Integration of childhood TB into maternal and child health, HIV and nutrition services

A case study from Malawi

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Integration of childhood TB into maternal and child health, HIV and nutrition services: A case study from Malawi

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COVER PHOTO: Children smile standing outside their house in a village in Thyolo District in Malawi. © UNICEF/UNI112705/Pirozzi

MATERNAL, NEWBORN AND CHILD HEALTH

WORKING PAPER

Month and year

Integration of childhood TB into maternal and child health, HIV and nutrition services

A case study from Malawi

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Mothers attend an under-five clinic at Mswaswa clinic, Malawi © UNICEF/UNI90650/d'Elbee

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Executive Summary

An estimated 1 million children worldwide fall ill with tuberculosis (TB) each year, yet only 36% of them are reported to national TB programmes. Besides challenges with the diagnosis of childhood TB, the main access barriers to TB services are linked to health system challenges. Vertical TB programmes have few linkages to other programmes and are often not accessible at primary and community levels of care. It is at this level where children with signs and symptoms of TB, similar to those of other common illnesses (such as pneumonia or acute malnutrition), will usually present, and where families affected by TB can be identified and screened. The need to better integrate TB into maternal and child health, as well as other relevant programmes is emphasised in global recommendations and approaches, such as the WHO childhood TB roadmap as well as the End TB strategy.

Country case studies were conducted in Uganda and Malawi in order to document and analyse experiences and perspectives on childhood TB integration into other programmes at country level and related health system requirements. The aim was to inform the broader thinking about integration of childhood TB services.

The Malawi case study identified and described different approaches to integration and unpacked the integration process. The perspective on TB integration of different relevant health actors at national and district level are described. The case study used a health systems approach and focused on the community and primary levels of the health system, paying attention to factors related to children of different ages in a lifecycle approach.

The method for the case study included document review, consultations with key health actors at national and district level, a facility visit and a participatory workshop at national level. An analytical framework approach was used to investigate the extent of integration of childhood TB interventions in multiple dimensions. An assessment tool for the case studies was developed, summarising the assessment questions by theme, combining a number of existing tools and frameworks on health care integration in general and childhood TB and benchmarks for integrated community case management (iCCM).

The case study found that political interest in integration is high and childhood TB and integration are addressed in the National TB Programme's (NTP) national strategic plan (NSP), TB guidelines, HIV/AIDS NSP and contact tracing standard operating procedures (SOPs). Participants' perceptions of the definition of integration focused around the provision of a comprehensive package of services at the service delivery level.

With regard to health systems functions, childhood TB is funded from the general TB budget which does not have a major gap but it highly donor-dependent. Aspects with insufficient funding include contact tracing, isoniazid preventive therapy (IPT) and decentralisation of services and diagnostics. The information system was not fully integrated, without systems to monitor implementation of childhood TB related aspects in programmes other than the NTP. There is limited use of data by health providers

for programme improvement. Training materials on childhood TB are being developed, but there is limited integration in training efforts. Logistics and drug supply systems in Malawi are highly donor-dependent. No major stock-outs of paediatric TB drugs have been reported.

The childhood TB strategy is mainly implemented at higher levels of care while lower levels lack capacity and access to diagnostic services. Paediatric TB and HIV programmes have advanced integrated delivery level, but nutritional services lack integration with childhood TB. The minimum level for childhood TB diagnostic and preventive services is the community health centre. At community level, TB/HIV adapted iCCM has been piloted in one district (by Save the Children). Scale-up of TB/HIV adapted iCCM is planned as part of the GFATM-supported scale-up of general iCCM under the Malaria grant by World Vision.

BCG is provided at birth. TB contact tracing is mainly implemented in a passive manner, apart from a pilot implementing new SOPs in four districts. Coverage of contact management is poor, which is linked to healthcare worker (HCW) capacity. A TB screening questionnaire for children is in place. Diagnostic tests available include smear (from health centre level), Xpert® MTB/RIF and radiology (from district hospital level) and culture (from referral hospital level). The health centre is also the lowest level at which paediatric specimens can be collected, although HCWs mainly rely on expectorated sputum. New child-friendly formulations for treatment of TB are now available, and phase-in was planned for the near future. Stocks of paediatric TB drugs are adequate.

A stakeholder analysis showed that there are many highly interested stakeholders who are supporters of childhood TB integration. Childhood TB and general integration of the TB programme into the broader health services is driven by the NTP and integrated management of childhood illness (IMCI), supported by the HIV programme. A childhood TB focal person is available, although there is no dedicated childhood TB technical working group (TWG). Larger TB/HIV and community health TWGs exist, which could include childhood TB on their agendas.

Extent of integration: Most health system and managerial/organisational functions have partially integrated childhood TB, while most clinical activities around promotion, prevention, case finding and treatment were considered to be partially or not integrated.

Factors influencing integration: Many health system characteristics that prevent integration and need to be addressed were identified. Childhood TB is not considered a priority in spite of the country's TB epidemic, and the political will and donor support for childhood TB. The overall context (poverty etc.) fosters the TB epidemic. Clinical interventions need a lot of strengthening at all levels.

The country teams developed action points to assist the Malawian MOH for moving forward the integration of childhood TB into routine services and programmes.

List of Abbreviations

ACSD	accelerated child survival and development
AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
ARI	acute respiratory tract infection
ART/ARV	antiretroviral/antiretroviral therapy
BCG	Bacillus Calmette–Guérin vaccination
BMU	basic maternity unit
CBO	community-based organisation
CHAI	Clinton Health Access Initiative
CHAM	Christian Health Association of Malawi
CHC	community health centre
CHW	community health worker
CMAM	community management of acute malnutrition
CPT	co-trimoxazole preventive therapy
CSO	civil society organisation
DHIS	district health information system
DHMT	district health management team
DPPD	Directorate of Planning and Policy Development
DOTS	Directly Observed Treatment Short-course
EHP	Essential Health package
EPTB	extra-pulmonary tuberculosis
ETA	emergency triage assessment
FAST	finding TB cases, actively, separating safely, treating effectively (infection control)
FBO	faith based organisation
GDP	gross domestic product
GFATM	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GHI	Global Health Initiative
HCW	healthcare worker
HR(D)	human resources (development)
HSA	health surveillance assistant
HSSP	health sector strategic plan
iCCM	integrated community case management
IEC	information, education, communication
IMCI	integrated management of childhood illnesses
INH	isoniazid
IPT	isoniazid preventive therapy
IRIS	immune reconstitution inflammatory syndrome
HIV	human immunodeficiency virus
HR	human resources
HSSP	health sector strategic plan

KNCV	Dutch tuberculosis fund
LTBI	latent tuberculosis infection
M&E	monitoring and evaluation
MCH	maternal and child health
MDG	millennium development goal
MDR-TB	multi-drug resistant tuberculosis
M(N)CH	maternal, (newborn) and child health
MOH	Ministry of Health
MUAC	mid-upper arm circumference
NGO	non-governmental organisation
NSP	national strategic plan
NTRL	national tuberculosis reference laboratory
NTP	National Tuberculosis Control Programme
OPD	outpatients' department
PHC	primary health care
PHI	paediatric hospital improvement
PHM	Project Hope Malawi
PMTCT	prevention of mother-to-child transmission
PPP	public-private partnership
RMNCAH	reproductive, maternal, newborn, child and adolescent health
SDG	strategic development goal
SOP	standard operating procedures
SSDI	Support for Service Delivery Integration
SWOT	strengths, weaknesses, opportunities, threats
TAs	traditional authorities
TB	tuberculosis
TOT	training of trainers
TWG	technical working group
UNICEF	United National Children's Emergency Fund
USAID	United Stated Aid Agency
USD	US dollar
USG	United States Government
WHO	World Health Organization

Introduction

The incidence of TB among children between the age of 0 and 14 years worldwide was estimated to be 1 Million (range 900,000 – 1,100,000) in 2014, accounting for approximately 10% of the total TB burden. About 136,000 children died of TB in 2014. The case detection rate for paediatric TB cases was only 36% in 2014, with 358,000 cases notified to National TB programmes, pointing to the large burden of undiagnosed childhood TB (1).

Young children under the age of five are at highest risk of developing TB disease following TB exposure and infection, and are also at highest risk for severe disease and related mortality. The number of children exposed to TB that would benefit from symptom screening and preventive therapy is even higher than the number with active TB that remain undiagnosed. Confirming the diagnosis of TB can be challenging because of a low bacillary load and the difficulty of collecting specimens for bacteriological testing. Therefore, TB in children is often a clinical diagnosis that is made presumptively, based on a combination of a history of exposure to an infectious TB case, clinical symptoms, physical signs, and radiological findings and/or tuberculin skin testing. In regions where other diseases with overlapping characteristics (for example HIV, systemic viral or bacterial infections, parasitic infections, and bacterial, viral, or atypical pneumonia) are also prevalent, the sensitivity and specificity of these diagnostic approaches are far from perfect (2,3).

Besides challenges with the diagnosis of childhood TB in the absence of accurate diagnostic tools, the main barriers to providing children access to TB diagnosis, prevention, treatment and care are related to weaknesses in the health system. TB programmes are traditionally structured vertically with few linkages to other programmes and do not necessarily have a strong presence at lower levels of care, especially the primary and community care levels. However, children with signs and symptoms of TB, that are similar to those of other common illnesses such as pneumonia or acute malnutrition, will usually present to child health services at the primary care level. Health care workers at this level often lack awareness and knowledge of risk factors for or signs and symptoms of the disease (4). Capacity in childhood TB usually is restricted to higher-level care facilities such as national referral hospitals and urban settings (5,6). Routine screening for TB among high-risk groups such as children, adolescents and pregnant women living with HIV or children with acute malnutrition is rarely implemented. Community-based services remain under-utilised even though they would be ideally placed to perform TB contact screening in households of newly diagnosed TB patients (4).

Over the last decade, there has been increasing awareness of the TB disease burden suffered by children and a growing drive to include them in global TB control efforts. In 2006, the World Health Organization (WHO) TB control strategy expanded its focus to other vulnerable populations, including children. Children are now explicitly included via linkages with maternal and child health efforts extending beyond the traditional vertical disease control approach. Building on past knowledge and embracing the recent momentum to move forward and reduce the burden of TB in children and adolescents, a roadmap for childhood tuberculosis was developed, indicating key priority actions and the enhanced investment urgently needed to tackle childhood TB (5,7). The need to better integrate TB into maternal and child

health, as well as other relevant programmes is emphasised as part of the childhood TB roadmap as well as the End TB strategy. Systematic screening of contacts and high-risk groups for TB is an important component of the End TB strategy. Without the successful detection and treatment of TB infection and disease in children, elimination strategies are unlikely to succeed (6). Ending TB is also relevant as part of the broader global health agenda of ending preventable maternal and child deaths under the sustainable development goals (SDGs) and the UN Secretary General's Strategy for Women's, Children's and Adolescent's Health (1).

Many countries are now strengthening their childhood TB activities by forming childhood TB working groups, developing guidelines and training, and building capacity. A lot of this work is led by and focusing on the TB programme. At the same time, and in the context of broader initiatives aimed at strengthening community and primary care systems, there is an opportunity to improve linkages, define roles and key interventions for other services and programmes (7).

Documenting and analysing experiences and perspectives on childhood TB integration into other programmes from different health actors at country level will provide relevant lessons, best practices as well as challenges and knowledge gaps that can be shared to inform the broader thinking about integration of childhood TB services. It will also assist to identify technical support needed, as well as research priorities to provide evidence for scale-up. For this purpose, UNICEF conducted case studies in Uganda and Malawi.

The aim of the case studies is to contribute to global, regional and country learning about integration of child TB services within existing maternal, newborn, child health (MNCH), HIV and/or nutrition programmes using a health systems approach.

Methodology

The Ministry of Health (MOH) of Malawi and UNICEF, supported by technical partners, conducted the case study on the integration of childhood TB interventions into the national health system from May 9 to 13, 2016, with the support of a consultant.

Process

The case study identified and described different perceptions and dimensions of integration and unpacked the integration process. It described the perspective on TB integration from the view of different relevant stakeholders at national and district level. The approaches followed, influential actors/institutions/networks engaged (or not engaged) as well as the remaining gaps related to integrating TB interventions with MNCH/HIV/nutrition programmes were described. The case study used a health systems lens and a focus on community and primary levels of the health system and the necessary components thereof.

The factors described related to children of different ages in a lifecycle approach, with special attention to community and facility-level primary care and the necessary linkages between these, as well as linkages to higher levels of care. Special attention was given to integrated management of childhood

illness (IMCI) and iCCM (integrated Community Case Management), as particular examples of primary care for children, as well as TB contact screening/tracing and management as part of interventions at the household level. The case study also took into account parallel ongoing efforts of integration (for example nutrition and iCCM, HIV and MCH, TB and HIV) and how these may facilitate or hinder the process.

Key questions for the case studies included:

- Is integration an objective and if so, why?
- Is there an integration strategy and what are the components of the strategy?
- What is understood by integration?
- What are the key challenges in childhood TB and why/where is there a need for integration?
- Who are the drivers of TB integration? Which actors, institutions and networks are involved, and what is their respective role?
- What programmes and services are targeted for childhood TB integration?
- What policies are affected by the aim to integrate (childhood) TB?
- What is the extent of integration? What is the trend over time?
- What different functions of the health system are involved in/affected by the integration process (for example policies and guidelines, M&E, financing, HR, monitoring and supervision etc.)
- What factors are influencing integration?
    - What are the key strengths/successes?
    - What are the key weaknesses/gaps/challenges?
    - What are the key opportunities?
    - What are the key threats and risks?
    - How are challenges on integration addressed or how have they been overcome?

The following methods were used to collect data for the case study:

1. Document review (focusing on overall strategy documents and documents specific to TB, MNCH, and HIV programming)
2. Consultations with key stakeholders at National level
3. Consultations with key stakeholders at District level
4. Facility visit (interview and observation)
5. Participatory workshop at National level

Analytical framework

A conceptual framework approach (See Annex A) was used to investigate the extent of integration of childhood TB interventions in multiple dimensions (systemic, organisational, professional, clinical, functional and normative integration) (8,9)– see text box.

Factors that facilitated or hindered integration (10,11) were categorised by:

- The nature of childhood TB as a public health priority
- Features of childhood TB interventions
- Behaviours of health actors in adopting childhood TB interventions

- Readiness and capacity of the health system, and
- The broader systems and political context.

Dimensions of integration at the micro, meso and macro level of health care (Source: Valentijn* et al*, 2013)

1. **Clinical integration** (i.e. integrated care of various providers): E.g. how have childhood TB care activities assimilated with the various existing maternal and child care activities?
2. **Professional integration** (i.e. partnerships between professionals both within and between organisations having a collective responsibility to provide a comprehensive and coordinated continuum of care): E.g. how do health managers and health workers share competences, roles and responsibilities and accountability to deliver comprehensive child care including childhood TB services?
3. **Organisational integration** (i.e. consortia brought together): E.g. how are childhood TB services coordinated across organisations/departments/units?
4. **Systemic integration at the national and district level** (i.e. coherence of rules and policies, both vertical [linking different levels of care] and horizontal [linking similar levels of care]): E.g. how have key health system functions, policies, financing, action planning aligned programmatic management of childhood TB services?
5. **Functional integration** (i.e. integration of non-clinical support): E.g. how have childhood TB recording and reporting, monitoring and evaluation assimilated with existing information systems; how have childhood TB supplies assimilated with existing supplies systems?
6. **Normative integration** (i.e. integration of values and commitment, and political will): E.g. has management of childhood TB safeguarded the same mission, vision, values and culture as child health care?

Participants

Key national and sub-national health actors were invited to participate in group discussions and observation visits. Participants were purposively selected based on their roles and responsibilities in child health and childhood TB programmes and represented the MOH, United Nations (UN) agencies, academic and research institutions, non-governmental organisations (NGOs), community-based organisations (CBOs), and technical and financial partners (Table 1). Annex B lists the names of the participants in the various meetings and workshops.

Table 1: Participants

	Consultations		Workshop
Participants (N=46)	**Blantyre**	**National**	**National**
Ministry of Health			
NTP		**1**	**6**
MCH			
Nutrition			
HIV			
IMCI/PHC		**1**	**4**
District Health Management Team	**6**		**3**
Health workers	**1**		**2**
Community Health Workers	**2**		
Partners/Non-Governmental Organisations	**3**	**1**	**7**
UNICEF/WHO		**4**	**5**

Donor agencies				
	Total	**12**	**7**	**27**

Setting

Information was collected at both national and district level. One health district (Blantyre District in the Southern Region) was purposively selected based on the existence of targeted childhood TB interventions supported by technical partners. One primary health facility was purposively selected based on the same criteria.

Assessment tool

An assessment tool for the case studies was developed (Annex C), summarising the assessment questions by theme. The tool combined a number of existing tools and frameworks on health care integration in general, childhood TB benchmarks/standards and iCCM benchmarks (see table 2).

Table 2: Tools and frameworks used for the development of the assessment framework for the childhood TB case studies

References:	**Links:**
KNCV Childhood TB benchmark tool 4.0 (November 2015)	https://www.kncvtbc.org/en/kb/kncv-benchmarking-tool-for-childhood-tb-policies-practice-and-planning/
GHI Principle paper on Integration in the Health sector (Integration Scoping Tool)	http://www.ghi.gov/principles/docs/principlePaperIntegration.pdf
USG Global Health Principles M&E Resource Guide (Integration results framework)	http://www.ghi.gov/principles/hss/#.VxSx05dJk2w
CCM Benchmarks and Indicators Chart	http://ccmcentral.com/benchmarks-and-indicators/benchmarks-framework/
Valentijn et al (2013)	http://www.ijic.org/articles/abstract/886/
Atun et al (2010)	http://www.heapol.oxfordjournals.org/cgi/doi/10.1093/heapol/czp055

Data collection

Notes were taken during bilateral consultation meetings at district and national level, transcribed and organised by themes of the assessment tool. Group discussions were organised in a 1.5-day workshop at the national level. Participants were divided into three groups and asked to share their perspectives on the extent of and the factors influencing systemic, managerial and organisational, and clinical integration of childhood TB. During a health facility visit, discussions were held with health workers and complemented by observation of service delivery where possible. All participants and respondents agreed to voluntarily share information for the case study.

Data analysis

The information collected was analysed by theme according to the broad areas listed in the assessment tool, and synthesised (by inductive reasoning).

Findings

National health system readiness for childhood TB integration

Malawi political, demographic, health and tuberculosis context

Malawi is a low-income country located in Southern Africa and has a land area of approximately 118,000 square kilometres, bordering Zambia to the west, Mozambique to the east, south and southwest and Tanzania to the north and north-east. The country is divided into three administrative regions: Northern, Central and Southern regions and 28 administrative districts. Each district is further divided into traditional authorities (TAs) and a village is the smallest administrative unit. Politically, each district is further divided into constituencies, which are represented by Members of Parliament (MPs). Malawi has a multi-party system, which was adopted in 1994. The country is ruled by a President. For operational purposes, the MoH has created 5 health zones with the Southern and Central Region each divided in two zones: North, Central East, Central West, South East and South West (TB NSP). [a]

Table 3 summarises the country's demographic, health and tuberculosis situation.

Table 3: National demographic, health and TB context at a glance

Indicator name	Data	Source	Year
Population	15,316,860	PHS 2008	2015
Under 5 population	2,891,148	PHS 2008	2015
Annual population growth	3%	PHS 2008	2015
Urban population	16.1%	UNDP	2014
Birth rate (births per 100,000 population)	41.8	CIA	2015
Total fertility rate	5.1%	WB	2014
Adult literacy rate 15-24 years	75.2%	MDG Endline	2014
Life expectancy at birth	62.8	UNDP	2015
Infant mortality rate	53/1,000	MDG Endline	2014
Child mortality rate	85/1,000	MDG Endline	2014
Maternal mortality ratio	574/100,000	MDG Endline	2014
Children under 5 underweight	16.7%	MDG Endline	2014
Total estimated TB burden *	56,000	WHO	2014
Estimated TB prevalence (all cases) *	334/100,000	WHO	2014
Estimated TB mortality (all cases) *	59/100,000	WHO	2014
Case detection rate *	43%	WHO	2014
Children aged 0-14 notified *	1,827 (11%)	WHO	2014
HIV prevalence (15-49 years)	10.3%	UNDP	2014
GDP per capita (current US$) (World Bank)	255.0	WB	2014
Population living on less than 1.25 USD per day	72.2%	UNDP	2014
Total expenditure on health per capita (US$)	24	WB	2014
Total expenditure on health as % of GDP	8.3%	WB	2014
World Bank income group	Low income	WB	2014
Human Development Index	0.445 (rank 173)	UNDP	2014

[a] Information based on Malawi NTP TB National Strategic Plan, 2015-2020

Gini index (World Bank)	46.1	WB	2010

Data sources:

2008 Population and Housing Census (projections for 2015); Malawi MDG Endline report (2015); http://data.worldbank.org/indicator/SI.POV.GINI?page=1; http://data.worldbank.org/indicator/NY.GDP.PCAP.CD; http://hdr.undp.org/en/countries; WHO Global TB report 2015; https://www.cia.gov/library/publications/resources/the-world-factbook/

* Note: Data from WHO global report (2015) can be different from national data in table 5

Malawi National Health System organisation

The MoH consists of central directorates which include Nursing, Clinical, Preventive, Health Technical Support Services, Planning, Finance, Human Resources, Administration, HIV/AIDS and Reproductive Health. The supervision, monitoring and evaluation responsibilities for public health facilities are devolved to the zonal level and each of the five health zones oversees a cluster of districts. The formal health care services in Malawi are provided by three agencies: The MoH (60% of services), the Christian Health Association of Malawi (CHAM) (37%) and the Ministry of Local Government (1%). Other providers (private practitioners, commercial companies and the army and police) provide the remaining 2%.

In Malawi health services are provided at three levels: primary, secondary, and tertiary levels. Primary-level services are delivered by rural hospitals, health centres, health posts and outreach clinics. These are mostly located at community level and provide the bulk of primary health care (PHC) services. The secondary level, consisting of district and CHAM hospitals, supports the PHC by providing surgical backup services, mostly for obstetric emergencies and general medical and paediatric inpatient care for common acute conditions. District hospitals provide referral health services for health centres and rural hospitals in their respective districts. Some of these hospitals also provide specialised health care. Tertiary hospitals provide referral services of specialist surgical and medical interventions for their respective regions, but also provide services similar to secondary level facilities. [b]

[b] Malawi Health Sector Strategic Plan 2011-2016 and NTP TB National Strategic Plan 2015-2020

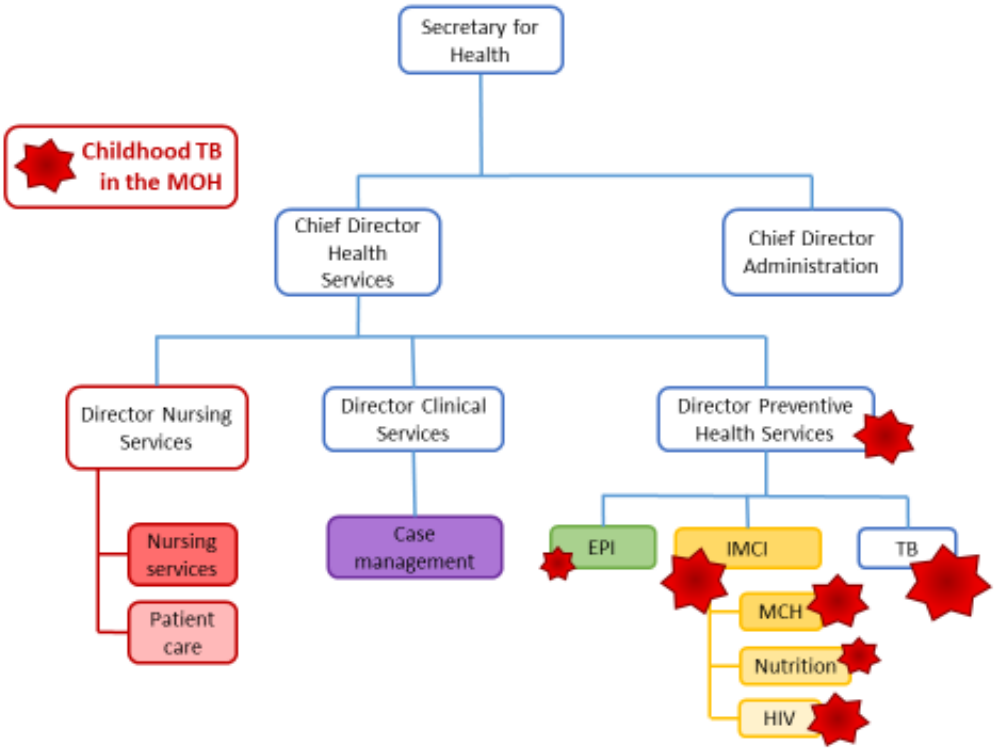

Figure 1: Malawi MOH organogram, with units addressing childhood TB services (indicated with a red star)

Malawi National TB Programme (NTP)

The NTP was established in 1964 under the MoH to coordinate the national response to the fight against TB in Malawi. According to the TB National Strategic Plan (NSP), TB control activities are fully integrated within the decentralised general public health system of the country, and private health facilities also provide TB control services under a central government brokered Public Private Partnership (PPP) framework.

TB services are provided free of direct cost to clients at point of care in public facilities and TB is among the priority EHP conditions. Decentralisation of TB diagnostic and treatment services to facilities lower than the district hospitals is an ongoing process. Microscopy (both light and florescent) remains the mainstay for TB diagnosis in Malawi with radiology as an adjunctive technology where it is available (mostly at district hospitals). As of August 2014, 247 public and CHAM health facilities across the country had capacity for both TB diagnosis and treatment initiation (in comparison, as of early 2016, there were 724 static ART sites, of which 631 provided prevention of mother to child transmission (PMTCT) of HIV option B+ services, e.g. lifelong ART for all HIV-positive pregnant women). Additionally, 284 peripheral laboratories had capacity for TB diagnosis through florescent or light microscopy. Table 4 summarises the number of TB diagnostic and treatment centres in Malawi. Xpert® MTB/RIF (Cepheid, USA) has been introduced in the past few years to increase detection of TB especially in sputum smear negative, hospitalised patients, patients with high risk of DR-TB and HIV positive clients in hospitals and in some community health centres. The National TB Reference Laboratory (NTRL) in the capital, Lilongwe,

provides high level diagnostic services including solid and liquid culture and drug sensitivity testing as well as quality assurance services to peripheral laboratories.

Table 4: Diagnostic and treatment centres for TB in Malawi (2015)

Types of services offered	Number	Population Coverage
Diagnostic centres with capacity for smear microscopy	257	1 Per 60,000
Designated TB Registration centres	247	1 per 66,000
Designated TB Treatment centres	700	1 per 23,000

Source: TB NSP 2015-2020

The NTP provides overall leadership and is responsible for policy formulation and guidance of TB control services in Malawi. The NTP falls under the Directorate of Preventive Health Services in the MoH. The NTP Programme Manager is responsible for the day to day management of the programme, supported by the Deputy Programme Manager and a team of dedicated officers responsible for TB/HIV, TB laboratory, medicines and commodities, treatment and patient support, operational research, M&E and data management. Technical assistance to the programme is provided by stakeholders on short and long term arrangements in different areas of expertise.

Within the MoH, annual planning is coordinated by the Directorate of Planning and Policy Development (DPPD). The NTP, in consultation with partners and implementers, prepares a draft plan with activities and a budget, which is submitted to the DPPD. The annual plans are guided by the National Strategic Plan (NSP), which sets the direction for the programme for a period of 5 years. Policy updates are developed in broad consultation with partners and stakeholders. Partners working at national level on TB and TB/HIV prevention and control participate in different technical working groups (TWGs) and other fora. District level civil society organisations (CSOs) and faith-based organisations (FBOs) and community support groups are part of the district resource team and provide technical support for collective decisions.

Each quarter, national supportive supervision is organised from national level to the 5 health zones in randomly selected districts and health facilities. Zones provide supervision to the districts on a quarterly basis. Supervisory activities at district level are carried out by TB officers in their respective districts on a quarterly basis. TB laboratory and drug management forms part of routine supportive supervision. [c]

Table 5 provides an overview of the most recent adult and paediatric TB data.

Table 5: National adult and paediatric indicators

Indicator name	Data	Year
Notification rate	106/100,000	2014
Prevalence rate (survey) – adjusted for all ages	343/100,000	2014
Total TB cases (all ages)	17,723	2014
Total TB cases aged 0-14 (%)	1,896 (10%)	
New PTB	11,153	

[c] Malawi NTP TB National Strategic Plan, 2015-2020

New Smear-positive PTB	5,564	
EPTB	4,567	
New cases	15,720	
Relapse cases	547	
Other re-treatment	1,456	
Treatment outcomes (new smear positive, all ages)	N=5,985	2013 cohort
Cure rate	-	
Success rate	85.8	Of evaluated
Default rate	3.0	Of evaluated
Failure rate	N/A	
Death rate	6.9	Of evaluated
Not evaluated	2.2	
MDR-TB total cases	19 (RR-TB 106)	2014
MDR-TB age 0-14 (%)	0	
TB/HIV collaboration	N=17,723	2014
Tested for HIV	94.1%	
HIV positive	53.0%	
On CPT	91.0%	
On ART	92.6%	
Paediatric TB		2014
Children with TB aged 0-4 years	799	
Children with TB aged 5-14 years	1,097	
Children with TB aged 0-14 years	1,896	
Adolescents with TB (10-19 years)	N/A	
Children eligible for BCG (age)	1	
BCG vaccination rate	92%	
Children with bacteriologically confirmed PTB	129	
Children with not bacteriologically confirmed PTB	1,047	
Children with EPTB	637	
Children with re-treatment TB	83	
Children with MDR-TB	0	
Children with TB tested for HIV	N/A	
Children with TB tested HIV+	N/A	
HIV+ children with TB on ART	N/A	
PTB index cases	13,890	2014 includes retreatment cases)
Children <5 household contacts of index cases	12,501	Projected using household size = 5, % under five children = 18%
Children <5 evaluated	3,187 (25.5%)	2014
Children <5 started IPT	2,770 (87.5%)	2014

Data sources:
Malawi NTP annual report 2014; NTP

National health policies affecting childhood TB

Overall strategy documents and documents specific to TB, MNCH, and HIV programming were obtained through internet searches and provided for review by MOH programme managers. These documents were reviewed to examine to what extent aspects around childhood TB services are included/addressed in relevant national strategies, policies and guidelines. A summary of the findings is included in table 6.

Table 6: Key health and TB policies with childhood TB aspects covered

Document name	Childhood TB position	Remarks
Health Sector Strategic Plan (HSSP) 2011-2016	TB in general part of EHP (essential health package), as major communicable disease. Focus for interventions: Community DOTS, Health promotion, Treatment of TB including MDR	No specific mention of childhood TB
TB National Strategic Plan 2015 – 2020	NSP: pillar 1 = Integrated case finding and patient centred TB diagnosis, treatment, care and support. Pillar 2 = TB/HIV Collaboration and Integration. Integration of components of TB services within other services forms a large basis of the interventions in this NSP. One of the major opportunities to further integrate service provision is with the HIV programme and the various services offered through the HIV control programme but is not limited to TB/HIV integration. TB case finding will be integrated with MCH and chronic illness clinics. The implementation of the strategic interventions and activities will follow an integrated approach and shall be done through the regular health service delivery system. The NSP also mentions the improvement of policies to further integrate TB screening into general health services (for example OPD and MCH programmes). Other interventions: strengthen referral linkages. Children: Health workers in high volume health facilities will be trained to improve their capacity to deal with childhood TB. The NTP will improve coverage and quality of contact investigation and IPT provision. Under pillar 3: prevention and impact mitigation: Upgrade policies to ensure that TB prevention including F.A.S.T. are integrated into all services including PLHIV services, MCH and IMCI (including iCCM) services and nutritional feeding centers.	
National Paediatric TB guidelines	Algorithm: first step is broad-spectrum antibiotics to all presumptive TB cases, if no improvement, TST, CXR, HIV test and sputum for smear x2. If tests do not indicate TB, management is based on HIV test result. If HIV+, IPT and CPT and referral for HIV care is provided. Children with persistent cough would be referred to a paediatrician. Contact management, BCG and neonates exposed to TB are covered in the guidelines (symptomatic HIV+ infants do not get BCG to prevent BCG IRIS). TB treatment for children is in line with WHO recommendations.	Clinical diagnosis does not become clear from the algorithm. The question arises what happens to HIV+ children with negative tests, who are still symptomatic. If one follows the algorithm, these children may be prescribed IPT, while they may have TB that cannot be bacteriologically confirmed.
TB Contact Tracing SOPs 2015	• Contact identification and registration - Contact tracing register • TB contact screening at facility (link with TB diagnostic services, IPT and HIV counselling and testing) • TB contact monthly follow-up (home visits to those who did not present at facility) - Home visit form • TB contact screening in community (home visits by HSAs to homes of index cases whose contacts did not present) • Post TB screening follow-up (for presumptive TB cases, or cases referred for IPT)	Piloted by CHAI in 4 districts

HIV/AIDS National Strategic Plan 2015-2020	Section on TB/HIV co-infection, including attention to pregnant women and children under objective 3. Interventions recommended: • Intensified TB case finding • Isoniazid preventive therapy (details on children under five, HIV positive children, pregnant women) • TB infection control • Early ART initiation for TB/HIV • Increasing the number of facilities with co-located TB and ART services	
Accelerated Child Survival and Development (ACSD) strategic plan for Malawi	Childhood TB broadly addressed under the high impact interventions	

Integration inputs

Policy and governance (normative integration)

In Malawi, the interest to improve childhood TB services and close the case detection gap is high, and most of the stakeholders realise that integrating with other programmes is the best way to identify TB contacts and improve TB screening of children who present to various services at community and primary care level. Participants felt that integration of health services for TB case management and prevention with other health programmes within the health system will enhance effective coverage of TB case management.

Diagnosis and treatment of childhood TB have been decentralised but not sufficiently and progress is slow. A gap, mainly around infrastructure, equipment, power and HR issues, exists for the majority of the community health centres (CHCs) to have these services available. Xpert® MTB/RIF is mainly available at district level facilities and not at lower levels and is therefore infrequently used for the diagnosis of TB in children. Obtaining sputum specimens from children is a major challenge affecting use of diagnostic tools and the confirmation of a TB diagnosis at all levels. The capacity of HCWs at lower levels is not optimal, they lack expertise and experience to clinically diagnose TB in children.

There is no separate integration strategy, but integration of TB services is addressed as part of the TB NSP (2015-2020). The country also has a TB/HIV collaboration and integration framework. The accelerated Child Survival and Development (ACSD) strategic plan for Malawi broadly tackles childhood TB under the high impact interventions, but more prominence and leadership is required. Policies affected by the aim to integrate (childhood) TB include the Child Health strategy, IMCI, Sexual and reproductive Health policy, and the NTP NSP and guidelines, as well as the Health Sector Strategic Plan.

Various perceptions and meanings of integration were discussed during the meetings and the workshop. Participants mentioned that integration needs to happen at all levels of the health system, including the national level, to make it possible for services to integrate at service delivery level. In Blantyre District, discussions were held with the District Health Management Team (DHMT) around the question whether one could talk about integration at all, if no definitive diagnosis is possible for children. Ultimately most participants agreed that the challenges with the diagnosis of TB in children actually form a reason for integration, rather than a barrier. During the workshop, there were additional discussions about the

meaning of integration. The perception was that childhood TB is already integrated in the national health system, since the TB programme is a national programme and childhood TB is part of the national TB programme. After exploring the various dimensions of integration, participants realised that integration moves beyond being part of a programme.

Some of the definitions of integration mentioned by participants included:

- Ensuring that every contact of a sick child under 5 with a community-based provider is used to assess the risk of TB and refer if indicated
- Integrated service: community-based provider who refers to a facility that can provide the services needed
- A comprehensive package of services available at the service delivery level and offered to each and every child

Childhood TB has been included in the community health worker strategy for the identification of TB contacts and contact tracing, but implementation is still being scaled up. Identification of TB contacts at community level is included in the TB/HIV adapted iCCM materials, which is piloted in the Blantyre district by Save the Children. HIV guidelines include TB screening of pregnant women, provision of IPT to asymptomatic neonates, and screening of HIV infected children. Nutrition guidelines do not include anything on screening of children for TB symptoms or TB contacts yet.

Health System Functions (systemic and functional integration)

Health financing

The total TB budget was 19m USD in 2014 (89% external and 11% domestic funding without funding gap) (global TB report 2015). The sources of funding include Government of Malawi, Global Fund, US Government, and other partners. Although childhood TB is included in the general TB budget, which does not have a major funding gap, some aspects of childhood TB do not have (sufficient) funding including contact tracing, IPT, decentralisation of services, diagnostic technologies, and HR development including tools. TB/HIV adapted iCCM is planned to be scaled up in the second half of 2016, supported by the GFATM.

Health information systems

Participants indicated that the different programmes have their own demands and have not yet fully integrated the information system and tools to collect data across programmes. There is a low capacity for performance management, and data are currently not used to inform programme management.

Age bands used for reporting NTP data on childhood TB are 0-4 and 5-14 years. Data is routinely collected on case finding and treatment outcome by disease category, sex, and age.

Collection of data on TB in children from other programmes is not currently happening (except for HIV) due to the lack of systemic integration within those programmes (HR, M&E systems etc.). Challenges encountered with referral from community to facility arise from the limited capacity to register and treat TB cases as TB registration centres are currently limited to higher level health facilities. This is being addressed by further decentralising TB diagnostic and treatment services to health centre level.

Research opportunities for conducting operational research include assessment of coverage/access to services; evaluation of the quality of care provided by HSAs, including the TB component; assessment of the reasons for the low numbers of children identified to be at risk of TB in pilot.

Health workforce

Currently trainings on TB for HCWs are mainly provided at pre-service level. Training modules and tools for paediatric TB are currently being finalised to be used within the next year for in-service training of HCWs in health facilities (including health surveillance assistants [HSAs], assistant environmental health officers [AEHOs], nurses, medical assistants, clinical officers, doctors). Aspects included in the training for facility-based health workers are clinical management including diagnosis and treatment, monitoring and side effects, prevention, supervision, mentorship, supply chain, data management, DHIS2 and health promotion. For community-based health workers (non-clinical) training includes prevention, referral, data management, supervision, and health promotion. Most programmes are conducting separate training, and have "disintegrated" programming and tools, for example job aides include programmatic areas like nutrition and HIV, but exclude information on TB. Integrated training manuals as well as harmonised job aids, supervision and management tools are needed to reduce duplication and make trainings and supervision more efficient.

Supervisory systems in place for HCWs and CHWs providing childhood TB services include integrated, supportive supervision, and mentorship, mainly done by senior HSAs for iCCM and health centre staff as well as cluster supervisors (AEHOs). Supervision checklists for TB/HIV adapted iCCM are in line with routine supervision within ICCM, whereby the checklist has been adapted to include TB/HIV.

Supply chain

Logistics and drug supply systems in Malawi are highly donor-dependent. Donors have implemented a parallel system for procurement, storage, distribution and monitoring of drugs.

Strengthening integrated supply systems would require integrated screening and diagnostic services, recording, monitoring and reporting tools, adequately trained HR, supervision, guidelines, and expanded logistical management.

Planning and Management (professional and organisational integration)

Stakeholder analysis

Stakeholder mapping was conducted during the national workshop to identify the involvement and role of key health actors, in childhood TB interventions (table 7). Health actors' interest and influence and power in childhood TB involvement were mapped on a matrix from low-high, which then positioned them as blocker, bystander, abstainer, driver, supporter (12).

Table 7: Stakeholder analysis

Level	Stakeholder	Involvement in Childhood TB	Interest in adopting Childhood TB	Influence and power	Position	Main concerns
National	MOH (overall)	Government	High	High	Driver	Scale-up, coordination
	USAID	Funder of Challenge TB, SSDI, other	High	High	Driver/supporter	Periodic funding Vertical funding

	Challenge TB	Childhood TB benchmarking, technical support	High	Medium	Supporter	Generalisation of TB interventions
	CHAI	Contact tracing, diagnosis	High	Medium	Supporter	Periodic/limited funding
	UNICEF	Childhood TB case studies, integration	High	Medium	Supporter	Periodic funding
	WHO	Roadmap for childhood TB	High	High	Supporter	Periodic funding
	PHM (project Hope)	TB/HIV, child survival, TB management	High	Medium	Supporter	Periodic funding
	Population Services International	HIV prevention, reproductive health	High	Medium	Bystander	Funding
	Action Aid	HIV/AIDS, human rights, poverty	High	Medium	Supporter	Technical capacity
	SSDI	Integration but not focusing on TB	Low	Medium	Bystander	Low interest
	College of medicine	Research	High	Medium	Supporter	Translation of research findings into policy & practice (by MoH)
District	Sue Ryder Foundation	Physical disabilities, rehab	High	Medium	Supporter	Coverage
Zonal	Baylor International Paediatric AIDS Initiative	Paediatric support Central Hosp, outreach	High	Medium	Supporter	Low coverage
	MSF	HIV	Low	Medium	Supporter	Down-scaling
	Dignitas International	TB/HIV integrated services	High	Medium	Supporter	Low coverage
Community	Save the Children	TB/HIV adapted iCCM	High	Medium	Supporter	Limited funding Training capacity
	World Vision	TB/HIV adapted iCCM	High	Medium	Supporter	Scale up Low involvement (new)

Planning and management

At the time of the case study, childhood TB integration was driven by the NTP, together with the IMCI programme. Other programmes (e.g. HIV, MNCH, nutrition) are involved through the IMCI programme manager who overseas these, but there has been limited active involvement of MCH and nutrition so far. Their managers have not participated actively in the consultations and the workshop for the purpose of developing the case study.

The larger fora of the TB/HIV and community health working groups at national and sub-national level exist but neither of these are specific for paediatric TB. The suggestion is to specify paediatric TB on the agenda of one of these fora, or to have a sub-working group for paediatric TB. An ad hoc paediatric group is called upon depending on need. Key members include Baylor, CHAI, College of Medicine, Paediatric and Child Health Association, WHO, USAID. Childhood TB is represented in other technical working groups, but needs more prominence in these groups.

The care and treatment officer at the NTP is the childhood TB focal person within the MOH. Programmes and services targeted for childhood TB integration include HIV, IMCI, iCCM, MCH, and Nutrition. Proposed entry points for childhood TB integrated services include the PHC facility, MCH, EPI,

PMTCT, Outreach clinics, village clinics, Nutrition (community management of acute malnutrition or CMAM), HIV clinical care, Youth friendly services, and school health. Coordination is needed between these services to ensure the continuum of care is maintained.

Key technical partners supporting the MoH in integrating childhood TB services include WHO, Challenge TB (KNCV), CHAI, Baylor, Save the Children, College of Medicine, Project Hope, among others.

Involvement of private providers in childhood TB is limited through existing PPPs for general TB services, in which paediatric TB services are also provided. The suggestion was made to redirect the public-private mix (PPM) forum to include childhood TB. The WHO PPM guideline (2010 tool kit) s are being used, but there is no policy document or manual available. Moreover, WHO guidelines are normative and always require adaptation to the country context. The smaller private providers need support in diagnosis and treatment and logistics as most of them are not officially listed as TB registration sites. Adherence to national guidelines is not a challenge at the moment but there is need to improve capacity to diagnose and treat children by most of the private providers.

The role of tertiary level facilities in childhood TB services or integration includes the management of complicated cases and research.

Integrated services may optimise the use of resources for childhood TB including human resources, infrastructure, vehicles, stationery and supervisory or programme management visits.

Demand creation and healthy behaviours

Very limited advocacy, communication and social mobilisation (ACSM) activities are currently conducted for childhood TB. District managers were not aware of any existing information, education, communication (IEC) materials on childhood TB. Integration of ACSM activities into general TB/child health/HIV messages is being planned for. The MOH reproductive, maternal, neonatal, child and adolescent health (RMNCAH) communication strategy aims to include Childhood TB at both community and facility level, but these efforts are still in an early stage. Managers recommended ensuring that all service providers across different tiers of health system are oriented on IEC on childhood TB, which would require integration of IEC with other child health programmes.

Service delivery and clinical integration

The national strategy on childhood TB is mainly implemented at higher levels of care (district hospitals and up), implementation at facility and community levels is still limited due to lack of capacity including for clinical diagnosis or paediatric specimen collection, and limited access to diagnostic services. TB screening for HIV-positive children is implemented in HIV service points, but interventions in other programmes are still limited.

Interventions for childhood TB in ANC and PMTCT services start with the pregnant mother, who is screened for TB. As the TB screening questionnaire is part of the standard tool, this cannot be missed. If a pregnant woman is symptomatic, she is referred to the nearest TB registration site (in the same or a different facility). Smear microscopy is done (Xpert® MTB/RIF is only available in 46 out of a total of 300 facilities). If she is diagnosed with TB, she will be initiated on TB treatment, although TB treatment is often not provided in the same facility or within the same building or room as HIV care and treatment.

After delivery, the mom/baby pair is referred to the TB registration site, where the baby gets IPT if it is asymptomatic (however, the HIV programme manager this was discussed with was not clear about the timing of IPT). IPT is included in the package of care for HIV-positive pregnant women, although no data are available on this yet.

Interventions for childhood TB offered in paediatric HIV services include screening for TB symptoms, and linking to IPT and TB treatment.

Nutrition services have a good link with HIV services: all moderate and severe acute malnutrition cases are routinely tested for HIV, and children who test positive are referred for HIV care and treatment. Nutrition also conducts M&E on HIV care for children in the programme. Screening for malnutrition at community level is done by measuring the mid-upper arm circumference (MUAC) in the village clinics (as part of iCCM). TB symptom and contact screening was not yet taking place in the nutrition programme at the time of the case study, and no guidelines existed on how to refer for TB screening. UNICEF was involved in updating the nutrition guidelines.

The lowest level at which childhood TB diagnostic and preventive services are offered (for clinical diagnosis, and availability of diagnostic tests e.g. bacteriology and radiography) is the community health centre (but only an unspecified proportion of facilities offer these services), but mainly from district hospital level upwards.

At community level all vertical programmes are included in the tasks of the HSAs, although screening and awareness raising of childhood TB is limited to the pilots run by Save the Children (TB/HIV adapted iCCM, see below) and CHAI (contact tracing) in a few districts. TB contact tracing and defaulter tracing are already implemented at community level, although the level of implementation varies. EPI outreach clinics are available and include BCG provision. Other community-based TB activities that are being implemented from 2016 include community based maternal and newborn care, with support from Challenge TB, UNICEF, and the GFATM. Participants felt that the community level can be used to promote integration, and that it would be more efficient to conduct training for all programmatic areas together and in an integrated way. Supervision, workload, and the referral system (including feedback) would be some areas that need to be addressed. A scale-up of TB/HIV adapted iCCM is planned to start in August 2016.

TB/HIV adapted iCCM is piloted in the Blantyre district by Save the Children, comparing the performance of iCCM between HSAs trained on the approach that includes an assessment of TB and HIV risk with HSAs implementing the routine iCCM approach. Findings from the pilot show that the number of children identified with HIV risk is higher than those identified to be at risk of TB (426 at risk of HIV, of which 9 were confirmed with HIV versus 17 at risk of TB). Over the same period, 32 incident adult TB cases were identified in the catchment area. In addition to the 17 children identified through iCCM, 6 children who were TB contacts were identified through facility-led contact screening activities. Data on how many of the children actually had TB are pending.

Follow-up of children referred for further evaluation is a challenge (including whether they presented to facility, whether they were assessed for TB and whether they were diagnosed). The TB register in the TB treatment initiation sites does contain a column to record the origin of the patient, but in practice this may not be completed accurately. During an observation visit to a village clinic run by an HSA in Njowe village it was noted that the definition of “TB contact” was limited to a person with TB in the same household as the child: when the HSA asked about a TB contact, the mother indicated that there was an

aunt with TB. Based on this, the HSA first ticked yes for TB contact, but then changed to no, as he then found out that the aunt was not living in the same house as the child.

Some participants raised the question whether IMCI is sensitive enough to pick up TB. Currently only children who have a cough for more than 3 weeks, or who do not respond to treatment for presumed pneumonia, are referred for further evaluation, which includes TB. Referral of children with presumptive TB often requires multiple referrals, as many of the PHC facilities do not have the capacity or the diagnostic tools available to evaluate these children. Children identified in the community may be referred to the nearest facility, who then refer further to hospital level, or a larger health centre that has the capacity to manage them.

The minimum package of services described in the HSSP includes 13 conditions that are prioritised in the EHP (essential health package), including TB. The focus of the EHP is on community DOTS, health promotion, and treatment of TB.

The ideal continuum of care for TB exposed and/or symptomatic children can be described as follows:

i. Identification at risk in community or through contact screening/symptoms screening at community/primary level
ii. Referral to TB treatment site for evaluation (multiple referrals may be needed)
iii. Screening for contact/symptoms
i. If symptomatic: follow diagnostic algorithm
ii. Diagnose TB
iii. Treat TB
iv. DOT ideally in community
v. Follow-up at TB treatment point.

If not symptomatic:

i. IPT initiation
ii. Follow-up at TB treatment site
iii. Support in community.

Childhood TB prevention

BCG is covered in the national TB guidelines, it is given at birth to all children, including children with asymptomatic HIV infection, but not to children with advanced HIV disease or AIDS.

The BCG vaccination coverage rate was 92% in 2014 (NTP data).

The policy on contact investigation includes asking TB patients for the names and ages of their household and workplace contacts, the names are recorded in the TB Contact Tracing Register, the HCW counsels these contacts to report to the nearest health facility for clinical evaluation and TB screening. If the contacts are ill, the HCW should visit the contacts in their homes.

CHAI, in collaboration with the MoH, is conducting a pilot with the new contact tracing SOP (developed in 2015). Index cases are requested to bring contacts to the healthcare facility, if they do, these are screened and evaluated as indicated. If they don't come, a home visit is conducted to screen contacts and link them to evaluation or preventive therapy. An algorithm for screening of childhood contacts for

TB is included in the TB guidelines. Childhood TB contact investigation is supposed to be performed at all levels, but implementation is still weak.

A contact register is used to record index case and contacts. Contacts who do not present to the healthcare facility are followed up with a home visit.

Preventive therapy is provided to childhood TB contacts by prescribing INH for 6 months for under-fives or HIV-positive children of any age, provided they are asymptomatic. IPT can be initiated at central hospitals, health centres and district level facilities, and follow-up takes place at the facilities where IPT was initiated. Coverage needs to be improved for all sites to have the capacity to screen and rule out TB, and initiate/follow-up IPT to asymptomatic contacts.

In addition to providing IPT to HIV-positive children with TB exposure, the 2016 HIV guidelines recommend to provide life-long IPT for all HIV-positive children in 10 high burden districts. IPT can be started together with ART and CPT for new patients, although the quality of the TB screening process is unknown (resulting in the risk of patients having active TB at enrolment and starting on IPT). The available formulation for preventive therapy is INH 100mg tablets. INH drug supply has been without any challenges.

Childhood TB diagnosis

The current national guidelines include the following TB screening questions for children used in primary healthcare facilities by HCWs:

- Current cough of any duration (productive or non-productive in nature)
- Unexplained weight loss
- Failure to thrive and/or malnutrition
- History of contact with a TB case
- Fever and/or night sweats

In community-based services TB symptom screening is not implemented, in the TB/HIV adapted iCCM approach only screening for TB contact is included.

Diagnostic tests available for childhood TB include smear (at some health centres, district hospitals and higher), Xpert® MTB/RIF (at district hospital level and higher), chest X-ray (at district hospitals and higher levels), culture (at referral hospital level and higher). The health centre is also the lowest level at which paediatric specimens can be collected (induced sputum/gastric lavage), although HCWs mainly rely on expectorated sputum, which is not useful for young children most of whom do not spontaneously expectorate.

Childhood TB treatment

Treatment guidelines for children are in line with the 2014 WHO recommendations. Children are hospitalised if indicated (specific hospital admission criteria are not included in the guidelines). Ideally children are supported through community-based directly observed treatment (DOT) (but

implementation levels are low), most patients are supervised with treatment administration by their care giver.

Formulations are available for TB treatment in children are fixed dose combinations rifampicin/isoniazid/pyrazinamide 60/30/150mg, ethambutol 100mg and rifampicin/isoniazid 60/30mg. The new dispersible child-friendly formulations have recently become available and the country is planning the transition from the old to the new FDCs in 2017 with the first order to be placed in October 2016. No stock-outs have been reported over the past year.

Integration outcomes

Acceptability

Client satisfaction with childhood TB services is assessed by conducting limited client exit surveys, which are done currently throughout the health service. A grievance system exists through ombudspersons at the district level.

Retention in care of children on TB treatment or preventive therapy is addressed through the general treatment adherence system that exists within the NTP, for all TB patients.

TB care for children is free of charge at all public facilities, while CHAM facilities charge user fees for services other than TB services e.g. other medication, bed and other laboratory services.

Activities undertaken to reduce stigmatisation and discrimination in the communities and at schools include community sensitisation and engagement of key opinion leaders at community, district and national levels. These include traditional leaders, faith leaders, political leaders and government leaders. Encouragement of health seeking behaviour for children who are TB contacts or who have TB symptoms is still limited, due to limited awareness at community level. There is potential for expanding TB/HIV adapted iCCM to include health education and awareness activities through trained HSAs.

Responsiveness/Quality

As TB diagnostic and treatment services for children are still highly centralised there is a need identified to further decentralise capacity and services to improve linkages and meet the demand created by various initiatives to improve case detection such as contact screening and TB/HIV adapted iCCM.

Children on TB treatment or preventive therapy are followed up at the point of IPT provision or TB treatment initiation. HSAs can potentially assist with support at community level, although the extent of this support is still limited. They could also facilitate timely referral to the facility level and subsequent follow up once treatment is commenced.

Participants felt that missed opportunities around childhood TB can be minimised by implementing routine symptom and contact screening for TB in children accessing a range of child healthcare services for example contact investigation and provision of preventive therapy to asymptomatic contacts.

Efficiency

Integration of childhood TB services is expected to result in more efficient utilisation of limited resources and improved coordination of health services as well as reduce duplication of services. Integration of childhood TB services was not expected to have an impact on the workload of CHWs and HCWs. As the CHW manages both prevention and treatment of childhood illnesses, integrated planning, follow up and

supervision is needed to ensure that TB/HIV and nutrition are included in the package of community/primary care interventions.

SWOT analysis

A SWOT analysis was conducted, based on the information provided during the stakeholder consultations at national and district level, as well as the discussions during the national workshop.

Key strengths/successes

- TB NSP on childhood TB:
    - Improving detection and diagnosis of childhood TB
    - Improving capacity of health worker in management of childhood TB
    - Improving coverage of IPT for prevention
- Childhood TB guidelines (part of national TB guideline)
- Childhood TB focal person at national level
- TB technical working group available but not specific to childhood TB
- Active case finding: integration with HIV and MCH platforms
- TB/HIV integrated services for adults and children
- TB/HIV adapted iCCM scale-up planned
- Contact tracing SOP piloted

Key weaknesses/gaps/challenges

- iCCM: Relatively low numbers of children identified to be at risk of TB, little information on impact on case finding (compared to risk of HIV).
- Service delivery: Lack of knowledge/confidence of HCWs, low index of suspicion
- Funding: Limited flexibility, donor dependency
- Contact tracing and IPT not systematically implemented leading to a low IPT uptake
- Lack of specific childhood TB training and materials for integration into other TB programme areas (in development)
- Further need to decentralise services and increase potential access and effective coverage
- Inefficient, uncoordinated nature of the transportation networks, affecting Childhood TB case detection and notification (this is not true for children)
- Low interest on Child TB related Operational Research in MOH and partners' research agenda.

Key opportunities

- Existence of an NSP that has taken childhood TB on board
- IMCI as a strategy for service integration of childhood health services – could be applied to integrated childhood services at community level.
- Potential for service integration/collaboration with Child Health Cluster, IMCI, ARI, EPI, Nutrition, Reproductive Health
- Global Fund funding
    - HSA refresher training (to include TB/HIV)

    - Action Aid to scale up TB/HIV adapted iCCM (start with pilot in 2 districts, document results then scale up)
- Experiences with TB/HIV adapted iCCM (Malawi MoH participated in WHO training of trainers in Uganda, April 2016)
- Availability of technical and financial support
- A strong pool of partners interested in childhood TB
- Existence of PPM forum for TB in general, could be revived to also include childhood TB

Key threats and risks

- Limited resources for decentralisation of services

Extent of integration of childhood TB interventions

The extent of the integration of childhood TB interventions was explored for the different dimensions of integration, considering systemic, management and organisational, and clinical integration. The extent of integration of interventions was defined on a scoring scale from "no" to "partial" (weak or provided with support from partners) or "full" integration. No integration is defined when there is no interaction, or segregation, or this is only done by partners; partial integration, when there is a linkage or coordination (this can be either weak without partner support, or supported by partners); and full integration when functions, activities, systems or structures are in mainstream routine. For this purpose, routine functions, activities, systems or structures were listed and the extent of integration of childhood TB was explored, discussed and scored in small groups of between 8 and 12 participants.

Systemic integration

The extent of integration of childhood TB into key health system functions mapping shows that most health system functions have partially (weak or provided with support from partners) integrated childhood TB, and only two functions, performance monitoring and pre-service education, were fully integrated (Table 8). The discussions during the national workshop revealed that TB services are fully integrated with HIV, but that policies are developed per programme, without an integrated policy for PHC.

The perceived collaboration among health partners, professions, structures and services on systemic integration of childhood TB (Table 9) derived from triangulation of information was graded by the same extent of integration score[d].

Table 8: Extent of integration of childhood TB into key health systems functions

Key health system functions	Description	Score:
Governance and leadership:		

[d] Adapted from: Deconinck *et al*. BMC Public Health (2016) 16:249 http://www.biomedcentral.com/1471-2458/16/249

Policy setting	National health, HIV and nutrition policies with Childhood TB as part of child healthcare (i.e. integrated management of childhood illness (IMCI) and child primary and hospital care with Childhood TB covered)	Partial *
National guidelines	National guidelines for IMCI and child primary/hospital care supporting comprehensive child healthcare, with Childhood TB/risk factors for TB/HIV as part of IMCI and child hospital care	Partial *
Technical leadership	A technical advisory group for Childhood TB exists	Partial *
Regulation and coordination	Regulation and coordination of health actors aligning with the national health and TB policies and implementation strategy	Partial *
Evidence-based decision making	Generation and interpretation of intelligence and research on policy and strategy options	Partial *
Social participation	Social participation of local and community actors in planning, building coalitions, and implementing and monitoring of comprehensive child healthcare with a people-centred approach	Partial *
Contingency planning	Plans and regulations for addressing contingencies	Not addressed
Health financing:		
Regular budget-pooled funding	Regular budget from pooled funds with a sector-wide approach covering financing for Childhood TB	Partial **
Annual costed action plans	Annual costed action plans of MOH covering Childhood TB interventions	Partial *
Health workers' payroll	Staff in national health facilities involved in Childhood TB on MOH payroll	Not addressed
Financial risk protection	Fee waiver system for children under 5 (or health insurance) covering comprehensive child healthcare	Not addressed
Health information:		
Health information system (HIS)	National HIS, including Childhood TB indicators	Partial *
Performance monitoring system	Performance monitoring of comprehensive child healthcare	Full
Contact coverage monitoring	Childhood TB coverage monitoring as part of comprehensive child healthcare coverage monitoring	Partial *
Health workforce:		
Adequate coverage of health workers	Adequate number of qualified health workers with geographic coverage for comprehensive child healthcare	Partial *
Competences of health managers and HCWs	Adequate technical and organisational management skills for comprehensive child healthcare	Partial *
Performance appraisal/motivation system	Performance appraisal and career development opportunities as part of the human resources management system	Not addressed
Pre-service education	Modules of pre-service education curriculum on comprehensive child health including Childhood TB	Full
Continuing professional development	Continuing professional development on comprehensive child health including Childhood TB	Partial *
Supplies:		
Essential medicines and medical supplies list	National essential drugs and medical supplies list including child-friendly formulations for Childhood TB	Partial **
Procurement system	National drugs and medical supplies needs (forecasting and) procurement, including for Childhood TB	Partial **
Logistic management system	National logistic management system for drugs and medical supplies, including for Childhood TB	Partial **
Service delivery:		
Demand generation	Demand generation by activating and informing communities for improved child health	Partial **
Early case finding	Early active (by volunteers in the community), systematic (by health workers at the health facility) and enhanced (by carer) case finding for selected child illnesses	Partial **
Community-based primary care	Promotive and preventive community health and integrated community case management (iCCM)	Partial **

Outpatient care (Facility-based primary care)	Outpatient management of Childhood TB without complications OR Comprehensive IMCI (including assessment and management of Childhood TB)	Partial **
Inpatient care (Child hospital care)	Inpatient management of severe Childhood TB/Childhood TB with complications until stabilisation as part of child hospital care OR Comprehensive child hospital care	Partial **
Health outreach	Health outreach activities for selected child illnesses including Childhood TB	Partial **
Referral and tracing between services	Referral and tracing system for the detection and retention in treatment of selected child illnesses, including Childhood TB	Partial **
Patient-centred continuity of care	Comprehensive child healthcare tracked over time and place responding to individual preferences, needs and values	Partial **
Continuous quality improvement	Continuous quality improvement of comprehensive child healthcare	Partial **

**** Partial, weak;*** ***** Partial, supported by partners***

Table 9: Perceived collaboration among health partners, professions, structures and services on systemic integration of childhood TB at national level

Collaboration among health partners, professions, structures and services	Score:
Partner coordination: Health system functions of child healthcare are coordinated among different health partners	Partial *
Professional coordination: Health system functions of child healthcare are coordinated among different professions	Partial *
Functional integration: Health system functions on health information, human resources and supplies cover child healthcare comprehensively	Partial **
Normative integration: Child healthcare and Childhood TB share common values and principles	Full
Horizontal integration: Health system functions of child healthcare are coordinated across the same levels of care	Partial *
Vertical integration: Health system functions of child healthcare are coordinated across the different levels of care	Full

**** Partial, weak;*** ***** Partial, supported by partners***

Managerial/organisational integration

During the workshop the managerial/organisational group only looked at the broad managerial and organisational categories without going into detailed activities under each of these categories. The extent of managerial and organisational integration of childhood TB showed that health financing is not integrated, while health information and the health workforce are fully integrated (although this may have been scored differently if the group had looked at the various activities under these broad categories) (Table 10).

Table 10: Extent of integration of childhood TB into routine managerial and organisational activities

Routine managerial and organisational activities	Score:
Managerial leadership:	Partial **
Translating policies and strategic plans into action plans	
Promoting and Regulating (controlling) adherence to guidelines	

Coordinating technical and financial partners	
Promoting stakeholder involvement in planning and monitoring	
Health financing:	No
Allocating and managing the health budget	
Mobilising additional resources	
Paying local staff and contractors	
Health information:	Full
Managing the HMIS (monitoring, reporting and recording)	
Sharing information for use and providing feedback to stakeholders including local government and communities	
Managing/overseeing population surveys	
Health workforce:	Full
Managing adequate skilled professionals and promoting equitable distribution of health workers	
Training health workers in clinical care and health facility management	
Conducting supportive supervision	
Providing training materials and/or job aids	
Providing job descriptions and appraisal system	
Creating career development opportunities to reduce attrition and improve motivation	
Supplies:	Partial *
Supply chain management	
Managing buffer stocks for contingencies	
Service delivery:	Partial **
Providing operational support to facility-based services	
Organising health outreach	
Organising community-based primary care activities	
Organising referral systems	

**** Partial, weak;*** ***** Partial, supported by partners;***

Clinical integration

The extent of clinical integration of childhood TB interventions into routine activities is presented in table 11. Relevant clinical activities were selected from a list provided during the workshop. Only linkage to the TB clinic and treatment support for children on TB treatment were considered to be fully integrated.

Table 11: Extent of integration of childhood TB into routine clinical activities

Routine health activities	Score:
Promotion:	
ACSM	Partial *
Community engagement, social mobilisation and involvement	Partial *
Health education	No
Contact screening & Prevention:	
Contact tracing	Partial **
Screening for contact	Partial **
Screening for symptoms	Partial **
Linkage to TB clinic	Full
Treatment support for IPT	Partial *
Assess HIV risk	Partial **

Household TBIC	Partial **
Diagnosis	
ICCM (TB/HIV adapted)	Partial **
Screening for TB symptoms/risk	Partial **
Screening for symptoms	Partial **
Linkage to TB clinic	Partial **
Assess HIV risk	Partial **
Treatment & Monitoring	
Treatment support on TB treatment	Full
Support on IPT	Partial **
Monitoring of children on TB treatment	Full
Monitoring of children on IPT	No
Screen for side effects	No

Partial, weak; ***** Partial, supported by partners;***

Table 12 provides an overview of perspectives on clinical integration of the various health actors. Since this exercise only involved stakeholders at the national level, results may not be representative for the district service delivery level. Only the supplies system perspective was considered to be fully integrated, although this was not in line with the scores by the other groups. Most of the other perspectives were not considered to be integrated at all.

Table 12: Clinical integration perceptions from different perspectives

Clinical integration perspective	Score:
The child's perspective: The child is screened, examined and treated comprehensively in the same way regardless its reason for visiting the health facility	No
The caregiver's perspective: The caregiver of the child feels that the child is examined and treated comprehensively like all other children regardless the reason for visiting the health facility	No
The volunteer's perspective: The community health worker is considering all needs of the child	No
The clinical provider perspective: The clinical provider is considering all needs of the child	No
The support staff perspective: (lab technician, pharmacist): Support staff are considering all the needs of the child	No
The teamwork perspective: Child health tasks are coordinated among co-workers in the work place; Same level staff are rotating and equally treating children; The vision and value of integrating Childhood TB into routine child healthcare is shared among colleagues, and all are collaborating	No
The supervisor of the platform perspective: The supervisor is organising and coordinating child healthcare and distributing duties among staff, and doing participatory problem solving	No
The registration and recording perspective: The same registration, medical records and supervision tools used for all child healthcare services	No
The information system perspective: The same information tools are used for all child healthcare services	No
The medical supplies perspective: Childhood TB tasks are coordinated among co-workers in the work place	Full
The referral system perspective: There a functional integrated referral system and exchange of information and problem solving with care system up the pyramid and the community; There a functional integrated referral system and exchange of information and problem solving with care system down the pyramid and the community	Partial **
The link to community perspective: There a functional integrated referral system and exchange of information and problem solving with the community	Partial **

Partial, weak; ***** Partial, supported by partners;***

When asked about the perceived compatibility of childhood TB services, participants in the clinical group felt it could cause frustration and/or discouragement, because the support systems (mainly resources/referral mechanism) are not in place to provide the service (to diagnose TB). Others felt that integrated service delivery facilitates efficient management by HSAs. Although it was not felt to pose an extra burden, it does cause fears of not being able to deliver. Some participants mentioned that to avoid additional workload, planning and briefing on integration should be adequate. Despite a lack of resources, it was stated that generally HCWs and managers are capable to deliver integrated childhood TB services.

Factors influencing integration

Factors influencing the integration of childhood TB that were identified through the group work discussions at the national level are summarised in figure 1.

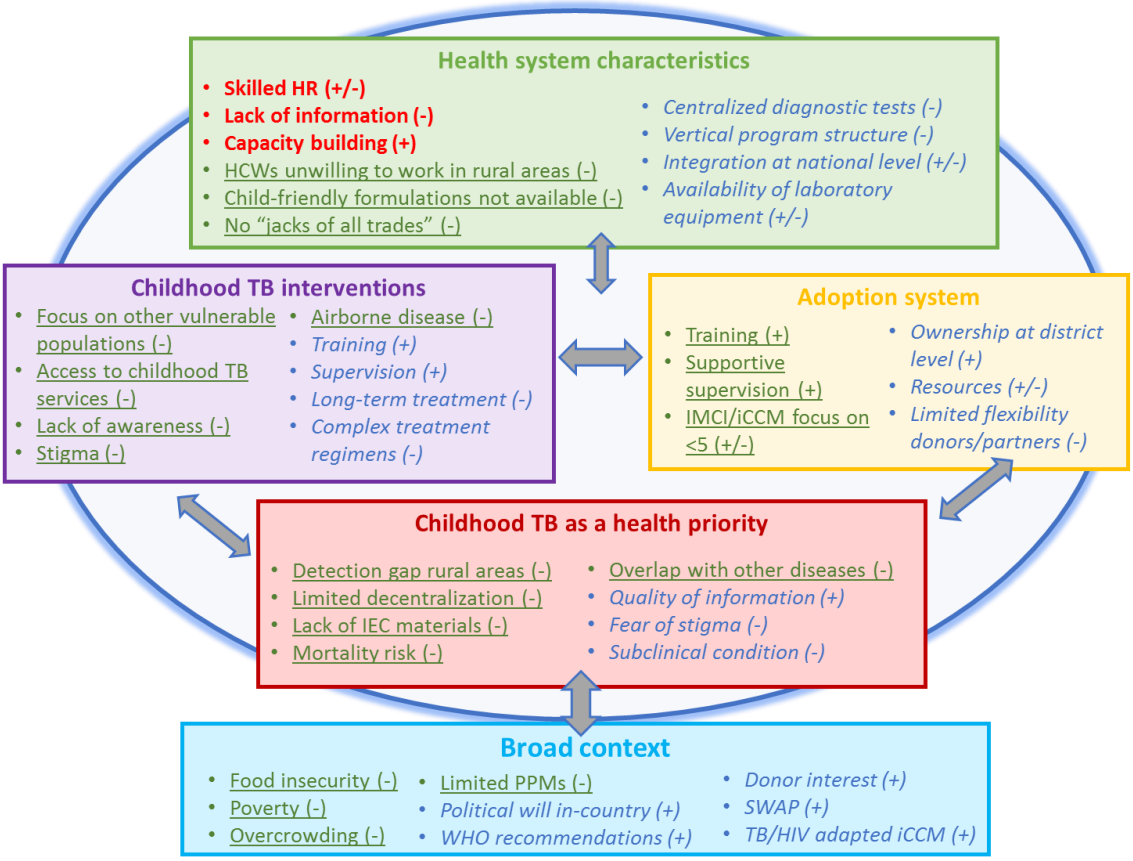

Figure 2: Factors influencing the integration of childhood TB

Red bold *are factors that influence systemic integration,* ***blue italic*** *managerial and organisational integration, and* **green underlined** *clinical integration; (+): positive influence; (-): negative influence*

Lessons learnt and needs for change

Reflections on the process of conducting the case study by key participants:

- "Childhood TB integration offers an opportunity for focused/targeted service delivery by level of care"
- "Integration offers an investment case where optimal use and leveraging of resources can easily be achieved"
- "Managed partnerships with MoH leadership is key for a successful childhood TB integration"
- "Use of existing structures is key for strengthened implementation of childhood TB"

Proposed needs for change to move childhood TB integration forward, as mentioned by participants during the consultations at national and district level, as well as during the participatory workshop are summarised by health system function and integration dimension in table 13.

Table 13: Proposed needs for change, organised by function of the health system/integration dimension

Policy and governance (normative integration) - Clarify roles at each level
Health financing - Resource mobilisation - Strengthen coordination mechanism for resources for integration - resources coming in Malawi are mainly for vertical projects - Develop a concept note for integration of childhood TB for resource mobilisation through GFATM, coordinated by the child health sub-working group under EHP (essential health package) TWG. Need to include TB, HIV, Nutrition and MCH representatives in this Child Health Sub-group (programmes are managed under IMCI).
Health workforce - Build capacity of HCWs at all levels - Develop tools for integrated supervision
Health information (Recording and Reporting) - Develop Integrated reporting tools - Develop M&E framework (including outcomes/final diagnosis/management of children at risk referred up to the HCF by HSAs) - Strengthen integration of childhood TB monitoring and reporting within the NTP
Supplies - Ensure uninterrupted supplies/drugs
Planning and Management of service delivery (professional/organisational integration) - Map entry points, stakeholders (organisations, civil society, NGOs active in TB/HIV) to answer the question: "where do people go to seek care?" - Use of local structures (e.g. councillors, MPs, chiefs) - Decentralise from tertiary level - Strengthen TB screening and referral of both mother and child at community level, health centre level – iCCM, EPI clinics, Community Based Maternal and New Born Care, IMCI, Antenatal Clinics, Postnatal clinics, U5/Child wellness Clinic, Community Management of Acute Malnutrition.
Demand creation and healthy behaviours - Raise awareness - IEC materials: develop materials on child TB (to create demand for services)
Clinical/services integration (including prevention, diagnosis, treatment) - Strengthen referral system (documentation and feedback) - Decentralise BMUs and adapt WHO recent guidelines - Provide TB screening at all entry points with referral

- Change of mind-set/thinking – think of TB in children
- Strengthen the One stop shop approach – training, capacity building, integrated manuals, supervision
- Strengthen monitoring of childhood TB and reporting within the NTP
- Strengthen Emergency Triage Assessment and Treatment (ETAT) and Paediatric hospital improvement (PHI) at secondary and tertiary level.
- Strengthen/put in place Youth-friendly initiatives for older children

Limitations

The main limitation for conducting the case study was the limited time available to collect the information. Only five days were spent in-country, with three days dedicated to bilateral meetings at district and national level, one and a half days for the workshop, with the last day planning and debriefing. Not all targeted stakeholders were available to participate in the consultations and the workshop. Since only one district and only one healthcare facility was visited, the findings may not be generalizable and transferable to all districts.

Conclusions

The Malawi case study explored perceptions of health actors about integration of childhood TB into national health systems. It helped gain an understanding of the possible pathways of integration and the requirements for the main health systems functions to make integration possible. The case study highlighted successes and challenges around childhood TB related to critical health systems functions at service delivery level, and the referral system between community and primary levels of care as well as higher levels. Examples of integration efforts at community and primary levels were described.

Integration of childhood TB is currently limited to some activities at service delivery level and pilot projects. These include:

- TB/HIV services integration (with some integrated reporting);
- TB/HIV adapted iCCM in one district, with plans to scale-up, and
- a pilot of a new contact tracing SOP in four districts.

Efforts to provide integrated service delivery are limited by the fact that childhood TB diagnostic, treatment and preventive services have not yet sufficiently decentralised, requiring referral into a referral system that is not functioning optimally. Other health systems functions such as health financing and health information have not (sufficiently) integrated yet, causing constraints for integrated service delivery at the community and primary levels.

Experiences with these programmes and insights from this case study can be utilised to expand integration approaches across MNCH, HIV and nutrition programmes, to improve child survival by improving childhood TB case detection and prevention.

This case study suggests the way forward lies with strengthening the referral system, building capacity of HCWs at all levels, contact tracing, and integration with IMCI and MNCH, including HIV and nutrition.

An important aspect that was identified in the case study is the need to ensure the readiness of services (in terms of HR capacity, supplies, quality etc.) to respond to the increased demand created by the proposed interventions around childhood TB diagnosis, treatment, contact investigation and prevention.

The case study led to the development of a targeted action plan for key health actors (Table 13, below).

Recommendations/action points

Table 14 summarises the action points and recommendations that were agreed upon to move forward with childhood TB integration based on the findings of the case study.

Table 14: Action points

Action points	Responsible	Support required	Timeframe	Remarks
Governance & leadership				
Development of country-specific framework/roadmap for integrated childhood TB	NTP/IMCI	TA Financial	December 2016	
Establish a platform for partners to share tools/updates/ coordination/integration efforts	NTP/IMCI	TA	October 2016	
Health financing				
Develop a coordination mechanism to coordinate resources for integration	NTP/IMCI	TA	October 2016	
GFATM funding for HSA refresher training (to include TB/HIV) and scale up TB/HIV adapted iCCM	NTP/IMCI	Financial	October 2016	
Develop new funding proposals for integration of childhood TB programme with other child health programmes (TB, HIV, Nutrition and MCH)	NTP/IMCI	Financial TA	October 2016	
Discuss user fees for children accessing TB services at CHAM	NTP/IMCI	TA	October 2016	
Health information (Recording & Reporting)				
Develop integrated recording and reporting systems and tools that allow monitoring of childhood TB related activities across programmes	NTP/IMCI	TA Financial	October 2016	
Develop an M&E framework (including outcomes/final diagnosis/management of children at risk referred up to the HCF by HSAs	NTP/IMCI	TA Financial	December 2016	
Strengthen integration of childhood TB monitoring and reporting within the NTP	NTP/IMCI	HRD Financial	October 2016	
TB/HIV adapted iCCM scale-up to review the M&E framework to incorporate routine data on follow-up and referral to the next level	World Vision		October 2016	
Operational/implementation Research				
Explore research opportunities including: • Assessment of coverage/access to services • Evaluation of quality of care provided by HSAs, including TB component	NTP/IMCI	TA	Ongoing	

• Assess reasons for relatively low numbers of children at risk of TB in iCCM pilot • Expand private sector involvement on childhood TB (revive PPM forum, and redirect to include child TB) • Follow-up of children referred for TB evaluation through IMCI				
Health workforce				
Develop integrated training manuals on child health, including TB	NTP/IMCI	TA Financial	December 2016	
Develop integrated supervision tools and job aids that include childhood TB	NTP/IMCI	TA Financial	December 2016	
Conduct training for all programmatic areas together and in an integrated way at community and primary levels	NTP/IMCI	TA Financial	From January 2017	
Capacity building of CHWs on case detection and follow up at community and household level	NTP/IMCI	TA Financial	Ongoing	
Supplies/logistics				
Implementation plan for new child-friendly TB formulations	NTP/IMCI	TA	September 2016	
Include childhood TB specimens in sample transportation system	NTP/IMCI	TA	September 2016	
Planning and management				
Further decentralisation of childhood specimen collection, diagnostic, treatment and prevention services to PHC level	NTP/IMCI	TA Financial	Ongoing	
Specify paediatric TB on the agenda of existing TB, TB/HIV or primary health care/child health TWG, or to have a sub-working group for paediatric TB	NTP/IMCI	TA Financial	October 2016	
Establish functional one-stop-shop services for pregnant women and children - training, capacity building, integrated manuals, supervision	NTP/IMCI	TA	October 2016	
Update nutrition guidelines to include TB symptom and contact screening and referral for TB evaluation	NTP/IMCI	TA Financial	October 2016	UNICEF and other partners to assist
Demand creation and healthy behaviours				
IEC materials: develop integrated materials on child health to include TB (to create demand for services)	NTP/IMCI/HEU	TA, materials Financial	December 2016	
Explore potential for expanding TB/HIV adapted iCCM to include health education and awareness activities by through trained HSAs	NTP/IMCI/HEU	TA Financial	October 2016	
Service delivery				
Make use of the community level to promote integration – address issues such as supervision, workload, and the referral system (including feedback)	NTP/IMCI/HEU	Financial Material	October 2016	

Expand HSAs scope of work to include TB treatment and preventive therapy support at community level	NTP/IMCI	TA, HR	December 2016	
Strengthen TB screening and referral of both Mother and child at community level, health centre level – iCCM, EPI clinics, Community Based Maternal and New Born Care, IMCI, Antenatal Clinics, Postnatal clinics, U5/Child wellness Clinic, nutrition, Community Management of Acute Malnutrition	NTP/IMCI	TA Financial	December 2016	
Strengthen implementation of TB screening and treatment initiation of both Mother and Child at the tertiary and secondary levels – Emergency Triage Assessment and Treatment (ETAT)/ Paediatric Hospital Improvement (PHI)	NTP/IMCI	TA Financial	December 2016	
Strengthen referral system (documentation and feedback)	NTP/IMCI	TA Financial	December 2016	
Decentralise BMUs and adapt recent WHO guidelines	NTP	TA, HR	December 2016	
Establish youth-friendly initiatives for older children	NTP/IMCI/RHD	TA Financial	December 2016	

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Annexes

A. Conceptual framework (Valentijn/Atun)

To investigate what key rules make childhood TB integration work, the case studies considered the following dimensions of integration at the micro, meso and macro level of health care (see figure 4) (9):

1. **Clinical integration** (i.e. integrated care of various providers): E.g. how have childhood TB care activities assimilated with the various existing maternal and child care activities?
2. **Professional integration** (i.e. partnerships between professionals both within and between organisations having a collective responsibility to provide a comprehensive and coordinated continuum of care): E.g. how do health managers and health workers share competences, roles and responsibilities and accountability to deliver comprehensive child care including childhood TB services?
3. **Organisational integration** (i.e. consortia brought together): E.g. how are childhood TB services coordinated across organisations/departments/units?
4. **Systemic integration at the national and district level** (i.e. coherence of rules and policies, both vertical [linking different levels of care] and horizontal [linking similar levels of care]): E.g. how have key health system functions, policies, financing, action planning, aligned programmatic management of childhood TB services?
5. **Functional integration** (i.e. integration of non-clinical support): E.g. how have childhood TB recording and reporting, monitoring and evaluation assimilated with existing information systems; how have childhood TB supplies assimilated with existing supplies systems?
6. **Normative integration** (i.e. integration of values and commitment, and political will): E.g. has management of childhood TB safeguarded the same mission, vision, values and culture as child health care?

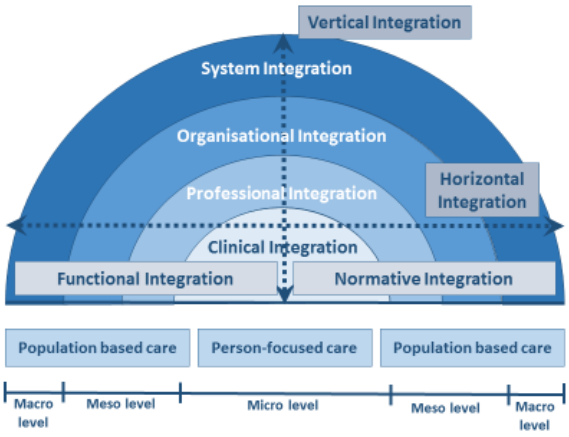

Figure 4: Dimensions of integrated care at the micro, meso and macro level of health care (Adapted from Valentijn* et al. *2013)

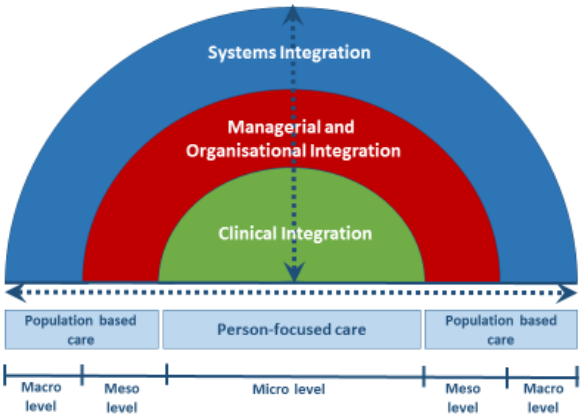

Figure 5: Simplified dimensions of integrated care at the micro, meso and macro level of health care (Adapted from Valentijn* et al. *2013)

To facilitate understanding by all participants in the case studies, this framework was simplified by reducing the number of dimensions to three as follows (see figure 5):

1. Clinical integration
2. Management integration (includes organisational and professional integration)
3. Systems integration (includes systematic, functional and normative integration)

To investigate the factors that facilitate or hinder the integration process, a set of questions was used that address the following components (figure 2):

1. **The problem** (Is childhood TB being perceived as a problem?): For example, knowledge on burden, causes and consequences of childhood TB, transmission, screening, evaluation and diagnosis, treatment, severity, urgency, and prevention;
2. **The intervention** (Is childhood TB care and prevention compatible with existing services?): For example, relative advantage, compatibility with existing health interventions, observability, complexity;
3. **The health actors as adopters** (Have there been childhood TB advocates, change agents, or obstructers? How do health workers cope with the additional challenges and workload?): For example, extent of promotion efforts by knowledge advocates and change agents; conformity of the intervention with norms, beliefs and values; capabilities, motivation and opportunities in participation promoting behaviour change; authority decision;
4. **The health system** (How have policies and regulations, financing, planning, monitoring and evaluation been adapted?): E.g. regulatory, organisational, financial, relational, functional and clinical changes at various levels to adopt and assimilate childhood TB services;
5. **The broad context** in which the adoption and assimilation process of the intervention occurs (How enabling is the political socio-economic environment to integration of childhood TB services?): E.g. political, legal, socio-economic environmental, demographic stability, donor mandated financing, interactions with national initiatives, contingency planning and resilience to shocks, advocacy mechanisms.

B. List of participants

Organisation	Name	Function
National Stakeholder consultations		
MOH NTP	Dr. James Mpunga	NTP director
MOH IMCI	Humphreys Nsona	IMCI programme manager
CHAI	Ilhame Ouansafi	Programme manager
UNICEF Health	Indrani Chakma	Health specialist
UNICEF HIV	Jacqueline R. Chinkonde-Nkhoma	HIV & AIDS Specialist
UNICEF Nutrition	Kudakwashe Chimanya	Nutrition Specialist
UNICEF Nutrition	Benson Kazembe	Nutrition Specialist
UNICEF C4D	Innocent Kommwa	Communication for Development Specialist
UNICEF Health	Texas Zamasiya	Health specialist
District village clinic and facility visit		
Save the Children	Steve Macheso	Project Manager
	Misozi Kambanje	M&E Coordinator
	Davie Chimwanza	Project Coordinator
St Vincent Health Centre	Elleni Maliya	Medical Assistant
	Mr Potani	Senior HSA Supervisor
Njowe Village Clinic	Yamikani Mkungudza	Health Surveillance Assistant
District Stakeholder consultations		
Blantyre District Office	Masankho Tsamba	Assistant District TB Officer
	Dr Tinkhani Mbichila	District Nursing Officer
	Samuel Tamaka	Senior Ass. HR Management Officer
	Penjani Chumda	Principal Environmental Health Officer

	Melayi Mhine	Health Services Administrator
	Jameson Chausa	Chief Preventive Health Officer
Save the Children	Steve Macheso	Project Manager
	Misozi Kambanje	M&E Coordinator
	Davie Chimwanza	Project Coordinator
National Workshop on childhood TB integration		
MOH NTP	James Mpunga	NTP Director
	Isais Dambe	Deputy Programme Manager
	Kuzani Mbendera	Care and treatment officer
	Belaneli Buma	M&E
	Andrew Dimba	Researcher
	Birru Shigut	TA
MOH IMCI	Humphreys Nsona	Programme manager
	Ernest Kaludzu	M&E officer
	Modrick Chiyenda	National IMCI trainer
MOH PHC	Precious Phiri	PHC officer
Dedza	Angella Chabuka	IMCI trainer
Ntcheu	Modrick Chiyenda	IMCI trainer
Chiradzulu	Prescott Kamtsitsi	IMCI trainer
Blantyre	Rodgers Kuyokuva	IMCI coordinator
	Beatrice Mtotha Nindi	Community TB focal person
KNCV – Challenge TB	Seraphine Kaminsa	Challenge TB
Project Hope	Rodrick Nalikungwi	Project Hope
CHAI	Ilhame Ouansafi	Programme manager
PSI	Felix Chinguwo	Programme manager
Action Aid	Kondweni Mshali	TB coordinator
World Vision	Alexander Chikonga	GF manager
Save the Children	Steve Macheso	Project manager
UNICEF	Texas Zamasiya	Health specialist
	Indrani Chakma	Health specialist
	Kyaw Aung	Chief, Health
	Innocent Komwa	C4D specialist
	Sabine Verkuijl	Consultant

C. Assessment tool

Assessment framework	
Policy and governance (normative integration)	
Policymakers, managers, and donors support integration	Is integration an objective and why?
	Which actors, institutions and networks are involved and what is their respective role?
Financing and resource allocation to foster integration	Is there an earmarked budget available for all components of childhood TB? What is the source of the budget (e.g. which programme, project, external funding etc.)?
	Is the budget for childhood TB fully funded?
	If no, which aspects do not have (sufficient) funding?
Decentralised functions	Which functions have been decentralised and to which level?
olicy and guidelines for integrated service delivery	What is understood by integration?
	Is there an integration strategy?
	If a strategy exists, what are the components?
	Is childhood TB included in the overall child health strategy?
	Is childhood TB included in the community health worker strategy and other policies?

	Is childhood TB included in the national strategic plan to prevent and control TB?
	Which sections on childhood TB are included in the national strategic plan?
	What kind of policies are affected by the aim to integrate (childhood) TB?
	Do National TB guidelines include specific guidance and standard operating procures on childhood TB, updated as per the most recent WHO recommendations (including details on diagnosis, contact management, prevention, BCG, neonates exposed to TB)?
	How is Childhood TB addressed in other relevant guidelines (e.g. HIV, nutrition, IMCI, iCCM etc.)?
Health System Functions (systemic and functional integration)	
HMIS—Integrate surveillance, M&E, and information systems	What different components of the health system are involved in/affected by the integration process and how (for example policies and guidelines, M&E, financing, HR, monitoring and supervision etc.)
HRH—Adapt HR functions, management systems, and tools	
Cross-training and task shifting	
Procurement and supply chain	
Medical tech—Laboratory and logistics systems are linked	
Planning and Management (professional/organisational integration)	
Joint planning for multiple programmes	Has mapping of childhood TB actors/partners been conducted?
	Who are the drivers of TB integration?
	Is there a childhood TB working group?
	If yes, which stakeholders are part of the working group?
	Does the working group have planned meetings and action plans?
	Is there a childhood TB focal person?
	What programmes and services are targeted for childhood TB integration?
	Has a needs assessment and situation analysis for the package of childhood TB services been conducted?
	What technical assistance is available to support integrated childhood TB services?
	What is the role of other programmes (e.g. HIV, MNCH, nutrition) in childhood TB?
	Is Childhood TB represented in other relevant technical working groups (e.g. MNCH, HIV, other)?
	What is the role of private providers in childhood TB services/integration (including reporting, adhering to national TB guidelines)?
	What is the role of tertiary level facilities in childhood TB services/integration?
Consolidate administration management and staff across programmes for smart integration	Which aspects of childhood TB are included in the checklists for monitoring and supportive supervision at all health system levels?
	Which healthcare workers at which levels are trained on childhood TB (and when does this training happen - pre-service or in-service)?
	Which aspects of childhood TB are covered in the trainings for professional staff and which for community-based staff?
	What supervisory systems are in place for HCWs and CHWs providing childhood TB services?
Pool/share resources across disease-specific programmes	Which resources for childhood TB are shared with other programmes (or vice versa)?
Demand creation and healthy behaviors	
Integrate behaviour change communication campaigns	What ACSM activities are conducted for childhood TB?
	What ACSM materials are available that include childhood TB?

Health behaviours are promoted in combination, e.g., nutrition and TB, TB and HIV/PMTCT	How are ACSM activities integrated into general TB/child health/HIV messages?
Barriers to health seeking are addressed in coordinated and integrated fashion	How are barriers to health seeking identified and addressed?
Services/clinical integration	
Manuals, guides, job aids, tools	To what extent is the national strategy on childhood TB implemented?
	Which tools, guidelines, job aids etc. are available at facility level?
Organisation of services to meet different needs	What interventions for childhood TB are offered in routine child health services?
	What interventions for childhood TB are offered in ANC/PMTCT services?
	What interventions for childhood TB are offered in paediatric HIV services?
	What interventions for childhood TB are offered in nutrition services?
	At what (minimum) level are childhood TB diagnostic services offered (for clinical diagnosis, and availability of diagnostic tests e.g. bacteriology and radiography)?
	At what (minimum) level are TB preventive services offered?
Linkages across facility and community care	What interventions for childhood TB are provided by community health workers at community-level?
	Is childhood TB included in IMCI? If so, how?
	Is childhood TB included in iCCM? If so, how?
	How is a sick child with TB symptoms managed at the community level?
	How are children with danger signs (e.g. cough for more than 2 weeks) managed? Is TB part of the assessment?
	How are children who are exposed to an adult with infectious TB managed at the community level?
Effective referrals	How does the referral system function between community care and PHC for children with TB symptoms or TB contacts?
	How does the referral system function between PHC level and higher levels of care for children with TB symptoms, active TB, TB contacts etc.?
	How are TB staff linked to other services (e.g. HIV, PMTCT, MNCH, nutrition)?
Minimum package of essential services	Is childhood TB included in the minimum package of services? If so, how?
Support a continuum of care (no missed opportunities)	Describe the continuum of care for TB exposed and/or symptomatic children
Coverage and access	
One-stop shop availability	What is the extent of childhood TB integration?
Increasing coverage to childhood TB prevention, diagnosis and management	What is the trend in childhood TB integration?
Expanded access of services per client contact (e.g. TB screening in PMTCT/ANC, TB contact management)	Provide examples of multiple services offered to different clients that include childhood TB (at different levels)
Acceptability	
Client satisfaction	How is client satisfaction with childhood TB services assessed?
Family-centered care	Explain how family-centered care is implemented at PHC and community level
Enabling environment	What activities are undertaken to reduce stigmatisation and discrimination in the communities and at schools?
	Is TB care for children free of charge at all levels?
Retention in care	How is retention in care of children on TB treatment or preventive therapy ensured?

Health seeking behavior	Explain how health seeking behavior for children who are TB contacts or who have TB symptoms is encouraged at PHC and community level
Community engagement	How is the community engaged in childhood TB services?
Responsiveness/Quality	
Services ready for the needs of sick and TB exposed children	Are all relevant services ready to provide care to TB symptomatic and/or exposed children?
Follow-up of children on TB or preventive treatment	How are children on TB treatment or preventive therapy followed up?
Reduced missed opportunities	How can missed opportunities around childhood TB be minimised?
Efficiency	
Cost savings/resource use	What impact does integrating childhood TB have on resource use?
Reduced duplication of efforts	What impact does integrating childhood TB have on duplication of services in the various programmes?
Functioning of the health system	What impact does integrating childhood TB services have on the overall functioning of the health system?
	What impact does integrating childhood TB services have on the workload of HCWs/CHWs?
Uptake (use)	
Uptake of integrated services	In the experience with integrating childhood TB services to date, how has the uptake of these services been?
Use of services along the continuum of care	What impact does integrating childhood TB services have on ensuring the continuum of care for pregnant mothers and children?
Quality of patient care, e.g., TB diagnosis, TB contact management	What impact does integrating childhood TB services have on the quality of child care at PHC and community level?
SWOT analysis	
Influncing factors	What factors are influencing integration and how?
Strengths	What are the key strengths/successes?
Weaknesses	What are the key weaknesses/gaps/challenges?
Opportunities	What are the key opportunities?
Threats	What are the key threats and risks?
Overcoming challenges	How are challenges on integration addressed or how have they been overcome?
Childhood TB prevention	
BCG/Primary prevention	Is there a section on BCG in the national TB guidelines?
	What is the policy on BCG for HIV-infected children?
	Is the BCG vaccination rate known? Include BCG coverage rate in NTP data.
Contact investigation	What is the policy on contact investigation?
	Is there an algorithm for screening of childhood contacts for TB?
	At which level(s) is childhood TB contact investigation performed?
	How is childhood TB contact investigation performed (who, how, what, where)?
	What is the role of community health workers in childhood TB contact investigation?
	Which linkages/referral mechanisms exist to ensure management of childhood contacts who are symptomatic?
Preventive therapy	What is the policy on preventive therapy for childhood TB contacts?
	How are children on preventive therapy followed up and for how long?
	What formulations are available for preventive therapy?
	Are there any challenges with supply of INH for preventive therapy?
	How is preventive therapy for children implemented (who, how, what, where)?
Childhood TB diagnosis	
TB screening	At which level(s) is TB screening performed?
	How is TB screening performed in healthcare facilities?
	How is TB screening performed in community-based services?

	Which programmes offer TB screening for children?
Diagnostic algorithm	What diagnostic algorithm is used for the diagnosis of TB and DR-TB in children?
Diagnostic tests	Which diagnostic tests are available for childhood TB and at which levels (bacteriology including smear, Xpert® MTB/RIF, culture as well as radiology)?
	What is the lowest level at which paediatric specimens can be collected (induced sputum/GLA)?
Childhood TB treatment	
Guidelines	Are treatment guidelines for children available?
	If yes, are they in line with WHO recommendations (both for drug sensitive and drug resistant TB)?
	How is treatment delivered to children (e.g. hospitalisation, facility-based DOT, community-based DOT, supervision by relative etc.)?
TB drugs for children	What formulations are available for TB treatment in children (e.g. paediatric formulations, fixed dose combinations)?
	Are there any challenges with supply of TB drugs for children?
Recording and Reporting	
NTP reporting on childhood TB	What data elements on childhood TB are routinely reported in the NTP?
	How are data evaluated and used at national, sub-national and district level?
	What age bands are used for reporting NTP data on childhood TB?
	How are data on TB in children collected in other programmes and reported to NTP (e.g. PMTCT, HIV, nutrition)?
Operational Research	What operational research is planned, developed and/or conducted on childhood TB?
Needs to move forward/scale up childhood TB integration (by health system function/dimension of integration)	
Policy and governance (normative integration) Health System Functions (systemic and functional integration) Financing Health workforce Information (Recording and Reporting) Supplies Service delivery (under clinical/services integration) Planning and Management (professional/organisational integration) Demand creation and healthy behaviours Clinical/services integration (including prevention, diagnosis, treatment) Responsiveness/Quality	