UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH COMMUNITY DEVELOPMENT GENDER ELDERLY AND CHILDREN

NATIONAL OPERATIONAL RESEARCH AGENDA ON TUBERCULOSIS 2015-2020

Foreword

Tanzania is among 22 countries that contribute more than 80 percent of the world's tuberculosis burden. The Ministry of health, Community development, gender, the elderly and children through National Tuberculosis and Leprosy Program (NTLP) has been putting different efforts for the control of the disease in the country.

In the context of limited resources, reaching National and Global targets for the control of TB requires a scale up implementation of approaches which have been proven to be effective. In this regard, the NTLP has identified operational research as one of its pillar strategy in the control of the TB disease, hence the development of this National Operational Research Agenda on Tuberculosis.

The Agenda is intended to guide NTLP, and other stakeholders to prioritise and harmonise operational research on Tuberculosis in Tanzania. It seeks to promote research in TB prevention and care including Drug resistant TB and impact mitigation to ensure that research findings are utilized effectively for programme development. Specifically, implementation of the Agenda will help the Ministry through the NTLP to inform individual researchers and institutions of key priority operational research areas on Tuberculosis to ensure that research activities that are undertaken contribute to the National goals on TB control.

All stakeholders are expected to formulate innovative plans that are aligned to the operational research agenda, and are urged to collaborate and keep the agenda as top priority. The MoHCGEC will continue to support stakeholders and to facilitate the synergy of the various efforts from different partners in the fight against the TB pandemic.

It is my sincere hope that all stakeholders shall join the fight against this pandemic using this Agenda as a platform. I wish to assure you on the Government's commitment to the implementation of the agenda and will continue to work with development partners and other stakeholders in response to the TB burden in our Country

Prof. Muhammad Bakari Kambi

Chief Medical Officer

AKNOWLDGEMENT

This National Tuberculosis (TB) Operational Research Agenda has been developed as part of the implementation process of our NTLP Strategic Plan V; 2015-2020. This Agenda is the result of work of different stakeholders involved in the control of Tuberculosis and leprosy in the country. Through a stakeholders' workshop, it was assured that the new agenda is based on lessons learned and knowledge gaps reflecting the vision of all stakeholders.

The contributors to this document were drawn from government institutions, non-governmental organizations, civil society organizations, academic and research institutions, development partners, as well as selected individuals. I would like to take this opportunity to acknowledge their dedication to the control of the disease and for their valuable contributions, which led to the development of this agenda. Special thanks go to Ms Suzanne Verver from KNCV-Challenge TB Project and the NTLP staff, who championed and took lead of the first stakeholder's workshop for National Operational Research Agenda on Tuberculosis which gave birth to this important document together with establishment of the National TB Operational Research Committee.

The Ministry of Health Community Development, Gender, Elderly and Children also recognizes the significance and financial support provided by KNCV under the Challenge TB Project which made possible for the initiation of the development of this agenda. In addition, the Ministry would like to thank the implementing partners who also contributed to this agenda and are continuing to complement government efforts in the control of tuberculosis disease in the country. Just to mention few; these were Muhimbili University of Health and Allied Sciences (MUHAS), National Institute for Medical Research (NIMR), Ifakara Health Institute (IHI), University of Maryland Dar es salaam, KNCV-Challenge TB Project, APOPO Project, Baylor college of Medicine, Pediatric Foundation.

Finally, but not least, I would like to thank all the NTLP staff who took part on the development process of this Agenda and continue to take the coordinating role for the TB control in the country.

Dr. Neema Rusibamayila
Director of Preventive Services

TABLE OF CONTENTS.

Foreword……....2
Acknowledgement…….3
Abbreviations…….5
Background……....6
TB epidemiology……6
National strategic plan…….....11
Operational Research……12
Research Agenda…….....12
Secondary priorities for the strategic plan period (2015/2016-2020)……....13
Sustainable Collaboration with all care-providers……14
Prevention of TB in PLHIV and joint treatment of TB and HIV……..14
Access to and delivery of treatment for drug susceptible and MDR/XDR TB…….14
Capacity building……...14
Dissemination of Research……15
National TB Research Committee/Network…….....15
References……17
Annex……18

LIST OF ABBREVIATIONS

AFB	Acid Fast Bacilli
APOPO	Anti-Persoonsmijnen Ontmijnende Product Ontwikkeling.
ART	Anti-Retroviral Therapy
CBO	Community-Based Organization
CORPS	Community Owned Resource Persons
CPT	Cotrimoxazole Preventive Treatment
CSO	Civil Society Organization
DOT	Directly observed Tratment
DST	Drug Sensitivity Test
FSWs	Female Sex Workers
HIV	Human Immunodeficiency Virus
IHI	Ifakara Health Institute
INH	Isoniazid
IPT	Isoniazid Preventive Therapy
KNCV	Royal Netherlands Tuberculosis Association
KNTH	Kibong'oto Tuberculosis National Hospital
MDR-TB	MultiDrug-Resistance Tuberculosis
MoHCGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MSM	Men who have Sex with Men
MUHAS	Muhimbili University of Health and Allied Sciences
NGO	Non-Government Organization
NIMR	National Institute for Medical Research
NTLP	National Tuberculosis and Leprosy Programme
OR	Operational Research
PASADA	Pastoral Activities and Services for People with AIDS
PI	Principle Investigator
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
PWID	Persons Who Inject Drugs
SHIDEPHA	Service Health Development and Education for People Living With HIV/AIDS
SOP	Standard Operating Procedure
TB	Tuberculosis
THIMS	Tanzania Health Information Management System
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistance Tuberculosis.

Background

This TB research agenda for Tanzania is based on the following documents:

1. National strategic plan 2015-2020
2. Review of published scientific papers 2004-2015.
3. International literature on TB research:
    a. A Global Action Framework for TB Research: the 3rd pillar of WHO's End TB Strategy (WHO STAG 2015)
    b. International roadmap for TB research (WHO 2011)
    c. Priorities in operational research to improve TB care and control (WHO 2011)

The decision on priorities was made during a national TB research meeting held in Morogoro from 24 – 25 June, 2015, attended by 25 representatives from the NTLP, research institutions, academia and from implementing partners and a CBO. In this meeting research institutes presented their unpublished recent and ongoing and planned research, and new research priorities relevant for NTLP.

The research agenda was designed to:

- Select studies based on priority problems related to TB control in Tanzania
- Assist in solving TB control problems encountered in Tanzania
- Be in line with global needs and initiatives
- Have impact on policy and practice in Tanzania

TB epidemiology

Tanzania is among the 22 high TB burden countries in the world and has the 8th highest TB burden in Africa (1). WHO estimates the prevalence of all forms of TB at 172 (92-277) per 100,000 and the incidence at 164 (157-170) per 100,000 with an estimated case detection rate of 79% (77-83) all forms. TB mortality is estimated at 12 per 100,000 both for HIV positive and negative persons. (WHO Global TB Report 2014, data reflecting 2013, not yet adjusted to newer prevalence survey data published in September 2013) (2).

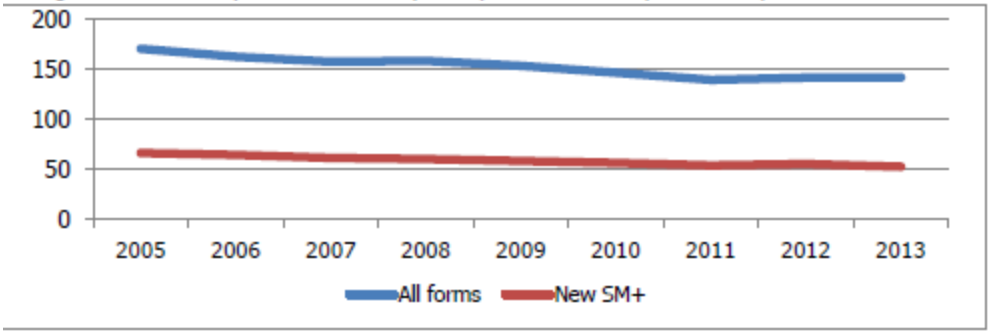
The first national TB prevalence survey was completed in 2012. The prevalence of bacteriologically confirmed TB was 295 per 100,000 adult (>15 years) population (95% CI: 229 – 360). Prevalence was higher in mainland Tanzania compared to Zanzibar, rural compared to urban populations, men compared to women, older compared to younger participants and in participants with lower compared to higher socio-economic position. Case Detection of new smear-positive adult TB patients was estimated to be between 42 and 54%. The majority of identified TB cases were 54 years or older, indicating a shifting epidemic away from young HIV-infected patients. The prevalence of bacteriologically confirmed TB in the adult population of Tanzania is higher than expected; the case detection of new smear-positive adults is markedly lower than previously reported. The report recommends that "There is an urgent need to assess patient identification and the conduct of laboratory procedures in the diagnostic centers. This can be achieved by intensifying supportive supervision in the country which has

been decreased in frequency and intensity during the last few years." (Final Prevalence Survey Report, September 2013) (2)

During the past ten years, the number of cases notified gradually declined, as well as the notification rate. (See figure below). In 2013 there was a slight increase in both new and relapse cases reported from 62,178 in 2012 to 64,053. Up until 2012, the decrease in notifications was considered to be largely attributable to the decline in the prevalence of HIV in the general population (from 7% in 2003 to 5.1% in 2012 (THIMS 2006 and 2012, National HIV Survey) (2), increased access to ART, and economic progress. At the same time, there is some evidence that programme case notification efforts have increased as there has been a steady rise in the number of facilities notifying diagnosed TB cases over the past decade.

The slight increase in case-finding between 2012 and 2013 is attributed to the implementation of case finding efforts in 2013: systematic use in out-patient departments of Standard Operating Procedures (SOPs) for identifying and examining persons with presumed TB, introduction of GeneXpert, roll out of pediatric TB training (654 health care workers representing 258 health facilities were trained on childhood TB in 2013), engagement of community-based groups in identification and referral of persons with presumed TB, and involvement of the private sector.

Figure 8: Trends of TB (all forms and smear positive) notification rates (2005 to 2013)



The burden of TB is highest in the regions where the two largest urban centers are located; Dar es Salaam and Mwanza contributed to 31.2% of the annual notified patients in 2012. This is partly due to population size and a very high notification rate in Dar es Salaam.

Treatment success of all forms of TB has been consistently above 85% since 2006. Case fatality rates reported in the cohort reports decreased steadily over the past 10 years from 11.6% in 2003 to 5.8% in 2012 (2). Increased access to ART for HIV infected TB patients is thought to have contributed to this decline. Vital registration statistics are not reliable, as well as data on patients dying between diagnosis and treatment registration. Treatment success for HIV infected patients reported with new smear positive TB are lower (78%) than in HIV negative TB cases (85%), in part due to higher case fatality rates in those with TB/HIV co-infection as compared to HIV negative patients (8% in 2012) (3).

The prevalence of MDR-TB measured in the drug resistance survey of 2007 was 1.1% (0.5-2) in new patients and 3.1 (0.9-7.9) in retreatment patients. This translates into an annual burden of incident MDR TB cases: of 530 (240-960) and 86 (25-220) among new and retreatment patients with pulmonary TB respectively, making a total 616. (WHO Global TB Report 2014) (3).

The country first started treatment of patients with MDR-TB in 2009 in Kibong'oto National TB Hospital (KNTH), in the Northern Kilimanjaro region (KNTH), where all diagnosed

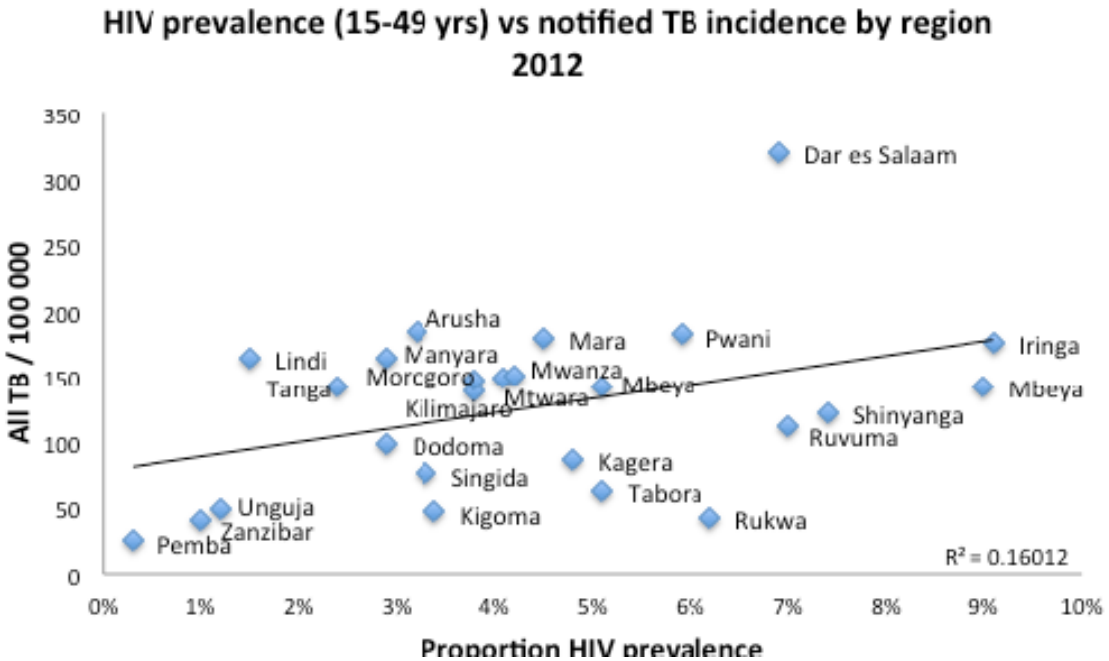
patients were referred from the entire country and admitted for long periods of time. Decentralization of MDR-TB treatment started in 2013 by implementation of an outpatient treatment model from the early phase of treatment initiation, in five sites in three regions Mwanza, Morogoro, and Dar es Salaam. From 2009 to mid-2014, a cumulative total of 286 MDR-TB patients were enrolled on MDR-TB treatment, with 74 of them diagnosed in the first half of 2014. Of these patients, 31% of the 286 patients were HIV co-infected (4)

In 2013, out of 2,780 notified retreatment patients 728 (27%) were tested with GeneXpert or C/DST. Among the total of 2,020 patients (retreatment and new) tested for MDR-TB, 279 (14%) were reported with GeneXpert Rifampicin Resistant TB or MDR-TB (on culture/DST). Treatment success rates of MDR-TB patients have been relatively high for the small cohorts evaluated to date: 73% (2009, n=15), 78% (2010, n=23), and 75% (2011, n=32).

HIV remains a major driver of the TB epidemic in Tanzania Mainland. An estimated 1.4 million persons are living with HIV (PLHIV). According to the Tanzania HIV/AIDS and Malaria Indicator survey 2011-2012, HIV prevalence was nearly twice as high in adult females as males (6.2% in females and 3.8% in males- age group of 15-49 years). In 2013, 83% of notified TB patients were reported with an HIV test result, of which 37% were co-infected (9). Of those, 73% received ART and 98% receive cotrimoxazole preventive therapy (CPT). Efforts to strengthen TB screening among PLHIV have been intensified in Care and Treatment Clinics (CTCs) with over 95% of the PLHIV receiving this service (4). While it is estimated that 10% of PLHIV will develop active TB every year, only about 1% are currently being identified and treated. As a component of the 3I's, TB Infection Control (TB-IC) in all health facilities, and in CTCs and MDR-TB treatment sites in particular, is either absent, or partially implemented without any sound TB-IC assessment and TB-IC plan in place.

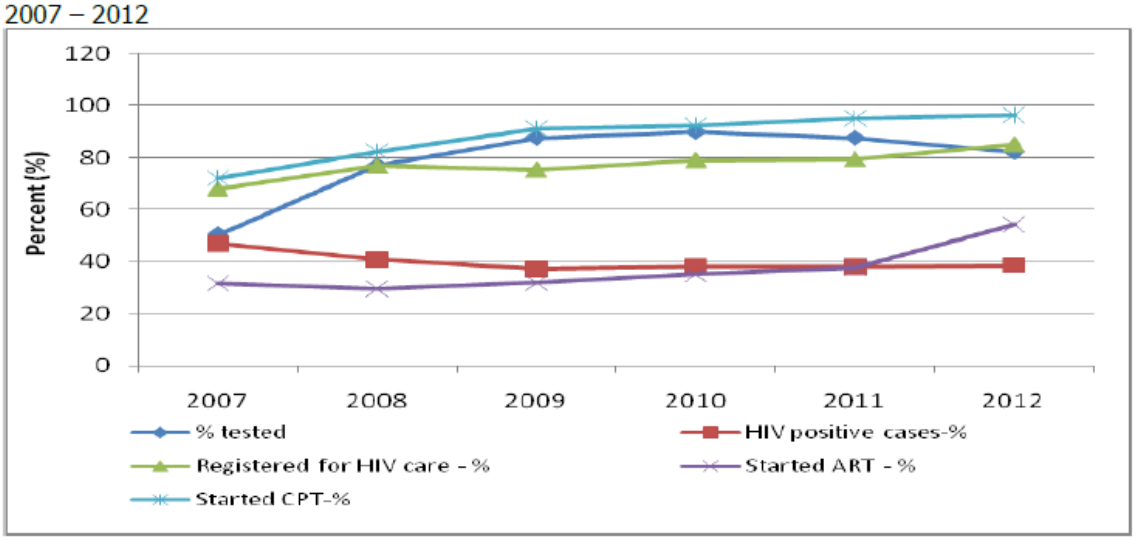
The figure below shows a relatively weak correlation between HIV prevalence and notified TB incidence (R^2 – 0.16) and suggests that the HIV prevalence is not the only factor driving the TB epidemic (e.g. access to care, climate, crowding, poverty).

Figure 27. HIV prevalence versus notified TB incidence by region in 2012.



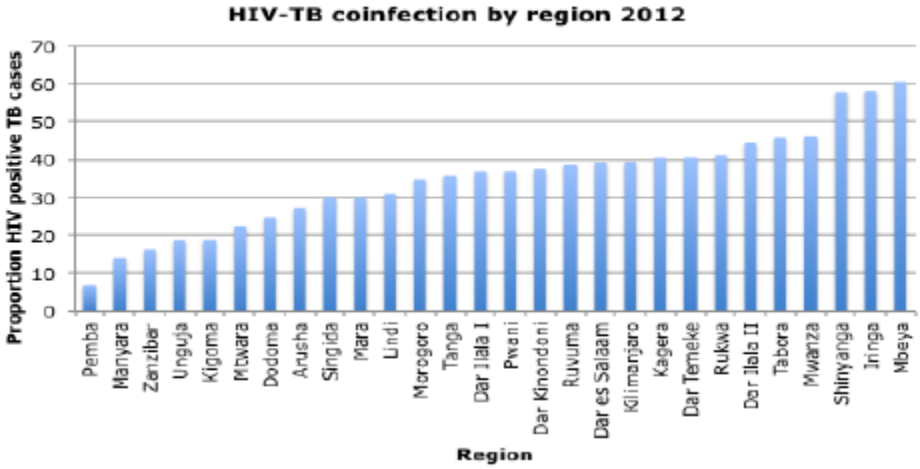
The figure below shows the trends of the major TB/HIV indicators in the period 2007-2012.

Figure 8: Trend of TB patients counselling and testing for HIV, initiated CPT and ART from 2007 – 2012



The figure below from the NTLP annual report shows the large variation of HIV prevalence among notified TB patients between regions.

Figure 1: HIV-TB co-infection by geographical region in 2012



The table below illustrates the coverage and lack of overlap of TB and HIV/ART care services, as well as lack of implementation of IPT for PLHIV. (Global Fund Single TB/HIV Concept Note 2014) (4)

Table 1: Distribution of health facilities by services provided

Sn	Services provided	Number of Facilities
1	Total number of health facilities	6,342
2	PMTCT	4,914 (77.5%)
3	TB DOT	3,267 (52%)
4	ART	1,403 (22%)
5	Both TB and ART services (one stop shop)	547 (9%)
6	CTCs providing IPT services	105 (2%)

Vulnerable and high-risk groups

The following populations are considered vulnerable or high-risk for TB disease in the country.

PLHIV: As documented above, HIV infection remains the most important risk factor for TB in the country for the general population, and for HIV key populations. Currently there is little or no evidence on the prevalence and burden of TB among these key populations (sex workers, MSM, homeless street children, fishing communities, migrants, long distance truck drivers and mobile populations).

Persons who inject drugs (PWID): Drug use is a growing problem in the country, including other co-morbidities such hepatitis C etc.). The population size is estimated at 50,000 (Pangea, 2010) (4). PWIDs in Dar Es Salaam are 12.9 times more likely to have TB than the general population (10). Zanzibar is thought to have a higher concentration of PWID than mainland Tanzania.

Prisoners: TB prevalence among prisoners in Tanzania is reported at rates of 4,000 cases per 100,000 population compared to 295 cases per 100,000 in the general population (4). There is considerable variation in notifications between prisons, depending on regional variations in TB and HIV prevalence, as well as prison conditions (crowding, ventilation) and TB prevention and care services (4).

Mine workers: Tanzania has several extractive industry sites and different forms of mining. The exact magnitude of TB in the mining sector is not well known, however national data show that 60-70% of TB patients in Simanjiro district in Manyara region originate from Mererani mining area. A mass screening campaign in Mererani mining area revealed 31 (4%) smear positive cases among 750 people screened (4).

Patients with diabetes disease: There is growing evidence in Tanzania that diabetes is a significant risk-factor for developing TB disease (4). In a study from Mwanza, the TB prevalence was 1.3% among diabetic patients; conversely, there was 16% diabetes prevalence among TB patients. Co-morbidity of TB and diabetes was associated with a 5-fold increase in mortality (4). The national prevalence of diabetes is estimated to be 7.8% in 2013(4).

Older age groups: The preliminary results of the prevalence survey (September 2013) showed increasing prevalence of TB in persons over 55 years of age. This points to an maturing epidemic where HIV co-infection prevalence is lower. Notifications in this age-group appear

relatively low, compared to the elevated prevalence in this group, suggesting relative under-diagnosis of elderly patients.

Children: Over the last 5 years, approximately 5,000 cases of pediatric TB were notified annually, accounting for between 8–10% of all notified TB patients. It is difficult to estimate the true proportion of TB among children in general, but in Tanzania it is believed to be around 15–20% of all cases (4).

Health care workers: Although clearly a population at risk for occupational acquired TB disease, there are no data available on the number of health care workers diagnosed with TB annually (NTLP Annual Report 2012)

.

HIV key populations: Several organizations in Tanzania provide care to PWID, MSM, FSWs, with outreach workers and peer educators facilitating linkage to drop-in centers, health facilities and other services that have been designed to respond to their needs. A faith-based organization (Pastoral Activities & Services for People with AIDS in Dar es Salaam Archdiocese [PASADA]) diagnosed around 400 TB patients per quarter in 2013-14 including approximately one-half among PLHIV. It also targets other key populations (i.e., PWID, FSWs and MSM). In Zanzibar community workers supported by Community Owned Resource Persons (CORPS) screen PWID for TB disease and do follow-up as required. There are still many organizations working with PLHIV which have not included TB prevention and care in their services (e.g. SHIDEPHA is an organization for PLHIV, having a strong network in the country), which offers many opportunities for better collaboration and coordination with TB partners in the improvement of TB prevention and care for PLHIV.

National Strategic plan

Reference is made to the national strategic plan 2015-2019. The ninth objective of this plan is to increase collaboration between the program and research/academic institutions on operational research

Achievements of the previous 5-year strategic plan were

- TB notifications have been decreasing slightly in the last 3 years,
- TB treatment success of around 90%,
- reduction of death rates among TB patients on treatment from 5% in 2009/2010 to 4% in 2014,
- initiation of ART to HIV/TB co-infected patients is 83%,
- the prevalence of MDR-TB in Tanzania is still low among new and previously treated TB patients

The main challenges identified were:

- The gap between notified TB susceptible cases and WHO estimated cases (63,000 vs 81,000)
- The gap between MDR-TB cases initiated treatment (32 in 2014) and WHO estimated cases (616)
- MDR-TB data is now almost 10 years old. The program plans to conduct a new drug resistance survey in 2016.

- No clear TB operational research agenda and no funding earmarked.

The NSP 2015-2020 specifies the following priorities for 2015-2020:

- Promote OR and capacity building for OR in collaboration with other (academic) institutions.
- A research department will be set up, and staff recruited.
- Develop a research agenda.
- Special attention will be given to research capacity at Kibong'oto Hospital to address MDR-TB.

Operational research

This agenda is focusing on operational research. This has been defined as Research into Strategies, interventions, tools or knowledge which can improve program performance and/or health care delivery (Lienhardt & Cobelens, Int J Tuberc Lung Dis 2011). This implies that veterinary, fundamental, basic research and clinical trials into new diagnostics, drugs and vaccines have not been taken into account.

Overview of published operational research on TB 2004 – 2015 in Tanzania
Out of 187 publications in Pubmed on tuberculosis in Tanzania, 136 were on TB operational research. Topics covered were on:

- TB diagnosis in the era of HIV – acid fast bacilli (AFB) and light emitting diode (LED) microscopy, Line Probe Assay (LPA), Xpert MTB/RIF, Urine LAM, Giant African Rats
- Diagnostics for latent TB infection: QuantiFERON-TB GOLD and Tuberculin Skin Test
- Prevalence of TB in children, pregnant women, Latent TB infection, People Who Inject Drugs
- TB care in high HIV settings (TB/HIV) – knowledge, awareness, delays, Community DOT
- Diabetes and TB/HIV
- Malnutrition in TB/HIV
- Drug resistance

It was concluded that past operational research has had substantial influence on the NTLP policies and strategies, but some areas have not been studied enough such as HIV negative populations, prisoners, refugees, mines, infection control in health facilities, community TB referrals, and TB among the elderly populations

Research agenda

The research agenda was organized around 4 topics, adopted from the document Priorities in Operational research to improve TB care and control (WHO, 2011):

1. Access, screening and diagnosis of TB
2. Sustainable collaboration with all care-providers
3. Prevention of TB in PLHIV and joint treatment of TB and HIV
4. Access to and delivery of treatment for drug-susceptible and M/XDR-TB

Selected priority research questions for year 1

1. Which is the best model of accessing MDR-TB treatment?
    a. Home-based vs health facility
    b. Mixed model
2. How much will intensified case finding methods from targeted groups such as communities, CSOs, volunteers and traditional healers increase case notification?
3. How to increase pediatric case detection?
4. What is the shared agenda of different care providers (private & NGO providers) and how can this facilitate establishment of sustainable collaboration?
5. Are PLHIV properly screened for TB and how can this be improved?
6. What is the burden of TB among miners?
7. What are the barriers to timely definitive diagnosis and treatment after TB suspicion?
8. How much can enhanced TB screening at all entry points in health facilities (government, private and pharmacies, MCH, wards) increase case notification?
9. How much is the out of pocket costs borne by TB patients while seeking for diagnosis and during treatment? Impact of cost of TB diagnosis, treatment and loss of income? How to screen and increase case finding in the elderly?
10. drug resistance survey in 2016.

In the box the priorities for year 1 are indicated.

Secondary priorities for the strategic plan period

Area 1: Access, screening and diagnosis of TB including contact tracing

1. How much can new diagnostic centers in rural areas contribute to improve case detection?
2. How to detect patients without having typical TB signs and symptoms?
3. How to select/screen high risk clients for TB (eg diabetes, elderly)
4. How to improve use of available diagnostic tools eg GeneXpert and Chest x-ray? (Currently underutilized), and how much increase in TB case detection can be achieved? How to maximize/improve screening and diagnostic algorithms to improve TB yield?
5. What are the barriers to starting TB treatment, both patient delay and health systems delay? Impact of cost of TB diagnosis, treatment and loss of income?
6. What will be the impact (on quality, case notification and human resources) of integrating TB management with other services
7. How to improve sputum specimen transportation within the laboratory network
8. How to reduce sample contamination
9. What is the feasibility of using rats to screen TB in different settings (eg hospitals, community screening) and what is cost-effectiveness compared to Xpert?

Area 2: Sustainable collaboration with all care-providers

1. What is the capacity of care providers (do mapping) and how can this enhance linkages amongst different care providers

Area 3: Prevention of TB in PLHIV and joint treatment of TB and HIV

1. Isoniazid preventive therapy (IPT) for PLHIV:
   a. What is the optimal duration and protective effect of IPT? (not repeating trials that have been done elsewhere, but a meta analysis of cohorts in different established groups offering IPT in the country)
   b. What is the IPT uptake in the country? Any challenges and opportunities?
   c. Does IPT increase INH resistance?

2. Miners, Migrants (Refugees)
   a. What is the burden, drug resistance and dynamics of treatment in miners (adherence, monitoring treatment outcome)
   b. How can we harmonize TB regimens and registers between countries

3. Prisoners, PWID, Sex workers
   a. What is the magnitude of TB/HIV co-infection in these risk populations?
   b. What is the dynamics of treatment outcome in these risk populations (adherence, monitoring treatment outcome)

Area 4: Access to and delivery of treatment for drug susceptible and MDR/XDR Tuberculosis

1. Is there enough capacity to decentralize MDR-TB services – human resources, infrastructure, network, promoting community awareness
2. Will decentralization increase access to treatment?
   a. reducing time to access
   b. Increasing acceptance and compliance
   c. Will it increase treatment success
3. What is the sustainability of decentralization?
4. What socio-support can be obtained from the communities
5. How to implement new MDR-TB regimens properly? What level of pharmacovigilance to establish?

Capacity building

Numerous research capacity building activities for health research are ongoing in Tanzania, including those by NIMR and MUHAS-school of public health. Most activities are covered by project financing, threatening the sustainability. The following suggestions for capacity building have been made:

- Capacity building be included into new proposals

- Promote use of TB research agenda in generating student projects in high learning institutions-MUHAS/NIMR
- Obtain/Establishing awards for student projects addressing TB research agenda
- Promote attendance to online courses for example coursera, UNION
- Share advertisements for NIMR and courses from other institutions
- Set-up a shared online accounts using media such as facebook, dropbox for networking
- Develop a website for the network, to be hosted on NIMR and/or NTLP website
- Promote use and implementation of the curriculum for TB control and prevention for higher learning institutions, developed some years ago

Dissemination of research

The dissemination of TB related operational research should always first be targeted at the local audience, before publication in national, regional and international scientific journals. Both NTLP, Academic partners, health workers and community on site should be included in dissemination events.

National TB research committee/network

During the national TB research meeting it was decided to establish a national TB research committee that will include MoH, NTLP, research partners and implementers and donors supporting TB control in the country, both government, private, NGOs and CSOs. The secretariat will be composed of 5 members purposefully selected: NTLP, NIMR, IHI, MUHAS, and at least one NGO. For year 1, NTLP will be the Chair and NIMR the secretariat. The terms of reference of the national committee will include:

a. general
   - Coordinate and keep oversight of the OR activities in line with the national priorities, strategic plans, guidelines and norms;
   - Create and promote an enabling environment for OR among all health staffs, e.g. training, appropriate equipment and infrastructure and recognition and promotion, etc.
   - Facilitate OR networking and sharing of information between program staff and researchers in different institutions.
   - Provide oversight to ensure the quality of evidence generated through OR and evaluate the overall implication of research results in terms of programmatic implementation.
   - Promote uptake and implementation of innovations and best practices
   - Facilitate and promote strategic dissemination of results through different forums, media, etc and advocate for use of evidence generated from OR to improve policy and service delivery
   - Recognize and promote capacity building of young researchers, for example through mentorship programs and young PI awards

b. Related to funding:
   - Create a pooled funding mechanism for the promotion, conduct and utilization of need based TB OR in Tanzania.

- Solicit, manage and facilitate securing research grants in collaboration with donors and implementing organizations.
- Design a mechanism for merit based availability of grants in collaboration with donors, funding organization and beneficiaries
- Maintain appropriate documentation of grants and provide regular update of the overall status of grant mechanism for donor as per the agreed framework and frequency;
- Announce calls for proposals using appropriate media; evaluate and approve proposals for funding based on merit and national priorities.

The secretariat will have the following tasks:

- Serve as a voting secretary of the TB RESEARCH COMMITTEE and prepare and maintain meeting minutes, proceedings and records.
- Along with the chairperson of TB RESEARCH COMMITTEE and core group, communicate with TB RESEARCH COMMITTEE members for update and facilitation of regular meetings
- Promote and actively participate in OR capacity building activities and conduct of relevant operational research and utilization of findings for informed decision making at national level.
- Facilitate and participate in ensuring the availability and uptake of research findings through preparation of newsletters, summary reports and policy briefs and inform the population at large through different outlets including electronic and print media.
- Facilitate and support the integration of OR in different programs and utilization of results in accordance to the guidance and norms of the country.
- Participate in monitoring and quality assurance of OR projects in their respective area.

REFERENCES

1. WHO, Global Tuberculosis Report, 2014
2. The First National Tuberculosis Prevalence Survey in the United Republic of Tanzania Final Report September 2013
3. THIMS National HIV Survey, 2012
4. Ministry of Health and Social Welfare (MOHSW), TB Epidemiological and Impact Analysis, 2013
5. NTLP Annual Report, 2012
6. WHO Global Tuberculosis Report, 2014
7. NTLP Annual Report, 2013
8. National AIDS Control Programme Care and Treatment report 2013
9. Global Fund Single TB/HIV concept note, 2014
10. Helping Tanzania Stop an HIV Epidemic Driven by Injection Drug Use, Pangea Global AIDS Foundation, 2010
11. Gupta et al., Active case finding for tuberculosis among people who inject drugs on methadone treatment in Dar es Salaam, Tanzania, IJTLD, 2014
12. USAID. Tuberculosis in prisons: a growing public health challenge. USAID Bureau for Global Health. Washington, DC. 2014.
13. Nsajigwa et al 2013 poster.
14. Manyara Regional Mining Association. MAREMA Report 2013
15. National TB Diabetes Operational Guidelines, 2012
16. Faurholt-Jepsen et al, Diabetes is a strong predictor of mortality during tuberculosis treatment: a prospective cohort study among tuberculosis patients
17. From Mwanza, Tanzania. Trop Med Int Health. 2013 Jul;18(7):822-9. doi: 10.1111/tmi.12120. Epub 2013 May 6.International Diabetes Foundation Atlas, 2013
18. Jenkins et al., Incidence of MDR-TB in children: a systematic review and global estimates. The Lancet, May 2014

Annex 1. List of participants

SN	Organisation	Expected # of parti-cipants	Name of participant	Contacts (email and/or phone number)	attended
1	NTLP	3	Dr Beatrice Mutayoba	beatricemutayoba@yahoo.com; beatricemutayoba@ntlp.go.tz	1
			Dr Deus Kamara	vedastusk@gmail.com	1
			Dr Zewana Kondo	zuweinakondo@gmail.com	1
2	NIMRI	3	Dr Mfinanga	gsmfinanga@yahoo.com	1
			Dr Julius Massaga	jmassaga@gmail.com/ jmassaga@nimr.or.tz	
			Dr Amos Kahwa	akahwa@hotmail.com	1
3	Zanzibar Integrated HIV, TB and Leprosy Program (ZIHTLP)	2	Dr Ahmed Khatibu	ahmedbenga@yahoo.com	
			Dr Khamis Suleiman	hamisznz@yahoo.com	
4	CDC	1	Godwin Munuo	munuoG@tz.cdc.gov	
5	Ifakara Health Institute (IHI)	1	Dr Lucas Ferner or	lukas.fenner@unibas.ch	
			Dr Francis Mhimbira	fmhimbira@gmail.com	1
6	MUHAS -School of Medicine	1	Dr Tumaini Nagu	jtjoyce20@hotmail.com or jtjoyce20@gmail.com	1
7	KCMC/KCRI	1	Dr Gibson Kibiki	gkibiki@gmail.com	
8	Walter Reed	1	Dr Julius Muhumuza	juliusmuhumuza@gmail.com	
9	PATH	1	Dr Zahra Mkomwa	zmkomwa@path.org	
10	AMREF	1	Dr David Ngilangwa	david.ngilangwa@amref.org	
11	Interactive Research & Development (IRD)	1	Saira Khowaja	saira.khowaja@irdresearch.org	
12	Baylor Pediatric Initiative	1	Dr Mercy	mminde@baylortanzania.or.tz, mercyminde@yahoo.com	1
13	Sokoine University of Agriculture (SUA)-APOPO Program	1	Cox Christophe	christophe.cox@apopo.org	1
		1	Georgies Mgode	apopo@apopo.org	1
14	USAID	1	Dr Ezra Mwijarubi	emwijarubi@usaid.gov	
15	NACP	1	Angela Ramadhani	arshayo@yahoo.com	
16	JSI	1	Deogratius Kimera	dkimera@tz.pfscm.org	

		1	Vincent Manyilizu	vmanyilizu@tz.pfscm.org	1
17	Local consultant	1	Dr. Egwaga	egwagas@yahoo.co.uk	1
18	KNCV	2	Dr Vishnu Mahamba	vishnu.mahamba@kncvtbc.org	1
			Amani Maro	amani.maro@kncvtbc.org	1
19	Maryland Global Research Initiative (MGRI)	1	Dr Abubakar Magimbi	amaghimbi@mgitanzania.org	1
20	WHO	1	Dr Neema Simkoko	simkokon@who.int	
21	Swiss Tropical Research Institute	1	Representative	manfred.stoermer@unibas.ch	
22	Mbeya Medical Research Program (MMRP)	1	Dr. Nyanda Elias Ntinginya	nelias@nimr-mmrc.org	1
		1	Dr. Leonard Maboko		1
23	ICAP	1	Dr Veronica Mugisha	vm2208@columbia.edu, mp2984@columbia.edu	
		1	Hussein Mtiro	vm2208@columbia.edu, mp2984@columbia.edu	1
24	KNCV HQ	1	Suzanne Verver	suzanne.verver@kncvtbc.org	1
25	MUHAS -TRIM TB	1	Dr Sabina Mugusi	sabina.mugusi@gmail.com	1
26	International Training & Education Center for Health (I-TECH)	1	Flavian Magari	fmagari@itech-tanzania.org	
27	GFATM	1	Dr Peter Mgosha	pmgosha@gmail.com	
28	Save the Children (SCI)	1			
29	MKIKUTE	1	Dickens Bwana	bwanadickens@yahoo.com	
		1	Joseph Mapunda	lussymapunda@yahoo.co.uk	1
30	Kibong'oto NTH	1	Dr Riziki Kisonga	kisonga2002@yahoo.com	1
31	Four RTLC	4			
	Total	**35**			
	Pwani	1	Dr Mpangile 0754 615914	'adenmpangile@ymail.com'	1
	Arusha	1	Dr Ntulwe 0713 777721	drchonge@yahoo.com	1
	Zanzibar	1	Dr Julius 0779 217750	'obedmshanaj@yahoo.com'	1
	Dar es Salaa	1	Dr Mteza 0715 879348	dr_mteza@yahoo.co.uk	
	Mwanza	1	Dr William	'wibyemelwa@yahoo.com'	
					25