentiation leads to the development of local focus and shared expertise within units, therefore members in these units develop specialised skills and core competencies in specific areas. There may therefore be a perceived lack of skill and the fear of moving into new territories that will be expressed as resistance to the change that integration brings. Cultural barriers are the most difficult to overcome (Dong et al. 2007). Standardisation of norms is useful in creating new values and cultures to facilitate change and so integration is by courting support from all stakeholders to do things differently and create new lived experiences (Anderson-Wallace and Blanter 2005).

Political barriers are a result of the fear of loss of resources, loss of power due to shared information, and the loss of functional territories (Barki and Pinsonneault 2005). This engenders resistance to change and lack of cooperation from the members of the units or organisations being integrated. External political decision-making concerning financing and resource allocation may lead to inequity and therefore lack of adequate resources to support or sustain integration.

Operational barriers include the model of service delivery, and the impact of treatment. The one-stop shop as described in Chapter 2 (p. 37) is more user-friendly and hence leads to improved access as well as utilisation. However this

results in high attendance at these clinics making waiting times even longer. On the other hand, the referral system is usually more costly to users in terms of time and money, increasing the risk of attrition and default. Other operational barriers arise from the implications of being managed for both TB and HIV. First of all TB treatment lasts between 6 and 8 months (NTP & NACP 2007), while HIV is classified as a chronic condition requiring lifelong management; and therefore a high level of personal commitment and resolve is required for successful TB/HIV integration.

Secondly, unwanted effects of drug treatment like adverse drug reactions, immune reconstitution inflammatory syndrome (IRIS), or drug-drug interaction between TB and HIV impact directly on the outcome of TB/HIV collaborative activities (Lawn et al. 2007). Lack of a health system's preparedness for integration in terms of adequate resources, infrastructure, treatment guidelines and appropriate monitoring and feedback mechanisms are major barriers to integration of TB and HIV services (Kodner and Spreeuwenberg 2002).

3.6 TB/HIV INTEGRATION AS A COMPLEX INTERVENTION

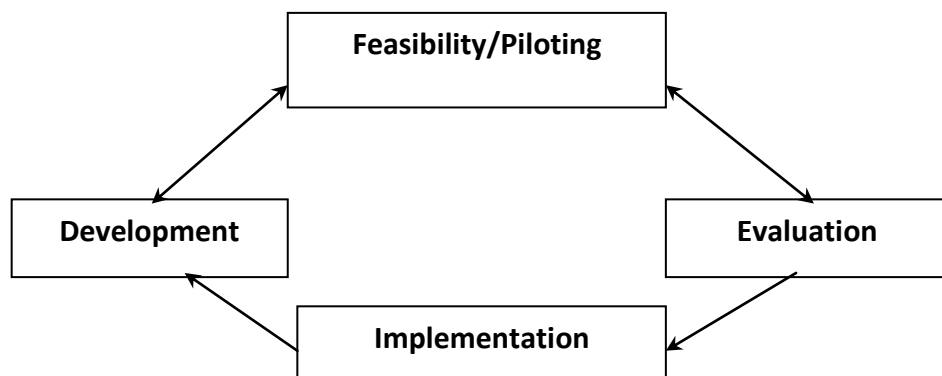
A complex intervention is defined as one that has several interacting components. The complexity may be with respect to the number of and interactions between the components, the number of groups or organisational levels targeted, or the number and variability of outcomes (Craig et al. 2008). These complexities have implications for the development and evaluation of these interventions as outlined below:

- A good theoretical understanding of how change occurs is necessary,
- Implementation failure can be misconstrued as ineffectiveness,

- Variability in individual level outcomes may be as a result of higher level processes,
- A range of outcome measures is required, and
- Local adaptation may be required.

Therefore for successful development and effective evaluation, the new Medical Research Council (MRC) guidance proposes four main stages: development, feasibility or piloting, evaluation, and implementation (Figure 10). The first stage is development of the intervention which is intended to identify the evidence base, identify or develop the relevant theory, and model the processes or outcomes. This stage ensures that the intervention can reasonably be expected to result in a worthwhile effect (Craig et al. 2008).

Figure 10: Development-evaluation-implementation process of complex interventions (Craig et al. 2008)



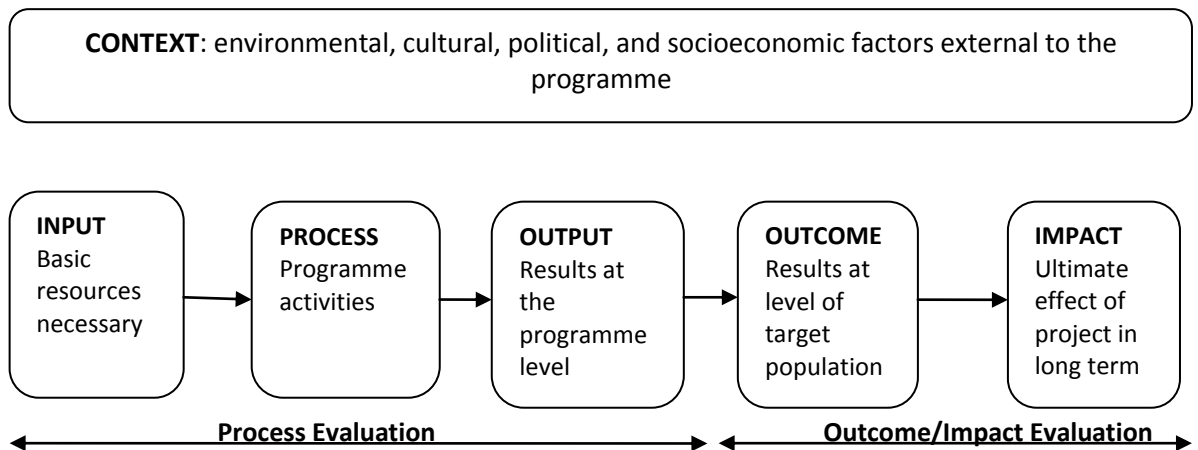
In the second stage the feasibility of the intervention can be assessed and the methods piloted: acceptability of procedures is tested, recruitment or retention rates can be estimated, and sample size can be determined. This stage can therefore be used to address any uncertainties identified in the previous stage and anticipate issues that can undermine the next (Craig et al. 2008). After feasibility

and piloting appropriate study designs can be used to assess effectiveness, understand the change process through process evaluation, and assess cost effectiveness in the evaluation stage (Craig et al. 2008). Implementation, the next stage, involves two main components. The first is dissemination to get evidence into practice. The second component involves surveillance and monitoring to observe unwanted side effects and long term outcomes, which then feeds back into the development. This is therefore a cyclical rather than a linear process. (Craig et al. 2008).

TB/HIV integration is a complex intervention because of the different components and their interactions, the different target populations, and the variety of outputs and outcomes. On account of its aim and objectives, this study can therefore be located in the feasibility/piloting stage in the development-evaluation-implementation process in figure 10 above. Specifically this study involves a piloting of methods of evaluation as well as a study of factors influencing the delivery of the intervention.

3.7 CONCEPTUAL FRAMEWORK

The conceptual framework of this study is an expansion on the input-process-outcome logic model for monitoring and evaluating programmes (Figure 11) as recommended by the WHO.

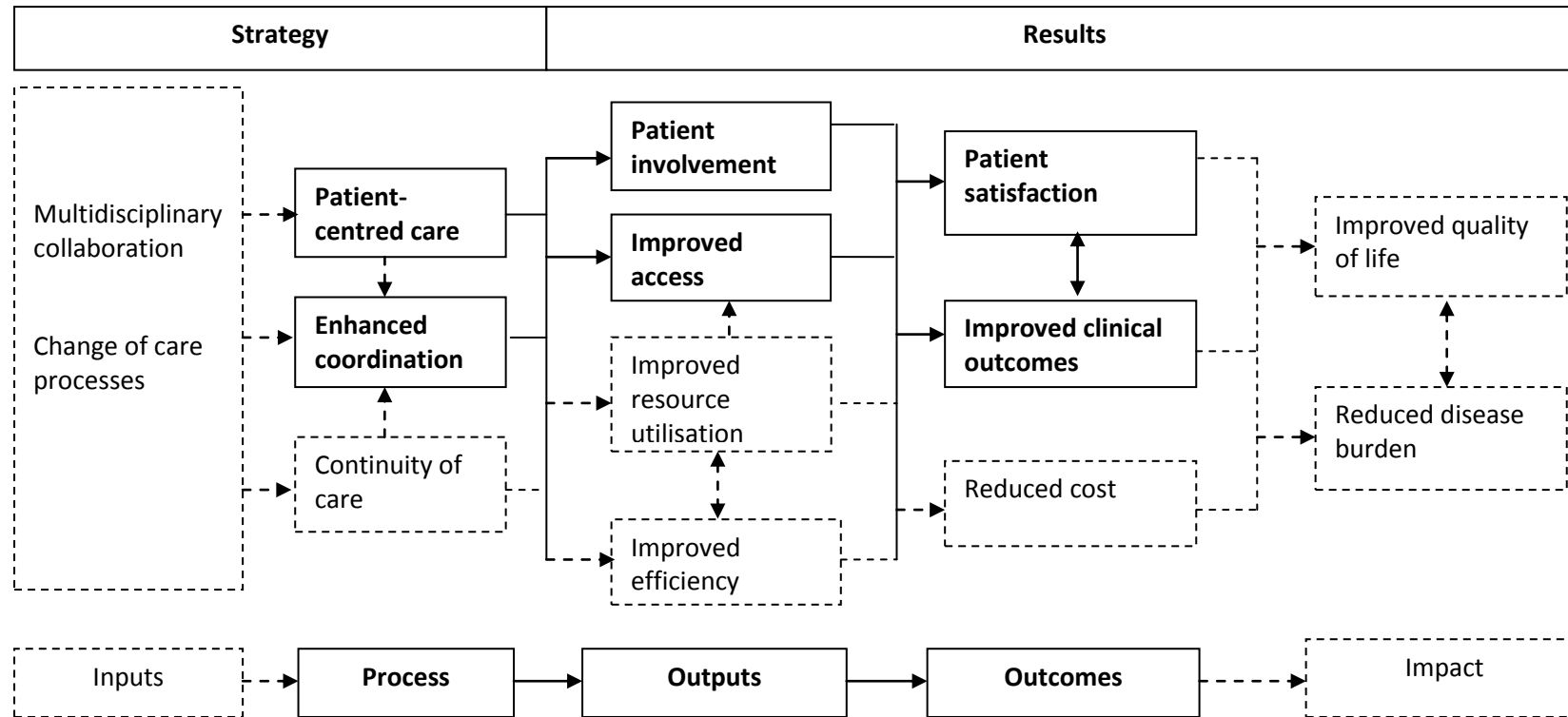
Figure 11: Framework for programme monitoring and evaluation (WHO 2004a)

The WHO framework (Figure 11) describes the elements of health programmes in terms of inputs, processes, outputs, outcomes and impact. Inputs refer to the core ingredients like human and financial resources, physical facilities, equipment, clinical guidelines, and operational policies. Processes refer to the multiple activities that are carried out to achieve the objectives of the program. It includes both what is done and how well it is done. Outputs are the results of program-level efforts, such as the number of activities conducted. Service delivery outputs may measure the volume of services provided to the target population, as well as access and quality of care. Outcomes measure changes at the population level, some or all of which may be the result of a given program or intervention. Impact refers to program results achieved among the target population and to what extent these achievements can be attributed to the intervention. (WHO 2004a, b).

As stated earlier, the conceptual framework for this study (Figure 12) is based on the model in figure 11 above. The elaboration on the model to develop the conceptual framework is based upon the strategies to achieve integrated care, as well as the anticipated results of integrated care. Inputs in integration are intended to establish multidisciplinary collaboration and provide the guidelines for change of

the care pathways. In integrated care the emphasis of the redesign of the processes is to make care more patient-centred, to enhance coordination, and to establish continuity of care. These are the underlying assumptions of integration that are anticipated to achieve the results which are described in the form of outputs, outcomes and impact.

Figure 12: Conceptual framework of integrated care



Key:

—▶ Focus of research

- - -▶ Other components of integrated care

↔ & ↔ Interdependence

Outputs of integrated care are improved resource utilisation, improved efficiency, improved access (Kodner 2009; WHO 2008a) and greater patient involvement (Pelzang 2010). These are all essential anticipated benefits of integrated care as they directly influence the programme outcomes which are improved clinical outcomes, reduced costs and patient satisfaction with care. Long term outcomes (or impact) of integrated care as a health improvement intervention include improved quality of life and the reduced disease burden in the population.

The strategies of integrated care are multidisciplinary collaboration and change of the care process, and these make care more patient-centred, improve continuity of care, and enhance coordination. The effects of these are then represented as the results of integrated care as related to the outputs, outcomes and the impact of integration. The conceptual framework of the study therefore depicts integration as a strategy for improving health care, showing the mechanisms by which the strategy is expected to achieve results, and relating these to the existing model for evaluating TB/HIV integration as defined by the WHO.

The conceptual framework of integrated care described above forms the basis upon which the appropriate study methods are identified. These methods are described in the next chapter.

4 STUDY METHODS

4.1 INTRODUCTION

Research in medicine and health has predominantly used quantitative methods of data collection based on positivism, but increasingly health researchers are using qualitative methods. This has been in response to the fact that lifestyle is a major determinant of health, and problems in public health especially are those of human behaviour rather than the challenges of developing new technical interventions (Green and Thorogood 2009). Health researchers are therefore turning to qualitative methods of social inquiry in addition to the traditional quantitative methods so as to better understand health, health behaviour and health services, and to improve the management and provision of health services (Green and Thorogood 2009).

It is however important that health research methods are theoretically sound and able to achieve the research objectives. This chapter and the next have therefore been used to address the methods and research settings of this study. On this basis, this chapter has been written to demonstrate how the methods of this research have been informed by the theoretical framework in the previous chapter, and how it will answer the research objectives and questions stated in Chapter 1. This chapter therefore identifies the research approach used and why, followed by a discussion on the specific research designs and data collection methods. Subsequent sections discuss data analysis and the methods and procedures used

for this purpose. The last two sections describe the rigour of the study, the ethical considerations and the limitations of the methods used.

4.2 RESEARCH APPROACH

A mixed method approach was used in this study and the paradigm of this approach is pragmatism. In pragmatism the main focus is solving problems so the emphasis is on 'what works' or drawing on 'subtle realism' which accommodates both qualitative and quantitative methods (O'Cathain and Thomas 2006). Research methods in pragmatism are therefore not predefined but depend on the problem and the research objectives (Creswell 2008a). Pragmatism is therefore about freedom of choice to draw on different approaches and procedures for what best serves the purpose of the research. Mixed methods research draws its strength from the theoretical and methodological differences of qualitative and quantitative approaches to generate more insight from one study than can be achieved by using either one on its own (O'Cathain and Thomas 2006). I therefore used mixed methods research and the pragmatic approach for the following reasons:

- This research is a problem-oriented one that seeks to address specific problems arising from public health practice and programme implementation. The choice of methods was therefore driven by the research objectives arising from the theoretical framework to provide a more holistic and meaningful picture of TB and HIV integration,
- A mixed methods approach is useful to explore and understand barriers to the implementation of complex interventions like TB/HIV integration in

order to refine evaluation designs as part of the feasibility and piloting phase identified in figure 10 above (p. 83),

- The approach provided the flexibility to broaden the scope of my research questions to understand the factors underlying programme outputs and outcomes to enhance the relevance of this research to policy (O'Cathain and Thomas 2006),
- The significance of the role of a patient in the management of chronic conditions is well established (WHO 2005). Mixed methods approach provides a means to better understand the role of the HIV-associated TB patient in their management so as to inform and design appropriate strategies to empower them to effectively fulfil this role,
- This approach also enabled me to choose from different methods and procedures (Creswell 2008a), and to decide when to integrate the data from the different methods used in order to provide a comprehensive understanding of the TB and HIV integration (Tashakkori and Teddlie 2009),
- Quantitative methods alone cannot accurately capture the diversity of goals, objectives and service inputs which contribute to health care outcomes (Bowling 2009). Therefore, the use of this approach is a means of achieving more relevant evidence.

4.3 MIXED METHODS DEBATES

There are two major debates about mixed methods as an approach to research. The first relates to its legitimacy as a research approach, and the second is about defining it.

4.3.1 LEGITIMACY OF MIXED METHODS RESEARCH

According to Lincoln and Guba (2000) different research paradigms and philosophies are not commensurable and therefore cannot be integrated. They are therefore of the opinion that methods can be mixed only within paradigms. Green and Thorogood (2009) also state that qualitative research is often rooted in rather different epistemological traditions which depart from one or more tenets of positivism and quantitative research. The opinion is that qualitative and quantitative researches originate from two different ontologies and epistemologies, and therefore cannot be used together. These seemingly 'opposing' paradigms have resulted in a qualitative-quantitative divide which has in turn fuelled a lot of methodological debates (Bergman 2008).

However another school of thought is that there is a qualitative-quantitative continuum of research approaches determined by the degree of inductive-deductive logic, subjectivity and value-addedness (Tashakkori and Teddlie 2009). Bergman (2008) suggests that the major source of the qualitative-quantitative debates is the linking of qualitative and quantitative methods with interpretive/constructivism and positivism respectively. And Onwuegbuzie and Teddlie (2003) are also of the opinion that the qualitative-quantitative debates arise from the confusion of the logic of justification with research methods. The research process is a complex and compromise-laden one that makes a clear distinction of qualitative and quantitative research too simplistic (Bergman, 2008). Johnson and Onwuegbuzie (2004) categorically reject an incompatibilistic either/or approach in favour of a more pluralistic or compatibilist approach.

Contemporary research is applied and problem-oriented: funded research is done more for the answers they provide for specific problems than for the sake of the knowledge itself. Under such circumstances these distinctly defined and exclusive paradigms become a constraint, and often mixed methods researchers *'have to maintain a strangely schizophrenic position towards the division of labor between qualitative and quantitative methods.'* (Bergman 2008, p. 14). Pragmatists do not allow paradigmatic boundaries to constrain them, but rather see qualitative and quantitative methods as a large and heterogeneous family of methods (Bergman 2008). Pragmatism challenges the very way in which we perceive research. Mixed methods approaches offer a useful philosophical and methodological middle position, they offer a practical outcome-oriented method of enquiry, as well as a method for selecting methodological mixes that can help researchers better answer research questions (Johnson and Onwuegbuzie 2004). Bergman (2008) therefore advocates for a rethink of the qualitative-quantitative divide for a better understanding and utility of these methods and justifies mixed methods research as follows:

- Nature of reality should be delimited only by the specifics of the research goals,
- Defining research approaches as paradigms is restrictive and misleading as researchers then tend to associate specific data collection and analysis methods with certain paradigms,
- The division between qualitative and quantitative methods is problematic, and based on questionable premises,

- Many assumptions behind qualitative and quantitative methods limit the application of the individual data collection and analysis techniques,
- Qualitative and quantitative methods should be regarded as a large and heterogeneous resource to unravel complex research aims and objectives,
- Mixed methods should not be about justifying 'inconsistent' research designs but should be an opportunity to explore the possibilities and limits of qualitative and quantitative methods.

4.3.2 DEFINING MIXED METHODS RESEARCH

The debate about the definition of mixed methods research centres on what is done and how it is done. Tashakkori and Teddlie (2009) define mixed methods research as one in which the investigator collects data, integrates findings and draws references using both qualitative and quantitative approaches or methods in a single study or program of inquiry. Most definitions refer to the use of both qualitative and quantitative approaches, data collection and analysis methods (Creswell 2008a; Johnson, Onwuegbuzie, and Turner 2007; O'Cathain and Thomas 2006). Some theorists are of the opinion that using different qualitative or quantitative methods should also qualify as mixed methods research (Brannen 2008; Johnson, Onwuegbuzie, and Turner 2007; O'Cathain and Thomas 2006).

Another key issue is the integration of these methods, and the level at which this is done. Some identify mixed methods as only those studies in which integration occurs throughout the study, and not just during interpretation: in which case it may be described as multiple methods or quasi-mixed methods (Tashakkori and Teddlie 2009; Johnson, Onwuegbuzie, and Turner 2007).

For this research mixed methods research is defined as one that uses both qualitative and quantitative methods which may be integrated throughout or during interpretation to address different research questions targeted at providing different types of evidence to achieve the study objectives.

4.4 RESEARCH DESIGN

4.4.1 INTRODUCTION

The aim of the study is to gather evidence for the improvement of the integration of TB and HIV services in Ghana so as to facilitate effective implementation and nation-wide scale-up. The objectives are to explore the effect of integration on TB and HIV service delivery, to compare the impact of different delivery models on TB/HIV integration, and to explore the influences of provider- and patient-related factors on the outputs and outcomes of TB/HIV services integration. A mixed methods approach has been chosen to address these objectives. This section of the chapter describes the mixed methods design used and explains the rationale behind the choice.

4.4.2 CHOICE OF RESEARCH DESIGN

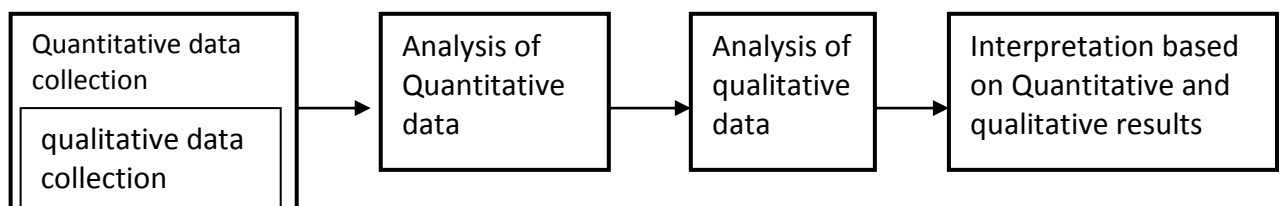
The pragmatic approach to this research has been driven primarily by the aim and objectives, as well as the anticipated application of findings in Ghana and their transferability. The research is an embedded mixed methods study made up of a natural experiment composed of before-and-after studies at three study sites, and a qualitative study at each of the sites as well. This design has been used based on appropriateness, feasibility and practicality.

- An embedded design (Figure 13) is used because different research questions require the different data sets to produce knowledge on different aspects of TB/HIV integration over a relatively shorter time (Creswell and Clark 2007),
- An embedded design provided the opportunity to collect the data concurrently to interrogate the different aspects of the theoretical framework, and also use qualitative data to explore some of the early quantitative findings. I did not use an explanatory or exploratory design because there was not sufficient time and resource for a sequential study, i.e. doing the quantitative study followed by a qualitative one, or vice versa,
- A natural experiment was appropriate because the study was being latched on to a service delivery intervention that was already on-going. Achieving randomisation and standardisation was not a primary design objective because this study was intended to explore the factors influencing the delivery of the intervention, and to pilot methods of evaluation. A randomised controlled trial was therefore not appropriate,
- A quasi-experimental before-and-after design was used at the individual study sites. This design cannot be used to draw causal conclusion because of the presence of confounders and the lack of randomisation. However as a pilot study, the findings will inform and further improve the intervention and evaluation. Also hypotheses could be generated to direct future research,
- Interrupted time series was also not done because although there were sufficient data points, the intervention included a number of components,

and was still on-going. Secondly the resources required to use such a design were not available to the student at the time of the research,

- Prospective or retrospective controlled studies were not done because there was not enough time available for identifying appropriate controls and then monitor effects of the intervention over extended periods in order to draw conclusions on the causal associations between the variables,
- Even though descriptive study designs are usually cheaper to do and can be done over a short time period, the designs are not as robust as the before-and-after study.

Figure 13: Diagram of mixed methods study design as applied (adapted from Creswell and Plano Clark 2007)



4.5 DATA COLLECTION

4.5.1 PARTICIPANTS

4.5.1.1 SITE SELECTION

TB and HIV integration had been piloted in a few districts which were to serve as learning sites for nationwide scale-up. The aim of sampling was therefore not to achieve a statistically representative sample, but to identify sites and cases that are likely to produce the most valuable data to improve integration. Purposive sampling was used to achieve this.

Three hospitals were purposively selected and used for the study primarily because, even though they are the first referral levels in the health system, they

deliver primary care services as well as serve as referral centres for primary care in Ghana. Also currently the decentralisation of HIV care, especially ART, is at the level of the district hospital. Therefore it is only at this level that all the models of delivery being studied can be described. The main inclusion criteria were thus the presence of a TB centre, the use of the new TB register, and the availability of ART services at the HIV centre.

Out of the 7 district hospitals in the region which had both TB and HIV services with ART. The three selected sites were the only sites that described the three models of service delivery to be studied and had started using the modified TB register. Matching of the sites were as follows: they had TB units, they had HIV units providing ART, had started using the new TB register, were hospitals that delivered both primary care, and specialised clinical and diagnostic care. Other inclusion criteria were having staff who had undergone training in TB/HIV co-infection and management, urban locations, and the use of the national guidelines on the management of TB and HIV.

4.5.1.2 STUDY POPULATION & PARTICIPANT SELECTION

Participants of the quantitative study included all TB patients registered at all the 3 study sites from January 2006 to December 2008. As the target of the study was service delivery processes and how these were reflected in outputs and outcomes, individual participant characteristics were not of primary interest in selection. And therefore all registered patients were included.

4.5.1.3 QUALITATIVE STUDY PARTICIPANT SELECTION

All TB/HIV patients who were registered at the 3 sites as well as providers working during May – July 2009 when the interviews were done were included in the

sampling frame. Purposive sampling was then used here too to identify eligible participants based on the inclusion criteria in table 12. The intention was to get a good mix of male and female patients in both phases of treatment. This sampling approach provides the flexibility to focus on participants critical to answering the research questions (Denscombe 2007). Though it does not give representative samples it provides rich data that is not otherwise available through other sampling methods, and data may be transferable to other relevant sites.

Table 12: Interview participants

Type of participant	Number	Inclusion criteria	Exclusion Criteria
Service providers	8	Facility TB/HIV co-ordinator DOTS centre treatment room nurse HIV centre nurse/physician Trained in TB treatment or HIV clinical care Training on TB/HIV co-infection	Not currently active in clinics
Patients	18	TB patients who are: <ul style="list-style-type: none"> - HIV positive - Male or Female - Completed at least a month of the intensive phase or in the continuation phase 	Critically ill patients
National Leadership	3	Programme Manager, NTP Programme Manager Rep, NACP National TB/HIV Coordinator	None

At each site eligible patient participants identified from the TB registers were approached to participate through their telephone contacts or during a scheduled visit. This initial contact was made by one of the TB/HIV team members because recruitment to participate would have been adversely affected if patients were approached by 'strangers' to talk about confidential and personal experiences with TB and HIV both of which are highly stigmatised. During this initial contact the study was introduced to them and they were invited to participate. Once an initial

verbal consent was achieved a date for the interview was scheduled. On the scheduled interview date a more detailed introduction and explanation of the study was done by the researcher and informed consent obtained by signature or thumbprint before each interview. For the referral site this initial contact was made during a weekly trip with the hospital outreach team to visit patients. These trips are part of the activities involved in the monitoring of community-based care. I therefore travelled with this team as they went on their trips. For those who agreed to participate, the interviews were held the same day, but in the absence of the members of the outreach team.

Twenty nine (29) interviews were held with three categories of participants (Table 12). There was a category of key informants from the national leadership. This included the Programme Manager of the NTP, the National TB/HIV Co-ordinator, and a senior official from the NACP. A second group of interviewees comprised TB/HIV team members in the three districts. The 8 members interviewed included one district TB coordinator, 3 TB team leaders, 2 VCT centre leaders and 2 other TB centre nurses. A total of 18 TB/HIV patients made up the third category: 5 were in the intensive phase of TB treatment and 13 in the continuation phase. There were 8 females and 10 males.

4.5.2 INTERVENTION

As noted in the preceding section, this study involved all TB patients registered at the TB treatment centres of each of the study sites 17 months before and 19 months after the intervention, as well as the facility TB/HIV team members and the national managers. The research studied integrated TB/HIV care as delivered from TB treatment centres in the three study sites. The TB/HIV intervention in this

research is defined as follows: fixed dose combination (FDC) therapy for all registered TB cases, provider-initiated counselling and testing (PICT) of all registered TB cases for HIV, initiation of co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) for all eligible HIV-positive TB cases, as well as the use of the modified TB register.

At the three sites therefore, the different service delivery models had different implications for the delivery of the intervention defined above. All three sites had already started using the new and modified TB registers which recorded the TB/HIV activities. Table 13 below describes how the other TB/HIV care components in the intervention were delivered according to the different service delivery models and showing where the different components of the TB/HIV intervention can be assessed.

Table 13: TB/HIV intervention delivery at TB treatment centres at study sites

Characteristic	One-stop shop	Partial integration	Referral
HIV Pre-test counselling	Available	Available	Available
HIV testing	Available	Referral to HIV unit	Referral to HIV unit
CPT initiation and/or continuation	Available	Available	Referral to HIV unit
ART initiation and/or continuation	Available	Referral to HIV unit	Referral to HIV unit

4.5.3 DATA COLLECTION METHODS

Secondary data was recorded from patient records in the hospitals, and semi-structured interviews were conducted with both providers and patients. Anonymous data collected from routine programme data was used as secondary data because it provided readily accessible data so that a lot of information was collected over a short period of time. Direct observation and measurement could

have been done prospectively and in real time but this would mean more time and money than was available for the PhD. Secondary data was therefore most appropriate for the quantitative study. The major disadvantages of this choice are associated with the quality of the data, its completeness, its relevance to the purpose of the study, and then accessing the data. These problems were addressed by tracing the individual patient folders where possible and using them to complete entries, restricting data collection to only relevant portions of what was available, and establishing relationships with providers at the national, regional, district and facility levels.

One-on-one semi-structured in-depth interviews were used as the tool for qualitative data collection. Interviews are an effective way of generating target-specific data, especially where key informants are used. The interviews will therefore give me the patient's perspective of TB and HIV integration, although it only tells what people say they do and not what they actually do. Also it may be flawed by poor recall on the part of participants, or biased if questions are poorly constructed.

Focus group discussions (FGDs) were not included because there is no obvious advantage in terms of additional information. This is because both TB and HIV are highly stigmatised conditions and therefore the usefulness of FGDs with patients would be limited by unwillingness to disclose in a group. Among the providers, the above would not be a hindrance, but the challenge would be getting all team members in such a discussion for a useful length of time because they tend to be few and very busy. This busy schedule of providers however did not

prevent one-on-one interviews with them as the interviews were arranged at their individual convenience and availability.

4.5.2 PREPARATION

In order to enhance the relevance of the study and promote uptake of findings by the national programmes the TB and HIV control programme managers, and the national TB/HIV coordinator had been consulted and included in the study as much as possible from the very beginning. A visit was paid to the National TB/HIV coordinator and the NTP manager to discuss the TB/HIV programme in order to identify the needs of the programmes, to establish a collaborative relationship, and to engender a sense of ownership on their part.

Preparing for the actual data collection involved identifying a sampling frame and visiting all possible study sites and getting approval and access to conduct the study. The National TB-HIV co-ordinator, was contacted for a comprehensive list of all health facilities in Ghana providing both ART and TB services. Seven of the hospitals on this list were in the region of interest, namely the Eastern Region. All seven hospitals were then visited in May - June 2008 for an informal interaction that was to help identify which specific facilities would be suitable: 3 sites were selected. Approval to conduct the study was then sought from each facility through the Regional Deputy Director of Health, after which ethical approval from the Ghana Health Service was also applied for and granted. Subsequently I visited all the three sites again to interact with the individual TB/HIV team members to introduce the study and notify them of the data collection.

4.5.4 QUANTITATIVE DATA COLLECTION

4.5.4.2 QUANTITATIVE DATA INDICATORS

There were 5 indicators (Table 14) used in this study: 3 output and 2 outcome indicators. These indicators were identified from the set of indicators developed by the WHO and selected for use in Ghana's TB/HIV collaborative activities policy guidelines (Ghana Health Service 2007; WHO 2004a, b). The output indicators of this study relate to screening of TB patients for HIV, co-trimoxazole prophylaxis for those found to be positive, and how many go on ART (Table 14). The outcome indicators used in this study are TB treatment success rate in all cases and in HIV positive cases.

Treatment success measures a program's capacity to retain patients through a complete course of chemotherapy with a favourable clinical result. It is useful because it is the only outcome indicator that can be used at all levels (e.g., from operational level to international level). There is a direct and immediate link between this outcome of treatment success and the impact of reduced TB mortality. For new smear-positive cases, there is a target of 85% treatment success, based on what can be reasonably achieved assuming the baseline proportion of adverse outcomes (including death, failure and default) to be about 15%. The 85% level formally became a global target via the World Health Assembly resolution of 1991 but has been revised in the Global Plan to Stop TB 2011 - 2015 (WHO 2010a).

Table 14: Quantitative indicators

Indicator	Definition	Numerator	Denominator	Relevance
Proportion of TB patients with known HIV status	Percentage of TB patients who had an HIV test result recorded in the TB register.	Number of TB patients registered during the reporting period who had HIV test result recorded in the TB register.	Total number of TB patients registered during the reporting period.	Measures HIV status of TB patients. Knowledge of HIV status enables HIV-positive TB patients to access appropriate HIV care and support services.
Proportion of HIV-positive TB patients who receive CPT	Number of HIV-positive TB patients who are started on or continue previously initiated CPT, during TB treatment, expressed as a proportion of all HIV-positive TB patients registered over the reporting period.	Number of HIV-positive TB patients, registered over the reporting period, starting or continuing CPT treatment during their TB treatment.	Total number of HIV-positive TB patients registered during the reporting period.	To monitor commitment and capacity of programmes to provide CPT to HIV-positive TB patients.
Proportion of HIV-positive registered TB patients given ART during TB treatment	Number of HIV-positive TB patients who are started on or continue previously initiated ART during their TB treatment, expressed as a proportion of all HIV-positive TB patients registered over the reporting period.	All HIV-positive TB patients, registered over the reporting period, who receive ART (are started on or continue previously initiated ART).	Total number of HIV-positive TB patients registered during the reporting period.	Outcome indicator to measure commitment and capacity of TB services to ensure that HIV-positive TB patients are able to access ART.
Treatment success rate (in all cases and in HIV-positive cases)	The percentage of a cohort of TB cases registered in a specified period that were cured or completed treatment.	Number of TB cases registered in a specified period that were cured plus the number that completed treatment	Total number of TB cases registered in the same period	Measures a program's capacity to retain patients through a complete course of chemotherapy with a favourable clinical result.

Output indicators measure what is actually done in giving and receiving care and so result from inputs and processes of the intervention. Output measures are useful for explaining differences in outcomes for particular providers. The main advantages of these measures are that they are more sensitive to small differences in service delivery, and they can be used in a short time frame (Mainz 2003; Mant 2001).

Outcome indicators measure changes in health status that can be attributed to care (Mainz 2003; Donabedian 1978). Broader perspectives include health-related knowledge, attitudes and behaviour of clients, and patient satisfaction with care. Outcome measures are useful for studying whole system performance and for detecting problems in the implementation of processes of care. They are advantageous because their validity as dimensions of quality are well established and they can be precisely measured (Donabedian 1966). The major disadvantage of outcome measures is that they are unable to distinguish between health care-related influences and others. They are described as having a low signal to noise ratio, i.e. they are likely to be affected by factors other than health-care related factors (Lilford, Brown and Nicholl 2007).

4.5.4.3 DATA COLLECTION PROCESS

The quantitative data collection involved creating a data set in Microsoft Excel of all TB cases registered at each of the study sites between January 2006 and December 2008 using the relevant variables in the facility TB registers. For the purposes of this study the point of reference of TB/HIV integration was June 2007 when the new register to monitor TB and HIV activities was introduced at each of the three facilities. The specific point to describe the introduction of the intervention was a

particular challenge. This is because as a complex intervention different activities including staff training had taken place prior to this study, and the use of the new registers which started in June 2007 was one activity directly related to programme outputs and outcomes. The use of June 2007 as the point of reference was therefore a choice appropriate for use with secondary data collection and for matching. Therefore the target coverage of data collection was 17 months before, and 19 months after integration.

4.5.5 QUALITATIVE DATA COLLECTION

4.5.5.1 PILOTING OF TOOLS

Piloting of the patient and TB/HIV-provider consent forms and interview guides was done in Legon Hospital which is also an urban-based district hospital with TB and HIV services located in the Greater Accra Region which is adjacent to the Eastern Region where the study was based. The pilot study was primarily intended to test the clarity and appropriateness of the questions. It involved 2 female TB/HIV providers, and 4 TB/HIV patients made up of two males and two females. The patients were identified from the TB register and approached to participate during their scheduled visits. One-on-one audio-recorded interviews were held at the hospital. The pilot study was used to refine the consent form and interview guides prior to data collection.

4.5.5.3 DATA COLLECTION PROCESS

During each interview, the aims and objectives of the study were explained again to all participants and written consent obtained after the information sheet had been read or translated to participants in their preferred language. Particular attention was given to explaining to the patient participants that they were not

obliged to participate. This was done to mitigate the impact of the recruitment process which may have inadvertently coerced some patients to participate. Further clarification and emphasis was made on the use of the information, as well as measures instituted to preserve the privacy and confidentiality of participants. Consent was also sought for each interview to be audio-recorded.

Managers: All the interviews with the managers were pre-arranged by telephone and appointments booked. The interviews were all held in English and they took place in the offices of the participants. The three interviews lasted about an hour each and they were all audio-recorded after they had each approved of that. These interviews were held after those with users and TB/HIV team members. The main aim was therefore to bring to their attention issues that had been raised in previous interviews, and seek their perspectives on resolving them. I also inquired about barriers of integration at the management level, as well as the future directions of the programme.

TB/HIV Team members: these interviews were also all held in English and they took place in the TB or HIV centres for the partially integrated and referral sites and in the nurses' office in the one-stop shop. As noted earlier, in all cases informed consent was sought prior to the interview, and all of them were recorded using a voice recorder. To encourage an honest discourse from providers, I reiterated my role as a researcher and not there in a capacity to make judgements on their individual performance or personal opinions. I began the interviews by asking participants to tell me a bit about themselves, and then about the team. These were then followed by questions about the services they deliver and their

experiences. Prompts and probes were used to clarify responses and to prevent straying from the topic. These also lasted between 30 and 60 minutes each.

Patient Interviews: the interviews with the patients mostly occurred in the facilities in two sites, but in the homes of patients in the referral site. Most of these interviews were held in Twi my local language; with a few in Ga Dangme. An interpreter was used for the interviews in Ga dangme. There was some loss of meaning in translation because the local dialects lack the flexibility of the English language that makes it easy to express oneself in many ways. The word 'integration' itself has no equivalent in the local dialects. The use of teachers of the languages to translate, and back translation were methods used to minimise this loss and retain context.

Initial questions were general to explore the experiences of the participants during their care, and their interpretation of these experiences. Specific questions were then asked to elicit patient views on accessing TB and HIV services. Prompts were used here as well to probe and to prevent the interviewee from straying. The duration of these interviews also ranged from 11 to 45 minutes. Interviews were held after patients had completed their consultation or monitoring visits, and so hospital staff or outreach team members were excluded.

4.6 DATA ANALYSIS

4.6.1 QUANTITATIVE DATA ANALYSIS

Data preparation was done to edit the raw data and transform it into a form that could be analysed to answer the research questions. In Microsoft Excel tables and figures were used to summarise the data for easy comparison. After ensuring that

all identifying data had been removed the data from all 3 sites was combined to create a data set in SPSS (PASW version 17) and new variables were added towards statistical analysis. These variables included those that categorised the data according to the year and quarters of each year, two more to represent the levels of integration and the intervention group (before or after integration), and another one that categorised age into 9 subgroups. The outcomes of TB treatment were also re-categorised as successful (cured or completed treatment) or adverse (defaulted, failure, relapse, and transferred out cases) in another variable.

Using SPSS software, the raw data was also transformed into proportions and percentages to be used to compute the output and outcome indicators for each quarter and as before-and-after values for each site. Means, standard deviations and ranges of demographic variables were computed. The tables, figures, and the measures of central tendency and spread were used to describe the data on outputs and outcomes over the period of study to observe any trends and differences across sites. Chi-square (χ^2) tests were also used to identify any significant differences in demographic characteristics of participants before and after integration.

In accordance with the objective of the study, Chi-square (χ^2) tests of significance were done not to test hypothesis of significant differences but to pilot the methods of evaluation. Statistical analyses were done in an attempt to assess the effect of integration on outputs and outcomes of TB treatment, and to determine the level of integration associated with the best outputs and outcomes. Chi-square tests and odds ratios (ORs) were used to determine whether or not

there were significant differences in outputs and outcomes before and after integration, or across the three sites.

Finally, statistical testing was done to explore the existence of any significant influences of any of the demographic characteristics and TB treatment outcomes before and after integration.

4.6.2 QUALITATIVE DATA ANALYSIS

4.6.2.1 APPROACH TO QUALITATIVE ANALYSIS

Qualitative research uses analytical categories to describe and explain phenomena (Pope et al., 2006) by developing conceptual definitions, developing typologies and classifications, exploring associations between attitudes, behaviours and experiences, developing explanations of phenomena or generating new ideas and theories (Green and Thorogood 2009). The different approaches to qualitative analysis fall on a continuum from completely inductive ones to mostly deductive styles. Lacey and Luff (2007) are of the opinion that irrespective of the approach used all qualitative data analysis goes through stages which may include familiarisation with the data, transcription, organisation and indexing of data, coding development of themes and categories, exploration of relationships, and development of theory. Framework analysis was the approach used in this study.

4.6.2.2 FRAMEWORK ANALYSIS

Framework is a structured thematic approach to analysis, with a well-defined procedure involving a number of distinct and interconnected stages, though not a mechanical process. It has been developed specifically for applied qualitative policy research in which objectives are set in advance, time scale is usually short, and there is often the need to link the analysis with quantitative findings. Framework

analysis has both inductive and deductive aspects. The individual accounts from interviews reflect the inductive component, but the pre-set aims and objectives mean that research starts deductively. It involves five key stages namely: familiarisation, identifying a thematic framework, indexing, charting, and mapping and interpretation (Lacey and Luff 2007; Pope, Ziebland and Mays 2006). This approach was therefore used for the following reasons:

- it allows the use of a priori as well as emergent themes, and so research objectives can be analysed as themes and categories,
- the research process can be planned and executed with specific scheduling, making it suitable for time-bound research like a PhD,
- It can be executed in a linear fashion so that all data collection can be done prior to analysis,
- It provides a systematic process that can inform third parties (e.g. funders and other stakeholders) of how results have been arrived at,
- it provides the opportunity to reconsider and rework ideas because the analysis has been documented and therefore accessible,
- Grounded theory was not appropriate because development of theories was not my objective, and there was not enough time to use that approach.

4.6.2.3 QUALITATIVE ANALYSIS PROCESS

All the recorded interviews were transcribed, and those not in English were translated and also transcribed into English. After this I read the transcripts and listened to the tapes to edit the transcripts and also to familiarise myself with the data to take note of key ideas and recurrent themes. The next stage was to develop a thematic framework by which the key issues, concepts and themes would be

examined and referenced. An initial framework was developed using all 29 interviews, because my intention was to develop one framework for all respondents to make comparison across the groups easier. The codes used in this initial stage were both descriptive and interpretive using both sentences and paragraphs as units of analysis.

The initial coding was done by writing the applicable codes in the margins of transcripts. Once all cases had been coded this way, the codes were combined into broader themes. These themes were derived from the research objectives, issues arising from the quantitative study, as well as those that emerged from the qualitative data itself. After coding the data, I had to go through again and again to recode and re categorise different codes. Afterwards I went back to the research objectives and questions in order to ensure that further analysis through charting, mapping and interpretation addressed the research objectives. During the charting and mapping I had to recode some areas and combine themes as the analysis progressed.

During mapping I went through each sub theme to read through what each interviewee said concerning each one of them. I then summarised each code according to the main topics or the range of issues brought up on each code.. I had initially planned to use NVivo7 but once I started using it the laptop got frozen anytime I wanted to save what work had been done. Eventually I had to abandon its use and resort to Excel. The use of Excel instead of NVivo7 or other qualitative software meant this process was much more prolonged than anticipated.

4.7 RESEARCH FRAMEWORK

The research framework (Table 15) is a schematic representation of the study showing the objectives of the study and how the research questions were addressed through the study methods. It is intended to provide a summary of this research and also to serve as a quick reference point with which to relate the subsequent chapters of the research.

Table 15 Research framework: summary of research objectives and methods

Objectives	Research Questions	Methods	Indicators/ Measures	Analysis
To explore the effects of integration on TB and HIV service on TB treatment outcomes	Has the integration of TB and HIV services affected TB treatment outcomes?		Outcome Indicators: TB treatment success rates	Descriptive analysis using tables and graphs Comparison of outcomes before and after integration using odds ratios and chi-square (χ^2) tests Analysis of association between HIV status and treatment outcome using χ^2
To compare the effect of different service delivery models on TB/HIV integration	Does increasing degrees of integration improve TB/HIV outputs and outcomes?	Natural experiment using before-and- after quasi-experiment and routine data at the individual study sites	Output indicators : Proportions of TB patients who had VCT, CPT & ART Proportion of HIV patients screened for TB	Descriptive analysis using tables and graphs Observing trends Comparison of outputs at all 3 sites using χ^2 contingency tables using the different levels of integration as 3 different exposures Use χ^2 contingency tables to analyse the association between level of integration and outcome of TB treatment in all cases and among HIV positive cases
	What is the optimal TB/HIV service delivery model?		Outcome Indicators: TB Treatment success rates in all cases and among HIV-positive cases	
To explore the influences of provider and user behaviour and experiences on TB/HIV outputs and outcomes	How does provider behaviour influence TB/HIV outputs and outcomes?	Semi-structured one-on-one interviews with users and providers	Coding (from objectives and emergent)	Charting, Mapping & Interpretation
	How does user experiences and behaviour influence TB/HIV outputs and outcomes?		Develop framework using priori and emerging themes	

4.8 STUDY RIGOUR

4.8.1 RIGOUR IN QUANTITATIVE STUDY

The following strategies were used in this study to address the threats to validity and reliability of the quantitative study.

4.8.1.1 MATCHING

Limited matching was used to make the three study sites as comparable as possible with respect to these important characteristics: offering TB and HIV/ART services, using new and modified TB register, and staff trained on TB/HIV management. This was aimed at limiting the effect of non-random allocation and control for confounders as well

4.8.1.2 STRATIFICATION

Data was also analysed by stratification; data was disaggregated according to age, gender and the other participant attributes, and compared to explore the existence of any associations between these attributes and successful TB treatment outcomes.

4.8.2 RIGOUR IN QUALITATIVE STUDY

Rigour in qualitative research also involves validity and reliability but the criteria for definition and strategies to achieve these are different from those applicable in quantitative research because of the differences in the types of evidence provided by the two research approaches. The different types of measures used to ensure rigour in the qualitative component of the study are as follows:

4.8.2.1 ENSURING METHODOLOGICAL COHERENCE

The mixed methods approach used provided the opportunity to use both quantitative and qualitative methods appropriately to study the different research

questions developed from the conceptual framework (p. 87). The different types of data were then appropriately integrated to answer the questions.

4.8.2.2 SAMPLING SUFFICIENCY

The main stakeholders of integrated TB/HIV care are the policy makers, service providers, and the users of the service. The sampling strategy ensured that adequate data for all these stakeholders was obtained. Purposive sampling was used to identify key informants on TB/HIV services integration.

4.8.2.3 THEORY DEVELOPMENT

The interpretation and inferences drawn from the data were constantly related to the conceptual framework and its theoretical underpinnings. This enabled comparison with and further development of the theory of integrated care, although not the development of a new theory.

4.8.2.4 TRIANGULATION

Although a triangulation design was not used in the study, there was triangulation of data as qualitative findings were used to explain some of the quantitative findings. This would improve the accuracy and add to a more comprehensive understanding of TB/HIV integration.

4.8.2.5 REFLEXIVITY

Reflexivity concerns the relationship between the researcher and the social world, and the impact of the researcher on the research. The issues of reflexivity addressed here relate to methodological and theoretical openness, the awareness of the social context of the research, and the wider social and political contexts (Green and Thorogood 2009), all of which together influenced what data was acquired, and how it has been analysed. Steps taken in selecting and accessing study sites, data production and analysis have been explicitly outlined earlier in this

chapter. The theoretical starting point of this research is that integrated care improves health outcomes as depicted in the conceptual framework, and this informed the research questions, the choice of mixed methods approach as well as the methods of data collection and analysis. Findings of the study were therefore continually related to the conceptual framework to emphasize their theoretical relevance.

Secondly, providers were aware of my background as a medical doctor and this influenced the interaction. All three managers are medical doctors by training as well, and were able to relate more at par in terms of power relations. The service providers on the other hand were all nurses and the interaction was influenced by the existing social context where nurses relate as subordinates to doctors. Some of them who felt I could help were more forthcoming with their experiences but some had doubts about this and were therefore more selective in their answers. My previous experience in the specific area also made it easier to share experiences and the freedom to use technical language in our communication.

Patients were not aware that I am a medical doctor but from the introduction of the study in the first contact perceived me as a potential source of solution to some of their problems. A number of them therefore asked for financial or some other support. The use of service providers to assist in recruiting patients as described earlier on page 97 may have made patients feel they have no choice but to participate. This was avoided by taking time to explain to each participating patient the purpose of the study and assure them of confidentiality and privacy. I also actively assured them that participation or lack of it would not influence the

care they receive. On the other hand the stigma and social exclusion associated with both TB and HIV means patients hesitate to share their experiences as TB/HIV patients. Consultations are also too short to be able to share these with service providers. Some patients therefore used this unhurried time during the interview as a rare opportunity to talk about living with TB/HIV.

In the wider social context TB/HIV integration enjoys a lot of political will at both national and programme level, and resources from the Global Fund. The study was therefore designed around the national TB/HIV policy so as to provide relevant and timely information to improve integration and its implementation.

4.8.2.6 RELEVANCE

The generalisability of findings is not in relation to the findings of this study but how this study informs the understanding of TB/HIV integration in similar contexts or similar issues in integrated care. The transferability of this research is demonstrated in identifying what was context specific and what would be more widely applicable within the findings.

4.8.2.7 TRANSPARENCY

A clear account of procedures used is provided as an audit trail for any audience.

Additional measures taken to make analysis more rigorous were providing evidence from the data for each interpretation made, analysing the whole data set to maximise reliability, and comparing data between and within cases, as well as to other studies including the quantitative study.

4.8.3 ETHICS

Ethical approval for the study was sought from the University Of Leeds Faculty Of Medicine Research Ethics Committee as well as from the Ghana Health Service

Ethical Review Committee. The core ethical principles of this study have been respect for persons and communities, and beneficence and justice (Mack et al. 2005). Ethical considerations in this study have therefore been based on avoiding deception or misrepresentation, protecting the identities and interests of participants, and guaranteeing confidentiality.

4.8.3.1 CONFIDENTIALITY

These steps were taken to ensure confidentiality of participants:

- Keeping data secure by use of passwords and codes, and restriction of access to the data,
- Storage of data and other related matters in locked safes,
- Non-disclosure of embarrassing information in publications,
- Signed consent forms kept separate from, and coded differently from corresponding interviews, and
- Fair and unbiased analysis.

4.8.3.2 PRIVACY

Participant privacy has been ensured by instituting the following measures:

- Conducting interviews in locations where minimal interference from other patients or health workers was encountered. In the hospitals interviews were held in a consulting room that would not be in use that period. Occasional interferences occurred where patients or other staff would knock and enter thinking there was on-going consultation. During such interferences the interviews were halted,
- Patient records that were not relevant to the study objectives were not included in the data collection. Data was anonymised,

- No identifying characteristics will also be used in publications.

4.8.3.3 BENEFITS

- Immediate benefits to patients are the improved delivery based on reactivity i.e. provider behaviour is altered because of the awareness of ongoing research,
- To providers the immediate benefit of motivation and stress release that comes with talking through achievements and problems. Secondly, their concerns and challenges were communicated directly to the policy makers at the national level,
- To the facilities the study will also identify gaps in service delivery and effective ways of addressing these at the facility level,
- In the medium to long term the study will result in improved patient outcomes, patient satisfaction, reduced cost and reduced disease burden, better quality of care and improved quality of life especially for TB/HIV patients. The findings of the study are intended to inform policy decisions that will improve working environment.

4.8.3.4 REDUCING RISKS

- Location and timing of interviews were chosen with safety of both researcher and participant in mind. A good balance of safety and privacy was pursued. Interviews were held during normal working hours and mostly in the clinics and offices. For those interviews held in the homes of participants I travelled with other health workers who stayed at a distance during the interview itself,
- Questions were asked with participants' sensitivity, feelings and other religious or cultural beliefs in mind. Local phrases that reflect the respect

for participants like 'please', 'with all due respect' and 'thank you' were used frequently. They helped in reducing any psychological difficulties of talking about much stigmatised health conditions,

- Participants had the option to refuse to answer any question or to withdraw participation at any point in time,
- Sensitive information will be handled in order not to result in victimisation or political embarrassment, particularly for the managers.

4.8.4 LIMITATIONS OF STUDY

This is a pilot study and therefore the findings are not statistically representative of TB/HIV programme in Ghana, but are intended to anticipate design and delivery issues that can undermine effective evaluation, so as to improve the intervention, its evaluation and implementation. The limitations of this study have been outlined in the subsections below.

4.8.4.1 Study design

- The concurrent approach used in the mixed methods design enabled the study to be conducted over a shorter period but prevented the use of the quantitative findings to inform the qualitative study. The qualitative study would then have been used to explain or corroborate quantitative findings,
- The quasi-experimental design is subject to a number of biases that prevent causative inferences to be drawn from the findings. The lack of randomisation and the absence of controls introduces a selection bias which makes the findings liable to confounders arising from differences in the individuals as well as the sites. And therefore the effects measured

could be due to these confounding characteristics either before or after integration,

- Quasi-experimental studies are also liable to temporal effects like history. History in this context refers to other events in or outside the study setting which is not of interest but that could have accounted for the effects measured. In this study such events included the on-going activities by the TB and HIV national programmes,
- Another relevant bias is statistical regression which describes the fact that dependent variables relating to any process naturally fluctuates around a mean. Changes in the TB/HIV output and outcome indicators of research interest could be falsely increased or decreased if the study coincided with an upward or downward trend of statistical regression respectively.

4.8.4.2 Sampling

- The use of purposive sampling and the recruitment process may have compounded the selection bias, which implies the effects measured could be due to the differences in participants and the study sites which are not of research interest,
- Only 3 study sites were used, which provides a low statistical power for inferences. And also the sample sizes of participants at each site used in determining outputs and outcomes were small, particularly the numbers used in the determination of treatment success rate in all cases and in HIV-positive TB cases. Another source of bias from the samples was the differences in participant numbers at the three sites: the referral site had as

many participants as the two sites combined, leading to different statistical powers of the findings,

- Cluster effect: this refers to the fact that individuals in a particular treatment group will tend to behave in a similar manner leading to a loss of independence in the participants at each site. This would result in errors in estimation of the effect of integration at each site.

4.8.4.3 Reliability of Intervention Implementation

Although national guidelines exist and training of staff are based on these guidelines, bias may arise from the differences in the implementation of integration (Cook and Campbell 1979). In this study the bias may arise as a result of the differences in the calibre of staff at the different sites. Bias may also be due to the variations in the aspects of the guidelines where providers exercise some discretion and make decisions about the specificities of the treatment e.g. counselling session,

4.9 CONCLUSION

I have used the above chapter to describe the methods used in this study. I introduced the mixed methods approach and then the study design. Subsequently the data collection and analysis methods are also described before the study methods are evaluated by reflecting on the strengths, challenges, and limitations of these methods.

The effectiveness of study methods are influenced variably by the context within which the study occurs. Therefore the setting of this study is described in

the next chapter to provide an insight into Ghana's health system and TB/HIV control in the country.

5 RESEARCH SETTING

5.1 INTRODUCTION

This chapter is intended to provide a description of the context within which this study was conducted for a better understanding of the study. There is a brief description of Ghana's demographic profile, geography, history and the economy. This is followed by a narrative on Ghana's health system, TB and HIV control in Ghana, as well as TB/HIV in Ghana. The chapter then concludes with an account of the study sites and the TB/HIV services they provide.

5.2 GHANA

5.2.1 DEMOGRAPHIC PROFILE

Ghana's population is 24,233,431 with a male to female sex ratio of 95 : 100 (Ghana 2011). The proportion of the population under 15 years however has decreased from 47 percent in 1970 to 36.5% percent in 2011. Population growth rate is 1.8% and life expectancy at birth is currently at 61 years.

5.2.2 GEOGRAPHY

The Republic of Ghana is centrally located on the West African coast and has a total land area of 238,537 square kilometres. Ghana is divided into ten regions (Figure 14). Ghana can be divided into three ecological zones: the sandy coastline backed by a coastal plain; the middle belt and western parts which are forests; and a northern savannah, which is drained by the Black and White Volta Rivers. The Volta Lake, created by the hydroelectric dam in the east, is one of the largest artificial lakes in the world. Ghana has a tropical climate with temperatures and rainfall varying according to distance from the coast and elevation (USAID 2011).

Figure 14: Administrative Map of Ghana



5.2.3 HISTORY

Ghana gained independence from British rule on 6 March 1957, and became a republic in the British Commonwealth of Nations on 1 July 1960. Its administrative and political capital is Accra. There are 10 administrative regions sub-divided into 170 districts to ensure equitable resource allocation and efficient and effective administration at the local levels (USAID 2011). The proportion of the population living in urban areas has been increasing over the years: changing from 30% in 1978 to 45% in 2003 (Ministry of Health 2007).

5.2.4 ECONOMY

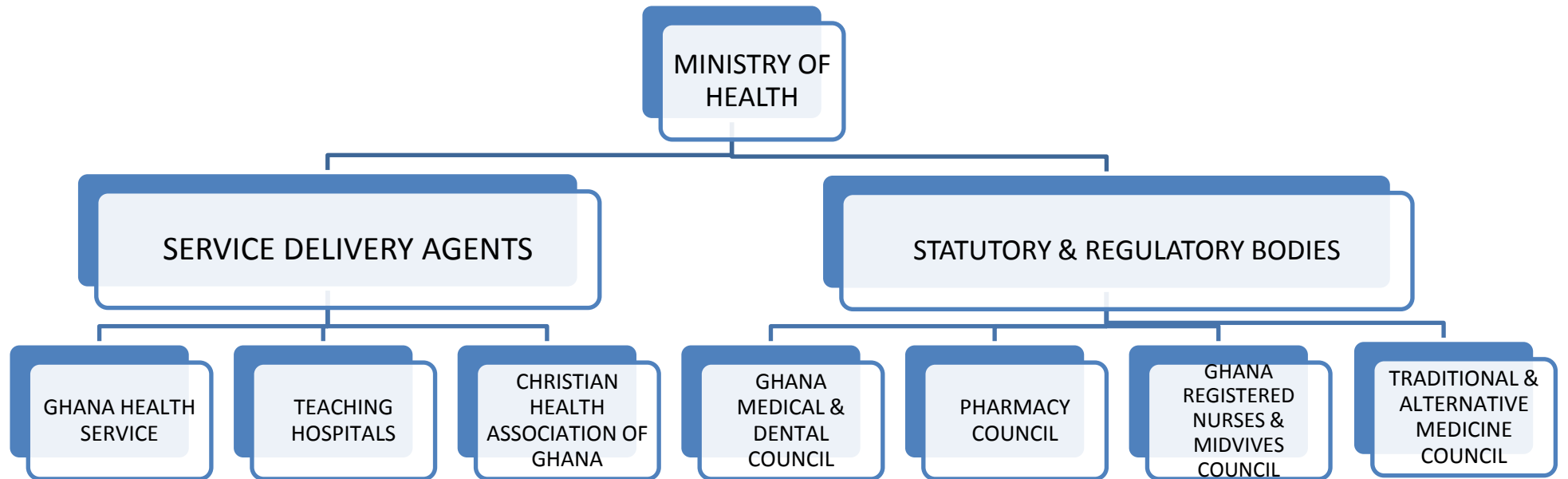
Agriculture is still the most important area of economic activity, followed by services, and then industry. Agriculture contributes 34% of the gross domestic product (GDP) and it employs about 50% of the population. The service sector, with a growth rate of 10%, is the fastest growing sector of the economy and it contributes one-third of the country's GDP. The industrial sector contributes a little over one-quarter (26%) to the country's GDP. The leading export commodities of the country are cocoa, gold, and timber. In recent times, the economy has diversified to include exports of non-traditional commodities such as pineapples, bananas, yams, and cashew nuts. Tourism is fast gaining prominence as a foreign exchange earner (USAID 2011).

5.3 THE HEALTH SYSTEM IN GHANA

5.3.1 MINISTRY OF HEALTH

Ghana has in the last two decades pursued a health sector decentralisation programme as a means of improving the performance in the sector. This decentralisation has been aimed at transferring fiscal, administrative, ownership and/ or political authority for health service delivery from the central Ministry of Health (MOH) to alternate institutions (Figure 15). The MOH is therefore now primarily involved in policy formulation, setting standards, mobilizing resources, capacity development, technical support, coordination of health research, and overall monitoring and evaluation of performance in the sector (Ministry of Health 2007).

Figure 15: Agencies under the Ministry of Health in Ghana



The Regional and District Health Administration ensure that services provided are in line with the national policies. Planned activities revolve around the 5 main objectives of the MOH, which are to increase geographical and financial accessibility in health, to provide better quality of care in all health facilities, to improve efficiency at all levels, to foster closer collaboration with communities and other partners, and to increase resources and ensure equitable and efficient resource distribution.

The Ghana Health Service (GHS) was established in 1996 as an autonomous agency responsible for implementing national policies from the MOH. This was seen as a necessary step for achieving a more equitable, efficient, accessible and responsive health care system. Taking health care out of the civil service provided the management flexibility for a more efficient system (Ghana Health Service 2011a). Christian Health Association of Ghana (CHAG), on the other hand is a non-governmental and not-for-profit organisation bringing together churches involved in the provision of health services. CHAG plays a complementary role to the MOH and the GHS, and is the second largest provider of health services in the country. CHAG's 182 member institutions provide about 42% of total health services in the country, and are predominantly located in rural, underserved areas (CHAG Ghana 2011).

5.3.2 PUBLIC HEALTH SECTOR

The public sector of the Ghana Health System is made up of the Ghana Health Service, Teaching Hospitals, Quasi-government facilities, and Faith-based organisations (FBOs) including CHAG. Service delivery organisations are graded into primary, secondary, and

tertiary care depending on the level of complexity of services and the administrative zones they serve (Table 16).

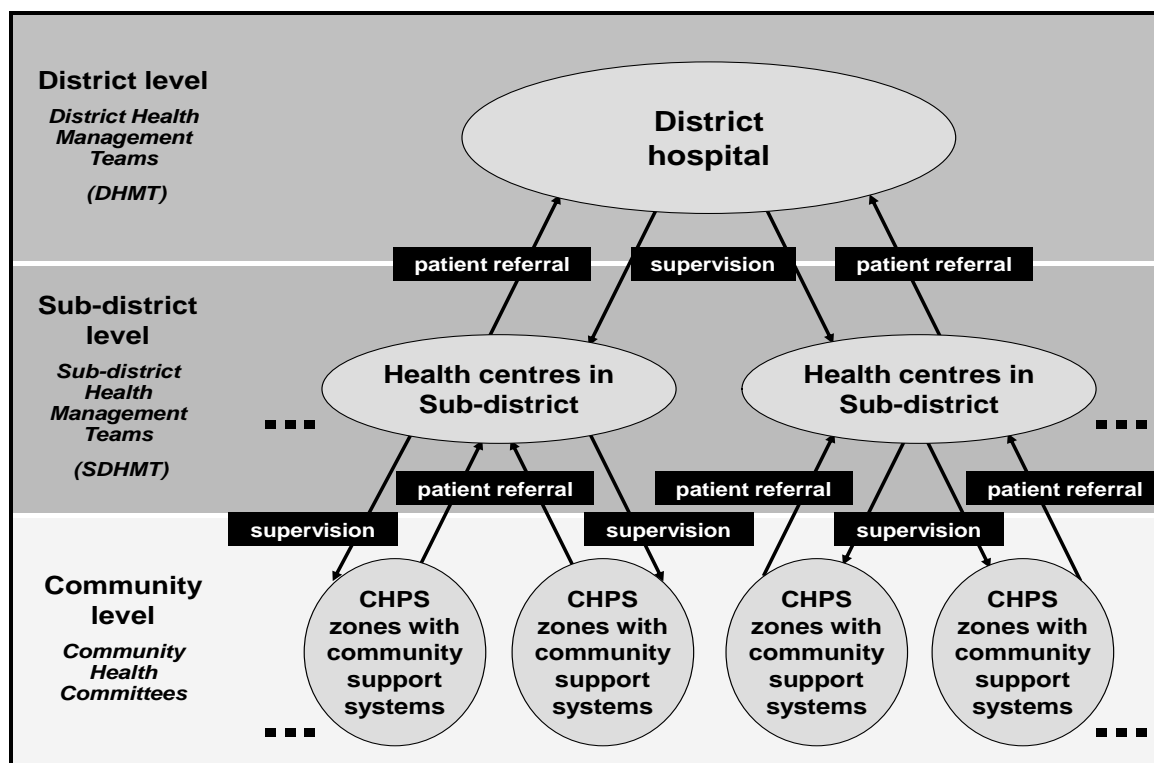
Table 16: Organisation of health service delivery in Ghana (Ghana 2005)

Level of Care	Institution	Services/Functions
Tertiary	Teaching Hospitals	<ul style="list-style-type: none"> - Apex of care - Research & Training
Secondary	Regional Hospitals	<ul style="list-style-type: none"> - 2nd referral level - Specialised clinical & diagnostic care
Primary	District Hospitals	<ul style="list-style-type: none"> - 1st referral point for primary health care - Clinical inpatient and outpatient care - Maternity services - Back-up for health centres

The quasi-government health facilities are those that were initially established to address the health needs of staff of some public institutions, but have evolved and become integrated into the public sector. These are primary and secondary level facilities that may be involved in teaching, training and/or research. They include the 37 Military Hospital under the Ministry of Defence, the University Hospitals under the Ministry of Education, and the Police Hospital under the Ministry of Interior.

Health service at the district level is also subdivided into sub-districts and communities (Figure 16). The District Health Administration provides technical and administrative support to health service providers. These include resource mobilization and distribution, training and research programmes. There is a District Health Management Team (DHMT) responsible for providing leadership in service delivery.

Figure 16: Health services delivery at the district level (Ghana 2005)



Key: CHPS – Community-based Health Planning and Services

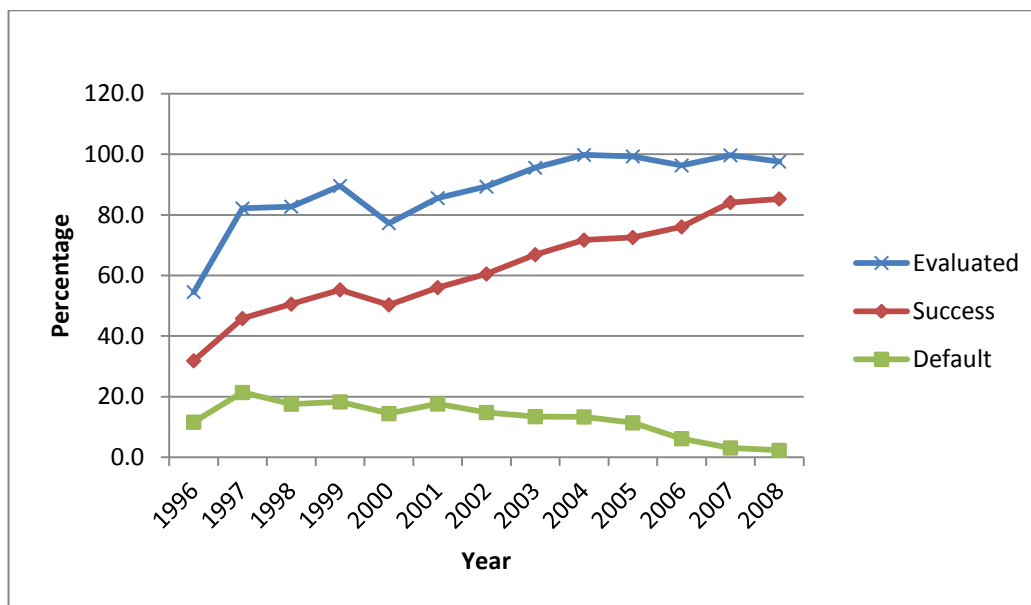
5.4 TUBERCULOSIS (TB) IN GHANA

5.4.1 EPIDEMIOLOGY

The last TB survey in Ghana was carried out in 1957 and therefore the exact burden of the disease is unknown. Current estimates are from WHO annual reports which suggest that TB case detection in Ghana is about 30% of all existing cases (NTP 2009a). The WHO 2010 Global TB report puts TB incidence in Ghana at 201/100,000 population, and case notification has increased from 7425 in 1996 to 14022 in 2008 (NTP 2009a). National figures show that there has been a trend indicating improving control as demonstrated by increasing numbers of patients evaluated after treatment,

successful treatment outcomes, and decreasing numbers of default cases [(NTP 2009b), Figure 17).

Figure 17: Trend of TB treatment outcomes in Ghana: 1996 - 2008



The overall male-female ratio among notified TB cases is 2:1; the peak age for women is 25 to 34 years, and 35 to 44 years for men. Multi-drug resistant (MDR) TB, a threat to global TB control, formed 0.9% and 14% of new TB and retreatment cases respectively (NTP 2009a).

5.4.2 NATIONAL RESPONSE

Tuberculosis control in Ghana started in the pre-independence era when the then colonial government recognized the need to combat the disease due to the threat it posed to the larger society. Therefore since the 1950s there has been a structure in place for the care of TB patients in all regional hospitals and the two Teaching Hospitals localised to the Chest Clinics. In addition most mission hospitals also run Chest Clinics which took care of TB patients. These clinics were supervised infrequently

by the Ministry of Health, and there were challenges such as late reporting of patients with advanced disease, no specific treatment guidelines, erratic drug supply and no proper evaluation systems (Ghana Health Service 2011b). In 1991 it was concluded that important measures were required to rectify the challenges of TB control, and a consensus was reached on the need for a control program followed by the drafting of a TB Control Program. The implementation of the program started in 1994 and in the same year, Ghana adopted the WHO DOTS (Directly observed therapy, short course) Strategy (Ghana Health Service 2011b)

The National TB Control Programme (NTP) has since been implemented countrywide and involves ensuring regular drug supply, surveillance, building capacity for TB treatment and control, and directly supervising treatment among others. Ghana achieved 100% DOTS coverage in 2000. TB treatment is free in Ghana: the Government of Ghana supports the programme financially every year but the main funding for its activities is from the Global Fund which is set aside to support the control of Malaria, Tuberculosis and HIV/AIDS. The NTP is now implementing the new Stop TB Strategy of WHO which has six strategies: to pursue high-quality DOTS expansion and enhancement, address TB/HIV, MDR-TB and other challenges, contribute to health system strengthening, engage all care providers, empower people with TB and communities through partnerships, and to enable and promote research (WHO 2010a).

5.4.3 CASE MANAGEMENT

TB management has been mostly decentralized in the country such that primary TB services can be accessed in communities or health centres in every district in the country. Management of TB in Ghana currently lasts 6 months using fixed dose combinations (FDCs) for the appropriate categories, and the drugs used are Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E) and Streptomycin (S) as indicated in table 17. Sputum smears are checked after the second and fifth months of treatment.

Table 17: Recommended treatment regimens for TB in Ghana (NTP & NACP 2007)

Patient Category	Definition	Initial Phase Treatment	Continuation Phase Treatment
		Daily (28 doses/month)	Daily (28 doses/month)
I	All New Cases New smear positive New smear negative PTB Concomitant HIV disease Extra-pulmonary TB	2 (HRZE) = 56 doses of HRZE	4 (HR) = 112 doses of HR
II	Previously treated sputum smear-positive PTB Relapse Treatment after interruption Treatment failure	2 (HRZE)S + 1 (HRZE) = 84 doses of HRZE + 56 doses of S	5 (HRE) = 140 doses of HRE
III	Children under 12 years	2 (HRZ) = 56 doses of HRZ	4 (HR) = 112 doses of HR

Currently diagnosis and susceptibility testing of drug resistant TB cannot be done in Ghana and samples have to be sent to Egypt or South Africa. Once this has been done treatment of cases occurs in the Korle-Bu Teaching Hospital Chest Clinic. However there are plans to establish a diagnostic and treatment centre in the country in the near future.

The outcomes of TB treatment in Ghana are cured, completed treatment, died, defaulted, failure or transferred out. Cured cases refer to all sputum-smear positive cases who have negative sputum-smear at month 2, 3 or 5, complete the designated treatment, and still have negative sputum smear after completing treatment. 'Completed treatment' is used to describe all smear-negative cases, EPTB cases, and children who successfully complete the treatment. It also includes all smear-positive cases who have sputum conversion at the end of the second, third or fifth month, complete treatment but are unable to do the final sputum smear at the end of treatment. Anyone who dies during TB treatment is counted as an adverse TB treatment outcome, irrespective of the cause of death.

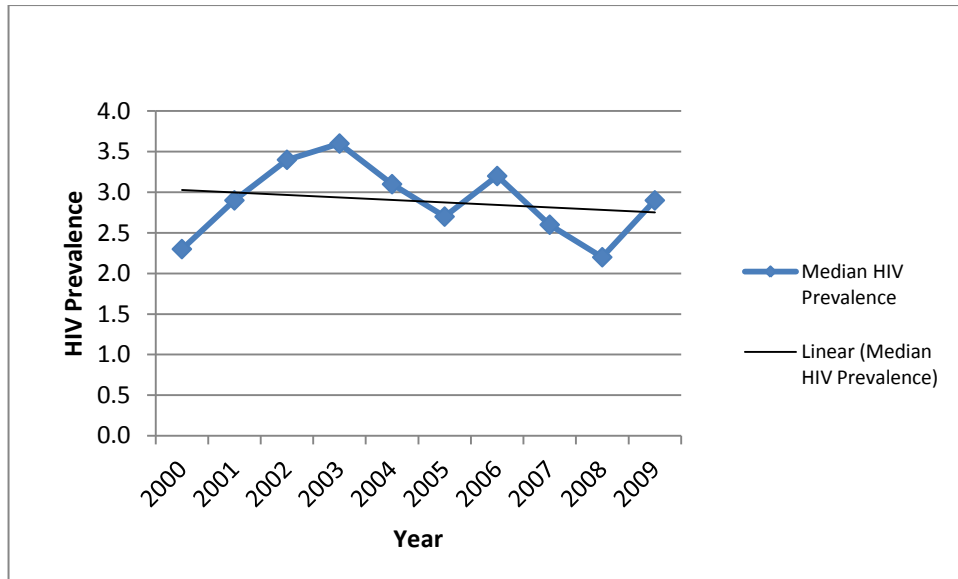
A person is described as a defaulter if after a month or more of treatment there is an interruption for more than a month. And transferred out cases represents all patients on TB treatment who after initiating treatment at one site, are referred to another treatment facility outside the district of the current treatment facility. If sputum conversion does not occur at the end of 5 months of treatment, a patient is said to have had a failure of treatment. 'Cured' and 'completed treatment' together constitute the successful outcomes while the rest are described as adverse outcomes. TB treatment success rate refers to the proportion of registered cases who were cured or completed treatment.

5.5 HIV IN GHANA

5.5.1 EPIDEMIOLOGY

The first HIV case was recorded in Ghana in 1986. HIV prevalence rate among adults (15 - 49 years) has decreased from 2.6% in 2000 and 3.1% in 2004 (GAC 2005a), to 1.9% in 2009 (NACP, 2010a). The total HIV population estimate for 2009 is 267,069 persons made up of 112,457 males and 154,612 females; 25,666 children were living with AIDS, and there were an estimated 20,313 deaths. AIDS orphans were 149,543 in total (NACP 2010a). Almost 40% of all new cases are due to unprotected paid sex, sex between men, and the use of contaminated drug-injecting equipment by two or more people on the same occasion (UNAIDS 2010).

According to the 2009 HIV Sentinel Survey, the median national prevalence of HIV in adults between 15 and 49 years is on a downward trend from 2000 (Figure 18) but with peaks in 2003, 2006, and 2009 (NACP 2010b). The median prevalence varied from 0.7% in North Tongu in the Volta Region to 5.8% in Koforidua and Agomanya in the Eastern Region. The prevalence in rural sites was 2.2% as compared to 3.6% in urban sites (NACP 2010b).

Figure 18: HIV Sentinel Sites survey in Ghana: 2000 - 2009

5.5.2 NATIONAL RESPONSE

The Government of Ghana established the National AIDS/STD Control Programme (NACP) in 1987 to coordinate the national response to the epidemic. NACP led in the development of a Short Term Plan (STP) for the prevention and control of HIV/AIDS that ran during 1987 and 1988. Subsequently, NACP developed the first Medium Term Plan (MTP-1) that guided HIV/AIDS prevention and control efforts between 1989 and 1993.

The Ministry of Health was primarily responsible for implementing the early programmes. However, over time, other public sector ministries, the private sector, non-governmental organizations (NGOs) and people living with HIV/AIDS (PLHIV) have become more involved in programme implementation. In 1997, NACP led the drafting of a policy document on HIV/AIDS. The purpose of the policy was to create a favourable environment for all HIV/AIDS control and prevention programmes, and to mitigate the social and personal consequences of HIV infection on those persons living

with the virus and on those persons who have already developed AIDS (NACP 2001). Following a review of the national response that stressed the importance of expanding a multi-sectoral approach to the epidemic the Ghana AIDS Commission (GAC) was established in 2000 to provide efficient and effective leadership, and to coordinate all programmes and activities of all stakeholders (GAC 2005b).

The national response has resulted in the development of guidelines to standardize treatment and care, training of service providers, and the setting up of VCT and PMTCT centres nationwide. In 2003, Ghana began the process of delivering ART to all eligible HIV-positive patients in the country at four public health facilities, and in 2005/2006, the Government of Ghana's HAART programme began to implement a scale-up plan, accompanied by ongoing efforts to scale up VCT and PMTCT services (Ghana Health Service 2007). At the end of 2009, there were 808 counselling and testing sites (with or without PMTCT), and 138 ART sites (NACP 2010a).

5.5.3 CASE MANAGEMENT

A heavily subsidised comprehensive HIV/AIDS care package with ART for eligible patients is currently hospital-based and can be accessed through acute medical services, referrals from testing and diagnostic centres, Reproductive and Child Health Clinics, PMTCT units, TB services, and other community- or home-based programmes (Ghana Health Service 2007). The mainstay of care includes prevention and management of opportunistic infections, provision of ART, and prevention of future spread.

5.6 TB/HIV IN GHANA

5.6.1 EPIDEMIOLOGY

According to estimates, 12% and 23% of all new TB cases were HIV positive in 2009 (WHO 2010a) and 2010 (WHO 2011). No systematic, nationwide study on the prevalence of TB and HIV prevalence co-infection has been conducted yet, but it is estimated that HIV-associated TB cases have been increasing since 1989 (Ghana Health Service 2007). According to Adjei et al. (2005), sero-prevalence of HIV in all TB suspects in the Korle-Bu Teaching Hospital-based study of 277 subjects was 46.2%. In 2009, 22.5% of all TB patients screened nationally for HIV were positive (NTP 2010).

5.6.2 RATIONALE FOR INTEGRATION

The main rationale for TB/HIV services integration is the recognition that the two diseases amplify one another's impact. TB is recognized as the most important opportunistic infection in HIV. TB increases mortality and morbidity in HIV patients by speeding up the progression of HIV infection to clinical AIDS. By the same token, HIV is known to be fanning the flames of the TB epidemic in Ghana as in other parts of the world. Secondly, while the NACP HAART programme is relatively new, the NTP is well established in all districts with 100% DOTS coverage, and has strengths that can be synergistic with the national scale-up of the HAART programme. Closer collaboration will increase efficiencies, improve service delivery, eliminate overlap, and help reduce national health care costs: both patients and health workers will benefit (Ghana Health Service 2007).

5.6.3 TB/HIV POLICY

A national policy for the 'Implementation of TB and HIV Collaborative Activities in Ghana' was launched in 2007 with the goals of strengthening the health system to respond to the TB/HIV dual epidemic, decreasing the burden of TB in people living with HIV/AIDS (PLHIV) and decreasing the burden of HIV among TB patients. The overall strategic framework consists of three linked sets of activities: effective implementation of the STOP TB Strategy for TB control, improved HIV prevention and care, and implementation of a set of additional collaborative TB/HIV activities for which both NTP and NACP are responsible (Ghana Health Service 2007).

5.6.4 TB/HIV INTERVENTION

The integration of TB and HIV services in Ghana has involved the introduction of collaborative activities into existing care processes, as well as new indicators for the management of TB and HIV, and the monitoring of their activities. Therefore in addition to the TB programme activities already in place, TB patients would also be routinely offered counselling and testing for HIV, Co-trimoxazole preventive therapy (CPT) for those found to be HIV positive, and if eligible Antiretroviral therapy (ART). HIV patients would also be routinely screened for TB on each visit. At the study sites, HIV screening, CPT and ART were routinely made available to patients through the TB centres and recorded in the new TB registers from June 2007, but the screening of HIV patients for TB had a much delayed and non-uniform start.

Prior to the launching of the TB/HIV policy in 2007, a number of meetings and workshops had been held at the national level to initiate a national response. After a number of stakeholders' meetings, a national TB/HIV coordinating body was

established in early 2005 to define the roles and responsibilities for TB/HIV collaborative activities by NACP and NTP. In allocating responsibilities, care was taken to minimize duplication of effort and to coordinate budgets. A major priority was to take advantage of the natural synergies and complementariness of the two programmes. Subsequently a focal person for joint TB/HIV collaboration was identified to coordinate and ensure joint TB/HIV activities (Ghana Health Service 2007).

Anderson and Maher (2001) identified that at the national and district level, some mechanism promoted to enhance TB and HIV/AIDS programme collaboration include the following:

- in-country high level political commitment,
- joint planning meetings,
- involvement of HIV and TB community groups on national interagency
- co-ordination committees,
- joint training of programme and general health service provider staff in TB and HIV issues,
- joint TB and HIV/AIDS programme reviews,
- utilisation of existing organisational structures and the sharing of experience,
- a strengthened referral system,
- implementation of HIV care packages, including TB prevention and care, and
- formulation of joint health education messages.

The TB/HIV policy therefore defined how these mechanisms would be combined to characterise the TB/HIV intervention. The different activities that have

been involved in the process of integration in Ghana have been outlined in table 18 according to the goals of the national policy.

Table 18: TB/HIV in Ghana

Policy objective	Related activities Implemented in integration
Health System Strengthening	Coordination of TB/HIV activities at all levels: <ul style="list-style-type: none"> - national TB/HIV focal person appointed - formation of coordinating partnerships at all levels to coordinate activities
	Joint TB/HIV Planning: <ul style="list-style-type: none"> - Developing partnership with national, community and private stakeholders - resource mobilisation and deployment - joint advocacy, communication and social mobilisation - support for operational research
	Health Infrastructure Development: <ul style="list-style-type: none"> - Human resource development and capacity building through joint training of health workers on TB/HIV i.e. pre-service, and in-service; continuing professional development and specialisation courses being planned - Health System Support: Capacity strengthening of laboratories to improve quality of diagnosis, supply of drugs, equipment and some infrastructure to TB/ART treatment centres, and improved partnership and linkages with other sectors of the health system - Strengthening Programme Management at all levels: Appointment of central unit staff like data and drug managers, focal persons for human resource development and monitoring and evaluation, regular updates of field manuals, clinical forms, registers and cards; and sensitisation of all stakeholders and partners
	Building Partnerships <ul style="list-style-type: none"> - Use of NGOs, community volunteers and family supporters in patient management - Training of NGOs, CBOs and FBOs
	Surveillance <ul style="list-style-type: none"> - Baseline survey of TB/HIV burden yet to be done - Use of regular reporting and recording tools provided by both programmes
	Supervision, Monitoring and Evaluation <ul style="list-style-type: none"> - Use of core set of TB/HIV indicators, and regular review and reporting on the indicators at district, regional and national levels - External monitoring and evaluation yet to be done - Forms and data recording tools have been modified to capture joint TB/HIV data. New TB/HIV specific forms not created
Decreasing the burden of TB in PLHIV	Prevention of TB infection in PLHIV <ul style="list-style-type: none"> - Active contact tracing for TB contacts of PLHIV - Operational research for more evidence on the feasibility of IPT yet to

	<p>be done</p> <p>Early diagnosis and treatment of HIV-associated TB</p> <ul style="list-style-type: none"> - HIV patients are screened for TB but not suspects as in the policy - Sputum cultures are hardly done for sputum negative HIV-positive patients as stipulated in the policy
Decreasing the burden of HIV in TB patients	<p>Prevention of HIV in TB patients</p> <ul style="list-style-type: none"> - Provider initiated counselling and testing for all TB patients - Discussion of sexual issues, availability of condoms, and STI screening and treatment at TB centres are not routinely done - Reduction of occupational and nosocomial exposure to HIV
	<p>Provision of ART</p> <ul style="list-style-type: none"> - Strong links between TB and ART centres have been established to facilitate cross referrals
	<p>HIV care and support during and after TB treatment</p> <ul style="list-style-type: none"> - Involves clinical, nursing and home care - Professional psychosocial support lacking. NGOs provide supportive social network - Continuity after TB care mainly the responsibility of individual patients

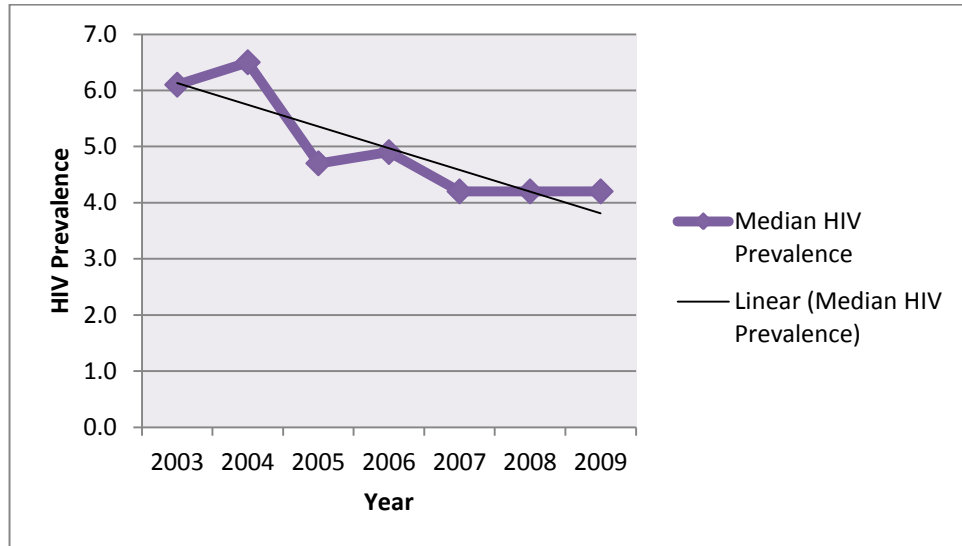
5.7 EASTERN REGION

The Eastern Region (ER), where the study was conducted, is in the south-eastern part of Ghana and is the third most populated region with 11.5% (2.1 million) of Ghana's population. It has Koforidua as its capital. Like all of the 10 regions in Ghana, it has one regional hospital and a network of district hospitals, health centres, mission hospitals, clinics and community facilities. Private clinics and maternity homes, chemical sellers, traditional healers, and traditional birth attendants are significant contributors to health care in the mostly rural population (Ghana Districts 2011).

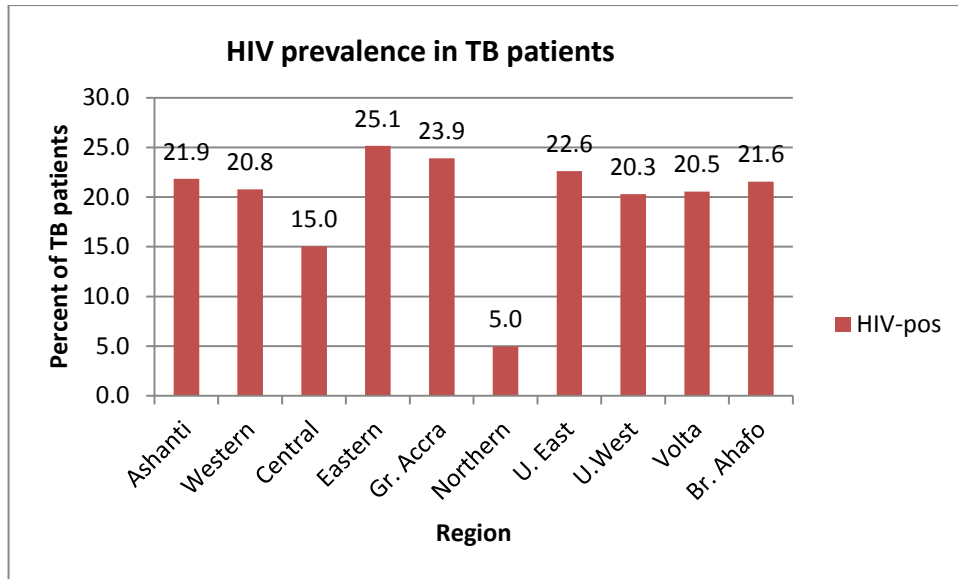
HIV prevalence in the ER was the highest nationwide in 2009 at 4.2%, with the highest site prevalence of 5.8% occurring in Koforidua and Agomanya (NACP 2010b). At the end of 2009, the region had the highest concentration (28.7%) of counselling and testing sites in any region, and had 17 ART hospitals (NACP 2010b). The ER has consistently contributed the highest number of reported AIDS cases nationwide

between 2007 and 2009: 50.8% in 2007, 30.0% in 2008 and 31.6% in 2009 (NACP 2010a). Even though the ER has consistently had the highest HIV prevalence levels nationwide, the region is also experiencing a similar trend of reduction as observed nationwide albeit more dramatic (Figure 19).

Figure 19: Trend of HIV Prevalence in the Eastern Region: 2003 -2009



AIDS deaths was also highest in the region in 2007 (23.4%) and 2009 (38.9%), but was second to Greater Accra Region in 2008 at 26.1% (NACP 2010a). In 2009, HIV-prevalence among TB patients nation-wide was also highest in the Eastern region (Figure 20)

Figure 20: TB/HIV burden by region in Ghana: 2009

5.8 STUDY SITES

The three study sites are all located in the Eastern region. St Dominic's Hospital, the one-stop shop (OSS), is located in the Kwaebibirem District and is the biggest mission hospital in Ghana with 357 beds. As at 2005 the population density of the district was 160 persons/km², as compared to 109 persons/km² for the region (KDA 2011). The commonest income-earning activities in the district are agriculture (76.8%) and industry (11%). The district has 2 hospitals, 4 health centres, and 3 community clinics, among other private health facilities. The St. Dominic's Hospital is the one of the most well-equipped health institutions in the district with 10 medical doctors, 148 nurses, and 5 medical assistants. The Hospital is the only service delivery facility that supports PLHIV in the form of feeding, transportation costs and other social activities (KDA 2011).

Atua Government Hospital is located in Agomanya in the Lower Manya Krobo which is one of the 21 districts in the Eastern Region. The population density in the 2000 census was 114 per square kilometre, greater than the regional figures of 109. The age dependency ratio is 1:07 (i.e. one active person to 0.7 inactive person) and the sex ratio is 95.2 males to 100 females, which is about the same as the national average of 95:100. There are four hospitals, which serve as the first referral points namely: Atua Government Hospital, Akuse Hospital, St. Martin's Hospital (Catholic) and Asesewa Hospital. The commonest economic activities are farming and trading (LMKDA 2006). The Atua Government Hospital is a 112-bed hospital established in 1977. Currently there are 2 permanent doctors and 72 nurses. It is the smallest of the three hospitals selected for this study.

The New Juaben covers an estimated 0.57% (110 km²) of the total land area of the ER. Females form 52% of the population. There are three main economic activities prevalent in New Juaben: service sector (44%), agricultural sector (28%), and industrial sector (27%). There are 2 hospitals in New Juaben: the Koforidua Central and the St. Joseph's both in Koforidua. There are also 3 health centres and 2 community clinics (NJMA, 2011). The Koforidua Central Hospital was established in 1926 and currently doubles as a referral centre for the region. It has 323 beds with 48 doctors and 220 nurses (Anim Boamah 2011).

The TB/HIV activities at the 3 sites are described below and a description of how these are related are summarised in table 19.

Table 19: TB/HIV Activities at study sites

Characteristic	One-stop shop	Partial integration	Referral
Location of DOTS and HIV Clinics	Co-located in a purpose-built building	Different parts of same hospital	Different parts of hospital & district
HIV Pre-test counselling	TB and HIV staff at centre	TB and VCT staff	TB or HIV staff
HIV testing	TB or HIV staff	HIV staff	HIV staff
Post-test counselling	TB or HIV staff	HIV staff	HIV staff
HIV treatment	Same location	Referred to HIV clinic	Referred to HIV clinic
HIV clinic staff	TB/HIV team	TB &VCT team leaders	HIV staff only
CPT prescription	TB or HIV staff	TB & VCT team leaders	HIV staff only
ART prescription	Team leader (doctor)	TB &VCT (nurses)	HIV staff only (nurses & doctor)

5.8.1 TB SERVICES

TB services in the OSS are mainly based in the Fevers' Unit. Services are available on all days because of the in-patient component of the unit. In the partially integrated site, the TB centre is located in a room in the general OPD and is headed by a senior nursing officer. Counselling done prior to registration and initiation of TB treatment is done on all weekdays. The TB Unit at the referral site had initially been located outside Central Hospital at the beginning of this study but was later relocated within the hospital although it still remained separate from the HIV/VCT centre. TB services are available all days of the week apart from the weekend.

Common characteristics observed about the TB services in all three sites were that both suspected and confirmed cases are received from the OPD, other wards, or as referrals from other facilities without diagnostic or treatment services, and there were usually no queues. All sites also used the national treatment guidelines, the new

TB registers, and they all regularly sent quarterly reports through the district coordinators as required by the NTP.

5.8.2 VCT FOR HIV AMONG TB PATIENTS

The three study sites all comply with the national policy for active case finding (Ghana Health Service 2007). All TB patients at the OSS are counselled for HIV and then tested if they consent. Although there is a separate VCT unit in the hospital, the Fever's unit has counselling and testing services available and patients do not have to be referred to the VCT centre. At the partially integrated and referral sites all new cases are referred to the VCT centre preferably before treatment is initiated. Privacy and the comfort of clients are well ensured and results are usually ready within an hour in all sites. VCT services are available all days including weekends and holidays at the OSS unlike the other two sites where the VCT centres are closed on weekends and public holidays.

5.8.3 CPT

Co-trimoxazole (CTX) prophylaxis is available through the HIV clinics for all HIV positive patients, including HIV-positive TB patients. The prescriptions are made out by the doctors and nurse prescribers at the HIV clinics. Patients who refuse to attend the HIV clinic are therefore not likely to receive CPT.

5.8.4 HIV CLINICAL CARE

The HIV clinics operate once a week at the OSS and the referral site (RS), and two times at the partially integrated site (PIS). The OSS and RS clinics are handled by doctors and nurses, but at the PIS the clinic is manned by two nurse prescribers. These

clinics are usually very heavy and often translate into long waiting times for patients, especially at the RS and PIS. Patients are referred from the VCT centre, the DOTS centre and other testing facilities in the district or elsewhere. All the clinics follow the national guidelines for the management of cases.

5.8.5 ART

As part of the national ART scale-up programme, ARVs are available in all three study sites at a heavily subsidised rate. Due to the use of rifampicin throughout the treatment of TB in Ghana, efavirenz (antiretroviral) which has a relatively lower interaction with rifampicin has been made available for HIV-positive patients on TB treatment (Ghana Health Service, 2007). CD4 testing is done to assess the eligibility for ART for each new patient and thereafter every 3 or 6 months to monitor the CD4 count. Currently a CD4 count value of 350 cells/mm³ or less (250 cells/mm³ prior to June 2008) is an indication for the initiation of ARVs. For co-infected patients who are eligible for ARVs, the guidelines suggest that the priority is to start TB treatment immediately.

The timing of the initiation of ART is determined by the level of the CD4 count. If the count is more than 350 cells/mm³, then ART is started after completion of TB treatment. For values between 250 cells/mm³ and 350 cells/mm³ ART is started after the initial phase of TB treatment. When CD4 count is less than 250 cells/mm³, ART is started after 2 - 4 weeks of TB treatment when the therapy is tolerated. ARTs are started concomitantly with TB treatment in cases where the CD4 count is 50 cell/mm³ or less (NTP & NACP 2007).

5.8.6 TB SCREENING AMONG HIV PATIENTS

Active TB case finding using the TB screening tool had not yet started in any of the 3 study sites although staff were aware of the screening tool. What currently pertains is the routine questioning of whether or not a patient has been treated for TB before. When complaints indicate it questions about cough lasting 2 weeks or more, fever and night sweats are asked to decide whether there is the need to do sputum AFBs.

5.9 CONCURRENT TB AND HIV PROGRAMME ACTIVITIES

The implementation of the TB/HIV policy in Ghana has not been in vacuum but was done in an enabling environment which had been created as a result of the effectiveness of previous TB and HIV control strategies, as well as other local and global factors. TB/HIV integration was therefore a component of broader nationwide strategies to improve effectiveness of and access to TB and HIV control programme activities (Ghana Health Service 2007). Other NTP objectives in addition to TB/HIV integration were to improve coverage and quality of DOTS expansion in Ghana, and to promote behavioural change communication (BCC) interventions in support of TB control activities.

As part of the former objective, interventions introduced included expansion of Public-Private Mix DOTS, improving access to DOTS services through community-based TB care facilitated by the use of treatment supporters, and reducing TB transmission in the Ghana Prison System (Ghana Health Service 2007). Quality improvement activities in the form of monitoring, supervision, training and education were also introduced.

BCC activities were targeted at encouraging healthy behaviours and reducing stigma (Ghana Health Service 2007).

On the HIV front, the main concurrent objective was the nationwide scale up of ART. And therefore in addition to existing activities of scaling up of counselling and testing, and PMTCT, the following activities were introduced in relation to the ART scale up: sensitization of communities and service providers, training of prescribers in ART and management of opportunistic infections, training of adherence counsellors and for VCT and PMTCT, ensuring linkages with support groups e.g. for PLHIV, and procurement and distribution of laboratory equipments (Ghana Health Service 2007). Other activities included refurbishment of clinical care sites, introducing an information management system, and strengthening of prevention and post-exposure prophylaxis (Ghana Health Service 2007).

5.10 CONCLUSION

In this chapter I have sought to provide a context for this study by giving a brief introduction to Ghana and the health system in the country. The chapter then continued with a background of TB/HIV in Ghana as well as the nation's response to the dual epidemic, and then an introduction to the study sites.

The next chapter is the first of three results chapters of this study and it reports the findings of the investigation into the impact of TB/HIV integration on TB treatment outcomes.

6 TB/HIV INTEGRATION AND TB TREATMENT OUTCOMES

6. 1 INTRODUCTION

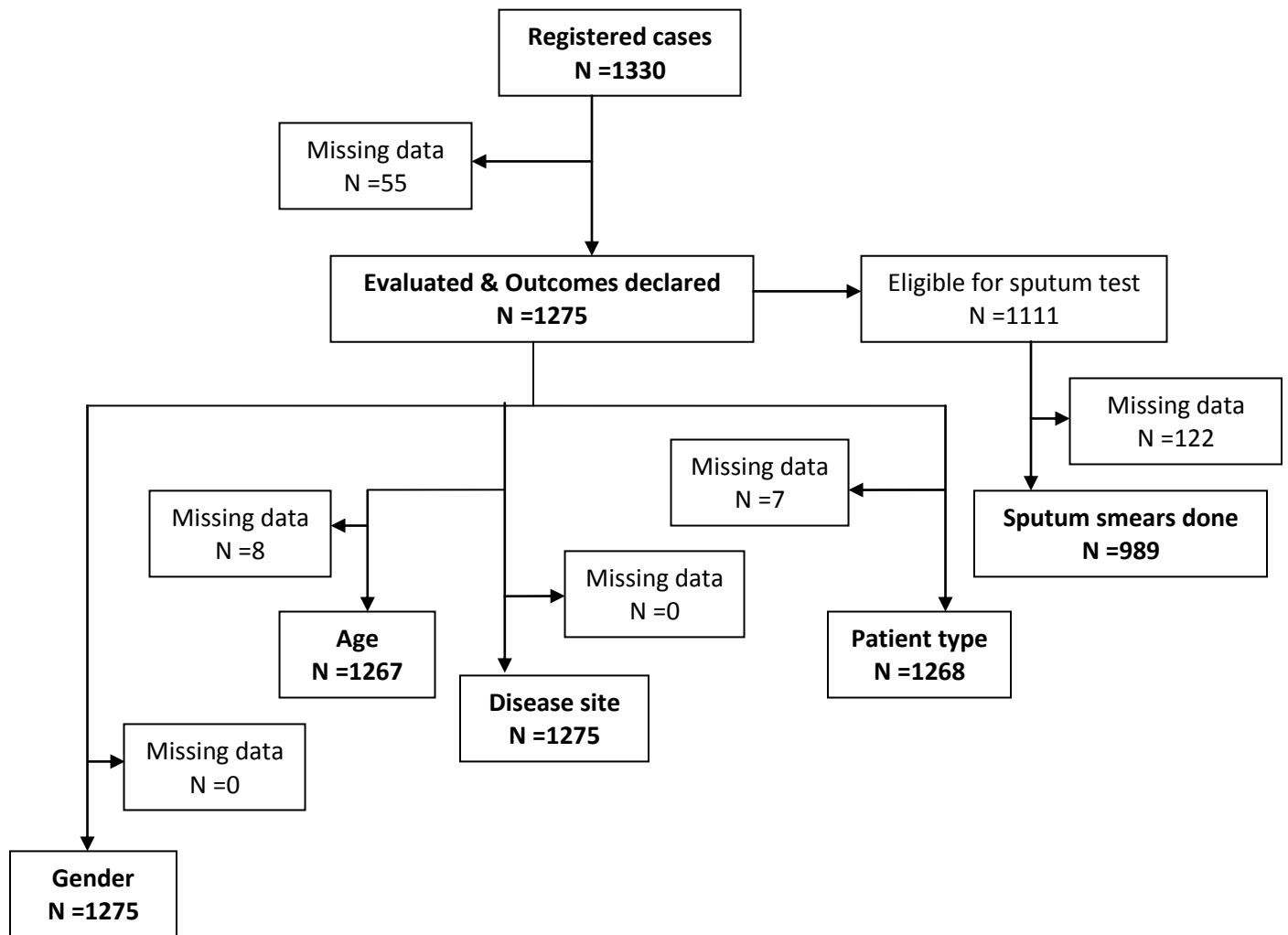
The purpose of this chapter is to address the first objective of this study which is to assess the effect of integrated TB/HIV services on the outcome of TB treatment at each of the study sites. TB treatment success rate was used as the main outcome indicator in addition to other TB treatment outcomes because it is one of the key indicators described by the national TB/HIV policy document. The focus of analysis was to determine if there could be any significant difference in TB treatment success before and after integration.

As has been made known in earlier chapters, this study is intended to inform evaluation, implementation and nationwide scale-up of TB/HIV in Ghana. The intention is therefore not to make definitive statements and draw causal inferences about the effect of integration. Therefore even though the results being presented in this and the next chapter have used chi-squares and odds ratios, the interpretation of these findings have been cautiously done as demonstrating how these methods can be used to assess the influence of TB/HIV integration in the Ghanaian setting and other similar contexts.. These two results chapters therefore present findings on the piloting of the methods of evaluating TB/HIV integration.

6.2 PARTICIPANT CHARACTERISTICS

In all, a total of 1330 TB cases were registered between the three study sites from January 2006 to December 2008: 727 (55%) were registered before integration and 603 (45%) after.

Figure 21: Flow diagram of participants involved in analysis



About 96% of these were evaluated and outcomes declared at the end of treatment, and among these there were different degrees of missing data with respect to the attributes of interest (Figure 21). The attribute with most missing data was sputum at

month 0 i.e. at registration: almost 11% of patients eligible for sputum smear had no recorded evidence of their sputum status (Figure 21, Table 20).

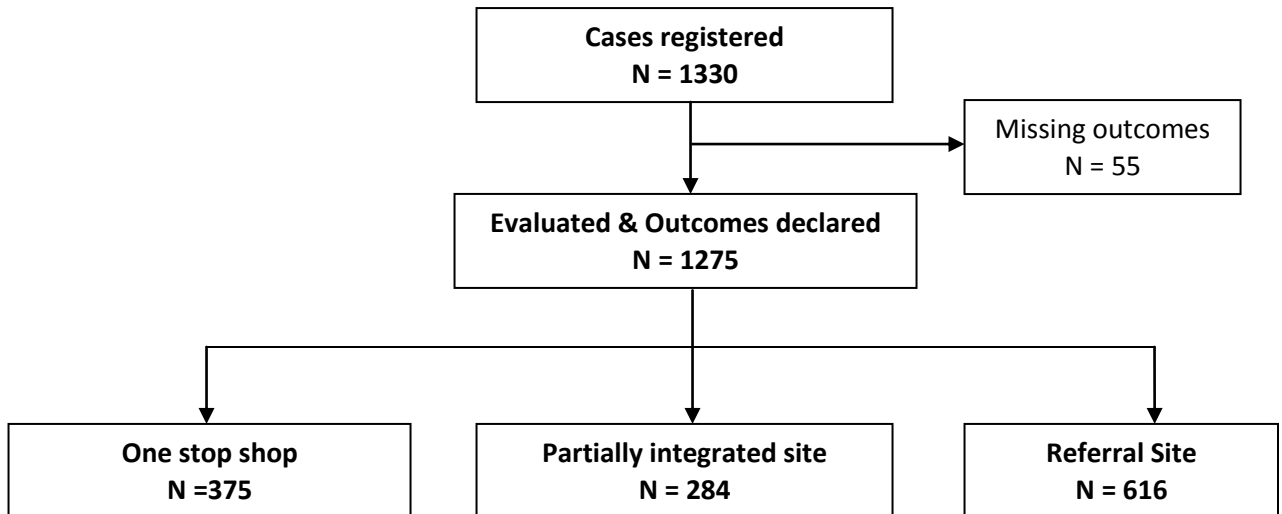
Table 20: Demographic characteristics and stratified treatment success rates

Characteristic	Frequency		Treatment success rates			
	Before (%)	After (%)	Before (%)	After (%)	Chi square (X ²)	p-value
Gender N = 1275	N = 708	N = 567				
Female	38.3	39.8	57.2	68.3	6.461	0.011
Male	61.7	60.2	46.5	69.4	41.010	0.000
Age N=1269	N = 704	N = 565				
Mean (SD)	40.5 (18.0)	41.8 (18.4)	50.6	69.0	43.958	0.000
Median (IQR)	40 (22)	39 (24)				
Range	1 - 97	2 - 105				
Age categories						
0 - 9	5.7	3.4	50.0	94.7	11.246	0.001
10 - 19	5.0	5.8	42.9	81.8	10.918	0.001
20 - 29	15.6	16.5	50.0	77.4	16.176	0.000
30 - 39	23.0	24.1	55.6	64.7	2.374	0.109
40 - 49	22.4	19.1	51.9	64.8	4.370	0.037
50 - 59	13.8	13.1	52.6	62.2	1.571	0.210
60 - 69	5.8	7.6	41.5	72.1	8.040	0.005
70 - 79	6.8	7.8	41.7	65.9	5.420	0.020
≥80	1.8	2.7	38.5	53.3	0.619	0.431
Site of Disease	N = 708	N = 567				
Pulmonary	92.7	88.5	50.3	67.9	36.245	0.000
Extra-pulmonary	7.3	11.5	53.8	76.9	6.923	0.009
Sputum @ month 0	N = 508	N = 481				
Positive	60.4	53.4	54.7	69.4	12.650	0.000
Negative	39.6	46.6	49.8	65.5	10.912	0.001
Patient Type	N = 702	N = 566				
New	88.3	90.5	48.7	69.7	50.921	0.000
Defaulter*	4.7	1.4	-	-	-	-
Failure*	0.6	3.5	-	-	-	-
Relapse*	5.6	4.1	-	-	-	-
Transferred *	0.7	0.5	-	-	-	-

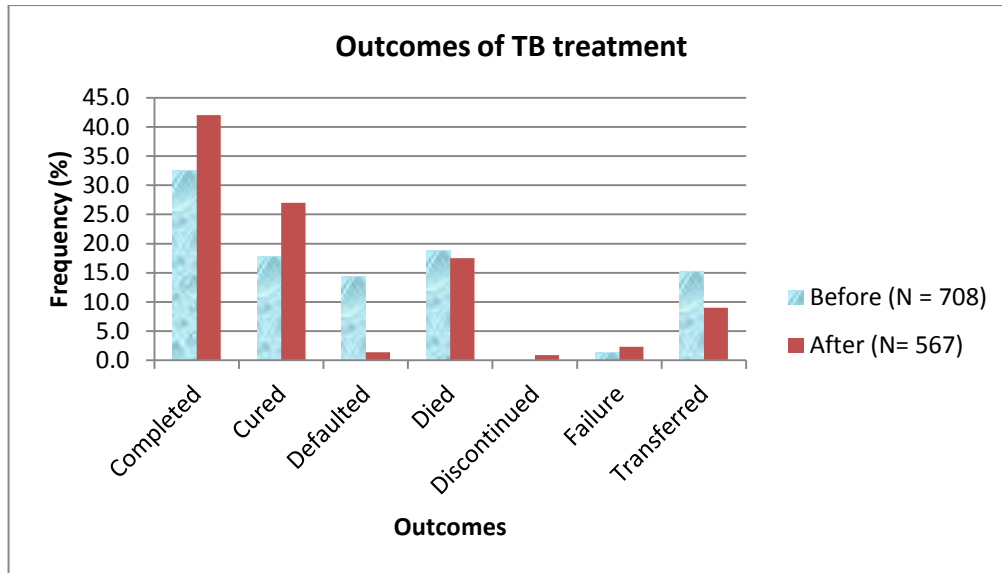
* Successful treatment outcomes data not included on account of the small sample sizes as compared to the new cases.

6.3 TB TREATMENT OUTCOMES

Figure 22: Participants involved in treatment outcomes

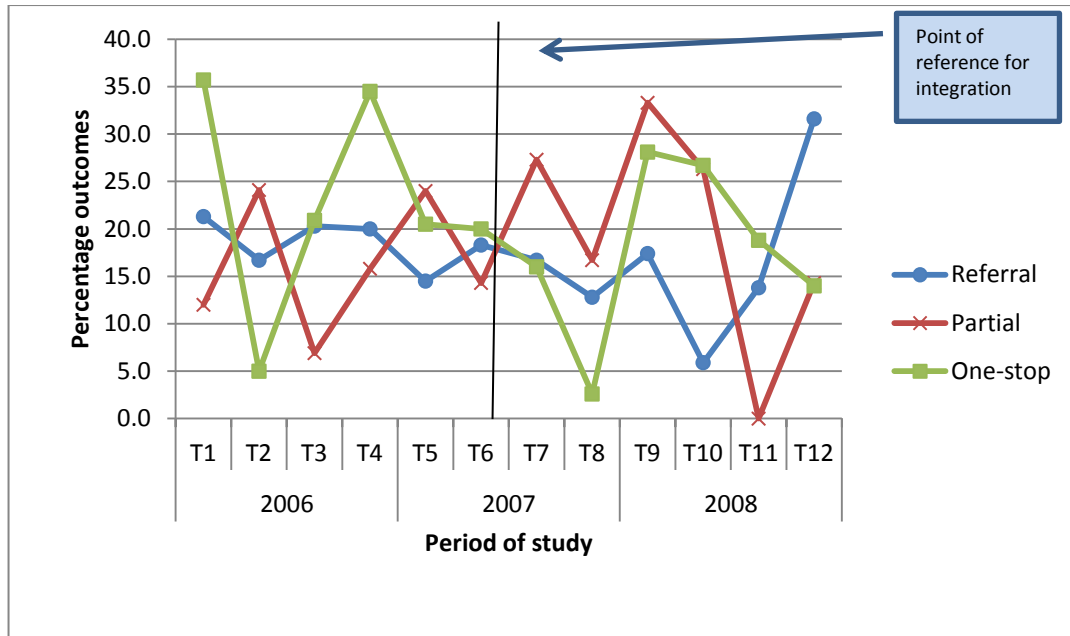


In all, about 96% of cases were evaluated at the end of TB treatment (Figure 22), which was comparable to the 97.6% national average for all TB cases evaluated over the period of study (NTP 2009b). Treatment success rose from 50.6% to 69% before and after integration respectively (Table 20). On the adverse outcomes before integration 18.8% died, 14.3% defaulted and 15.3% of cases were transferred out after treatment had been initiated. Both cured and completed rates increased after integration while defaults, and cases transferred out decreased (Figure 23). Only 1.4% of cases defaulted after integration, and cases transferred out reduced to 9%. As with the cases before integration, deaths during treatment were high at 17.5% after integration. Failures were 1.3% before and 2.3% after integration.

Figure 23: TB treatment outcome of cases evaluated before and after integration

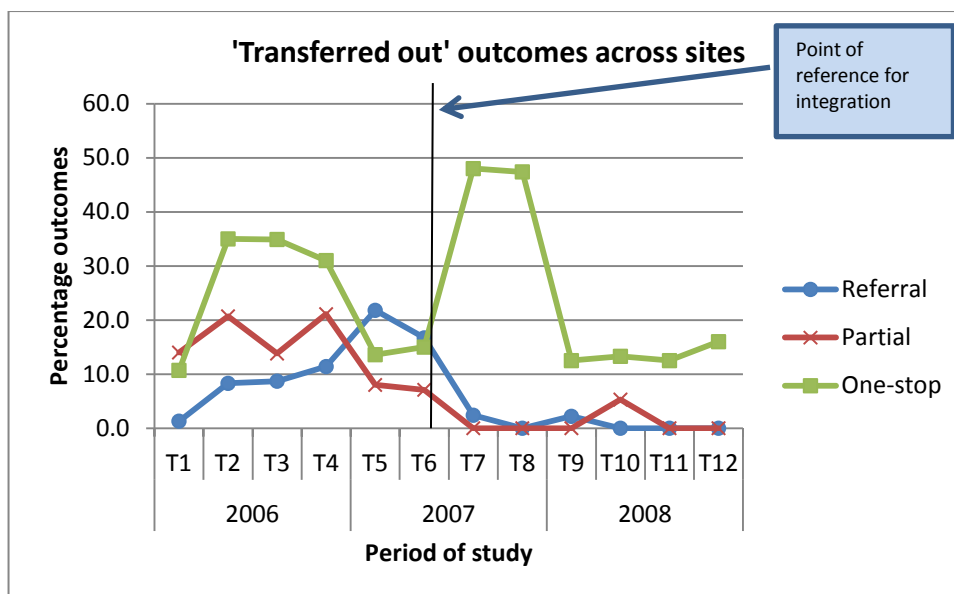
Death rates reduced marginally from 18.8% before integration to 17.5%, but this was not statistically significant. The death rate among TB patients was much higher at the study sites than figures reported by the national programme corresponding to 9% in 2006, 8.5% in 2007, and 7.5% in 2008. All the 3 sites had high death rates over the study period with no significant reductions after integration (Figure 24).

Figure 24: Trend of death rates among TB patients



With cases transferred out during treatment, there was marked difference between the one-stop shop (OSS) and the other two sites. The rates were generally higher at the OSS with peaks in 2006 and 2007 (Figure 25) and there seemed to be no difference after integration. The other two sites had lower transfer rates and demonstrated a reduction trend after integration (Figure 25, Table 21).

Figure 25: Trend of TB cases transferred out during treatment across study sites



Defaulter rate fell from 14.3%, which was much higher than the national rate (6% for 2006, and 3.2% for 2007), to 1.4% (NTP 2009b). Defaults reduced most significantly at the referral site. There was however no record of default at the PIS, suggesting either poor record keeping or misclassification of outcomes. Failure rates increased from 1.3% before, to 2.3% after integration.

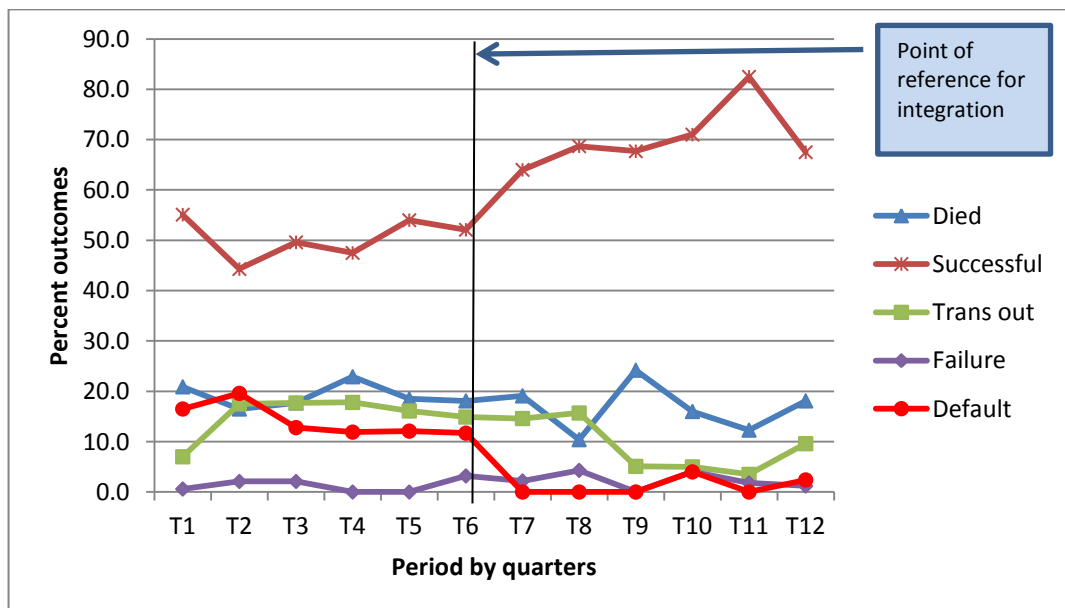
Table 21: “Transferred out” and “Defaulted” outcomes

Study site	Transferred out cases			Defaulted cases		
	Frequency		χ^2 (p-value)	Frequency		χ^2 (p-value)
	Before integration	After integration		Before integration	After integration	
RS	41 (11.1%)	2 (0.8%)	41.737 (0.000)	84 (22.8%)	2 (0.8%)	15.066 (0.000)
PIS	24 (14.7%)	1 (0.8%)		-	-	
OSS	43 (24.4%)	48 (24.1%)		17 (9.7%)	6 (3.0%)	

6.4 TB TREATMENT SUCCESS RATE

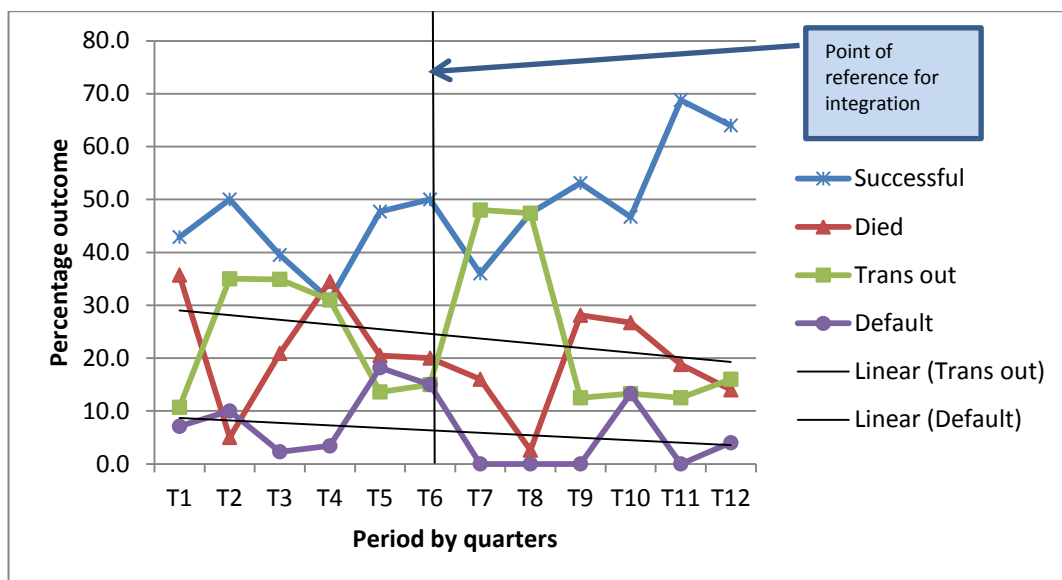
TB treatment success rate involves the number of TB cases that are cured at the end of treatment or completed treatment expressed as a percentage of all registered TB cases (p. 105). The treatment success rate before integration was 50.6%, and rose to 69% after integration [$\chi^2 = 43.958, p = 0.000$]. And the OR (95% CI) was 2.17 (1.72 to 2.74) suggesting that the odds for having successful treatment after integration may be more than twice the odds before integration. The seeming increase in treatment success was however still lower than national rates of successful outcomes over the same period: 76.1% in 2006, 84.4% in 2007, and 85.3% in 2008 (NTP 2009b). There was however a demonstration of continuous improvement in treatment success over the period of study (Figure 26).

Figure 26: TB treatment outcomes at all sites



6.4.1 ONE-STOP SHOP (OSS)

Figure 27: TB treatment outcomes at one-stop shop



At this site there were 375 cases evaluated at the end of TB treatment. TB treatment success was 42.6% before and 52.8% after integration (Table 22). The difference in the TB treatment success before and after TB/HIV integration was not significant as demonstrated by both the χ^2 test statistic and the odds ratio (Table 22).

Table 22: Statistical analysis of TB treatment outcomes before and after integration

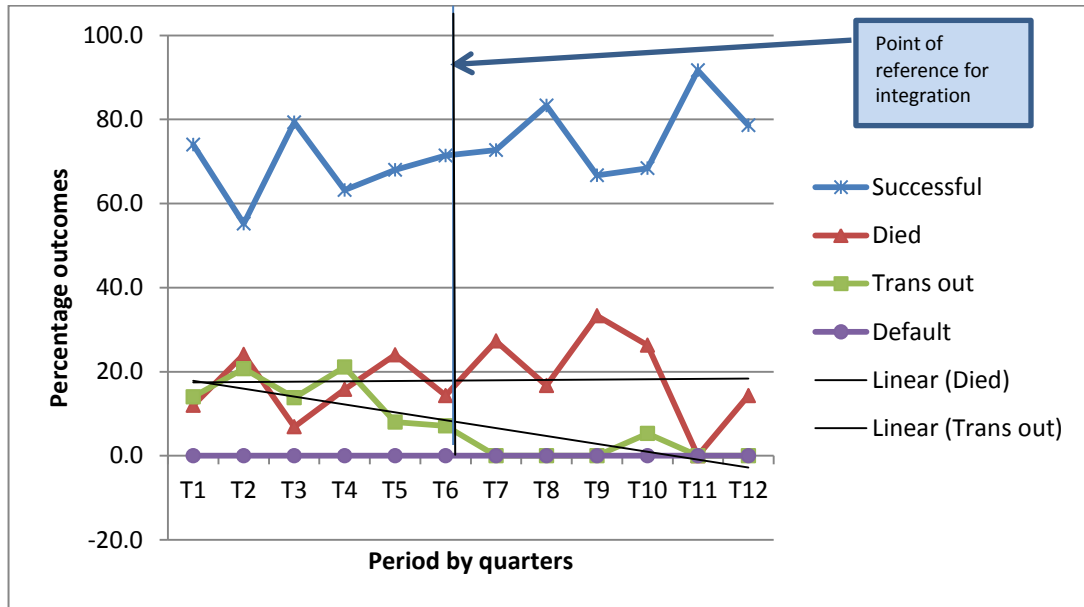
	Level of integration		
	OSS	PIS	RS
Treatment success rate before integration (%)	42.6	69.3	46.1
Treatment success rate after integration (%)	52.8	76.0	78.5
χ^2 (p-value)	3.855 (0.050)	1.556 (0.265)	64.539 (0.000)
OR (95% CI)	1.50 (1.00 to 2.26)	1.40 (0.82 to 2.37)	4.28 (2.97 to 6.18)

It was observed that this site had the lowest treatment success rate both before and after integration. This is not surprising as the site had the worst rates of deaths and transfers as observed in figures 24 and 25 above.

6.4.2 PARTIAL INTEGRATION SITE (PIS)

This site had the lowest number of participants registered and evaluated after TB treatment. Among the 284 participants for whom outcomes were declared treatment success rate was 69.3% before and 76% after integration. This site had the lowest increase in treatment success among the three sites, and the increase was not significant (Table 22 above).

Figure 28: TB treatment outcomes at partially integrated site

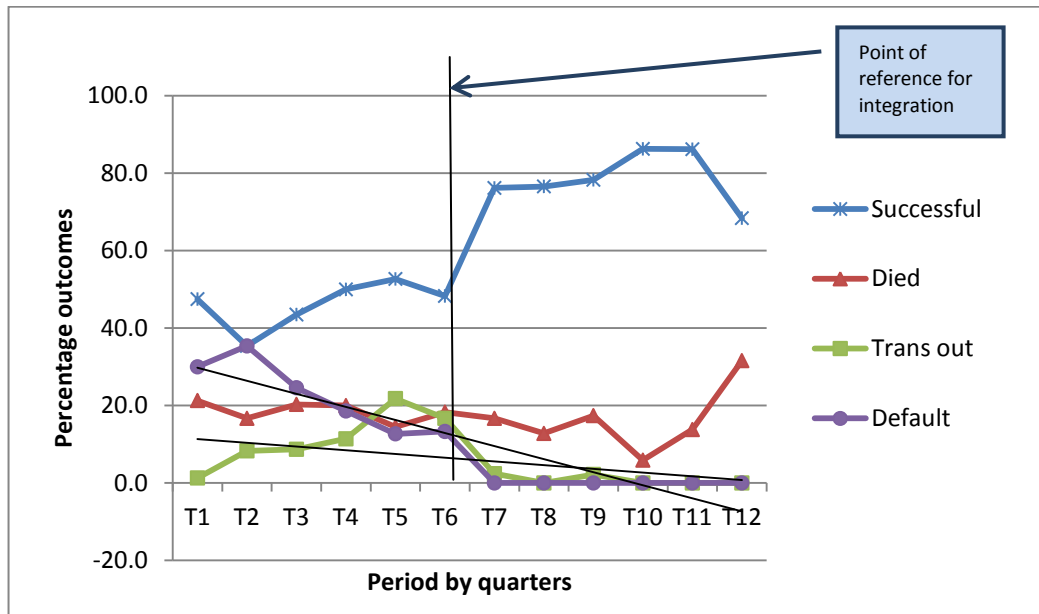


6.4.3 REFERRAL SITE (RS)

There were 616 registered cases with declared outcomes and treatment success rate before and after integration were 46.1% and 78.5% respectively. Although this is the

least integrated site, the RS demonstrated the greatest increase in treatment success after integration. and the difference was significant (Table 22 above). The difference in TB treatment success rates that were recorded before and after the integration suggests that the odds of having successful TB treatment outcome after integration may be greater by more than four times that before integration.

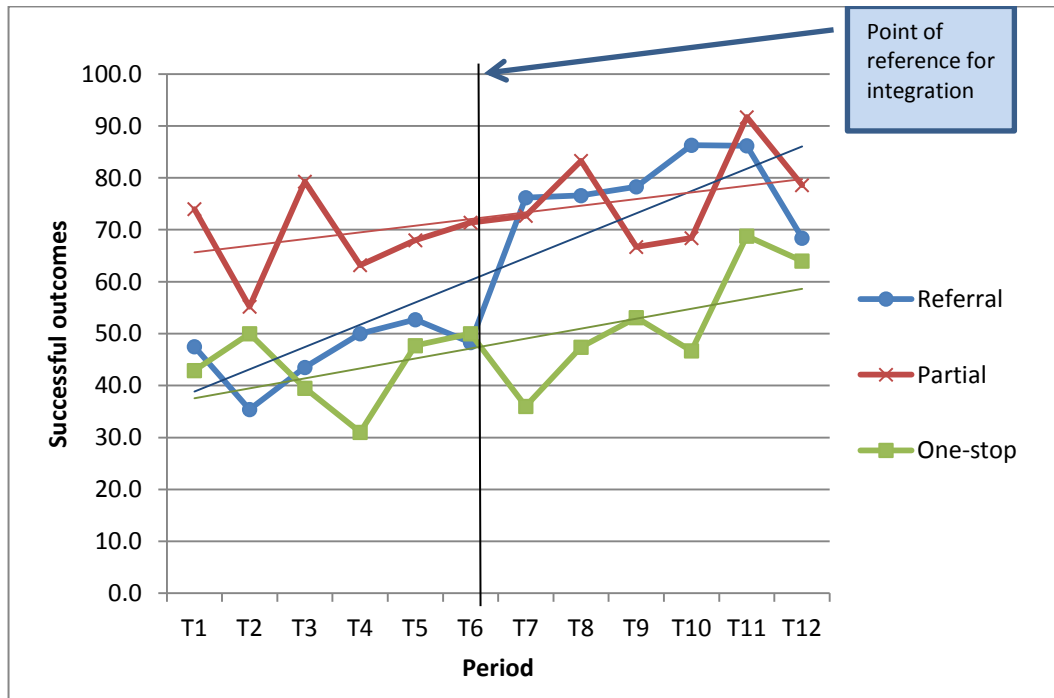
Figure 29: TB treatment outcomes at referral site



Over the period of study, the data from all sites suggested a positive trend for treatment success, although they were lowest at the one-stop shop (Figure 30). While there was no significant change in successful outcomes at the OSS and PIS, the findings suggest that there was an apparent improvement at the RS. Although observing the trends on the graphs and statistical testing suggest that treatment success rates have been improving after integration, adverse outcomes still remain high preventing the achievement of programme targets (Figure 26). Treatment success seemed to increase after integration and as integration progressed as shown in figure 26 displayed above.

This increase in successful outcomes was associated with reductions in cases transferred out and default cases while deaths and failures remained relatively unchanged as shown in figure 26 on page 160 above.

Figure 30: Treatment success trend across sites

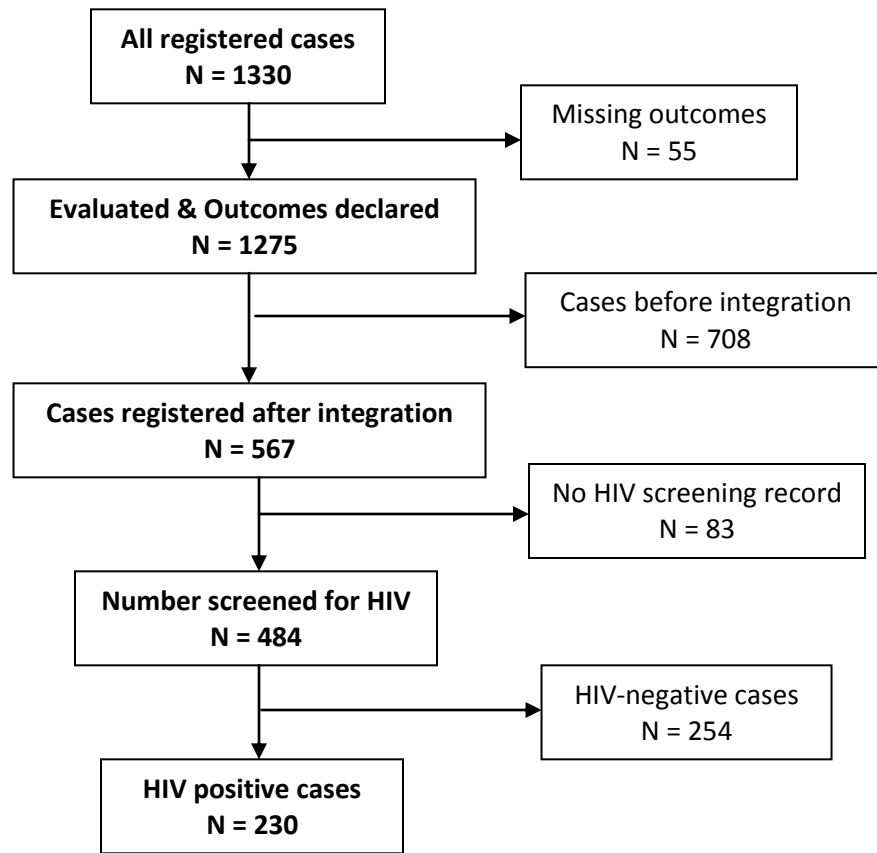


There was a similar trend with the outcomes at the three study sites as demonstrated in figures 27 - 29. The graphs showed a decreasing trend in ‘transferred out’ cases at all the sites, and a decrease in defaults at the referral site and OSS.

While the trends for all the ‘died’ outcomes had very low gradients at the OSS and the referral sites, deaths at the partially integrated site remained fairly stable (Figure 28). Therefore the reduction in cases transferred out and default cases seem to be more significant contributors to the improvement in TB treatment success rates.

6.5 TB TREATMENT OUTCOMES IN HIV-POSITIVE CASES

Figure 31: HIV-Positive participants analysis



Treatment outcomes in HIV-positive TB patients was assessed only after integration when HIV screening for TB patients was routinely done. Treatment was successful in 72.1% of the 254 HIV-negative patients with an upward trend, while the treatment success rate in the 230 HIV-positive cases was 63.9% but with a downward trend (Figure 32).

Figure 32: TB treatment success rate by HIV status after integration

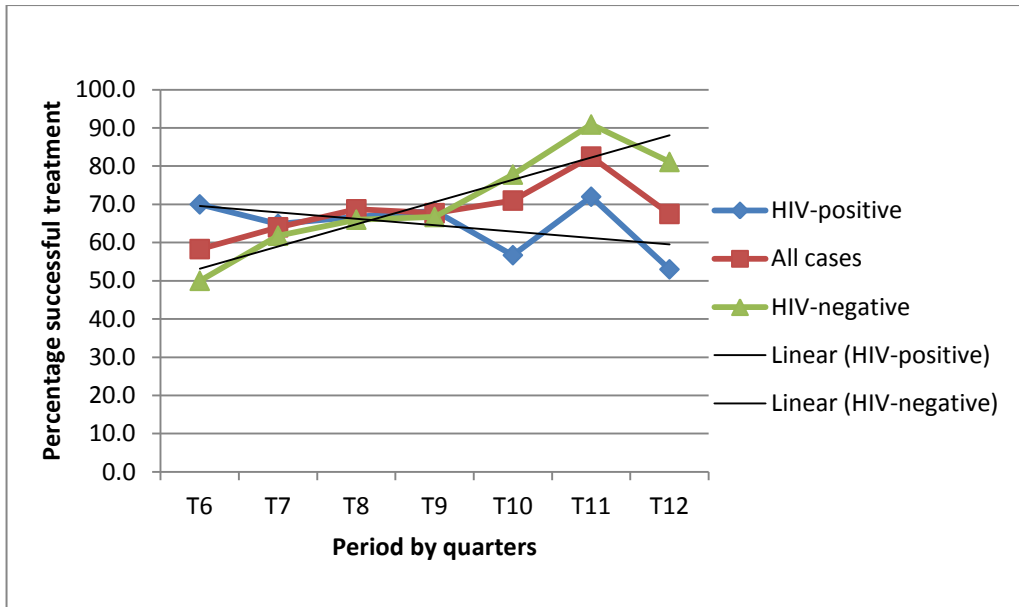
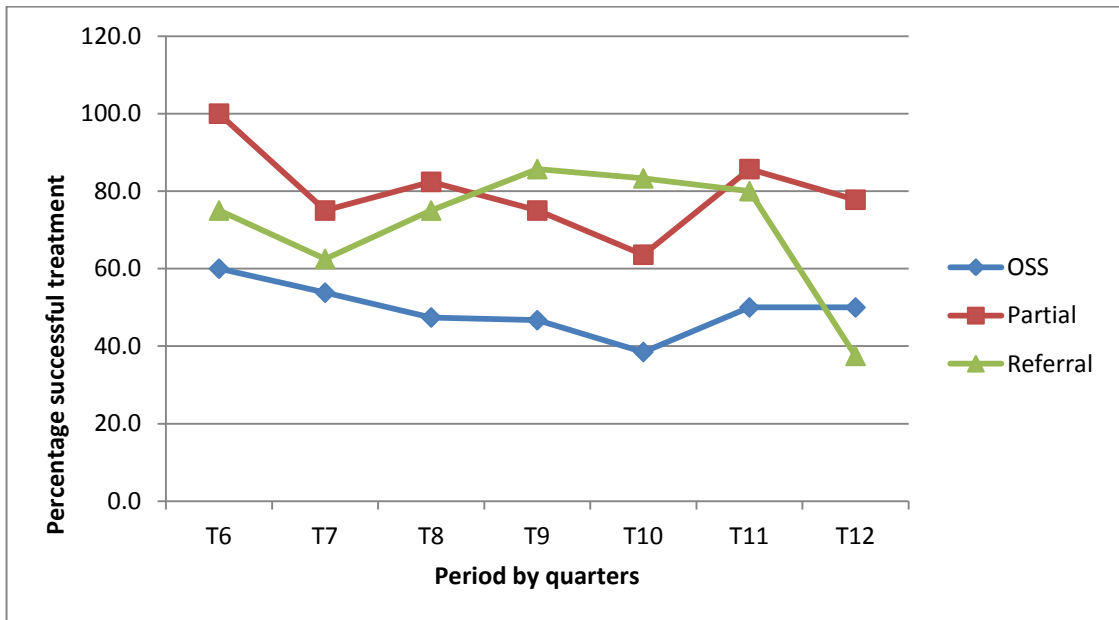


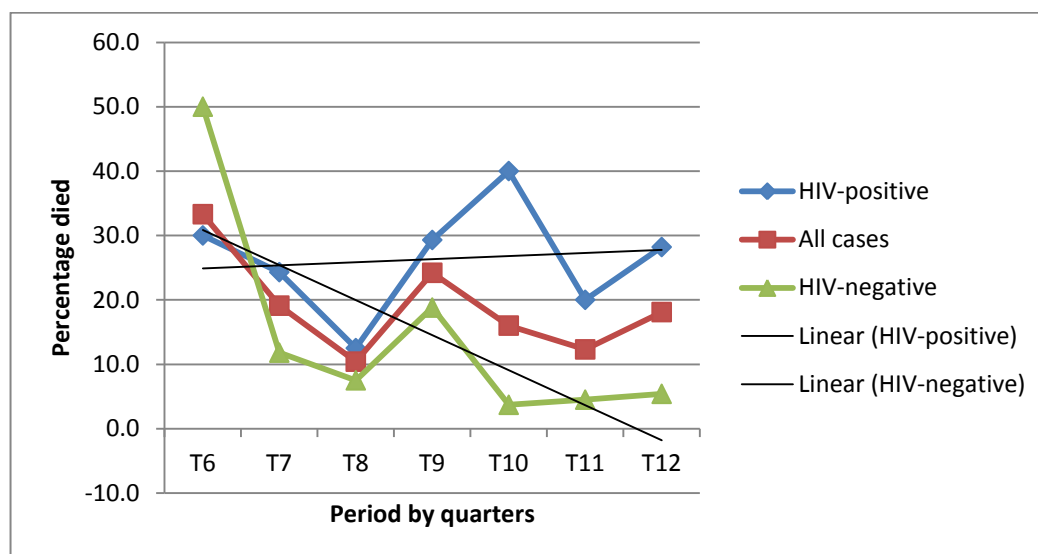
Figure 33 below also demonstrates that treatment success at each of the three sites also had remained unchanged or had a downward trend over the period of study, reaffirming the observation in figure 31 above.

Figure 33: Treatment success rates in HIV cases after integration



HIV-associated TB mortality was found to be 25.2%, which accounted for 58.6% of all deaths, as compared to 9.8% mortality among HIV-negative TB patients accounting for 25.2% of all mortalities. The proportion of cases that died during TB treatment among HIV-positive TB patients had an upward trend contrary to what was observed among HIV-negative patients (Figure 34).

Figure 34: TB deaths by HIV status



It was also observed that even though successful outcomes formed 72.9% among patients with unknown HIV status, mortality among them was more comparable to that among HIV-positive patients at 19.8%. Failure and default rates were also highest among them at 3.7% and 2.5% respectively

6.6 CONCLUSION

As indicated at the beginning of the chapter, these results are presented not as conclusions drawn from a robust study design which qualifies to do so, but as a proof of concept: that it is feasible to use similar designs to assess the effect of TB/HIV

integration on TB treatment outcomes. A total of 1330 TB cases were registered in all three study sites and out of these 95.6% were evaluated at the end of treatment. About 89% (1180) of all cases were newly diagnosed cases, and 92.7% of cases were pulmonary. Almost 11% of cases eligible for sputum smear testing had no record of their sputum status, and Of the 1161 that were to have sputum testing 10.7% did not have any record of their sputum status. and 598 (57.7%) out of the 1037 cases tested for sputum had positive sputum PTB. High death, default and transfer out rates were major contributors to the adverse TB treatment outcomes in all sites.

TB treatment success rate was averagely 50.9% before and 69% after integration in all the cases evaluated. Pertaining to the adverse outcomes, default and transferred out rates reduced from 14.3% and 15.3% before integration to 1.4% and 9% after integration respectively. Deaths on the other hand remained high at 18.8% before and 17.5% after integration. At the individual sites treatment success before integration was 42.6%, 69.3% and 46.1% at the OSS, PIS, and RS respectively. And these rates increased to 52.8%, 76%, and 78.5% respectively after integration. The difference in the treatment success rates at each site was significant only at the RS.

The X^2 test statistic at 95% confidence level and the OR with its 95% confidence interval suggest that there was a significant difference in TB treatment success rates before and after integration when all the data was analysed together. However when analysis was stratified by the level of integration, the evidence suggested that there was no difference in treatment success rates at the OSS and PIS before and after integration. The data however suggested that there was a significant difference in

treatment success rates before and after integration at the RS. TB cases seem to be more likely to have a successful outcome at the referral site after integration.

HIV-positive TB cases were also found to have lower TB treatment success rate of 63.9% and higher mortalities of 25.2% as opposed to treatment success rate of 72.1% and mortality of 9.8% among HIV-negative TB cases. HIV deaths accounted for 58.6% of all TB deaths after integration. After integration treatment success in HIV-positive cases deteriorated over the period of study while that in HIV-negative cases improved.

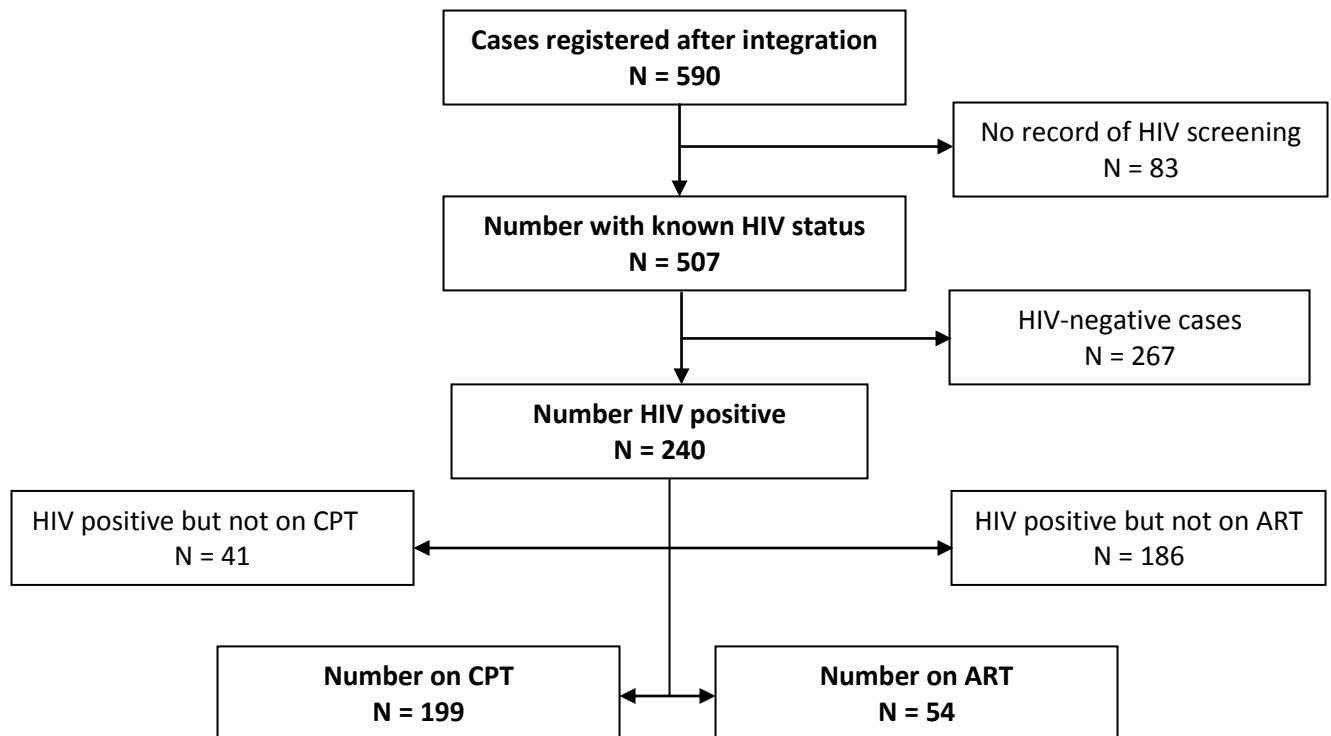
In the next chapter, the three different service delivery models at the different study sites will be compared in another quantitative study in order to determine what would be the best service delivery model as outlined in the second objective of this study.

7 COMPARING TB/HIV SERVICE DELIVERY MODELS

7.1 INTRODUCTION

In this chapter, the objective is to explore whether increasing levels of integration are associated with improved outputs of TB/HIV activities and TB treatment outcomes. Output indicators representing HIV screening, CPT uptake, ART uptake, and the outcomes of TB treatment of all three sites were collected for the period from 1st June 2007 to 31st December 2008: this covers 19 months after integration. Statistical results are presented here too not as conclusive findings on the effect of the degree of integration on TB/HIV outputs, but again as evidence of its feasibility.

Figure 35: Participants for comparison of degrees of integration



7.2 PARTICIPANT CHARACTERISTICS

There were 590 TB cases registered in all 3 sites from 1st June 2007 to 31st December 2008 i.e. the period after integration. There were more males than females at each site. The mean age for all sites was about 41 years, and 60% of cases were aged between 20 and 49 years. Most (90.3%) of the cases were new ones (Table 23). Sputum AFBs testing was done for 98.6% of those eligible, and out of these 53.8% were sputum positive.

Table 23: Characteristics of cases after integration

	Level of integration (%)			
	OSS	PIS	RS	All sites
Gender	N = 207	N=132	N = 251	N = 590
Female	43.0	48.5	33.1	40.0
Male	57.0	51.5	66.9	60.0
Age	N = 207	N = 132	N = 250	N = 589
Mean (S.D)	41.8 (18.8)	41.4 (17.4)	41.6 (18.4)	41.6 (18.3)
Median (IQR)	39.0 (24)	39.0 (22)	40.0 (25)	40.0 (24)
Range	2 - 105	3 - 86	1 - 97	1 - 105
Patient type	N = 207	N =132	N = 251	N = 590
New	91.3	89.4	90.0	90.3
Defaulter	0.5	2.3	1.6	1.4
Failure	3.4	0	5.6	3.6
Relapse	4.3	7.6	2.4	4.2
Month 0 Sputum	N = 188	N = 113	N = 208	N = 509
Number screened	99.5	98.2	98.1	98.6
Number positive	57.2	46.8	54.4	53.8
Outcomes	N = 199	N = 121	N = 247	N = 567
Cured	22.6	30.6	28.7	27.0
Completed	30.2	45.5	49.8	42.0
Died	18.1	21.5	15.0	17.5
Defaulted	3.0	0	0.8	1.4
Failed	1.0	0.8	4.0	2.3
Transferred	24.1	0.8	0.8	9.0

Out of the 590 cases after integration, 507 were screened for HIV. There were more females (51.7%) than males among the HIV-positive TB cases, as compared to the HIV-negative group where women were 31.8%, and the mean age for both sexes was lower

at 38.8 years in the HIV-positive group of cases (Table 24). Majority of cases (90.9%) in both groups were also newly diagnosed TB cases .

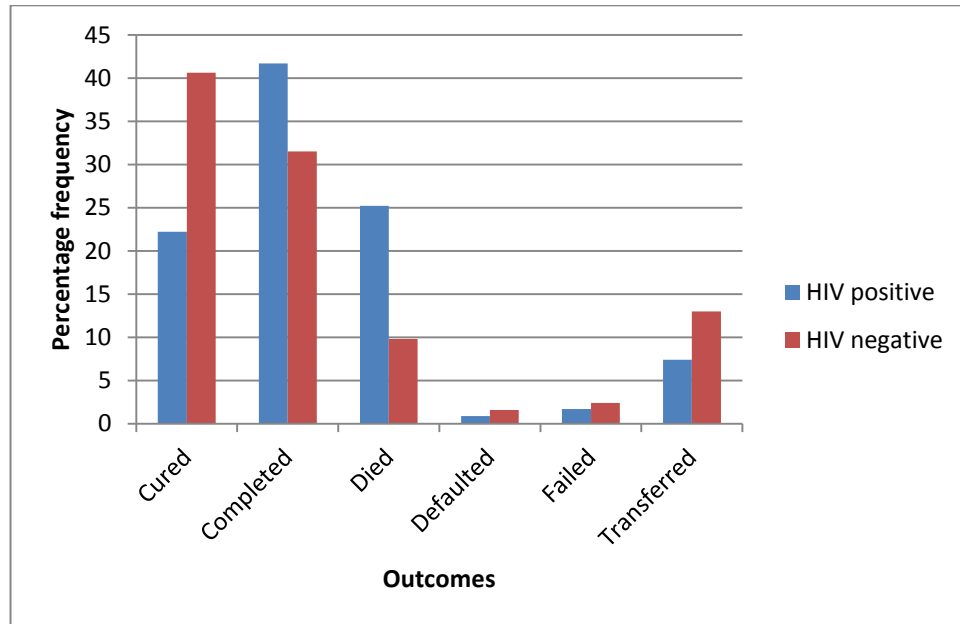
Table 24: Comparison of participant characteristics in HIV positive and negative cases

	HIV-positive cases	HIV-negative cases
Number (N)	240	267
Gender		
Female	51.7%	31.8%
Male	48.3%	68.2%
Age		
Mean (S.D)	38.8 (12.8)	42.4 (19.8)
Median (IQR)	39 (16)	38.5 (30)
Range	2 - 77	3 - 103
Patient type		
New	90.9%	90.9%
Defaulter	1.3%	0.8%
Failure	3.5%	4.0%
Relapse	3.9%	4.0%
Disease site		
Extra-pulmonary TB	6.7%	13.9%
Pulmonary TB	93.3%	86.1%
Month 0 Sputum		
Number screened	90%	99.1%
Number positive	46.8%	61.3%
Outcomes		
Cured	22.2%	40.6%
Completed	41.7%	31.5%
Died	25.2%	9.8%
Defaulted	0.9%	1.6%
Failed	1.7%	2.4%
Transferred	7.4%	13.0%

Only 90% of HIV-positive cases had sputum AFBs done at the beginning of treatment as compared to 99.1% in the HIV-negative group. The HIV-positive TB cases were associated with a higher percentage of smear negative TB cases and fewer EPTB cases (Table 24). HIV-negative TB patients had a higher cure rate and a lower rate of treatment completion when compared with HIV-positive cases (Figure 36, Table 24). Among the adverse outcomes, only the number of deaths were higher among the HIV-

associated TB cases. Death rate was 25.2% as compared to 9.8% in HIV-negative cases (Figure 36). More HIV-negative cases defaulted, failed or were transferred out.

Figure 36: TB treatment outcomes by HIV status



7.3 TB PATIENTS WITH KNOWN HIV STATUS

This indicator relates to how many of these TB patients had been screened for HIV prior to or during TB treatment. Out of the 590 cases only 85.9% had a record of having been screened for HIV. For the remaining 14.1% (83), their status remained unknown because there was no recorded evidence of testing. For all the patients with known HIV status at the different sites, 47.3% were positive for HIV. According to table 25, 98.6% of cases at the OSS had been screened for HIV as compared to 91.7% and 72.5% at the PIS and RS respectively.

Table 25: TB/HIV activities outputs across sites

TB/HIV Activities	Level of integration n (%)			
	Outputs	OSS	Partial	Referral
Number of TB cases registered		207	132	251
Number of TB cases screened for HIV		204 (98.6)	121(91.7)	182 (72.5)
Number of cases screened and are HIV-positive		96 (47.0)	79 (65.3)	65 (35.7)
Number of HIV-positive TB cases on CPT		79 (82.3)	59 (74.7)	61(93.8)
Number of HIV-positive TB cases on ART		0 (0.0)	47 (59.5)	7 (10.8)

From table 26 the OR of HIV screening done at the OSS versus the RS suggests that the odds of having HIV screening done at the OSS are higher than that for the RS. The same applies for the odds at the OSS versus PIS, as well as the PIS versus RS as presented in the same table (Table 26). The X^2 test statistic (p-value) for combined OSS and PIS was 65.102 (0.000) suggesting a significant difference.

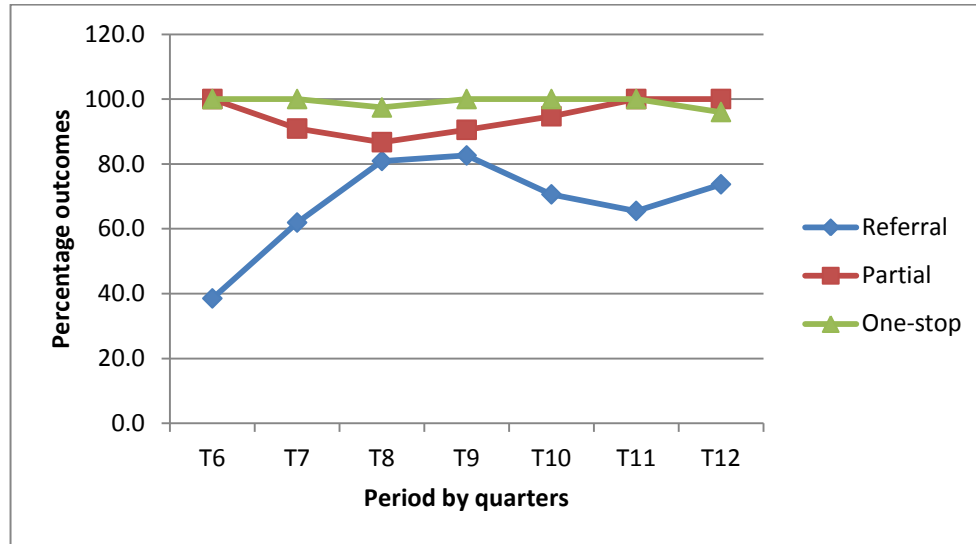
Table 26: Statistical analysis of HIV screening at study sites

Sites	X^2 (p-value)	OR (95% CI)
OSS : Referral	68.262 (0.000)	25.78 (7.99 to 83.22)
OSS : Partial		6.18 (1.69 to 22.60)
Partial: Referral		4.17 (2.12 to 8.20)
OSS /Partial: Referral	65.102 (0.000)	8.80 (4.82 to 16.08)

This suggests that increasing levels of integration may be associated with higher odds for HIV screening among TB patients at the study sites. Graphical display of the proportions for trends confirm that HIV screening was highest at the OSS, and supporting the observation that increasing degree of integration may be associated

with higher proportions of patients with known HIV status (Figure 37) and therefore higher uptake of HIV screening. The difference between the proportions at the three sites though was not constant, with screening at the RS in particular showing a more remarkable upward trend.

Figure 37: HIV screening among TB patients



7.4 CO-TRIMOXAZOLE PREVENTIVE THERAPY (CPT)

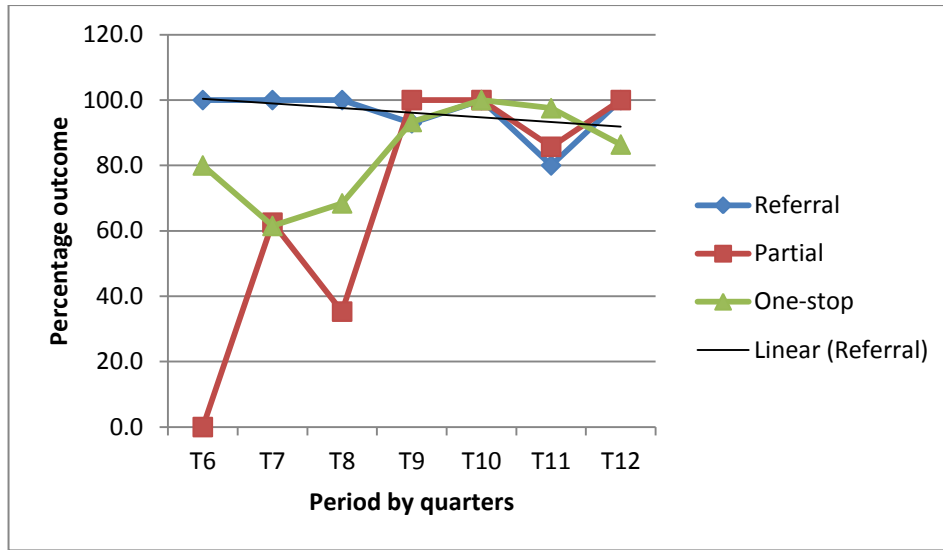
A total of 240 (47.3%) out of the 507 participants screened for HIV were positive, and were therefore eligible for CPT according to the national guidelines. At the OSS 82.3% of HIV positive patients were on CPT, while the figure was 74.7% at the PIS. At the referral site, 61 out of the 65 (93.8%) HIV positive TB patients were on CPT (Table 25). The analysis using χ^2 and ORs imply that the OSS and PIS were rather associated with lower odds for providing CPT to HIV-positive TB patients as compared with the RS (Table 27).

Table 27: Statistical comparison of CPT uptake at study sites

Sites	χ^2 (p-value)	OR (95% CI)
OSS : Referral	9.288 (0.010)	0.30 (0.03 to 0.95)
OSS : Partial		1.58 (0.76 to 3.26)
Partial: Referral		0.19 (0.06 to 0.60)
OSS /Partial: Referral	7.517 (0.006)	0.24 (0.08 to 0.72)

The study data implies that integration of TB and HIV services may be associated with lower odds of providing or monitoring CPT prophylaxis. HIV-positive TB patients were therefore more likely to be given CPT or have a record of this at the referral site.

Observing the trend of CPT at the study sites showed that there was more variation in the first 3 quarters after integration than the later 4 quarters as the percentages of patients on CPT at all sites had figures closer to 100 (Figure 38). The most dramatic increase occurred at the PIS followed by the OSS. The trend at the RS on the other hand had a downward slope. No one particular site was consistently having the highest proportion of HIV-positive TB patients on CPT. The statistical and trend analysis do not support the observation that CPT levels increased with increasing degrees of integration as was observed with HIV screening among TB patients.

Figure 38: Proportion of HIV-positive TB cases on CPT

7.5 ANTIRETROVIRAL THERAPY (ART)

In all, only 54 (22.5%) out of 240 HIV-positive TB patients had a record of being on ART. At the individual study sites the PIS had 59.5% (47 out of 79) on ART, while only 10.8% (7 out of 65) were on ART at the RS. At the OSS there was no record of any HIV-positive TB patient on ART in the TB register (Table 25, Figure 39).

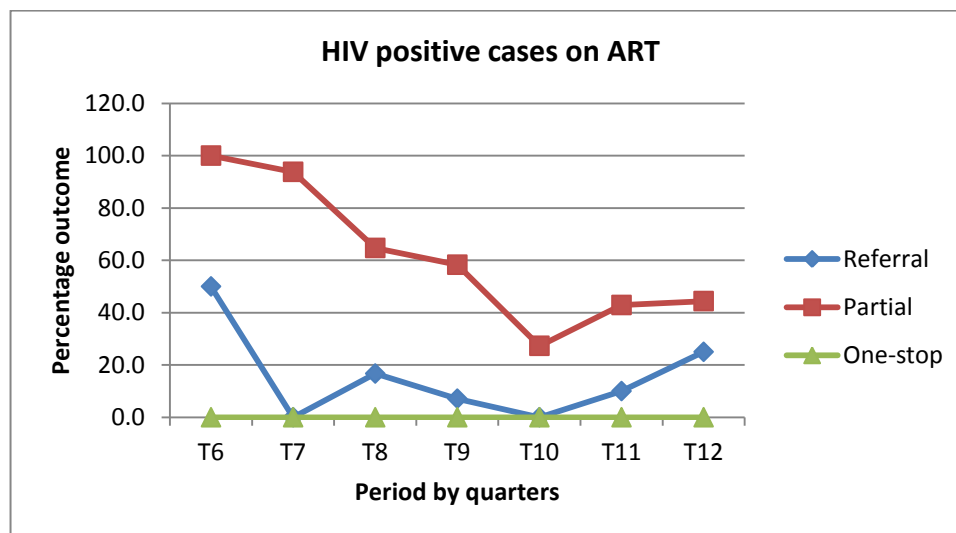
Table 28: Comparison of ART at study sites

Sites	χ^2 (p-value)	OR (95% CI)
OSS : Referral	95.001 (0.000)	0 (0)
OSS : Partial		0 (0)
Partial: Referral		12.17 (4.93 to 30.04)

Due to the lack of records on HIV-positive TB patients on ART at the OSS, the OR was 0 with no confidence interval to compare the OSS with either the PIS or the RS. The odds of an event can be calculated only when it has occurred. Therefore it was not possible to directly compare ART status of HIV-positive TB patients at the OSS with the other

two. At the other two sites the trend analysis shows that there were more patients at the PIS on ART than at the RS throughout the study period after integration. However the trends at both sites had downward gradients for the first four quarters before rising again.

Figure 39: Proportion of HIV-positive TB patients on ART



7.7 CONCLUSION

There were 590 TB cases registered at the 3 study sites after integration, and 40% were females. The mean age was about 41 years for all sites and most of the cases were newly diagnosed ones. Sputum AFB testing was done for 98.6% of those eligible, and 53.8% were sputum positive. The average proportion of TB cases with known HIV status was 85.9%, and 43% of these were HIV positive. HIV screening among TB patients was highest (98.6%) at the OSS and lowest (72.5%) at the RS. HIV screening at the PIS was 91.7%. The odds for HIV screening among TB patients was significantly higher with increasing level of integration, suggesting that increasing level of integration may be associated with greater uptake of HIV screening services.

About 82.9% and 22.5% of HIV positive TB patients were on either CPT or ART respectively. CPT uptake was highest (93.8%) at the RS, followed by the OSS with 82.3%. At the PIS, CPT uptake was 74.7%. There was no significant difference in the odds when the OSS and PIS were compared. CPT does not seem to be related to level of integration according to this data.

Only 22.5% of HIV-positive TB patients were on ART: at the PIS 59.5% were on ART as compared to 10.8% at the referral site. There was however no record of any patients at the OSS on ART, making it difficult to examine the impact of increasing degree of integration. A comparison of the ART access at the referral site and the partially integrated site suggests that there were higher odds of ART uptake at the PIS.

The foregoing chapter has reported findings on the comparison of three service delivery models in the second of three results chapters. To conclude the presentation of findings of this study, I present the findings from the qualitative study that explored the influences of patient behaviour and experiences, as well as provider behaviour, on TB/HIV integration in the next chapter.

8 EXPLORING INFLUENCES ON TB/HIV INTEGRATION

8.1 INTRODUCTION

The aim of this chapter is to explore how user and provider experiences and behaviours affect outputs and the outcomes of TB/HIV services integration. Health service delivery as an interaction between provider and the patient implies that the impact of this interaction is determined by both parties. The purpose of this chapter is therefore to explore the influence of the provider and patient on the processes that account for or achieve the observed outputs and outcomes. Best practices and barriers related to provider behaviour, patient behaviour and the organisation of care itself can thereby be identified as well as more effective strategies for improved integration.

Data collection involved using one-on-one semi-structured interviews to gather information about TB/HIV integration from co-infected patients, TB/HIV service providers at the facilities, as well as managers from the national offices of the TB and HIV control programmes. The providers interviewed included 7 females and 4 males made up of 3 national managers, 1 district TB coordinator, 2 VCT nurse/HIV prescribers, 1 TB nurse/HIV prescriber, and 4 TB nurses. Their level of experience of working with TB and/ or HIV patients ranged from 1 to 14 years. Among the 18 adult patients interviewed 5 were in the intensive phase of treatment and 13 in the continuation phase.

Data analysis was thematic using a-priori themes that were used to design the study as well as emergent ones. There were 6 main sub-themes identified from the

data and these were: working in TB/HIV, living with TB/HIV, managing TB/HIV, financing care, TB/HIV perspectives, and barriers and facilitators. In accordance with the analytical strategy, the stated objectives for the study as well as the conceptual framework, the discussion and interpretation was done under broader themes which are provider behaviour, patient experience, patient behaviour, and organisation of care as described below.

8.2 PROVIDER BEHAVIOUR

The focus of this section is on how provider behaviour enhances coordination, how providers involve patients in their care, and how these practices vary across the study sites. Providing patient-centred care involves exploring the disease and illness experience, understanding the whole person, finding common ground, enhancing prevention and health promotion, and enhancing continuity relationship between provider and patient (Stewart 2001; Stewart et al. 2000). These characterise the process and influence outputs and outcomes of TB and HIV integration.

8.2.1 UNDERSTANDING THE WHOLE PERSON

All providers interviewed admitted to privacy and confidentiality being a priority in service delivery. Both providers and patients refer to private one-on-one counselling sessions as a major strategy for providing privacy and confidentiality for patients. And the providers include restricted access to patient folders and secure storage as an additional strategy as shown in the statements below:

“Their folders are being kept at the office. We don’t allow even staff from outside this place to use or to touch it. So that one the privacy is there and the confidentiality too is

there. If you want to educate the patient on his/her disease, it's only the patient that we talk to. But if he himself or she herself wants you to inform someone...even that one we ask the patient herself to give the information to the person he wants you to tell.”
(TB nurse at OSS)

HIV screening for example is done within the voluntary counselling and testing (VCT) centre in the referral site (RS) and partially integrated site (PIS), and in the one-stop shop (OSS) in the same building. Patients therefore do not have to join other patients in the general laboratory. Also patients are given the right to decide who to disclose their status to or should be their treatment supporter. These practices, aimed at improving patient involvement, compliance and patient satisfaction, were reported by both providers and patients from all three sites. Providers also admitted that other TB/HIV team members maintained privacy and confidentiality of patients:

“...privacy and confidentiality in our unit...That one, I assure you...it's very good. We don't sell our clients out to people....”(VCT nurse/HIV prescriber at RS).

However one provider at the partially integrated site said she could not vouch for other team members' ability to do so:

“I do not disclose someone's status to another person. If someone else will do it I cannot tell” (TB nurse/HIV prescriber at PIS).

Staff at the PIS and the OSS acknowledged that sometimes family members of patients bring pressure to bear on providers to breach confidentiality. Also because TB and HIV

patients use a specific area of the OPD as a waiting area on HIV clinical care days, it had become common knowledge that patients sitting in this area may be HIV patients. The same problem exists in the OSS where a specific ward is designated for TB/HIV cases.

Another challenge was the lack of patient confidence in privacy and confidentiality. Two patients admitted they were not sure if the nurses had kept their privacy. The two patients had not been assured of confidentiality and were always anxious whenever they met any of the nurses outside the hospital:

"Sometimes I worry that some of the nurses, especially the students...may disclose it to others or point fingers at me in public. That scared me. Because of that I am unable to associate freely with people or go to public places." (Female patient at OSS).

"...there is one nurse who attends the same church I do with her children. But I don't know whether she has told anyone else...If I go to the doctor, she comes around. So I know she and her children know. As to whether she has told someone at church, I cannot say." (Female patient at referral site)

During visits to the hospitals I observed that at the partially integrated site the 2 nurse prescribers who manned the HIV clinics used one consulting room due to lack of adequate rooms. This meant two patients would be seen at the same time. This lack of privacy severely challenges the ability of patients to discuss every problem they may be experiencing.

Privacy and confidentiality is an attribute of health care delivery that demonstrates the provider's recognition of the patient as a person. TB and HIV are

both highly stigmatised diseases and therefore the provision of privacy and confidentiality becomes even more crucial in demonstrating a provider's understanding of the life context of the patient. This is an essential component of patient centred communication that enhances patients' perception of patient-centred care which should be a fundamental part of the process of care to influence outputs and outcomes. Stewart et al. (2000) demonstrated that patient perception of patient-centred care improved patient health outcomes, and therefore this may have contributed to the overall improvement in outputs and outcomes observed after integration.

8.2.2 FINDING COMMON GROUND

This involves describing the problem, formulating a management plan with the patient, answering patient's questions, and discussing management with patients. Provider-patient interaction is a basic and essential component of health service delivery. All patients interviewed confirmed that they were happy with the interactions they had with providers, primarily based on how they were spoken to. Most patients appreciated that they were not verbally abused, and that providers were patient with them and corrected them gently. Patient involvement in care involves discussing and agreeing with patients on what the problem is and the management plan (Stewart et al. 2000). It is not just about engagement but includes working with the patient's beliefs and values, providing for physical, psychological, social and cultural needs, and sharing decision-making (Pelzang 2010). The providers in this study however demonstrated a limited understanding of this concept as portrayed in their responses below to a question on how patients are involved in their care.

“You know, after the counselling, you throw it to the one. If, let’s say that the one is from far, some of them they wouldn’t like anybody to know that they are having this condition. So, with that one, if that will be the case, he would say, “I will bring my relative.”” (TB nurse at PIS)

“Normally ... I don’t know what to say about this (long pause). I think we involve them in all that we do. Like when we sit down weekly, we give health talks ... and then we advise them on how to take their drugs and how to eat eh...well-balanced diet...eh...sleep and rest; we talk a lot about it. And then they...they listen when we talk. So they are very much involved in all that we do for them. We don’t eh... isolate them. We talk to ... we do everything with them.” (TB Nurse at OSS)

“We [used to] counsel them and tell them if there is any reaction or so, so and so, then they should report back. Then...what else?...we [used to] talk to them.” (TB Nurse at RS).

Patient involvement in care was limited to giving information to patients to let them understand their role in executing a pre-determined treatment plan. This practice was observed in all 3 study sites. Therefore finding a common ground on what the problem is and mutually agreeing on a management plan was flawed, thus undermining the delivery of patient-centred care (Pelzang 2010; WHO 2005). Actively including patients in their management shifts them from being passive recipients of care to being active decision-makers, satisfaction with care increases and adherence to medical recommendation improves (WHO 2005). The lack of this attribute in TB/HIV services in the study sites may therefore have contributed to why outputs and outcomes improved after integration but not enough to meet target like 85% treatment success rate (WHO 2010a) or better in any of the three sites.

8.2.3 ENHANCING PREVENTION AND HEALTH PROMOTION

Patient education was the main strategy here. Patient information was said to be mainly delivered through counselling sessions which were used to convince patients to accept screening, to educate patients on their conditions, and to improve adherence. Counselling sessions were also used to help patients identify a family member or volunteer to be a treatment supporter, and to inform patients of an NGO or PLHIV support group where available. Patients are also educated on diet and other health-related behaviour to promote wellness and healthy lifestyles which strengthens patient-centred care (WHO 2005).

“They told me to cover my mouth while coughing in public. They also educated me on how to prevent it. They advised me against indiscriminate spitting. They said I should spit into a container and cover it. If the container gets full, I can pour it into the water closet and wash the container.”(Female patient at OSS)

However at all the three sites all patients used a common waiting area during HIV clinic days, thus HIV patients with or without TB sat together in long queues promoting transmission of TB.

8.2.4 ENHANCING CONTINUITY RELATIONSHIP BETWEEN PROVIDER AND PATIENT

The existence of TB/HIV teams at the study sites which managed cases and follow-up visits on specific clinic days enhanced relational continuity for patients particularly at the PIS and the OSS where teams worked more closely together. An effective tool used to enhance this continuity was the giving of specific appointment dates to patients for review or refill at both TB and HIV centres in all sites. Informational continuity, which is

the use of information on past events and personal circumstances to make care appropriate for each individual, was however limited since TB records and HIV records are kept apart even in the OSS due to national programme monitoring procedures. However this probably did not have any significant impact on TB/HIV outputs and outcomes because as demonstrated by van Walraven et al. (2010) it is relational continuity that is associated with improved patient outcomes and satisfaction. The impact of informational continuity on patient outcomes was rather uncertain.

8.2.5 ENHANCING COORDINATION

Integration is promoted when procedures and tasks are specified for all the integrating units through the use of guidelines and protocols as a coordinating mechanism through standardisation of work (p. 69). A notable strength of TB/HIV integration in Ghana is the availability of a clear policy, as well as treatment guidelines for the management of TB/HIV co-infection. Although there were no copies readily available at the study sites, provider descriptions of the care process at each of the three sites demonstrated that they had a good knowledge of, and endeavoured to adhere to what was in the policy and treatment guidelines. The use of these protocols and guidelines also helped reduce the variation in management of cases, and provided management continuity through a consistent and coherent approach to disease management (Haggerty et al. 2003).

Providers at the PIS and the OSS confirmed during interviews that they worked as a team. Teams met to plan TB/HIV activities and find solutions to problems.

“Here, I can say it is well integrated, because recently, both the DOTS nurses and the Counselling Unit nurses – we all merged with the Disease Control Staff and had a meeting on how we can merge and work as a team. So, there it was...decided that we have to screen all our cases for TB”. (VCT Nurse/HIV prescriber at PIS)

“We don’t actually have days that we meet, but once in a while - every quarter (we) meet...that is all those that give CT services, the PMTCT and then the TB coordinators...we all meet to discuss issues about TB/HIV at the regional hospital ...So since we started we have met about three times at the regional hospital. It is (the regional HIV/AIDS coordinator) who calls that meeting” (District TB coordinator)

However providers at the TB centre in the referral site experienced otherwise. They acknowledged there was a TB/HIV team but that it did not function as one. Even though they were capable of screening TB patients for HIV and were willing to assist at the overcrowded HIV clinics, they did not get access to test kits and were not welcome in the HIV clinics either:

“When they come here...any TB patient you have to test HIV, So we [used to] send them there because we don’t have the kits here. Oh, we have been asking for it but they don’t ...‘Oh, I will come, I will give you people.’ If you go there they would say, ‘Oh, I will come’ ... any time they come we send them there to do it”

“I have been there (HIV clinic) twice. If you go even you can’t get a chair to sit and treat ... They would say, “Ah, this is for some ...” Then you come back. They say we should go and help them...When you go, this one ... eh, that nurse who is there would change the face as if you are coming to collect the money. We have to say things as they are. She would frown.” (TB nurse at RS).

This lack of teamwork may have contributed to the lower HIV screening rate at the RS as compared to the rates at the OSS and the PIS.

8.2.6 VARIATION IN PROVIDER PRACTICES

Generally the basic care across sites was standardised based on the use of the national treatment guidelines however none of the sites had a copy of the national treatment guidelines available for reference although providers were aware of its existence when asked.

Another challenge had to do with the screening of HIV patients for TB. First of all there was no consistent definition of what TB screening referred to. In the hospitals, providers referred to the whole process of asking questions and then sending sputum to the laboratory for AFBs as screening. One manager also reaffirmed this definition:

“The whole concept of the screening is from the question to the lab. It’s the whole gamut altogether, which is considered as screening... altogether. You ask your questions and then you do the lab. When you need the lab, then once you’ve done...you’ve asked your questions then you’ve done your screening” (Manager).

However another manager referred to the use of the screening tool as the screening, which then identified suspects who needed to be tested for sputum AFBs.

There is a testing and the screening. We’ve been correcting this misnomer for a long time. Any time we talk about screening people equate it to the sputum test, which is not. (Manager).

Providers at the all sites stated they were aware of the TB screening tool. But one nurse prescriber at the referral site said the score from the screening tool identified

infected patients, wrongly interpreting the tool. The many uncertainties surrounding the screening of HIV patients for TB may be contributory to the challenges of achieving that target. None of the three sites had any data on TB screening among HIV patients in the quantitative study.

HIV testing was available any time of day or night at the OSS because there is an in-patient unit as well. At the RS and PIS, although the TB and HIV units were located within hospitals, they just operated as clinics and did not operate in the evenings, during the night or on weekends. This may have contributed to the OSS having the highest proportion of TB patients screened for HIV.

Generally these differences in the provider behaviours were observed not to be related to the degree of integration but rather more related to the systemic barriers and inefficiencies.

8.2.7 POLITICAL BARRIERS

8.2.7.1 PROTECTING FUNCTIONAL TERRITORIES

Integration is adversely affected when members of the integrating units fear the loss of influence and power that comes with integration, thus resisting the change as described here:

“At the regional operational level, there is a bit of – how do I say – a bit of professional jealousies for people who initially have worked on as HIV who are used to working in a certain way to be asked to immediately reconcile his activities with another. Sometimes, it means looking at the resources from which he is working. People feel threatened by it” (Manager)

Another manager thinks people get very possessive at the district level and had this to say:

“Unfortunately, when they give people money they tend to form kingdoms. People want to run kingdoms... ‘I’m in charge; I’m doing my activities’... forgetting that at the end of the day we are looking at one patient. We are interested in one patient who must be managed. So at the District level, we are having – really at the District level – we are having a lot of challenges, because people want to ... ‘It’s my money, so let me run it’. Yeah, they want to build their kingdoms, have their territories” (Manager).

At the facilities some nurses talk about their experience when they tried to attend HIV clinics to support the staff as discussed earlier under ‘enhancing coordination’ in section 8.2.5 above. The lack of teamwork is due to a fear of loss of territory and may be the underlying cause of the unwillingness of HIV staff to acknowledge TB staff as partners in service delivery. When asked why the TB nurses are not a part of the HIV clinic in that hospital, a nurse prescriber said this:

“No. No, they are not part of it. Because some of them have not been trained on the adherence counselling.” (VCT nurse/HIV prescriber at RS).

8.2.7.2 FEAR OF LOSS OF RESOURCES

Historically the NACP has always had a lot of resources at its disposal for implementing their activities. District and regional coordinators who have been used to managing these resources alone may be less inclined to collaborate or be involved in integration for fear of losing or sharing their resources:

“You see, one is at the high level of programming and service provision to the operational level, and one has catching up to do. The one who has catching up to do controls more resources by way of ... So, when the experienced guy wants to talk to him, “Are you talking to me because of my resources that I have or genuinely because you want us to ...” (Manager)

This attitude undermines teamwork and hence coordination.

8.3 PATIENT EXPERIENCES

8.3.1 ACCESSING SERVICES

Access to care involves services being made available by the provider and the patient's ability to utilise the services. The study found that all the TB/HIV activities were available in all three study sites. TB services were available in all 3 sites from Monday to Friday during normal OPD hours. The TB services were all walk-in clinics with no queues. With HIV, clinics were held once a week at the OSS and the RS, and twice a week at the PIS. There were no strict clinic hours with the clinics closing when all patients had been seen:

"But we have never refused to see anyone, not even when they are over a 100. We sit and see all of them" (TB nurse/HIV prescriber at PIS)

Clinics can be particularly heavy at times but there were challenges in establishing a second clinic day at the RS:

"They had wanted to make it (HIV clinics) a daily affair so that all other doctors can take care of them. But unfortunately, when they are trained some would go for other courses and then they would ... then the whole thing will be on one person. When they are trained, because of other courses they want to take then they leave the system. That's why we are almost every time [like that]. Other than that we would have done it, because many people have been coming all the time; after the training then they leave...So that is our problem" (VCT nurse/HIV prescriber at RS)

Although only two patients at the PIS complained of long waiting times, providers expressed sentiments about patient reactions to the long waiting times:

“like the way they gathered here yesterday they will insult us alright...but so it is when working with people so what can we do? But we continue working. Because they are many, there are delays. Besides, when they arrive, they don’t submit their cards in an orderly manner. Some come late and place their cards beneath others so when we turn them over and serve the cards beneath, those whose cards are on top get offended”
(TB nurse/HIV prescriber at PIS)

“when they come and then they think they are keeping long, they become angry. They can say all sorts of things” (VCT nurse/HIV prescriber at RS)

And I personally observed that although patients arrived early to queue, clinics started late due to other commitment of the HIV prescribers, and were fraught with interruptions from other health workers. These experiences affect patient satisfaction and influence adherence (Munro et al. 2007) and eventually outcomes.

Munro et al. (2007) identified inadequate and irregular supply of drugs as a factor that influenced patient adherence. However the findings of this study did not fit with this observation. None of the providers or patients complained of a lack of logistics or drugs. On the contrary there was always adequate supply of drugs and test kits needed to deliver the services at their levels.

“as for the drugs, we never run short” (Female patient at PIS)

“the drug for the disease itself I always get there” (Female patient at RS)

“at the end of every quarter, we make returns to Koforidua, and then the dispensary goes down to collect the drugs for us. So we don’t have problems with drugs” (TB nurse at OSS)

Both providers and patients confirmed that patients encountered a number of challenges in living with TB/HIV, which affected their ability to utilise services. The commonest of these was the financial burden. Seventy five percent of the 8 facility providers interviewed reported instances where patients had been unable to access healthcare or adhere to treatment on account of lack of money. And 44% of the 18 patients interviewed also admitted facing financial difficulties associated with accessing and paying for their care, as well as their daily upkeep. Most patients lose their capacity to earn a living and then have the additional burden of financing care. Five out of the 18 patients had to stop working when they got ill. Although TB treatment is free and HIV care is also heavily subsidised other additional costs can be prohibitive:

“She has nothing to eat, and we have told them to eat before taking the drugs, so she cannot come for it. ...sometimes some of them after taking the drug they do not have food to eat...even the food to eat before taking the drug is a problem” (TB nurse/HIV prescriber at PIS about a defaulter)

“Mama, hmm. My only problem now is...I know I get the drugs, but the next thing is how to get money to eat and do other things. That is my only problem” (Male patient at OSS)

“My family also assisted me. I was very hard working, so I had a lot of wax prints (cloth) and other material things. So if I needed money, I could sell some to bring me here. Today, I’m also counted among the living...I have been selling some of my things; that’s what helps me” (Female patient at PIS).

Family and community support was found to be key factors in making it possible for patients to access services from determining where to seek help to financing care.

“My children are taking care of me. If I need something, I only have to call them and they would bring it. At first when the illness was severe, [my son] came to live with me. He was supervising me to take my drugs according to the dosage or the time table. When my health improved, he went back to his wife” (Female patient at PIS)

“...shortly after I started treatment, I ran out of money. Since then, it’s my sisters who have been taking care of me. So they have spent a lot of money. Yes. They’ve been taking care of my feeding and everything. Excuse me to say that you have to pay even to use the toilet. So if I need to use the toilet I have to ask them before I can go. They gave me ten thousand cedis [(¢10,000), about £0.40] to come here this morning...” (Male patient at PIS)

“As for the feeding I have many friends and I have a lot of people who love me. They come and visit me then they give me money. So all that money I have been keeping them and using it for feeding. And also I have a friend-brother. He is like a brother to me because I took him to somebody to learn driving ... So he has been doing well. Sometimes he allows the wife to cook and then she will bring it to me. So by 12.00 noon she will bring me food, then in the evening time too, a church member in the house he too will provide food for me” (Male patient at RS who uses a wheel chair)

This supports the postulate by Munro et al. (2007) in their model of factors affecting patient adherence, that financial burden and social contexts including family and community are two key influences.

8.3.2 PATIENT INVOLVEMENT IN CARE

Patient-centred care strengthens the role of patients in managing their own health problems, so that they become experts in their own care and needs (WHO 2005). In order to fulfil this role patients need to be informed to be able to share in decision-

making (Pelzang, 2010). When asked, all the patients admitted they were informed of their diagnoses and felt comfortable talking about their problems during consultation. Most of them were also able to ask questions if they did not understand something, and felt the providers explained things to them. Some patients were comfortable enough to ask questions because providers had encouraged them to, because they felt they needed more understanding of their situation, or because of their desire to get help

“And there is a saying that ‘if you don’t sell your illness you won’t get cure for it. So, if I meet anyone who can be of help to me in respect of my ill health, I will freely tell the person about my problem” (Male patient at OSS).

Patient-physician communication influences patient health by first influencing the patient’s perceptions of being a full participant in the discussions (Stewart et al. 2000). And therefore the availability of opportunities, and willingness of patients to ask questions would enhance patient-centred care. However some patients did not or hesitated to ask any questions because they needed more time to familiarise with the new staff, they were not aware they could do so or felt there was no need to do so because the providers knew best.

“When the other madam was here at first, I could do that. But it is like...since this one came I have not sat down with her to talk like I am doing with you now. It is now that if by the grace of God I go home and I begin to visit regularly the familiarity would come. Then if there is anything she has to tell me, then I would also be able to tell her all my concerns.” (Male patient at PIS).

Patient involvement in their care has therefore been limited in that although they were given information about their illness and had the opportunity to ask questions, there was very little or no shared decision-making in most cases. This would therefore be a limitation to how much it can contribute to improved patient satisfaction and health outcomes.

8.3.3 SATISFACTION WITH CARE

Out of the 18 patient participants, 55% admitted to being satisfied with care. Patient satisfaction with care is an important health outcome whether it is assessed subjectively by patient perception, or objectively. Patient satisfaction with care is a reflection of how care meets the expectations of patients, and according to the conceptual framework of integrated care for this study, is influenced by patient involvement, improved access as well as improved clinical outcomes (p. 87). Patients primarily expected to get well by coming to hospital. Some also said they wanted to be able to go back to work or get their strength back, among others as shown below:

“...I was hopeful that I would recover, that’s why I came here...” (Female patient at OSS)

“Others have the infection, so I don’t expect to die any time soon” (Female patient at RS, with two young children).

Providers on the other hand were of the opinion that free medications, empathy, and acceptance were patients’ expectations. None of the patients had an expectation of being treated with respect and dignity, and this may be the reason why patients were so appreciative of this aspect of their interaction with providers as described under “Finding common ground” in section 8.2.2 above.

For most patients their expectations were being met because they had seen improvement in their health. However one patient from the referral site could not tell whether or not her expectations were being met but she trusted the providers knew what they were doing:

“Hmm. They [providers] know what they are doing so I cannot say” (Female patient at RS).

On how they felt they were being managed, most patients acknowledged that they were being managed well and believed all other patients were equally managed well. Five patients felt the treatment they had received was commendable. Two patients (one from the PIS and the other from the RS) though felt that even though they were being treated well they could not speak for other patients.

Most patients were satisfied with the care they had received for the following reasons: they were getting solutions to their complaints, they were happy with the way they were being managed, or they were confident of getting all the help they need.

“... I feel better than before. Formerly I looked very slim like a skeleton, but now I can see that I’m fine...” (Male patient at PIS)

“By the grace of God I have ...I have received what I came for. Now I would say that almost all my expectations have been met. Because now...I couldn’t walk at first...I could not go anywhere, but now I can walk a little. So I feel that ...err...God is doing his work” (Male patient at OSS)

“Oh! Now I am better. By the grace of God I am better. Yes. I am better” (Female patient at RS).

One female patient acknowledged she was not yet satisfied with the care. This woman's dissatisfaction may be due to the fact that even though she was in the 6th month of TB treatment and over a year on ART she still had significant symptoms of pain in her legs and not able to walk without support. Her expectations for coming to hospital initially was to get medication so she gets well, and at the time of this interview the expectation was to get pain relief and not to die soon. This suggests that patient satisfaction may not just be related to the meeting of expectations, but that patient expectations also change throughout treatment. It may therefore be important to use counselling to identify patient expectations and align the management plan with these patient expectations.

8.4 PATIENT BEHAVIOUR

Factors that affected patient behaviour and influenced health outcomes include socio-cultural barriers like stigma and beliefs about the illness.

8.4 1 STIGMA

Seventy five percent of providers said they strictly adhered to privacy and confidentiality because it was a means to prevent patient status from being known leading to stigmatisation. Only three patients made reference to stigma: they were all females with one each from each site. Two of these were cases of perceived stigma while the third from the OSS had experienced both perceived and enacted stigma. Stigma has become a major cultural barrier associated with both TB and HIV control programmes. It influences the behaviours of health workers, family, communities, as

well as patients themselves. Home visits, contact tracing and community education for instance are organised in ways that protect patients.

“if the client doesn’t give you the go-ahead to do that [contact education]... we have various catchment areas. So that if you know there is a problem here you can go there on a different day. And so that nobody would know. You can gather about two, three houses including the house in which the patient is, so that you do your education”.
(District TB Coordinator at RS)

However some staff go on home visits in their uniforms and think patients should be able to accept their conditions and not be ashamed:

“Sometimes, you go they would feel shy or something like that. Then we tell them that they shouldn’t be shy from those people because TB is everywhere. A doctor can get it; nurse, child... everybody can get TB. So we [used to] talk to them. We have to talk to them to be free...Even Nelson Mandela got it” (TB nurse at RS)

Due to the fear of rejection patients expect after such ‘exposures’ some have been known to give false addresses or relocated in the middle of treatment. This makes monitoring and follow-ups difficult, increasing the risk of default and loss to follow-up.

Other health providers who are not members of the TB/HIV team have been known to stigmatise both TB/HIV team members and patients. The TB/HIV team members are treated like they are infectious. And this may explain why it is difficult to recruit and retain new team members. Also there have been instances where TB/HIV patients present to hospitals and are asked to wait till a TB/HIV team member is available to attend to them. One provider had this to say:

“it looks as if those of us attending to the cases, the cases are ours (laughter). When they (other health workers) should see an HIV or TB patient outside, “Hey, one of your patients is here.” Something like that. And it shouldn’t be that way” (VCT nurse/HIV prescriber at PIS)

Patients may be presenting with any of the other illness for which patients present to the outpatients department (OPD), but the TB or HIV ‘label’ means no one outside the team is willing to touch them. This may lead to delays in providing service, and preventable exposure where patients have sputum positive TB. These behaviours may contribute to adverse treatment outcomes.

The response of family and friends to the news of one’s diagnosis is a major factor in deciding who to disclose to or solicit help from. Two patients describe their individual experiences:

“At our place, if they get to know that you have this sickness they will treat you like you are useless. Even if you sell, they won’t buy. They think they could be infected even through a handshake. Then this one will tell that person and then another and another. So, if they get to know they can behave in a manner that can make you die prematurely” (Female patient at PIS)

“Sometimes I worry that some of the nurses, especially the students, because they know what is wrong with me they may disclose it to others or point fingers at me in public. That scared me. Because of that I am unable to associate freely with people or go to public places...Yes. I feel shy... even when I’m going to church I feel shy.” (Female patient at OSS)

Stigma has been the reason why a number of patients travel long distances to access TB or HIV care, making it impossible to directly observe the continuation phase of treatment. Clinic attendance is more costly for such patients, and they can easily default because home visits and follow-ups are near impossible. It was observed that at the most integrated site where there is a dedicated ward for TB/HIV; the patients had more challenges in dealing with stigma because the community was well aware that that particular ward was for people with TB or HIV.

“Those living in this (...) town...They know it, that this ward belongs to those with HIV and those with TB. But, you know, when they come and they are looking for a relative...Those who still have that thing at the back of their mind they would tell you, “I’m looking for where those who are coughing are.” ...So when they come, what we normally do is that we sit them down and explain to them to minimise that stigmatisation” (TB nurse at OSS)

Anyone admitted there or seen attending the clinics there is more likely to be identified with TB/HIV more easily than would occur in the two other sites. At the referral and partially integrated sites the problem of stigma was not as much of a problem because the premises used for clinics are different and these are also consulting rooms used for general clinics on other days. The problem of stigmatisation could arise when people become aware of the specific days for TB and HIV clinics. However this did not come up in this study.

8.4.2 BELIEFS ABOUT ILLNESS

The beliefs patients have about the source of illness influenced when and where help was sought. Most patients said they did not know where they got the disease from,

some felt it was related to the type of work they did, and one knew she contracted the HIV from her former fiancé. Most of the patients first sought help from hospitals. There were two patients who thought the source of the illness was spiritual and therefore first sought help from church. According to one of them:

“When it started, I was taken to a church. There, the priest said it was a spell. Yes, that someone had cast a spell on me and the priest will be able to remove the spell from me. So after the spell had been removed, I was told I could now visit the hospital.”
(Male patient at PIS)

The second one said the pastor told him it was a spiritual problem. Even though he now knew it was HIV he still believed it was a spiritual problem. These attitudes may lead to delays in getting to hospital for the appropriate care because they usually get to hospital only if they have a pastor’s permission or they are not seeing any improvement in their condition. One lady spent 4½ months at a prayer camp where her mother sent her until her husband asked that she be sent to a hospital. As demonstrated by this patient, where and when to seek help is determined by significant others for a number of them. Only about half of patients interviewed said the decision about when and where to get help was theirs. These behaviours were observed at all sites with no difference with the different levels of integration.

8.5 ORGANISATION OF CARE

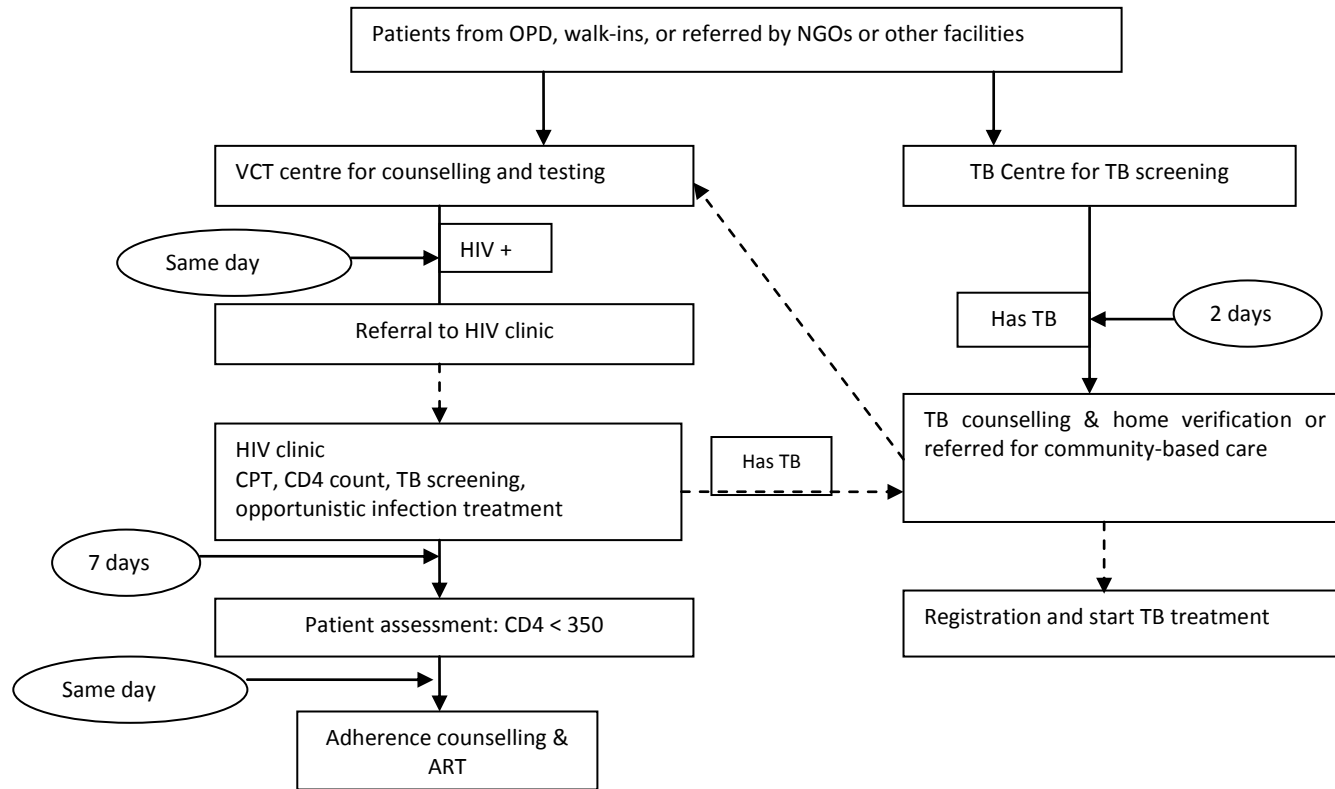
As discussed in the theoretical review chapter (p. 62), integrated care focuses on changing care processes by organising new collaborations and allocating tasks

differently. This section therefore discusses how the organisation of TB/HIV services may influence the outputs and outcomes of integration by influencing provider and patient behaviours, as well as patient experiences in accordance with the objectives of this study. The major issues discussed here are the care process, the facilitators of integration through enhanced coordination, and barriers to integration.

8.5.1 CARE PROCESS

The different degrees of integration at the three study sites translate into different care pathways for patients. Patients referred to the one-stop shop therefore go through fewer steps from diagnosis to initiation of treatment as compared to those at the referral site as described by both patients and providers (Figures 40 - 42). Thus the different configurations of the services based on the degree of integration influences continuity of care by enhancing coordination. Haggerty et al. (2003) suggest that continuity of care is not an attribute of the health system but it describes how patients experience care.

Figure 40: Care pathway at referral site



Key:

-----> Variable time dependent on when patient reports to hospital or when staff is available for the function

Figure 41: Care pathway at partially integrated site

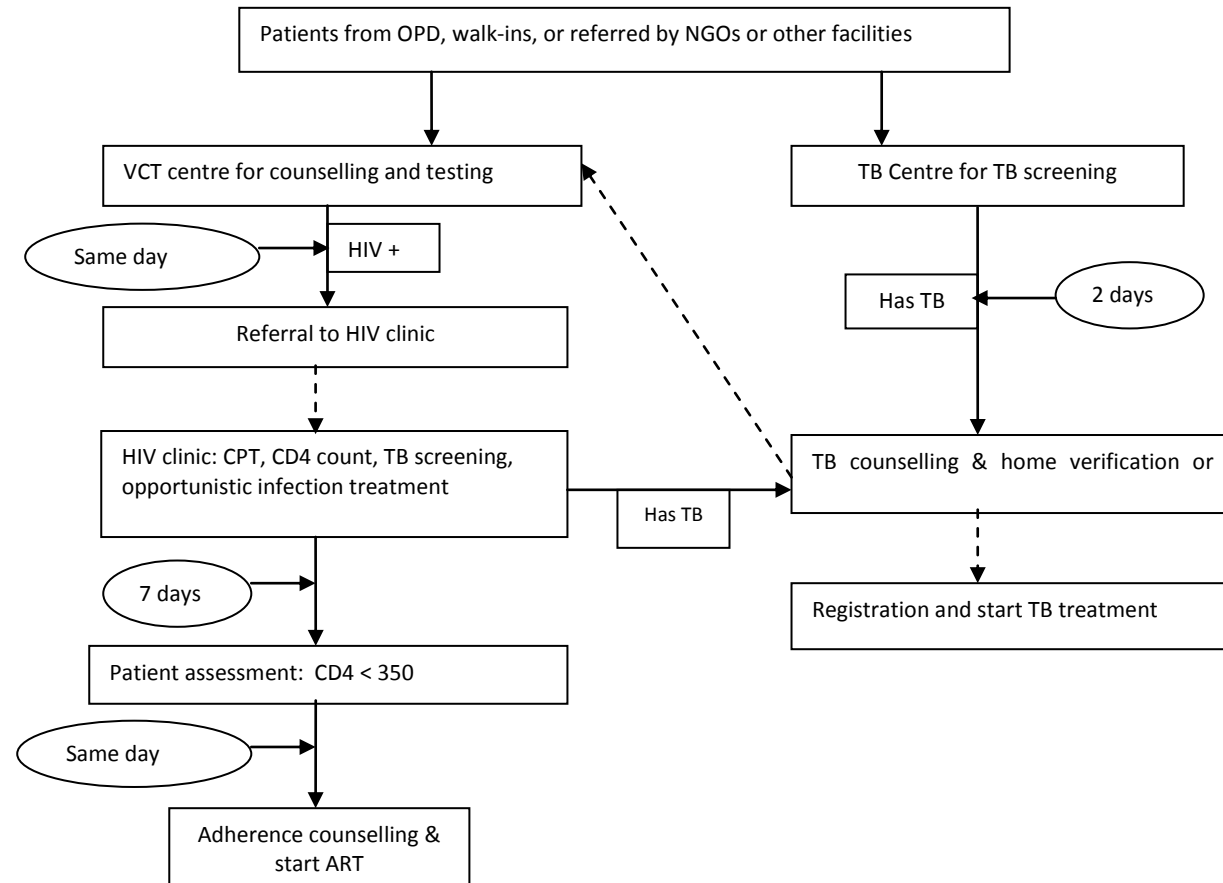
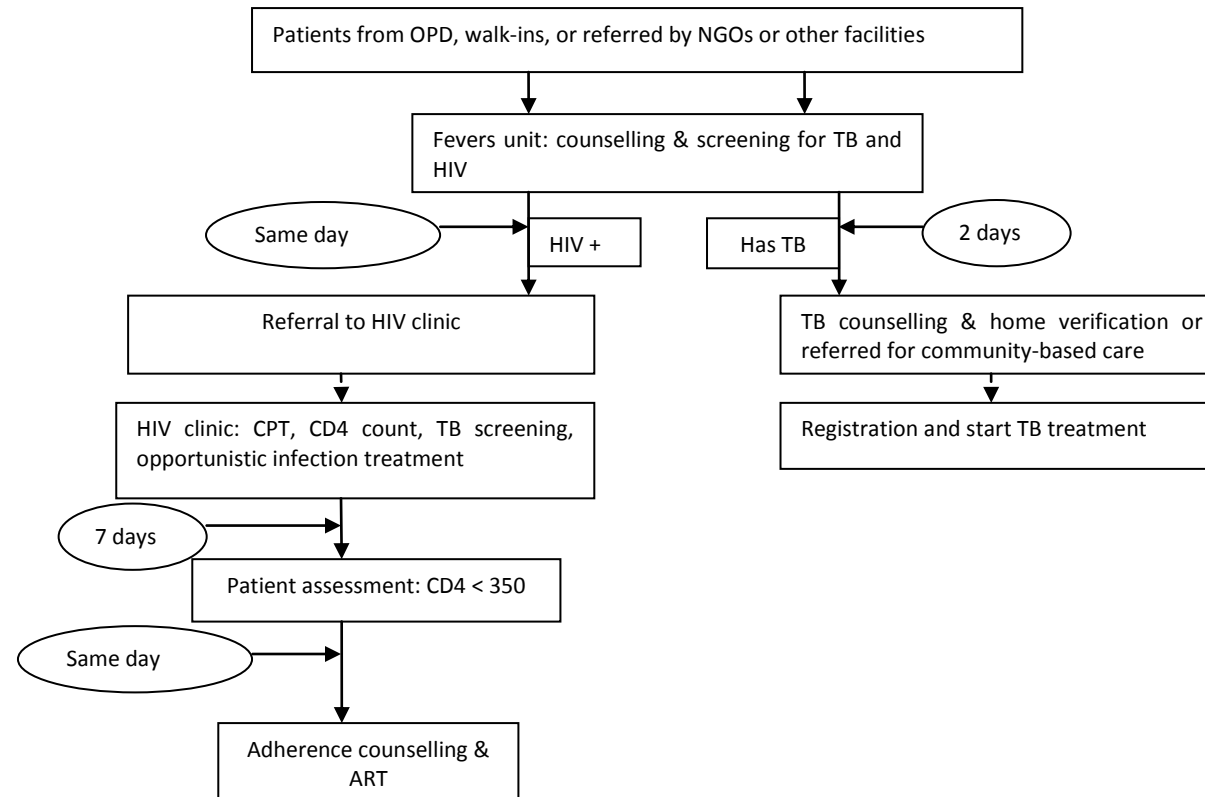


Figure 42: Care pathway at one-stop shop



Continuity of care facilitates coordination (Haggerty et al. 2003) which then improves access as depicted in the conceptual framework of this study (p. 84). Outputs and outcomes after integration would therefore be expected to be more significantly improved at the one-stop shop because the co-location of services improves coherence, connectedness, and improves access. However this trend was not demonstrated in all outputs in the quantitative study. Only HIV screening among TB patients improved with increasing integration as expected: 99% at the OSS (one-stop shop), 92% at the PIS (partially integrated site) and 72% at the referral site (RS) (pp 174). The proportion of HIV-positive TB patients on co-trimoxazole prophylaxis (CPT) was highest (94%) at the RS, as compared to the OSS (82%) and PIS (75%). This may be explained by the fact that the staff at the OSS and PIS laid more emphasis on HIV screening to know the status before treating for TB than on the prophylaxis. This was evident when they described the care process for patients with very little reference to CPT apart from the nurse at the RS:

"If the fellow is positive, we refer them ... to be registered on Mondays and Thursdays during our clinical hours...we give another lab form to be sent ...for CD4 and Hb. ... depending on the...eh...CD4, then we do adherence counselling for the ART" (VCT nurse/HIV prescriber at PIS)

"If they are tested positive, the next step is to...do CD4 before ... clinical care...If they are due for drug, then we prepare them for adherence counselling...then we start giving them medicine." (TB nurse/HIV prescriber at PIS)

"All those TB cases that come in are tested for HIV, because you have to know the HIV status and then treat. Let them know the implications of the HIV and AIDS so that they would be aware" (TB nurse at OSS)

"Someone can walk in to have the counselling and testing, and then that person can be positive...they will be referred to any of the doctors ... Then they will be asked to do the CD4 count and other tests. And it is upon that that they can be put

on either the opportunistic infection treatment or on ART” (VCT nurse/HIV prescriber at RS)

This lack of appropriate emphasis may be due to the fact that the very high level of awareness of HIV even among the general Ghanaian public (Population Council 2010), may not be matched with adequate knowledge about the usefulness of CPT and ART or monitoring them for that matter. And this mismatch may partly be responsible for the incomplete records for CPT and ART; particularly at the OSS where there was no record of any patient on ART.

8.5.2 STRENGTHENING COORDINATION

8.5.2.1 DIRECT SUPERVISION

In the interviews with managers all three stated that the leadership role of the Regional Deputy Directors of Health, who are also responsible for Public Health, had been instrumental in ensuring coordination at the district level:

“you need a strong Deputy Director -Public Health, who can sit the two together as lieutenants and compel them to work and report to him” (30: Manager)

“The SMO PH or Deputy Director – PH, that’s how they are now called, would ...give leadership and ensure that there is a team – TB/HIV team – and they should collaborate and do monitoring together.” (31: Manager)

“At the Regional level, we have the TB teams, the HIV teams...we have a team that is in charge of TB headed by the Regional Coordinator and supported by the SMO PH. So we try to rope in the SMO PHs into these things so that they are interested in what is happening. All these SMO PHs have been trained in TB/HIV collaboration – the concept, the principles, and everything. So it’s prepping them to be together” (32: Manager)

The managers also identified the fact that in districts where there was one person as the coordinator for both TB and HIV integration worked better. This direct supervision ensured that the multidisciplinary collaboration occurred and each party performed the activities allocated to them.

8.5.2.2 STANDARDISATION OF OUTPUT

This is achieved by identifying a common set of outputs and outcomes. Integration of TB and HIV services in Ghana is not intended to create a new programme, but to identify and effectively manage the interfaces between the two services so that access to one becomes an entry point to the other. The TB/HIV policy therefore identifies a number of outputs whose indicators are used to monitor the integration (Ghana Health Service 2007). These indicators are the number of TB patients identified through the HIV clinic and treated, and the number of HIV patients identified through the TB centre and given prophylaxis or ART. At all the three sites all the indicators were reported on except the number of TB cases identified through the HIV clinics which none of the sites had any data on.

8.5.2.3 STANDARDISATION OF SKILLS AND KNOWLEDGE

This occurs by training different people in different skills so that each one knows what is expected of them as well as what is expected from others. It was observed in this study that although most providers have been trained in the policy and basic services like counselling and testing, other staff had specific duties in addition. Some nurses have been trained as adherence counsellors and prescribers, and there were also data management staff specifically responsible for record keeping and reporting. As described below, there are also plans to train doctors in the

management of TB co-morbidities and complications to strengthen capacity at the district level.

“We call them Referral Clinicians for both TB and HIV. The Referral Clinician is expected to be at the regional hospitals so that when districts have problems they can discuss...So the next step in our TB/HIV collaborative activities is to train doctors who have experience in managing what we refer to as ‘Managing the TB Co-morbidities’. That is, they should go beyond managing TB/HIV, but managing TB, HIV, diabetes, hypertension” (30: Manager)

Standardising knowledge and skills would therefore help reduce process variations and reduce discontinuities (Murray 2009). Since this mechanism was employed in all three sites it would contribute to improved indicators after integration but not across the different study sites.

8.5.2.4 MUTUAL ADJUSTMENT

The existence of TB/HIV teams in hospitals, districts and regions is a further strength of integration, as this encourages both formal and informal communication at all levels. Managers have been particularly interested in team building as a means of promoting integration at all levels through flexible communication between the integrating units: they adapt as work progresses (Glouberman and Mintzberg 2001a).

“When we are training, let’s say, a new site for ART we do not separate anybody. We put doctors, nurses, pharmacists, medical assistants; we put them together to build a team.” (31: Manager)

Providers at the referral site also talked about examples of mutual adjustment when they described situations where nurse prescribers identified and managed

routine HIV cases so the doctors handled those who were ill or had complications. This helped to reduce the waiting time. There were instances where the different teams at the site coordinated to supply both TB and HIV drugs on the same day, especially for patients who travelled long distances; this example though was more of an exception at the referral site.

“But when the people were plenty we decided to... prescribe for those who are not having any other ailment... those who are not sick will come here for their refill ... We have the pharmacists and other counsellors from the wards who help with the counselling” (21: Nurse prescriber at RS)”

At the partially integrated site patients could go for TB drugs on HIV clinic days.

8.5.2.5 LEADERSHIP/ POLITICAL WILL

Another facilitator of integration was the political will that translated to responsiveness of the leadership at the national level to address the needs and challenges brought to their attention. Leadership was quick in reviewing guidelines and protocols in order to achieve set objectives of TB/HIV integration. When it became obvious that the reporting of screening of TB among HIV patients was not being done, TB screening tool was designed to facilitate the screening, and the HIV patient booklet also altered to make reporting of TB screening easier.

“... if you did a thorough analysis of the booklet...it’s gone through a lot of phases. And it’s been revised about twice. What we have now makes room for you to say that the patient has been screened – whether the patient has been screened or not” (Manager)

And then also the leadership has made it a priority to quickly decentralise ART services from the regional and district levels to catch up with the level of access of TB services.

8.5.3 STRUCTURAL BARRIERS

Differentiation gives rise to structural and cultural barriers (Axelsson and Axelsson 2006; Barki and Pinsonneault 2005). The structural barriers to integration that were identified arise from the differences in the access to the individual programmes, differences in the calibre of staff delivering services, differences in their information systems, development of local focus within each programme, and different financial systems.

8.5.3.1 DIFFERENCES IN ACCESS

It was observed that the National TB control programme (NTP) has effectively decentralised service delivery through the DOTS strategy. From 1994 when Ghana adopted the WHO strategy, by 2005 there was 100% coverage in Ghana (WHO 2007a). The National AIDS/STI control programme (NACP) on the other hand is not as decentralised. Comprehensive HIV/AIDS services are currently available only in Teaching Hospitals, Regional hospitals and some District and Mission Hospitals (NACP 2009). As at the end of 2007 for instance, there were 422 VCT sites and ART centres as opposed to 1600 TB treatment sites (NTP 2009a). One manager had this to say:

“ART? ... We are on course as far as the target for doing that is concerned. We would wish to go down to sub district level, but first, we want to put ...at least one ART site in every district. We have covered more than half of the districts across the country. Now, our challenge is that a lot of the districts don't have adequate capacity to do the ART, because some of the newer districts... don't have hospitals

at all. So you cannot put ART... The challenge is that we tend to have ... a lot more of DOTS treatment centres than ART centres.” (Manager)

There is therefore a limit to the level of integration that can be achieved in the districts and sub districts where only TB services are available. What TB centres can offer will be pre-test counselling with or without the testing itself. Therefore to address this barrier:

“The ART treatment should be rapidly decentralised” (Manager).

8.5.3.2 DIFFERENCES IN INFORMATION SYSTEMS

The two programmes have two different and separate recording, reporting and feedback systems. Different indicators are reported on in a parallel fashion from the facilities through the districts and regions to the National programme offices. The TB/HIV indicators that are reported on are exchanged at the facility level and then on through their usual channels to the national level. The indicators are reported on at review meetings at all levels but not much else is exchanged between the two programmes by way of information at the facility and district levels.

It was observed that these TB/HIV indicators were regularly reported on from the TB programme but not from the HIV programme. Some participants interviewed are of this opinion:

“Of all the indicators, there is only one indicator that we are not meeting. That is screening people living with HIV – the number of TB cases identified in people screened. That is the only indicator so far that we haven’t met” (Manager)

“We realised that ... TB people were screening more people for HIV than the HIV people screening persons who are HIV positive for TB, because they don’t really

take them through the screening process, and also, test those who become suspects.” (Manager)

*“As I was saying getting the data from HIV to TB is becoming a bit of a problem”
(District TB coordinator)*

The only reference to TB/HIV in the NACP 2008 annual report was how much money was spent on TB/HIV, but not on any specific activity or indicator (NACP 2009). There was no reference to TB/HIV in the 2009 report (NACP 2010a). The NTP on the other hand had already started reporting on TB/HIV activities in the 2007 annual report (NACP 2010a; NACP 2009). This was corroborated by the quantitative study in which no data for TB screening among HIV patients was available in any of the sites.

8.5.3.3 DEVELOPMENT OF LOCAL FOCUS

Due to the specialisation, each programme and the workers within it develop procedures, activities and routines that were followed to achieve the goals of each unit. However integration demands that some of these procedures, activities and routines be altered, but some staff are unable to move away from these established ways of doing things. Some TB physicians will therefore fail to look for any other illness apart from TB. Once TB is diagnosed it becomes the main focus of management, neglecting the fact that there may be other co morbidities that will influence the outcome of their management.

“We have seen that if you don’t take time, they look for the diseases that they think they are specialists in and manage to the neglect of others. So, now we are going to talk about TB co-morbidities.” (Manager)

This local focus also manifests when monitoring teams visiting service delivery points look out for only TB or HIV activities instead of doing both to facilitate integration.

“Sometimes everybody is busily doing their activities; and we forget that we have to merge some of our activities and plan them together. So I plan to say, like TB, I plan to say maybe, visit my TB sites. But I forget to add on that in the same TB clinic, I could be looking at the HIV clinic and finding out the challenges they have, and reporting to the HIV programme when I get back. Some of us do; some of us don’t do.” (Manager).

Development of local focus therefore threatens the achievement of TB/HIV targets as collaborating partners may neglect TB/HIV activities.

8.5.3.4 DIFFERENT FINANCIAL SYSTEMS

Although both programmes are funded through the Global fund, the funding is vertical and comes for specific activities designed by the programmes. Staff may therefore get preoccupied with achieving these goals and satisfying funding agencies to the detriment of integration

“The challenge is that with a lot of the funding that comes, it’s vertical – funding is somewhat vertical – because we are using Global Fund a lot. And so, sometimes everybody is busily doing their activities; and we forget that we have to merge some of our activities and plan them together.” (Manager)

8.6 CONCLUSION

In this chapter, the impact of provider behaviour, patient behaviour, and patient experiences on TB/HIV indicators have been explored using a qualitative approach. Provider-patient interactions were characterised by provision of privacy and confidentiality, and provision of information on the illness, its management, and

prevention but very limited shared decision-making. Other provider behaviours included using information to enhance healthy lifestyles and continuity of relationship between provider and patient. These mechanisms were used to enhance patient-centeredness of care. Other mechanisms including standardisation of work, and mutual adjustment were employed to enhance coordination. Political barriers were the main factors that led to provider behaviours that adversely affected health outcomes.

Patient experiences that enhanced perception of patient-centeredness of care, and therefore health outcomes were involvement of patients in their care, and satisfaction with care. Stigma and beliefs about illness were other influences on TB/HIV outcomes. There were other organisational characteristics of TB/HIV care that affected providers and patients: differences in the care processes across sites, and strengthened coordination through direct supervision, standardisation, mutual adjustment, political will, and structural barriers of integration.

The next chapter will be a discussion that seeks to bring together the three results chapters, relate them to how they have achieved the objectives set up at the beginning of the study, as well as national and international implications.

9 DISCUSSION

9.1 INTRODUCTION

This penultimate chapter is intended to bring the whole study together and demonstrate the extent to which the identified objectives and research questions have been addressed, and the implications of the research on current knowledge, policy and practice. The first section of the chapter therefore provides a summary of all key findings in both the qualitative and quantitative studies. This is then followed by another section which describes the implications of this study on TB/HIV integration in Ghana and in the international context. The subsequent sections include one in which the methods of the study are evaluated, followed by what areas are recommended for the future, and finally the conclusion of the study.

9.2 KEY FINDINGS

The purpose of the study is to provide evidence for the improvement of the integration of TB and HIV services in Ghana so as to facilitate effective implementation and nation-wide scale-up. It was therefore a study to explore the delivery of the intervention and pilot methods of evaluation, to pre-empt factors that could undermine effective evaluation of Ghana's TB/HIV programme, and to give recommendations on how to improve implementation nationwide. The objectives were to examine the impact of integration on TB and HIV service delivery, to compare different service delivery models of TB/HIV activities, and to explore the influences of behaviours and experiences of providers and patients on the outputs and outcomes of TB/HIV services.

9.2.1 TB/HIV INTEGRATION AND TB TREATMENT OUTCOMES

In response to the first research question as to whether or not TB/HIV integration has improved TB treatment outcomes, the study demonstrated that TB treatment success may improve after integration, and was supported by statistical significance as well as graphical trends. Based on the methods therefore TB/HIV integration has the potential to improve treatment success rates, corroborating other research findings that integration improves successful outcomes (Huerga et al. 2010; Miti et al. 2003).

However ascertaining the extent of the contribution of TB/HIV integration to this improvement in treatment success is challenging and may be misrepresented as the improvement may be due to other strategies being implemented concurrently by the TB control programmes to improve its effectiveness. As demonstrated earlier in chapter 6, improvement in TB treatment success was also associated with significant decreases in 'default' and 'transferred out' cases which may have improved as a result of other TB-specific strategies that were in place like community-based TB treatment and the use of treatment supporters in all three study sites.

According to Miti et al. (2003) community-based care and treatment support improve compliance and adherence, and thereby reduce default. Outcome indicators are primarily about recovery, restoration of function and survival, and they seek to measure changes in health status that can be attributed to care (Mainz 2003; Donabedian 1978) and therefore any intervention that improves care contributes to outcomes. They are therefore generally non-specific and not very sensitive (Mainz 2003). TB treatment success rates may therefore be appropriate

for monitoring TB control strategies as a whole but may not be adequately specific for monitoring and evaluating the impact of TB/HIV services integration as an intervention, especially in health care settings where interventions are already implemented and all confounders cannot be controlled for.

Also TB treatment success rates of new smear positive cases i.e. cure rates, which are used for the TB treatment quarterly cohort analysis may not be appropriate as the incidence of HIV-associated TB increases. This is because treatment success rates based on only smear positive TB cases exclude EPTB cases and smear negative PTB. However HIV has been shown to lead to more EPTB and false smear negative cases because of reduced expectoration especially with advancing disease in which case sputum cultures are recommended to identify the truly smear negative cases (Getahun et al. 2007). This was confirmed in this study where only 47% of HIV-positive TB cases had sputum positive TB as compared to 61% of HIV-negative TB cases. Only 45% of all new cases in this study were sputum positive and this represented 38% of all TB cases registered. Therefore in settings like Ghana where sputum cultures are not routinely requested for HIV-associated smear-negative TB cases, using smear-positive TB treatment success rates to monitor TB/HIV activities may be unrepresentative and increasingly inappropriate. An emphasis on an indicator which includes smear positive and smear negative PTB, as well as EPTB would be more appropriate in monitoring both TB and TB/HIV activities.

Research has also established that HIV-associated TB is associated with an increased risk of TB deaths (Reid et al. 2006) and TB treatment failure especially among those not on ART (Khan et al. 2010). Even though TB deaths include death

from any cause while on TB treatment, Elliot et al. (1995) demonstrated that most deaths in HIV-associated TB is due to active TB and its complications or complications of the HIV infection itself. The study confirmed this as the mortalities in HIV-positive TB patients accounted for 59% of all TB deaths. In view of the findings of this study that TB/HIV co-infection may have a more direct impact on TB deaths than on successful treatment outcomes, it would be suggested that TB deaths could be explored as an indicator to monitor the impact of TB/HIV integration in similar contexts. This fits with propositions of Maher et al. (2005) that TB deaths are crucial for monitoring programme performance but are limited by incomplete coverage of all incident TB cases, inaccurate routine programme reporting of deaths, and the unknown contribution of deaths from TB and HIV alone. Even though their study focussed on countries with high HIV prevalence in addition to heavy TB burden, this study suggests that TB mortalities can also be useful for monitoring TB/HIV integration in low income countries with high TB burden but lower HIV prevalence.

9.2.2 COMPARING TB/HIV SERVICE DELIVERY MODELS

HIV screening increased with increasing degree of integration, but CPT and ART did not. The RS was associated with higher levels of CPT while ART was highest at the PIS. The study therefore did not produce sufficient evidence to support the school of thought that increasing degrees of integration led to better service delivery outputs and outcomes. This is contrary to the findings of Kachiza et al. (2010) who reported that the OSS provided the best model of delivery for TB/HIV services.

Increasing levels of integration did not result in increasing treatment success rates. TB treatment success rates were lowest in the OSS after integration

in all cases and in HIV-positive TB cases as well. The RS was associated with the highest odds for successful treatment in all cases, but in HIV-positive cases the highest odds were in the PIS though difference between the RIS and PIS for HIV-associated cases was not significant. There seemed to be no relationship between integration and treatment success in HIV-positive TB patients.

There were a lot of missed opportunities not utilised by providers to deliver TB/HIV services: 14% of TB patients were not screened, and only 83% and 23% of those who were HIV-positive were put on CPT and ART respectively all below the national and regional targets for these indicators (NTP 2009). This confirms the study by Tribble et al. (2009) and Pevzner et al. (2011) which found that there were still many missed opportunities to HIV screening. Both studies suggested that the missed opportunities were due to limited availability of services as opposed to low utilisation.

Fraser et al. (2007) suggested that these gaps are due to providers not offering the service or they do not record what they do, as observed in this study: at the OSS for instance there was no data on ART use. These discrepancies in data result in poor and inaccurate data, lead to underestimation of the burden of disease and make it impossible to determine the impact of the intervention (Pevzner et al. 2011). More resources therefore have to be invested in the search and research for strategies to improve data accuracy and completeness in the context of increasing patient numbers and fewer providers. Fraser et al. (2007), suggest that electronic information systems can be used to support overwhelmed staff in resource-limited settings to effectively track and follow-up patients, provide easy access to extensive data for providers, and address the challenges of referrals,

feedback and duplication in addition to informational continuity. The usefulness of the electronic information system in addressing the above problems and the challenges of accuracy and completeness depends on using well-trained staff who also understand the usefulness of the data being collected.

The capacity of TB/HIV team members to effectively handle the data management of TB and HIV services is one of the many the barriers identified in this study: these were structural and political barriers of integration, and health system barriers to implementation. This underscores the findings of Okot-Chono et al (2009) that health system barriers to implementation are a major source of barriers to TB/HIV integration. The evidence from this study suggests that the existing barriers to integration, particularly the health system barriers to implementation, impair its effectiveness and hence the ability to assess the intervention accurately.

The impact of these barriers may prevent the accurate assessment of the effect of different degrees of integration on outputs and outcomes. Although the OSS has been advocated as the best model for service delivery (p. 37), a categorical statement on which model of service delivery is best would be inappropriate in this study. The success of integration is determined by multiple interactions arising from the contexts and settings (Greenhalgh et al. 2004), and as long as factors from these settings and contexts remain a major barrier to integration, these barriers would have a significant impact on integration as an intervention than the service delivery model. The study therefore did not have adequate information to draw any conclusions on which would be the best service delivery model.

9.2.3 EXPLORING PATIENT AND PROVIDER INFLUENCES ON TB/HIV INTEGRATION

A key objective of this study was the identification of patient and provider influences targeted at the processes of TB/HIV integration to determine outputs and outcomes. The focus of this study was on patient-provider interactions that demonstrated patient-centeredness and enhanced coordination or otherwise.

The study observed that patient-provider interactions and their behaviours reflected a limited role of the patient. The interaction reflected the traditional, compliance-oriented approach in which patients are seen as the recipients of medical decisions and prescriptions (Aujoulat, D'hoore and Deccache 2007). Patients therefore surrender varying amounts of control to health care professionals in order to gain the expertise, technology, and compassion available from health care professionals (Anderson and Funnell 2005). The health care providers take responsibility for solving their patients' problems and this feeling of responsibility leaves many health care professionals feeling frustrated when their patients do not follow recommendations (Anderson and Funnell 2005).

At the study sites patient-provider interactions were characterised by providing privacy and confidentiality, giving information on the diagnosis to patients, health promotion and prevention, what was expected of them during management, and answering patient questions where they had the courage to ask. Patient involvement was limited to determining what time of day they wanted to take their daily medication and who they wanted to be their treatment supporter. Patient-provider interactions therefore lacked many of the characteristics demonstrating that the disease and illness experience has been adequately explored, understanding of the whole person, and finding common ground.

Patient behaviours in this study also reinforced this compliance-oriented paradigm as this defined their behaviour and expectations: to be told what to do and do what you are told because providers 'know best'. Patients seemed ignorant of their rights to be treated with dignity and respect and therefore patients viewed such behaviour from providers as an additional service. Patient-centred care leads to greater enablement, improves adherence and patient satisfaction, and leads to better outcomes (Pelzang 2010; Holmström and Röing 2010).

The study findings seem to imply that integrated TB/HIV services delivery portrays more characteristics of the process model of patient-centred care than the systems approach as described under the theoretical review chapter (p. 64). Both providers and patients need to be adequately equipped to take up their respective roles in patient-centred care. And the question remains as to whether there are measures in place to equip both provider and patient. Preparing the health worker includes providing skills including interviewing and communicating effectively, assisting changes in health-related behaviour, supporting self-management and using a proactive approach to coordinate care across time (WHO 2005). Patient empowerment can be used to strengthen the role of the patient in patient-centred care, which is limited to the clinical health care setting, as well as for life outside this setting. Patient skills needed to fulfil this role include coping skills, goal setting for changing behaviour, self-monitoring, changing their environment to support behavioural changes, self reward, accessing social support (WHO 2005), and the ability to reflect on the benefits of changing behaviour (Holmström and Röing 2010).

It was also observed that the TB/HIV policy in Ghana also demonstrated the perception that the provider was responsible for the patient's health, confirming the school of thought that the compliance-based approach to care as a paradigm is not only embedded in the minds of individual health care professionals, but is also the basis for most of the policies and procedures of health care organizations (Anderson and Funnell 2005). The focus of the policy was therefore to find a way of 'giving' TB/HIV patients what they needed, and presupposing that providers as 'experts' knew what the patients needed. TB control programmes have traditionally employed a compliance-based approach to complete treatment while HIV control adopts a more patient-centred approach to encourage long term adherence. One rationale for integration was to take advantage of the natural synergies and complementariness of the two programmes (Ghana Health Service 2007). However with more commitment being exhibited by the more decentralised TB component of integration and the existing health system challenges, the patient-centred approach which was to be emphasised seems to be subsumed instead as observed in the study.

All the three patients who talked about stigma reported instances of felt or perceived stigma which refers to the fear of being discriminated against as opposed to enacted stigma in which there is an experience of a prejudicial act. One of them had also experienced enacted stigma. Daftary, Padayatchi and Padilla (2007) observed a similar trend and also noted that perceived stigma was a barrier to accessing services and prevented TB patients from utilising TB/HIV services. Bond and Nyblade (2006) identified three main causes of TB/HIV stigma, namely the perception that TB is a sign of HIV, the judgemental attitudes of communities that

immoral people get HIV, and finally the exaggerated fear of contagion. The study also confirmed some of the findings of Dodor and Kelly (2010) about the manifestation of TB stigma in Ghana. The study corroborated their results that health care workers who were not part of the TB/HIV teams feared being infected by TB patients and therefore avoided interacting with them. When TB patients presented with other illness they would have to wait to be seen by TB/HIV team members. Although this study did not elicit that health care workers perceived being asked to work with TB/HIV patients as a punishment, there was the high attrition rate among trained staff that could be another manifestation of the unwillingness to work with TB/HIV patients. There was however no evidence to support their view that TB units were located in isolated places and they lacked tools and equipments.

The study also identified the financial burden of illness, social support structure and beliefs about the illness as other determinants of patients' willingness and ability to access services, and adherence to treatment. Seventy five percent of facility providers and 44% of patients interviewed admitted the challenges faced in relation to financing of their care and daily maintenance. The high financial burden identified was an affirmation of the findings of Gyapong et al. (2009) in their study to determine the cost of TB treatment in Ghana. They found that there was an average reduction of 40% and 82% in monthly household and patient incomes respectively. On the average pre-diagnosis and diagnosis costs were 38% of monthly household incomes, while treatment costs were equivalent to 108% of monthly household incomes. These determinants although based

outside the health care setting, have a profound impact on patient outcomes based on their ability to cope with them.

The study did not provide any data to suggest that patient or provider behaviours varied significantly with the different levels of integration, but as observed with the quantitative study results patient and provider behaviours were mostly influenced by barriers that were mostly unrelated to the degree of integration apart from stigma. The qualitative study therefore confirms the quantitative findings that barriers to implementation may currently be more important in determining the impact of integration than the degree of integration. A more patient-centred approach is therefore required to address and minimise the effects of health system challenges, and to optimise the impact of facilitators to ensure more effective integration.

9.3 IMPLICATIONS OF STUDY

9.3.1 POLICY AND PRACTICE: LOCAL AND NATIONAL CONTEXT

The integration of TB and HIV services in Ghana is an on-going intervention introduced as part of a nationwide drive to improve the control of both TB and HIV. This study identifies in chapters 6 and 7 that output and outcome indicators are below national targets. And in accordance with programme objectives and the objectives of this study this section identifies both good and bad practices, and then makes recommendations for improvement. A number of best practices and strategies employed which have resulted in improved access to TB/HIV services and contributed to improved treatment outcomes were identified. However existing barriers have undermined effectiveness such that anticipated targets are yet to be

achieved. In order to maintain and build up on achievements to facilitate nationwide scale-up, the best practices identified should be re-enforced and replicated, while the barriers and detrimental practices identified should be addressed through prudent management of resources. Outlined below are best practices and recommendations arising from this study to achieve this.

9.3.2 BEST PRACTICES

A number of strategies were identified as enhancing coordination and facilitating continuity of care as discussed in the theoretical review in chapter 3. Outlined below is a summary of these practices and their areas of impact.

Table 28: A catalogue of best practices and facilitators of integration

Area of intervention	Best Practices
TB/HIV Policy	<ul style="list-style-type: none"> - A clearly defined policy being implemented, and which has led to the development of treatment guidelines and related protocols and tools - On-going refinement and contextualising of national policy based on feedback from early learning sites - Demonstrable leadership, commitment and political will - On-going decentralisation of services to address the difference in access to TB and HIV services
Human Resource for TB/HIV	<ul style="list-style-type: none"> - Systematic and continuous training of TB/HIV workers - The use of different types of staff, particularly the use of both highly skilled and less skilled staff in TB centres especially within the context of acute health worker shortages - The use of community volunteers and family treatment supporters to promote adherence - Promotion of teamwork - Staff motivation through enabler's package and training
Monitoring & Evaluation	<ul style="list-style-type: none"> - Standardised output and outcome indicators for monitoring and evaluation are clearly specified - The use of existing recording and reporting systems and structures, as well as updating these where they do not meet the requirements for integration - Regular joint review meetings at district, regional and national levels - Defined hierarchical leadership at facility, district and regional levels to provide direct supervision.
Service delivery	<ul style="list-style-type: none"> - Provision of patient privacy and confidentiality, patient education and counselling - Treating patients with dignity and respect

	<ul style="list-style-type: none"> - Drug treatment: use of FDC with Rifampicin-based regimens, in conjunction with appropriate ART - Availability of resources: no stock outs - Use of appointments to follow-up patients and enhance management continuity - Teamwork at the facility level with division of labour
Socioeconomic support	<ul style="list-style-type: none"> - Enabler's package that provides food and money for patients - Collaboration with NGOs to identify cases and support patients - Mechanisms for financing care like health insurance and credit facility for ARVs

9.3.3 RECOMMENDATIONS

In addition to the best practices identified, there were also some practices that have not been beneficial or been detrimental to efforts to integrate TB and HIV services. The following recommendations are therefore based on suggestions to address these not so beneficial practices. The recommendations are related to the TB/HIV policy, human resources for TB/HIV, monitoring and evaluation of TB/HIV activities, and TB/HIV service delivery. The purpose of these recommendations are to make care more patient-centred, enhance coordination further, and to promote greater continuity of care.

9.3.3.1 MAKING CARE MORE PATIENT-CENTRED

- The study observed that there was very limited decision sharing between providers and patients concerning patient management. And often patients had inadequate knowledge about their treatment. Patients were also ignorant of their roles in management. Care therefore needs to be made more patient-centred,
- A clear definition of what patient-centred TB/HIV care means in Ghana should be provided. Teaching models and educational curricula based on this definition should be introduced to provide adequate educational

emphasis. The focus of the policy should not be deciding what patients need and providing them for patients to comply with. Policy should recognise patients as partners in their care and let this reflect in protocols and guidelines,

- Patient counselling sessions can be used as opportunities to provide patients with skills including coping skills, goal setting to support behavioural changes, self-monitoring skills, and how to access social support,
- It was demonstrated in the study that patients received a lot of counselling through which they were educated on their conditions and the treatment plan. Making care more patient-centred will require the inclusion of different dimensions to the patient-provider interaction. The interaction should explore the patient's life context and how the illness has impacted them, and more involvement of patients in decision making that considers all that is important to them. These interactions should also be used to manage patient expectations to enhance patient satisfaction by identifying patient needs and addressing them. This would promote adherence and reduce adverse outcomes.

9.3.3.2 ENHANCING COORDINATION

- Barriers to coordination included the lack of cooperation from other staff due to their fear of loss of influence and resources, the separate funding streams of both programmes, and the development of local focus as a result of the different requirements from external funding agencies. The different information systems was also a barrier,

- The study recommends that due to the pervasive nature of health system barriers identified, a move towards OSS for all TB/HIV services should rather be seen as a long term objective. The health system barriers undermine the effect of the degree of integration to an extent that investing limited resources to create OSS nationwide will not yield the anticipated benefits. The priority should be to identify effective ways of strengthening the health system. In the mean time the referral and partially integrated models can be effectively used within contexts suggested in the subsequent sections,
- Enhancing coordination in care is primarily focused on exploring strategies that improve coordination and improve continuity within existing services. Strategies like strengthened linkages, feedback and patient appointments should be used to improve referral services and patient follow-up. These strategies would then enhance coordination for referral and partially integrated models to effectively deliver TB/HIV interventions,
- The referral and partially integrated models may also be preferable in a TB and HIV programming context where there is an effective community-based care with treatment supporters, as well as an effective collaboration and referral system between the two programmes,
- The referral and partially integrated models are recommended especially for patients in communities where both diseases are highly stigmatised (enacted or perceived) to the extent where it interferes with utilisation of services, while stigma is addressed.

9.3.3.3 MONITORING AND EVALUATION

- Less than satisfactory practices that need to be remedied include incomplete and inaccurate data, and lack of feedback from referred cases and from the regular reports submitted through the districts and regions to the national offices. Improving data quality should be prioritised,
- Appropriate indicators are critical components in effective evaluation, and they have to be sensitive enough to give adequate information on what is being measured. One recommendation to improve the relevance and usefulness of indicators in monitoring TB/HIV activities is to emphasise the use of treatment success rates which include cured and completed cases among sputum positive and negative TB, as well as EPTB cases. This should be in addition to cure rates (includes only new smear positive cases). It is also being recommended that TB mortality be included as a contributor to monitoring and evaluation.

9.3.4 POLICY AND PRACTICE: INTERNATIONAL

This study establishes its relevance by contributing to the body of knowledge in both integrated care, and TB and HIV control, and also provides evidence for practice that is transferable to other settings and contexts as defined in the key findings above. The following recommendations can be transferrable in similar contexts:

- TB mortality rates may be a more relevant indicator for monitoring and evaluating TB/HIV integration in a context where TB/HIV integration is part of a complex of strategies for TB control, low access to ART, and low rates of MDR- or XDR-TB,

- In health systems where barriers to implementation contribute most significantly to TB/HIV outputs and outcomes, organisation of care should focus on overcoming these barriers as opposed to providing different degrees of integration as the impact of the varying degrees of integration may not be felt,
- Patient empowerment may be relevant in addressing the challenges patients face in living with TB and HIV, especially those outside the health care settings. Patient empowerment should be a component of strategies to address stigma; these should not just be stigma-reducing interventions but should include skills for patients to deal with perceived or experienced stigma.

9.4 RESEARCH IMPLICATIONS

9.4.1 STUDY DESIGNS

The study further contributes to knowledge by providing information relevant for designing studies to explore delivery of TB/HIV interventions, to pilot methods of evaluation, or the design and execution of a definitive evaluation study. The study identifies and emphasises the following:

- The development of a conceptual framework of integrated care for studying TB/HIV indicators and factors influencing them,
- The relevance of characterising and standardising an intervention prior to its evaluation,
- The study also demonstrates how routine, anonymised data can be used for monitoring and evaluation in TB/HIV integration,

- Based on the findings of this study recruitment rate for each of the indicators used can be determined in designing subsequent evaluative studies in Ghana and in similar context of TB and HIV disease burdens,
- The study informs sample and cluster sizes determination for statistically representative samples and clusters to address confounders in future more rigorous studies,
- This study also informs how mixed method approaches can be used to explore and understand other integrated health services.

9.4.2 FUTURE WORK

- Study designs: research using more robust and rigorous study designs and mixed methods approaches should be conducted for more effective TB/HIV evaluation,
- Revision of guidelines on the time of initiation of ART: current guidelines suggest that the CD4 count be used as an indicator to initiate ART. However current research through mathematical modelling suggests that yearly HIV testing of every adult and immediate initiation of ART on diagnosis of HIV has the potential to reduce transmission of both HIV and TB (Granich et al. 2009). Research should therefore be directed at exploring the implications of these findings in real life settings,
- In order to improve the completeness, accuracy and data quality the following are recommended to explore and pursue strategies to improve accuracy of recording and reporting of TB/HIV activities, using trained data management staff to take over all recording and reporting. and improve accuracy and completeness of data. There should also be encouragement of

local use of data to enhance awareness of the usefulness of data being collected,

- Another area of research would be the readiness of patients in low-income countries to take up the responsibility of being empowered, and tools for empowering patients within the limitations of resources, time, technology and educational levels,
- The feasibility and safety research on the use of IPT in low-income settings should be made a priority to accelerate the review of policies to make this intervention available to patients,
- More research on post-mortems and clinical/microbiological studies of sufficient size to determine TB case fatality rates and the specific causes of TB deaths more accurately is needed.

9.5 EVALUATION OF STUDY METHODS

This was a study intended to inform the implementation and nationwide scale-up of integrated TB/HIV services in Ghana. It informs the evaluative study designs to assess the effect of integrated TB/HIV services, compares different degrees of integration for service delivery, and explores the patient- and provider-related factors influencing outputs and outcomes. Statistical representation and generalisability of findings was not an objective and therefore even though the study design was not robust enough to provide causal linkages between integration and TB/HIV outputs and outcomes, it provided timely and relevant information to inform TB/HIV integration and its implementation. A natural experiment with before-and-after studies and qualitative interviews provided the flexibility and the

tools to study the practice of integration. The findings of the study therefore may not be generalisable because of the impact of the context, but they are transferable to similar contexts for facilitating integration and its implementation.

A particular challenge of this type of intervention research is the balancing of methodological rigour and feasibility. Realistic threats to rigour include the cost of research, local political factors as well as the socioeconomic environment. Outlined in the following subsections are strategies that could be employed to enhance the validity and reliability of this research.

9.5.1 STUDY DESIGN

- A sequential study made up of an initial quantitative study followed by a qualitative one would have provided more opportunities to use the qualitative study to explore the underlying factors accounting for the quantitative findings,
- Restricted randomisation using matching or stratification on a larger number of factors affecting the outcomes of interest would limit the confounders, increase precision and improve the statistical power (Atienza and King 2002),
- Direct observation of patient-provider interactions, as well as patient experiences at the hospitals would have provided more insight into the influences on integration and also to improve quality and reliability of data.

9.5.2 SAMPLING

- A larger number of sites as well as larger number of participants per site would reduce cluster effect as well as the within-group variances in the

output and outcome measures of interest (Atienza and King 2002; Grimshaw et al. 2000).

9.5.3 DATA COLLECTION

- The patient interviews could have been used to explore patient experiences of the continuity of care to enhance the understanding of the processes of integrated care, and therefore how to improve them.

9.5.4 METHODS OF ANALYSIS

- Analysis of co-variances and other multi-level analyses can be used to account for the heterogeneity in individual participants, and between the sites (Atienza and King 2002; Cook and Campbell 1979,). These analytical methods and models can also be used to account for the effect of history and statistical regression,
- Joint analyses can also be done by pooling data from multiple studies with similar measures. In which case the different studies should have common or comparable measures, and then the specific sources of variation associated with each study has to be considered as well (Atienza and King 2002).

Based on the design and methods the findings of these studies have been appropriately described as recommendations but not categorically proven statements.

10 CONCLUSIONS

This was a study to pilot methods of evaluation of TB/HIV integration and to explore the factors influencing the delivery of the intervention. It was made up of a quantitative study to explore the effect of TB/HIV integration on TB treatment outcomes and the impact of increasing degrees of integration on outputs and outcomes. The second component was a qualitative one to explore barriers and facilitators of integration.

The study observed that integration has the potential to improve TB and HIV treatment outcomes but its effect is currently undermined by health system barriers. These barriers seem to overshadow the impact of the degree of integration on the outputs and outcomes of integration. TB treatment success improved after integration and at all sites too but this increase was not related to the degree of integration. Although HIV screening among TB patients improved with increasing integration, CPT and ART did not. Therefore the study was unable to provide evidence to support the view that increasing degrees of integration resulted in increasingly better TB/HIV outputs and outcomes. Consequently an optimal delivery model could not be identified.

Although many facilitators were identified, the study also identified some barriers to integration: these include inadequate patient involvement in their care, unwillingness of providers to collaborate with others, patient beliefs about illness, and patient socio-economic status.

Following these findings recommendations have been made to improve integration by making care more patient-centred, improving continuity and enhancing coordination in four main areas namely, TB/HIV policy, human resource for TB/HIV, monitoring and evaluation, and service delivery both locally and internationally. Areas for further research to expand knowledge and improve TB/HIV practice have also been recommended to include the use of multi-method approaches of evaluation, feasibility and safety of IPT in individual nations in SSA to improve uptake, and paradigmatic changes to make care more patient-centred.

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APPENDICES

Appendix I: Literature Search Strategy

Database: Web of Knowledge

Limits: All years
English language
Lemmatization on

Search terms: Tuberculosis and HIV and Integration and Africa - 42
Tuberculosis and AIDS and Integration and Africa - 32
Tuberculosis and HIV and Collaboration and Africa - 46
Tuberculosis and AIDS and Collaboration and Africa - 36
Tuberculosis and HIV and Management and Africa - 333
Tuberculosis and AIDS and Management and Africa - 184
Tuberculosis and HIV and Partnership and Africa - 50
Tuberculosis and AIDS and Partnership and Africa - 34

Database: Science Direct

Limits: English language
Journals
2004 to date

Search terms: Tuberculosis and HIV and Integration in Africa - 583
Tuberculosis and AIDS and Integration in Africa - 593
Tuberculosis and HIV and Collaboration in Africa - 909
Tuberculosis and AIDS and Collaboration in Africa - 836
Tuberculosis and HIV and Management in Africa - 2363
Tuberculosis and AIDS and Management in Africa - 1969
Tuberculosis and HIV and Partnership in Africa - 879
Tuberculosis and AIDS and Partnership in Africa - 854

Resource: Medline OVIDSP

Databases: Embase
Global Health
Health Management Information Consortium
Ovid Medline (R) (1996 to September 2011)

Ovid Medline (R) In-process and other non-indexed citations –
October 16 2011
Leeds University Library's Journals @ Ovid (full text)

- Search terms:
1. Tuberculosis in Africa - 105
 2. TB in Africa - 41
 3. HIV in Africa – 408
 4. AIDS in Africa - 848
 5. TB and HIV integration in Africa - 0
 6. TB and HIV collaboration in Africa – 0
 7. TB and HIV management – 16
 8. 1 or 2 – 142
 9. 3 or 4 – 1228
 10. 8 and 9 – 4

Additional Search terms

11. Tuberculosis and HIV integration – 13
12. Tuberculosis and HIV collaboration – 23
13. Tuberculosis and HIV partnership – 3
14. TB-HIV in Africa – 0
15. TB-HIV – 988

- Limits:
- English Language
 - Human
 - 2004 to current

- a. Are there any intentions to make it entirely free?
 - b. What are the factors that determine when ART should start in a TB patient who qualifies for it?
 - c. For newly diagnosed TB patients on TB treatment, if they are found to be HIV positive and qualify for ART, when should treatment start?
10. How accessible is the National TB/HIV guidelines?
11. How has the retraining of staff been achieved?
12. In your opinion, how have you done as a programme?
- a. What have been the main challenges to the effective implementation?
 - b. What have been the major achievements of the TB/HIV policy?
13. What would you say is the way forward for TB/HIV integration in Ghana?

APPENDIX III: Provider Interview Guide

Date:

ID:

Location

Start:

End:

- 1. Tell me about the TB/HIV team in this hospital?**
 - a. Who are the members?
 - b. How does the team work?
 - c. How do team members relate to each other?

- 2. How did you become a member of the TB/HIV team?**
 - a. How would you describe your work as a member of the TB/HIV team?

- 3. How are the TB and HIV clinics organized?**
 - a. What days and times do they operate?
 - b. Where do the patients come from?

- 4. How do you get equipments, medicines and other logistics the team needs?**
 - a. Are the following always available: HIV test kits, laboratory reagents, specimen containers, relevant stationery?
 - b. Have you run out of any of these in the past year?
 - c. How long did it take to resolve?

- 5. Do TB/HIV patients pay for their care?**
 - a. What do they pay for?
 - b. Is there any support or subsidy available?
 - c. If yes, where is it from and how is it used?
 - d. Any NGOs involved in TB/HIV care or support?

- 6. How are new patients managed?**
 - a. What happens when a new patient comes to the DOTS centre?
 - b. What about a new patient at the HIV clinic?
 - c. What happens to a new TB/HIV case?
 - d. What about old (already known) cases?

- 7. How do you decide what treatment a new TB/HIV patient gets?**
 - a. Is there any protocol or guidelines you use to manage TB/HIV cases?
 - b. If yes, where is it from? Who develops it?
 - c. Do you own a copy?
 - d. Is there a copy in the room where patients are seen?
 - e. How do you use them? When? How often?
 - f. Are you aware of any national TB/HIV guidelines/protocol?

- 8. How are TB/HIV patients involved in the decisions about their care?**
 - a. Do you ask them what they want?
 - b. Are they educated on all treatment and procedures they undergo?

- 9. What do you think TB/HIV patients want when they come to hospital?**
 - a. How do you work to meet these expectations?
 - b. How do you know whether or not you have met these expectations?

- 10. How would you describe the attitudes of TB/HIV patients towards you?**
 - a. How do their attitudes affect the way you do your work?
 - b. Are you able to treat all patients the same?
 - c. If yes, how are you able to do that?
 - d. If no, why do you think it is so?

- 11. Apart from the type of disease, what else do you consider as important in managing TB/HIV patients?**
 - a. Tell me about patient privacy.
 - b. What about patient confidentiality?
 - c. How do you provide these for your patients during consultation, counseling and other treatment?

- 12. In general, how do you feel about your work and the care you provide for TB and HIV patients?**
 - a. What makes your work difficult?
 - b. What makes it easier?
 - c. What more do you think can be done?

- 13. What else would you like to say or add to what we have said so far?**

APPENDIX IV: Patient Interview Guide

Date:

ID:

Location

Start:

End:

- 1. Please tell me about yourself**
 - a. What do you do?
 - b. What was your life like before you fell ill?

- 2. Tell me about this illness?**
 - a. How did this illness come about?
 - b. How has it affected your family?
 - c. How has your life changed since you fell ill?

- 3. Why did you come to this hospital for your treatment**
 - a. When do you come to clinic?
 - b. How often do you come?
 - c. How do you get here from your house?
 - d. Who comes with you?

- 4. What happened the first time you came here with this illness?**
 - a. How did they find out that you had 2 diseases?
 - b. What was done for you the first time?
 - c. What treatment were you given?

- 5. What happens when you come to hospital now?**
 - a. What treatment do you get now when you come for review?
 - b. What do you pay for when you come here?
 - c. How long do you stay here during visits?
 - d. How do you get your medicines, and your tests done?

- 6. What did you want to be done for you when you first came here with these diseases?**
 - a. How would you describe the treatment you receive here?
 - b. Is it what you expected?
 - c. Do you get all the treatment you need here?
 - d. If yes, in what way?
 - e. If no, what more do you need?

- 7. Do you think the best of care is given here?**
 - a. Why or why not?

8. What are the staff's attitudes towards you??

- a. How do the hospital staffs treat you when you come here?
- b. Are all patients treated the same?
- c. If no, why the difference?

9. How are you involved in deciding what treatment you get?

- a. Are you asked for your opinion or consent for any care given?

10. Do you feel comfortable in this environment?

- a. Are you able to tell the staff all your problems
- b. Are you able to ask any questions about anything you do not understand?
- c. What is it in this place that makes you comfortable enough to tell or ask them all you want to?

11. What can you say about the treatment given so far?

- a. How has the treatment affected the illness so far?
- b. What do you like about the care received?
- c. What do you not like?
- d. What are the problems you face when you come here?
- e. What more do you think can be done to improve the care for you?

12. Is there anything you would like to say or add to what we have already said?

APPENDIX V: Patient Consent Form

Researcher Address:

Gloria A. Ansa

University Hospital, Legon

P.O.Box LG 79

Legon, Accra

Contact: 021 513 890, 0267 893 219

Part I: Information Sheet

Tuberculosis (TB) and HIV affect a lot of people in Ghana, and they harm not only the sick, but their families and communities as well. It is therefore very important that these patients are identified and treated early to restore health and to prevent spread to other people. Health workers are therefore working together (i.e. integration) in some districts to improve the care of TB/HIV patients, and there are plans to spread to all parts of the country. The purpose of this study is to improve integration and hence the care of TB/HIV patients. Information will be collected from district hospital TB and HIV clinic records between January and July 2010 to find out if the care for patients follows national guidelines, and if outcome of patient care has improved. The study will also find out the problems of integration and what can be done to solve these by interviewing a few patients and health workers. The results of this study will be used to improve care in this and other hospitals where TB/HIV care is given through the National AIDS/STI and TB Control Programs. The information from the study will be reported as part of my studies, and parts published to educate other people on TB and HIV integration. This hospital will also receive a report about all the findings.

Taking part in this study means spending about an hour to answer some questions about the kind of TB/HIV care provided in this hospital. If you allow it, the interview will be recorded. It is not compulsory to take part in this study because whether you take part or not will not affect the kind of care you receive. If you decide to take part, nobody apart from me will know what you or any other participant says. No names will be put on reports, and the record of this interview will be kept safe in a locked drawer for up to 2 years after the study and then destroyed. You are therefore encouraged to be honest about your opinions. You can also withdraw from the study at any point, and that will not be held against you either.

Part II: Certificate of Consent

- I have read the above information (or had it translated to me)
- I have had the opportunity to ask questions about it
- All my questions have been answered to my satisfaction
- I understand that I have a right not to take part or to withdraw from the discussion at any time.
- I consent voluntarily to be a part of this study

THUMBPRINT

Name of Participant _____

Signature of Participant _____

Date (DD/MM/YYYY) _____

- I have witnessed the accurate reading (translation) of the consent form to the potential participant
- The individual has had the opportunity to ask questions.
- I confirm that the individual has given consent freely.

Name of Researcher _____

Signature of Researcher _____

Date (DD/MM/YYYY) _____

A copy of this Informed Consent Form has been given to the participant:

Yes

No

Local Contact:

Peace Barnor

University Hospital, Legon

P.O.Box LG 79

Legon, Accra

Contact: 0302 513 890, 0244 560 016