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

A case study from Uganda

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

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COVER PHOTO: Mother with her three children leave Puranga health Centre II, Pader District after medical treatment © UNICEF/UN025711/Bongyereirwe

MATERNAL, NEWBORN AND CHILD HEALTH

WORKING PAPER

Month and year

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

A case study from Uganda

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Brothers visiting Kanywanbogo Health Center III in Ibanda District of Uganda for their regular checkup.

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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 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 Uganda 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 methodology 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 iCCM benchmarks.

The case study found that the political interest in childhood TB integration in Uganda is high and that integration as a strategy forms part of the TB National Strategic Plan (NSP) and joint TB/HIV Global Fund for AIDS, TB, and Malaria (GFATM) concept note, although non-TB related policies and guidelines have limited content on integration. Comprehensive and up-to-date stand-alone paediatric TB guidelines are available. Participants' perceptions of the definition of integration focused on comprehensive child care for a range of conditions.

With regard to health systems functions, childhood TB is funded from the general TB budget, which is 21% unfunded. Capacity building, case finding, sample collection and contact tracing were reported not to have sufficient funding. Childhood TB reporting tools have recently been revised. Data on childhood TB are routinely collected for the HIV programme and ANC services, but not for other programmes. Training on paediatric TB based on the new guidelines has started at regional level, while master training of TB/HIV adapted iCCM has been conducted and phased scale-up will commence in three

districts. Supervision tools include childhood TB aspects for TB and the HIV programming, but not yet for other programmes.
Formulations available for children are rifampicin/isoniazid/pyrazinamide (RHZ) 60/30/150mg and rifampicin/isoniazid (RH) 60/30mg paediatric fixed dose combination (FDC) and separate ethambutol. Supply of paediatric TB formulations has been irregular. New child-friendly formulations will be phased in within the next year.

Implementation of childhood TB services is expected to roll out to lower levels as soon as healthcare workers (HCWs) at health centre (HC) levels III and IV have been trained. TB screening, linkage to diagnosis, treatment and prevention are offered in routine child health services and in ANC/PMTCT services, but the quality and extent are unknown. TB/HIV integration for children is at an advanced level, although the number of integrated service delivery points are limited, due to a lower number of TB treatment sites than ART sites. Nutrition services have not yet integrated childhood TB services. The lowest level at which childhood TB diagnostic services are offered is HC level III with referral for evaluation, while TB preventive services being offered from HC level IV. Interventions at community-level include contact tracing, referral to TB services, DOT, follow-up of patients on IPT/TB treatment, health education, provision of critical information, promotion of all healthcare programmes, and community mobilisation, at varying levels of implementation. The referral system between community levels and PHC and between PHC and higher levels is weak and no systems exist to ensure that patients reach the referral facility.

BCG is given at birth except for babies with contra-indications. Contact tracing is covered in detail in the guidelines, but is currently limited to passive contact tracing originating from the TB treatment facilities, due to resource constraints. IPT is not fully implemented due to INH supply issues, and limited to HC level IV and up. TB symptom screening is performed from HC II, although not fully implemented at the lower level facilities. As per the paediatric TB guidelines TB screening is recommended in OPD, YCC, nutrition, in-patient, ANC, maternity, PNC, HIV/ART clinic, mother-baby care point as well as community-based services, but not yet fully implemented. Diagnostic tests available include smear microscopy (HC IV and up), Xpert® MTB/RIF (some HC IV and up) and radiology (district hospital and up). Culture is used for special cases only. The lowest level for paediatric specimen collection is the district hospital.

Childhood TB and general integration of the TB programme into the broader health services is driven by the National Tuberculosis and Leprosy Programme (NTLP), maternal and child health and the AIDS control programme. A baseline assessment on childhood TB capacity was conducted in 2014/15, showing limited health care worker (HCW) knowledge, skills and confidence at lower levels, with corresponding lower case notification rates.

Most health system functions have fully or partially (with support from partners) integrated childhood TB, while many routine managerial and organisational activities have not yet or are only partially integrated childhood TB, with only partner coordination and HMIS management being fully integrated. None of the activities around promotion, contact screening, prevention, diagnosis, treatment and monitoring were considered to be fully integrated.

Many broader health system characteristics were reported that prevent integration and need to be addressed. Child TB is not really seen as a priority and challenges with surveillance and diagnosis hamper interventions. The overall context (for example poverty) fosters the TB epidemic, while at the same time there is significant donor support and funding for childhood TB. Global recommendations have a positive influence on integration efforts.

Action points were developed with the country teams to assist the Ugandan Ministry of Health (MOH) with moving forward with integration of childhood TB into other programmes.

List of Abbreviations

AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
ARI	acute respiratory tract infection
ART/ARV	antiretroviral/antiretroviral therapy
BCG	Bacillus Calmette–Guérin vaccination
CBO	community-based organisation
CHC	community health centre
CHS	community health services
CHW	community health worker
CMAM	community management of acute malnutrition
CPT	co-trimoxazole preventive therapy
CSO	civil society organisation
CXR	cheat X-ray
DCCS	directorate for community and clinical services
DHIS	district health information system
DHMT	district health management team
DHO	district health officer
DOTS	Directly Observed Treatment Short-course
DTLS	district TB and leprosy supervisor
EHP	Essential Health package
EMTCT	elimination of maternal to child transmission
EPTB	extra-pulmonary tuberculosis
ETA	emergency triage assessment
FAST	finding TB cases, actively, separating safely, treating effectively (infection control)
FBO	faith based organisation
FDC	fixed dose combination
GDP	gross domestic product
GFATM	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GHI	Global Health Initiative
GOU	Government of Uganda
HC	health centre
HCW	healthcare worker
HR(D)	human resources (development)
HSA	health surveillance assistant
HSD	health sub-district
HSDP	health sector development plan
iCCM	integrated community case management
ICF	intensified case finding
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
LC	local council
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
MOLG	Ministry of Local Government
MUAC	mid-upper arm circumference
NGO	non-governmental organisation
NMS	national medical store
NRH	national referral hospital
NSP	national strategic plan
NTRL	national tuberculosis reference laboratory
NTLP	National Tuberculosis and Leprosy Control Programme
OPD	outpatients' department
PEPFAR	President's emergency fund for AIDS relief
PHC	primary health care
PHI	paediatric hospital improvement
PHP	private health practitioner
PNC	post-natal care
PNFP	private not for profit
PMTCT	prevention of mother-to-child transmission
PPP	public-private partnership
RMNCAH	reproductive, maternal, newborn, child and adolescent health
RRH	regional referral hospital
SDG	strategic development goal
SOP	standard operating procedures
SSDI	Support for Service Delivery Integration
STI	sexually transmitted infection
SWOT	strengths, weaknesses, opportunities, threats
TAs	traditional authorities
TB	tuberculosis
TCPM	traditional and complementary medical practitioner
TOT	training of trainers
TWG	technical working group
UNICEF	United National Children's Emergency Fund
UNMHCP	Uganda national minimum health care package
USAID	United Stated Aid Agency
USD	US dollar
USG	United States Government
VHT	village health team
WHO	World Health Organization
XDR-TB	extensively drug-resistance tuberculosis
YCC	young child clinic

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 Uganda and UNICEF, supported by technical partners, conducted the case study on the integration of childhood TB interventions into the national health system from May 16 to 20, 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=76)	**Wakiso District**	**National**	**National**
Ministry of Health			
NTLP		2	5
MCH		5	7
Nutrition		3	1
HIV		1	
Other		1	2
District Health Management Team	9		2
Health workers	5		
Partners/Non-Governmental Organisations		2	17
UNICEF/WHO		6	6
Donor agencies			2
Total	**14**	**20**	**42**

Setting

Information was collected at both national and district level. One health district (Wakiso District in the Central 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 two-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

Uganda political, demographic, health and tuberculosis context

Uganda is a Presidential Republic, with the President both Head of State and Head of Government, formed in 1962, following independence from the British. The country practices a multiparty democratic parliamentary system with legislative power held by the National Assembly, made up of elected Members of Parliament from across the country. Health functions are managed by the Minister of Health.

Administratively, the country is divided into 111 districts and the capital city of Kampala, in four administrative regions: Northern, Eastern, Central and Western. Uganda follows a system of five tiers of local council (LC) governance linked through political and administrative units. The districts (LC V) are subdivided into 181 counties and 22 municipalities (LC IV); 1,382 sub-counties and 174 town councils (LC III); 7,138 parishes (LC II) and 66,036 villages (LC I). Parallel with the administration are traditional Kingdoms that enjoy some degree of mainly cultural autonomy. [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
Total population	34,634,650	Census	2014
Under 5 population	6,130,333	Census	2014
Annual population growth	3.0%	Census	2014
Urban population	16.8%	UNDP	2014
Birth rate (births per 1,000 population)	43	WB	2014
Total fertility rate	5.8	Census	2014
Adult literacy rate	72.2%	Census	2014
Life expectancy at birth	63.3	Census	2014
Infant mortality rate	53/1,000	Census	2014
Child mortality rate	80/1,000	Census	2014
Maternal mortality ratio	360/100,000	MDG Endline	2013
Children under 5 underweight	13.8%	MDG Endline	2011
Total estimated TB burden	60,000	WHO	2014
Estimated TB prevalence (all cases)	159/100,000	WHO	2014
TB prevalence (all ages)	253/100,000	Prevalence survey	2015
Total burden (survey)	87,000	Prevalence survey	2015
Estimated TB mortality (all cases)	29/100,000	WHO	2014
TB case detection rate	72%	WHO	2014
Children with TB aged 0-14 notified	3,316 (8%)	WHO	2014
HIV prevalence (15-49 years)	7.4%	UNDP	2014
GDP per capita (current US$)	714.6	WB	2014
Population living on less than 1.25 USD per day	37.8%	UNDP	2014
Total expenditure on health per capita (US$)	52	WB	2014
Total expenditure on health as % of GDP	9.8%	WB	2014
World Bank income group	Low income	WB	2014

[a] Information based on the Uganda Health Sector Development Plan, 2015/16 – 2019/20

Human Development Index	0.483 (rank 163)	UNDP	2014
Gini index	42.4	WB	2012

Data sources:
Uganda National Population and Housing Census 2014; Uganda 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/

Uganda National Health System organisation

The National Health System (NHS) is made up of the public and the private sectors. The public sector includes the Government of Uganda (GoU) that provides healthcare under the Ministry of Health (MoH), and the ministries of Defence, Education, Internal Affairs (Police and Prisons) and of Local Government (MoLG). The MOH healthcare services are structured into: national referral hospitals (NRHs) which are semi-autonomous; regional referral hospitals (RRHs) which are self-accounting and under MoH oversight; public general hospitals; and health centres (HCs) that are classified in four different levels: HC IV, HC III, HC II and village health teams (VHT, HC I) which are under the district health system managed by the local councils.
The private health sector consists of Private Not for Profit (PNFP) providers, Private Health Practitioners (PHPs) and the Traditional and Complementary Medicine Practitioners (TCMPs). Of all hospitals in the country, 52% are public, 41% are PNFP and 7% are Private for Profit (PFP).
The provision of health services in Uganda is decentralised with districts and health sub-districts (HSDs) playing a key role in the delivery and management of health services at the district level. [b]
The Directorate for Community and Clinical Services (DCCS) manages the national disease control department (under which the NTLP, the AIDS Control Programme and the Malaria programme fall), Community Health Services (CHS) (including the Reproductive Health, Child Health and Health Education/Promotion units), Clinical services and Vector-borne diseases (see figure 1).

Uganda National TB and Leprosy Programme (NTLP)

The NTLP is a disease control programme under the department of the National Disease Control of the MoH. Its core functions are to establish country wide quality diagnosis of TB and leprosy and patient-centred treatment; coordinate implementation of TB and leprosy prevention and care services; and prevent and manage leprosy-related disabilities.

The operational structure of NTLP consists of three levels: The National level (also referred to as the central unit); the Regional level (initially referred to as the zone); and the District level. The districts in the country are grouped into regions, which are supported by the regional focal persons for TB and leprosy care and prevention services. At the district level, the District Health Officer (DHO) is responsible for the management of health service delivery including TB and Leprosy care and prevention services. The DHO assigns a district health team member (the District TB and Leprosy Supervisor (DTLS)) the responsibility of overseeing TB and Leprosy services in the district. At the Health Sub-district level (HSD), a health worker is assigned the responsibility of overseeing TB and Leprosy care and prevention services,

[b] Information based on the Uganda NTLP TB National Strategic Plan, 2015/16 – 2019/20

and this person is referred to as the health sub-district Focal Person. At the district, HSD and health facility level, TB care and prevention services are integrated into the general health services. [c]

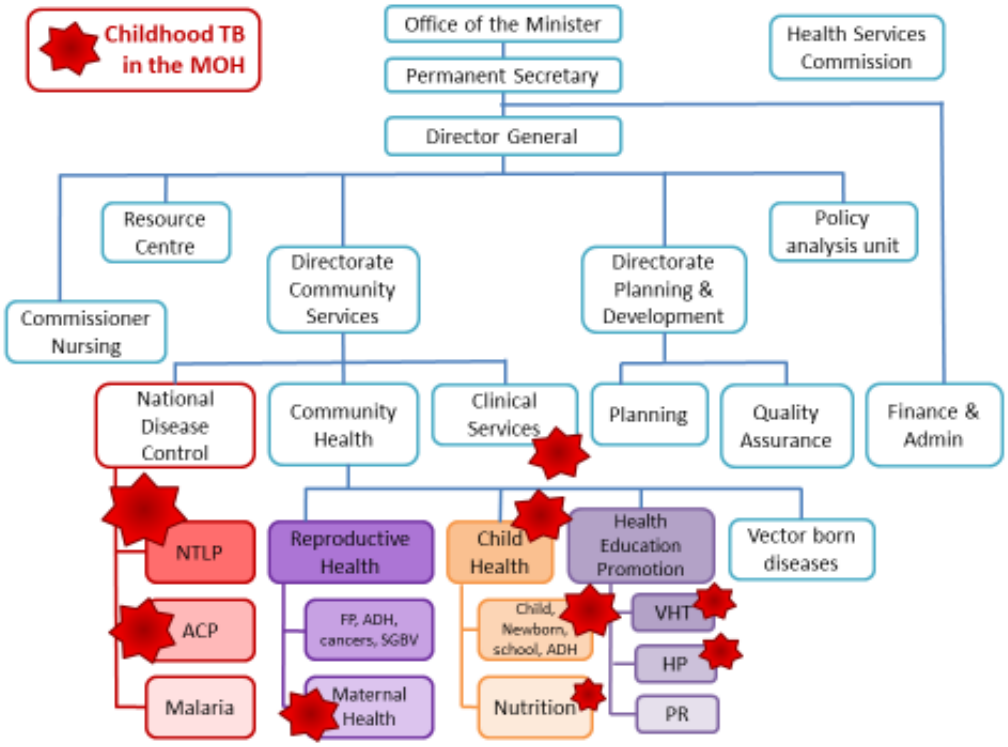

Figure 1: Uganda MOH organogram, with units addressing childhood TB services (indicated with a red star)

A paediatric TB coordinator is working within the NTLP to coordinate all activities around childhood TB, and liaise with other departments. This position was created in 2013 and funded through Baylor Uganda (using PEPFAR funding). A childhood TB Technical Working Group (TWG) was established in 2013, and coordinates all childhood TB related activities, including the development of stand-alone paediatric TB guidelines and a paediatric TB training curriculum (in 2015). The TWG consists of managers from the HIV, MCH, RH, NTLP programmes as well as specialist paediatricians from the main teaching hospitals, the Uganda Paediatric Association, development partners and implementing partners. Childhood TB is represented in other technical working groups including HIV and TB/HIV (National Coordinating Committee). Table 4 provides a summary of national adult and paediatric TB indicators.

Table 4: National adult and paediatric TB indicators

Indicator name	Data	Year
Notification rate	124/100,000	2014
Prevalence rate (survey) – all ages	253/100,000	2015
Total TB cases (all ages)	45,268†	2014
Total TB cases aged 0-14 (%)	3,132 (6.9%)	2014/15
PTB	39,285	2014/15
Smear-positive PTB	27,729	2014/15

[c] Information based on the Uganda NTLP TB National Strategic Plan, 2015/16 – 2019/20

EPTB	4,020	2014/15
New cases	41,126	2014/15
Relapse cases	2,063	2014/15
Other re-treatment	1,891	2014/15
Treatment outcomes (new smear positive)	N=25,632	2013/14
Cure rate	49.7%	2013/14
Success rate	79.3%	2013/14
Default rate	10.0%	2013/14
Failure rate	0.9%	2013/14
Death rate	5.7%	2013/14
Not evaluated	1.6%	2013/14
MDR-TB total cases	244	2014/15
MDR-TB age 0-14 (%)	8 (3.3%)	2014/15
TB/HIV collaboration	N=45,268	2014/15
Tested for HIV	96.1%	2014/15
HIV positive	42.8%	2014/15
On CPT	98.1%	2014/15
On ART	87.4%	2014/15
Paediatric TB		
Total number of notified TB patients	43,736†	2015
Children with TB aged 0-4 years	1,330	2015
Children with TB aged 5-14 years	1,585	2015
Children with TB aged 0-14 years	2,915	2015
Adolescents with TB (10-18 years)	N/A	
Children eligible for BCG (age)	At birth	
BCG vaccination rate	98% *	2015
Children with bacteriologically confirmed PTB	659	2015
Children with not bacteriologically confirmed PTB	1,689	2015
Children with EPTB	567	2015
Children with MDR-TB	8	2015
Children with TB tested for HIV	90% *	2015
Children with TB tested HIV+	816 (32%)	2015
HIV+ children with TB on ART	728 (89%)	2015
PTB index cases	16,726**	2014/15
Children <5 household contacts of index cases	14,858	Projected using household size = 4.7, %, under five children = 18.9%
Children <5 evaluated	5,732 (38.6%)	2014/15
Children <5 started IPT	668 (11.6%)	2014/15

Data sources:

Uganda NTLP annual report 2014/2015; NTLP

† Figures differ slightly as a result of a different reporting period (2014/2015 versus 2015)

* Estimates

** Data from quarterly reports: smear-positive PTB only, excludes other bacteriologically confirmed PTB index cases

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 is provided in table 5.

Table 5: Key health and TB policies with childhood TB aspects covered

Document name	Childhood TB position	Remarks
Health Sector Development Plan (HSDP)	TB one of the major causes of life years lost in Uganda Target related to TB: increase (overall) TB case detection rate from 80% to 95% Key interventions: • Early detection, treatment initiation and adherence in all diagnosed TB patients. • Early detection and improve DR-TB patient management (including infection prevention, and home based care). • Improve access to and utilisation of quality laboratory network and radiology services for TB diagnosis. • Empower patients, their families and communities in TB care through referral of presumptive TB patients to diagnostic facilities, supporting treatment adherence and conducting contract tracing. • Scale-up implementation of the one-stop model for co-infected TB patients in ART accredited facilities.	No specific mention of childhood TB
Child survival strategy 2009-2015	Aspects included: "Increase the proportion of TB cases that are cured from 62% to 85%", TB is mentioned as "vaccine preventable disease", strategy refers to HSDP II priority "to reduce maternal and child mortality, … tuberculosis …"	Updated strategy not reviewed
TB National Strategic Plan 2015/16 – 2019/20	Challenge described in NSP: Low TB case detection among children. Operational objective 1: To detect 85% of estimated TB cases and successfully treat 90% of them by 2020. Strategic intervention 1.1.: Increase the capacity of health workers to diagnose TB, especially childhood and clinically diagnosed TB. This intervention covers maintaining and actualisation of guidance documents, capacity of healthcare workers in diagnosing and treating TB including sample collection in children and mentoring for healthcare facility teams on TB care and prevention services. Strategic intervention 1.8: Integrate TB care and prevention services into NCD and MCH services. This intervention brings TB collaboration mechanisms into non-communicable disease control and maternal and child health services. Diabetic patients and women attending EMTCT services will be the first groups targeted under this intervention.	
National Paediatric TB guidelines	Dedicated chapter on integration: Integration of TB care services at the various health care service points to enhance early childhood TB case finding, treatment, prevention, and improves outcomes. Services to be integrated: TB health education, TB screening using the ICF guide, HIV testing, TB evaluation and management, TB treatment, IPT for under five TB contacts and HIV positive children and adolescents, TB contact screening and management, TB Infection control, TB/HIV Documentation, Continuous Quality Improvement	In print
National guidelines on collaborative TB/HIV activities	TB/HIV integration guidelines in development (co-infected children included)	

Village Health Team strategy and operational guidelines	NTLP included in VHT coordinating committee. In strategy/guidelines no mention of childhood TB.	
iCCM	TB/HIV adapted materials not yet available. Pilot study planned in three districts with adapted materials (including TB and HIV risk)	
One-stop shop guide for TB/HIV integration (in development)	This guide will cover TB/HIV integration: - For all age groups - for all programmes - in different clinics and - with all MOH departments and partners	In development (not available for review)
National Communication Strategy for Tuberculosis Control	Sample messages on TB and its symptoms, transmission, myths, the link with HIV/AIDS, treatment of TB, and people at risk of TB (including young children, children whose mother/caretakers have TB, children who have not had BCG, people living with HIV/AIDS)	Made available at the national workshop

Integration inputs

Policy and governance (normative integration)

Most participants agreed that there is a great need to integrate childhood TB into the broader health system to ensure holistic management, as well as to improve efficiency and reduce duplication. Paediatric HIV has received more attention to this effect than paediatric TB. It was noted that many of the programmes offered are not yet clearly linked with the TB programme. Similarly, in school health services TB is not addressed while HIV and sexually transmitted infections (STIs) form part of life sciences education.

Various perceptions and meanings of integration were discussed during the various meetings and the workshop. Definitions mentioned by participants included:

- Services that are offered routinely in the main public health system (excluding projects and pilots) at all levels, including community level. This includes equipped and engaged VHTs: identification of children at risk, referral to the healthcare facility, sample taking and testing, TB treatment for those diagnosed, monitoring by VHTs
- No separation of services: patients can be managed in a one-stop shop for all aspects of the services, at all levels of the healthcare system
- TB/HIV integration: All TB related services to be offered in the HIV clinic and all HIV services to be offered in the TB clinic until TB treatment has been completed
- Integrated child care: complete care for the child (every program needs to know how to care for the child), with a focus on child survival. All services should be offered in one package, including prevention, detection and treatment using a family approach, focus on broader aspects and including promotive activities
- Harmonisation of assessment and care for more than one condition, horizontally and comprehensively.

Integration as a strategy is included in Global Fund joint TB/HIV concept note and the TB NSP, as well as the TB/HIV guidelines. A dedicated chapter on integration is included in the new paediatric guidelines. Components include integration of TB care services at the various health care service points to enhance

early childhood TB case finding, treatment, prevention, and improved outcomes (see also under policy review).

The development of stand-alone paediatric TB guidelines was coordinated by the childhood TB TWG in 2014/2015, followed by the development of a training curriculum based on the guidelines. The diagnostic algorithm in the guidelines is based on the 2014 WHO recommendations. Contact tracing and isoniazid preventive therapy (IPT) are covered in detail. Recommended treatment regimens are based on WHO recommendations (using new paediatric fixed dose combinations (FDCs): rifampicin/isoniazid/pyrazinamide (RHZ) and rifampicin/isoniazid (RH). The introduction of new, child-friendly dispersible FDCs is planned for 2017. The guidelines also include a clear algorithm on the management of TB exposed neonates.

Health System Functions (systemic and functional integration)

Health financing

The total TB budget was 24m USD in 2014 (10% domestic, 69% international, 21% unfunded) (WHO, 2015). Childhood TB is funded from the general TB budget. Aspects that do not have (sufficient) funding include capacity building, case finding, sample collection and contact tracing.

Health Information

The TB NSP identifies "several challenges around data evaluation and utilisation for the TB programme in general". These include poor data collection, storage, access and utilisation for performance improvement at all levels. Research findings are used for programme improvement, although limited research has been conducted on childhood TB-related aspects. Age bands used to collect data on childhood TB are 0-4 and 5-14 years, through the digitalised Health Information System (HMIS): DHIS2. Other data elements on childhood TB routinely reported in the NTLP include HIV status, type of disease, treatment outcomes and TB/HIV collaborative activities (HIV testing services, CPT, ART). There is currently no method to analyse data on adolescents (10-18 years) separately. The childhood TB TWG has revised the reporting tools for childhood TB.

The HIV programme is collecting data on TB screening in HIV-positive children, although some managers questioned the quality of the data, and whether they are a true reflection of the TB screening process. Data are also collected on TB diagnosis and IPT in HIV-positive children. This data is however not routinely collected as the tools do not disaggregate this information by age and as a result, it is only captured during supervision visits. Pregnant women's TB status is collected in the ANC register. The recorded information consists of a coding system (1-4) for no signs or symptoms of TB; TB suspect (to refer or collect sputum); diagnosed with TB or; currently on TB treatment. The PNC register does not have a column for recording information on TB for the mother or child. Other programmes do not have data collection tools for collecting data related to childhood TB (screening, prevention or treatment) yet.

At community level VHTs conduct registration of households, where all persons in the household are captured, including information on pregnancy, ART, and children under the age of five (TB-related information is not yet included).

Health workforce

Supervision: Each programme has separate checklists. There are plans to incorporate these into an integrated supervision manual/tool. The NTLP TB support supervision checklist was updated to include aspects of childhood TB screening, diagnosis, treatment and prevention. The ACP Paediatric HIV

supportive supervision and mentorship tools capture aspects of childhood TB screening, diagnosis, treatment and prevention.

Training: Regional trainings of trainers (TOT) on the new paediatric guidelines are being rolled out with support from technical partners. Facility-based trainings will follow the regional TOTs. These trainings cover all aspects addressed in the guidelines including TB diagnosis, management, prevention, management of neonates exposed to TB. Training for community-level staff (VHTs) focuses on contact tracing and TB DOTs. An international TOT for master trainers on the TB/HIV adapted iCCM was held in Uganda in April 2016. TB/HIV adapted iCCM trainings are now planned for implementation once the materials are adapted to the country context and piloted, probably in late 2016.

Generally, participants were of the opinion that a reorientation of the minds of policymakers and technical people is needed: Promoting health rather than disease-specific vertical programmes, as the definition of health is broader than the absence of disease.

Supply chain

Integration of drug supply is needed. The need for child-friendly TB drug formulations was identified, e.g. the newly developed dispersible tablets, with a transition to their use planned for 2017. Reliable estimates of supply needs will be required, taking into consideration increasing childhood TB case detection, which will have financial implications. There are currently supply issues with separate ethambutol (as per the new guidelines the recommended treatment regimen for children is rifampicin/isoniazid/pyrazinamide FDC plus separate ethambutol) – this has led to healthcare workers dispensing adult FDCs, which may result in over- or under-dosing. There are also regular stock-outs of INH 100 mg hindering preventive therapy provision.

Other logistics that need integrated systems include Xpert® MTB/RIF (Cepheid, USA) testing for collected samples, packaging and transportation of the samples using the Hub system (a system that makes use of motorbike riders to take laboratory samples to central collection points).

Planning and Management (professional/organisational integration)

There was insufficient time to conduct a full stakeholder analysis. However, a number of stakeholders were identified by participants during the workshop at national level including:

- Patients affected by TB
- Caretakers of children affected with TB
- CSOs in the community
- Healthcare facilities
- Local leaders: help mobilise communities to demand and use services
- Funders: GF, CDC, PEPFAR, USAID, UNICEF, CHAI
- Media
- Primary healthcare programmes: EPI, iCCM, HIV, nutrition, child health, maternal health
- Ministry of Health: needs to prioritise the programme
- District local government: need to allocate resources to the programme
- Civil society organisations
- Private providers: some of these providers are involved in diagnosis, management and follow-up of TB, and reporting to the NTLP
- Technical partners: WHO, The Union, Baylor, Mildmay, EGPAF, MSH, Uganda Paediatric Association, Makerere College of Health Sciences

Childhood TB and general integration of the TB programme into the broader health services is driven by the NTLP, maternal and child health and the AIDS control programme (ACP).

An assessment of 112 public and private healthcare facilities' capacity to manage childhood TB was conducted by the NTLP in 2014/2015, starting at regional level. The findings showed that the number of childhood TB case notifications decreased with decreasing levels of healthcare. The assessment also found limited health worker knowledge, skills, and confidence to manage children with presumptive or confirmed TB, and limited access to the standard management recommendations. The DETECT TB project (coordinated by the Union against TB and Lung Disease, in collaboration with the NTLP, Baylor and Mildmay) conducted a baseline assessment in 2015, in 2 districts covering 57 facilities, showing low levels of childhood TB case detection and similar challenges around capacity to diagnose, prevent and manage childhood TB.

Ideally, all services that are accessed by children should be targeted for integrating childhood TB services, including OPD, in-patients, young child clinic (YCC), maternity, ANC, PNC, nutrition, mother-baby care points for HIV positive mother baby pairs, EPI, and community-based services (iCCM). These services should provide integrated services, focusing on TB screening of children at every entry point and at every opportunity, combined with improved referral systems. Nutrition is the least involved programme at present. The plan is to include TB screening and contact screening in the guidelines that are due for revision (see section on services/clinical integration, page 24).

Involvement of private providers is currently limited. Projects that engage private providers in (general) TB services, including for case finding, treatment and reporting, exist, but these do currently not address childhood TB.

The role of tertiary level facilities in childhood TB services and integration include the provision of integrated services at tertiary level, focusing on TB screening of children at every entry point at every opportunity.

Demand creation and healthy behaviours

A National Communication Strategy for TB Control was developed by the MOH in 2015, which aims to increase knowledge about TB among the general population in Uganda, and includes sample messages on TB and its symptoms, transmission, myths, the link with HIV/AIDS, treatment of TB, and people at risk of TB (including young children, children whose mother/caretakers have TB, children who have not had BCG, people living with HIV/AIDS). The reproductive, maternal, newborn, child and adolescent health (RMNCAH) Communication Strategy entailing integrated advocacy, social mobilisation and communication strategy and action plan for 'A Promise Renewed' was developed by UNICEF Uganda to support communication efforts, although this does not explicitly cover childhood TB. Integrated behaviour change communication (BCC) activities, such as campaigns, are currently not conducted. VHTs provide limited health education on TB in general at community level. There are no advocacy, communication and social mobilisation (ACSM) materials available that include childhood TB. ACSM activities need to be integrated into general TB, child health and HIV messages. Most participants felt that increased awareness would lead to demand creation for TB screening and diagnostic services.

Service delivery and clinical integration

The training on the new paediatric TB guidelines that is currently being rolled out has a strong component on integration of TB services at all entry points. Tools that will be available for HCWs to use at facility level include the intensified case finding (ICF) guide, paediatric dosing charts and the TB register.

TB screening, linkage to diagnosis, treatment and prevention are offered in routine child health services and in ANC/PMTCT services, although implementation levels vary. No tools exist to monitor the extent and the quality of these activities. The ANC register captures the TB status of the mother (see section on information systems), although this information is not completed well. A mother-child health passport is used, which is given to each pregnant woman. This passport captures a history of TB in the mother, as well as PMTCT/HIV care for the mother and the newborn, but does not include information on TB screening or prevention for either at any point in the lifecycle.

All TB treatment sites are also ART sites, but not all ART sites are providing TB treatment. ART is available at HC level II and up, while TB treatment is available at HC level III (diagnosis) and IV (treatment initiation) and up. This means that ART is available in over 2,000 additional facilities in the government and PNFP sector compared to sites with TB diagnostic capacity, and in another additional 1,100 compared to the number of TB treatment sites [d]. The HIV patient chart includes TB screening questions to prompt HCWs to ask these questions at every visit (the proportion of HIV patients screened for TB at the last visit is around 98%). Screening is the first step in the cascade to diagnose TB. Depending on whether or not TB treatment is available in the HIV clinic, patients are referred for treatment or start treatment at the same site. HCWs in the HIV clinic do have the capacity to identify, diagnose and treat TB and provide preventive therapy, but integration is just starting in terms of treatment availability at some HIV clinics (currently TB treatment is mainly available in the TB clinic and in the main pharmacy in the facility). The main gap in integration is TB screening in other departments such as OPD and child clinics. Pre-ART and ART registers have a column on TB status (no signs/symptoms; presumptive TB; TB diagnosis; TB treatment). The new OPD registers have a column for TB screening, laboratory results and linkage to TB treatment. Monitoring the quality of completion of the registers was identified as a need. Annual support supervision is taking place for TB/HIV integration.

No interventions for childhood TB are currently offered in nutrition services, neither at community nor at health facility levels. Nutrition assessment and support (NUS) offered in nutritional services include anthropometric measurements, provision of supplementary foods to malnourished children, but TB is not yet featuring in the guidelines and therefore no active TB screening is offered at nutrition entry points. Children with failure to thrive are only referred for further evaluation if they do not respond to malnutrition treatment after 42 days (as per current guidelines), which participants indicated to clearly pose a missed opportunity with possibly serious consequences. HIV appears to be better integrated in the nutrition programme, and this is happening in both directions, from and to HIV care, with HIV counselling and testing of every child that accesses nutritional services. Participants indicated that there is a need to include clear guidelines to integrate TB, including symptom screening and history of exposure/contact. The nutrition guideline is due for review (has not been updated since 2012) and the plan is to work with childhood TB focal person to include TB. Growth monitoring is weak in Uganda and would provide another opportunity to integrate with TB and HIV.

[d] Data source: http://www.ubos.org/onlinefiles/uploads/ubos/pdf%20documents/PNSD/2010MOHStatAbst.pdf

The minimum level at which childhood TB diagnostic services are offered is HC level III (for clinical diagnosis, mainly in the DETECT TB project, currently in two districts) (see section on TB diagnosis on page 18). Generally, HCWs at this level will refer children with presumptive TB for diagnostic testing/initiation of treatment to a higher level. Most HC level IV facilities are TB diagnosis and treatment points. At HC level I (VHT) and II, no diagnosis of childhood TB is possible. HCWs at HC level II don't manage TB, although they have some knowledge about childhood TB they don't focus as much on TB as at the higher levels.

TB preventive services are generally only offered at HC level IV or higher, although the DETECT TB project has decentralised these services to HC level III in the two districts of Wakiso and Kabarole.

Interventions for childhood TB ideally provided by community health workers at community-level include contact tracing, referral to TB services, DOT, follow-up of patients on IPT/TB treatment (home visits), health education, provision of critical information, promotion of all healthcare programmes, and community mobilisation, but implementation is limited. General iCCM (without TB/HIV) is offered at community level in all districts. The WHO/UNICEF TB/HIV iCCM materials are being adapted to country context and a pilot/operational research is scheduled to start soon in three districts (Kayunga, Wakiso and Sheema). Current IMCI and iCCM materials only include the danger signs of cough for more than 2 weeks that prompts referral for further evaluation for presumptive TB in children under five. The evaluation would include taking sputum (if possible), CXR at hospital level, or a clinical diagnosis based on history of contact and signs and symptoms. Children who are exposed to an adult with infectious TB on treatment are supposed to be identified through contact screening, but this is not fully implemented. VHTs are also tasked provide education on TB infection control in households during home visits, but this again is not well implemented.

The paediatric TB guidelines state the following on the role of the CHW in childhood TB:

- Strengthen early identification of TB cases and those who require IPT through TB symptom screening and referral
- Strengthen treatment adherence by enhancing DOT
- Promptly identify and refer TB contacts in need of clinical evaluation for TB and asymptomatic children under the age of five years who will benefit from IPT
- Follow up of patients on TB treatment and those who have missed their clinic appointments (including follow up sputum smears)

When discussing the functioning of the referral system between community care and PHC for children with TB symptoms or TB contacts, the question was raised whether facilities are prepared to receive children referred for screening. Participants indicated that there is a need for a stronger relationship between the VHTs and HCWs at the facilities. HCWs do not always recognise or respect referrals from the community, which discourages VHTs to refer patients. It was stated that many HCWs do not know who their VHTs are. Therefore, linkages need to be strengthened, as the continuum of care is critical. As one programme manager remarked: “Services is what counts, not programmes”. Contact tracing is currently conducted mainly in a passive way, rather than actively.

The DETECT TB project makes use of community linkage officers, who are linked with the VHTs. This is the only project that has trained VHTs on the identification of children with TB symptoms. VHTs conduct follow-up in the homes, they can identify presumptive TB and take samples. A suggestion to improve the

effectiveness of the referral system is to provide transport vouchers or food which may help to create demand for TB services.

The referral system between PHC level and higher levels of care was reported to be weak, causing out-of-pocket expenses for families. Back-referral information is often lacking and there is no method to track whether the referred patient actually reached the referral facility or hospital, and started treatment. Participants suggested the use of "facilitated referral" (usually by a CHW accompanying the patient) or to provide transport vouchers to improve the efficiency of the referral system.

TB staff are linked to other services (e.g. HIV, PMTCT, MNCH, malnutrition) through referral between units/departments in most clinics. Standard operating procedures or guidelines for the one-stop shop with a focus on TB/HIV are in development.

The Uganda National Minimum Health Care Package (UNMHCP) includes:

- Health promotion, environmental health, disease prevention and community
- Health initiatives, including epidemic and disaster preparedness and response
- Maternal and Child Health
- Prevention, management and control of communicable diseases
- Prevention, management and control of non-communicable diseases

Ideally, participants explained that the continuum of care for TB exposed and/or symptomatic children would function as follows:

i. Active contact tracing, or screening for contact at community level (VHTs)
ii. Recording in household registration form, contact tracing form
iii. Referral to HC III
iv. TB screening at all entry points at HC III
v. Clinical diagnosis at HC III, or referral to HC IV for sputum testing/other samples if suspected EPTB
vi. Initiation of TB treatment
vii. Registration at HC III/IV
viii. Follow-up at HC III or IV
ix. Treatment support by VHTs
x. Recording of treatment outcome.

If asymptomatic contact:

i. Initiation of IPT at HC III/IV
ii. Recording in IPT register
iii. Preventive therapy support by VHTs
iv. Monthly follow-up at HC III/IV
v. Recording of completion of course.

Currently missed opportunities do occur frequently.

Childhood TB prevention

The BCG vaccine is given at birth to all neonates, except to neonates exposed to a mother with TB until evaluated. If the baby is on IPT or TB treatment, BCG is given 2 weeks after completion. The policy on

BCG for HIV-infected children is not very clear: BCG IRIS (immune reconstitution inflammatory syndrome) risk is mentioned in infants starting ART early. In the contact algorithm the policy states that neonates that are well but born to a mother who is infectious, do not receive BCG until 2 weeks after completing IPT and child is HIV negative. This implies that HIV-positive babies do not get BCG. But this is not explained anywhere else. The main challenge with implementing this policy is that confirmation of the HIV status at birth is not possible. This issue was identified as confusing and has been addressed in the training materials. The BCG vaccination rate is around 98% (NTLP).

The policy on contact investigation (Uganda childhood TB guidelines) states that cases targeted for contact screening include: Index cases with bacteriologically confirmed PTB or MDR-TB/XDR-TB (proven or suspected); Person living with HIV; child <5 years of age. A symptom based approach to screening is recommended, using a contact screening form to identify contacts at risk for TB and contacts with TB, inviting the index TB case to bring his or her contacts to the health facility for screening and further management and/or seeking consent to schedule and conduct a home visit. All symptomatic children should be referred to a health facility for further evaluation including history taking, clinical examination, and investigations. All asymptomatic children under the age of 5 years should be referred to a health facility for IPT initiation. Contacts of MDR TB cases do not receive IPT. Implementation is limited to passive contact tracing to some extent.

The new paediatric TB guidelines includes an algorithm for screening of childhood contacts for TB. Childhood TB contact investigation is performed at HC IV and hospitals especially for patients in the direct catchment population of the facility. The focus for contact tracing (mainly passive) is on TB treatment sites. There is a limited link between the hospital and other areas. In the DETECT TB project contact tracing is conducted from HC level III/IV and in the community (home visits). The NTLP has prioritised active contact tracing for MDR-TB patients due to limited resources. This is implemented with support from GFATM.

The process for childhood TB contact investigation as outlined in the paediatric TB guidelines covers the following steps:

- Step 1: Identification of the index TB cases to be prioritised for contact screening
- Step 2: Initiation of the process of TB contact screening by educating the index TB case on contact screening, inquiring about contacts, using health facility and community structures (VHTs) to conduct home visits or inviting the index TB case to bring contacts to the health facility for screening and further management
- Step 3: Contact Identification involving interviewing the index TB case for information about contacts
- Step 4: Contacts assessment and priorities assignment based on greatest risk of TB infections (and TB disease
- Step 5: Evaluation of contacts

As outlined in VHT policies, the role of CHWs in childhood TB contact investigation includes conducting home visits, completion of contact screening form, and referral of symptomatic contacts to HCF for evaluation or asymptomatic contacts for IPT, although implementation still lags behind. The VHT should then takes two copies of the contact screening form with him/her to the home visit, and for those children who were symptomatic get a copy to take to the healthcare facility where the child could then be either diagnosed or start on IPT. Correct/full completion of the tool is a challenge. VHTs refer

contacts to the healthcare facility but there is no mechanism to follow-up whether referrals have indeed arrived.

According to the paediatric TB guidelines, the following patients are eligible for IPT:

- Children under the age of 5 years with a history of contact with an active PTB case
- All HIV positive children >12 months of age irrespective of TB exposure and ART status
- All HIV positive children <12 months of age with a history of contact with an active PTB case
- All HIV positive children who have successfully completed TB treatment

However, this guidance is not fully implemented due to shortage of INH - IPT now focuses on contacts only. IPT is currently limited to higher-level facilities (HC level IV and up); facilities are put on a priority list based on numbers of TB patients on the registers. An updated IPT register is being implemented, with support from technical partners. There is a need for capacity building to ensure correct completion. This register is kept in the TB clinic by the TB focal person which may pose challenges if a clinician prescribes, while the register is located in the TB clinic. Children on preventive therapy are followed up monthly (for monitoring for side-effects and TB symptoms) for the duration of IPT (6 months) at the level of initiation of IPT or ART. INH 100mg tablets and solution are available for preventive therapy, although stock-outs in the national medical store (NMS) have been reported. The Union is procuring INH for the DETECT TB project.

Childhood TB diagnosis

TB symptom screening (as per the ICF guide in the paediatric TB guidelines) is performed from HC II, although not fully implemented at the lower level facilities. The ICF guide includes four symptoms: cough >2 weeks, fever, weight loss/failure to thrive, lymphadenopathy. In community-based services TB screening is not currently happening.

The guidelines focus on Out Patient Department (OPD), Young Child Clinic (YCC), Nutrition, In-Patient, Antenatal Care (ANC), Maternity, Post Natal Care (PNC), HIV/ART clinic, Mother-Baby care point (which is also integrated into the PNC) as well as community-based services for TB screening services. It needs to be noted that these are new guidelines which still have to be fully implemented.

The diagnostic algorithm for a clinical diagnosis of TB in children:

- Based on the WHO algorithm (included in new national Paediatric TB guidelines)
- Children with presumptive TB will have sputum done; if this is negative or if laboratory tests are not available or accessible, a chest x-ray may be done. If radiology is not available, an antibiotic trial may be given. Children can be treated without sputum testing or without x-ray.

Healthcare workers have gained confidence in managing TB in children. A call centre that can be reached toll-free is available for healthcare workers to discuss cases. At health Centre level II drugs for TB in children are not available and they will refer to level III or higher level.

Diagnostic tests available for childhood TB include smear microscopy (in some HC IV, district hospital and up), Xpert® MTB/RIF (some HC IV, district hospital, referral hospital) and radiology (district hospital and up). The use of culture is prioritised for children at risk for MDR-TB and for special cases where a clinician cannot make a decision based on the algorithm. The lowest level at which paediatric specimens can be collected (induced sputum/gastric lavage) is the district hospital.

Childhood TB treatment

The paediatric TB guidelines recommends the following indications for hospital admission for children with TB:

- Severe forms of TB including miliary TB with respiratory distress, TB meningitis, TB pericarditis, and TB spine with neurological complications
- Severe malnutrition for nutritional rehabilitation
- Signs of severe pneumonia (i.e. chest in-drawing)
- Other co-morbidities e.g. severe anaemia
- Severe adverse reactions such as hepatotoxicity

Children without admission indication are managed at the TB treatment site. DOT is recommended, but not always done. Most children have a care-giver administering the drugs. VHTs do visit children on TB treatment, but this is infrequent in most cases.

Formulations available for TB treatment in children include rifampicin/isoniazid/pyrazinamide (RHZ 60/30/150mg) and rifampicin/isoniazid (RH 60/30mg) paediatric FDC and separate ethambutol (100mg). Ethambutol is reportedly frequently out of stock, leading to HCWs then resorting to adult FDC RHZE to give all 4 drugs as per new guidelines. An application has been filed through the Global Fund for the new child-friendly formulations. The paediatric TB guidelines already includes recommended dose of anti-TB medicines by weight band using expected new dispersible FDCs.

Integration outcomes

Acceptability

Client satisfaction with childhood TB services is not currently assessed/monitored. Very limited activities to reduce stigmatisation and discrimination against TB (and the link with HIV) in the communities are currently conducted at schools. This has been identified as a need to address. VHTs conduct health education activities in the communities, including information on TB and HIV, to address stigma and create demand for services. A communication strategy was developed in 2015 (see policy review).

Although TB care for children is free of charge at all levels, out-of-pocket expenses related to referral and transport can be high. Retention in care of children on TB treatment or preventive therapy is ensured through follow-up by VHTs. Ideally patients not returning for check-up and refill at the facility would be identified for tracing by VHTs, but the extent of implementation is still limited. Health seeking behaviour for children who are TB contacts or who have TB symptoms is encouraged at PHC and community level through awareness activities and health education, although the level of implementation is still low. The community is engaged in childhood TB services though the Village Health Teams, who are volunteer community health workers.

Responsiveness/Quality

The question whether all relevant services are ready to provide care to TB symptomatic and/or exposed children, was raised by several managers and partners in the meetings and workshop. It appears that there is still a mismatch between the need for and the readiness of the services.

Missed opportunities around childhood TB can be minimised by ensuring screening for TB symptoms and contact/exposure at every entry-point, by ensuring capacity of HCWs to recognise, diagnose and

manage children with TB, and by ensuring a well-functioning referral and back-referral system, to link patients with the relevant level of care for TB evaluation, prevention, treatment initiation and follow-up.

Efficiency

Integrating childhood TB is expected to reduce duplication and improve efficiency, resulting in cost savings, as well as to strengthen health system functioning and increase efficiency.

Integration of childhood TB services is not expected to have a severe impact on the workload of HCWs/CHWs, as the numbers are still low. This may become an issue for VHTs when TB services are scaled up (including contact tracing). Inclusion of one question on TB contact would have limited effect on the workload, but will affect referrals and to some extent the workload at HC III and IV.

Uptake (use)

In terms of uptake of integrated TB services for children, it is mainly the DETECT TB project that has experience with this. Preliminary results show an increase in the proportion of childhood TB cases detected (as a percentage of all TB cases notified) from 7 to 11%, which might be partly attributed to the decentralisation of diagnostic capacity from district hospitals down to HC level IIIs. These include mainly clinical diagnoses.

Theoretically integrating childhood TB services has a positive impact on ensuring the continuum of care, but there was insufficient experience and data to make any statement on this at this stage.

SWOT analysis

A SWOT analysis was done, based on the information provided during the bilateral meetings at national and district level, as well as the discussions during the national workshop. See table 6 below.

Table 6: SWOT analysis

Key strengths/successes	***Key weaknesses/gaps/challenges***
• Advanced state of TB/HIV integration for both adults and children • Enabling environment: Childhood TB programme components institutionalised in government NTLP: National TB Strategic Plan, M&E framework, implementation guidelines, capacity building plan, training guidelines, GF TB/HIV joint concept note • Forums for engagement: Dialogue and collaboration between NTLP, MCH, HIV, Pharmacy are ongoing; Paediatric TB TWG, MCH cluster, TB/HIV collaborative activities; and Improving childhood TB/HIV indicators • Collaboration with stakeholders: Dialogue and collaboration between NTLP and different stakeholders ongoing; DETECT Child TB project; and planned TB/HIV iCCM pilot	• Health workforce: HCWs capacity and perception that childhood TB is not a public health threat, training not fully rolled out, HCW capacity (to diagnose/treat), attitudes and awareness lacking, and training of VHTs does not cover childhood TB • Service delivery: geographical access to diagnosis of TB, sample collection, contact tracing, preventive therapy, TB infection control, community systems not well organised, TB infection control, management of adults with TB (link between bacteriological confirmation and contact tracing) • Leadership and governance: Long history of vertical programming; ownership of integration, organisation of services • Financing: donor inflexibility and dependence • HMIS: Inadequate programme data on childhood TB (especially routine data), recording and reporting needs integrated registers and patient cards

	• Logistics/supply chain: Child friendly formulations, short expiries, stock outs (child FDCs, INH), sample containers, sample transport, limited number of Xpert® MTB/RIF machines (only at referral hospitals) • Referral system: tracking of patients, back-referral • Stigma: Health workers and community, influences health seeking behaviour, linked with HIV • Role, information and communication of various stakeholders at district and the community level
Key opportunities	***Key threats and risks***
• TB/HIV collaborative activities: one stop services • RMNCAH Sharpened plan – new focus with strategic shifts to high mortality, burden populations, high impact interventions, multi-sectoral actions and accountability under a life cycle approach • Nutrition: Growth monitoring, revision of severe malnutrition guidelines, community nutrition programmes • MCH mother/baby passport: TB information could be included • Child health days – currently combines immunisation, screening for HIV, health education, de-worming and nutrition screening • District Health Information Systems: data elements on child TB • Laboratory specimen transport hub system: EID dry blood spots and TB lab specimens to central testing laboratory, digitalised results • ICCM: Screening and referral • E-learning (e.g. I-CAT): Rapid dissemination of guidelines • School health programmes • Facilitated referrals and use of transport vouchers for referrals	• Inadequate data on childhood TB e.g. disease burden and disaggregation of data • Dependency of children on adults/ mothers • Donor prescription, piecemeal funding • Overall weak health systems in the country • Financial sustainability with reliance on external funding

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 supported by 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 fully or partially (with support from partners) integrated childhood TB, and only one (contingency planning) not (Table 7)[e]. The discussions during the national workshop revealed that guidelines are integrated in some service areas for example HIV but integration is lacking in other areas e.g. child health, nutrition, iCCM. The health information system was considered to be fully integrated, and child TB data elements/tools were revised by the TWG, but collection of information in other programmes is not yet happening besides for HIV.

The perceived collaboration among health partners, professions, structures and services on systemic integration of childhood TB (Table 8) was derived from triangulation of information and was graded by the same extent of integration score.

Table 7: Extent of integration of childhood TB into key health system functions

Key health system functions	Description	Score:
Governance and leadership:		
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)	Full
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	No
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	Full
Health workers' payroll	Staff in national health facilities involved in Childhood TB on MOH payroll	Partial **
Financial risk protection	Fee waiver system for children under 5 (or health insurance) covering comprehensive child healthcare	Full
Health information:		
Health information system (HIS)	National HIS, including childhood TB indicators	Full
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	Full
Health workforce:		

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

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	Full
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	Full
Supplies:		
Essential medicines and medical supplies list	National essential drugs and medical supplies list including child-friendly formulations for Childhood TB	Full
Procurement system	National drugs and medical supplies needs (forecasting and) procurement, including for Childhood TB	Full
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)	Full
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 8: 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	Partial *

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

Managerial/organisational integration

The extent of managerial and organisational integration of childhood TB shows that many routine managerial and organisational activities of service delivery at the district level have not yet or partially integrated childhood TB, and only partner coordination and HMIS management are fully integrated (Table 9). The discussions revealed that TB (in general, including childhood TB) does not feature in health budgets at district level (managed by local government).

Table 9: Extent of integration of childhood TB into routine managerial and organisational activities

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

Partial, weak; ***** Partial, supported by partners;*** ****No, only done by partners***

Clinical integration

The extent of clinical integration of childhood TB interventions into routine activities is presented in Table 10. Relevant clinical activities were selected from a list provided during the workshop. None of these activities around promotion, contact screening, prevention, diagnosis, treatment and monitoring was considered to be fully integrated. The DETECT TB project is the main pilot addressing contact screening and decentralisation of childhood TB diagnosis in two districts, resulting in many of the activities scored as partly integrated, supported by partners.

Table 10: Extent of integration of childhood TB services into routine clinical activities

Routine health activities	Score:
Promotion:	
Advocacy	No
Communication	Partial *
Social mobilisation campaigns	Partial **
Community engagement for social mobilisation and involvement (targeted communication on TB identification and management)	Partial *
Health education	Partial **
Contact screening & Prevention:	
Contact tracing, screening for contact/symptoms, linkage to PHC/TB clinic if symptomatic, identification of healthy contacts eligible for IPT and linkage to PHC	Partial *
Prevention	
Referral for preventive therapy (or initiation of preventive therapy)	Partial *
Treatment support for children on preventive therapy	Partial *
Asses HIV risk	No
Screening of children on IPT/TB treatment for side effects/TB symptoms	Partial *
Household TB infection control	Partial *
Diagnosis	
iCCM	No
Screening for TB symptoms/risk	No ***
Screening for HIV risk, referral for TB evaluation, linking children at risk to TB and/or HIV care, referral for HIV testing	No
Treatment & Monitoring	
Treatment support for children on TB treatment Screen for side effects	Partial *

**** Partial, weak;*** ***** Partial, supported by partners;*** ******No, only done by partners***

Table 11 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 information system perspective was considered to be fully integrated, in line with the information system and the management thereof, scored by the two other groups.

Table 11: 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	Partial *
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	Partial **
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	Partial *
The registration and recording perspective: The same registration, medical records and supervision tools used for all child healthcare services	Partial *
The information system perspective: The same information tools are used for all child healthcare services	Full
The medical supplies perspective: Childhood TB tasks are coordinated among co-workers in the work place	No
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;*** ******No, only done by partners***

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.

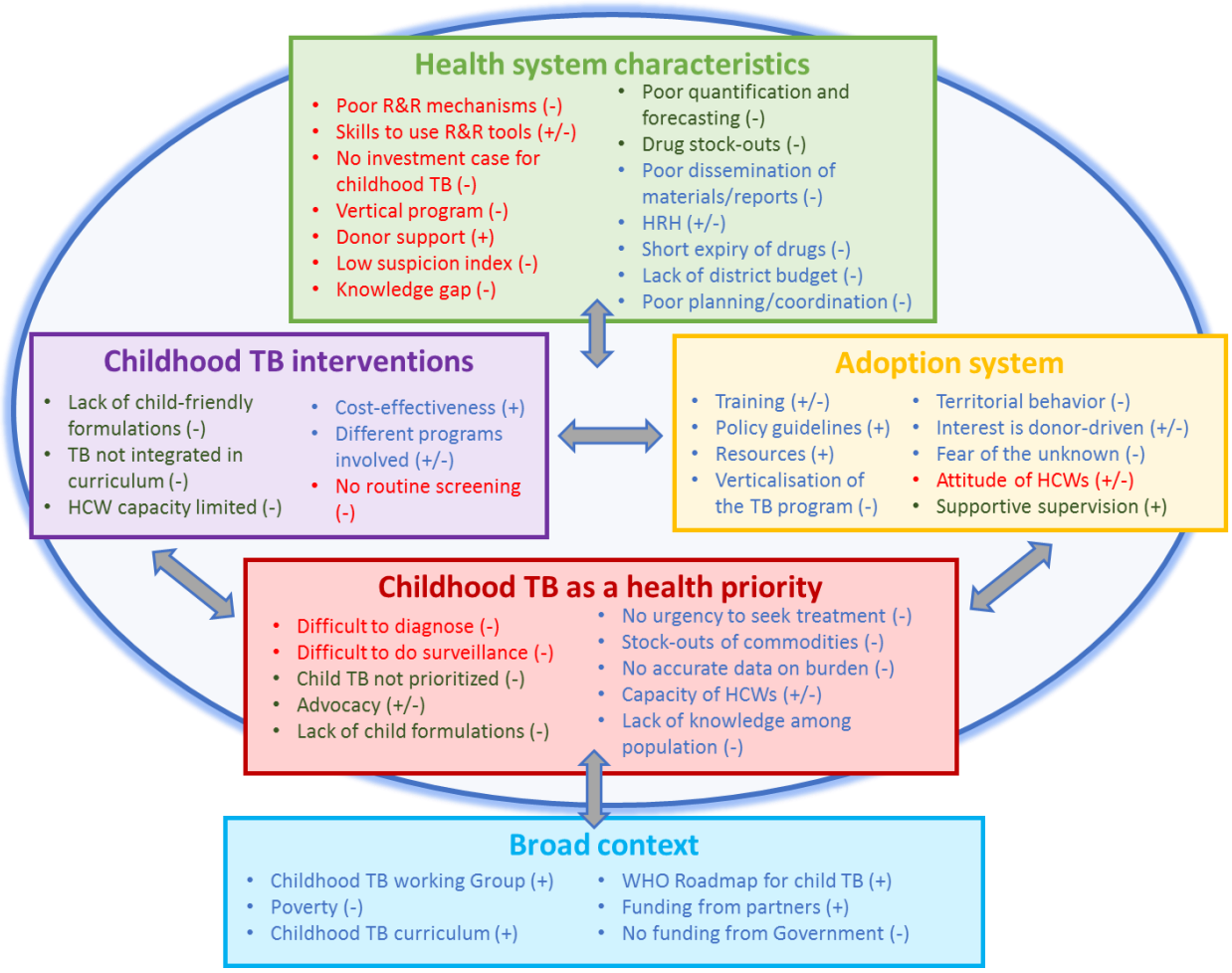

Figure 2: Factors influencing the integration of childhood TB

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

Lessons learnt and needs for change

The needs for change to move childhood TB integration forward, as mentioned by participants during the bilateral meetings at national and district level, as well as during the participatory workshop are summarised by health system function/integration dimension in table 12.

Table 12: Identified needs for change, organised by function of the health system/integration dimension

Policy and governance (normative integration) - Revise policies to gain in clarity - Advocate to decision-makers to prioritise to develop policies to strengthen TB and mobilise resources
Financing - Mobilise financial resources - Explore the possibility of providing incentives for families affected by TB to reduce (catastrophic) out-of-pocket expenses - Financing – largely donor-dependent
Health workforce - Conduct holistic training/capacity building – creating higher levels of suspicion of TB in children in HCWs and VHTs - Provide supportive supervision
Information (Recording and Reporting) - Expand reporting: o Linking of reports by VHTs to DHIS o Screening at all levels and all services - Monitor performance of implementation - Strengthen childhood TB recording and reporting in other programmes
Supplies - Strengthen supply chain management: Diagnostic equipment, equipment for sputum induction, drugs (child-friendly formulations, INH, pyridoxine), biohazard management, sample containers, reagents in the laboratory - Decentralise Xpert® MTB/RIF availability - Accreditation of facilities/providers to supply TB drugs (no system in place at present) – workload, capacity
Planning and Management (professional/organisational integration) - Develop a framework with guide on coordinated and integrated care - would need to be periodically reviewed and appraised o Focus on issues that will make it work, including simple issues like tools and registers o Clarification of goals for integration for users o Clarification of the process of integration - Define implementation - SOPs are needed - Decentralise TB services (diagnosis, treatment, prevention)
Demand creation and healthy behaviours - Expand community awareness to create demand for services - Target Schools: o Awareness through drama and campaigns o Improving conditions at boarding facilities - Involve traditional leaders to create demand for screening of TB and services - Involve traditional healers like herbalists - Create demand for screening, testing and diagnosis of childhood TB through community awareness/sensitisation - Improve housing conditions (e.g. in schools)
Clinical/services integration (including prevention, diagnosis, treatment) - Strengthen the referral system/process (including tools) and back referral o Suggestions: to use VHTs to follow up on patients who are referred to check whether they arrived at their facility; to provide incentives or transport for patients o "Facilitated referrals": patient accompanied by VHT to the HCF (and provision of transport vouchers e.g. for boda boda), similar to what is in place for MCH now

- Strengthen contact tracing for case detection and preventive therapy by VHTs and HCWs: the index case linked to VHT who screens for TB symptoms, takes samples, bring these in for testing and support treatment for those diagnosed with TB
- Link VHTs to private facilities (there are more than 1000 private facilities and about 109 public facilities)
- Link with (mal)nutrition services:
    - Include TB in nutrition programmes: ensure TB symptom and contact screening is done in all malnourished children
    - Improve growth monitoring and link children failing to gain or losing weight with TB services
- Ensure that services are available and ready to meet the demand
- Diagnose EPTB
- Simplify diagnosis – allow for clinical diagnosis

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 workshop, due to an HIV-programme meeting and an emergency malaria-response meeting happening on the same days. Since only one district and only one healthcare facility was visited, the findings may not be generalizable and transferable to all districts.

Conclusions

The Uganda 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 around 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.

Significant progress has been made in putting childhood TB on the national agenda in Uganda, through the appointment of a paediatric TB coordinator, the establishment of a childhood TB TWG, the development of paediatric TB guidelines and a training curriculum, and rolling out of capacity building. Collaboration and joint planning between the NTLP and MCH at national level is setting the scene for broader integration.

Integration of childhood TB is currently limited to activities around TB/HIV services integration (with some integrated reporting). A pilot project with TB/HIV adapted iCCM is planned for late 2016 in three 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. A facility-based training curriculum has been developed that will strengthen service delivery. One pilot project is successfully showing the impact of community-based contact screening, referral and decentralised diagnosis at lower level health facilities. Clear roles for CHWs have been outlined in TB guidelines and policies, but these have not yet been fully

implemented, and therefore the impact of these broader activities at community level on integration and case detection/prevention could not be assessed.
Other health systems functions, including financing and health workforce development, 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, treatment and prevention.

This study suggests the way forward lies with strengthening the referral system, building capacity of HCWs at all levels, contact tracing and further integration with 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 13 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 13: Action points and recommendations

Action points	Responsible	Support required	Timeframe	Remarks
Governance & leadership				
Develop country-specific framework/ roadmap for integrating childhood TB applying a systems lens	NTLP/MCH	Community department; district teams; GF; UNICEF; partners (each partner has a specified region in which they implement activities). Short term T/A or Facilitator, financial support for consultation/ consensus workshops and costing the framework	Dec 2016	Present idea to MCH TWG
Health financing				
Explore the possibility of providing incentives for families affected by TB to reduce (catastrophic) out-of-pocket expenses	NLTP/MCH/ community	GF; UNICEF; partners (each partner has a specified region in which they implement activities. T/A and Financial support required for designing and costing a voucher scheme/ or suitable alternative mechanism and piloting it in a few sites	Dec 2016	Work closely with RH Voucher TWG.
Dialogue with funding agencies to support integrated activities that lead to community systems strengthening (for example Global Fund)	NTLP/MCH	GF focal coordination office; CDC; USAID; UNICEF; CHAI Strengthen MoH Childhood TB TWG and their participation in MCH advocacy activities	July-Dec 2016	
Include integrated childhood TB activities in upcoming funding mechanisms/concept notes/investment case (Global Fund, GFF)	NTLP/HIV/MCH	GF focal coordination office; CDC; USAID; UNICEF; CHAI Support national TWG participation in the development, initiation and roll out of the RMNCAH investment plan, GFF, GAVI, BTC, SIDA, WB and Global Fund projects T/A and financial support to write concept notes/proposals for Childhood TB activities	July 2017- onwards	Incorporate Childhood TB in the GFF, GAVI and other funding streams
Information system (Recording & Reporting)				

Develop data collection tools for all entry points that conduct TB screening	NTLP/MCH/HIV /Resource centre	Participate in the revision of HMIS, e-health and m-health tools including the annual RMNCAH health facility assessment tools under development, and health service delivery standards	2018: Resource centre might review tools in 2017	
Strengthen childhood TB recording and reporting in other programmes	NTLP	Conduct rapid health information and surveillance data systems assessment to understand potential areas for strengthening and inclusion of child TB screening, contact investigation, preventive treatment, treatment and MDR data Introduce Childhood TB surveillance system	2018	
Operational/implementation Research				
Conduct operational research on performance of diagnostic algorithm in local context	NTLP	UNICEF; CDC; USAID; CHAI; Partners. This will be supported by UNICEF in a few selected districts.	2017	Already submitted in the NTLP/UNICEF work plan 2016/17.
Health workforce				
Ensure HCW/provider motivation, skills and attitude • **Training: explore innovative ways for disseminating new guidelines, including e-solutions (include component on communication)**	NTLP	District teams; Implementing partners T/A and financial support to develop e-learning materials on childhood TB within the context of integration and pilot, disseminate and evaluate the materials	Ongoing	Trainings ongoing with support from IPs
Strengthen supervision/mentorship: Integrated support supervision	NTLP	District teams; implementing partners Develop mentorship guidelines for childhood TB within the context of integration.	Ongoing	Paediatric TB is also captured during the TB and HIV support supervision/ mentorship
Train VHTs on contact tracing, TB risk assessment (e.g. TB/HIV iCCM), TB education/awareness, ideally as part of integrated training, basic package of interventions	NTLP	District teams; Implementing Partners T/A and additional funding for the on-going TB/HIV-iCCM integration research is urgently needed.	2017	The anticipated UNITAID funding will support scale up of childhood TB integration The CHEWs system will build on the VHT work.
Supplies/logistics				
Ensure proper quantification of TB drugs	NTLP/ Pharmacy Division	T/A and funding to support National scale up of new Paediatric TB formulations	Ongoing	Ongoing for 2017/20 meds

Decentralise Xpert® MTB/RIF availability	NTLP/NTRL	Financial support for procurement of Xpert® MTB/RIF and T/A for system maintenance.	2017-2020	Included in NSP
Ensure stable supply of child-friendly treatments, including for preventive therapy to all facilities that manage childhood TB	NTLP/ Pharmacy Division	NMS; GF Financial support to ensure availability of IPT	2016 onwards	
Planning and management				
Decentralise TB services	NTLP	Districts, Implementing partners. Inclusion of TB in district work plans T/A and financial support to decentralise implementation of TB, including childhood TB especially contact investigation. Scale up of the DETECT TB and TB/HIV-iCCM approaches.	2017 onwards	
Strengthen TB programme management at district level	NTLP	Same as for Decentralisation of TB services (above)		
Develop SOPs based on integrated childhood TB roadmap (see under leadership and governance)	NTLP	Community department; district teams; GF; UNICEF; and other partners T/A and funding based on the TB roadmap	2017 onwards	
Demand creation and healthy behaviours				
Strengthen adherence, follow-up, advocacy/communication	NTLP/USTP/MCH/communication	T/A and funding needed to disseminate and operationalise the existing national TB communication strategy	2016-2017	
Create demand for childhood TB service by increasing awareness of TB in children	NTLP/USTP/MCH/communication	Operationalise the existing national TB communication strategy to include 'Louder than TB' approach.	2016 onwards	
Service delivery				
Design and strengthen referral systems to ensure identified childhood TB cases access further care	NTLP/MCH/ Community	T/A and funding	2016 onwards	
Ensure access to care of children with TB: Active process, at different levels of care, screening at all contact points	NTLP	Implementing partners	Ongoing	
Explore mechanisms for improving child contacts of TB patient referrals	NTLP/MCH	Implementing partners	2017	

from the community and primary care level		ICCM/TB integration pilot/ feasibility study results dissemination and implementation of the recommendation		
Strengthen contact tracing based on index case, evidence-based and cost-effective • **Active screening for contact (PTB contact but also chronic coughers) at care entry points** • **Ensure sustainability: targeted versus mass screening (e.g. Index cases – mothers, growth monitoring – failure to thrive/loss of weight, investments in community systems – investments needed** • **Integration of contact tracing activities into VHT activities**	NTLP	Implementing partners T/A and financial support to scale up TB contact tracing	2017 onwards	
Increase coverage of asymptomatic contacts with preventive therapy	NTLP/QPPU	NMS		
Use nutrition as a critical entry point (including growth monitoring and management of SAM): Ensure TB is included in revised guidelines	NTLP/MCH/ Nutrition	MOH and technical partners T/A and funding to prioritise and include Childhood TB in the Nutrition guidelines	2017	
Link VHTs to private facilities	NTLP	Funding to roll out the Public Private Mix (PPM) guidelines with integrated community TB component.	2017 onwards	
Include TB screening in mother-baby passport	MCH/NTLP	Funding to support review meeting and printing of passports that include childhood TB information.	2016 onwards	

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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?

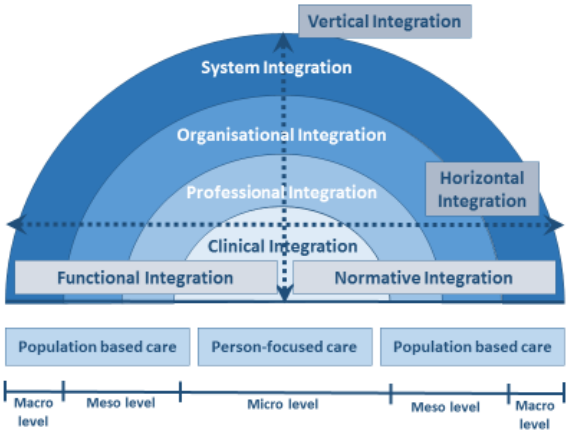

Figure 4: Dimensions of integrated care at the micro, meso and macro level of health care (Adapted from Valentijn* et al*. 2013)

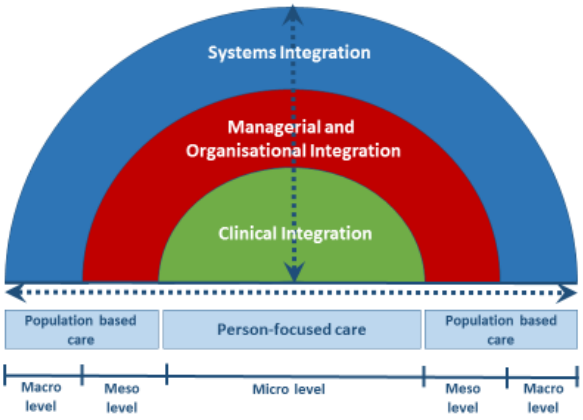

Figure 5: Simplified dimensions of integrated care at the micro, meso and macro level of health care (Adapted from Valentijn* et al*. 2013)

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):

7. Clinical integration

8. Management integration (includes organisational and professional integration)
9. 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):

10. **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;
11. **The intervention** (Is childhood TB care and prevention compatible with existing services?): For example, relative advantage, compatibility with existing health interventions, observability, complexity;
12. **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;
13. **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;
14. **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/NTLP	Dr. Mugabe Frank	Programme Manager – NTLP
	Dr. Sekadde Moorine	Paediatric TB Coordinator
MOH/ACP	Dr. Katureebe Cordelia	Coordinator Pead and Adolescent HIV
MOH	Dr. Christopher Oleke	PHE
MOH	Dr. Rita Atugonza	PO
MOH/Nutrition	Dr. Jacinta Assimwe	Principal Nutrition Officer
	Nakasiita Felista	Nutritionist
MOH/CH	Dr. Namagala Elizabeth	QI Advisor - MNCH
	Dr. Elisha Grant	Technical Advisor - Diarrhoea/Pneumonia
	Albert K Lule	Senior Programme Officer – Nutrition
	Dr. Jesca Nsungwa	ACHS – CH
	Nabanoba Allen	Technical Advisor
	Josephine Naaba K.	CH
WHO	Dr. Bongomin Bodo	NPO CAH
	Dr. Olivie Sentumbwe	NPO/FHP
The UNION Uganda	Dr. Stella Zawedde Muyanja	Project Manager
Baylor Uganda	Dr. Miriam Murungi	TB/HIV Coordinator
District facility visit		
Wakiso HC IV	Naluwalo Veronica	Nursing Officer
District Stakeholder consultations		
Wakiso DLG	Mwombaze Expedit	District TB/Leprosy Supervisor
	Kakeeto Johnson	Health Assistant
	Mpiima Juma	Vector Control Officer
	Namulondo Edith	Biostatistician
	Nabuganda Betty	EPI/FP
	Katumba Sharif	Health Assistant
	Sserufusa Ronald	DDI
	Kagwire Robert	District Health Educator
Lubbe HC II	Namakula Gorreth	Midwife
Magogo H/C II	Katushabe Margret	Nurse
Kyengeza HC II	Babirye Sylivia	Nurse
Wakiso H/C IV	Kakeeto Alex	DTLP Wakiso
National Workshop on childhood TB integration		
MOH – NTLP	Dr. Sekadde Moorine	Paed. TB coordinator
	Dr. Mabuumba Edward	SMO
	Dr. Ebony Quinto	M&E specialist
MOH	Mr. Tabuzibwa Michael	SHE
	Dr. Eisha Grant	CH-TO
	Mr. Albert K. Lule	SPO
	Dr. Jesca Nsungwa	ACHS-CH
	Ms. Namukose Samalie	Senior Nutritionist
	Dr. Namagala Elizabeth	SMO CH
	Ms. Nanyonjo Margret	Child Health
	Ms. Nabanoba Allen	TA CHD
	Ms. Josephine N. Kyaligonza	TA –CH
	Mr. Ronald Ssentuuwa	TA-CHD
NTLP/TRACK TB	Dr. Muchuro Simon	TBIC officer
NTLP	Dr. Claudio Marra	MDR T/A

WAKISO District	Dr. Mijambazi Expedito	DHO
CDC	Rosemary Odeke	PHS-TB
USAID	Herbert Kisamba	Asst. SQIA
The Union	Ms. Annah Nakanwagi	Country Director
	Ms. Stella Zaweedde .M	Project manager
WHO	Dr. Bongomin Bodo	NPO-CAH
	Ms. Semegne	Volunteer
Uganda Stop TB Partnership	Dr. Isiko Kawanguzi Paul	Executive Director
MSH/UHSC	Eric Jemera Nabuguzi	PTA-RMNCH
MSH-STAR-E	Mukuye Andrew	TB Technical Advisor
Star EC	Dr. Moses Olwenyi	Programme specialist PMACT
STAR –EC JSI	Dr. Alex Batwaula	Senior TB/HIV Specialist
Uganda Paed. Assn	Dr. Rebecca Nantanda	President
SHEEMA	Dr. Aine Byabashaija	DHO
Malaria Consortium	Mr. Badru Gidudu Walimbwa	PM
	Dr. Denis Mubiru	PM-ICCM
	Dr. Julian Atim	PM
BAYLOR	Ms. Pauline Anunge	Paed. Research Coordinator
PACE	Ms. Rebecca Babirye	Team lead Child survival malaria
Reach out Mbuya	Dr. Betty Nsangi	Executive Director
USAID RHITES EGPAF	Mr. Muhwezi Darlington	Tech Advisor TB/HIV
IDI	Dr. Nassuna Louise	PMTCT Co-coordinator
CHAI	Ms. Lorraine Kabuuga	EM & diagnostic manager
UNICEF	Dr. Flavia Mpanga Kaggwa	Health Specialist
	Dr. Fred Kagwire	Health Specialist
	Ms. Eunice Esule	RTM Programme Manager
	Dr. Sabine Verkuijl	Consultant

C. Assessment tool

Assessment tool	
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?
Policy 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 behaviours	
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-centred care	Explain how family-centred 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 behaviour	Explain how health seeking behaviour 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	
Influencing 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 (see under clinical/services integration) Planning and Management (professional/organisational integration) Demand creation and healthy behaviours Clinical/services integration (including prevention, diagnosis, treatment) Responsiveness/Quality	