



TUBERCULOSIS: DATA ASSESSMENT IN KEY, VULNERABLE AND UNDERSERVED POPULATIONS IN KENYA



REPORT
January 2018

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P O Box 112-00202, KNH

Tel: +254 20 386 1596, 251 5790

Nairobi, Kenya

www.kelinkenya.org

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P O Box 13776-00800, Nairobi

Tel: +254 708 484 878/ +254 714 214 303

Nairobi, Kenya

Table of Contents

ABBREVIATIONS	4
ACKNOWLEDGEMENT	5
EXECUTIVE SUMMARY	6
INTRODUCTION	7
KENYA: GEOGRAPHY, DEMOGRAPHY AND HEALTH OVERVIEW	7
1.0 KEY FINDINGS AND RECOMMENDATIONS	9
1.1. KEY FINDINGS	9
1.2 RECOMMENDATIONS	12
1.2.1 Recommendations to the National Government	12
1.2.2 Recommendation to County Governments	15
1.2.3 Recommendations to civil society organizations (CSOs)	16
2.0 BACKGROUND, METHODOLOGY AND SUMMARY	18
3.0 UNDERSTANDING AND DEFINING KEY, VULNERABLE AND UNDERSERVED POPULATION IN KENYA	22
3.1. Drivers of TB in Kenya	23
3.2. TB and HIV in Kenya	25
3.3. TB and Healthcare Workers in Kenya	28
3.4. TB and Prisons in Kenya	29
3.5. TB and Refugees in Kenya	30
3.6. TB and Long-Distance Truck Drivers in Kenya	31
3.7. TB and urban slums in Kenya	32
3.8. TB and Diabetics in Kenya	33
4.0 FIELD RESEARCH FINDINGS	35
4.1 Recommendations with Timelines	41
Annexures	43

LIST OF FIGURES

Figure 1: Age distribution of prevalence and TB case notification by gender	8
Figure 2: TB Programme funding includes staff, drug-susceptible TB drugs, laboratories, patient support, community engagement, public-private mix surveys and operational research	17
Figure 3: Age distribution of prevalence and TB case notification by gender	19
Figure 4: TB/HIV Trends in Kenya	23
Figure 5; TB case notification by year	24
Figure 6: TB/HIV Trends in Kenya.1 HIV is a significant risk factor for HIV and over the years, there has been an increase in the TB/HIV coinfection possibly due to intensified screening.	27

LIST OF TABLES

Table 1: HIV/TB Co-infection rates per county	25
Table 2: Key Population Estimates per County	36
Table 3: County Specific Key and Vulnerable Populations	38

1 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report, ibid.*

ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immuno-Deficiency Syndrome
BMU	Basic Management Unit
CHVs	Community Health Volunteers
CSOs	Civil Society Organizations
NTLD-P	National Tuberculosis Leprosy and Lung Disease Program
DHIS	District Health Information System
DR-TB	Drug resistant TB
DOT	Directly Observed Treatment
FGDs	Focus Group Discussion
IDF	International Diabetes Federation
KVU	Key, Vulnerable and Underserved populations
KDHS	Kenya Demographic Health Survey
HBCs	High Burden Countries
HIV	Human Immuno-Deficiency Virus
HMIS	Health Management Information System
IPT	Isoniazid Preventive Therapy
KELIN	Kenya Legal and Ethical Issues Network on HIV and AIDS
KMA	Kenya Medical Association
KIIs	Key Informant Interviews
LAM	Lipoarabinomannan
LTBI	Latent TB infection
MDR-TB	Multidrug-resistant Tuberculosis
MOH	Ministry of Health
NGO	Non-Government Organisation
OPP	Out of Pocket Payments
PLHV	Person living with HIV/AIDS
TB	Tuberculosis
TIBU	“Treat” It’s an android based application running on handheld devices and stores data online which is accessible via the internet.
TST	Tuberculin skin test
WHO	World Health Organisation
XDR-TB	Extensively drug-resistant Tuberculosis

ACKNOWLEDGEMENT



I take this opportunity to thank Stop TB Partnership for the financial and technical support towards piloting a *Data assessment for TB Key, Vulnerable and Undeserved Population* in Kenya.

I am grateful to communities of people living with HIV, TB survivors, members of key and affected populations, development partners, government agencies at the national and county level, whose feedback was immensely useful. I appreciate their support and partnership in undertaking this assessment. Special thanks goes to the National Tuberculosis Leprosy and Lung Disease Program (NTLD), AMREF Africa-Health, Stop-TB Partnership (Kenya), World Health Organisation (WHO) Country Office, County Tuberculosis Leprosy and Lung Disease Coordinators (CTLs) from Busia, Homa Bay, Kisumu, Nairobi and Mombasa, Kenya Prisons, MSF-Kenya, National Empowerment Network of PLHIV in Kenya (NEPHAK), Jinsi Yangu, Center for Disease Control (CDC) Country Office, Talaku Community Organisation, Pamoja TB Group, among others. The multi-sectoral approach provided key insights in to the assessment. The full list of the participants is included in Annex 1

I also thank the consultant, Dr Stella Bosire, for the excellent research and compiling the assessment report. Lastly, I appreciate the KELIN team - Lucy Ghati, Timothy Wafula and Edgar Makona - for their dedication, leadership and providing strategic direction in ensuring the assessment was a success.

A handwritten signature in black ink, appearing to read 'Allan Maleche'.

Allan Maleche
Executive Director (KELIN)

EXECUTIVE SUMMARY

Kenya Legal and Ethical Issues Network on HIV and AIDS (KELIN) with technical and financial support from Stop TB Partnership piloted a *Data Assessment of TB Key, Vulnerable and Underserved population in Kenya*. The assessment was undertaken with the following objectives:

- To prioritize key populations most affected by TB in Kenya and illustrate impact of data limitation on access to prevention, treatment, care and support services;
- To develop recommendations to address gaps in access to prevention, treatment, care and support for TB key, vulnerable and underserved populations.

It should be noted that through multiple partnerships, the National TB program and donor-funded projects are working towards achieving 80% reduction in new TB cases, 90% drop in TB mortality and 100% protection against catastrophic expenditure for TB.²

TB burden is heavy among the poor and vulnerable, aggravating social inequalities. Generally, data on key and vulnerable population is limited mainly due to lack of a surveillance mechanism and effective monitoring of TB prevalence among risky populations. Addressing the vulnerable population is critical towards reducing TB epidemic in a country whose TB prevalence has doubled, 40% of TB infections are missed and 83% of TB infection occurring among HIV negative people.³

² World Health Organization (2017) *The End TB Strategy*, available at <http://www.who.int/tb/strategy/en/> (accessed February 22, 2018).

³ National Tuberculosis Leprosy and Lung Disease - Program (2016) *Kenya Tuberculosis Prevalence Survey 2016: Fact Sheet*, available at <https://www.chskenya.org/wp-content/uploads/2017/04/TB-Prevalence-Survey-Findings-and-Call-to-Action.pdf> (accessed February 22, 2018).

Critical in addressing TB infection lies in addressing, social, cultural, legal and economic factors. This will include mapping the key population according to regions, developing indicators for surveillance, passive to active case findings with engagement of communities and key population, integrating TB services among other key population services such as methadone therapy, increasing political will and developing social nets to protect TB patients against catastrophic financial expenditure.

This calls out for defining who the key and vulnerable population are and prioritizing their needs towards a more responsive TB care. This report outlines the findings and recommendations from the assessment process in Kenya, which entailed desk research, key informant interviews, focus group discussions, stakeholder meeting and a validation meeting.

The report is structured as follows: First, the report gives a snapshot of the geography, demography and health statistics of Kenya – providing an overall picture of the country. The report also outlines the process that was followed in conducting the assessment. This includes the process stakeholder engagement through working group meetings, key informant interviews and consultative forums.

Second, the report gives a summary of the key findings emanating from this assessment. This summary indicates findings from both desk research and field interviews. Third, the report gives the overall recommendations of this assessment.

These recommendations are based on an analysis of the key findings and consultation with various stakeholders during the assessment process. Lastly, the report gives a detailed account of the methodology of the assessment, the situation of TB in Kenya and detailed findings of the assessment.

INTRODUCTION

KENYA: GEOGRAPHY, DEMOGRAPHY AND HEALTH OVERVIEW

Kenya is on the eastern side of Africa with an estimated population of 43 million people, the 29th most populated country in the world. The country has a total area of 582,650 km² and borders Uganda, Tanzania, Ethiopia, South Sudan and Somalia. It is divided into 47 counties with 75% of its population living in rural areas. The capital city of Kenya is Nairobi with an estimated population of 3.5 million people.

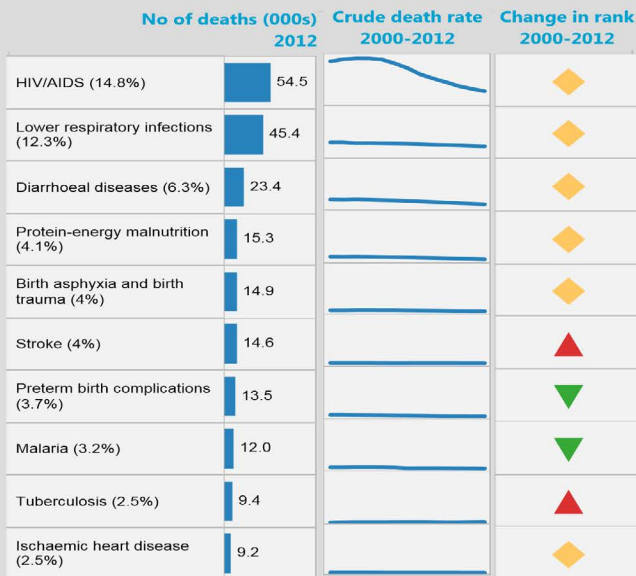
The population of Kenya is diverse with 44 ethnic communities. The population is young with 60% of the population under the age of 30. The World Health Organisation (WHO) reports that the life expectancy in Kenya was estimated at 63.4 years in 2015.⁴ The infant mortality had improved from 77 to 52 per 1000 live births. The current maternal mortality rate stands at 362/100,000. Wide disparities in health occur due to social-economic, gender and geographical disparity. Immunization coverage was at 79% and infectious diseases are the leading cause of morbidity and mortality in Kenya. HIV and AIDS is responsible for 29.3% of all deaths, TB contributes to 14.4% while malaria contributes to 16%. Non-Communicable Diseases account for more than 50% of the total admission and over 50% of the hospital deaths in Kenya. Prevalence of diabetes in persons aged between 20-79 years is 4.7%.⁵

⁴ WHO (2015) *World Health Statistics 2015*, available at http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439_eng.pdf (accessed February 20, 2018).

⁵ See Ministry of Health (2015) *Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases 2015 – 2020*, available at <http://ianphi.org/documents/kenyastrategyforNCDs.pdf> (accessed February 20, 2018)

Top 10 causes of death

HIV/AIDS was the leading cause of death, killing 54.5 thousand people in 2012



Rank decreased increased no change

Deaths by broad cause group



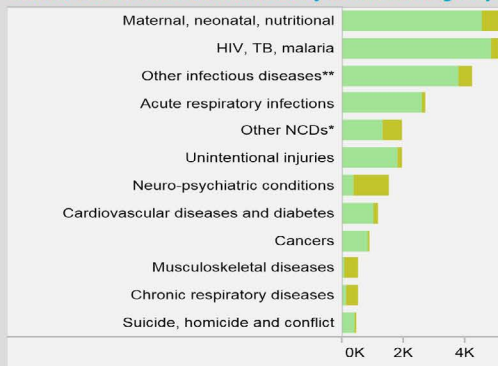
Causes

- HIV, TB, malaria
- Acute respiratory infections
- Other infectious diseases
- Maternal, neonatal, nutritional
- Cardiovascular diseases and diabetes
- Cancers
- Chronic respiratory diseases
- Other NCDs
- Suicide, homicide and conflict
- Unintentional injuries

Burden of disease, 2012

Disability-adjusted life years (DALYs) are the sum of years of life lost due to premature mortality (YLL) and years of healthy life lost due to disability (YLD).

DALYs, YLL and YLD (thousands) by broad cause group



*Other noncommunicable diseases (NCDs) including non-malignant neoplasms; endocrine, blood and immune disorders; sense organ, digestive, genitourinary, and skin diseases; oral conditions; and congenital anomalies.

** Infectious diseases other than acute respiratory diseases, HIV, TB and malaria.

YLL YLD

Probability of dying, 2012

Probability of dying between relevant exact ages, for a person experiencing the 2012 age-specific mortality risks throughout their life.

Before age 15, all causes	Male	28%
	Female	24%
Before age 70, all causes	Male	70%
	Female	63%
Between ages 15 and 49, from maternal causes	Female	22%
Between ages 30 and 70, from 4 major noncommunicable diseases (NCDs)	Both sexes	18%

~Cancers, cardiovascular diseases, chronic respiratory diseases and diabetes

Source: Country statistics and global health estimates by WHO and UN partners
For more information visit the Global Health Observatory (http://who.int/gho/mortality_burden_disease/en/)
Last updated: January 2015

Figure 1: Kenya WHO Health Statistical Profile.⁶ The above figure highlights the top 10 causes of mortality in Kenya. HIV, TB and Malaria continue to have a high burden.

⁶Gordon C McCord, Anne Liu & Prabhjot Singh (2012) "Deployment of community health workers across rural sub-Saharan Africa: financial considerations and operational assumptions," *Bulletin of the World Health Organization* 2012, available at <http://www.who.int/bulletin/volumes/91/4/12-109660/en/> (accessed January 17 2018).

PART I

1.0 KEY FINDINGS AND RECOMMENDATIONS

1.1. KEY FINDINGS

(a) Resources and Opportunities for data collection, planning and implementation of key population TB interventions and programs

- i) The assessment established that there are limited resources and opportunities for data collection, planning, and implementation of TB key population interventions and programmes. There is high donor dependence and the government allocated minimal resources for TB. Reports from the County respondents indicate that some of their budgets for TB had been reduced significantly deterring successful TB programming.
- ii) The respondents reported that data collection at facility level was done manually and the tools used did not disaggregate the data to reflect gender, social, cultural, economic and behavioral risks to TB. The respondents recommended that resources be allocated for automation of data at facility level to improve efficiency, validity, reliability and confidentiality of records.
- iii) A progressive approach was reported from the County Government of Kisumu which has supported a key population (men who have sex with men) led facility which offers TB/HIV care by assigning it

a Master Facility code (MFL). The health facility shares data collected for TB with the County utilizing the TB registry. This partnership has seen sensitization of healthcare workers to treat and capture data from all persons irrespective of sexual orientation.

(a) Population size estimations for key and vulnerable populations

- i) The assessment established that there were no population estimates for TB Key, Vulnerable and Underserved populations in Kenya and that Kenya has not conducted any comprehensive size estimation of the key populations. The minimal data that exist reflect on TB/HIV co-infection among certain HIV key populations.
- ii) Similarly, the assessment established that there are no key populations (KP) measures (indicators) to capture specific TB risks, drivers and service access barriers such as behavioral, social-economic and legal factors.
- iii) Existing data captured male and female sex and not the transgender or intersex population. Further, the respondents indicated that the data capturing software TIBU had no indicator on other key populations except on HIV, prisoners, smoking history and diabetes.
- iv) The respondents reported that the District Health Information System (DHIS) provided purely clinical information and did not measure critical TB prevalence, size, behavioral risks and service access barriers among key populations.

- v) There is no mechanism in place to document non-statistical and non-representative measures including perceptions, beliefs, opinions, and behaviours of key and vulnerable populations.
- (b) Mechanisms for surveillance and effective monitoring of TB prevalence and behavioural risks in key populations. The assessment established that:**
- i) The key and vulnerable population data included in the TB surveillance mechanism were that of persons living with HIV (PLHIV) and prisoners. The respondents reported that this is done within the HIV programme where indicators are available for screening. TB data collected from the HIV programs does not disaggregate the data in risks and drivers. On the other hand, data on key populations reflected those who access the available services and those not reached were left out.
 - ii) At facility level, the TB data were recorded and then aggregated at national level based on age and sex. The key population with recorded data in this sense were PLHIV and prisoners. Only the Sex workers outreach programme (SWOP) clinics supported by partners had expanded their tools for data collection to capture some risky behaviours.
 - iii) There is minimal financial allocation for TB surveillance among key and vulnerable population. The prison TB surveillance is donor supported which is unsustainable. Further, it is recommended that health care workers (HCW) have six monthly Latent TB infection (LBTI) screening which does not occur partly due to the high cost of investigative tools such as Lipoarabinomannan (LAM) as Tuberculin skin test (TST) was prone to errors.
 - iv) Not all populations were screened for TB. Stigma, legal and social barriers hindered routine screening for the mobile population. Diabetic patients did not have routine screening of TB at clinical level.
 - v) Drug resistance surveillance in persons newly diagnosed with TB was not comprehensively captured due to the shortages in numbers of GeneXpert machines. Nairobi a high prevalence region had thirteen (13) GeneXpert machines which were shared among different facilities.
 - vi) The respondents reported that the available TB data from surveillance was scanty and unable to inform TB national strategic and investment plan for key and vulnerable population.
 - vii) The available data prioritized in the National TB Programme (NTLD) strategic plan for Key and Vulnerable population had no clear implementation plan.
 - viii) Respondents underscored the need to report TB independently on the Kenya Demographic Health survey as is done for HIV and Malaria.

- (c) **Mechanisms in place to ensure personal safety and confidentiality of key populations throughout the process from data collection, analysis to reporting**
- i) The respondents reported that no guidelines existed to ensure personal safety and confidentiality of vulnerable populations throughout the process from TB data collection, analysis to reporting. For HIV, the patients were coded at the time of diagnosis and treatment cascade. However, since TB is a notifiable disease as per the Public Health Act (Cap 242), cases of TB had to be reported.
 - ii) The respondents reported that key populations-led organizations were right based and personal safety and confidentiality throughout the process from data collection, analysis to reporting was maintained. These facilities were regarded as key population friendly facilities and were points of preference for service delivery for the key and vulnerable population.
 - iii) At facility level, the TB patients were not requested to give consent before service delivery.
- (d) **Available data, data collection methods and quality assurance mechanisms**
- i) Data at facility level was recorded manually which risked multiple errors of precision, timeliness, validity, reliability and integrity.
 - ii) The respondents reported that data collection at facility level was manually done and the tools used did not disaggregate the data to reflect gender, social, cultural, economic and behavioral risks to TB.
 - iii) Data transmission was done monthly from the facility level to Basic Management Unit (BMU) then electronically to TIBU.
- (e) **Non existence of clear framework to track implementation and performance**
- i) The respondents reported that the framework that exists at local levels for tracking performance of TB is pegged on HIV and does not consider the other TB key populations.
 - ii) The respondents reported that there are already existing structures within counties that can be utilized to track performance of TB. Most of the Counties have quarterly review meeting in the form of cluster review meetings. These Counties have annual work plans based on their respective county development plan and national strategic plan (NSP); monthly meeting at the county level and county health management team members chaired by the county director of health.
 - iii) The respondents reported that a health system surveillance platform was needed to track TB M&E looking at Human resource for health, supply chain, logistics and service delivery.

- iv) The respondents reported that the lack of adequate data for Key and Vulnerable population resulted in untimely and non-evidence- based planning and decision making.
 - v) The respondents reported that there should be resources allocated for M&E to be utilized for planning and implementing the M&E framework for TB for Key and Vulnerable population.
 - vi) The respondents indicated that the M&E indicators developed should reflect long term impact of TB care focusing on improved health outcomes and social and financial protection.
- (f) Engagement with the key populations in the design and implementation of TB programs**
- i) The respondents reported existence of structural and legal factors that exacerbated discrimination against key and vulnerable populations hindering their engagement in TB programs.
 - ii) The respondents further reported that the nonexistence of comprehensive key and vulnerable population data led to overlooking their importance and their contribution in designing and implementing TB program.
 - iii) The respondents reported that some partners had stakeholder forums conducted on a quarterly basis; and communities affected by TB were included in the conversations. However, the government had little engagement with other non-HIV related key and vulnerable populations.

1.2 RECOMMENDATIONS

1.2.1 Recommendations to the National Government

i. Mapping of key, vulnerable and underserved populations:

- Since there is no comprehensive data on TB key, vulnerable and underserved populations, the National TB Programme should carry out research and develop tools to identify and collect this data. The data should be disaggregated by gender, age, specific TB risks drivers and barriers to access to services.

ii. National surveillance:

- The Ministry of Health needs to develop surveillance tools that capture data disaggregated by age, gender, risks and barriers to TB care.
- The surveillance mechanism should provide an accurate prevalence and burden of TB for each of the key and vulnerable population.
- The surveillance data collected should provide accurate behavioural, legal, biological and gender barriers to access to TB care.
- The data collected should be periodically processed at national level and the reports shared at county levels.
- TB surveillance of key and vulnerable population should capture access to services, drug resistance and case definition.

- The Ministry of Health should invest in Automation of the systems at facility level.
- The Ministry of Health should allocate adequate resources for surveillance mechanism.

iii. Referral mechanism:

- Strengthening existing referral mechanisms for TB patients particularly the mobile population (migrants, prisoners, long distance track drivers and refugees).
- Implement the East Africa Community (EAC) Framework of Health for cross-border movement within the region.
- Automation of the referral mechanism and establishment of and development of Unique identifiers of TB patients to prevent duplication and loss to follow up.

iv. Multi-sectoral approach:

- The National TB Programme should engage and coordinate all TB activities within government agencies and Ministries.
- The National TB Programme needs to also coordinate TB services offered by other non-governmental players such as international agencies and CSOs'.
- The National TB Programme should strengthen Private Public Partnership to scale up access to timely and evidence-based TB care for key and vulnerable population. The Government should invest in capacity building of private providers to offer gender sensitive and right based TB care.
- The National TB Programme should harmonise TB indicators and standardize the monitoring and evaluating framework for key and vulnerable population.

- The National TB Programme should advocate for separation of HIV/TB findings in the Kenya demographic health survey.
- The National TB Programme should ensure that key and vulnerable population are meaningfully engaged in designing, planning and implementation of TB related activities.
- The National TB Programme strategic plan should prioritize key and vulnerable population and integrate services within the National public grid.
- The National TB Programme together with NASCOP should strengthen the collaborative TB-HIV activities to increase uptake of IPT.

v. Law and policy reforms:

- Ensure equal and meaningful participation of the key and vulnerable population in designing and implementing policies, guidelines and standard operating procedures.
- Strengthen mechanisms for participation and access to information for TB key, vulnerable and underserved populations.

vi. Integration and evidence-based service delivery:

- NTLD-P should develop guidelines to ensure holistic and comprehensive TB services delivery for TB key populations by integrating TB services to other health programs such as methadone therapy for injecting drug users (IDU) and hormonal therapy for transgender.

- NTLD-P should ensure that both diagnostic and treatment services are available in key and vulnerable population friendly facilities leveraging on new technologies such as GeneXpert and LAM.

vii. Health education:

- The National government should engage public and private institutions in dissemination of TB information throughout Kenya.
- Integration of TB Health education to the community as part of programming activities to improve the health seeking behaviours. This can be done by leveraging on the existing community health volunteers (CHV) who not only offer support to TB patients but also ensure that health information trickles to the grass root levels.

viii. Human resource for health:

- The Ministry of Health should provide guidelines working with the Public Service Commission to implement the community health volunteers (CHVs) scheme of service in the national grid of health care workers (HCW). The community through CHV plays a critical role of creating demand for TB services. This is in line with the Global Investment Framework and the One Million Community health workers initiative.⁷

- The CHVs create demand for TB health services by:
 - Cascading of TB information to the grassroots
 - Increasing uptake of TB screening services
 - Ensuring treatment access, adherence and follow up of the defaulters.
 - Provision of psychosocial support
 - Strengthening the link between health facilities and the communities
 - Improving coordinating mechanism
- Build capacity among health workers to offer gender affirming and right based care for TB patients.
- Develop a health worker occupational and safety protocols to compensate for HCW affected by TB while at the workplace.
- Ensure availability of protective gear for health-care workers to reduce transmission and infection with TB (respirators, surgical masks and gloves).

ix. A more inclusive approach to TB planning:

- NTLD-P should strengthen collaborations with state agencies and non-state actors to tackle social determinants of health that are barriers towards TB access (poverty, housing, nutrition, education).
- Engage and scale up communities in TB care by capacity building them with knowledge of TB prevention, control and treatment.

⁷ Earth Institute at Columbia University (2011) *One Million Community Health Workers: Technical Task Force Report*, available at http://www.millenniumvillages.org/uploads/ReportPaper/1mCHW_TechnicalTaskForceReport.pdf (accessed February 20, 2018).

- NTLD-P should improve on TB commodities planning and forecasting to avoid stock-outs especially within borders and in conflict regions.
- Strengthen implementation of TB treatment guidelines, diagnostics and follow up to reduce cases of DR-TB.
- Harmonization of TB guidelines and treatment regimens across the East African Borders to reduce cases of DR-TB.
- Strengthen collaboration with civil society organizations and work with them towards eradicating TB in Kenya.

x. Social protection:

- The Ministry of Health collaborating with other stake holders should develop a Social Protection Policy for TB patient in line with Universal health coverage (UHC) goals of preventing catastrophic expenditure. This will also call on addressing other social determinants of health that are barriers to access of TB care.
- In co-operating TB in the National Health Insurance Fund (NHIF) benefit Package.
- Develop a non-contributory policy to provide cash benefits and services to populations living in poverty to ensure income, shelter and food security.
- Develop a TB work place policy as a strategy for social protection.

1.2.2 Recommendation to County Governments

iv) Local level mapping and definition of Key and Vulnerable populations

- County governments should define and map their key and vulnerable populations by developing tools for data collection that are sensitive and address confidentiality concerns of KVVU population.

v) Population size estimates

- County health teams should have population estimates of key and vulnerable populations for purposes of planning and resource allocation. The research method should include both qualitative and quantitative information especially of the prioritised key, vulnerable and underserved populations.

vi) Automation of data collection

- The county government should invest in electronic medical records (EMR) at the facility. The data collected by EMR should be comprehensive to capture Key and Vulnerable populations. Automation not only improves validity and reliability of data collected but it also ensures confidentiality. Automation of data at facility level will assist in risk profiling for Key and Vulnerable population which will then ensure that their health needs are addressed comprehensively.

vii) **Coordination with CSOs working in TB**

- County Health teams should coordinate with CSOs providing TB care from those involved at service delivery to those in advocacy.

viii) **Inclusion**

- Key and Vulnerable population should be involved in planning and implementation of TB services at county level.

ix) **Policies and laws**

- The County Health team should address stigma and discrimination towards Key and Vulnerable population among healthcare workers by creating awareness, sensitizing them and training them on rights of patients

x) **Human resource**

- The County health team working with the county public health committees should develop a mechanism for including and absorbing the community health volunteers by offering them incentives and training.

xi) **Service delivery**

- More flexible hours are needed at facilities so as to cater for the Key and vulnerable populations who work both at night and day. There is also need to have mobile outreaches for TB care to reach the mobile populations.

xii) **TB education**

- County governments should escalate TB preventive and promotive education in all public and private institutions with attention to the most at risk such migrant population, the slum dwellers and health care workers.

While dissemination of TB information, the County health team should ensure that the information, education and communication (IEC) materials are regularly updated. The county should work with TB champions in sensitization.

1.2.3 Recommendations to Civil Society Organizations (CSOs)

- Advocate for social protection for TB patients in line with Universal Health Coverage (UHC).
- Be involved in budget advocacy to increase resource allocation for TB. There is currently no specific line budget for TB unlike in HIV.
 - i. Advocate for update of diagnostic tools in TB care such as LAM, including shorter course and effective TB drugs.
 - ii. Civil Society Organisations should shadow the Government and hold it responsible for TB care and following up on key deliveries.

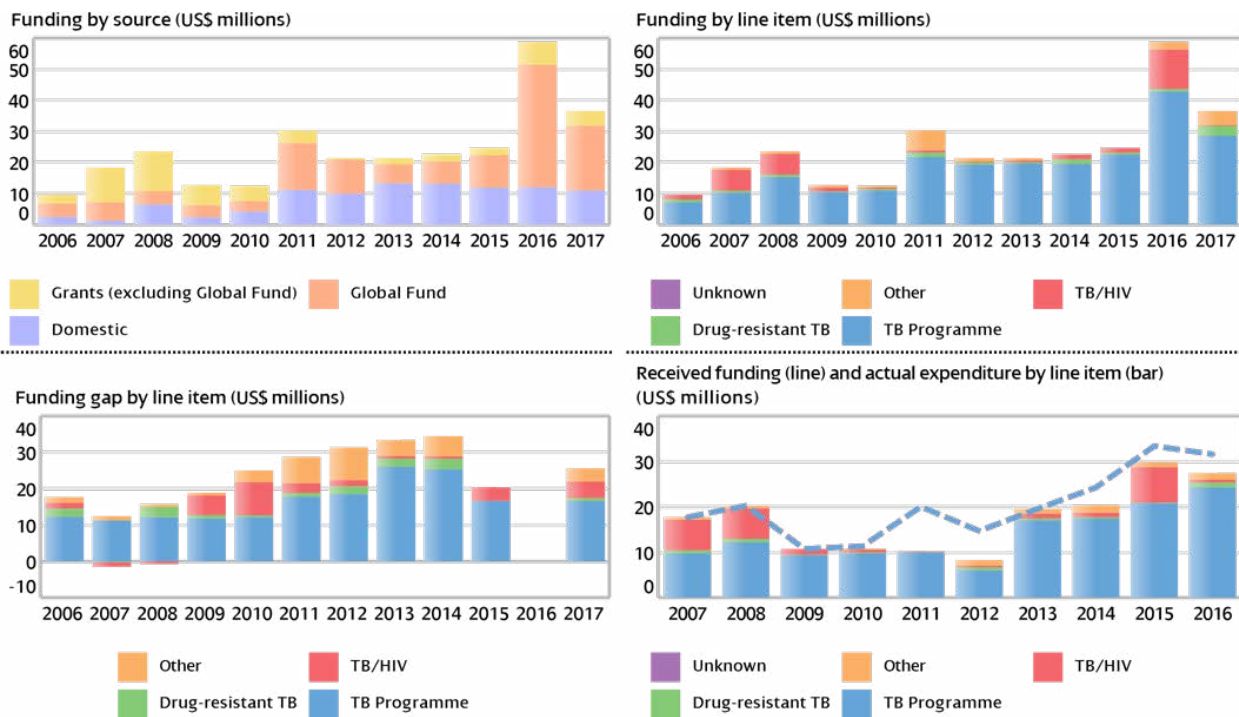


Figure 2: TB Programme funding includes staff, drug-susceptible TB drugs, laboratories, patient support, community engagement, public-private mix surveys and operational research⁸.

⁸ This figure highlights donor dependency for TB support in Kenya. The global fund and grants dominate resources allocated to TB care in Kenya. Domestic funding has been dwindling despite the increased TB prevalence.

PART II

2.0 BACKGROUND, METHODOLOGY AND SUMMARY

Introduction

Mycobacterium tuberculosis is the leading cause of death from an infectious disease in the world with approximately 11 million people getting infected annually. In 2016, 10.4 million people were infected with TB, out of which 1.7 million died including 400,000 living with HIV. Of the deaths, 95% occurred in low and middle-income countries. One million children were infected in 2016 and 250,000 died of TB including children living with HIV.

40% of deaths among PLHIV were attributed to TB. There were 600,000 new cases of Rifampicin drug resistant TB and 490,000 MDR-TB worldwide. Globally the TB incidence has been falling at about 2%. Ending TB epidemic is reflected in the SDG.⁹ Only 1.2 million people who were co-infected with TB and HIV received treatment. 10.4 million TB infected people were put on first line treatment and success rates were 49%. 23% of people developing DR-TB were enrolled on second-line treatment, and only 11% successfully completed the course.¹⁰

In the wake of increased TB infection globally, new trends have emerged not consistent with the association of TB and HIV.

9 WHO (2018) "Tuberculosis: Fact Sheet," available at <http://www.who.int/mediacentre/factsheets/fs104/en/> (accessed February 22, 2018)

10 Stop TB Partnership (2017) *The Tuberculosis Report for Heads of State and Governments: Global Plan to End TB 2016 – 2020*, available at http://www.stoptb.org/assets/documents/resources/publications/acsm/909090_PDF_LR.pdf (accessed February 22, 2018).

Bates *et al* report that non communication disease (NCD) risk factors like diabetes, malnutrition, smoking and chronic lung disease have resulted to an increase in TB infection and recommends integration of TB care for services for NCD to enhance efficiency of public health response.¹¹ Research has shown a strong association between alcohol consumption and risk of TB. Alcohol as a risk for TB reduces the immune system, reduces the availability of anti-TB drugs in the body, higher rates of re-infection higher rates of defaulting and development of DR-TB.¹²

The overall goal of End TB strategy focuses on reducing the number of TB deaths, reducing the incidence rate and financial protection to all. It is projected that by 2030, there will be a reduction to 90% of TB deaths and 90% reduction in TB incidence.¹³ The over-arching principles are in integrated patient care, bold policies and supportive systems, and intensified research and innovation.

Kenya's Vision 2030 aims at having a globally competitive and prosperous Kenya with high quality life by 2030, It aims at providing a robust health infrastructure and investing in improving quality of health service.¹⁴

11 Creswell J, Raviglione M, Ottmani S, Migliori GB, Uplekar M, Blanc L, *et al.* (2011) "Tuberculosis and noncommunicable diseases: neglected links and missed opportunities," *European Respiratory Journal* 37: 1269-1282, available at . <http://erj.ersjournals.com/cgi/doi/10.1183/09031936.00084310> (accessed November 24, 2017).

12 See Stop TB Partnership (2017), "The TB report for Heads of state and governments," *ibid.* See also WHO "Tuberculosis: Surveillance of drug-resistant TB," available at <http://www.who.int/tb/areas-of-work/monitoring-evaluation/mdr-tb-surveillance/en/> (accessed November 24, 2017).

13 WHO (2017) *The End TB Strategy*, *ibid.*

14 Government of Kenya (GoK) (2007) *Kenya Vision 2030: A Globally Competitive and Prosperous Kenya*, Ministry of Planning & National Development and Vision 2030, Government Printer, Nairobi.

The KHSSP Project proposed to have achieved a 62% decrease in deaths due to communicable diseases by 2018.¹⁵ Kenya is among the top 30 High TB Burden countries globally. The latest survey indicate that the prevalence rate is 558/100,000 population an increase from the 2015 prevalence of 233/100,000 population. If the Kenya surveillance system was optimal to detect every TB case in Kenya, there would be 138,105 cases of TB in 2016 as compared to the actual 75,896. The report indicated that 75,896 were diagnosed in 2016 leaving a 40% gap of undetected and untreated TB.¹⁶ There were more men than women infected by TB. However, for those above 65 years more women than men were diagnosed with TB. The age set most at risk was 15-34 years. Of note was that 83% of those diagnosed with TB being HIV negative with the urban population being more at risk.

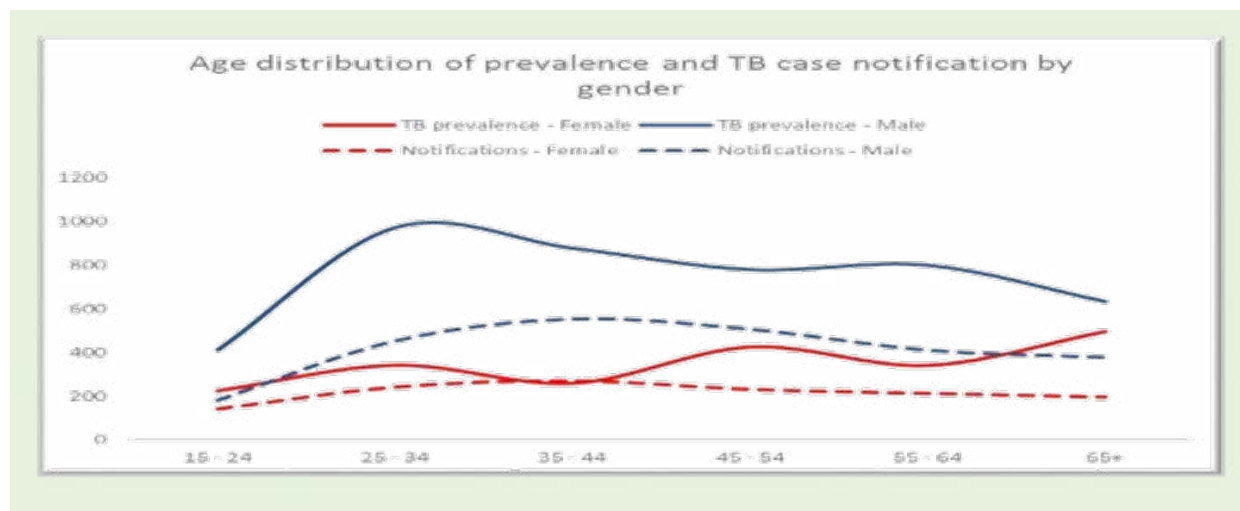


Figure 3: Age distribution of prevalence and TB case notification by gender.¹⁷ Men have a higher Prevalence of TB than women. Other gender such as transgender prevalence is not indicated

While HIV remains an important driver of TB, the latest TB prevalence surveillance studies indicated that 83% of the new cases were from HIV negative individuals. This calls for intensive efforts to address other drivers of TB epidemic. For example, research has now linked NCD18 and TB notably diabetes mellitus, mental illness, malnutrition, alcohol related conditions and chronic obstructive pulmonary diseases.¹⁹ Other risks have been attributed to alcohol and tobacco smoking and unsafe sex practices.

¹⁵ Ministry of Health (2013) *Transforming Health: Accelerating attainment of Universal Health Coverage - The Kenya Health Sector Strategic and Investment Plan – KHSSP July 2012 –June 2017*, available at <http://e-cavi.com/wp-content/uploads/2014/11/kenya-health-sector-strategic-investment-plan-2013-to-2017.pdf> (accessed November 24, 2017).

¹⁶ Ministry of Health (2016) *Kenya Tuberculosis Prevalence Survey 2016*, *ibid*.

¹⁷ Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, Ministry of Health, Kenya; 2015.

¹⁸ George Kasera, S. Karanja, C. Mwachari, E. Masini, J. Kioko (2016) "Risk Factors for Tuberculosis Going Beyond HIV: A Case Control Study in Kisii County, Kenya," *Prime Journal of Social Science (PJSS)* ISSN: 2315-5051. Vol. 5(9), pp. 1423-1427, September 31, 2016, available at <http://www.primejournal.org/PJSS/pdf/2016/sep/Kasera%20et%20al.pdf> (accessed February 22, 2018).

¹⁹ Marais BJ, Lönnroth K, Lawn SD, Migliori GB, Mwaba P, Glaziou P, et al. (2013) "Tuberculosis comorbidity with communicable and non-communicable diseases: integrating health services and control efforts," *Lancet Infect Dis* 2013; 13: 436–48, available at <http://linkinghub.elsevier.com/retrieve/pii/S147330991370015X> (accessed November 24, 2017).

Poverty index in Kenya estimated to be 46%²⁰ has contributed to the high burden of TB through poor housing, poor nutrition, overcrowding in homes and workplaces. There is thus need to re-configure our health systems to focus on tackling NDCs and the challenges they pose to public health. Such a re-alignment of services could be guided by four key principles of integration of services, innovation in service delivery, inclusion of communities and information and communication for better care.

Despite the high burden of TB, Kenya has made strides in adopting technology for surveillance and sharing of knowledge. *TIBU ECHO*, a tele-consultation program, has been piloted in different areas for knowledge sharing by enabling peripheral facilities gain knowledge from experts in the National and regional centers.²¹ However, to achieve effective TB control there is need to enhance collaboration between the public and private sector. In 2015, the private sector contributed 19% of all TB notified cases.²²

In line with the Kenya Health Policy²³ and the National Strategy for Tuberculosis, Leprosy and Lung disease, Kenya anticipated to reduce the TB incidences by 5%, reduce prevalence of MDR-TB by 15%, decrease TB mortality by 3% and reduce the incidences of TB among PLHIV by 60% (19) through case findings, reducing TB transmission, prevention of active disease and sustaining gains in the context of the devolved system.

20 World Bank (2017) "The World Bank in Kenya: Overview," available at <http://www.worldbank.org/en/country/kenya/overview> (accessed November 23, 2017).

21 NTLD "TB ECHO," available at <https://www.nltp.co.ke/tb-echo/> (accessed November 24, 2017).

22 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

23 Government of Kenya (2012) *Kenya Health Policy 2012-2020*, available at http://www.nationalplanningcycles.org/sites/default/files/country_docs/Kenya/kenya_health_policy_final_draft.pdf (accessed November 22, 2017).

Purpose of the assessment

KELIN with support from Stop TB Partnership piloted the first data assessment for TB key, vulnerable and underserved populations in Kenya which entailed an assessment of the policy frameworks for TB care with an aim of identifying data gaps and offer recommendation in prevention, treatment, care and support for the key, vulnerable and underserved population.

The study assessed the gaps on data for Key Vulnerable and Underserved populations in Kenya and whether strategies to address TB among this population captures other demographic characteristics, risks, social and economic characteristics.

Methodology

This section contains the research design, sample selection, research tools used, data collection, management and analysis. The research process included:

- (a) **A desk review process that interrogated the following documents relevant to TB**
 - Key international documents from World Health Organisation (WHO) and Stop TB Partnership.
 - National TB Prevalence Survey Report 2016
 - National Tuberculosis, Leprosy and Lung Disease Program (NTLDP) Strategic Plan 2014- 2018.
 - Literature sourced from PubMed and Google Scholar.

(b) Initial Stakeholders' Meetings

On 6 December, 2017 an initial stakeholder's dialogue to introduce the TB Data Assessment of key, vulnerable and underserved populations in Kenya was conducted. The meeting was attended by thirty eight participants who comprised of representatives of civil society and communities affected by TB, representatives from the national and county government, development partners, and representatives of key, vulnerable and underserved populations, among others. The dialogue was used to gather perceptions of the stakeholders on who the TB key populations are and why. They identified a total of nineteen categories of TB key, vulnerable and underserved populations. This study prioritized eight as follows: PLHIV, health care workers, prisoners, refugees, long distance truck drivers, urban slum dwellers, and diabetics.

(c) Key Informant Interviews (KIIs):

KIIs were conducted between 11 December 2017 and 12 January 2017 with fifteen respondents, who included County TB, Leprosy and Lung Disease Coordinators (CTLC's) from four counties (Homa Bay, Busia, Kisumu and Nairobi), two representatives from the National Tuberculosis, Leprosy and Lung Disease Program (NTLD-P), two representatives of the Kenya Prison Department, two technical partners (WHO and CDC), four implementing partners (AMREF and MSF) and two representatives of civil society organizations. One focused group discussion, which had one male TB survivor and one transgender woman was also conducted. In total, the team collected views of two male TB survivors (former TB patients); one in an interview and another in a focus group discussion.

(d) Working Group Meetings

A working group comprising of eight members (from civil society, communities and government) provided oversight for the assessment. Members of the working group had previously been trained by Stop TB on the CRG assessment tools at a workshop held in Bangkok, Thailand (July 24-27, 2017). The working group developed the concept note for undertaking the Data assessment, including the work plan and budget.

(e) National validation

On 19 January 2018, KELIN conducted a workshop to validate the findings of both the Data Assessment of TB in Key, Vulnerable and Underserved Populations. The validation meeting was attended by 36 participants from the national and county government, civil society representatives and communities affected by TB, development partners, among others. The meeting collected more views and build consensus on the findings of the assessment.

Field research design

This was a cross sectional descriptive survey employing qualitative techniques for data collection and analysis. Qualitative research is non-statistical and measures opinions, beliefs, perceptions and behaviours of the population.²⁴

Data was collected by conducting in depth interviews and group discussion. The target population included government officers from the National and the County governments, civil society representatives, development partners, communities of TB and representatives from the key population.

²⁴ Silverman, D. (2000) *Doing qualitative research: A practical handbook*, Thousand Oaks, CA: Sage

Stakeholder mapping

The participants were purposely selected for the study. A focus group discussion was held targeting representation from the key population and former TB patients. A multi-stakeholder meeting was also conducted whose participants were representatives from CSOs, TB survivors, County and Sub-county TB coordinators, community health workers and other service providers.

Data analysis

A coding framework was developed through reading the FDG and Key Informants Interviews transcripts as well as topic guides. A thematic framework was developed after reviewing the data and research question into QDA *Lite software*.

Limitations of the study

- 2017 was marred by a hostile political environment that resulted in delays of the study. The study was initially to be conducted for a period of four months but was undertaken in one and a half month.
- Data of Key and Vulnerable population is minimal and the data availed in this report relied on key informants and the literature review.

PART III

3.0 UNDERSTANDING AND DEFINING KEY, VULNERABLE AND UNDERSERVED POPULATION IN KENYA

Risky behaviour in some populations increases their risk to HIV and TB. Social, legal, structural and contextual factors increase vulnerability to TB infection. Consequently, these factors limit access to information, prevention services and commodities and care and treatment. The 5-key population that are disproportionately affected by HIV and consequently by TB include: men who have sex with men (MSM), injecting drug users (IDU), sex workers (SWs) and transgender people. Other vulnerable groups prone to TB and HIV due to their characteristic risks are migrant workers, refugees, long distance truck drivers, military personnel and miners. Programs should therefore identify these population and tailor make services that address their health needs.

The Global Fund defines key population as population that experiences a high epidemiological impact of one of the diseases combined with reduced access to services and or being criminalized or marginalized.²⁵

The National Strategic Plan on TB, Leprosy and Lung disease defines key population as those who have a high disproportion of TB and have challenges in access to care.

²⁵ See The Global Fund (2014) *Key Populations Action Plan 2014-2017*, available at https://www.theglobalfund.org/media/1270/publication_keypopulations_actionplan_en.pdf (accessed February 22, 2018).

The strategic plan lists the following:

- slum dwellers;
- uniformed personnel;
- persons living with HIV (PLHIV);
- contacts of TB patients;
- health care workers;
- refugees;
- prisoners;
- diabetics; and
- malnourished individuals.²⁶

3.1. Drivers of TB in Kenya

While progress has been recorded by the Global Fund to eradicate HIV, TB, Malaria and neglected diseases, successes have been impaired by the inability to reach the vulnerable and excluded population. The failures reflect gender disparities, human rights gaps, cultural, financial, political and social barriers faced by this population.²⁷ To have a sustained response to TB in the wake of a high incidence of 523/100,000,²⁸ efforts need to be focused on the hard to reach. Data then forms the core to identification of the key, vulnerable and underserved communities.²⁹ Healthcare workers, prisoners, mobile population, refugees, uniformed service, urban slums and diabetics have been recognized as the High Risk population in Kenya.³⁰

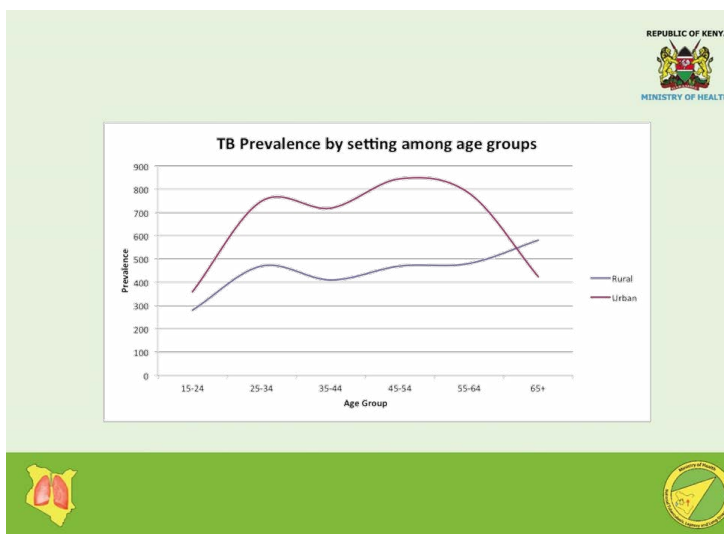


Figure 4; TB prevalence by age³¹

26 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

27 Matthew Greenall, Osamu Kunii, Kate Thomson, Rene Bangert & Olivia Nathan (2017), "Reaching vulnerable populations: lessons from the Global Fund to Fight AIDS, Tuberculosis and Malaria," *Bulletin of the World Health Organization*, Volume 95, Number 2, February 2017, 85-164, available at

<http://www.who.int/bulletin/volumes/95/2/16-179192/en/> (accessed February 22, 2018).

28 Ministry of Health (2016) *Kenya Tuberculosis Prevalence Survey 2016*, *ibid*.

29 McLaren ZM, Schnippel K, & Sharp A. (2016) "A Data-Driven Evaluation of the Stop TB Global Partnership Strategy of Targeting Key Populations at Greater Risk for Tuberculosis," *PLOS ONE*, October 12, 2016, available at <http://dx.plos.org/10.1371/journal.pone.0163083> (accessed November 11, 2017).

30 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

31 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

Intervention should be developed to address poverty, policy gaps, poor health systems and affordability issues as structural barriers to health access. Individual risks factors such as HIV and health illiteracy can be addressed both at programmatic and service delivery points. Stigma and discrimination against key population continues to be a barrier to access to health services.

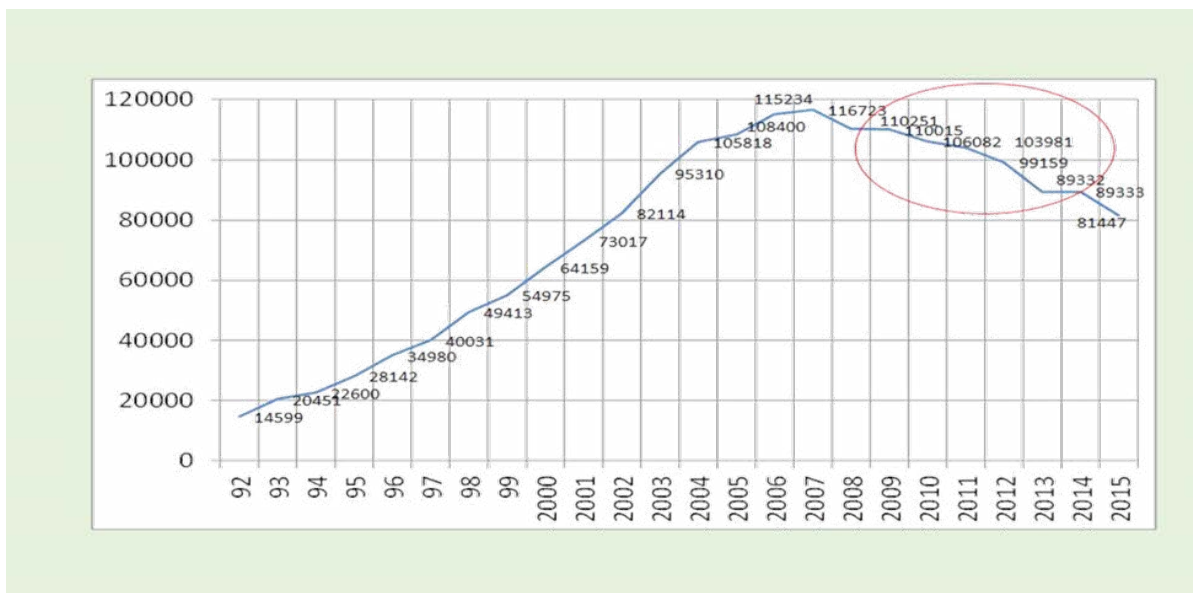


Figure 5; TB case notification by year³²

Diagnosis challenge: There is no gold standard diagnostic tool for Latent TB infection (LTBI) among those at high risk. Tuberculin skin test (TST) and Interferon gamma release are the available diagnostic tools for LTBI.³³ Tuberculin skin test however possess the disadvantage of being unable to distinguish cured TB from Latent TB while interferon gamma release assay is unavailable because of cost.

Poverty accelerates the health risks among the key, vulnerable and underserved population, with resultant effect of living in overcrowded housing and poorly ventilated housing. Poverty increases stress, poor social capital and risky behaviours such as smoking and alcohol consumption. Malnutrition predisposes individuals to TB infection by reduced immunity while also affecting adherence to medication. Financial and human resource limitations and the fragmented referral systems prevent continuity of care particularly for key population, with absence of gender specific and key population friendly health services.

Tuberculosis patients often incur large costs related to illness, as well as for seeking and receiving health care. Such costs can create barriers to accessing treatment and adherence which can lead to poor health outcomes and increase risk of transmission of disease. These costs also present an economic burden that result in financial difficulties and/or push households into poverty or poor households further into poverty.

³² Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

³³ Storla DG, Kristiansen I, Oftung F, Korsvold GE, Gaupset M, Gran G, et al. (2009) "Use of interferon gamma-based assay to diagnose tuberculosis infection in health care workers after short term exposure," *BMC Infectious Diseases* 2009 9:60, available at <http://bmcinfectdis.biomedcentral.com/articles/10.1186/1471-2334-9-60> (accessed November 11, 2017).

3.2. TB and HIV in Kenya

HIV and TB are synergistic, with HIV increasing the incidence of TB and TB associated with increased mortality among PLHIV, and as an indicator of AIDS defining illness.³⁴ The risk of TB infection is 16-27 times greater in PLHIV than in the general population.

Table 1: HIV/TB Co-infection rates per county.³⁵ Counties with a high HIV prevalence had a concurrent high TB prevalence based on the risk factors for co-infection.

County	Co-infection rate
Homa Bay	64%
Siaya	63%
Kisumu	59%
Migori	52%
Busia	44%
Vihiga	43%
Kakamega	36%
Kisii	35%
Nyamira	35%
Nyandarua	34%
Nairobi	33%
Uasin Gishu	32%
Nakuru	32%
Kilifi	30%
Laikipia	30%
Nandi	30%
Trans Nzoia	29%
Kajiado	29%
Nyeri	29%
Bungoma	29%
Mombasa	29%
Taita Taveta	28%
Makueni	28%
Turkana	27%
Kiambu	25%
Kericho	24%
Narok	24%
Kwale	24%
Machakos	23%

34 Kwan CK, Ernst JD. (2011) "HIV and Tuberculosis: a Deadly Human Syndemic," *Clin. Microbiol. Rev.* April 2011 vol. 24 no. 2 351-376, available at <http://cmr.asm.org/cgi/doi/10.1128/CMR.00042-10> (accessed November 20, 2017); See also Cui Z, Lin M, Nie S, Lan R. (2017) "Risk factors associated with Tuberculosis (TB) among people living with HIV/AIDS: A pair-matched case-control study in Guangxi, China," Jin X, editor. *PLOS ONE* March 20, 2017 available at <http://dx.plos.org/10.1371/journal.pone.0173976> (accessed November 21, 2017).

35 National AIDS Control Council (2016) *Kenya-HIV-County-Profiles-2016*, available at <http://nacc.or.ke/wp-content/uploads/2016/12/Kenya-HIV-County-Profiles-2016.pdf> (accessed February 2, 2018).

County	Co-infection rate
Tharaka Nithi	23%
Bomet	23%
Murang'a	22%
Kitui	22%
Isiolo	21%
Samburu	21%
Elgeyo Marakwet	21%
Baringo	20%
Kirinyaga	19%
Embu	19%
Meru	17%
Lamu	16%
Tana River	11%
Marsabit	10%
Pokot	9%
Garissa	4%
Mandera	2%
Wajir	2%
Kenya	30%

Kenya is one of the countries that have adopted the WHO guidelines on TB/HIV care by integrating services, effective patient centered prevention, early detection and prompt treatment. To enhance case detection, Kenya is increasing efforts to ensure Xpert MTB/RIF are the first diagnostic for presumptive TB and is exploring urine based TB-LAM for PLHIV.

As at 2016, the National HIV prevalence was estimated at 5.4% and the country has experienced much progress in addressing HIV and AIDS. HIV incidence among 15-49 has dropped from 4.48 per 1000 in 2000 to 1.46 per 1000 in 2016 while new infections dropped from 88,600 to 56,000. The HIV related mortality has also stabilized since 2015 with only 30,000 deaths occurring above 15 years. The number of people initiated on ART has also increased from 656,369 to 1,018,900 a 64% coverage of the total population of PLHIV.

With the devolved system of government, HIV care was also devolved to county levels and this has seen all counties develop Costed AIDS Strategic Plan (CASPs) and so far, 34% of all counties have HIV specific budgets in their plan for Financial Year 2016/2017. These efforts have contributed to strengthening interventions in service delivery.³⁶

³⁶ National AIDS and STI Control Programme (NAS COP) (2015) *Kenya HIV Estimates 2015*, available at <http://nacc.or.ke/wp-content/uploads/2016/12/Kenya-HIV-Estimates-2015.pdf> (accessed February 22, 2018); See also National AIDS Control Council (2016) *Kenya-HIV-County-Profiles-2016*, *ibid*.

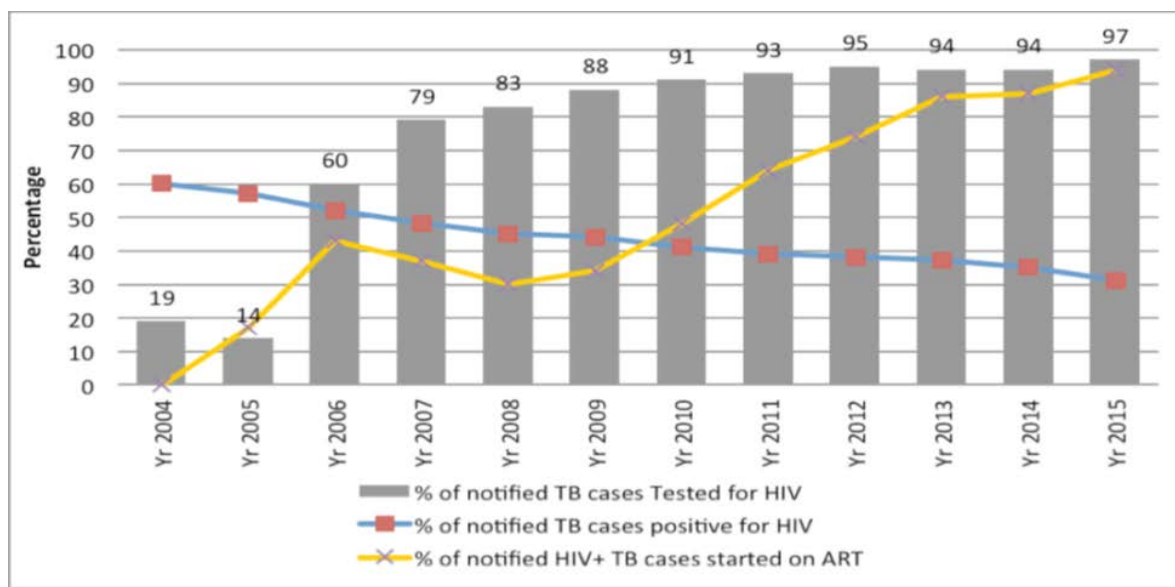


Figure 6: TB/HIV Trends in Kenya.³⁷ HIV is a significant risk factor for HIV and over the years, there has been an increase in the TB/HIV coinfection possibly due to intensified screening.

In 2016, 95% TB patients had documented HIV test, with 92% of those on ART and cotrimazole preventive treatment. Close to 600,000 PLHIV had been initiated on Isoniazid Preventive Therapy (IPT) for those enrolled for care. TB/HIV mortality in Kenya had a correlation to timing of initiation of therapy³⁸ and WHO reports that the mortality rate of 16/100,000 persons.³⁹ These call for intensification of IPT uptake among PLHIV as the uptake is low.

Timely treatment of patients results in better outcomes of HIV/TB patients. *Monital et al* in their study report that delayed treatment among HIV patients was associated with low CD4 counts, no HIV disclosure, intolerance to TB medication and contradicted ARVs.⁴⁰ Concurrent treatment for these two conditions creates several management challenges, including drug interactions, shared drug toxicities, TB immune reconstitution inflammatory syndrome (TB-IRIS) and high pill burden, which potentially impacts on adherence⁴¹ Intensive case findings and early detection for latent TB and Isoniazid prophylaxis will reduce the morbidity and mortality associated with TB.⁴²

37 Ministry of Health Kenya (2015) *National Tuberculosis, Leprosy and Lung Program 2015 Annual report*, *ibid*.

38 Abdool Karim SS, Naidoo K, Grobler A, Padayatchi N, Baxter C, Gray A, et al. (2010) "Timing of Initiation of Antiretroviral Drugs during Tuberculosis Therapy," *N Engl J Med* February 25, 2010; 362:697-706, available at <http://www.nejm.org/doi/abs/10.1056/NEJMoa0905848> (accessed November 20, 2017).

39 MOH (2014) *National Strategic Plan on Tuberculosis, Leprosy and Lung Health 2015 – 2018* available at <http://www.nltp.co.ke/download/national-strategic-plan-2015-2018/> (accessed February 22, 2018).

40 Patel MR, Nana M, Yotebieng M, Tabala M, Behets F, Van Rie A. (2014) "Delayed antiretroviral therapy despite integrated treatment for tuberculosis and HIV infection," *The International Journal of Tuberculosis and Lung Disease*, Volume 18, Number 6, 1 June 2014, pp. 694-699(6), available at <http://openurl.ingenta.com/content/xref?genre=article&issn=1027-3719&volume=18&issue=6&page=694> (accessed November 27, 2017).

41 Schutz C, Meintjes G, Almajid F, Wilkinson RJ, Pozniak A. (2010) "Clinical management of tuberculosis and HIV-1 co-infection," *European Respiratory Journal* 2010 36: 1460-1481, available at <http://erj.sjournals.com/cgi/doi/10.1183/09031936.00110210> (accessed November 17, 2017).

42 Gray DM, Young T, Cotton M, Zar H. (2009) "Impact of tuberculosis preventive therapy on tuberculosis and mortality in HIV-infected children," *Cochrane Database of Systematic Reviews* 2009, Issue 1. Art. No.: CD006418, available at <http://doi.wiley.com/10.1002/14651858.CD006418.pub2> (accessed November 17, 2017); See also Ayele HT, Mourik MSM van, Debray TPA, Bonten MJM. (2015) "Isoniazid Prophylactic Therapy for the Prevention of Tuberculosis in HIV Infected Adults: A Systematic Review and Meta-Analysis of Randomized Trials," *Wilkinson KA* (eds) *PLOS ONE* 2015 Nov 9, 10(11), available at <http://dx.plos.org/10.1371/journal.pone.0142290> (accessed November 17, 2017).

WHO recommends the use of 2 I's in prevention of HIV/TB mortality: intensified case finding of TB, isoniazid prevention therapy and infection control for TB.⁴³ Intensified efforts should be aimed at increasing IPT treatment, active case finding, ART uptake and improvement in diagnostic procedures. Further, active case finding within the communities should be intensified especially among the HIV negative individuals who are now driving the epidemic.⁴⁴

3.3. TB and Healthcare Workers in Kenya

Healthcare workers in Kenya include staff working in any clinical department, in paramedical sections (such as pharmacy), laboratories, and administrative and other support sections of the health facility. WHO estimates that the risk of developing active infection from latent TB is 10-15% among healthcare workers.⁴⁵ TB is therefore a threat to both patients and healthcare workers. Risk of TB among healthcare workers is higher in high incidence population.⁴⁶ High burden of TB among health care workers occur in high burden countries⁴⁷ and Kenya is among the 30 high burden countries in the world. A study in Western Kenya revealed that 60% of the healthcare workers had latent TB.⁴⁸

43 WHO (2013) *Consolidated Guidelines on the use of Antiretroviral Drugs for Treating and Preventing HIV Infection: Recommendations for a Public Health Approach*, available http://apps.who.int/iris/bitstream/10665/85321/1/9789241505727_eng.pdf (accessed November 17, 2017).

44 World Health Organization "Kenya: TB profile," available at https://extranet.who.int/sree/Reports?op=Replet&name=%2F-WHO_HQ_Reports%2FG2%2FPROD%2FEXT%2FTBCountryProfile&ISO2=KE&LAN=EN&outtype=pdf (accessed February 22, 2018).

45 WHO (2015) *Guidelines on the management of latent tuberculosis infection*, available <http://www.who.int/tb/publications/latent-tuberculosis-infection/en/> (accessed February 22, 2018).

46 Munn Z, Moola S, Riitano D, Lisy K. (2014) "The development of a critical appraisal tool for use in systematic reviews addressing questions of prevalence," *International Journal of Health Policy and Management*, 3(3), pp. 123-128, available at http://ijhpm.com/article_2870_607.html (accessed November 20, 2017).

47 Nasreen S, Shokoohi M, Malvankar-Mehta MS (2016) "Prevalence of Latent Tuberculosis among Health Care Workers in High Burden Countries: A Systematic Review and Meta-Analysis," Wilkinson KA, (eds.) *PLOS ONE*. 2016 Oct 6, 11(10), available at <http://dx.plos.org/10.1371/journal.pone.0164034> (accessed November 10, 2017).

48 Agaya J, Nnadi CD, Odhiambo J, Obonyo C, Obiero V, Lipke V, et al.

Agaya et. al further report that the risk of developing TB was proportion to the amount of time spent on exposure and healthcare workers risk developing MDR-TB. This study was consistent with the one done by *Galgalo et al* which reported that health care workers who spent more than 5 hours per day with TB patients had high odds of developing TB as compared to the general population.⁴⁹

HIV and AIDS, re-emergence of MDR-TB, increased exposure to patients with TB, attitudes and lack of knowledge are drivers of TB infection among healthcare workers.⁵⁰ Despite the existence of comprehensive policy for TB infections, barriers still exist that have hindered TB care for healthcare workers.⁵¹ Stigma and discrimination associated with TB compounds the lack of data reflecting the incidences and prevalence of TB among healthcare workers in Kenya. Absence of screening tools have been identified as barriers to TB infection control among healthcare workers.

Regular screening, IPT uptake and infection control strategies need to be strengthened and cascaded to all facilities. There is also need to capacity build the healthcare workers on existing policies, protocols, standards and guidelines of infection control as knowledge is critical in TB infection control.⁵²

(2015) "Tuberculosis and latent tuberculosis infection among health-care workers in Kisumu, Kenya," *Tropical Medicine & International Health*, Volume 20, Issue 12, December 2015, Pages 1797–1804, available <http://doi.wiley.com/10.1111/tmi.12601> (accessed November 22, 2017).

49 Galgalo T, Dalal S, Cain KP, Oeltmann J, Tetteh C, et al. (2008) "Tuberculosis risk among staff at a large public hospital in Kenya," *Int J Tuberc Lung Dis*. 2008 Aug;12(8):949-54, available at <https://www.ncbi.nlm.nih.gov/pubmed/18647456> (accessed November 27, 2017).

50 Stop TB Partnership (2016) *Key Population Brief: Health Care Workers* available at http://www.stoptb.org/assets/documents/resources/publications/acsm/KPBrief_HealthCareWorker_ENG_WEB.pdf (accessed February 22, 2018).

51 Ministry of Health (2014) *Kenya: Guidelines for TB infection control for Healthcare workers in Kenya 2014*, available at http://guidelines.health.go.ke:8000/media/Guidelines_for_TB_infection_Prevention_and_Control_for_Health_Workers.pdf (accessed February 20, 2017).

52 Brouwer M, Katamba A, Katabira ET, van Leth F. (2017) "An easy

There is need to address occupational health services compensation guidelines, address stigma and discrimination by reviewing existing laws, improve on TB surveillance with active case findings and utilization of technology for TB surveillance.

3.4. TB and Prisons in Kenya

As of 2016, the Kenya prison population was 53,841 against a maximum capacity of 26,687 almost double the capacity.⁵³ Results of a study carried out in Kamiti Prisons found that the prevalence of active TB was seven times that of the general population.⁵⁴ A study in the Nakuru GK Prison indicated that TB and HIV were closely intertwined. HIV status was a strong risk factor for TB among patients who self-reported their HIV status where the estimated risk of clinical disease in HIV infected persons was between 6-26 times.⁵⁵

The National Strategy Plan outlines a plan to reach the prison population by implementing screening upon entry to prison, enhance infection control practices, introduce diagnostic and DOT strategy capacity on site, develop health education tools for the prisoners and the

tool to assess ventilation in health facilities as part of air-borne transmission prevention: a cross-sectional survey from Uganda," *BMC Infectious Diseases* (2017) 17:325, available at <http://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-017-2425-6> (accessed November 11, 2017); Bhebhe LT, Van Rooyen C, Steinberg WJ. (2014) "Attitudes, knowledge and practices of healthcare workers regarding occupational exposure of pulmonary tuberculosis," *African Journal of Primary Health Care & Family Medicine*; Vol 6, No 1 (2014), available at <http://phcfm.org/index.php/phcfm/article/view/597> (accessible November 20, 2017); Engelbrecht M, Janse van Rensburg A, Kigozi G, van Rensburg H. (2016) "Factors associated with good TB infection control practices among primary healthcare workers in the Free State Province, South Africa," *BMC Infectious Diseases* (2016) 16:633, available at <http://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-016-1984-2> (accessed November 10, 2017). 53 Kenya | World Prison Brief, available at <http://www.prisonstudies.org/country/kenya> (accessed November 21, 2017). 54 Aywak A, Irimu H, Mayo EO, Okaru CN, Bhatta KM (2005) "The prevalence of active pulmonary tuberculosis among prisoners at Kamiti Maximum Security Prison, Kenya," available at <http://erepository.uonbi.ac.ke:8080/xmlui/handle/11295/95850> (accessed 21 November 2017). 55 Amwayi A., Kikui G., Muchiri E. (2010) "Modifiable factors associated with active pulmonary tuberculosis in a Kenyan prison," *East Afr. Med J.* 2010 Oct 6; 87(2), available <http://www.ajol.info/index.php/eamj/article/view/60596> (accessed November 21, 2017).

prison staff and develop a referral mechanism.⁵⁶ In a multisystemic review to assess the risk of TB, *Biadglegne et al* report that the incidence of TB within the prisons is 3-1000 times that in the general population.⁵⁷

The risk of developing LTBI in prison is 26 times the general population.⁵⁸ Individuals with other behavioral risks as sex workers, injecting drug users, homeless, those addicted to alcohol, and the poor are at a higher risk of being incarcerated and this further place this population is at high risk of TB/HIV co-infection.⁵⁹

HIV co-infection, repeated imprisonment,⁶⁰ increased length of stay in prisons,⁶¹ poor ventilation, nutritional status⁶² and history of drug use⁶³ are key drivers of TB in prisons.

56 MOH (2014) *Kenya: National Strategic Plan on Tuberculosis, Leprosy and Lung Health 2015 – 2018*, *ibid*.

57 Biadglegne F, Rodloff AC, Sack U. (2015) "Review of the prevalence and drug resistance of tuberculosis in prisons: a hidden epidemic," *Epidemiology & Infection J.*, Volume 143, Issue 5, April 2015, pp. 887900, available at <http://www.journals.cambridge.org/abstract/S095026881400288X> (accessed November 21, 2017).

58 Getahun B, Wubie M, Dejen G, Manyazewal T. (2016) "Tuberculosis care strategies and their economic consequences for patients: the missing link to end tuberculosis," *Infectious Diseases of Poverty* (2016) 5:93 available at <http://idjournal.biomedcentral.com/articles/10.1186/s40249-016-0187-9> (accessed November 11, 2017).

59 Stop TB Partnership (2014) *Key Population Brief focus on Prisoners 2014*; available at http://www.stoptb.org/assets/documents/resources/publications/acsm/KPBrief_Prisoners_ENG_WEB.pdf (accessed February 22, 2018).

60 World Health Organisation (WHO) "Tuberculosis in prisons," available at <http://www.who.int/tb/areas-of-work/population-groups/prisons-facts/en/> (accessed February 22, 2018).

61 Nyasulu P, Mogoere S, Umanah T, Setswe G. (2015) "Determinants of Pulmonary Tuberculosis among Inmates at Mangaung Maximum Correctional Facility in Bloemfontein, South Africa," *Tuberculosis Research and Treatment*, Volume 2015 (2015), Article ID 752709, available at <https://www.hindawi.com/journals/trt/2015/752709/cta/> (accessed February 22, 2018).

62 Aurelie Fontaine (2014) "Prison feeding programs for HIV and TB inmates more than a matter of supplying food, Global Fund sub-recipients find," *Global Fund Observer*, Issue 238, March 3, 2014, available at http://www.aidspace.org/gfo_article/prison-feeding-programs-hiv-and-tb-inmates-more-matter-supplying-food-global-fund-sub (accessed February 22, 2018).

63 Getahun H, Gunneberg C, Sculier D, Verster A, Raviglione M. (2012) "Tuberculosis and HIV in people who inject drugs: evidence for action for tuberculosis, HIV, prison and harm reduction services," *Current Opinion in HIV and AIDS*: July 2012 - Volume 7 - Issue 4 - p 345-353, available at <http://content.wkhealth.com/linkback/openurl?sid=WKPTLP:landingpage&an=01222929-201207000-00011> (accessed November 21, 2017).

Effective MTB infection control in prisons protects the well-being of both the prisoners and the wider community.⁶⁴ Financial and human resource limitations and the fragmented referral systems prevent continuity of care when detainees cycle in and out of prison. It is recommended that substantial investments are required to develop program level policy guidelines, build human resource capacity and strengthen the prison health system to improve TB prevention, treatment and care to meet the international goals.⁶⁵

There is no national data reflecting the burden of TB in the Kenyan prisons despite the few isolated studies that have shown existence of high prevalence and incidence. Research is required on the prevalence and drug resistance of smear negative TB cases in prison and the evidence should also reflect the strains and transmission dynamics. The data to be captured should reflect age, sex, risks, DR-TB and treatment outcomes to better understand TB trends within the prison population

3.5. TB and Refugees in Kenya Kenya hosts the largest population of refugees in Africa, the largest of the camps being *Kakuma* and *Dadaab* with a population of 181,821 and 351,446 respectively as of March 2015.⁶⁶ An increase of migrants has been experienced since then, with March 2016 recording a refugee population of 597,683.⁶⁷ Majority of the

64 NTLD (2016) *Kenya Tuberculosis Prevalence Survey 2016*, *ibid*.
65 Telisinghe L, Charalambous S, Topp SM, Hecce ME, Hoffmann CJ, Barron P, et al. (2016) "HIV and tuberculosis in prisons in sub-Saharan Africa," *The Lancet* 2016 September;388(10050):1215–27, available at <http://linkinghub.elsevier.com/retrieve/pii/S0140673616305785> (accessed November 21, 2017).

66 International organization of Migration (IOM) (2015) *Migration in Kenya: A Country Profile 2015*, available at http://publications.iom.int/system/files/pdf/migration_profile_kenya.pdf (accessed February 22, 2018),

67 "Kenya Country Profile - Updated April 2016," *Danish Refugee*

refugees are urban refugee population from Somalia, followed by refugees from Ethiopia, the Democratic Republic of the Congo, Eritrea, and others. Overall, approximately 72 per cent of the refugee population in Kenya is from Somalia, followed by South Sudan (16%), Ethiopia (5%). In 2014, 6,805 refugees were resettled from Kenya.

There are currently an estimated 20,000 stateless persons in Kenya, including Kenyan Somalis and Kenyan Nubians.⁶⁸ Internal displacement in Kenya is due to conflict, natural disasters, climatic changes and forced eviction. The most recent post-election violence of 2007 saw over 650,000 internally displaced Kenyans.

Kenya is a preferred destination for refugees because it offers a stable economic, social and political environment that attracts refugees.⁶⁹ The major challenge facing refugees in Kenya lies in access to health. Migrants face multiple barriers to accessing health due to; language barriers, irregular immigration status, lack of a migrant inclusive policy and inaccessible health services undermining the realization of a right to health.⁷⁰

Geographical accessibility, availability, affordability and acceptability forms core to the access issues all which have been given priority to be addressed in the National TB strategy.⁷¹ Poor living conditions and overcrowding in refugee resettlement increases risk of TB.⁷²

Council, Regional Mixed Migration Secretariat available at <https://reliefweb.int/report/kenya/kenya-country-profile-updated-april-2016> (accessed November 23 2017).

68 IOM (2015) *Migration in Kenya: A Country Profile 2015*, *ibid*.

69 IOM (2014) "An analysis of Migration Health in Kenya," available at https://publications.iom.int/system/files/pdf/an_analysis_of_migration_health_in_kenya.pdf (accessed February 22, 2018).

70 IOM (2015) *Migration in Kenya: A Country Profile 2015*, *ibid*.

71 Ministry of Health (2014) *Kenya Health Policy 2014-2030*, *ibid*.

72 WHO (2017) "Tuberculosis control in vulnerable groups," available at <http://www.who.int/bulletin/volumes/86/9/06-038737/en/> (accessed November 22, 2017).

There are poverty accelerated health risks among migrants from the resultant effect of living in overcrowded housing, poorly ventilated, malnourished, stress, poor social capital and risky behaviours such as smoking and alcohol consumption.⁷³ Migration increases transmission of TB more so if migrants are moving from a high prevalent country.

Targeted intensive screening and enhanced surveillance for migrants reduces the spread of TB among the migrants and in the general population. In its commitment to realize the SDG on Health, International Organization for Migration (IOM) vision of a healthy migrants is centered on three key approaches: i) Promoting migrants right to health ii) Maintaining the good public health outcomes and iii) contribute to positive health and development outcomes of migration.⁷⁴

Interventions should be developed to address poverty, policy gaps, poor health systems within borders and affordability issues as structural barriers to health access, while individual risks factors such as HIV and health illiteracy can be addressed both at programmatic and service delivery points. Focus should also be put on environmental factors as GBV, language barriers, stigma and discrimination.

73 IOM (2017) "Human Mobility & Tuberculosis," available at <https://www.iom.int/human-mobility-tuberculosis> (accessed November 22, 2017); See also "Plenary three: social protection for a more holistic approach to ending TB," *The 47th Union World Conference on Lung Health*. <http://liverpool.worldlunghealth.org/updates/plenary-three-social-protection-for-a-more-holistic-approach-to-ending-tb> (accessed November 22, 2017); and Gibney KB, MacGregor L, Leder K, Torresi J, Marshall C, Ebeling PR, et al. (2008) "Vitamin D Deficiency Is Associated with Tuberculosis and Latent Tuberculosis Infection in Immigrants from Sub-Saharan Africa," *Clin Infect Dis*. 2008 Feb 1; 46(3):443–6, available at <https://academic.oup.com/cid/article-lookup/doi/10.1086/525268> (accessed November 22, 2017).

74 IOM strategy to Support SDG on Health, available at <https://sustainabledevelopment.un.org/content/documents/10386IOM%20Strategic%20Support%20to%20SDGs%20web.pdf> (accessed February 22, 2018).

Migrants in Eastleigh were found to be prone to DR-TB due to the fact that they do not finish their medication and often experience inadequate follow up which also risks further transmission of TB within the general population.⁷⁵

As Kenya continues to be an economic powerhouse within the region as outlined in the Vision 2030 blueprint, addressing logistical challenges, failed health systems within borders and lack of policy should be addressed. Referral mechanisms, reducing health disparities by reviewing national strategies, facilitating and promoting a right based approach to health and offering health services where migrants are, while exploring partnerships and collaborations will maintain a health migrant population.

Strengthening documentation of migrants will facilitate TB surveillance for active TB, DR-TB and LTBI by active case finding, data collection and analysis for proper programmatic and policy response.

3.6. TB and Long-Distance Truck Drivers in Kenya

In a study to map the health services along major transport corridors, the EAC reports that there were few facilities providing ART and TB treatment; less than 40% and only 31% provided TB care.⁷⁶ This study revealed that most of the facilities were privately owned and were costly to the average key population. Further the reports highlights gaps in knowledge for healthcare workers serving this population.

75 IOM (2014) "An analysis of Migration Health in Kenya," *ibid*.

76 East Africa Community (EAC) (2015) "Mapping of Health services along Major Transport corridors in East Africa," available at [http://kenya.iom.int/sites/default/files/Mapping_of_Health_Services_along_Major_Transport_Corridors_in_East_Africa%20\(1\).pdf](http://kenya.iom.int/sites/default/files/Mapping_of_Health_Services_along_Major_Transport_Corridors_in_East_Africa%20(1).pdf) (accessed February 22, 2018).

Risky sexual behaviours along transport corridors in Kenya among the long-distance truck drivers and sex workers continue to drive the epidemic of HIV and consequently TB infection. IOM in its 2011 report on the health of mobile population report that ports, cities, border crossings and truck stops have income disparities where mobile men have money and women of low social economic status fuels the market for sex.⁷⁷ Key population along the transport hubs face challenges in accessing health services.

However, while most facilities utilized some form of Health Management Information System a considerable number of the facilities still used a paper based system to capture data on the key population and this restricted further data collection to reflect the TB burden.

3.7. TB and Urban Slums in Kenya

The UN-HABITAT defines a slum as a group of individuals who live under the same roofing in an urban area lacking one or more of the following: durable permanent housing that protect against extreme climate conditions, sufficient living space, access to safe water in sufficient amounts, adequate sanitation and security of tenure that prevents forceful eviction.⁷⁸ One in eight people live in slums globally, and it is estimated that a total of one billion people live in slum conditions.⁷⁹

The Kenyan urban slums are considered a high risk setting due to overcrowding, poverty, geographical and social barriers. The urban population has been reported in the recently conducted survey on TB prevalence in Kenya as key priority areas for call to action to find

77 IOM (2014) "An analysis of Migration Health in Kenya," *ibid*.

78 UN-HABITAT (2006) "State of the World Cities," available at http://mirror.unhabitat.org/documents/media_centre/sowcr2006/SOWCR%205.pdf (accessed February 22, 2018).

79 UN-HABITAT *Slum Almanac 2015-2016: Tracking Improvement in the Lives of Slum Dwellers*, available at <https://unhabitat.org/slum-almanac-2015-2016/> (accessed November 26, 2017).

the missing cases. In a study to assess if slum dwellers were at an elevated risk of HIV infection, *Madise et al* conclude that the risks of slum dwellers were higher than the general population which was attenuated by age, ethnicity and age at sexual debut.

High magnitude of TB in slums has also been reported in a study in Nigeria by *Ogbudebe et al* reporting that high proportion of PTB with mostly smear positive TB was associated with HIV.⁸⁰ With the correlation of HIV and TB, this finding could ultimately increase the risks of coinfection.⁸¹ The slum population is a major reservoir for health conditions that the health sector must deal with and this could lead to greater expenditure of resources to manage chronic illnesses which are preventable.⁸²

In a comparative study to assess the health indicators in slum, rural and urban communities, *Mberu et al* concluded that mortality and morbidity were worse in slums than anywhere else.⁸³ Low Social economic factors have been attributed to an increase in TB prevalence.

80 Ogbudebe CL, Izuogu S, Abu CE. (2016) "Magnitude and treatment outcomes of pulmonary tuberculosis patients in a poor urban slum of Abia State, Nigeria," *Int. J. Mycobacteriology*. 2016 June, 5(2):205–10, available at <http://linkinghub.elsevier.com/retrieve/pii/S2212553116300103> (accessed November 26, 2017).

81 J. Madise N, Ziraba AK, Inungu J, Khamadi SA, Ezeh A, Zulu EM, et al. (2012) "Are slum dwellers at heightened risk of HIV infection than other urban residents? Evidence from population-based HIV prevalence surveys in Kenya," *Health Place*, 2012 September, 18(5):1144–52, available at <http://linkinghub.elsevier.com/retrieve/pii/S1353829212000652> (accessed November 26, 2017). See also Magadi MA. (2013) "The Disproportionate High Risk of HIV Infection Among the Urban Poor in Sub-Saharan Africa," *AIDS Behav*. 2013 June, 17(5):1645–54, available at <http://link.springer.com/10.1007/s10461-012-0217-y> (accessed November 26, 2017).

82 Riley LW, Ko AI, Unger A, Reis MG. (2007) "Slum health: Diseases of neglected populations," *BMC Int Health Hum Right*. 2007 December; 7(1), available at <http://bmcinthealthumrights.biomedcentral.com/articles/10.1186/1472-698X-7-2> (accessed November 26, 2017).

83 Mberu BU, Haregu TN, Kyobutungi C, Ezeh AC. (2016) "Health and health-related indicators in slum, rural, and urban communities: a comparative analysis," *Glob Health Action* 2016 December;9(1):33163 : available at <https://www.tandfonline.com/doi/full/10.3402/gha.v9.33163> (accessed November 26, 2017).

Malnutrition is another risk factor for TB predisposed individuals in urban slums to TB infection by reduced immunity while also affecting adherence to medication. Urban centers are characterized by a cash based economy and access to income is essential for food and nutrition.⁸⁴

Active case finding within the slum areas should be strengthened as this could lead to early diagnosis and treatment. Kenya has no epidemiological data to reflect the burden of TB in the urban slums. Adoption of electronic medical records has the potential to improve continuity of care. The data should be disaggregated to reflect age, sex, gender and risks.

With the correlation to malnutrition and TB, there should be political will and commitment to ensure food security and policies containing food prices are improved. The multiple for profit and non-profit institutions offering care within urban slums should be regulated to ensure quality of care delivery. Community based DOT (CB-DOT) interventions should be tailored in line with the local settings. Addressing stigma at community level by increasing advocacy efforts and awareness will tackle social barriers associated with TB. Urban slums are hard to reach geographically and use of portable health information assessment and mobile diagnostics will improve on case findings.

84 Galal O, Corroon M, Tirado C. (2010) "Urban Environment and Health: Food Security," *Asia Pac J Public Health* 2010 July;22(3 suppl):254S–261S, available at <http://journals.sagepub.com/doi/10.1177/1010539510372993> (accessed November 26, 2017); See also Amendah DD, Buigut S, Mohamed S. (2014) "Coping Strategies among Urban Poor: Evidence from Nairobi, Kenya," Molyneux S. (eds.), *PLOS ONE* 2014 January;9(1):e83428, available at <http://dx.plos.org/10.1371/journal.pone.0083428> (accessed November 26, 2017).

3.8. TB and Diabetics in Kenya

A new threat is facing TB control which presents itself as an increase of people living with diabetes. In 2015, the International Diabetes Federation (IDF) estimated that there are 415 Million people in the world living with diabetes⁸⁵

IDF estimates a prevalence of 2-5% in Kenya and its speculated that over 50% of diabetic cases are not diagnosed. IDF 2014 reports a disparity in distribution of Diabetes Melitus (DM) with 10.7% among the urban and 2.7% among the rural dwellers.⁸⁶ The *Kenya STEPwise survey* for NCD risk factors in 2015 report that the rise in DM is associated with demographic and social changes such as globalization, urbanization, aging population and adoption of unhealthy lifestyles such as consumption of unhealthy diets and physical inactivity.⁸⁷

Studies have shown that DM increases the risk of developing TB about three-fold.⁸⁸ DM is associated with delayed innate immunity to TB.⁸⁹

85 International Diabetes Foundation (IDF) "International diabetes atlas - 8th Edition," available at <http://www.diabetesatlas.org/> (accessed November 28, 2017).

86 Da Rocha Fernandes J, Ogurtsova K, Linnenkamp U, Guariguata L, Seuring T, Zhang P, et al. (2016) "IDF Diabetes Atlas estimates of 2014 global health expenditures on diabetes," *Diabetes Research and Clinical Practice*, Volume 117, 48 – 54, available at <http://linkinghub.elsevier.com/retrieve/pii/S0168822716300808> (accessed November 28, 2017).

87 MOH (2015) *Kenya STEPwise Survey for Non Communicable Disease risk factors report*, available at <http://aphrc.org/wp-content/uploads/2016/04/Steps-Report-NCD-2015.pdf> (accessed February 22, 2018).

88 Ronacher K, Joosten SA, van Crevel R, Dockrell HM, Walzl G, Ottenhoff THM. (2005) "Acquired immunodeficiencies and tuberculosis: focus on HIV/AIDS and diabetes mellitus," *Immunol Rev* 2015 March;264(1):121–37, available at <http://doi.wiley.com/10.1111/imr.12257> (accessed November 28, 2017).

89 Vallerskog T, Martens GW, Kornfeld H. (2010) "Diabetic Mice Display a Delayed Adaptive Immune Response to Mycobacterium tuberculosis," *J Immunol*. 2010 Jun 1; 184(11):6275–82, available at <http://www.jimmunol.org/cgi/doi/10.4049/jimmunol.1000304> (accessed November 28, 2017).

Diabetic patients are more likely to have pulmonary than extrapulmonary TB and given that lung cavities are associated with higher bacterial burden in sputum, DM patients then are important contributors to the spread of TB.⁹⁰ In a systemic review to address the prevalence and associated factors of TB and DM comorbidity, *Workneh et al* reveal that the global burden of TBDM comorbidity is high and was fueled by associated factors and suggested that screening TB patients for DM was an important public health intervention. *Worknen et al* identified the male sex as a risk factor associated with TBDM.

Alcohol consumption and tobacco smoking was attributed to this risk.⁹¹ Women were also recognized to be at risk of TBDM due to poor health seeking behaviours and their exposure to TB patients when offering care. Other risk factors identified were old age, urban population, high income earners due to sedentary lifestyles and long-term DM was associated with impaired innate and adaptive immune response.

A study on effects of diabetes on tuberculosis control in high burden areas revealed that reduction of the prevalence of diabetes could accelerate the decline of TB and required a multi-faced approach including integrated care for TB

and active screening for TB in diabetic patients.⁹² Effective collaborative with NCD programs and integration of broader health plans for NCD should help in planning and budgeting.⁹³

Data is lacking in Kenya to estimate the magnitude of TB-DM. The NCD policy 2015-2020 does not reflect strategies to address comorbidities associated with high mortality in DM patients with key focus on TB due to the correlation. Establishing a link between TB and DM will need to come from engagement of the political class with commitment to provide resources to address treatment access to DM and consequently DM. TB active case finding should be intensified among DM patients.

90 Reis-Santos B, Locatelli R, Horta BL, Faerstein E, Sanchez MN, Riley LW, et al. (2013) "Socio-Demographic and Clinical Differences in Subjects with Tuberculosis with and without Diabetes Mellitus in Brazil – A Multivariate Analysis," Mokrousov I (eds.), *PLOS ONE* 2013 Apr 24; 8(4):e62604, available at : <http://dx.plos.org/10.1371/journal.pone.0062604> (accessed November 28, 2017); See also Restrepo BI, Fisher-Hoch SP, Crespo JG, Whitney E, Perez A, Smith B, et al. (2007) "Type 2 diabetes and tuberculosis in a dynamic bi-national border population," *Epidemiol. Infect* 2007 April; 135(03):483, available at http://www.journals.cambridge.org/abstract_S0950268806006935 (accessed November 28, 2017).

91 Workneh MH, Bjune GA, Yimer SA. (2017) "Prevalence and associated factors of tuberculosis and diabetes mellitus comorbidity: A systematic review," Wilkinson KA (eds.), *PLOS ONE* 2017 Apr 21.

92 Pan S-C, Ku C-C, Kao D, Ezzati M, Fang C-T, Lin H-H. (2015) "Effect of diabetes on tuberculosis control in 13 countries with high tuberculosis: a modelling study," *Lancet Diabetes Endocrinol.* 2015 May; 3(5):323–30, available at <http://linkinghub.elsevier.com/retrieve/pii/S221385871500042X> (accessed November 28, 2017).

93 Lönnroth K, Roglic G, Harries AD. (2014) "Improving tuberculosis prevention and care through addressing the global diabetes epidemic: from evidence to policy and practice," *Lancet Diabetes Endocrinol.* 2014 Sep; 2(9):730–9, available at <http://linkinghub.elsevier.com/retrieve/pii/S2213858714701093> (accessed November 28, 2017).

PART IV

4.0 FIELD RESEARCH FINDINGS

Introduction

This section outlines information gathered from key informant interviews (KII), focus group discussion and community multi-stakeholder dialogue forum. The responses were from 12 KIIs that included informants from National TB program, County TB coordinators, healthcare workers, CSOs, former TB patients among others. The respondents had tools tailored for each category of KII (see annex).

Overview of TB for key, vulnerable and undeserved population in Kenya

Respondents reported that TB infection rate was higher than had previously estimated. Reference was made to the TB prevalence survey 2016. The highlights of the survey indicated that 83% of those who had TB infection were HIV negative, 40% of TB cases were undiagnosed and untreated. Men were more infected, and the mean age is 25-36 years.

It was clear from the respondents that Kenya does not have a well understood and defined TB Key and Vulnerable populations. The Key population well discussed, and some with existing health programs are Sex workers and Men who have sex with Men.

The respondents also indicated that there were no population estimates done for Key and Vulnerable population particularly during the last National TB survey that was conducted in 2016.

The respondents indicated that there had never been a government-led prioritization of TB programmes for Key and Vulnerable population and those that existed had a correlation with HIV.

The respondents reported that the existing TB programs for the Key population were run by Key population Non-governmental organizations which were donor driven hence unsustainable in the long run.

Qualitative findings exemplify that TB affects those who are already more vulnerable or marginalized including Persons Living with HIV (PLHIV), People who use drugs (PUDs), mobile populations, rural and urban poor, miners, prisoners, women and children.

The respondents cited men who have sex with men (MSM), male and female sex workers (M/FSW), adolescent's girls and young women (AGYW), elderly people, truck drivers, street families, migrants, refugees, slum dwellers, children under five years, *matatu* (public transport) industry including drivers and touts, and contacts of known TB positive.

Respondents in the stakeholders meeting also indicated that PSV operators, factory workers, people living next to dumping sites, *jua kali* workers (informal sector workers) and learning institutions were other key, vulnerable and underserved population who were at a high risk of TB infection.

Table 2: Key Population Estimates per County

County	FSW	MSM	PWID
Kenya			
Nairobi	29,494	10,000	6,216
Mombasa	9,288	782	2,101
Kilifi	4,676	640	509
Kwale	1,112	257	134
Lamu	-	-	-
Taita Taveta	1,389	6	0
Tana River	-	-	-
Garissa	-	-	-
Mandera	-	-	-
Wajir	-	-	-
Embu	1,032	29	117
Marsabit	1,966	46	3
Meru	3,391	509	545
Isiolo	-	-	-
Makueni	1,966	46	3
Kitui	794	260	20
Machakos	3,385	617	214
Tharaka Nithi	3,150	100	0
Nyeri	988	9	62
Nyandarua	-	-	-
Kiambu	4,603	310	597
Muranga	442	184	123
Kirinyaga	739	20	24
West Pokot	1,004	8	0
Turkana	724	0	0
Trans-Nzoia	815	13	8
Narok	576	4	7
Nandi	-	-	-
Nakuru	5,309	259	131
Elgeyo Marakwet	-	-	-
Laikipia	1,355	29	60
Kericho	1,116	0	0
Kajiado	1,564	26	11
Bomet	550	-	-

1) Occupational Risks

a) *The Fishing population:*

- The respondents reported that the fishing

population were a Key population based on the already existing high prevalence of HIV among them due to the risky behaviours.

- The respondents also report that, the housing around the fishing shores are poorly ventilated, overcrowded further increasing the risk of TB.
- They respondents also indicated that the fishing population has challenges in accessing health services owing to the geographical location of the fishing towns coupled by high transport costs. This was mainly a challenge to TB patients during the initiation phase.

(b) *Health Care Workers.*

- The respondents indicated that there were very few reported cases of TB among health care workers possibly due to;
 - ✓ Stigma and discrimination
 - ✓ Lack of a clear framework of workplace compensation.
 - ✓ Fear of losing their job
- The respondent reported that healthcare workers were at an increased risk of contracting TB. Due to the shortages within the workforce, the health care workers had to spend more time with patients worsening the already existing risks.
- The respondents indicated that healthcare workers did not undergo regular screening for TB infection due to diagnostic challenges.

(c) Uniformed Populations:

- The respondents from the Prison reported that they were at a high risk of TB due poor ventilation in prisons.
- They reported that the wardens did not have regular TB screening.
- They also reported that many warders who were diagnosed to have TB infection preferred to be followed up in different facilities due to stigma and discrimination.

- The respondents also highlighted that there were cultural barriers that prevented men from accessing care as modern treatment was viewed as emasculating and that hospitals were only for women and children.

2) Biological Risks

- The respondents report that health conditions such as Diabetes Mellitus, malnutrition and HIV increased risk of TB infection due to the compromised immunity status.
- The respondents also raised concerns of lack of integrated facilities that managed multiple comorbidities for TB patients. Injecting drug users who had TB and Hepatitis C coinfection had to access services separately.

3) Gender and Age

- The respondents reported Men were at an increased risk of TB due to risky behaviour such as alcohol consumption and smoking.
- Men preferred to self-treat themselves and only sought hospital care when complications set in.
- Some respondents highlighted that women unlike men had many chances of accessing a healthcare worker or a health facility due to the multiple services available targeted to women.

Table 3: County Specific Key and Vulnerable Populations

TB KP identified by CLTC	Homabay	Busia	Kisumu	Nairobi
PLHIV	✓	✓	✓	
Fishermen	✓	✓	✓	
Fishing population in beaches	✓	✓	✓	
Islanders	✓	✓		
Health care workers		✓	✓	
Sex workers	✓	✓	✓	✓
Truck drivers		✓		
Boda boda riders(motorcycles transporters/operators)	✓			
Matatu crew(mini van transporters)			✓	✓
Casual labourers in factories and industries	✓			✓
Miners and quarry workers	✓			
Slum dwellers	✓		✓	✓
Homeless people/street families				✓
MSM		✓		✓
IDUs		✓		✓
Children under five years		✓		✓
Adolescents		✓		✓
Elderly people		✓		

- The respondents reported that the extremes of ages were at risk of TB due to low immunity.
- The respondents highlighted the diagnostic challenges among children indicating that bronchial lavage could only be done by trained personnel.
- The respondent also reported challenges to access to TB and other health services among the transgender. This was due to identification challenges, stigma and discrimination from the health workers. A transgender female indicated that lack of identification card resulted in them not getting meaningful employment resulting in them residing in poor housing region further exposing them to TB.

4) Social Economic Risks

- The respondents reported that slum dwellers were at a high risk of TB infection due to overcrowding, poor access to nutrition and lack of water and sanitation.

5) Emerging Populations

- People living in marginalised areas and who has access challenges due to mobility. These populations include nomads and pastoralists.
- People working in the transport sector: *matatus*, *boda-bodas*, long distance track drivers.
- Those who face barriers to access to health due to their illegal status; refugees and immigrants.
- These include homeless populations including street families. Their vulnerability is accelerated by malnutrition, overcrowding, substance abuse and poor health seeking behaviours.

Drivers of TB among key, vulnerable and underserved population

1) Social-cultural Norms and Practices

- Poverty pushed individuals to live in overcrowded slums, access poor housing, malnutrition, poor health seeking behaviours due to lack of resources to seek for health services.
- Discrimination from the public and at service delivery points prevented access to health.

- Cultural beliefs such as men being regarded as macho, stronger and the belief that sickness is for women and children also led to the gender disparities towards access to health.

2) Health Seeking Behaviours

- Respondents reported that most patients seek health services first from private providers and traditional healers from the community. These resulted in late seeking of health services exposing the general population and risking development of DR-TB.
- The respondents also report that unlike HIV, there was inadequate knowledge among the community and healthcare workers.

“ Kisumu tried to engage traditional healers/ herbalists last year, didn't get a good number of them; some of them were worried that Government was trying to audit their activities. The second meeting had more traditional healers. And now some traditional healers are referring patients to the TB program. Kisumu County is now including the traditional healers in the sub county meetings and are recognising their contributions to TB program; program developed curriculum for traditional healers”, Dr. Timothy Malika, CTLC Kisumu.

3) Infrastructural Factors

- The vastness of some of the counties; geographic coverage renders access to diagnosis to become a problem
- Diagnosis; GeneXpert is not available in all facilities and this resulted in delaying of diagnosis. Chest facilities did not have chest x-rays to facilitate diagnosis.
- Not all prisons have a health facility and they depended on the county facilities to access healthcare services. Those that had facilities did not have transport provision for transporting samples hence they had to physically take prisoners to health facilities for diagnosis and follow-up.
- Referrals from prisons are not streamlined and many patients were lost to follow up especially those who had shorter sentences. Other prisoners did not want to be identified as prisoners hence they used false identifications further impeding referrals. Need emphasis on patient education on treatment adherence. These initiatives are usually supported by development partners. Access to chest X-ray has been an issue because of fee; maybe present a voucher for all TB patients and then reimburse the facilities; lots of support from partner who support the HIV free chest X-ray initiative.

4) Political and Legal Barriers on TB

- The respondents noted that there are no existing policies for TB care for KVVU population and those that exist correlate with HIV.

- The respondents also report that government policies took very long to develop, are costly and most dependent on donor funding hence despite the urgency in addressing TB among KVVU population, the policy framework might take longer to develop.
- Historically there has been political will towards addressing HIV. However, this has not been experienced with TB. The respondents also report that the KVVU are not included in the planning and implementation process of policy.

5) Public Private Disconnects

- The private sector provides 40% of Kenyans with health services including TB. The respondents note that the private sector is very critical in reaching the key population, but lack capacity and information of current guidelines to do so. This risks TB care to patients.
- The private sector was also costly and exposed TB patients to catastrophic expenditure.

6) Cost of Treatment

- The respondents noted that TB services are not entirely free and that patients still have to bear costs such as consultation fee and transport fees which impedes access to health.

7) Multi-sectoral Disconnect

- The respondents note that the government agencies did synchronise TB care and they work in isolation. Each had its own indicators, reported separately and they did not synchronize their strategic plan as concerns TB.

4.1 Recommendations with Timelines

County Governments	Short-Term	Mid-Term	Long-Term
	<ol style="list-style-type: none"> 1. Local level mapping and definition of Key and Vulnerable populations: County governments should define and map their key and Vulnerable population by developing tools for data collection that are sensitive and address confidentiality concerns of KVVU population. 2. Population size estimates: County health teams should have population estimates of Key and Vulnerable populations for purposes of planning and resource allocation. 3. Service delivery: More flexible hours are needed at facilities so as to cater for the Key and vulnerable populations who work both at night and day. There is also need to have mobile outreaches for TB care to reach the mobile populations. 4. TB education: County governments should escalate TB preventive and promotive education in all public and private institutions with attention to the most at risk such migrant population, the slum dwellers and health care workers. While dissemination of TB information, the County health team should ensure that the information, education and communication (IEC) materials are regularly updated. The county should build TB champions who will be key in TB advocacy. 5. Mobile Services: County governments should have mobile service provision for TB especially to the Mobile populations. 	<ol style="list-style-type: none"> 1. Automation of Data collection: The county government should invest in electronic medical records (EMR) at the facility. The data collected by EMR should be comprehensive to capture Key and Vulnerable population. Automation not only improves validity and reliability of data collected but it also ensures confidentiality. Automation of data at facility level will assist in risk profiling for Key and Vulnerable population which will then ensure that their health needs are addressed comprehensively. 2. Human resource: The County health team working with the county public health committees should develop a mechanism for including and absorbing the community health volunteers by offering them incentives and training. 	<ol style="list-style-type: none"> 1. Policies and laws: The County Health team should address stigma and discrimination towards Key and Vulnerable population among healthcare workers by creating awareness, sensitizing them and training them on patient chatter. 2. Coordination CSOs working in TB: County Health teams should coordinate with CSOs providing TB care from those involved at service delivery to those in advocacy. 3. Inclusion: Key and Vulnerable population should be involved in planning and implementation of TB services at county level. The youth and adolescents should also be involved in preventive and promotive TB services.

Civil Society	On a rolling Basis
	<ol style="list-style-type: none"> <li data-bbox="731 178 1362 268">1. Advocate for social protection for TB patients in line with Universal Health Coverage (UHC) by partnering with the government, TB communities and the Key population. <li data-bbox="731 300 1362 420">2. Be involved in budget advocacy to increase resource allocation for TB. There is currently no specific line budget for TB like for HIV. Partners should emphasis on matching the funds the government has allocated to TB before funding them. <li data-bbox="731 453 1362 510">3. Advocating for update of diagnostic tools in TB care such as LAM, including shorter course and effective TB drugs. <li data-bbox="731 542 1362 632">4. Civil Society Organisations should shadow the Government and hold it responsible for TB care by filling up on the key deliveries.

Annexures

Questionnaire:



STRUCTURED QUESTIONNAIRE: DATA ASSESSMENT ON TB KEY, VULNERABLE AND UNDERSERVED POPULATIONS

CONSENT

This questionnaire seeks to solicit your honest, views, knowledge and perceptions on the current situation of Data Management and Assessment on TB Key, Vulnerable and Underserved Populations in Kenya. The survey will assess the current levels of knowledge and practice on data for TB Key, Vulnerable and Underserved Populations by both the state and the public. Every subject matter discussed with you will be treated with all the ethical and confidentiality requirements of Good Research Practice. Please do not take part if you feel that anyone is pressuring you to undertake the interview, you should be here by your own choice.

This survey is being organised by KELIN Kenya and the STOP TB Partnership. If you have any questions about any aspects of the interview, please feel free to contact them using the details provided by us.

Before you answer any questions I would like you to know that:

- a) Your participation in this activity is entirely voluntary.
- b) You are free to refuse to answer any questions.
- c) You are free to stop this interview at any time.

The data collected in this interview will be kept strictly confidential and will only be available to data analysts. Short quotes from individual interviews may form part of the report, but under no circumstances will your name or any identifying characteristics be included in the report, or connected to anything that you have said.

Do you have any further questions before I seek your consent to interview?

Has oral consent been obtained?

YES If NO → please thank the respondent and discontinue the interview.

Thank you for agreeing to take part in this survey.

I will now declare that you have given oral consent for the interview.

Name / Signature of interviewer: _____

Date: _____ Location: _____

General overview of TB in Kenya

1. Kindly describe your role(s) at your organization
2. Briefly describe the TB related activities your organization is involved in, in Kenya.
3. Are there specific subpopulation groups that may face increased vulnerability to TB?
4. What socio-cultural norms and practices may contribute to increased risk of TB transmission among key and vulnerable populations?

1.0 TB Programming in Kenya

1. Which barriers do these key populations face when accessing TB and TB-HIV and TB-diabetes services in Kenya?
2. What can be done to remove barriers for refugees/immigrants in terms of accessing TB services? What can be done to improve cross-border TB surveillance and TB service provision within the neighbouring?
3. Does Kenya have a well understood and defined key populations based on TB risks they face?
4. Is there a mechanism for service planning at national level to prioritize, design and scale up TB programmes for key populations?
5. Are there strategies for the integration of harm reduction (Methadone Maintenance Therapy, needles and syringes exchange), HIV and TB services to mitigate treatment disruptions, and increased risk of drug resistance?
6. What systems are in place for the HIV and TB screening for all?.
7. What interventions are there for TB preventive treatment for inmates with HIV; harm reduction services such as MAT for inmates who are drug users lowering TB treatment adherence; Inter-facility transfer planning that integrates HIV/TB/harm reduction public services (health, social) and community (psychosocial) in places where the released inmate will reside to ensure treatment adherence.

3.0 Data Assessment

1. Is the current TB data disaggregated by gender, age and key population groups? Do we have measurement indicators that are responsive and sensitive to key populations? Are these indicators harmonized for inter- and cross-county comparison?
2. Do the existing indicators responsive to the level of risk and needs for Key Populations?
3. What mechanisms are in place to ensure personal safety and confidentiality of key populations throughout the process from data collection, analysis to reporting?
4. While collecting key population-specific data is there a defined and prioritized key populations most affected by TB.
5. Do the key population data available from surveillance, able to inform TB national strategic plans and investment cases? Do we collect both quantitative and qualitative data on social stigma against ex-drug user's limits re-integration into society?
6. Do you have a clear framework at the local level to track implementation and performance? How do you engage the Key Populations in the design and implementation?
7. How do you use the available data for designing prevention and health services for TB?

4. Recommendations

1. What would be critical to the success of TB programmes for key populations, namely multi-stakeholder, participatory, human rights-based, gender-responsive and evidence-driven?
2. What would be the ideal service cascade at the community level for performance monitoring that are particularly useful for key populations?
3. What will foster political will, local ownership and partnerships to achieve long-lasting results and profound changes in reducing and eliminating data collection disparities?
- 4.

Thank you very much for taking time to participate in this assessment.

Annexure II: TB KPs prioritization from four counties

TB KP/CTLC	Homabay	Busia	Kisumu	Nairobi
PLHIV	✓	✓	✓	
Fishermen	✓	✓	✓	
Fishing population in beaches	✓	✓	✓	
Islanders	✓	✓		
Healthcare workers		✓ *	✓	
Sex workers	✓	✓	✓	✓
Truck Drivers		✓		
<i>Boda boda</i> riders (motorcycle transporters/operators)	✓			
<i>Matatu</i> crew (mini van transporters)			✓	
Casual laborers in factories and industries	✓			✓
Miners and quarry workers	✓			
Slum dwellers	✓		✓	✓
Homeless people/Street families				✓
MSM		✓		✓
IDUs		✓		✓
Children under 5 years		✓		✓
Adolescents		✓		✓
Elderly people		✓		
Refugees/Immigrants				✓

Annexure III: List of Working Group Members

Name	Organisation
(a) Allan Maleche	Executive Director (KELIN)
(b) Maureen Kamene	National Tuberculosis, Leprosy and Lung Disease Program (NTLD-P)
(c) Geoffrey Okallo	Data Collection Specialist, NTLD-P
(d) Violet Mavisi	Gender Expert
(e) Timpyian Leseni	Talaku TB Community Organisation
(f) Steve Anguva	Pamoja TB Community Organisation
(g) Khairunisa Suleiman	TB and Public Health Expert
(h) Timothy Wafula	TB and HIV Thematic Area (KELIN)

Annexure IV: List of Key Informants

No	Name of Interviewee	Designation	Type of Organization
1	Carolly Migwomba	CTLC Homa Bay	County Government
2	Bernard Bosire	CTLC Busia	County Government
3	Timothy Malika	CTLC Kisumu	County Government
4	Elizabeth Mueni	CTLC Nairobi	County Government
5	Eunice Mailu	M&E Officer	NTLD-P: National Government
6	Maureen Kamene	Head	NTLD-P: National Government
7	Joseph Mutiria and Ernest Kimutai (joint interview)	TB/HIV Prevention Officer and TB/HIV Clinical Officer	Prison Headquarters: National Government
8	Enos Masini	TB Technical Advisor	WHO: Technical/Development Partner (Non-state actor)
9	Ulo Benson and Anne Munene (joint interview)	Project Manager and Project Officer	*AMREF: Technical Partner (Non-state actor).
10	Alexander Vandenbulcke and Stephen Wanjala (joint interview)	Medical Coordinator and Deputy Medical Coordinator	MSF Paris: Technical Partner (NGO)
11	Evaline Kibuchi	National Coordinator	Stop TB Partnership Kenya Civil Society (NGO)
12	Nelson Otwoma	National Coordinator	NEPHAK: Civil Society (NGO)
13	Herman Weyenga	TB/HIV technical advisor for CDC Kenya	CDC
	FGD		
14	Steve Anguva	Founding Member	Pamoja TB (CHV and TB survivor)
15	Alexandra Ogeta	Executive Director	Jinsi yangu

Annexure V: List of Participants - Initial Stakeholders Dialogue

Participants Name	Designation
1. Erick Okioma	Community TB champion, Kisumu County
2. Soloaka Pilipili	County TB Coordinator, Kajiado
3. Esha Fumo	Sub-County TB Coordinator, Mombasa County
4. Karen Kuria	Stop TB Partnership, Kenya
5. Winnie Wachiuri	UNAIDS - Kenya
6. Rebecca Awiti	Community Health Advocate, Soweto CBO
7. Timpyian Leseni	TALAKU community based organisation
8. Mary M. Asoyong	Sub-County TB Coordinator, Busia County
9. Maurice Oora	Lean on me, Kisumu County
10. Elizabeth Odara	Community health volunteer, Kisumu County
11. Nancy Jaramba	Community health volunteer, Kisumu County
12. Donald Yara	Sub-county TB coordinator, Homa Bay County
13. Christine Mwamuidi	Amref Health Africa
14. Amos Ndobi	National TB Programme, Data specialist
15. Melissa Murihia	Key Populations consortium
16. Sarah Chandi	MOH
17. Dr. Stella Bosire	<i>Consultant</i> Data Assessment
18. Reuben Yego	Sub-County TB Coordinator, Nandi County
19. Joseph Mutiria	Kenya Prisons
20. Samuel Makau	Global TB Caucus (GTBC)
21. Brandley Njuhia	Kenya Sex Workers Alliance (KESWA)
22. Judy Odundo	Women Fighting AIDS in Kenya (WOFAK)
23. Khairunisa Suleiman	<i>Consultant</i> gender assessment
24. Gatukuru Dennis	Kenya AIDS NGOs Consortium (KANCO)
25. Anne Ronoh	Community TB Champion, Nandi County
26. Jennifer Ngulugu	National TB Programme
27. Geoffrey Okallo	National TB Programme
28. Jane Otieno	Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH)
29. Molly Ojwando	Health NGOs Network (<i>HENNET</i>)
30. Stephen Angula	Pamoja TB group
31. Felix Mutiso	Kenya Network of religious Leaders Living with or Personally Affected by HIV (KENERELA+)
32. Christine Nahawa	Community health advocate
33. Patricia Ochieng	DACASA community based organization
34. Zacheas Muturi	AMREF
35. Eunice Mailu	National TB Programme

Participants Name	Designation
36. Jackie Wambui	National Empowerment Network of People living with HIV/AIDS in Kenya (NEPHAK)
37. Njeri Kuria	National Transport and Safety Authority
38. Samuel Kyalo	Lawyer
39. Rashid Bulize	Health care worker
40. Kim West	MSF
41. Wairimu Gitau	MSF-Kenya
42. Timothy Wafula	KELIN
43. Lucy Ghati	KELIN

Appendix VI: List of Participants at Validation Workshop

Participants Name	Designation
1. Mary Katana	Sub county TB coordinator, Mombasa County
2. Eunice Mailu	National TB programme
3. Teresa Michieka	Ministry of Health
4. Khairunisa Suleiman	Consultant
5. Timpiyan Leseni	Talaku CBO
6. Mavisi Violet	Consultant
7. Jennifer Njuhigu	Ministry of Health
8. Zulfikar Ali	Community Health Advocate, Kisumu County
9. Sam Kyalo	Lawyer
10. Geoffrey Munialo	Health care worker
11. Gloria Kerubo	Sauti Skika, NEPHAK
12. Kendi Anastacia	NEPHAK
13. Evaline Kibuchi	Stop TB – Kenya
14. Samuel Makau	GTBC
15. Dr Carolly Mwigambo	County TB Coordinator, Homa Bay County
16. Chrisantus A. Ndhawa	Community Health Advocate
17. Mercy Kinyua	TB Action Consortium
18. Dr Bernard Bosire	County TB Coordinator, Busia County
19. Stephen Anguva	Pamoja TB group
20. Wariara Mugo	MSF
21. Joseph Mutiria	Kenya Prisons
22. Ernest Kinyua	Kenya Prisons
23. Rahab Mwaniki	Kenya AIDS NGO Consortium
24. Sarah Chandi	Sub county TB coordinator
25. Melissa Murihia	KP Consortium

Participants Name	Designation
26. Irene Kuria	KP Consortium
27. Dr Stellah Bosire	Consultant
28. Patricia Asero	Dacasa Community based organisation
29. Timothy Wafula	KELIN
30. Alexandra Ogeto	Jinsiangu
31. Dr Jane Ong'ang'o	Kenya Medical Research Institute (<i>KEMRI</i>)
32. Winnie Wachiuri	UNAIDS
33. Geoffrey Okallo	National TB Programme
34. Solonka Pilipili	County TB Coordinator, Kajiado
35. Bradley Njuria	Kenya Sex Workers Alliance
36. Edward Omondi	Amref Health Africa
37. Teresa Michieka	Ministry of Health
38. Farijalla Olinia	Ministry of Health
39. Lucy Ghati	KELIN



Nairobi Office
4th floor Somak House Mombasa Road

- ✉ 112 - 00202 Nairobi
- ☎ +254 788 220 300
- 📠 +254 708 389 870
- ✉ info@kelinkenya.org
- 🌐 www.kelinkenya.org
- 🐦 @KELIKenya

Kisumu Office
Aga Khan Road Opp Jalaram Academy

- ✉ 17708 - 40100 Kisumu,
- ☎ +254 (57) 253 2664
- 📠 +254 708 342 197
- ✉ info@kelinkenya.org
- 🌐 www.kelinkenya.org
- 📘 Facebook/kelinkenya