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National Tuberculosis, Leprosy and Lung Disease Program

NATIONAL TUBERCULOSIS, LEPROSY AND LUNG DISEASE PROGRAM (NTLD – P)

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Executive Summary

Tuberculosis is the ninth leading cause of death worldwide and a leading cause from a single infectious agent, ranking above HIV/AIDs. Kenya remains a high burden country for both TB, MDR TB and HIV with TB ranking fourth cause of death among infectious diseases. Until recently, Kenya's burden was believed to be declining, however, the prevalence survey conducted in 2016, demonstrated that the estimated burden of TB was 169,000 people against 85,188 diagnosed and initiated on treatment. This translated to more than 40% of the adults with TB and 65% of children missed. Therefore concerted efforts must be put in place to ensure that strategies towards early identification and treatment initiation must be out in place to close the gap.

The purpose of the Annual Report is to provide information of the status of TB control in Kenya at national and county level against the set strategies and targets. In 2017, there were 85,188 patients diagnosed with TB with children accounting for 9.1% of the patients. Males accounted for 64% of the patients. HIV testing among TB patients was 95% with a coinfection rate of 28% with an ART initiation rate of 95%. The treatment success rate for the 2016 cohort was 81% with a death rate of 6%. Surveillance for DR TB among new patients was 46% while among retreatment cases was 71% with 577 DR TB patients diagnosed and notified. The treatment success rate for the 2015 cohort was 75% with a mortality rate of 15%. The private sector contributed to 18% of the TB patients notified in Kenya.

To achieve a reduction in incidence, mortality and the number of families that face catastrophic costs due to TB, the National Tuberculosis, Leprosy and Lung Disease program (NTLD-P) is committed towards adopting and sustaining innovative strategies, new diagnostic technologies and new drugs and regimens as well strengthening monitoring, evaluation and research.

Dr. Maureen Kamene
Head, National Tuberculosis, Leprosy and Lung Disease Program
Ministry of Health

Chapter One: Epidemiology of Tuberculosis in Kenya

Burden of TB in Kenya

Prevalence

In 2015/2016, the country conducted its first post-independence TB prevalence survey. The objective of this survey was to determine the prevalence of bacteriologically confirmed pulmonary TB and to assess the health seeking behavior of TB patients and those reporting TB symptoms. The survey participants' enumerated 126,389 individuals with 63,050 participating in the survey with a participation rate of 83%. The survey was fully digital and was conducted in accordance with the WHO guidelines for national TB prevalence surveys. The results, which were released in 2017 revealed that the true burden of TB in Kenya was 426 cases/100,000 population. With this burden, it is estimated that 169,000 persons fall ill with TB every year, yet only about 80,000 are notified annually. This therefore means that about 40% of estimated TB cases are not diagnosed, treated and/or notified annually. The trends for children are presumed to be similar.

The key findings were as summarised below:
1. The survey identified a total of 305 prevalent TB cases translating to a weighted prevalence of 558 [95%CI 455-662] per 100,000 adult population. Compared to the 2016 reported notification rate for Kenya, the prevalence to notification ratio was 2.5:1
2. The highest burden of disease was in the 25-34 age group, with a prevalence of 716 per 100,000. Males had a high prevalence rate of 809 per 100, 000 compared to12 Assessing Kenya's TB Burden female prevalence of 359 per 100,000. There was a higher burden of TB in the urban (760 per 100,000 population) compared to rural settings (453 per 100,000 population) and among the elderly over the age of 65 years.
3. The gap between prevalence and notification rates is higher among males, age groups 25-34, and the older age group of 65 years and above.
4. Screening for TB using cough of more than two weeks would have missed 52% of the cases. The combination of cardinal symptoms of cough of more than two weeks, fever, night sweats and weight loss would miss 41% of the prevalent cases. Testing all people with any symptom consistent with TB - cough of any duration, hemoptysis, night sweats, weight loss, fatigue, fever, and shortness of breath - would have substantially increased the case yield to 74%.
5. Twenty six percent of prevalent cases diagnosed during the survey were asymptomatic. They did not have any current cough, fever, weight loss, night sweats, fatigue, breath shortness nor chest pains.
6. The use of Xpert MTB/RIF identified 77.7% of the bacteriological confirmed cases hence increasing the diagnostic yield compared to smear microscopy which had a lower sensitivity of 46%.
7. Chest x-ray emerged to be a good TB screening tool with a sensitivity of 88%. Over 50% of the confirmed TB cases had no classical TB symptoms but had an abnormal chest x-ray.
8. Twenty one percent of the survey participants with respiratory symptoms reported to have sought prior care at private clinics and retail chemists.
9. Sixty seven percent of the prevalent cases with at least one TB related symptom had not sought any health care prior to the survey; majority of them were men.

10. Among the prevalent cases who had sought prior care for their respiratory symptoms, 80% of them had not been diagnosed with TB before the survey.
11. A lower prevalence of HIV among survey cases (16.7%) compared to notified cases (31% in 2015)

In response to the high undetected burden of TB, the survey recommended;
- Replacement of smear microscopy with a rapid point-of-care diagnostic test, such as Xpert MTB/RIF, in all health facilities while enhancing sputum delivery mechanism at all levels.
- Implementation of chest X-ray screening for TB
- Increasing engagement of private providers including retail pharmacies in TB screening, diagnosis and care
- Using integrated and innovative communication strategies to influence community health-care seeking behavior with a special focus to men
- Use of a broader TB symptom screening criteria that considers any TB related symptom: cough of any duration, hemoptysis, night sweats, weight loss, fatigue, fever, and shortness of breath.
- Screening all persons seeking care in all health care facilities for TB

Case Notification of Drug susceptible TB in Kenya

Figure 1. 1: TB Case Notification over time

In 2017, there was a 12% increase in case notification from 75,898 in 2016 to 85,188. This can be attributed to various strategies that include:

- Active case finding in high volume facilities in thirteen selected counties as a strategy to find the missing cases
- Immediate and prompt notification of all TB patients diagnosed at the point of care
- Capacity building and onsite mentorship of health care workers
- Scale up of gene xpert machines and expansion of the gene algorithm as the first test of choice at the xpert site
- Strengthened collaboration between county and national government in control of Tuberculosis

Summary of Characteristics of Drug Susceptible TB Patients in Kenya, 2017

85,188 Case Notification 2017

64% Male   **36%** Female

9.1% Paediatric   7,714   Previously Treated   **6.6%**   5,581

56% Bacteriologically Confirmed   44,375   **64%** DST Coverage for Bacteriologically Confirmed

DST Coverage   **46%** Among New Cases   **71%** Among Previously Treated

9% CHV Contribution   Private Sector Contribution   **18%**

96% HIV Testing Rate   **28%** Co-Injection Rate   **95%** ART Uptake   **95%** Cotrimoxazole Uptake
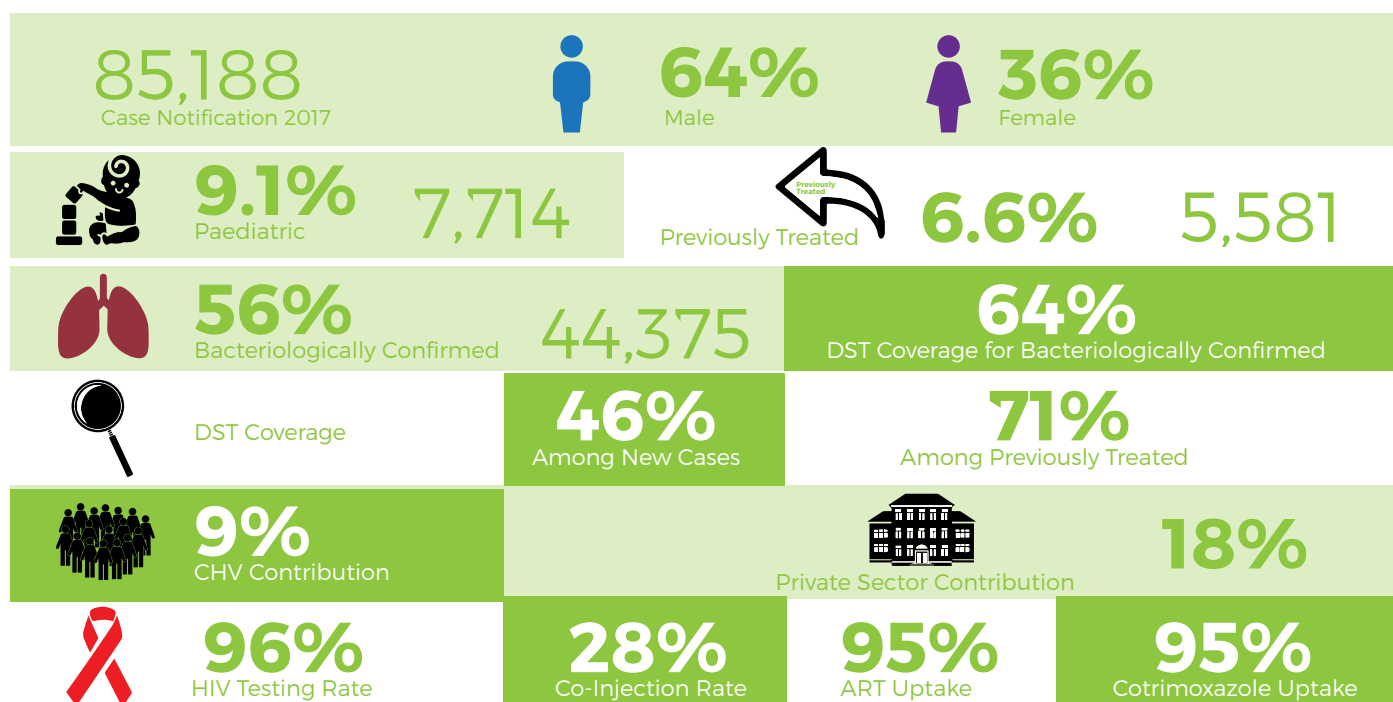
Treatment outcomes for Drug Susceptible TB Patients, 2016 Cohort

Total Number of Cases Notified **75,898**

New Cases **71,134**

Previously Treated **4,764**

Outcomes

Indicator	All Forms	Previously Treated
TSR	81%	78%
CR	69%	64%
Death Rate	6%	7%
Loss to Follow-up	5%	8%
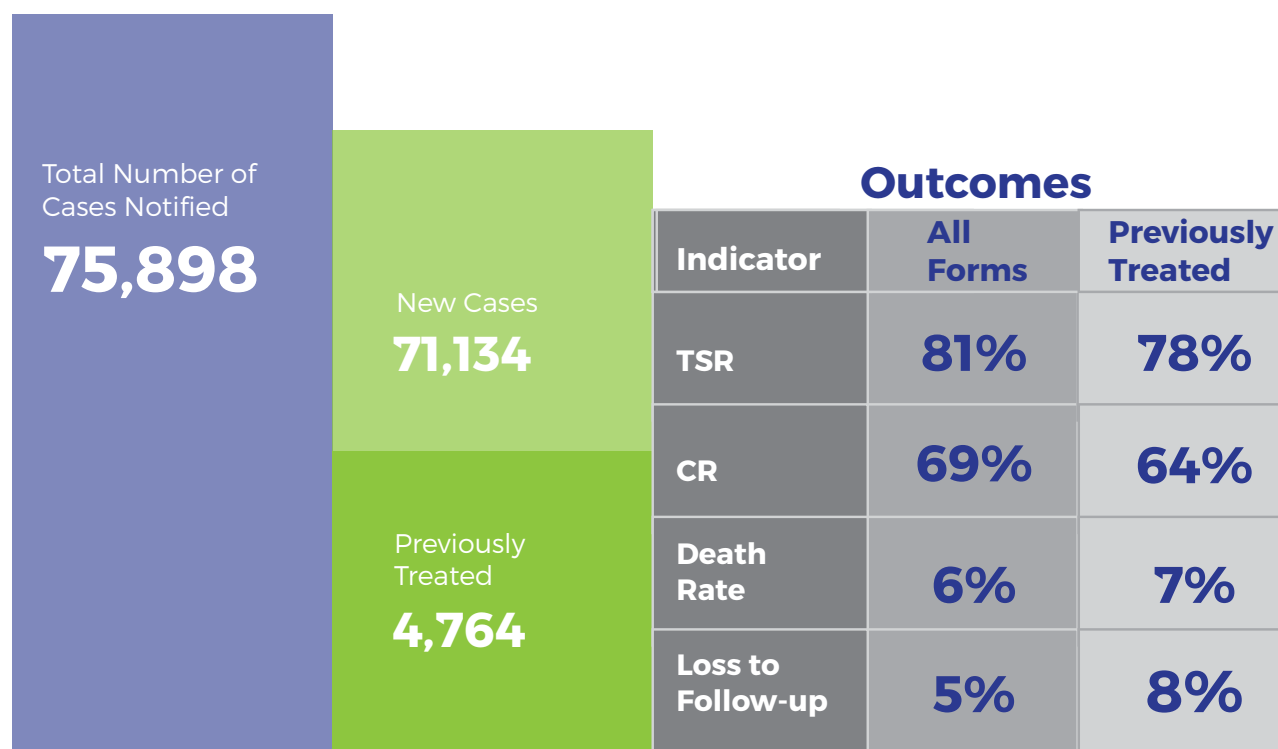
*For County specific case notification and treatment outcomes, refer to Appendix 3

Childhood Tuberculosis

Children aged between 0 and 14 years accounted for 9% (7714) of all cases notified with TB in 2017. This was an improvement from 8.5% (6619) notified in 2016.

Figure 1. 2: Proportion of Pediatric TB cases, adults and cases notified for year 2008 - 2017

Among the children notified in 2017:

5%
3,931
0-4 years

2%
1,594
5-9 years

3%
2,189
10-14 years
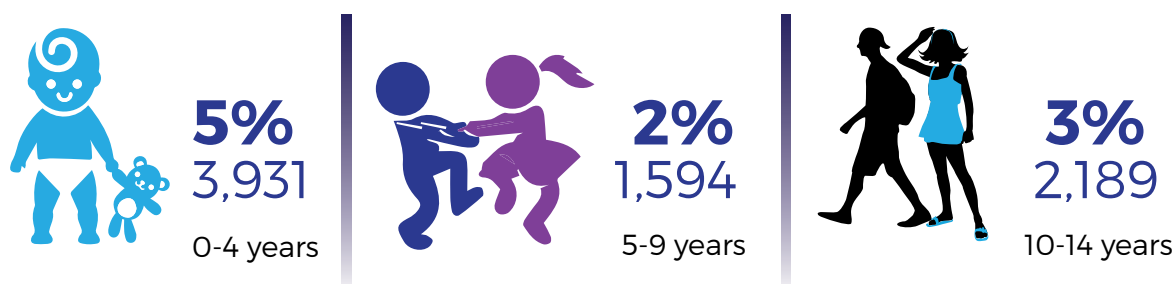
The proportion of children with bacteriologically confirmed pulmonary TB cases decreased from 19% to 17%.

- Among the 40,648 Xpert tests done in 2017, 4% (1719) of the samples were from children aged 0-14 years.
- Positivity of gene xpert in children was 13%.
- The community referred 11% of the children diagnosed with TB
- 72% of the children notified with TB had nutrition assessment done and status documented
- 33% of the children had a Z-score below -1.
- Of these, 52% received nutrition support.
- 94% of children notified with TB had a HIV test done with a HIV coinfection rate of 19%.
- 99% were on CPT and 96% on ART

Treatment Outcomes for Childhood TB in Kenya, 2016 Cohort

Total Number of Cases Notified

6,369

New Cases

6,211

Previously Treated

158

Outcomes

Indicator	All Forms	Previously Treated
TSR	85%	85%
CR	67%	53%
Death Rate	4%	9%
Loss to Follow-up	3%	3%
Not Evaluated	7%	3%
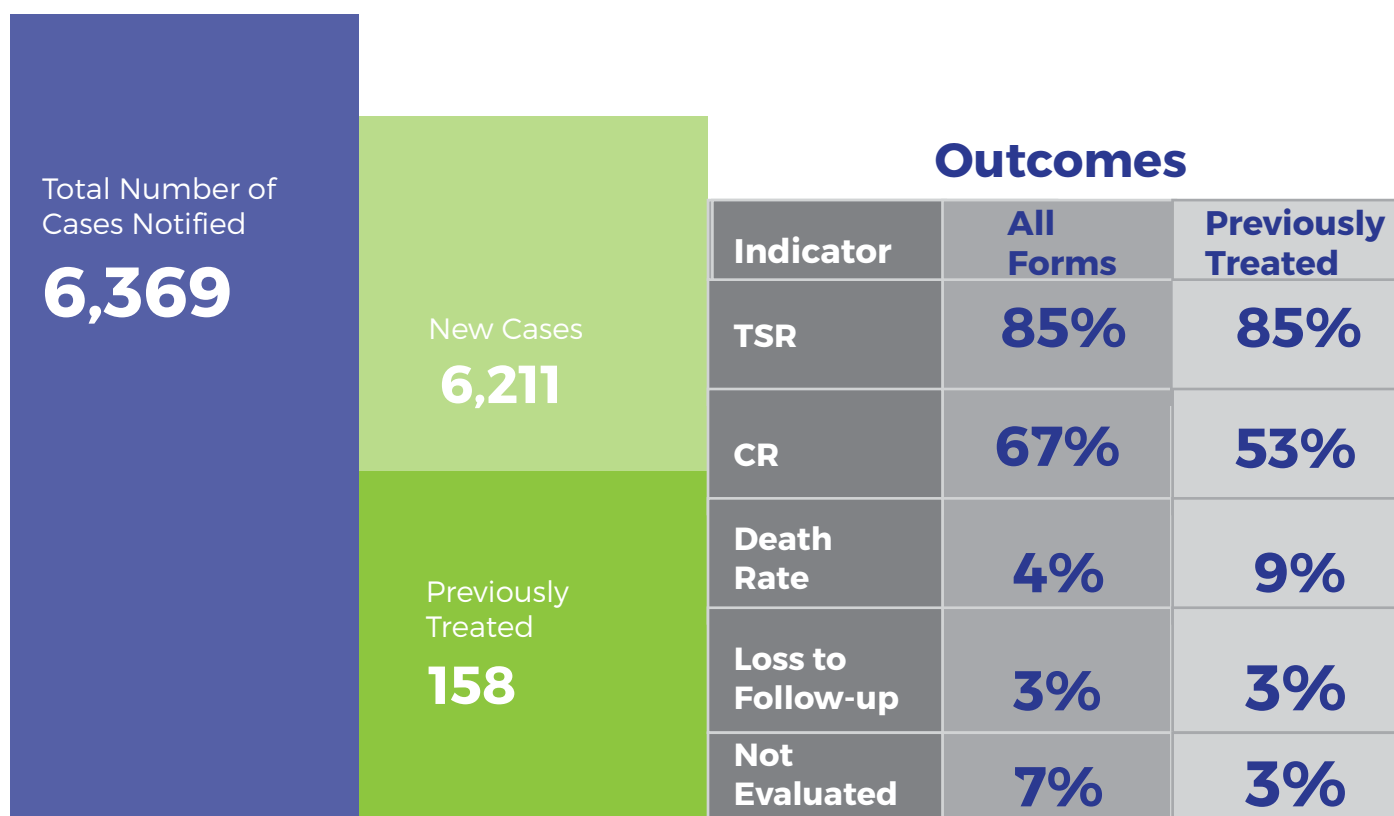
Interventions and Strategies Adopted to Improve Paediatric Case Finding

- Integration of childhood TB into other maternal and child health services enhanced paediatric case detection.
    - Childhood TB diagnosis and treatment was added as a component of the revised IMCI guidelines for management of under-fives
    - Continuous sensitization and on job training for health care workers to strengthen their capacity on suspicion and diagnosis by use of nasopharyngeal and gastric aspirates to obtain specimen
    - Improving availability and access to chest xray and other diagnostics Scaling up contact tracing through the introduction of contact tracing registers for use in health facilities
- Use of diagnostic and treatment guidelines among paediatric populations
- Strengthening sensitization and improved engagement of the private sector, specifically pediatricians in childhood TB
- Roll out of a TB Reach project in 10 counties will support enhanced case detection and IPT uptake among children
- Strengthening screening and contact tracing of under-five contacts of index bacteriologically confirmed cases

5,559

Isoniazid Preventive Therapy Among Under 5s'

Children aged below 5 years who have been exposed to bacteriologically confirmed TB cases are eligible for isoniazid as a control strategy to prevent TB:

- Children initiated on IPT improved slightly from 3,527(11% in 2016) to 5,559(13% in 2017.) This was against a ratio of 1:1 for every bacteriologically confirmed TB patient.
- The National Tuberculosis Program has placed emphasis on the benefits of initiating children on Isoniazid as an intervention of preventing TB among children aged below 5 years.
- There is need for robust and continuous sensitization by all stakeholders to ensure that all eligible children benefit from this intervention.

The uptake has been sub-optimal despite the availability of paediatric friendly commodities. There is need to ensure that all contacts of bacteriologically confirmed TB patients are screened and those found to screen negative are initiated on IPT.

Treatment outcomes for Isoniazid Preventive Therapy among under-fives, 2016 Cohort

	Completed	Died	Discontinued	Defaulted	Not Evaluated
	72%	0%	1%	2%	25%

Isoniazid Preventive Therapy Among HIV Positive Patients

Isoniazid preventive therapy is one of the 5 I's Kenya has adopted in addressing TB/HIV coinfection. In 2015, the country scaled up IPT provision to PLHIVs who screen negative for active tuberculosis as a way of treating latent TB.

TB/HIV Collaboration Mechanisms

In 2017, a total of 118,306 PLHIVs were initiated on IPT giving a cumulative figure of 632,736 PLHIVs who have ever initiated on IPT.

NASCOP conducted a data quality audit in selected facilities and documented the following discrepancies on the IPT data. The audit found that, the information in the register did not align with those in the MOH 731 and DHIS reporting framework.   In the same year, NTLD-P and NASCOP revised the IPT register to include the summaries which were initially missing.

118,306

Number of PLHIV initiated on IPT in 2017

632,736

Overall Number of PLHIV initiated on IPT

There has been continuous collaboration between the two disease programs of NASCOP and NTLP to sustain the gains of integration. The national TB/HIV Technical working group has a membership from the two programs, development and implementing partners, civil society, private health facilities and other stakeholders. The national TB/HIV TWG in 2017 focused on:

- Strengthening of TB/HIV integration
- Outreach for TB screening and diagnosis among HIV positive patients
  Busia county was supported with a truck to provide mobile digital chest xray services at primary care level. These services were provided to HIV patients free of charge. Over 2000 images were uploaded. However, there was capacity gap among clinicians in xray interpretation.
- Agreed to adopt TB LAM as an adjunct diagnostic tool for severely ill PLHIV and severely ill patients of unknown HIV status. Development of a comprehensive draft guideline on use of TB LAM in Kenya is ongoing and in advanced stages.
- Launch of dolutegravir (DTG) in public sector with the following guideance
    - This is an integrase strand transfer inhibitor (INSTI) which was launched for use in public sector in June 2017. It is available as a single formulation of 50 mg tablet taken once daily by adolescents over 12 year and over 40kg and adults.
    - DTG is recommended to be used in combination with dual fixed dose combination of TDF/3TC as an alternative regimen for PLHIV with Efavirenz intolerance, PWID on ART and for constituting third line regimen for PLHIV failing second line protease inhibitor (PI) based regimen.
    - For TB/HIV coinfection, the DTG dose is doubled to twice per day. For patients already on DTG based regimen at the time of drug susceptible TB diagnosis: use standard rifampicin based FDC anti TB treatment, continue DTG and increase dose to 50mg twice a day for the duration of TB treatment, adjust the dose after completion of TB treatment to 50mg once daily.
    - Patients with 2nd line PI/r based ART and develops TB: substitute PI/r to DTG 50mg twice daily and initiate rifampicin based TB treatment, continue DTG based ART, adjust the DTG dose after completing treatment to 50mg once daily.
    - DTG is being considered as first line regimen for HIV treatment. Fixed dose combination of TDF/3TC/DTG (TLD) will be available from July 2018. ART guideline is under review to recommend TLD in first line treatment for the following population: all ART initiations (adults and adolescents), TB/HIV coinfection, adolescents above 15 years and over 35kgs, transition of PLHIV on current first line ART regimens to TLD (Tenofovir, lamivudine, dolutegravir).
- Began plans of development of a framework for integration of TB and HIV testing platform that aims at using multi disease testing devise like the genexpert machine for Early Infant HIV diagnosis (EID), viral load testing and TB diagnosis. Pilot planned in 2 counties to address impact on integration on testing volumes across both TB and HIV. Integrated sample network to improve efficiencies and effectiveness.

- The Pharmacy and Poison Board (PPB) shared a Preliminary report on Causality analysis on Isoniazid preventive therapy. 53 patient reports were evaluated and a final report was to be forwarded to the Director of Medical Services for adoption. Adverse events were observed but none of the adverse events were significantly associated with fatalities among the reported cases.

Drug Resistant TB Situation in Kenya

Kenya remains a high burden country for both drug sensitive (DS) and drug resistant (DR) TB. Despite the decline in case notification of drug susceptible TB cases, the case detection of DR TB cases has been increasing over the years. The trend is expected to rise with increasing access to drug sensitivity testing following the scale up of gene xperts machines and the increased capacity for 1 and 2nd line line probe assay (LPA) in the country.

Surveillance and quality of care for DR TB remained a key area of focus for the programme. In 2017:

Summary of Characteristics of Drug Resistant TB Patients in Kenya, 2017

577 DRTB Cases Notified	**4%** Children	**68%** Male	**32%** Female

Age groups most affected **15-44 yrs** — **400** Patients **69%**

Nutritional Status	**68%** Undernourished	**318** cases

Model of Care
78% Community based — 450 patients	**21%** Facility based — 120 patients	**1%** Inpatient — 7 patients

HIV Testing Rate **39%** Co-injection rate	**96%** ART Uptake	**99.5%** Cotrimoxazole Uptake

New Molecules
Bedaquline 10 patients — **Dlm** 1 patient

Resistance Pattern
167 INH Monoresistant	**395** Rifampicin Resistant	**8** Poly-drugs restistant	**5** Pre-XDR	**2** XDR

Treatment outcomes for Drug Resiatant TB Patients, 2016 Cohort

Total Number of Cases Notified **440**

RR Cases **276**

73% Completed Treatment

Outcomes

Treatment Outcome	Overall	RR	Mono Resistant	PDR
TSR	73%	76%	64%	74%
Death Rate	15%	14%	17%	4%
Loss to Follow-up	5%	4%	8%	13%
Not Evaluated	7%	6%	11%	4%
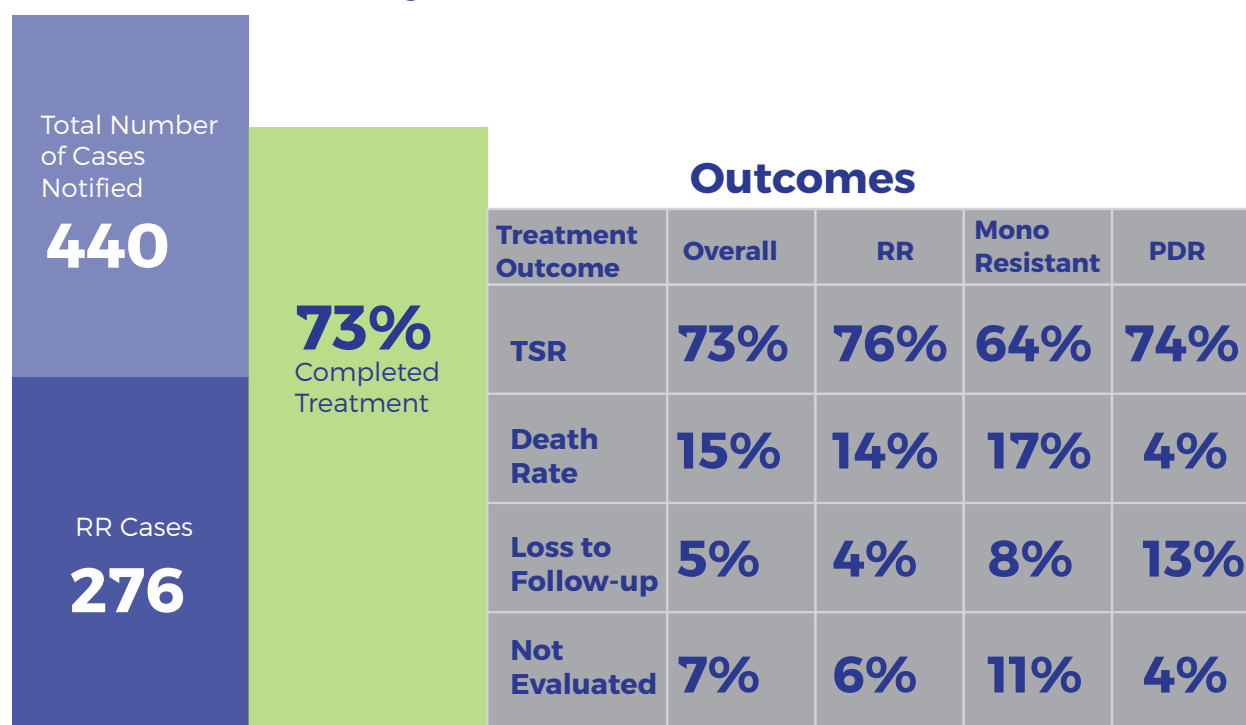
By the time of compilation of this report, some patients had not been assigned an outcome

Introduction of the Shorter-Term MDR TB regimen

Kenya introduced the short term regimen for rifampicin resistant TB patients in October 2018 following a conditional recommendation issued by World Health Organization (WHO) in May 2016. This significantly shortened the duration treatment from 24 months to 9-11 months of treatment. The national programmatic management of drug resistant TB (PMDT) technical working group (TWG), led by the PMDT coordinator, ensured a successful national roll out which involved meticulous planning. It entailed:

- Robust discussion and deliberations with the national DR TB Technical working group
- Engagement with multiple stakeholders
- Ratification and endorsement by TB ICC
- Policy development and approval
- Forecasting and quantification of second line drugs and 1st and 2nd line LPA kits
- Revision of procurement, supply and management of the commodities
- Revision of diagnostic and treatment guidelines
- Update of reporting and recording tools
- Training and sensitization of health care workers

A total of 153 patients were enrolled in 2017 in the fourth quarter. We anticipate remarkable outcomes for this cohort as evidenced in various observational studies that have shown promising results with increased treatment success rate of upto 89%. Further, this will alleviate patients from the catastrophic effects associated with lengthy treatment seen with the conventional (24 months) regimen and a significant reduction of reported adverse drug reactions and lost to follow-up.

Social Protection for DR TB patients

In 2017, the Ministry of Health, began enrolling all DRTB patients to the National Hospital Insurance Fund (NHIF) scheme. In this scheme, the NTP pays out KES 500 for each patient diagnosed with DR TB to cushion them from incurred health-related expenditure during the course of their treatment. This package also covers the patients for two years post treatment to take care of any complication that may arise after treatment completion.

As is the practice, the NTP, with support from Global fund extends cash transfer to all DR TB patients during the course of treatment to facilitate access to care

Systematic and descriptive evaluation of death of TB patients in Kenya

Tuberculosis is a curable disease and any death due to it is an unfavorable outcome. World Health organization (WHO report, 2017) from simulation of data, estimated that death due to TB in Kenya accounted for an estimated 53,000 people (36,000-73,000) against 169,000 people with TB in 2016. Death among HIV negative people accounted for 29,000 deaths (16,000-45,000) while HIV positive people accounted for 24,000 (14,000-36,000). Further, a mortality audit conducted in Kenya demonstrated that TB is among the top ten major cause of death taking the fifth position. It accounts for 11 deaths per 100,000 population. The details of the mortality evaluation are summarized below.

For Kenya to achieve End TB strategy targets of reducing deaths due to TB by 95% by 2035, additional effort and attention needs to be drawn to address this. They include, but not limited to, early diagnosis and early treatment initiation, high quality holistic medical and psychosocial

care and post treatment support to avert this unfavorable outcome. It is important to evaluate every death of a TB patient that occurs by conducting mortality audit on a case by case basis to determine the immediate events and factors that may have led to the death.

A. Mortality evaluation and characteristics of Drug Susceptible TB Patients Notified in Kenya
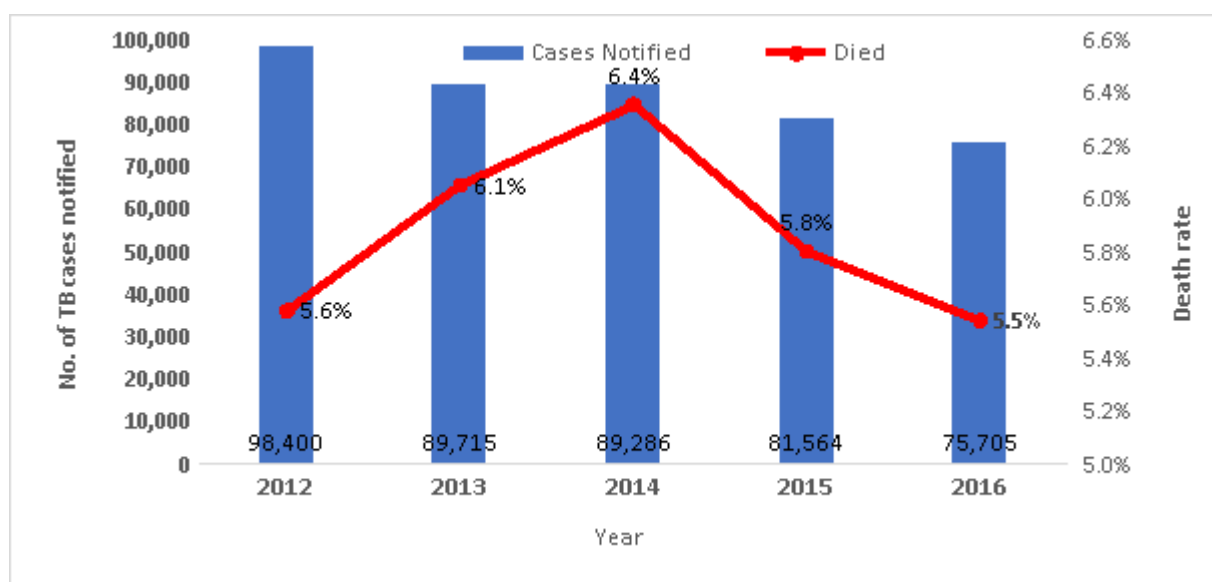
Figure 1.3: Shows the trend of death of drug susceptible TB patients between 2012 and 2016
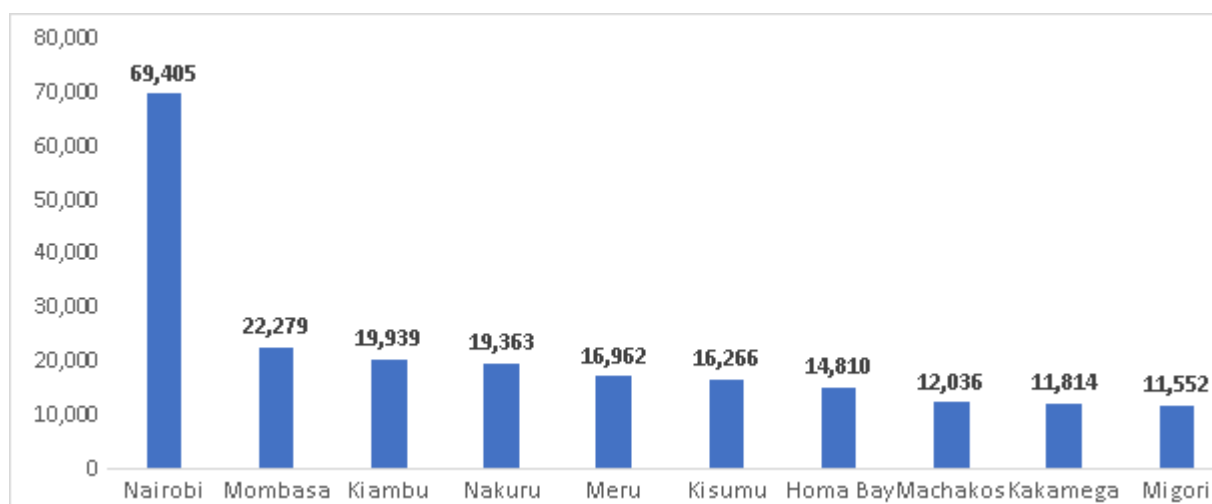
Figure 1.4: Top-10 counties that contribute half of the TB cases in Kenya between 2012 and 2016
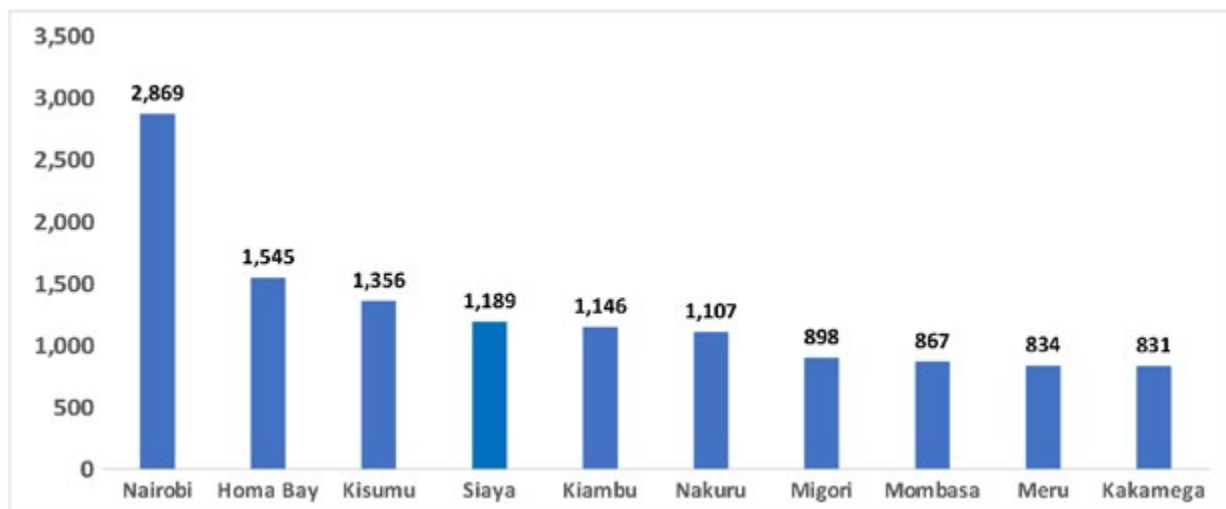
Figure 1.5: Top-10 counties that contribute half of the deaths in Kenya, 2012-16. Nairobi, Homa Bay, Kisumu, Migori and Siaya account for 62% of the death due to TB.
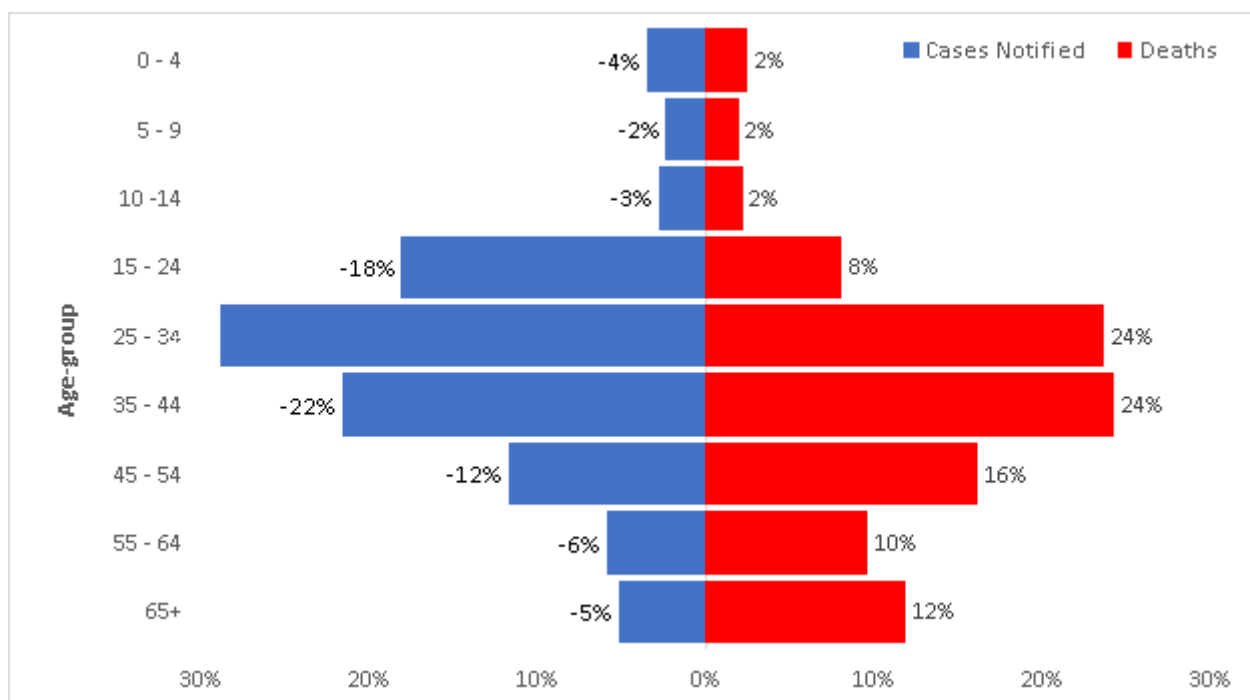
Figure 1.6: Pyramid comparing the distribution of patients notified by age group (in blue) against the distribution of deaths in each age category (in red), 2012-2016.

Although patients aged >55 years account for 11% of the patients notified, they account for 22% of the TB patients who died within the period under review. Children <15 years of age accounted for 9% of the patients notified with 6% of the deaths occurring within the period.
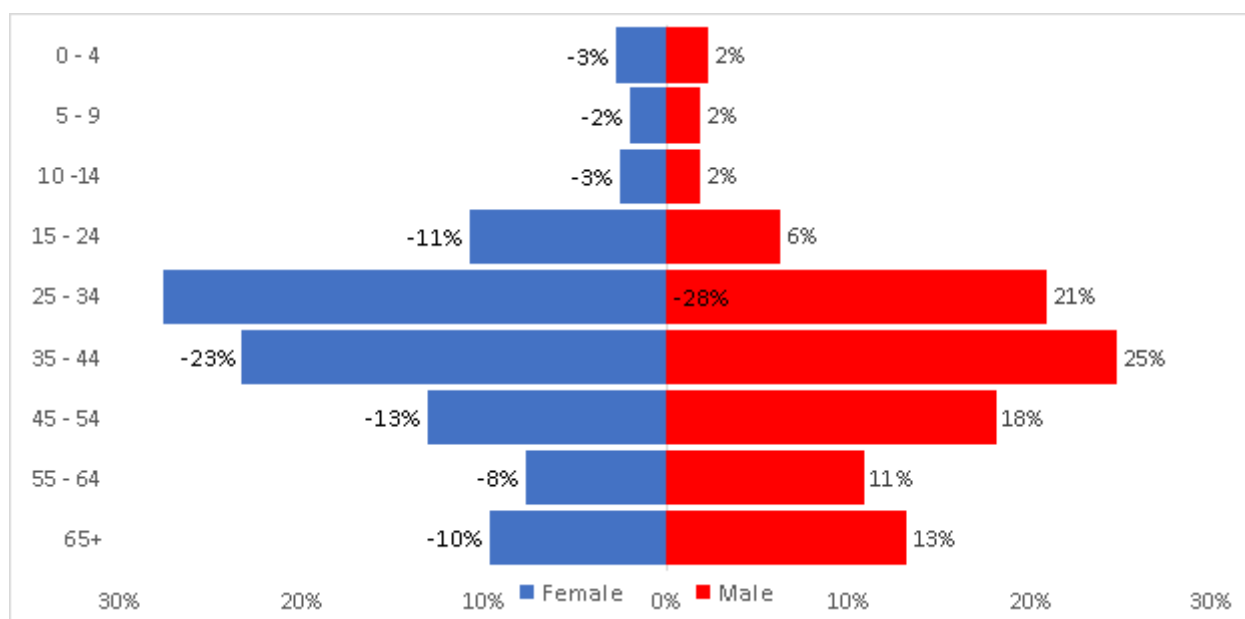
Figure 1.7: Pyramid demonstrating the distribution of death by age group and sex, 2012-2016
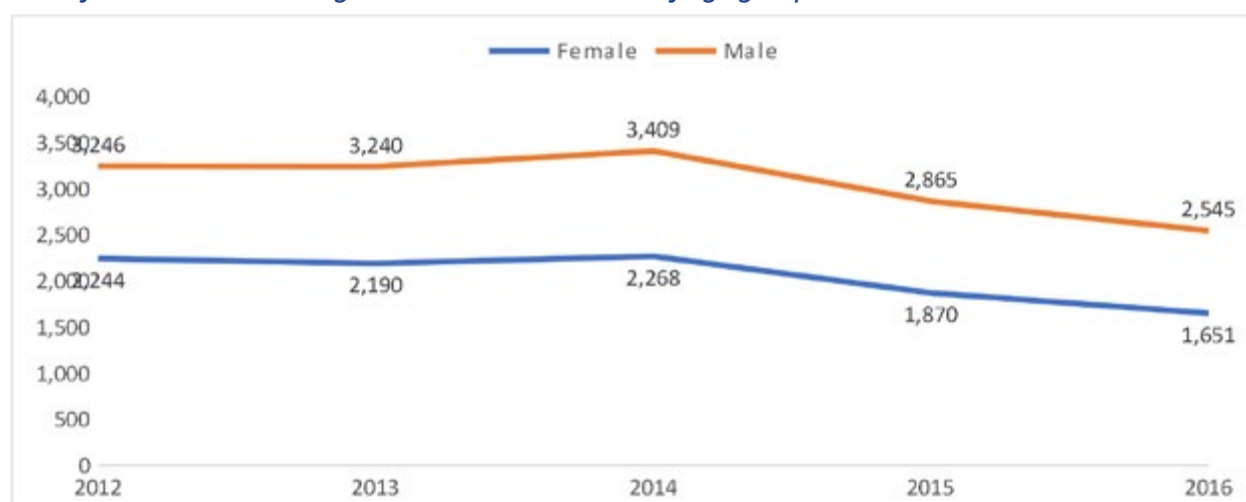
Figure 1.8: Shows the trend of death rate of TB patients by Sex, 2012 and 2016
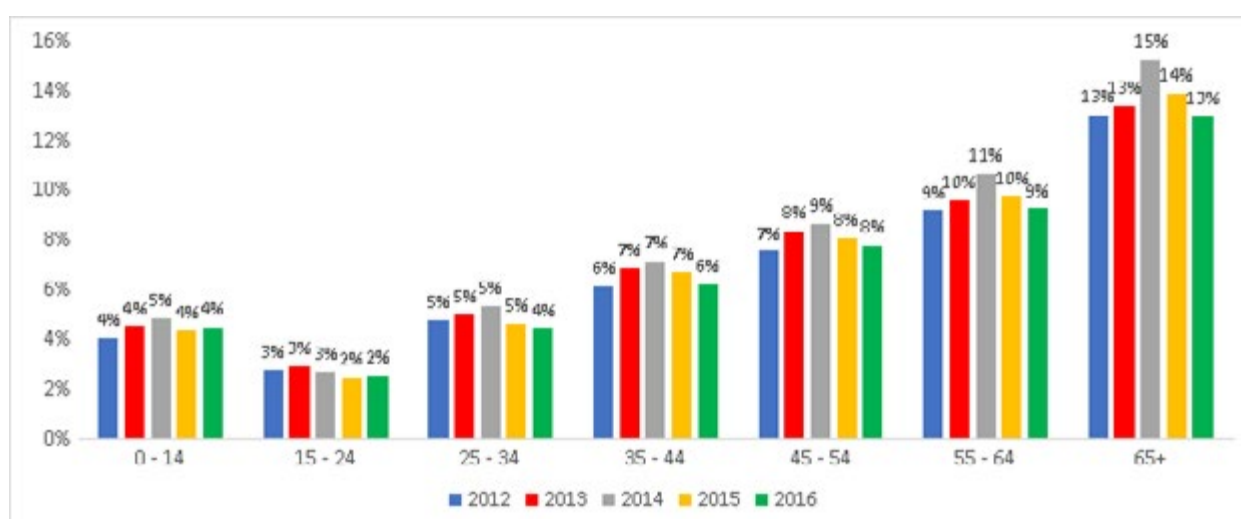
Figure 1.9: The illustration above seeks to demonstrate the distribution of death as an outcome as accounted within each age group for the period under review: 2012-2016.

For example, in 2012 (blue) the age group 65 and above years, death as treatment outcome was 13%. For children 0-14 years, in 2013 (in red), death as a treatment outcome was 4%. This demonstrates that patients aged 65+ years have the highest death rates as treatment outcomes.
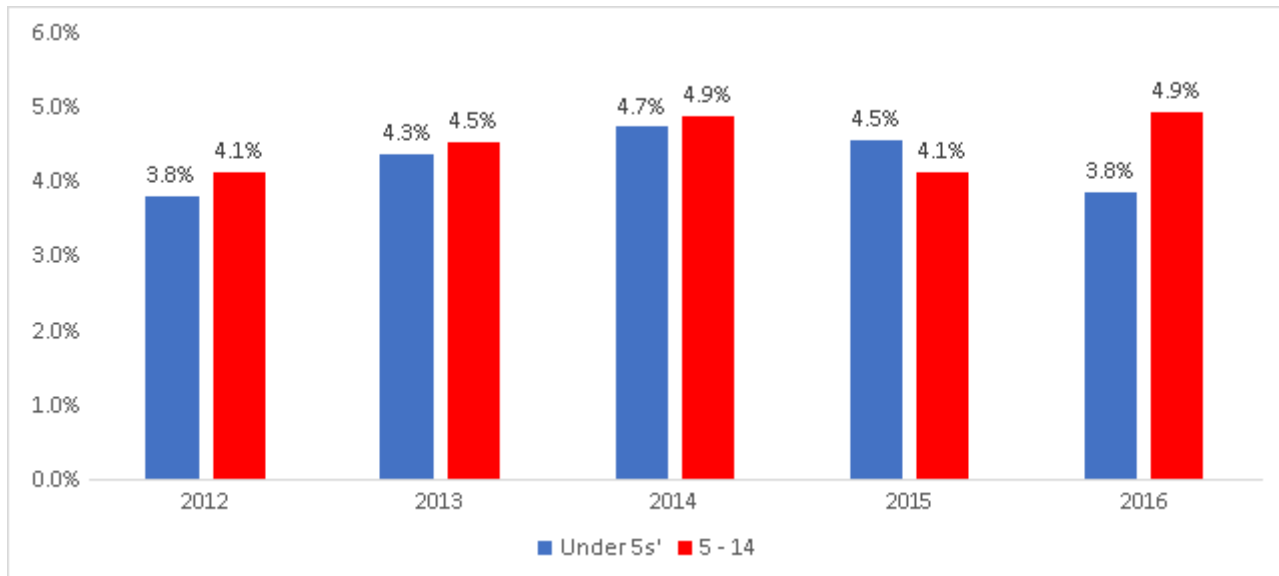
Figure 1.10: Distribution of death of TB patients among Pediatrics, 2012-2016
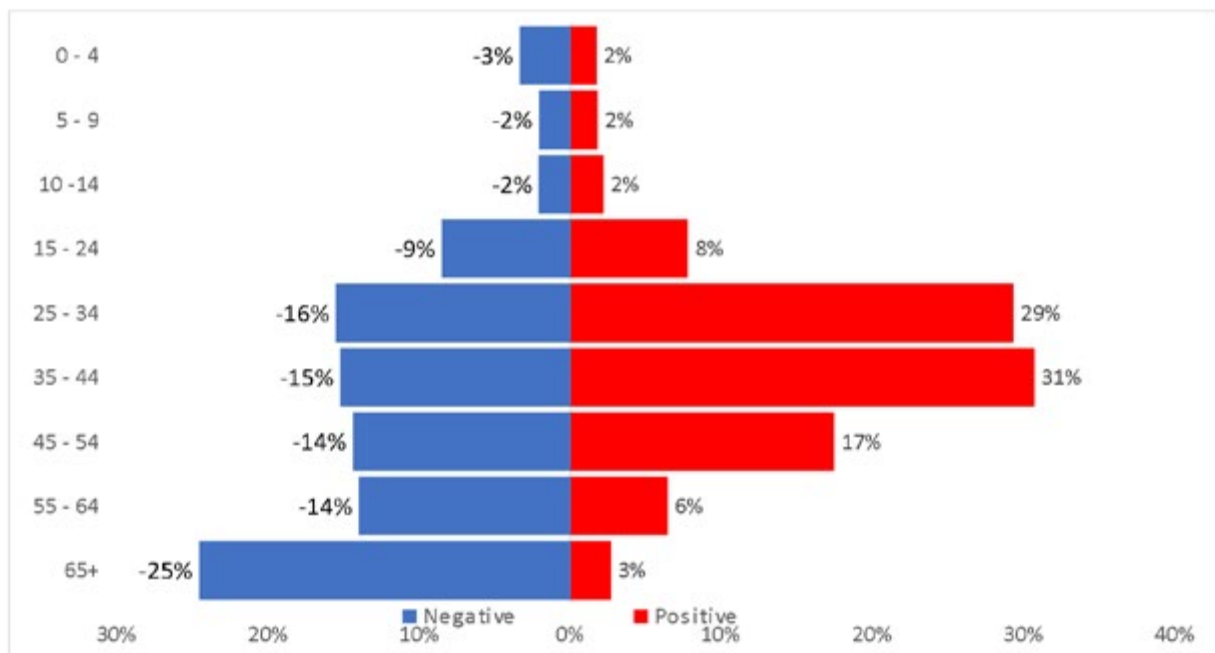
Figure 1.11: Pyramid demonstrating the distribution of patients who died by HIV status and age-group during the period under review, 2012-2016.
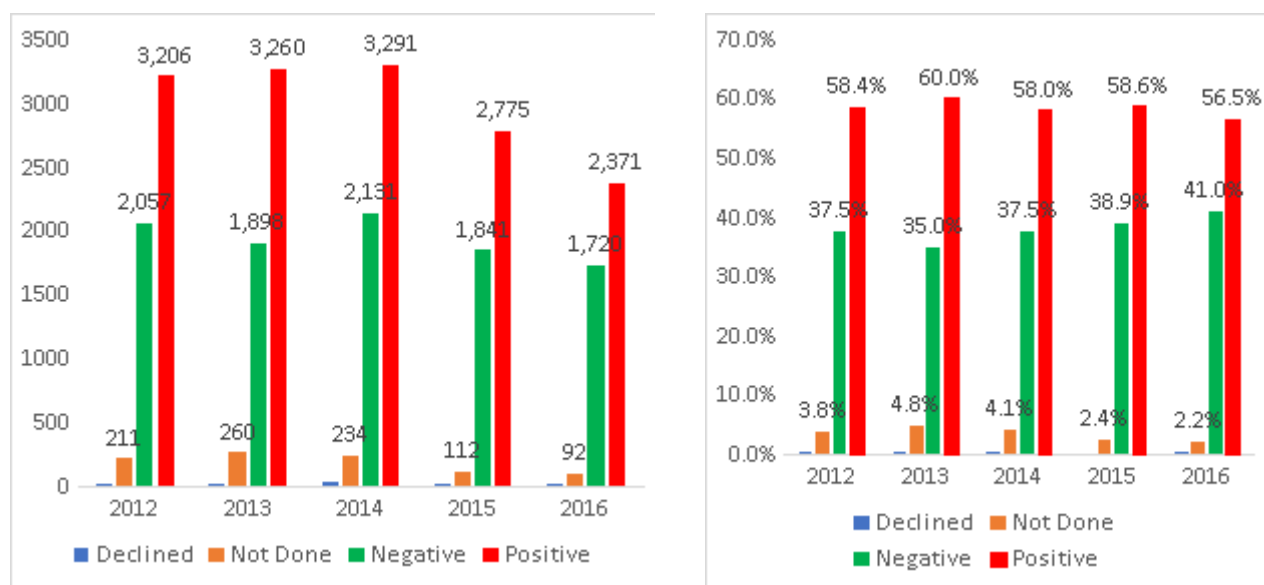
Figure 1.12: Shows the proportion of death by HIV status in actual numbers as well as proportions, 2012-2016
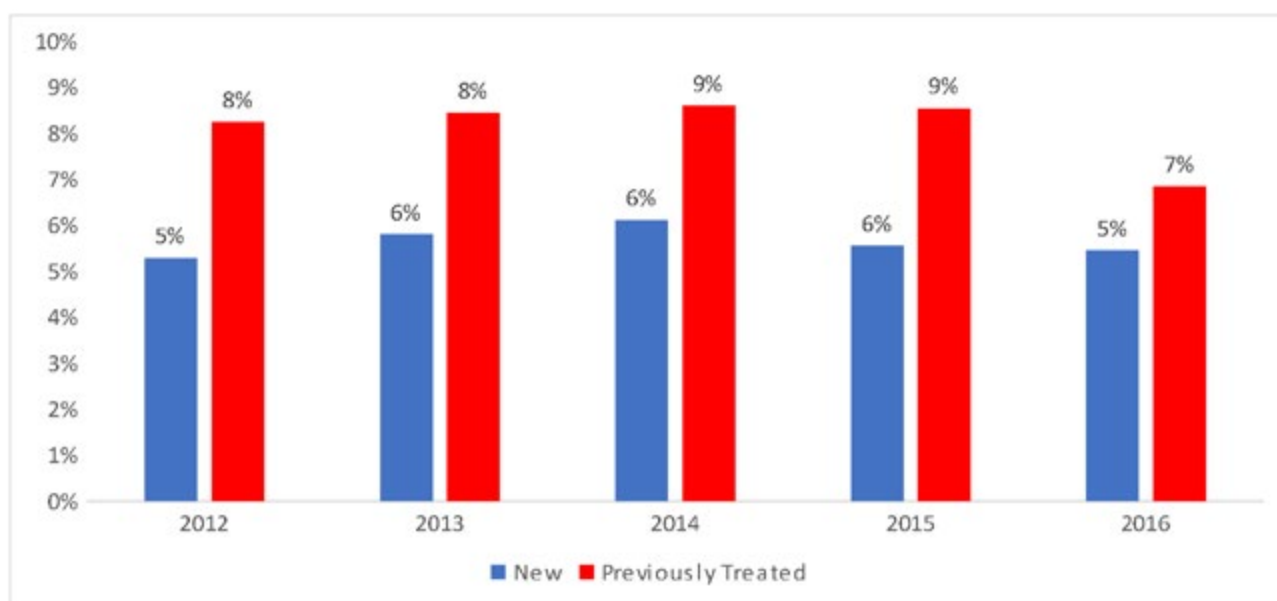
Figure 1.13: Shows the proportion of death by treatment history, 2012-2016
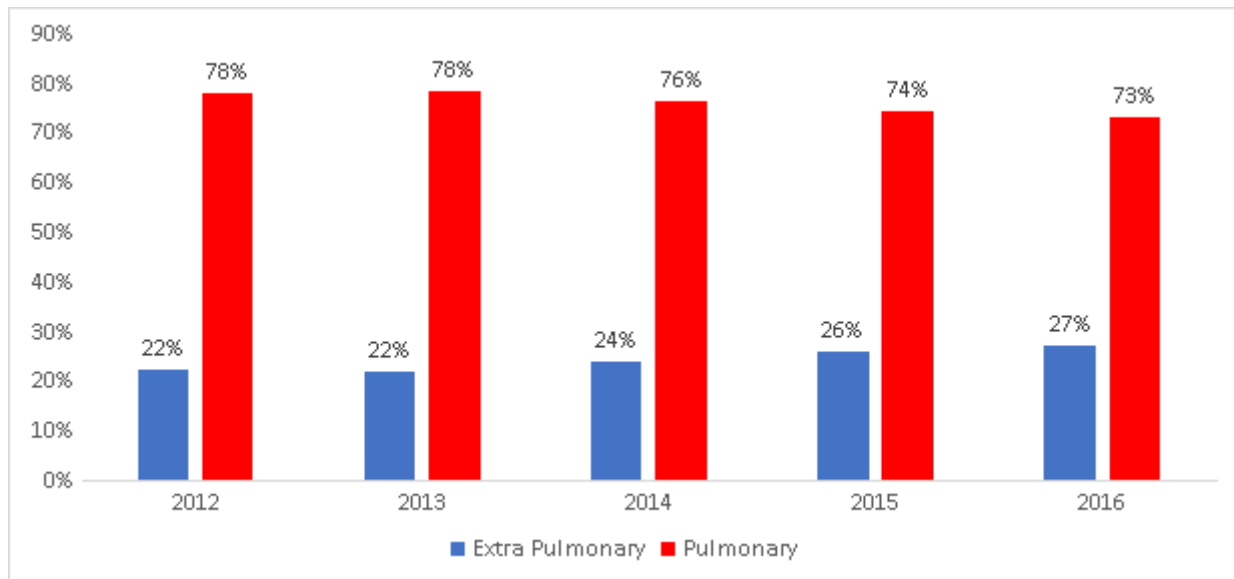
Figure 1.14: Shows the proportion of death by site of Tuberculosis, 2012-2016
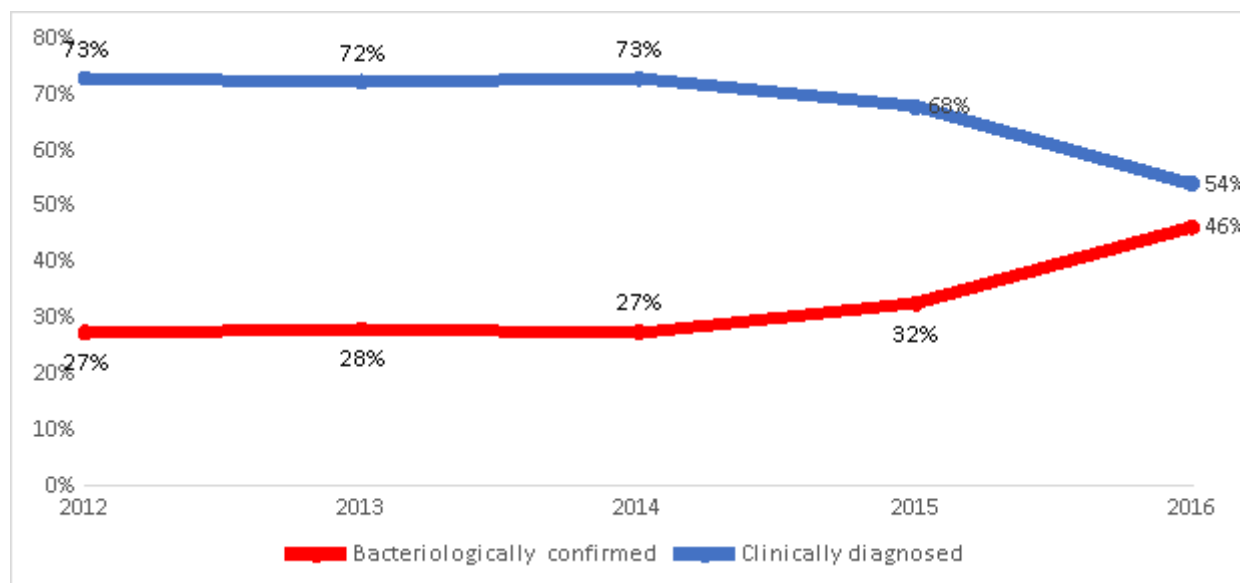
Figure 1.15: Shows the proportion of death categorized by bacteriologically confirmed and clinically diagnosed, 2012-2016
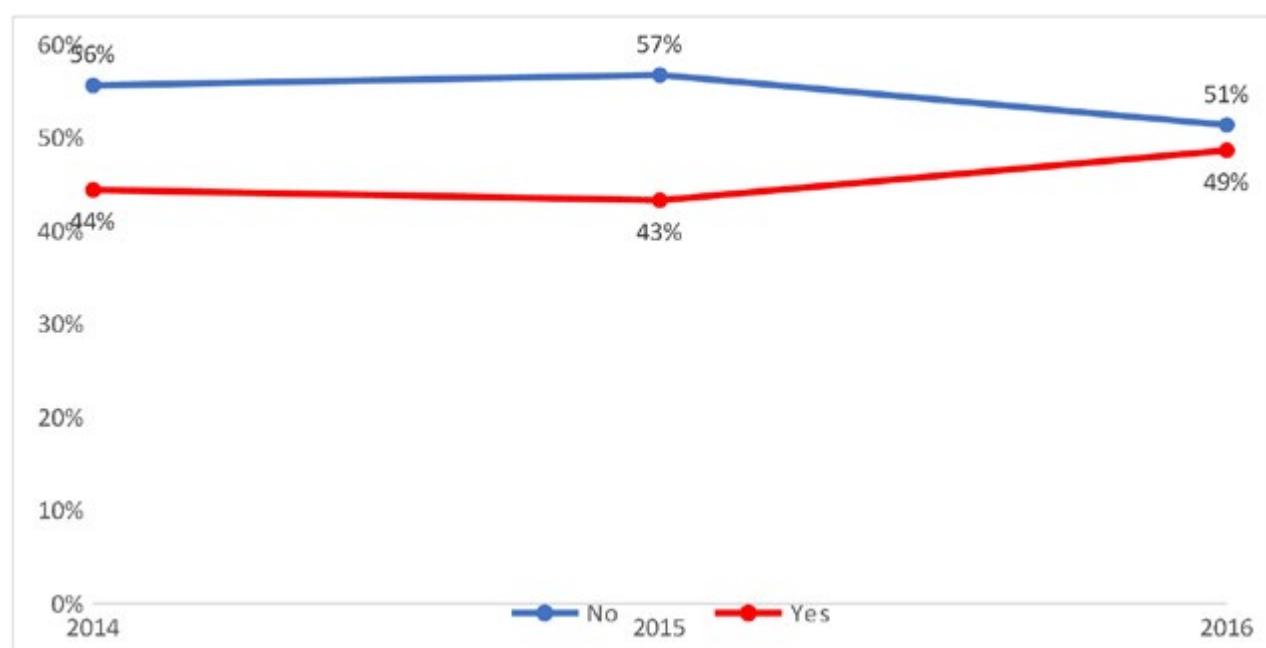
Figure 1.16: Shows the proportion of death by nutrition support among patients with BMI <18.5, 2012-2016

B. Mortality Evaluation and Characteristics of the Drug Resistant TB patients Notified in Kenya
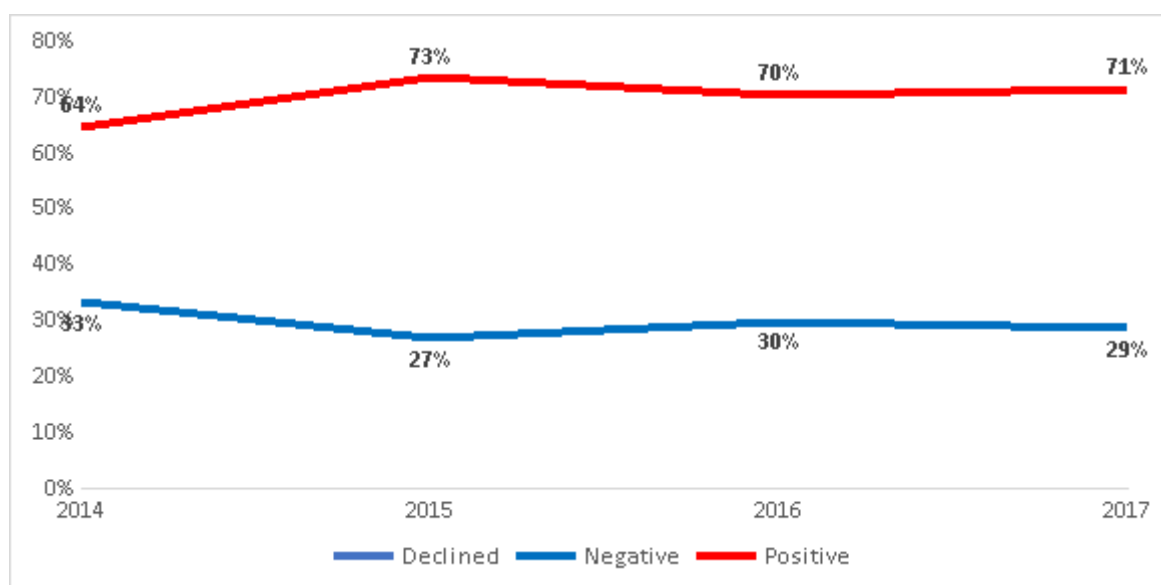
Figure 1.17: Distribution of DR TB deaths by HIV status between 2014 and 2017
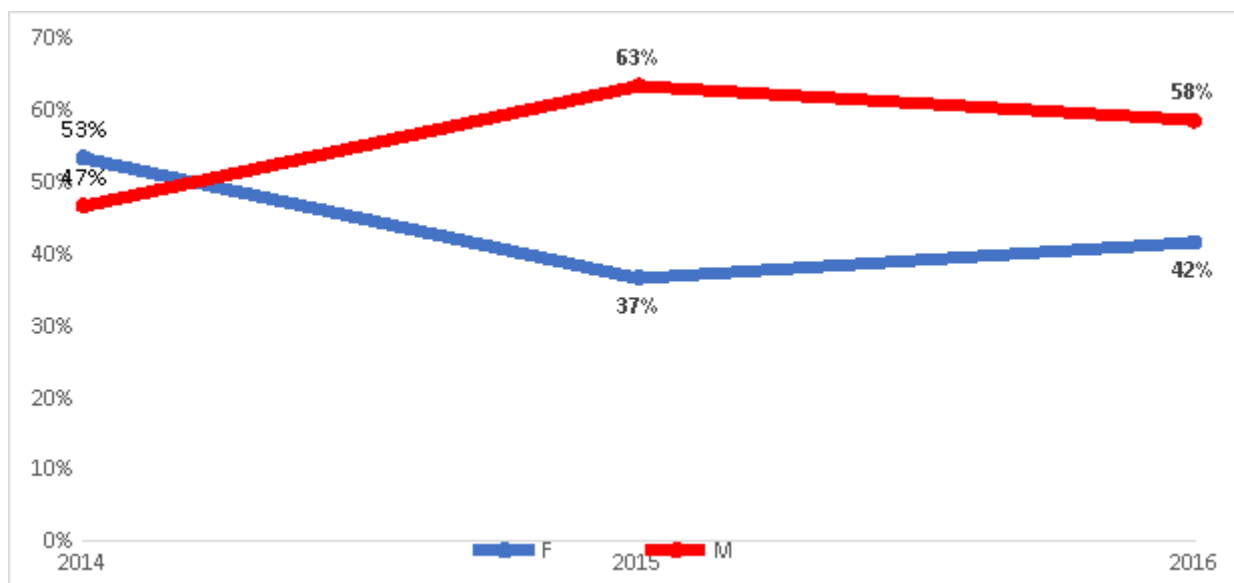
Figure 1.18: Distribution of DR TB deaths by sex between 2014 and 2017

C. Mortality study in Kenya 2012-2016: Cause of death, trends, and data quality

This was a retrospective cross-sectional analysis of mortality and cause of death (CoD) through a systematic review of hospital medical records and re-certification of the CoD. The purpose of the study was two-fold:

i. The study was intended to determine and describe the quality of the medical records documentation of Cause of Death (CoD) certification by clinicians using the Medical Certificates (D1s) from the CRS.
ii. In selected hospitals in Kenya, recertification of the medical records for the deceased for the period 2012 - 2016 was carried out to determine the CoD and mortality trends. This was done by assigning the correct sequencing of CoD according to the revised WHO standard form (ICD-10 2016).

Key findings from the Mortality Study 2012-2016 Report Findings

- Tuberculosis is among the top ten major cause of death and takes the fifth position with 4.7% of deaths (5,845) which is about 11 deaths per 100,000 population.

- Tuberculosis deaths are reported to be higher in males than females with 1 death in every 7,200 males and 1 death in every 12,000 females

- Most TB deaths occur among people aged between 20-64 years which is the most economically active and productive age and least in age group 5-9 years.

- Pulmonary TB accounted for 76% of the total number of deaths reported

- Overtime from 2012 HIV-positive TB deaths has drastically reduced from slightly above 50% to about 32% of all deaths in 2016.
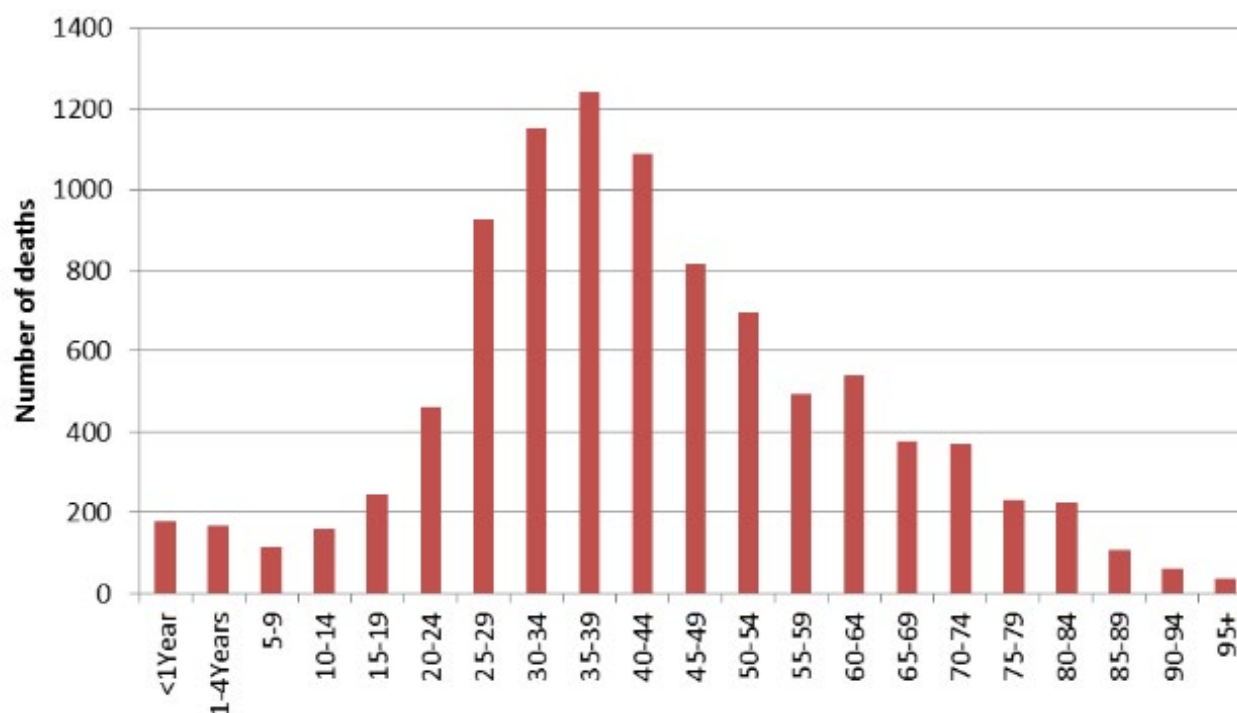
Figure 1.19: Number of Tuberculosis deaths by age group 2012-2016

Figure 1 above demonstrates that the most deaths occur between 20-64 years which is economically active and productive age and least in age group 5- 9 years. This results is almost similar to the Kenya Tuberculosis survey results of 2016, that suggested tuberculosis as the 4th leading cause of death and the epidemic affected the young (15-34yrs): the economically productive age groups. It also agrees with the WHO report 2017 that ranked TB to Ninth position globally.
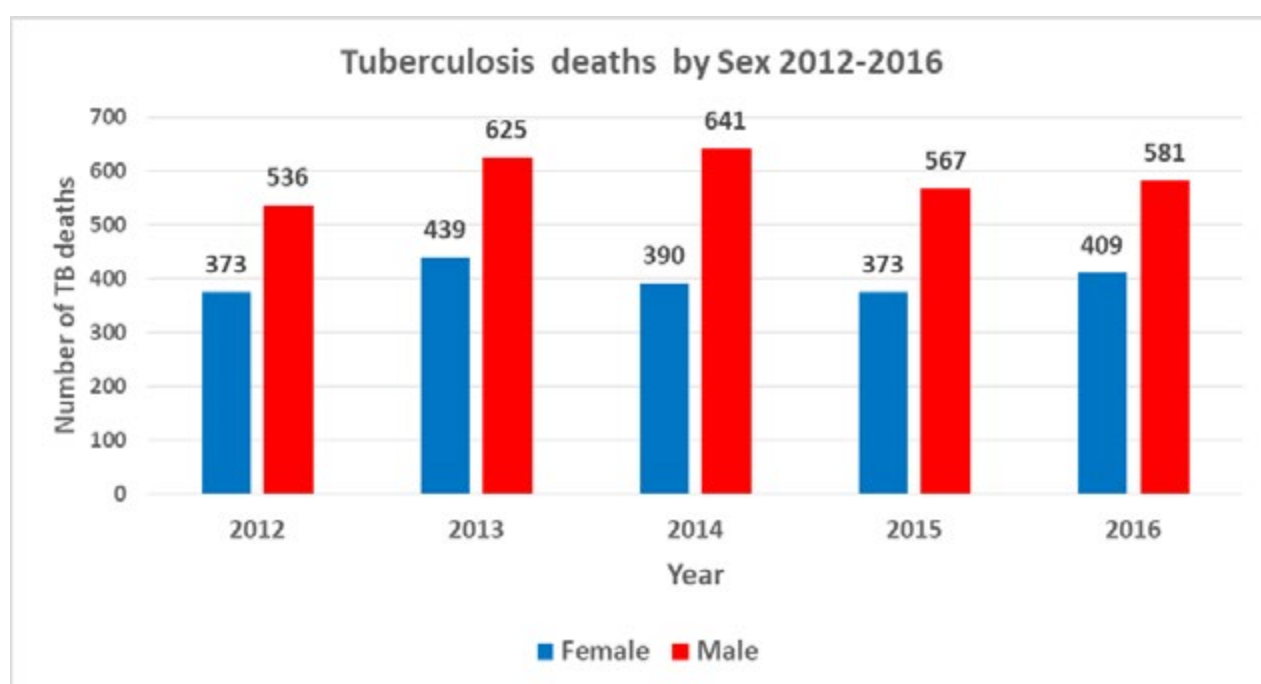
Figure 1.20: Number of TB deaths by sex per year 2012-2016

Figures 2 above shows that mortality was generally high in males compared with females; A total of 2950 (60%) of deaths attributed to tuberculosis males while female were 1984 (40%). The trends for both gender shows similar steady decline except in 2016 where there was a slight increase of deaths compared to the previous year (2015).
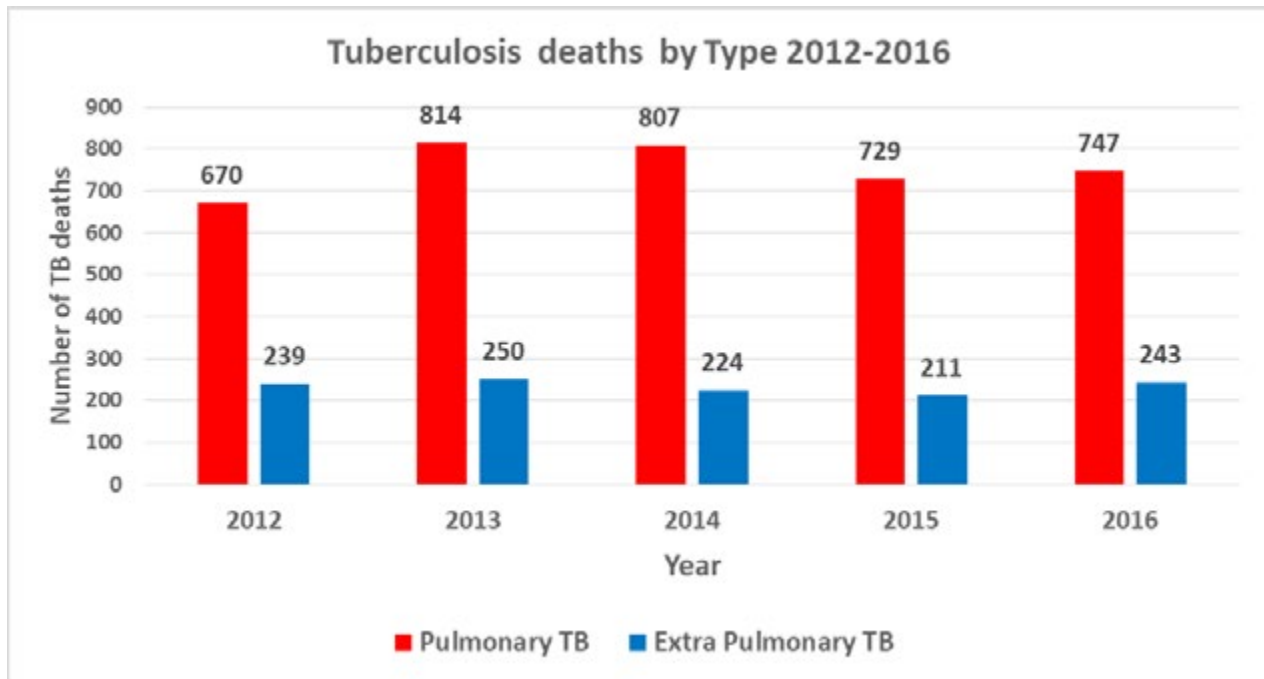
Figure 1.21: Mortality trends as per type of TB: Pulmonary and extra-pulmonary 2012-2016

Figure 3 above denotes comparatively; pulmonary tuberculosis cases have a higher mortality to those with extra pulmonary tuberculosis. The trends over the years from 2013 as shown by the study indicate that reduction of mortality from pulmonary tuberculosis was higher as compared to the reduction in extra pulmonary tuberculosis cases.
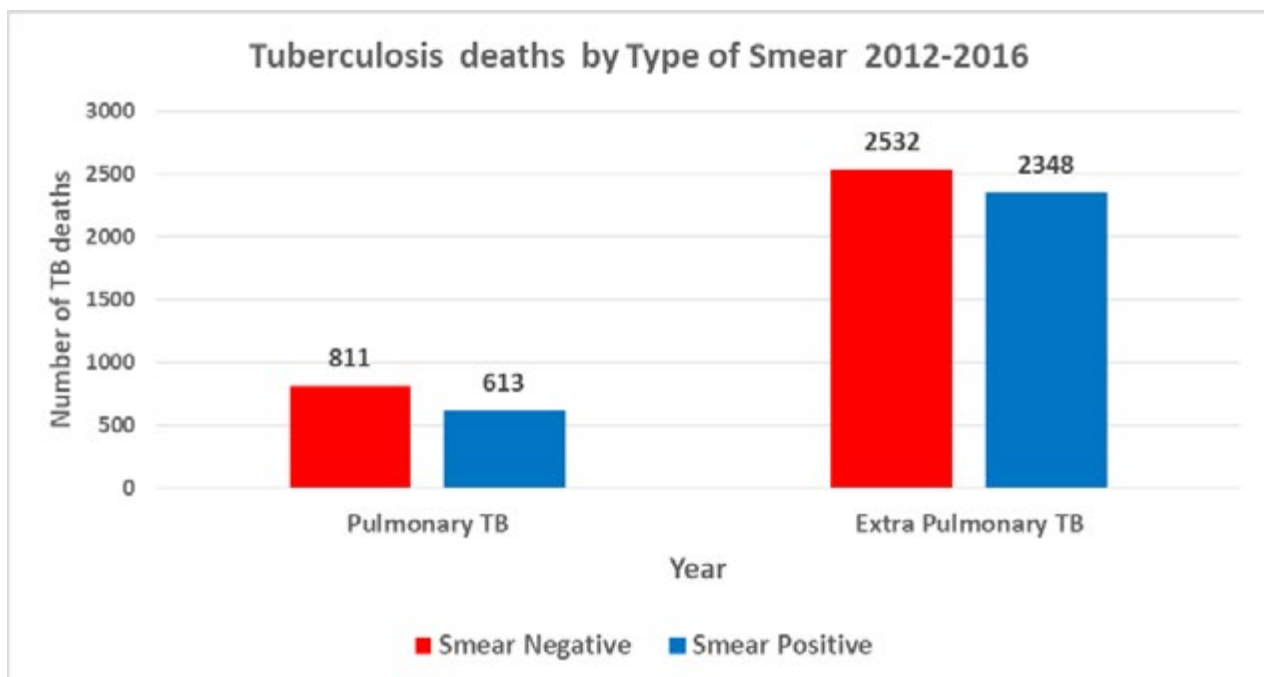
Figure 1.22: Comparison of PTB and EPTB deaths with relation to HIV status

Tuberculosis is the leading cause of death among the people living with HIV. The study found out that mortality was more prevalent among the smear negative TB cases compared to smear positive cases as shown in figure 4 above. This is an agreement with the global trend as reported by WHO report 2017.
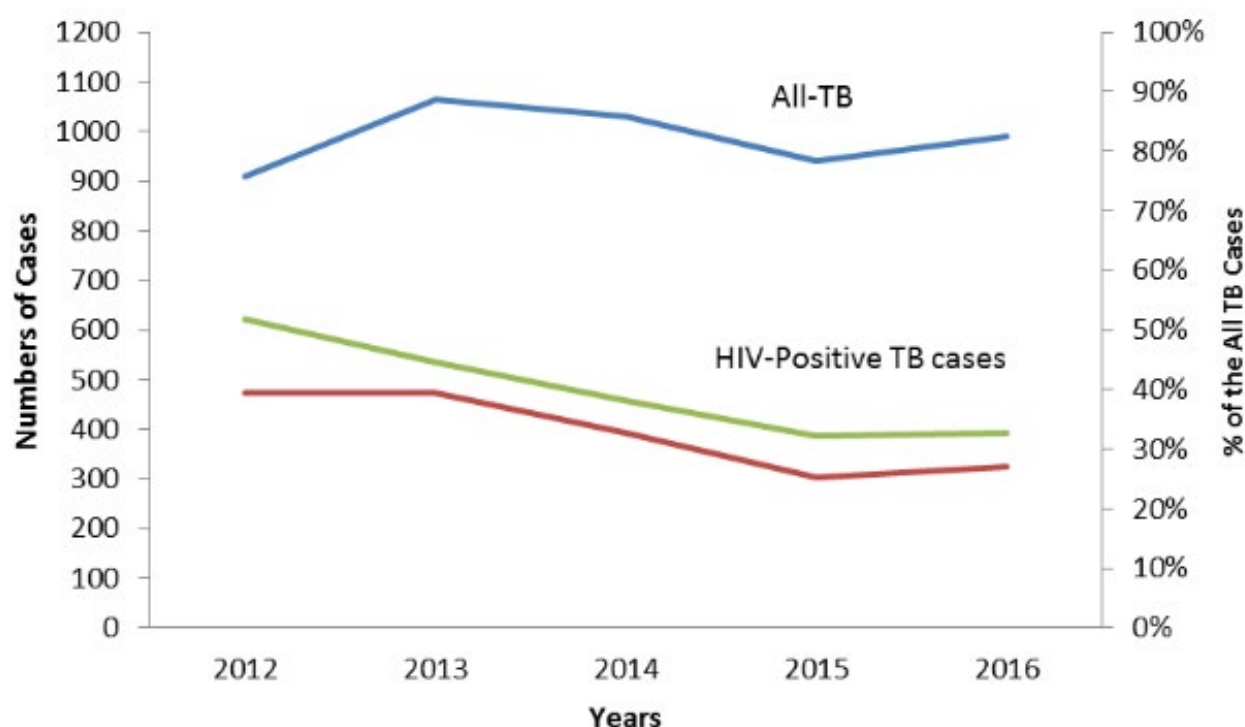
Figure 5: TB mortality trend All-TB and HIV-Positive TB cases 2012-2016

Overtime from 2012 HIV-positive TB deaths has drastically reduced from slightly above 50% to about 32% of all deaths in 2016 as shown in figure 5 above. The results agrees with WHO report (2017) that showed reduced trends on mortality rates among HIV positive TB cases than what was experienced among the TB cases who are not HIV positive globally.

Reference: Mortality Trends in Kenya 2012-2016: Cause of death, trends, and data quality,March 2018 Edition

Leprosy Situation in Kenya

Leprosy, an airborne disease caused by bacteria Mycobacterium leprae and Mycobacterium lepromatosis, a "forgotten disease" across the world was announced by World Health Organization as eliminated in 1989. It is a chronic infection mainly affecting the nerves and skin. However, there remain leprosy endemic counties where late diagnosis and physical disability persist. Looking at the national statistics over the last 6 years from the National Tuberculosis, Leprosy and Lung Disease Program (NTLD-P), a total of 36 counties have reported a case(s) since 2012. Counties (7) have been classified as high burden Counties while others (5) although not high burden have consistently reported cases. In 2017, 20 counties reported at least one leprosy case.

Presence of childhood leprosy (less than 15 years) which account for active transmission has been demonstrated through presence of children with leprosy (6% of the total cases). Classification of the reported cases by type, PB contributed (11%) while MB was (89%). Data on disability grading is still scanty with only 42% of the patients graded. Out of the patients with disability grading, grade 1 was (35%) while grade 2 accounted for (17%).

Within the coastal region, 24 Sub Counties have reported cases since 2012, Kilifi County has had the highest number (186) of cases followed by Kwale county with 139 cases. Looking at SubCounties within Kwale, Kinango, Lungalunga, Matuga and Msambweni have consistently reported cases and are classified as high burden sub counties.

Leprosy surveillance is well integrated in the health care system in Kenya with County and Sub County Tuberculosis and leprosy coordinators provide technical and supervisory role including aggregating data at the facility level and updating the case based electronic system.

Nutrition situation in Kenya

The NTLD-P recognizes good nutrition as an essential element promoting health and quality of life of patients. In respect to this, all TB patients requiring nutrition interventions are provided for as will be demonstrated in this report.

In 2017 55% of the diagnosed drug susceptible and 60% of drug resistant TB were found to be undernourished at the time of diagnosis.

Nutrition status of drug susceptible TB patients in 2017

BMI Classification			Food Support	
	Number	Proportion	Number	Proportion
Normal	29,087	34%	2,289	8%
Moderate Acute Malnutrition	23,958	28%	9,506	40%
Severe Acute Malnutrition	12,609	15%	7,202	57%
Overweight	3,079	4%	151	5%
Obese	913	1%	32	4%
Not Evaluated	15,542	18%	3,540	23%
Total	**85,188**		**22,720**	

Nutrition situation of TB patients in 2017

BMI Classification	Number	Proportion	Food Support	
			Number	Proportion
Normal	200	35%	52	26%
Moderate Acute Malnutrition	174	30%	118	68%
Severe Acute Malnutrition	121	21%	94	78%
Overweight	23	4%	2	9%
Obese	5	1%	1	20%
Not Evaluated	54	9%	27	50%
Total	**577**		**294**	**51%**

TB Case finding contribution by the private facilities

In 2017, 15,609 (18 %) cases were notified from the private facilities.

TB in prison

The NTP and implementing partners undertook key activities in 2017 in the prisons. They included:

- Rolling out to all prisons screening of all prisoners for TB using the prisons screening tool (PF10)
- Ensured that moving forward, all new inmates will be screened before admission in all prisons in the country.
- Trained 130 health care workers and prison wardens working in prison health facilities on infection prevention control

Tuberculosis and Diabetes Mellitus collaboration

Diabetes and TB are both chronic diseases with high socio-economic impact at the individual, household, community and health systems levels. Diabetes triples the risk of developing TB and worsen the clinical course of TB while TB can worsen glycaemic control. Thus, TB must be diagnosed early in people with diabetes and vice versa.
In 2017:
- Trainings of at least 2 participants from each county was conducted drawn from 37 counties, with : Vihiga, Migori, Nyamira, Lamu, Tana River, Turkana, Bomet, Trans Nzoia, Garissa and Mandera identified for the next round of training.
- NTLD-P procured the following to facilitate the bidirectional TB/DM screening:
  - 150 glucometers
  - 3880x100's glucose strips, 1688x100's lancets, gloves and swabs.

Identified Opportunities and upcoming events and strategies in TB/DM
There is need for clinical job aids, standard operating procedures as well as strengthening reporting and recording practices
Launch national dissemination/launch of the bi-directional screening
Continuous capacity building of health care workers

Chapter Two: Active Case Finding

Active case finding for TB in Kenya is an intervention that seeks to implement the End TB strategy whose vision of "a world free of TB", also expressed as "zero deaths, disease and suffering due to TB" is the guiding principle. Kenya as other signatory countries of this international commitment aims to end TB Epidemic by 2035 anchored on the first pillar of the End TB strategy as the guiding principle of a patient centered care.
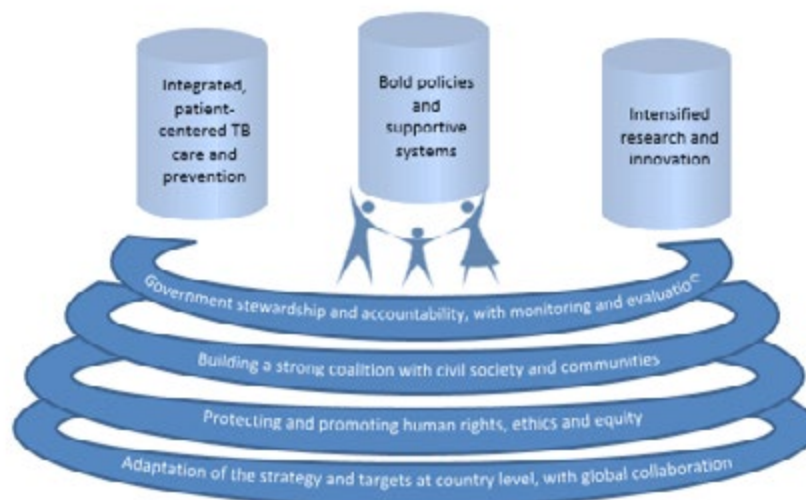
Reference:- (WHO, End TB Strategy 2015)

Components of the First Pillar of End TB strategy are:

a) Early diagnosis of TB including universal drug- susceptibility testing, and systematic screening of TB contacts and high risk groups
b) Treatment of all people with TB including drug- resistant TB, and provision of patient support
c) Collaborative TB/HIV activities, and management of co-morbidities
d) Preventive treatment of persons at high risk (IPT), and vaccination against TB (BCG)

In addition, the Kenya's prevalence survey found that three quarter of the people with TB symptoms who seek care do not get diagnosed or are missed. This is the leak that active case finding seeks to seal as an intervention to implement the first Pillar of the End TB strategy.

The Approach: Facility-Based Active Case Finding
Facility based active case finding looks to expand screening for TB beyond the historically 'high risk' patient groups such as TB contacts and people living with HIV (PLHIV) to include all patients visiting a health facility at all facility points of entry.
It involves systematic screening for TB among all patients presenting to the health facility regardless of the signs and symptoms.
Ultimately, the main goal is to ensure that early detection of TB cases is a permanent and routine activity carried out in all service delivery points (SDPs) of all health facilities through enhancing facility ownership.

Figure 2.1:Cardinal symptoms of Tuberculosis

Figure 2. 2: Call to actions to finding missing TB cases
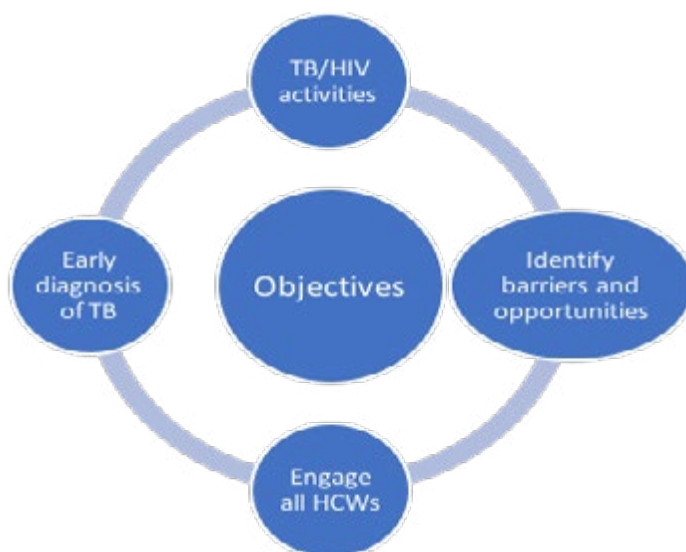
Figure 2. 3: Objectives of facility-based Active Case Finding

The main objective of facility-based Active Case Finding is to:

- Foster early diagnosis of TB through prompt identification of various barriers and mitigating them
- Careful analysis of opportunities and maximizing on their impact
- Expanding and sustaining TB/HIV collaborative activities
- Engaging health care workers who are at the core of ACF implementation
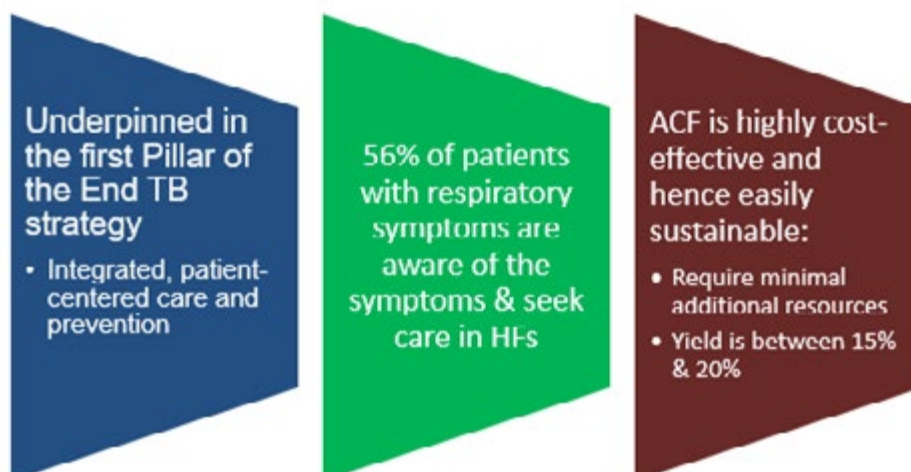
Implementation of Active case finding

Initial Phase (Pilot)

Upon obtaining preliminary results of the prevalence survey towards the end of 2016 that demonstrated that the we were missing cases, the program rolled out aggressive initial phase of the ACF initiative to bridge the gap.

This phase targeted 13 counties (shown in the figure below) which comprised of low, medium and high burden TB areas. Further, only county referral hospitals were the initial focus of interest. However, with time more facilities were incorporated.

The methodology adopted was:
- Sensitization of Hospital leadership whereby the medical superintendents and nursing officer in charge were targeted
- Building the capacity of Health Care Workers
- Improving the laboratory capacity
- Enhancing documentation by providing the RR tools and sensitization on their use

During the implementation phase, three models of the patient pathway were evident:

- Sample collection at the laboratory: presumptive TB cases from various service delivery points are referred to the laboratory for sample collection
- Sample collection at the service delivery points
- Sample collection at the chest clinic

Each facility in its unique nature should carefully evaluate its context and determine which model works best as a strategy to finding the missing cases.

The TB program recommends collections at service delivery points.

Overly, the uptake of the ACF intervention has been great with all the pilot facilities reporting an increase in TB case finding, this has significantly contributed to the 12% increase that the country attained in 2017 as some of the non-pilot counties also adopted the strategy at a low scale. The program thus plans to scale up ACF to all the 47 counties within the year.
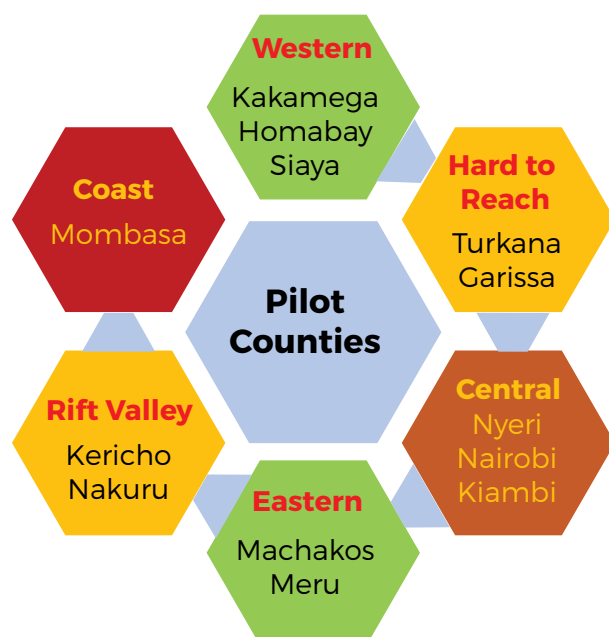
Figure 2. 5: Pilot Counties for Active Case Finding

Table 2. 1: Results of ACF in the Pilot Counties

County Referral Hospitals	2016	2017	Difference	% change
Coast Provincial General Hospital	45	235	190	422%
Mama Lucy Kibaki Hospital - Embakasi	175	625	450	257%
Meru District Hospital	158	542	384	243%
Nakuru Provincial General Hospital	134	459	325	243%
Machakos Level 5 Hospital	173	396	223	129%
Homa Bay District Hospital	124	281	157	127%
Kakamega Provincial General Hospital	229	447	218	95%
Lodwar District Hospital	345	624	279	81%
Siaya District Hospital	69	123	54	78%
Kericho District Hospital	221	365	144	65%
Nyeri Provincial General Hospital	103	169	66	64%
Garissa Provincial General Hospital	119	120	1	1%
Thika Level 5 Hospital*	329	242	-87	-26%
Total	2224	4628	2404	108%

Thika Level 5 had rolled out an electronic mode of recording (EMR). TB module had not been incorporated in the system hence the negative difference

Targeted mobile outreaches using digital X-ray machines

- Community ACF activities are crucial to complement facility-based interventions.
- Targeted outreaches with the use of digital X-ray machines to capture asymptomatic presumptive cases who would otherwise have been missed by the symptom screening alone.
- Key high risk populations are identified and mobilized beforehand within the target community.

In the fourth quarter of 2017, 15 targeted outreaches were conducted in 8 counties and the results are summarized in the figure below.

Targetted Mobile Outreaches using Chest X-Ray

Targetting men:- Drug dens. bodaboda riders, matatu crew, company workers

Selected Counties

Nairobi
Nakuru
Meru
Kakamega
Homabay
Nyeri
Kiambu
Mombasa

Over 4500 X-rays done

Over 230 TB cases diagnosed
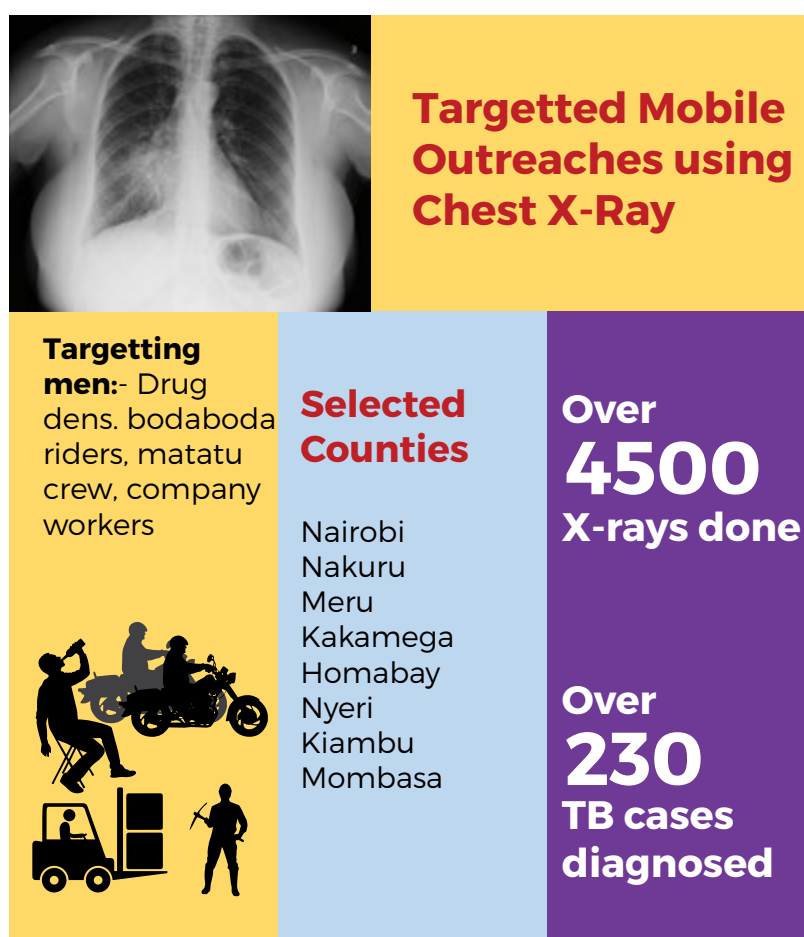
Chapter Three: Diagnostic capacity and surveillance of TB in Kenya

Gene Xpert implementation and Performance

By end of 2017, the country had a total 153 gene xpert machines strategically placed across the country against the national target of 250 by 2017.

Table 3.0:

Map Showing Distribution of GeneXpert Sites in Kenya as at February 2016

Gene Xpert expansion Plan							
Year	2011	2012	2013	2014	2015	2016	2017
No of machine	3	11	24	71	126	131	153
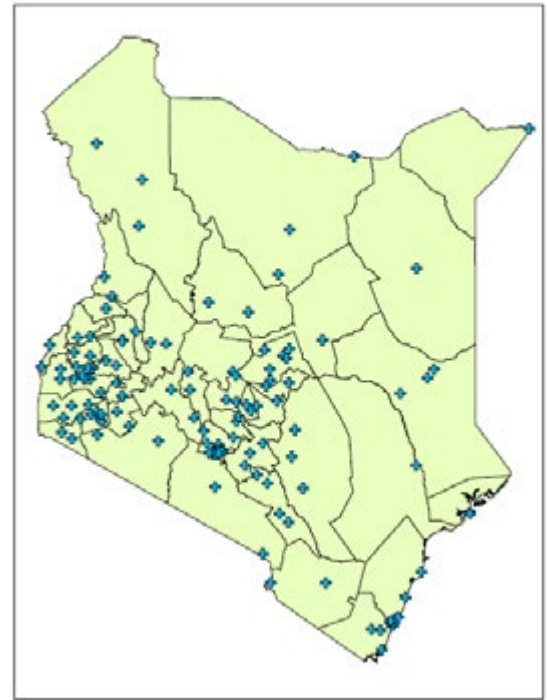
Gene Xpert performance in Kenya
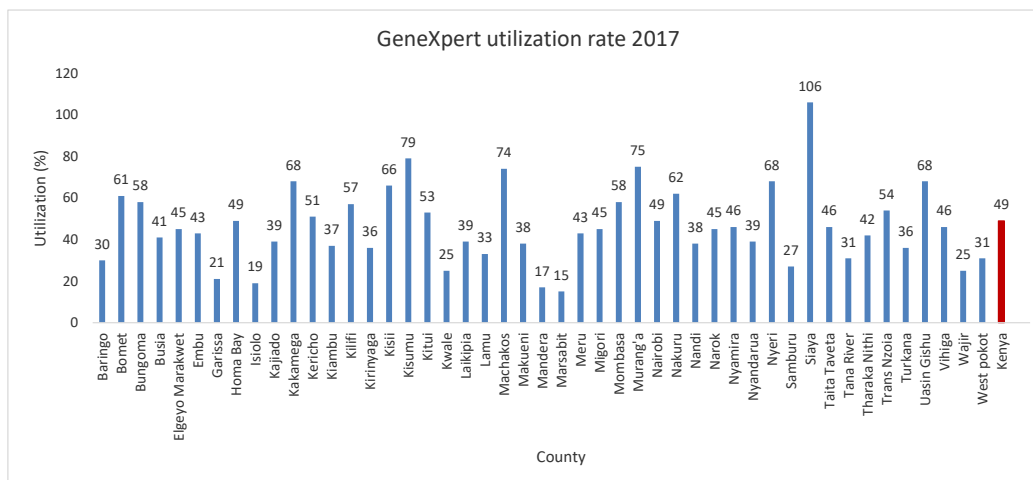
Gene xpert machines are linked to a national web-based reporting system – GX LIMS with 149 machines reporting online resulting in 97% reporting rate in 2017.

Figure 3. 1: Genexpert Performance against Target in Kenya, 2017

153 — No. of GeneXpert Machines

No. of Machines that reported — **149**

49% — GeneXpert Utilization rate

GX LIMS Utilization — **70%**

21% — Error rate
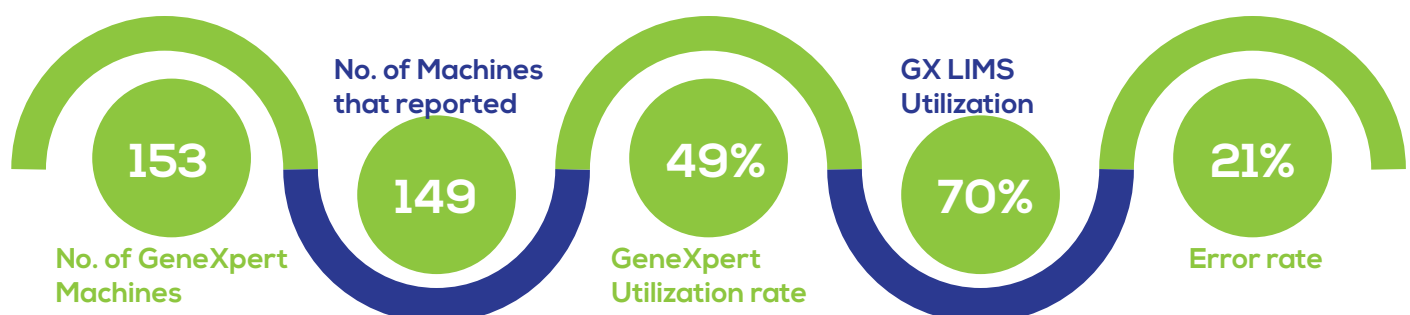
Table 3.1: Gene Xpert Performance Indicators Between 2012 and 2017 in Kenya

YEAR	Tests and Results						
	Total Tests	MTB		RIF		Invalid / No Result	Errors
		Positive	Negative	Resistant	Indeterminate		
2012	1,273	391	803	38	6	16	63
2013	6,430	2,210	3,747	193	39	36	437
2014	22,887	5,608	16,130	303	211	198	951
2015	83,387	17,084	61,207	776	474	2,002	2,964
2016	193,169	29,022	156,285	1,169	219	3,199	4,622
2017	256,250	34,540	213,206	1,202	-	8,504	228

In 2017, the rate was affected due to:

- Gaps in sample transportation
- Knowledge gaps among healthcare workers
- Challenges in reporting to the online platform due to
- Protracted health care worker strike

The NTLD-P and in close collaboration with the counties has made concerted efforts to ensure that each county has a technical working group that frequently reviews and evaluates the performance to ensure optimum operationalization and utilization of the gene xpert machines. To this effect, each county has a gene xpert super user who assists in trouble shooting of technical issues that affect the utilization of the machines. Mentorship to the testing sites as well as routine preventive maintenance of the machines is offered to optimize on their utilization.

Optimization of sample transportation will be fully integrated and coordinated by NTLD-P to ensure that all samples are transported timely.

Areas for opportunities:

- Continuous on job training/ sensitization among health care workers
- Strengthening of sample networking and referral mechanisms for facilities within counties to gene xpert sites
- Continuous on job training so as to enable completeness of data
- Ensure all sites report on commodities to ensure there is consistent availability
- Develop a power backup mechanisms for all xpert sites. Counties governments have been requested to factor this is in their budgets
- High staff turnover was experienced in the year. Need for staff retention mechanisms and continuous gene xpert refresher training to achieve quality results
- To avoid missing cases at health facilities, there is need to continuously sensitize more health care workers on indications and standard operation procedures of gene xpert

Panel Testing
To improve on quality results, panel testing was introduced to 153 testing sites, with enrollment of the rest of the sites planned for 2018.
Capacity building for gene xpert

- 16 more Xpert super users were trained in 2017 in addition to 47 previously trained.

⬥ Super users offer routine preventive maintenance services and troubleshoot on gene xpert related challenges in their respective counties.

- The laboratory personnel were updated on global laboratory initiative (GLI)
- Gene xpert sensitization was done to heath care workers at county and sub-county levels with at least 50% coverage of treatment and diagnostic facilities sites

Common challenges and action points for follow up
- ⬥ Sub-optimal sample networking and referral
- ⬥ Incomplete filling of request forms encountered in most facilities
- ⬥ Online reporting of commodities need to be improved.
- ⬥ Power backup system across the country remained a challenge. Counties were encouraged to collaborate with their administrative counties as well as supporting partners for support.
- ⬥ High staff turnover was experienced in the year which results in knowledge gap. There is thus need for staff retention mechanisms and continuous gene xpert refresher training and continuous on job training to achieve quality results
- ⬥ Protracted healthcare workers strike was a challenge in most of the diagnostic and treatment sites

National Tuberculosis Reference Laboratory

The National Tuberculosis Reference Laboratory (NTRL), is a section under Microbiology and a unit under the Division of National Public Health Laboratories (NPHLS).

Its main role is to perform surveillance for both drug susceptible and drug resistant TB by conducting culture and drug susceptibility testing (DST) for 1st
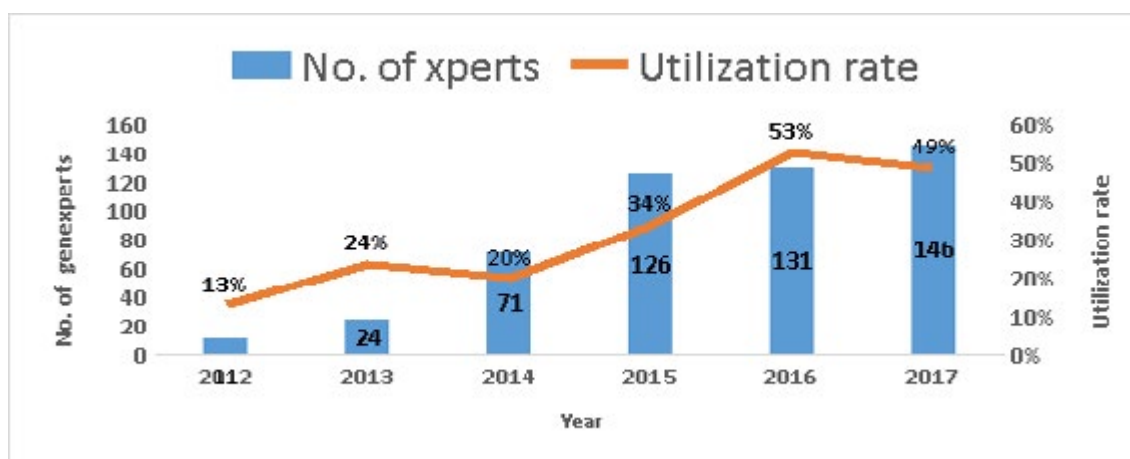
Figure 3. 1: Genexpert Utilization rate over time

and 2nd line drugs. In addition, NTRL plays the following roles:

- NTRL coordinates microscopy support supervision for County referral hospitals
- Conducts gene-xpert external quality assurance (EQA) in collaboration with CDC Atlanta
- Performs cultures on both solid and liquid medium
- Performs both phenotypic and genotypic first line and second line DST. This includes Line probe assays (LPA Hain) - MTBDRplus and MTBDRsl.
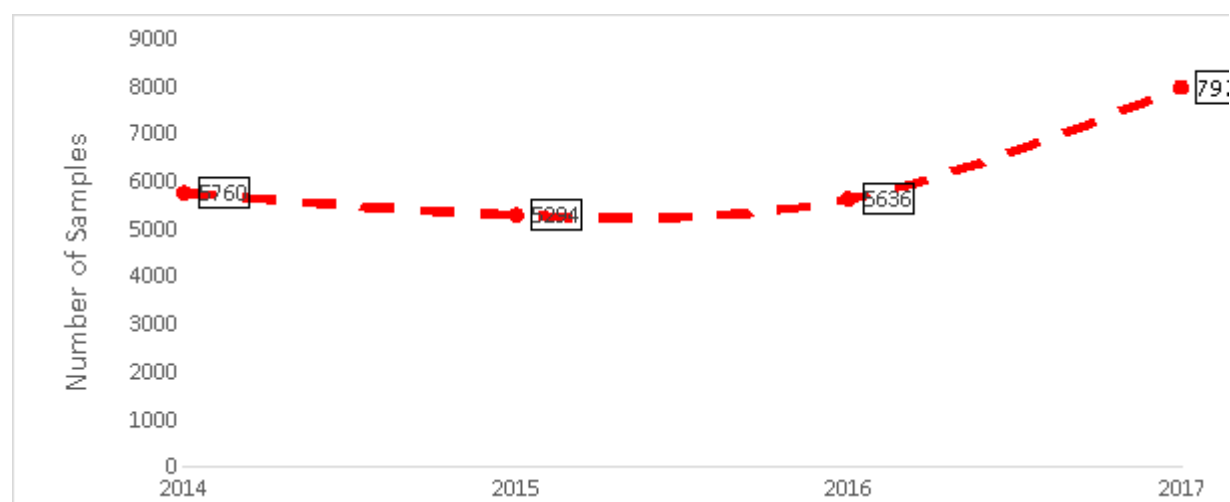
Figure 3. 2: Workload at NTRL over time

There has been gradual increase in workload in the NTRL over the years with the most increase recorded between 2016 and 2017 . This can be attributed to

The number of previously treated cases in the country in 2017 was 5,630 while those who were smear positive at month 2 were 1359. This gives 6,989 number of patients as eligible for DRTB surveillance. 6731 (96%) samples were received for culture.

KEMRI CDC TB culture laboratory based in Kisumu covers 17 Counties mainly from the western region.

Distribution of MDR TB cases diagnosed at NTRL in 2017
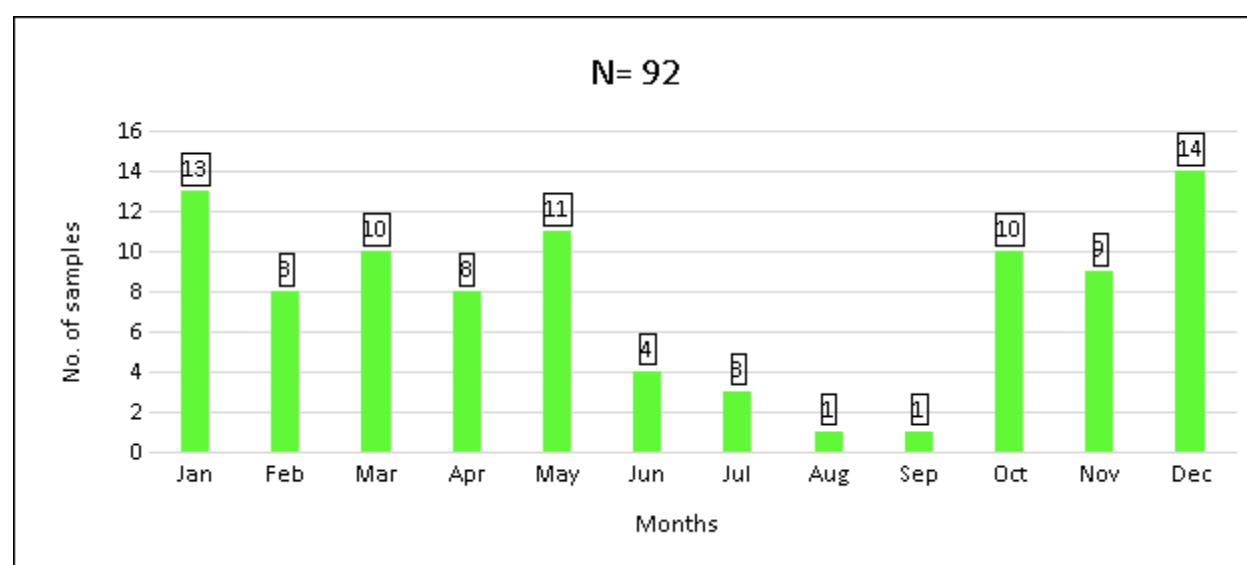
Figure 3. 4: Monthly distribution of MDRTB cases diagnosed at NTRL in 2017

Distribution of The Workload in The Culture Laboratories in Kenya, 2017
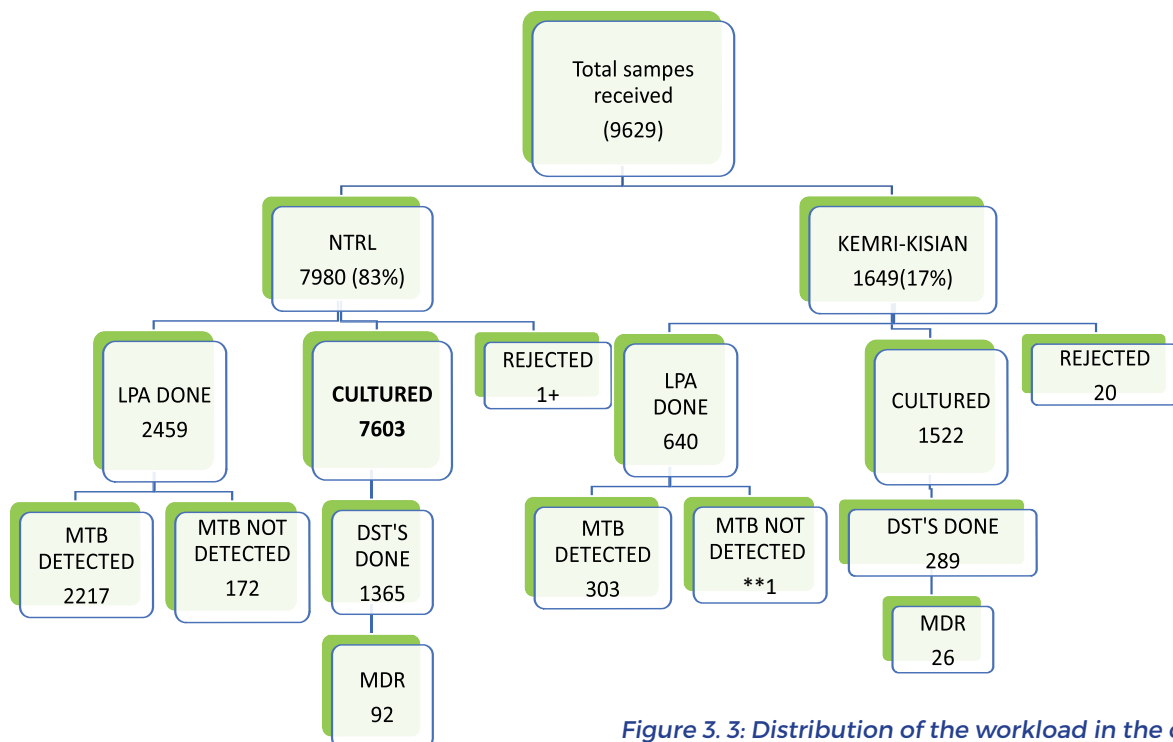
Figure 3. 3: Distribution of the workload in the culture laboratories in Kenya, 2017

Outcomes of Line Probe Assay (LPA) at NTRL in 2017
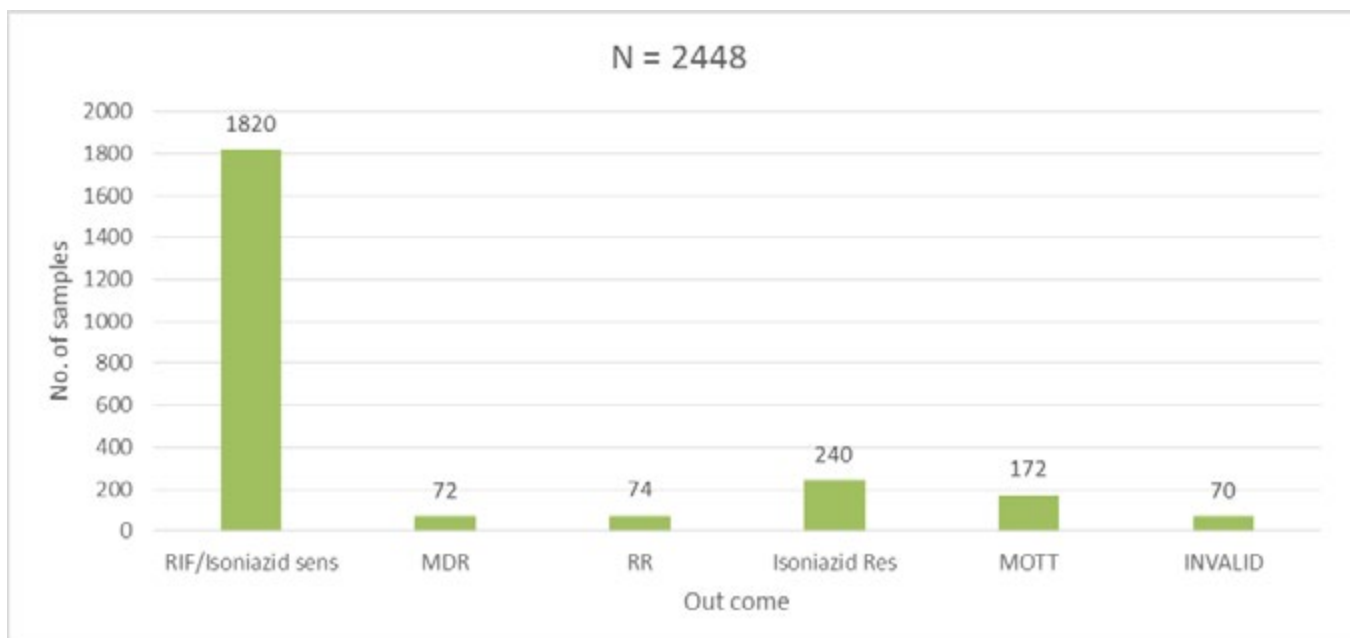
Turn Around Time (TAT) for results at NTRL in 2017
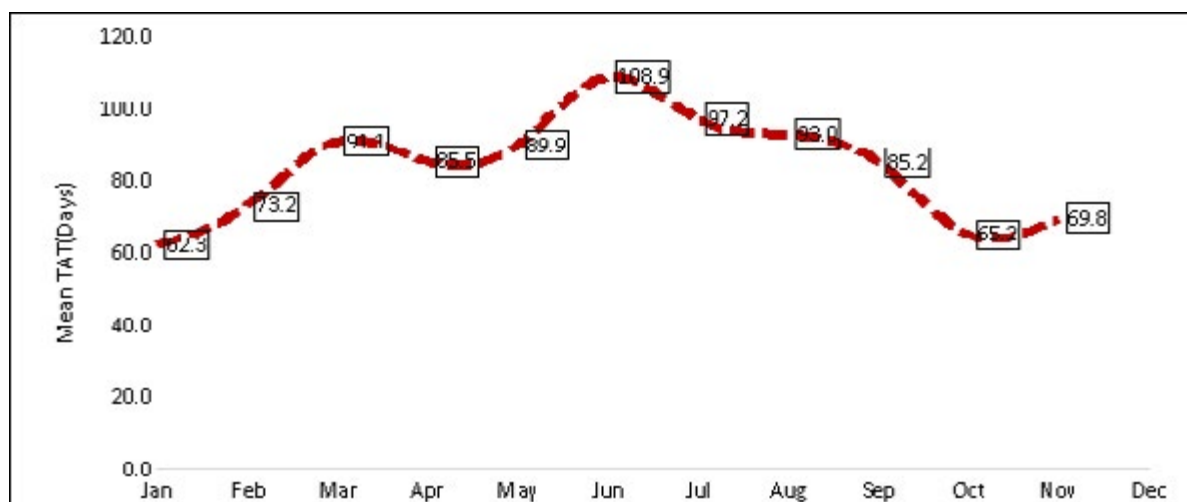
Figure 3. 5: Monthly Turn Around Time at NTRL for the year 2017

Panel testing

Panel testing (PT) was planned to evaluate proficiency of MLTs for fluorescence based microscopy and its training program. NTLD-P in collaboration with JICA procured and supplied 200 sets of panel slides made by Research Institute of Tuberculosis (RIT) and Japan Anti-Tuberculosis Association (JATA). Panel testing was implemented at individual laboratories using Primo Star iLED by CMLCs in quarter 1 2017. 46 counties out of 47 participated with a total of 348 MLTs tested by PT at 179 laboratories.

Table 3.2 demonstrates a correlation between panel results and MLTs results. More False negatives than false positives were identified. Sensitivity and specificity were 71% and 94% respectively. 89 out of 348 MLTs (26%) could not make the passing criteria (score 80 and without any major errors). Analyzing PT is continued by NTLD-P to seek association factors with proficiency

Table 3.2: Sensitivity and Specificity of MLT Results

Panel result	MLT's results					Sub Total
	Negative	Scanty	1+	2+	*P	
Negative	1,642	76	15	6	1	1,740
Scanty	401	246	33	3	1	696
1+	*,	+*	193	**	0	*3+
2+	58	148	136	6	0	*3+
*P	6	0	2	26	313	*3+
Sub Total	2,146	553	390	75	316	3,480

Through follow-up supervision for the panel test, following points were considered causes of false negatives;
Reflection of bacilli was not sharp and clear because the objective lenses were no clean.
Interfering fluorescence because the aperture diaphragm of the condenser was not closed completely,
A few cases not follow staining SOP were observed.

Other key activities conducted by NTRL in 2017

1. NTRL increased coverage of sites participating in Gene-Xpert panel testing (PT) from 93 sites in 2016 to 158 sites in 2017.

2. Conducted Corrective Action Preventive Action (CAPA) trainings to gene xpert sites supported by University of Mary land, AMREF, Global Implementation Solution and FHI 360s

3. Conducted microscopy support supervision to County Referral Hospital Laboratories.

4. Initiated the development of a dash board for clinicians and county TB coordinators to track and monitor the progress and status of samples sent to NTRL

5. Strengthened laboratory staff capacity for first and second line DST testing by training four staff at the Supra Reference Laboratory Brisbane

6. Capacity building for 23 staff from NTRL on monitoring and evaluating skills for use of data for decision making

NTRL staff at the Monitoring and Evaluation workshop, 2017

ISO 9001:2008 QMS Certified

The future opportunities

There are expansion plans to increase TB culture and drug sensitivity testing to laboratories to other regions in Kenya, namely: Malindi, Machakos and Kitale county referral laboratories

Microscopy services in Kenya

In 2017, NTLD-P conducted trainings, quality improvement, operation research and panel testing for microscopes.

Holistic approach for quality improvement (QI activities)

Quality Improvement activities involved training of controllers (CTLCs and SCTLCs), auditing blinded rechecking, investigating reasons of major errors, and seeking solutions. Two counties Meru and Kericho were selected in this purpose. In last 2 years, unacceptable laboratory rate in Meru and Kericho were more than 30% and 0% respectively. The activities were implemented in quarter one and quarter two of 2017.

Chapter Four: Supplies management and Pharmacovigilance

NTLD-P is responsible for the coordination supply chain management of the commodities to ensure uninterrupted supply of TB and Leprosy medicines as well as laboratory consumables in Kenya. This is done through meticulous coordination by committees within the program.

Commodity Security Committee

The commodity security committee is a special organ within NTLD-P that ensures an all-round provision of commodities for both first line and second line medicines as well as Gene Xpert consumables. This committee sits consistently on a monthly to review the commodity status at both the national and county level and subsequently, share this information with the both arms of government, Global Fund and other key stakeholders for planning and decision-making.

There were adequate stocks for both first line and second line medicines as well as laboratory consumables in 2017.

NTLD-Program Forecasting, Quantification and Procurement Plans

The forecasting and quantification exercise was conducted in 2017 for the planning of first and second line drugs for 2017/2018 using the Quan TB software. Further, the NTLD-P uses this software as an early warning system for supply chain management by generating a dashboard that gives the commodity status in Kenya at a given time (Figure 4.1.

Figure 4. 1: Inventory status of commodities as at January 10 2018

Quality Assurance of TB Medicines

The NTLD-Program carried out a joint post market surveillance in collaboration with the Pharmacy and Poisons Board (PPB), NASCOP and the Malaria Control Program in 2017. Sampling was carried out and submitted to the National Quality Control Laboratory for analysis.

Joint collaboration of NTLD, NASCOP and Malaria Control Programs

Health system strengthening, pharmacovigilance and capacity building activities for NTLD-P, NASCOP and Malaria Control Programs was supported jointly by Global Fund new funding model (NFM).

The health system strengthening activities include:
- Renovation sub-county medicine stores
- Redistribution of medicines and other program commodities at county level
- County supportive and technical assistance
- Post market surveillance
- DHIS-LMIS integration:
  - ◆ All the county pharmacists, sub-pharmacists and pharmaceutical technologists were trained in 2017. The migration to DHIS platform is expected to take place in 2018

Pharmacovigilance

The NTLD-P developed the tuberculosis and leprosy pharmacovigilance manual as well as the training curriculum which will be used to sensitize heath care workers. Further, the pharmacovigilance reporting tool was incorporated in TIBU phase IIIb and will be operationalized to strengthen the reporting system.

Kakamega cluster, DHIS-LMIS training.

Global Drug Facility (GDF) technical assistance to Kenya, 2017

In 2017, The Stop TB Partnership's Global Drug Facility (GDF) conducted a technical assistance mission with the aim of providing regional mentorship in strengthening procurement capacity of global supply system to ensure timely equitable access to quality-assured TB medicines and diagnostics as well new TB medicines and regimens. Further, it equipped the country with skills of applying market intelligence in its operations.

Commodity Reporting

There has been an upward trend in the country reporting rates for the year 201 (from 36 % in January to around 85% Dec).
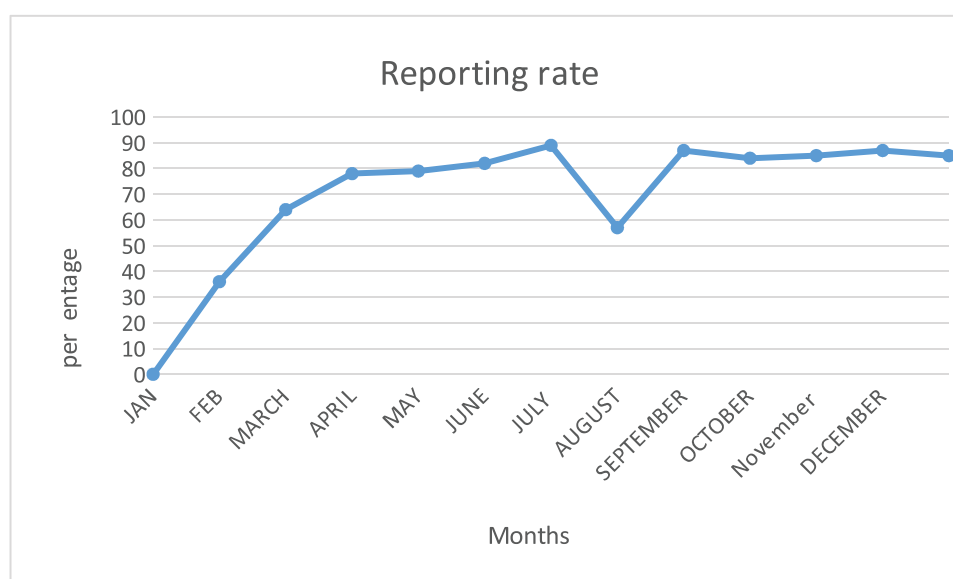
Figure 4. 2: Monthly Commodity reporting rates for the year 2017

Chapter Five: Health Promotion, Community and Stakeholder Engagement

Advocacy
Political engagement

In 2017, a program officer was engaged to coordinate the Parliamentary Caucus. There were frequent updates given to the members of the TB Caucus on TB control progress. Members of Parliament have been engaged in the budgeting process to ensure the budget for TB was maintained.

The NTLD-Program in collaboration with the Stop TB Partnership engaged multiple stakeholders to discuss TB control and prevention.

These engagements brought on board the following multi-stakeholders:
- COTU /ILO: integrated TB in the Labour day celebrations and screening conducted thereafter
- NTSA and engaged the boda boda riders
- Ministry of education- Had a presentation to the Women Education Researchers of Kenya (WERK) on the need to include TB related research in the programs and in the education policy)
- World AIDs Day Celebrations with NTLD-P involved in the planning of world TB day
- Mentorship of TB/Leprosy advocates
- Flower farms in Kiambu County

World TB Day 2017 Commemoration

Globally, World TB Day is commemorated on 24th March every year, it offers an opportunity to reflect on the progress made towards ending TB as well as provide a platform to raise awareness about enormous burden of TB.
The global theme for 2017 was "Unite to End TB," which called for more partnerships and increased efforts towards ending TB in the world. In line with this global Theme, Kenya adopted "Mulika TB Maliza TB, Unite to End TB for a TB Free Generation", as the National Theme for 2017.

As part of the World TB day commemoration, the following activities were undertaken some of the activities were pre world TB day activities.

1. Kenya Tuberculosis Prevalence Survey Findings Dissemination

On March 24, the Ministry of Health supported by various health partners officially disseminated findings of the recently concluded, first post-independence National TB Prevalence Survey. The first TB prevalence survey in Kenya was done in 1958-1959.

The unveiling of the TB Prevalence Survey Report

Hon Stephen Mule with the Prevalence Survey Report

Dr Enos Masini, Former Head, National Tuberculosis, Leprosy and Lung Disease Program

2. Pre-World Tuberculosis (TB) School Health Activity

NTLD-P held a pre-World TB Day commemoration at Kiambu Township Primary School in Kiambu County. The activity raised public awareness around childhood TB to encourage testing, early diagnosis and the use of the recently launched child-friendly medicines for treatment.
The event brought together school pupils and teachers from Kiambu County, County executive committee (CEC) officials, members for health and education department of Kiambu County, the National TB Program and all stakeholders in TB control. TB messages were disseminated through song, dance, poems and skits focusing mainly on prevention, screening and treatment.

CEC for Health, Kiambu County Dr Jonah Mwangi

- 2017 Media Engagement Workshop
  In the build-up to World TB Day 2017, NTLD-P in collaboration with USAID funded TB ARC, held a media workshop for national level staff, county TB coordinators, partners and TB champions to empower them on media engagement skills.

- Radio And Tv Programs
  The radio and TV interactive talk shows were carried out as part of pre world TB day activities. Program officers from both national and county level together former TB patients were invited to various media houses and interacted with journalists and members of public.

- Other Sensitization Fora
  ### a. NTSA
  NTLD-P in collaboration with Stop TB Partnership-Kenya sensitized a total of 30 NTSA officials in November 2017 on basic facts of TB transmission, prevention, diagnosis, treatment and treatment adherence. In future, this collaboration will be strengthened to integrate TB interventions within available opportunities in NSTA to sensitize stakeholders within the public transport sector.
  Insert photo

  ### b. Youth Group and BODA BODA RIDERS
  The Ministry of Health through National TB program in conjunction with Stop TB partnership held two day sensitization meetings to engage the youth organization by name BLAST (Building Lives Around Sound Transformation) and Boda Boda Riders at Nairobi. The two meetings were half day each and brought together members of the two organization to be sensitize on TB facts with the aim of having them to sensitize other members on health seeking behavior and TB prevention and control.
  A Total of twenty seven (27) youths and thirty (30) boda boda riders (Motor cycle Riders) were sensitized on basic facts on TB under the tagline Mulika TB Maliza TB. Finding the missing cases is everybody responsibility. There were 5 Facilitators drawn from National TB and Lung Disease Program, Stop TB partnership, and from Nairobi

4. Labour Day celebration

Procession during the Labour Day celebration at Uhuru Park

5. The 4Th Kenya International Scientific Lung Health Conference

The Ministry of Health in collaboration with technical partners organized the 4th Kenya International Scientific Lung Health Conference between June 20 and 23, 2017 themed: "Sustainable Innovations for Lung Health".

This conference brought together over 400 lung health experts, health professionals, researchers, academicians, politicians, civil society among from across the country and the international fora. It provided a good opportunity to disseminate, review and reflect on information to improve lung health across Kenya and across the continent.

Community Engagement

Civil society organizations (CSOs) TB control activities at the county level

AMREF Health Africa, a principal recipient for the non-state actors for Global Fund, sub-granted 29 CSOs to implement Community TB control activities in all the 47 counties in Kenya. The activities included: Contact investigation, tracing of treatment interrupters, outreaches, screening in prisons, sub county data review meeting, training on infection prevention and control (IPC), training of CHVs and CHEWs on community TB care, among others.

- Tracing and referral - 18,176 treatment interrupters
- Screening of 42,687 under-five children contacts of 18,176 bacteriologically confirmed TB patients
- Trained 389 of CHVs and 392 CHEWs on community TB
- Provided health education and screening of prison inmates in 16 Prisons

Community systems strengthening (CSS) Integrated model for TB, HIV and malaria
The Ministry of Health in collaboration with Red Cross Society and AMREF Health Africa, as the principal recipients for the non-state actors of Global Fund support, conducted a pilot of integrated TB, HIV and malaria model in one sub county in each of the following counties: Lungalunga sub county (Kwale county), Emuhaya sub county (Vihiga county) and Rangwe sub county (Homabay county) using the community health strategy. The CSS activities are guided by the CSS Technical Working Group (TWG) which is composed of the Ministry of Health disease control programs: Malaria, TB, CDHU and HIV programs, Kenya Red Cross Society and AMREF.
This model has ensured that there is continuous services provision to the community.
Collaborative milestones include:

- Baseline survey of community health strategies in systems strengthening
- Development and finalization of the integrated TB, HIV and malaria training curriculum
- Review of the gender mainstreaming curriculum
- Review of community reporting tools and finalization of the DHIS test site for integrated community reporting
- Trained 947 CHVs and XXX CHEWs on integrated TB, HIV and malaria Model
- Provided CHVs with bicycles and community kits

Dr Athman Chizugo CEC Medical and Health Ministry Kwale County, with representatives from Community Development Unit, Amref Health Africa from WOFAK Commissioning of the bicycles for the CHVs in Lungalunga Kwale County

6. Development TB isolation policy
The High Court of Kenya on 24th March 2016 annulled the detention in prisons of patients who default on anti-TB medication. Due to this court directive, the Ministry of Health issued a circular on confining of infectious patients in health facilities other than prisons. In order to comply with this directive, the TB ICC appointed and mandated a taskforce to spearhead a road map for policy formulation on isolation of TB patients in 2017.

Public Private Mix (PPM) in Kenya

Engaging all relevant health care providers in TB prevention and care through PPM approaches is an essential component of WHO's End TB Strategy.

PPM for TB prevention and care represents a comprehensive approach for systematic involvement of all relevant health care providers in TB control to promote the use of International Standards for TB Care and achieve national and global targets to end TB. PPM encompasses diverse collaborative strategies such as:

- Public-private (between NTP and the private sector)
- Public-public (between NTP and other public sector care providers such as general hospitals, prison or military health services and social security organizations)
- Private-private (between an NGO or a private hospital and the neighborhood private providers) collaboration.

The aims of this work are to identify people with TB symptoms as soon as possible, no matter where in the health system they first present, and to establish mechanisms that allow for efficient and high quality diagnosis and treatment.

Milestones made in PPM

- PPM governance was strengthened by having a full time PPM coordinator at the national level.
- The program developed a PPM action plan for the period 2017-2020 which outlines six key areas/models of engagement as illustrated below.

i. Private sector (institution and individual provider) model

- NTP in collaboration with KAPTLD supported PPM activities in 18 counties with urban populations of >200,000 (an increase from 14).
- About 300 private health facilities were engaged in 2017.
- Training of 2,454 facility staff of whom 1,779 (72%) were frontline Health Care Providers (HCPs) offering TB diagnosis and/ or treatment services was done.
- Training of County and Sub-County HMT members (91) in the Counties of Nairobi, Kwale, Vihiga, Nyeri and Trans Nzoia
- Mapping of 730 clinics and hospitals in Kiambu, Nairobi, Nakuru, Uasin Gishu and Kisumu was conducted

A critical challenge identified in expansion of the PS model has been the limited financial resources restricting scale-up for effective implementation of TB care involving the formal sector.

ii. Pharmacist model

The objective of the proposed pharmacist engagement model is to promote identification of presumed TB cases by the pharmacist and their prompt referral to the network of NTLD providers to facilitate early diagnosis and management of TB.

Mapping of 864 pharmacies in Kiambu, Nairobi, Nakuru, Uasin Gishu and Kisumu was conducted in 2017.

iii. Paediatric TB model

The model aims at exploring the possibility to engage the private pediatricians to expand access to TB services for children.

- Sensitization of 92 Pediatricians in Nairobi, Mombasa and Kisumu counties were conducted

- NTLDP participated in the Kenya Paediatrics Association conference in Kisumu that saw a Pediatric TB symposium engage on paediatric TB standard care
- Four facility-based pediatric TB CMEs were conducted in Nairobi County. Two skills-based workshops to build capacity on diagnosis of TB in children for 134 participants of whom 72 were pediatrics consultants.

iv. Laboratory model

It is currently unclear how many TB cases are diagnosed through the private laboratories. Thus, proposed activities in this model were designed to strengthen the collaboration with the private laboratories and establish linkages of diagnosed cases from the private laboratories to the NTLD network.

In 2017:
- There were 285 private laboratories currently providing TB diagnostic services mainly through smear microscopy and few Xpert in the country
- 90% of them participated in the National EQA system for AFB microscopy
- 562 laboratories were mapped in in Kiambu, Nairobi, Nakuru, Uasin Gishu and Kisumu in 2017

v. Corporate Model

- One sensitization meeting with the Matatu owners in Nairobi County was conducted.
- Through a collaborative effort of the Private Sector Consortium against HIV AIDS in Kenya, (FKE, COTU, SWHAP, NOPE, ILO, NACC) TB ARC partnered with the NTLDP and County TB Coordinating Teams (Nairobi & Mombasa Counties and the environs), in reaching out to the business world (Corporates) in an effort to accelerate the TB Case Finding.
- The pilot phase saw various explorative meetings held in order to identify the willing companies for the proposed interventions.
- TB screening was conducted in Mombasa, Kilifi, Machakos, Baringo and Kajiado Counties. The companies where the intervention was conducted include agricultural companies, manufacturing company and long-distance truck transport companies.
- The interventions at workplace included:
  - Conducting awareness on TB as part of occupational employees' health education,
  - Advocacy by sensitizing the Corporates' management on integration of TB control into the existing workplace policy platforms
  - TB Screening for workers on site referral of employees with TB to the nearest health facilities for further diagnosis, treatment, care and support.

Challenges within the PPM structures in Kenya

- The companies have Occupational Safety and Health Policy awareness but TB is not incorporated.
- Large farms have operational health facilities within their setups but are not yet evaluated for accreditation as TB treatment sites.
- Clinicians in the corporate lack TB information and guidelines updates.
- Companies have insured their staff in private insurance providers to offer wellness programming, however there is inadequate TB information and awareness amongst the providers and the workers.
- There is generally lack of updated IEC materials in the corporate sector.

Informal PPM Performance

The informal service providers (ISP) in Kenya mainly consist of herbalists, drug sellers and vendors, village doctors, traditional healers and traditional birth attendant (TBA) among others.

- Collaborations between NTP and KANCO saw a total of 1533 informal providers engaged across the 7 counties (Nairobi, Homa Bay, Marsabit, Tharaka Nithi, Kisumu, Bungoma & Makueni) up from 5 counties, yielding 14.8 % of TB cases in 2017.
- Entry meetings for the new county Mombasa and Makueni were conducted in 2017.
- Mapping exercise of 397 informal service providers (ISP) was conducted in Mombasa and Tharaka Nithi counties.
- KANCO in collaboration with NTP conducted two supportive supervision visits in Marsabit and Tharaka Nithi and sensitized 272 ISPs.
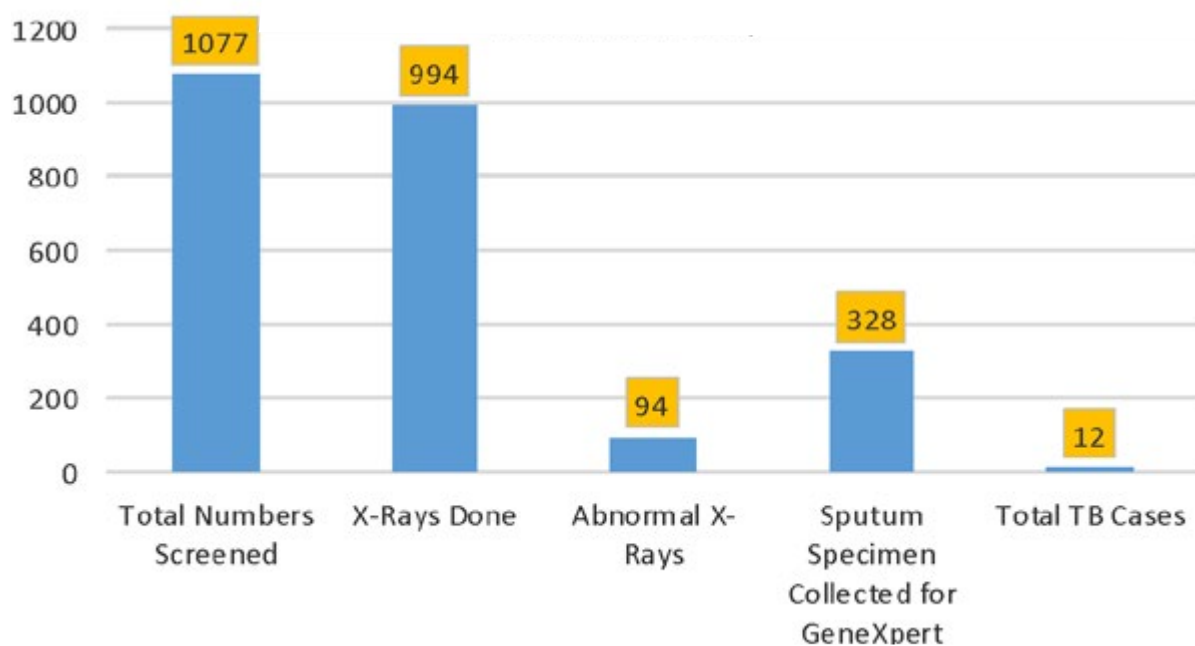
Figure 1. 3: Accelerated TB case Finding in 5 Corporates

Regional collaboration

Intergovernmental Authority for Development

NTP program officers participated in a consultative meeting for Intergovernmental Authority for Development on HIV, TB and Malaria Strategic Plan 2018-2025 in Addis Ababa Ethiopia.
The strategic plan is addressing the following regional areas of interest:

i) Strengthen regional coordination and collaboration
ii) Improve access to quality TB services in cross-border and mobile populations
iii) Facilitate TB operational research and regional surveillance system
iv) Ensure community engagement and ownership in the prevention, control, care and treatment of TB
v) Mobilize resources for TB program for cross border and mobile populations.
vi) Also carried out were other cross-border collaborative activities to support DR TB, cross-border transfers and tracing of lost to follow-up.

Chapter Six: Program Management, Monitoring, Evaluation and Research

The Global Fund Grant

The Global Fund New Funding Model (NFM) grant that started on 1st October 2015 came to an end on 31st December 2017. This grant was implemented by two principal recipients (PRs) with PR1 being The national Treasury and PR2 was AMREF Health Africa. The total grant budget was USD 67M. The grant average performance for the entire period was a rating of A2 which meets the expectation of The Global Fund and The Kenya Coordinating mechanism (KCM). The close out fund absorption for the grant was 74% with the construction of the KEMSA warehouse that delayed accounting for 24% of the grant.

The major programmatic achievements for the grant were:

- The 1st post-independence prevalence survey was completed and disseminated in 2017 where the burden of missed cases was realized.
- The 1st ever patient cost survey to determine catastrophic costs borne by patients who are undergoing TB treatment was completed in 2017.
- Several studies were completed namely: TB Adherence to Treatment, Gene Xpert Impact, Patient Pathway,
- Launch of new child friendly paediatric medicines in October 2016, with a lesser pill burden for children.
- Reduction of treatment time for DR TB patients from 24 months to 9 months, accompanied by the use of new molecules, Bedaquilin and Delaminid.
- There was assured and steady supply of all medicines with no stock outs reported, meaning and efficient procurement and supply management system
- Enrollment of Dr TB patients to the NHIF scheme and payents done by the programto enhance Universal Health Care to DR TB patients
- During that period of NFM, 1186 Dr TB patients were put on treatment and over 226,000 Drug sensitive cases were put on treatment.
- The country has also been able to build the capacity of health care workers in TB, DR TB and lung disease management and reporting
- Adoption of electronic reporting through TIBU has been supported by Global fund through the provision of tablets, computers and printers including training on the use of the same.
- The vital registration strengthening where the current grant and the new one will be able to support training of 22 health care workers in each of the 47 counties.
- Strengthening of M&E systems has also been the key highlight of the GF grant where there was efforts to integrate TIBU with DHIS and also LMIS with DHIS. It also supported employment of 48 registered clinical officers and 109 lab technicians to provide services across the country.

Signing of the New Global Fund Grant 2018-2021

Through the TB ICC, a funding request development team for TB in Kenya was formed in April 2017 under the leadership of Dr. Newton Omale, Head of Policy and planning at the NTP. The process of proposal development was an all-inclusive process that comprised the PR1, PR2, the Civil society and multi country stakeholders.

This culminated in the signing of a new grant on December 15th 2017 that is expected to be implemented from January 2018 up to June 2021, with an allocation of USD 45M for TB control. A further USD 6M was granted as catalytic funding to find innovative ways to find the missing TB persons. Special initiatives to find the missing Tb cases were also suggested and adopted by the country that include the TB Challenge Fund and the Pay for performance initiatives, which are expected to catalyse the increased ACF.

Programmatic Monitoring, Evaluation and Research

Research

i. Prevalence Survey

Kenya conducted its first tuberculosis (TB) prevalence survey approximately 60 years ago in 1958-59. Since then, Kenya has relied on WHO estimates to extrapolate incidence and case detection rates. In 2015-16, the National Tuberculosis, Leprosy and Lung Diseases Program (NTLD-P) and her partners successfully conducted the first post-independence TB prevalence survey. The survey was fully digital and was conducted in accordance with the WHO guidelines for national TB prevalence surveys. The objective of this survey was to determine the prevalence of bacteriologically confirmed pulmonary TB and to assess the health seeking behavior of TB patients and those reporting TB symptoms.

This was a population based cross sectional survey with a sample size of 72,000 individuals designed to provide national level estimates. Clusters were selected using probability proportion to size and from this 100 clusters were randomly selected using the probability proportional to size (PPS) method from a Kenya National Bureau of Statistics sampling frame with 32 clusters in urban stratum and 68 in rural stratum. All persons 15 years and above in the selected clusters who had lived in the household for a minimum of 30 consecutive days and who consented to the survey were included, while congregate settings were excluded. Screening for the eligible participants was through the WHO recommended screening strategies; symptom questionnaire and chest radiograph. Bacteriological confirmation for the sputum eligible was tested with Xpert MTB/RIF and solid culture.

Results

A census to identify eligible participants enumerated 126,389 individuals. Of these, 76,291 (60%) were eligible and 63,050 participated in the survey hence a participation rate of 83% with a higher rate in females (87%) than males (77%).

There were 9,715 (15%) eligible for sputum examination with a higher number eligible by chest X-ray findings (53%) only and 30% eligible by symptoms only.
The survey identified a total of 305 prevalent TB cases translating to a weighted prevalence of 558 [95% CI 455-662] per 100,000 adult population. Extrapolation of the burden to all forms of TB and all ages resulted in a national prevalence of 426 (347-504), higher than the WHO 2015 estimate of 233 (189-281) per 100,000 population. Compared to the 2016 routine notification rate for Kenya the prevalence to notification ratio was 2.5:1 indicating a need for active case finding to close the gap. This prevalence translates to a calculated 169,000 (103,000-250,000) incident cases (all forms and ages) in 2016.

Of the TB cases, 90 (29.5%) were diagnosed by Xpert MTB/RIF alone, 68 (22.3%) by culture alone and

147 (48.2%) were detected by both methods. The highest burden of disease was in the 25-34 age group, with a prevalence of 716 per 100,000. Males had a high prevalence rate of 809 per 100, 000 compared to female prevalence of 359 per 100,000. There was a higher burden of TB in the urban (760 per 100, 000 population) compared to rural settings (453 per 100,000 population). Screening for HIV among the 305 prevalent cases was done in the health facilities that these individuals were referred for treatment. The screening indicated a TB-HIV co-infection rate of 16.7%. Among the prevalent cases, 269 (88%) had abnormal chest X-ray findings suggestive of TB, 147 (48%) had cough of 2 weeks or more and 115 (38%) had both abnormal chest X-ray and cough of 2 weeks or more. Among the prevalent cases 225 (74%) had at least one TB related symptom (any coughing, fever, weight loss, night sweats, haemoptysis, fatigue, shortness of breathe or chest pains) and 57% reported a cough of any duration. When the symptomatic 225 (74%) were asked whether they sought care for their symptoms the following were their responses; those who did not seek care prior to the survey were 146 (64.9%), those who sought care were 75 (33.3%) and 4 (1.8%) did not provide a response on the actions they did in relation to their symptoms. Of the prevalent cases, 49 (65%) of those with symptoms who did not seek treatment were men.

ii. The First Kenya TB Patient cost survey, 2017

A survey was conducted to assess the economic burden incurred by Tuberculosis patients and their households in Kenya. In line with the End TB Strategy, the survey also provides the baseline upon which to periodically measure the percentage of TB patients and their households who incur catastrophic total costs due to TB. The actual data collection was conducted between 16th May 2017 and 28th June 2017.

This nationally representative, two-stage cluster sampled cross-sectional survey was undertaken through interviews with 1,071 drug-susceptible TB (DS-TB) and 282 multidrug-resistant TB (DR-TB) patients from 30 counties in Kenya who had been on treatment for at least two weeks. The patients were queried on direct costs, time losses, household consumption expenditures, asset ownership, and coping measures, income, expenditures and asset ownership. Total costs (direct and indirect) were expressed as a percentage of annual household consumption expenditure, and if they exceeded 20%, the household was classified as "experiencing catastrophic total costs". Overall 26.5% of TB affected households, including 86.4% of DR-TB affected households experienced catastrophic costs. The median total cost borne by patients seeking diagnosis and treatment per TB episode was KES 26,041.49. Median total cost of Kshs 25,874.00 and Kshs 145,109.53 was incurred as a result of an episode DS-TB and DR-TB respectively. Direct non- medical costs due to nutrition and food supplements accounted for 68.5% of expenses (Ksh 17,739.71). To cope, 27.8% of TB patients used negative coping mechanisms like taking a loan, use of savings and sale of assets to meet the expenses.

The survey recommends development of various policy guidance and programmatic interventions to reduce and compensate for costs faced by TB patients and their households. This include linking TB-related vulnerable households to existing social protection programs; alignment of food support with need by extending it to cover TB patients with moderate to severe malnutrition and malnourished children in TB households while ensuring equity in food support by extending vulnerable groups like men; inclusion of TB care in the NHIF benefit package while increasing coverage of NHIF among TB patients; development and implementation of policies and laws to eliminate discrimination and ensure job security for TB patient; engagement of all health providers in the provision of timely and quality-assured TB care and establishment of a high-level multi-stakehold-

er coordinating mechanism and forum for the country implementation of the End TB Strategy.

iii. Contribution of Community Health Volunteers in TB control,2017

A cross sectional survey conducted between January and April 2017 to determine the contribution of community health volunteers in TB control found that the proportion of TB patients referred by CHVs has remained constantly low at 4% for the last five years despite the intensive investment under the support of partners. The objective of this study was to determine the actual proportion of notified TB patients that were referred by CHVs and identify the factors that may contribute to their incorrect recording and reporting in Kenya. This cross sectional study of patients in intensive phase of treatment for drug sensitive TB found that the proportion of TB patients who reported that they were referred by CHVs was 18% (N=1986). Out of the 355 patients who said they were referred by a CHV, only 88 (24.8%) were notified to the national TB program as referral by CHVs.

Due to poor documentation, the proportion of TB patients referred by CHVs in Kenya is higher than is actually reported. The greatest loss in documenting CHV referrals is during the transcription of information from the TB facility register to the electronic reporting system (TIBU). Patients who first entered cared through the TB clinic had a higher chance of correct reporting. The study recommends that National Tuberculosis Leprosy and Lung Disease (NTLD-P) should come up with strategies to ensure that every TB patient referred by a CHV is recorded as a CHV referral in the TB facility register. There is also need to sensitize the sub county TB coordinators to correctly transmit TB patient referral information from the TB facility register to TIBU.

iv. Factors Associated With Non-Adherence to Tuberculosis Treatment in Kenya,2017

The study aimed to assess level of adherence to TB treatment and determine associated factors among patients on first line TB treatment in Kenya. The study was conducted across 15 counties with a sample population of 1487. The proportion of the patients found to be non-adherent was 35%. The results from this study suggest a range of factors (risk factors,) associated with non-adherence to TB medication; older age, male gender, presence of extra-pulmonary TB (EPTB), being HIV negative, intensive phase of treatment, having a treatment supporter, limited availability of food, experiencing medication-related side effects and increased cost of transport to health facility. The identification of these risk factors of anti- tuberculosis treatment non-adherence, indicates that strategies should be directed towards them.

The study recommends the National Tuberculosis Leprosy and Lung Disease (NTLD-P) should actively focus on supporting TB patient treatment adherence through health communication and awareness while leveraging on the use of social media platforms to help increase the reach of its public messages paying special attention to key affected populations like men. In addition, NTLD-P and stakeholders should consider introducing digital health interventions like Short Messaging Services (SMS) reminders and medication monitors to help support patient adherence while strengthen TB/nutrition programs collaboration to help identify TB patients with food shortages and develop mechanisms for their support.

Program Evaluation
1. Mid-Term Review

i. Mid-Term Review of the National Strategic Plan (2015-2018) for the National Tuberculosis, Leprosy And Lung Disease Program

Kenya conducted a successful mid-term review of the implementation of her National Tuberculosis, Leprosy and Lung Disease (NTLD-P) Strategic Plan 2015-2018 from March 9th to 20th, 2017.

The NSP review was in the context of its implementation that coincided with the new Constitution of Kenya (2010) that has devolved governance structure that called for a paradigm shift in implementing existing strategic plans. The program review was also in the context of implementation of NSP during the end of Millennium Development Goals (MDG) and Stop TB strategy, and coming in of Sustainable Development Goals (SDG) and END TB strategy respectively. In addition, the first national post-independence TB disease prevalence survey and a TB drug resistance survey had been successfully completed, providing epidemiological distributions of disease among population. The program review was aimed to identify the main achievements, weaknesses, strategic and programmatic gaps, threats and opportunities to inform realignment of control strategies to the global and local developments and imperatives.

The main objectives were:

1. To assess the progress made by the National TB, Leprosy and Lung Disease Program (NTLD-P) in the implementation of the 2015-2018 strategic plan with regards to set objectives and set targets:
2. To conduct an epidemiologic review of TB in the country in light of the recently completed TB disease Prevalence Survey and anti-TB Drug Resistance Survey (DRS)
3. To conduct a programmatic gap analysis (including SWOT and PESTEL)
4. To assess the alignment of the current strategic plan to The Constitution of Kenya 2010 (devolved system of governance), Vision 2030, Kenya Health Policy 2014-2030, Kenya Health Sector Strategic Plan 2014-18, Second Medium Term Plan 2014-2018, Sustainable Development Goals (SDGs) and The End TB Strategy
5. To identify, document lessons learnt and make recommendations to the existing (2015-2018) and subsequent strategic plans

The review focused on the following thematic areas and these were the findings:

Program implementation in a devolved governance structure

- The NSP was implemented during the transition from the central governance to the devolved system.
- The review found the existence of TB, Leprosy, Lung Disease coordinators at county and sub-county levels, and continued government financing of first line anti-TB medicines.
- Devolved structures maintain national policies and strategies
- Some counties are increasingly allocating budget for TB control at County level, there is need to scale this up

Accelerating appropriate diagnosis

- The TB Laboratory network is well established and accessible, with a functional EQA scheme.
- Laboratory reagents and commodities for the Laboratory microscopy network were adequate.
- Laboratory personnel have adequate technical skill to perform smear microscopy, and use of smear microscopy (ZN/FM) as first test where Xpert is not accessible is being practiced.
- GeneXpert is generally being used as first line for all presumptive TB cases, and there is real time reporting of case based data through SMS and Email alert.
- Panel testing/External Quality Assurance (EQA) for all GeneXpert sites is implemented on a quarterly basis, and there is monitoring of Xpert use using GX LIMS.

- There has been training of super users at every county, and the TB laboratory network for culture and drug susceptibility testing has also been established with its own supportive quality assurance program.
- The sample networking has been developed and being implemented by the National level and partners in some regions.
- The gaps identified included:
  o Inadequate laboratory staffing at peripheral levels
  o Knowledge gaps in biosafety, AFB, GeneXpert on results interpretation
  o Inadequate space for TB microscopy
  o Unstable power supply
  o EQA (blinded rechecking) implemented but some lack feedback reports and no corrective action
  o Weak sample referrals networks (affected the turnaround time for gene xpert, culture and LPA results, and also led to contamination)
  o Inadequate Xpert facility infrastructure: UPS, power, temperature, internet; universal DST is not being pursued; and there is no NPHL strategic plan to create a written plan to identify gaps at national and county level (trainings, equipment, EQA, infrastructure, HR, accreditation) and to mobilize necessary funding.
  o For the National Reference Laboratory:
    ▪ It was recommended that they focus on gene xpert turnaround time as a key indicator
    ▪ Ensure universal DST
    ▪ Develop a NPHL strategic plan
    ▪ Enable specimen collection by all facilities (even non-diagnostic facilities)
    ▪ Develop and implement alternative government financed means of specimen transportation

Ensure stable & quality supply of drugs, diagnostic tests & commodities
- There is centralization of TB drug and laboratory commodities procurement
- There is countrywide distribution of anti-TB medicines and commodities is done through KEMSA
- Government financing covers 70% of first-line anti-TB medication supply and supplies were generally widely available
- There were reports of stock-outs of anti-TB medicines, including new child friendly formulations & second-line medicines in certain facilities both in public and private sectors.
- Recommendations:
  o In order to ensure uninterrupted supply of anti-TB medicines and commodities, it is recommended to maintain the centralized procurement of essential TB control medicines and commodities to sustain focus in a devolved set up
  o Commodity reporting to be strengthened in the counties and pharmacovigilance support to be offered and facility and county levels
  o Government is urged to devise a system to facilitate timely disposal of expired medicines

Findings
(i). Core TB DOTS
- Diagnostic capacities, including , molecular testing, had significantly expanded across the

country
- Treatment success rate for all forms of TB have remained high during the implementation period of the National Strategic Plan
- It was noted that most TB cases are missed based on the estimated incidence and notification rates. The gap may be as a result of the following:
  - o Limited screening for people with TB symptoms in the community and at health facilities
  - o Significant loss of patients to follow up between laboratory diagnosis and TB treatment initiation
  - o Access to chest x-ray services is limited
  - o Gaps in contact investigation

(ii) Childhood TB
- There is evidence of active action towards improving childhood TB diagnosis
- Availability of child friendly medication
- Increasing access to childhood diagnosis through availability of Gene Xpert testing
- Policy of free access to care for children under 5 years is not being applied evenly
- There is need to increase resources for paediatric TB
  - o Apply the existing waiver system, and enforce the policy of free charges for all children
  - o Identify, equip and support Centers of Excellence for child TB to develop capacity among health care workers in child TB & lung health
  - o minimize barriers to access to diagnostics – (free CXR, Xpert) and improve specimen/results transport system;
  - o Address challlnges as regards tuberculin supply
  - o Collaborate with EPI program to manage & implement broader child health initiatives

(iii) Programmatic Management of Drug-Resistant TB
- PMDT has been scaled up country wide with regular updating of internationally compliant national policy guidelines and algorithms.
- There is an uninterrupted availability of second line anti-TB medicines (SLDs). All patients notified are being put on treatment with no diagnosis/ treatment gap
- There is a robust in-country diagnostic capacity for drug resistant TB using conventional culture and DST, liquid culture, and rapid molecular testing using Xpert MTB/Rif & FL & SL LPA
- There are various models of specimen referral networking.
- There was low coverage and utilization of Xpert testing as first line test for TB diagnosis among presumptive cases
- There was a significant proportion of DR-TB patients missing follow up of culture results.
- No isolation facilities in most county hospitals.
- There were gaps in systematic monitoring and reporting of Adverse Drug Reactions (ADR) for DR TB patients
- The audiometry machines and tests were not available to monitor patients on SLDs
Leprosy
- Kenya is a low endemic country for leprosy and has achieved and sustained national elimination status since many years past.
- The 6 high burden Counties include Kwale, Kilifi, Homa Bay, Siaya, Kisumu and Busia which

account for 73% of notified cases from 2014-2016.

- There was need for resource mobilization for funding for Leprosy control activities.
- It was recommended that counties develop, fund and implement systematic contact surveillance around newly detected cases.

(iv) Engaging all care providers (Public-private Mix):

- Kenya has shown sustained commitment in implementing the PPM policy
- The private sector contributed 17% of all cases notified in 2015 and 2016
- Kenya Association for the Prevention of Tuberculosis and Lung Diseases (KAPTLD), has been playing a catalytic role in sustaining the PPM approach in the country
- Despite these efforts, coverage of private health care providers in the provision of TB control services remains low and uneven across counties, ranging from 0% to 65%
- There is a significant knowledge gaps among private providers in all areas of TB care and prevention
- Private laboratories participating in PPM activities were not participating in microscopy EQA schemes, raising fears of quality of diagnosis
- There is need to mobilize the necessary resources to implement the recently developed PPM action plan at a larger scale.
  Promote and strengthen community engagement:
  People presumed to have TB face barriers in accessing care. This leads to low case notification and higher loss to follow up. From the review, it was found that it was important for:
- Formation and strengthening of TB support groups to provide psychosocial support to new patients, and piloting of community TB care models for possible adoption and scale up.
- There is also need for systematic screening of people in the community for TB symptoms, collection of sputum samples in the community and transportation to laboratories and actively linking people with TB to appropriate treatment (and reporting), strengthening and utilizing existing
- Health platforms and harmonizing financial support for CHVs across Counties

(v) Enhance the multi-sectoral response to Tuberculosis and HIV

- Collaborative TB/HIV activities have been mainstreamed at all health care settings. TB/HIV services were found to be well-integrated.
- Over 95% of TB patients are being tested and an equally high proportion of those that are dually infected are accessing ART and CPT.
- Provision of preventive therapy for people with HIV has scaled up significantly during the period of the NSP, currently estimated at 50% coverage.
- Airborne infection control measures are being minimally implemented
- Health worker screening programs were not found in place
- It was recommended to improve supervision for recording and reporting of IPT:
  - o   To develop and roll out a contact tracking register to facilitate identification of children eligible for IPT
  - o   To develop education materials aimed at improving acceptability among parents f or IPT provision in children
  - o   To improve pharmacovigilance in IPT provision
  - o   To designate IPC officers at County level to ensure implementation of IPC plans at health facilities
  - o   To institute occupational health and safety measures, including routine HCW surveillance for TB

(vi) Enhance evidence-based program monitoring and implementation
A Nation-wide TB prevalence survey and a nation-wide drug resistance survey were both successfully conducted during the life of this NSP. In addition PPM action plan, an Epi-analysis, and patient pathway were also conducted during the life of the NSP. There are currently ongoing preparations to conduct a catastrophic cost survey
Creating an enabling environment

The NSP is well linked to government policy as stated in key strategic documents such as the Kenya Health Sector Strategic and Investment Plan (KHSSP) 2014-2018, the Second Medium-Term Plan (MTP) 2014-2018 and Vision 2030. The adopted polices and strategies were also consistent with international recommendations at the time of the NSP development. Centralization of TB drug and laboratory commodities procurement is enabling smooth sustained control activities at County and sub-county levels, so are sustained positions for TB coordinators at county and sub-county levels. Government financing of first line anti-TB medication supplies to the tune of 70% augurs well for sustainability.
There is need to sustain the investments made in TB control from both domestic and external sources so as to create an enabling environment at both facility, county and National level by capacity building health care workers, community health volunteers, organizations and communities.

Advocacy and Communication: The mid-term review found that a TB communication strategy exists, but few people are aware or utilizing the documents. It is recommended that the NTLD-P provide guidance on the development of guidelines for TB advocacy at the county level, clearly defining target audiences & channels of engagement, priority issues and potential partners. Further, it should create a summary document and implementation plan of existing TB communication strategies and adopt home-grown strategies and not just printing IEC materials for TB information dissemination.

(vii) Human Rights and Gender
In a landmark ruling, the High Court of Kenya declared confinement in prison of TB patients who are not willing to take medication unconstitutional. The Ministry of Health in collaboration with the legal community, embarked on development of a national patient-centered policy guidelines on how patients with infectious diseases should be cared in patient-centered care, and in particular to identify appropriate isolation facilities to support patients who have been unable or unwilling to adhere to treatment were then thus
Expand the utilization of the Practical Approach to Lung Health (PAL)
The PAL guidelines have been developed and disseminated and there is a training curriculum and manual including IEC materials in place. It was found that the health care workers had been trained on PAL and spirometers procured and distributed.
Close partnership between KAPTLD, the NTLD-P and others including the World Lung Foundation and The UNION and various pharmaceutical companies have been working towards initiating centers of excellence for asthma care; and the development and dissemination of asthma guidelines.

2. Data Quality Assessment
In 2017, the NTLD-P carried out data quality assessment (DQA) in six counties where two sub counties were selected at random and all the TB treatment facilities assessed for data quality. The counties were; Elgeyo Marakwet, Garissa, Kajiado, Machakos, Trans Nzoia and Marsabit. Due to technical errors the data from Marsabit was not analyzed and included in the final DQA report. The overall

level of agreement between TIBU and the facility register was 94%which is below the acceptable range of between 95% - 105%. Four sub counties (33%), were within the acceptable range. The best performing sub counties were Yatta (100%), Kathiani (97%), Loitokitok (95%) and Keiyo North (102%).Endebes had more patients In TIBU than there were in the register while in Fafi less patients had been notified in TIBU.

There was general improvement of utilization of patient record cards from 55% in 2016 to 67% in 2017. Loitoktok Sub County performed well on this with 100% records being traced to record cards.

The recommendations from the assessment were:
- There is need to enforce timely notification of patients. The program policy recommends that only 5% of the patients diagnosed are carried over to the next quarter. This can be achieved by increased supervisory visits
- There is need to create awareness on data review and utilization among HCWs. This will enhance the use of data for decision making.
- The process of printing recording and reporting tools should be fast tracked
- Data SOPs should be developed at the national level, disseminated and distributed to all the service delivery points
- Health facilities need to ensure that data is securely kept in lockable cabinet and access control measures are in place.

3. Performance Review Meeting

Performance review meeting is an activity organized jointly by the TB program and its partners. It is held bi-annually to review the county performance on TB indicators against the national target. The activity brings together the county, national teams together with implementing partners and all relevant stakeholders to take stock of the performance.

In 2017, the counties are clustered into three groups so as to have sizeable numbers to aid in meaningful deliberations. At minimum, counties send four pax (County TB and Leprosy Coordinator, County Medical Laboratory Technologist, County Director of Health, County Pharmacist) and more often are always accompanied by their local implementing partners who play a key in service delivery. A standard template highlighting key indicators is normally shared in advance for the responsible to populate their county data which will be presented and discussed during plenary. During presentations, counties are taken to task to explain their best practices in areas where they have performed well and identify gaps for where targets are not met. This generates an action plan which prioritizes areas of focus. They also get a chance to show their presentation prowess (power point slides and presentation skills) and this forms a basis for voting where the best county is awarded.

Such meetings provide a platform for intercounty learning and sharing experiences. They also get updates on the new targets, latest policies, circulars and upcoming researches. The greatest limitation has been the inability to hold such a forum for sub county TB and leprosy coordinators who collect this data and would be best placed to share their day to day experiences.

Chapter 7: Finance & Administration, Human Resource and Capacity Building

1. Finance and Administration

The Government allocated to NTLD-P KES 451,886.925 Million and 2,880,500million respectively for key TB commodities and Administrative cost during the FY 2017/2018. This was mainly to supplement the procurement of key commodities such as first line anti-TB medicine and Laboratory reagents and running the day to day activities.

Table 7.0:

ACTIVITY	AMOUNT (KES)	Percentage
Telephone and mobile phones	180,000	6.3
Accommodation- Domestic travel	127,500	4.5
Publishing and printing services	75,000	2.6
Subscriptions to newspapers	25,500	0.9
Catering services	71,250	2.5
General office supplies	202,600	7
Refined fuels for transport	472,500	16.3
Refined fuels for production	236,250	8.1
Transport cost & charges	1,500,000	51.8
TOTAL BUDGET	**2,880,500**	**100**

Table 7.1: Development Fund

Particular	Amount (KES)
Medical Drugs	302,250,000
Capital Grant to semi-autonomous agencies	149,636,925
Total Budget	451,886,925

2. Human Resource

During the year under review, the NTLD-Program had a staff establishment of 55 staff: 38 technical staff, 22 Global Fund project staff, 4 staff seconded to the Program by CHAI and 1 by International TB-Union. There are 7 support staff and 9 professional drivers. The Global Fund Project supported 156 field staff in different cadres in the counties. They include: 44 clinical officers and 112 laboratory technologists. During the year, JICA and FIND International provided technical assistance to the laboratory by placing a laboratory specialist to help build capacity by way of training (JICA) and also provision of equipment and reagents. USAID seconded 1 technical assistant officer.

Transition

The program received eight (8) new officers and 6 officers left the program on transfer and among them was the former head of the program Dr. Enos Masini who joined World Health Organization. Dr. Maureen Kamene was appointed as the head of program.

Awards

Three program officers were awarded for their outstanding performance in 2017: Employee of the year that went to Martin Githiomi, team Player of the year went to Newton Omale and entertainer of the year went to Kiogora Gatimbu.

3. Program fleet
Table: 7.2

	No. of vehicles	Station/County
1.	15	NTLD-P
2.	1	MOMBASA
3.	1	NAKURU
4.	1	UASIN GISHU
5.	1	BUSIA
6.	1	KISII
7.	1	KISUMU
8.	1	NYERI
9.	1	EMBU
10.	1	GARISSA

Among the 15 program vehicles, 2 were newly procured through KEMSA and one was donated by JICA.

4. Internship opportunities

One of the key indicators on youth and women empowerment is to ensure progressive involvement of the youth in internship/volunteer programs as well as transfer of skills to the youth through apprenticeship. NTLD-Program staff mentored the following youth through internship

Table 7.3: Internship opportunities provided in 2017

S/No	Area of Study	Section Attached	Number
1	Environmental Health and Public Health	Prevention and Health Promotion	2
2	ICT	Monitoring &Evaluation	2
3	Laboratory	Care and Support	3
4	Care	Care and Nutrition	2
5	Administration	Accounts and admin.	5
		TOTAL	**14**

5. Training and capacity building
Roll out of the Integrated Curriculum Trainings 2017

After a successful completion of developing the integrated TB, Leprosy and Lung Diseases guidelines in 2016, we embarked on the health care workers (HCWs) trainings with a target to train 2,500 pax. The trainings process comprised of the pilot stage where training of trainers was conducted and the HCWs trainings.

TOTs training

Training of trainers was a key component to the achievement of the target health care workers trainings. A total of 250 TOTs were trained comprising of medical officers, clinical officers, nursing officers, pharmacists, nutritionists, medical lab technologists and monitoring and evaluation officers from national level, County level and the 20 training firms.

HCWS Training

The program adopted an approach of contracting specialized training firms to conduct the HCWs trainings. Their role was purely to train with direct supervision from the national and county officers. The Country was categorized into 20 regions. Twenty (20) training firms were contracted and given a target to train 250 HCWs per region. The following results were realized as summarized below:-

Number of Health care workers Trained
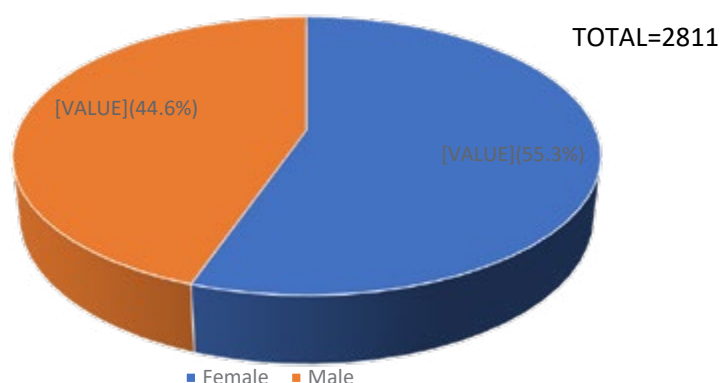
Figure 6. 1: Total number trained by gender

As described in the figure above, a total of 2,811 HCWs were trained out of a target 2,500 with more females (55.3%) being trained compared to males.

Distribution of Health care workers trained by cadre
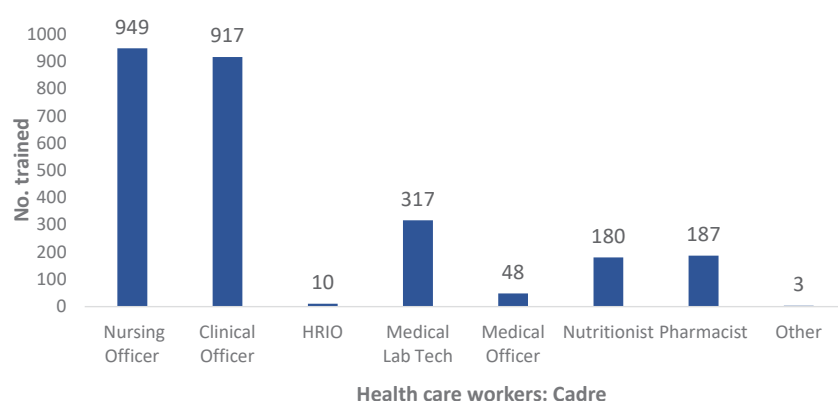
Figure 6. 2: Number trained by Cadre

Distribution of health care workers trained by counties
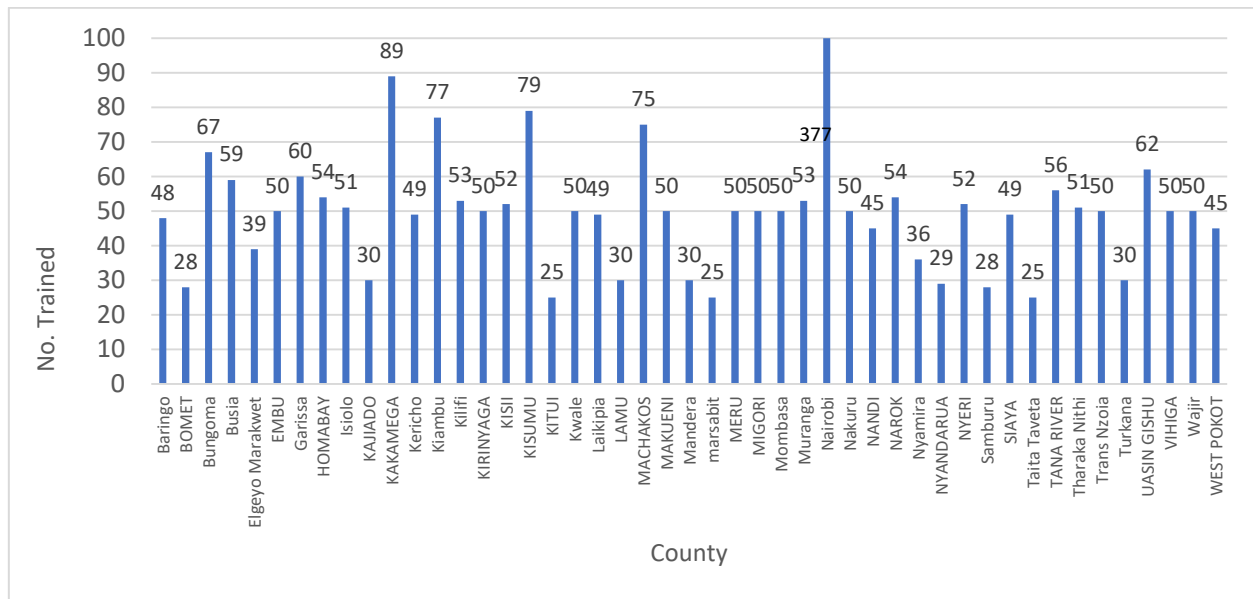
Figure 6. 3: Number trained by County

The above chart describes the number of health care workers trained per County. The average number trained per County was 40 while Nairobi had the highest number trained due to its dense population.
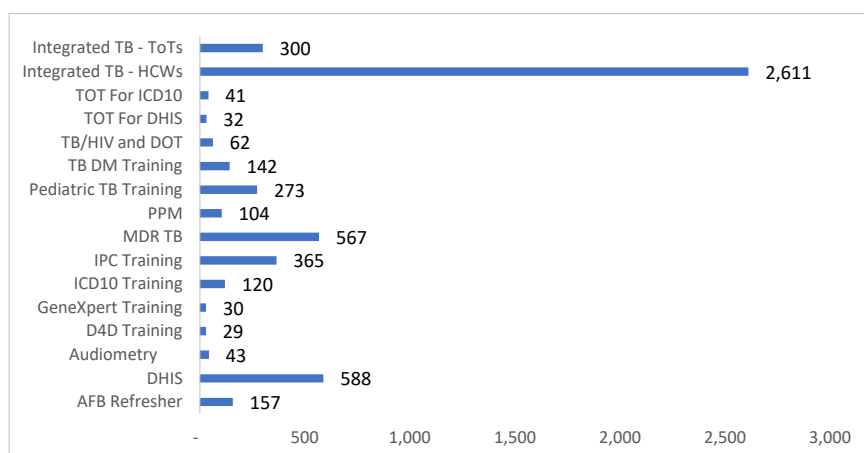
Figure 6. 6: summary of total number of health care workers trained per module in 2017 in Kenya

6. Sponsorship for local and international professional courses and confrences

No	Target	Type of training	Number of participants	Source of Funds
1.	Program Officers and County TB Officers	Local	23	GLOBALFUND
2.	Program Officers and County TB Officers	International	17	GLOBAL FUND
3.	County TB Coordinators	Union course	6	GLOBAL FUND
4.	International Conferences		3	GLOBAL FUND

Annexes

Annex 1: Summary of indicator performance per County

County Profile					Case Finding 2017 (All)			Childhood TB		Treatment outcomes (2016 cohort)					TB/HIV indicators among DS TB patients				Nutrition 2017		Genexp	IPT	DRTB Case Finding		DRTB Treatment outcomes (2015 cohort)				
County	Population	TB Control Zones	AFB Sites	GxPert Sites	TB Treatment sites	Number	CNR/100,000	Number	Proportion	TSR	CR	Death rate	LTFU	Not Evaluated	HIV Testing	Coinfection	ART uptake	CPT uptake	BMI<18.5	ON Food Support	Utilization rate	IPT Uptake	DR TB surveillance	Total no. of cases	TSR	CR	Death rate	LTFU	Not Evaluated
Baringo	737,242	6	32	2	74	653	88.6	53	8%	76%	57%	5%	11%	9%	88%	20%	99%	99%	56%	29%	30%	6%	63%	4	50%	50%	25%	0%	25%
Bomet	961,011	5	30	2	48	1562	162.5	134	9%	87%	63%	4%	4%	4%	95%	19%	97%	100%	44%	41%	61%	23%	71%	6	50%	33%	33%	0%	17%
Bungoma	1,987,135	10	103	3	115	2102	105.8	248	12%	82%	74%	7%	3%	8%	96%	28%	96%	99%	37%	23%	58%	18%	81%	5	80%	20%	0%	0%	20%
Busia	594,672	7	56	4	56	1301	218.8	130	10%	84%	68%	8%	4%	4%	99%	42%	99%	100%	40%	41%	41%	22%	87%	5	100%	60%	0%	0%	0%
Elgeyo Marakwet	490,995	4	26	1	30	618	125.9	49	8%	86%	48%	5%	6%	2%	98%	21%	98%	98%	56%	35%	45%	13%	67%	3	100%	100%	0%	0%	0%
Embu	604,825	4	54	2	78	1605	265.4	202	13%	78%	69%	5%	5%	11%	88%	17%	91%	96%	40%	24%	43%	6%	63%	8	88%	13%	0%	13%	0%
Garissa	1,223,379	5	30	2	31	916	74.9	128	14%	89%	80%	3%	3%	4%	97%	3%	93%	100%	45%	39%	21%	11%	57%	69	84%	80%	1%	7%	0%
Homa Bay	1,138,126	8	82	8	156	2134	187.5	197	9%	82%	69%	11%	3%	3%	100%	61%	99%	100%	40%	48%	49%	25%	79%	15	67%	33%	33%	0%	0%
Isiolo	167,892	3	8	2	26	624	371.7	73	12%	82%	59%	4%	6%	9%	88%	17%	99%	99%	51%	42%	19%	8%	63%	4	100%	50%	0%	0%	0%
Kajiado	912,078	5	42	2	39	1563	171.4	160	10%	86%	70%	3%	5%	6%	98%	28%	95%	98%	43%	23%	39%	9%	54%	4	0%	0%	0%	50%	50%
Kakamega	2,023,342	12	74	4	127	2437	120.4	238	10%	81%	76%	9%	4%	5%	99%	34%	99%	100%	37%	30%	68%	7%	75%	4	75%	75%	25%	0%	0%
Kericho	1,006,332	6	46	3	61	1723	171.2	111	6%	88%	72%	3%	5%	5%	95%	26%	88%	99%	48%	37%	51%	17%	71%	5	40%	0%	40%	20%	0%
Kiambu	1,843,078	11	96	5	121	4345	235.7	325	7%	68%	49%	5%	4%	22%	97%	28%	89%	99%	39%	22%	37%	11%	64%	11	91%	36%	36%	9%	0%
Kilifi	1,394,897	7	43	2	111	1918	137.5	218	11%	81%	70%	8%	6%	4%	99%	26%	96%	99%	49%	34%	57%	18%	74%	10	100%	0%	0%	0%	0%
Kirinyaga	599,554	5	46	2	63	1358	226.5	175	13%	85%	70%	5%	6%	3%	99%	17%	96%	99%	42%	23%	36%	13%	61%	10	90%	30%	10%	0%	0%
Kisii	1,360,707	9	88	2	113	1857	136.5	149	8%	91%	89%	5%	3%	1%	99%	36%	95%	100%	40%	22%	66%	19%	86%	11	55%	45%	45%	0%	0%
Kisumu	1,144,166	7	93	8	128	2453	214.4	152	6%	81%	70%	8%	4%	6%	95%	55%	95%	99%	42%	13%	66%	16%	81%	16	44%	19%	44%	6%	6%
Kitui	1,186,550	8	58	3	149	2222	187.3	125	6%	85%	81%	7%	4%	3%	100%	21%	99%	100%	59%	29%	53%	16%	75%	12	75%	42%	8%	17%	0%
Kwale	816,940	4	39	3	78	889	108.8	122	14%	78%	68%	9%	4%	10%	94%	24%	91%	98%	37%	28%	25%	10%	67%	4	25%	0%	50%	0%	25%
Laikipia	529,783	3	25	3	40	1011	190.8	94	9%	87%	76%	7%	4%	1%	98%	23%	96%	98%	44%	24%	39%	13%	72%	5	60%	40%	0%	0%	0%
Lamu	127,631	2	14	1	24	325	254.6	48	15%	86%	83%	5%	2%	8%	96%	13%	95%	98%	40%	44%	33%	57%	100%	1	100%	0%	0%	0%	0%
Machakos	1,287,166	8	60	3	127	2638	204.9	130	5%	86%	80%	6%	4%	3%	98%	25%	97%	100%	52%	36%	74%	11%	79%	7	57%	57%	29%	14%	0%
Makueni	1,036,364	7	60	4	112	1730	166.9	90	5%	86%	84%	7%	3%	3%	98%	27%	96%	99%	56%	39%	38%	18%	62%	7	57%	43%	43%	0%	0%
Mandera	2,014,073	4	16	1	22	605	30	86	14%	94%	90%	1%	1%	3%	97%	3%	100%	88%	50%	60%	17%	11%	67%	7	57%	43%	43%	0%	0%
Marsabit	341,147	4	14	3	36	673	197.3	76	11%	90%	74%	3%	2%	6%	91%	12%	93%	96%	52%	30%	15%	13%	76%	3	67%	67%	33%	0%	0%
Meru	1,589,123	8	73	5	122	4252	267.6	316	7%	84%	70%	5%	6%	4%	95%	19%	91%	98%	53%	36%	43%	12%	62%	8	75%	75%	13%	13%	13%
Migori	1,083,068	8	72	4	111	1515	139.9	117	8%	88%	72%	9%	3%	0%	100%	48%	100%	100%	42%	32%	45%	26%	91%	7	100%	71%	0%	0%	0%
Mombasa	1,180,755	8	51	7	92	3854	326.4	232	6%	83%	78%	4%	5%	7%	97%	29%	97%	99%	40%	13%	58%	6%	83%	17	47%	18%	18%	6%	29%
Murang'a	1,070,208	7	69	7	89	2062	192.7	171	8%	86%	77%	7%	4%	2%	98%	20%	97%	99%	47%	25%	75%	14%	90%	11	73%	45%	45%	9%	0%
Nairobi	4,229,440	22	232	15	209	12861	304.1	953	7%	73%	65%	4%	4%	19%	93%	33%	90%	96%	30%	15%	49%	10%	68%	76	71%	41%	14%	4%	9%
Nakuru	2,127,647	11	80	5	145	3478	163.5	261	8%	83%	64%	6%	5%	5%	99%	30%	90%	99%	39%	26%	62%	15%	74%	18	61%	11%	22%	6%	11%
Nandi	999,201	6	37	2	54	769	77	64	8%	88%	79%	7%	4%	1%	96%	28%	91%	100%	47%	32%	38%	25%	75%	12	100%	0%	0%	0%	0%
Narok	1,129,189	6	45	2	70	1439	127.4	180	13%	82%	62%	4%	8%	6%	98%	21%	95%	99%	47%	29%	45%	9%	77%	12	92%	58%	8%	0%	0%
Nyamira	706,464	5	63	3	77	767	108.6	54	7%	90%	88%	7%	2%	1%	99%	32%	99%	100%	39%	41%	46%	23%	83%	5	100%	80%	0%	0%	0%
Nyandarua	677,004	5	43	2	53	808	119.3	95	12%	85%	81%	9%	4%	1%	99%	32%	91%	98%	37%	38%	39%	17%	68%	3	80%	0%	0%	0%	20%
Nyeri	787,467	5	57	2	72	1318	167.4	144	11%	84%	73%	7%	4%	5%	97%	29%	91%	97%	40%	19%	68%	11%	69%	5	100%	60%	0%	0%	0%
Pokot	680,351	4	28	3	46	1596	234.6	268	17%	79%	46%	4%	14%	3%	97%	10%	96%	99%	54%	18%	27%	8%	57%	10	70%	40%	20%	20%	10%
Samburu	297,183	3	5	1	34	585	196.8	88	15%	90%	73%	5%	5%	0%	78%	25%	89%	95%	61%	61%	106%	2%	74%						
Siaya	994,660	7	79	5	133	1811	182.1	154	9%	77%	70%	10%	6%	6%	99%	57%	96%	100%	46%	32%	46%	24%	63%	9	67%	67%	22%	11%	11%
Taita Taveta	357,804	3	48	2	52	516	144.2	43	8%	81%	60%	9%	4%	5%	94%	25%	89%	96%	45%	36%	31%	8%	76%	7	86%	14%	14%	0%	0%
Tana River	301,766	3	25	1	28	415	137.5	65	16%	86%	71%	6%	3%	5%	97%	8%	97%	100%	45%	18%	42%	31%	91%						
Tharaka Nithi	428,042	3	25	1	39	1248	291.6	179	14%	90%	81%	4%	4%	3%	94%	21%	97%	98%	35%	13%	54%	11%	40%	3	100%	33%	0%	0%	0%
Trans Nzoia	1,086,508	5	35	1	51	1301	119.7	117	9%	84%	63%	8%	6%	3%	97%	31%	97%	99%	35%	36%	36%	19%	54%	2	100%	0%	0%	0%	0%
Turkana	1,135,133	6	27	2	49	2272	200.2	433	19%	82%	45%	2%	11%	5%	95%	22%	95%	97%	59%	45%	68%	7%	46%	6	50%	17%	17%	17%	17%
Uasin Gishu	1,186,595	7	51	2	56	1600	134.8	136	9%	83%	59%	4%	5%	8%	96%	34%	97%	100%	39%	24%	46%	12%	87%	5	80%	60%	20%	0%	0%
Vihiga	675,753	4	34	2	44	882	130.5	65	7%	83%	77%	11%	3%	2%	98%	33%	99%	100%	49%	42%	25%	22%	82%	4	50%	50%	50%	0%	0%
Wajir	1,299,722	4	22	1	27	577	44.4	66	11%	92%	86%	4%	1%	3%	97%	1%	100%	100%	55%	50%	31%	15%	71%						
Kenya	49,521,246	69	537	32	3618	85188	172	7714	9%	81%	69%	6%	5%	5%	96%	28%	95%	99%	43%	27%	49%	13%		577					

Annex 2: TB Country Profile

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	44365	43288	38581
Clinically Diagnosed	22182	15007	22495
Previously Treated	5152	4262	6071
EPTB	13489	13152	14418
TB among children all forms (Under 15)	7714	6369	6960

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	167	123	138
Rifampicin Resistance (Including MDR)	395	308	276
Pre XDR	5	3	0
PD Resistance	8	9	24
XD Resistance	2	1	1
Total	**577**	**431**	**439**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	5535	3484	1702
Treatment outcomes			
C		2088	1412
NC (Not Complete)		1269	224
DC (Discontinued)		23	14
TO (Transfer out)		31	18
DF (Done failed)		70	29
D (Death)		3	5

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	65%	81%	1%	5%	6%	6%
Clinically Diagnosed	-	81%	0%	4%	7%	0%
Previously Treated	-	78%	0%	8%	6%	48%
EPTB	-	78%	0%	3%	9%	0%

Case Notification Rates per County in 2017

CNR2017
030 - 100
101 - 175
176 - 250
251 - 380
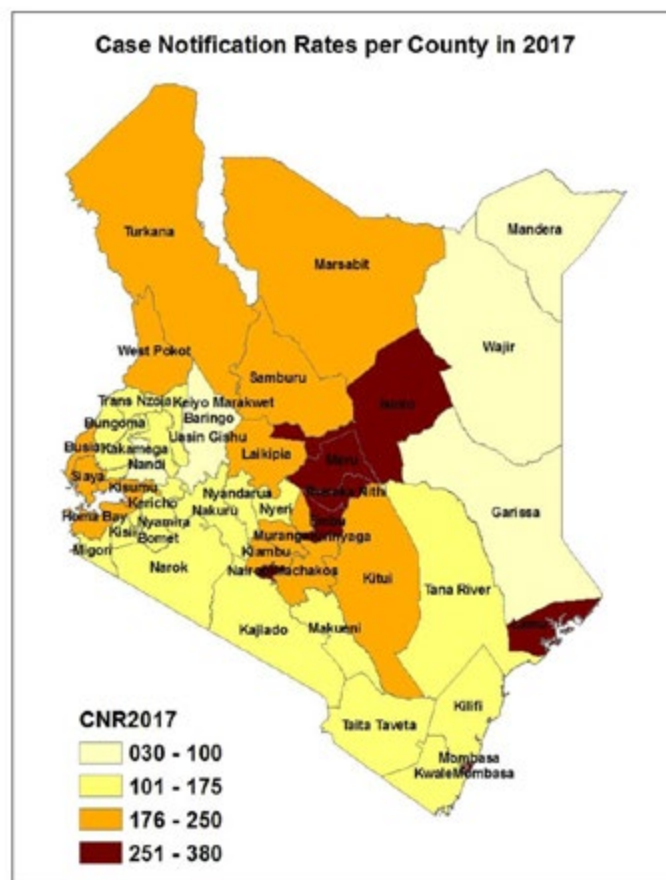
DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	73%	80%
Failure	0%	0%
LTFU Rate	6%	5%
Death Rate	16%	15%
TO Rate	3%	2%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	81581	73215	61454
TB / HIV Con infection rate	28%	30%	32%
No on CPT	23145	22627	20363
No on ART	22095	21926	19654

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Annex 3: TB County specific Profiles: Baringo County
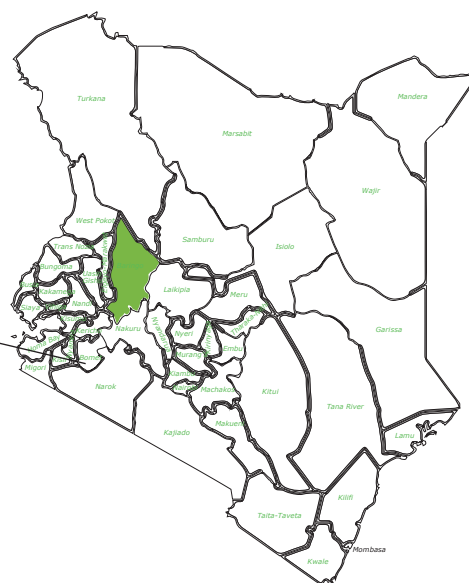
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	416	418	296
Clinically Diagnosed	74	79	141
Previously Treated	55	44	55
EPTB	108	107	128
TB among children all forms (Under 15)	53	51	58

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	2	1
Rifampicin Resistance (Including MDR)	10	6	3
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**11**	**8**	**4**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	24	4	2
Treatment outcomes			
C		3	2
NC (Not Complete)		1	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	57%	76%	1%	11%	3%	1%
Clinically Diagnosed	-	82%	0%	9%	6%	0%
Previously Treated	-	59%	0%	23%	9%	0%
EPTB	-	79%	0%	3%	7%	0%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	25 %	100 %
Failure	0 %	0 %
LTFU Rate	0 %	0 %
Death Rate	25 %	0 %
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	575	553	390
TB / HIV Con infection rate	17%	20%	29%
No on CPT	114	127	122
No on ART	114	121	116

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Bomet County

Bomet
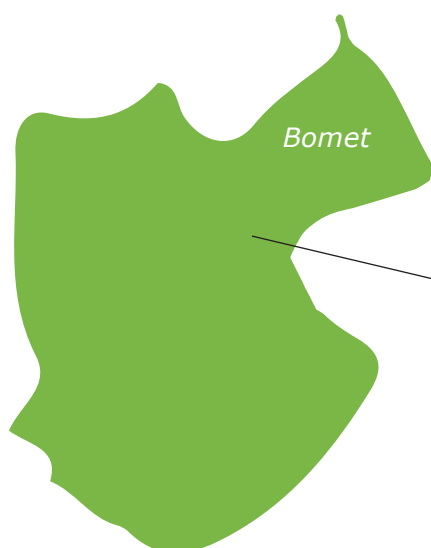
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	895	671	625
Clinically Diagnosed	369	352	465
Previously Treated	92	37	44
EPTB	206	261	326
TB among children all forms (Under 15)	134	111	134

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	3	0	0
Rifampicin Resistance (Including MDR)	4	2	5
Pre XDR	0	0	0
PD Resistance	1	0	1
XD Resistance	0	0	0
Total	**7**	**2**	**5**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	63%	88%	0%	5%	2%	2%
Clinically Diagnosed	-	88%	0%	3%	6%	1%
Previously Treated	-	73%	0%	14%	3%	3%
EPTB	-	87%	0%	3%	8%	1%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	50%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	33%	0%
TO Rate	17%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	180	42	7
Treatment outcomes			
C		23	7
NC (Not Complete)		19	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1489	1249	1181
TB / HIV Con infection rate	18%	23%	23%
No on CPT	285	300	282
No on ART	278	288	265

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Bungoma County
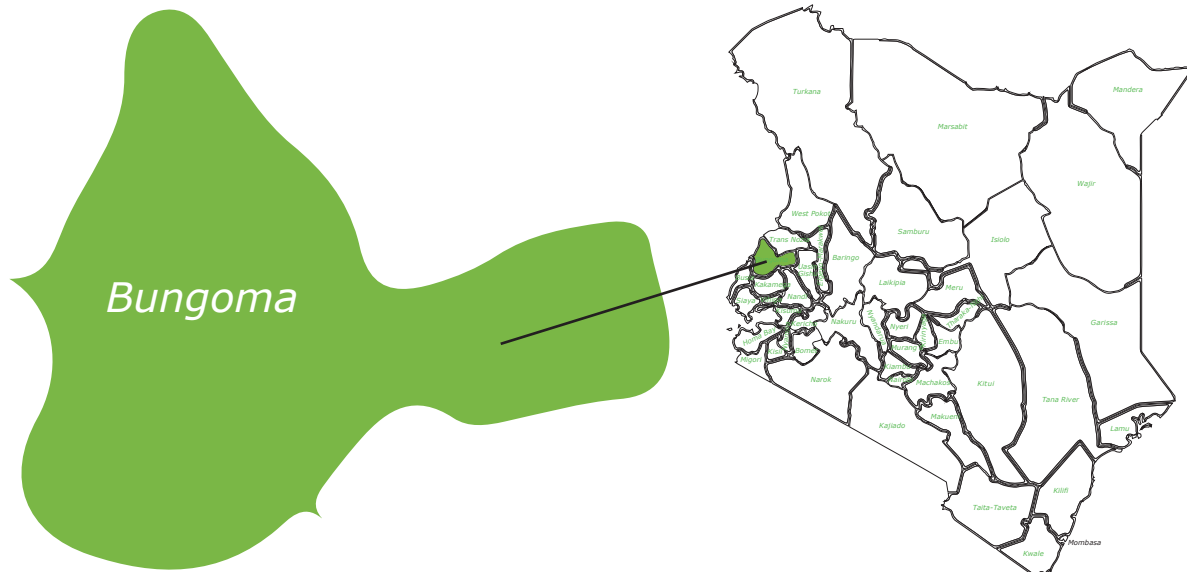
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	912	1023	646
Clinically Diagnosed	697	375	422
Previously Treated	153	141	114
EPTB	340	316	331
TB among children all forms (Under 15)	248	185	172

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	6	2
Rifampicin Resistance (Including MDR)	8	4	3
Pre XDR	1	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**10**	**10**	**5**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	83%	1%	3%	5%	2%
Clinically Diagnosed	-	83%	0%	3%	10%	1%
Previously Treated	-	76%	0%	6%	8%	1%
EPTB	-	81%	0%	1%	9%	1%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	60%	50%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	25%
TO Rate	0%	20%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	161	114	34
Treatment outcomes			
C		67	31
NC (Not Complete)		35	1
DC (Discontinued)		0	0
TO (Transfer out)		3	0
DF (Done failed)		9	2
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1994	1806	1020
TB / HIV Con infection rate	27%	29%	30%
No on CPT	558	537	308
No on ART	541	519	298

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Busia County
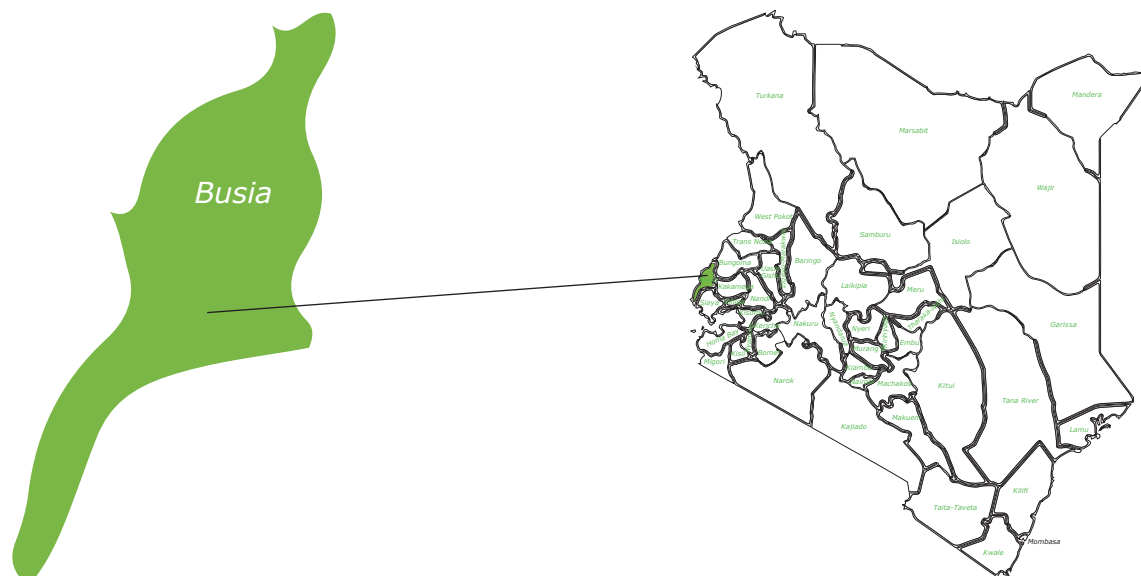
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	661	585	430
Clinically Diagnosed	399	144	424
Previously Treated	80	68	120
EPTB	161	144	213
TB among children all forms (Under 15)	130	91	112

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	6	1
Rifampicin Resistance (Including MDR)	5	3	3
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**7**	**9**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	83%	1%	3%	5%	2%
Clinically Diagnosed	-	83%	-	3%	10%	1%
Previously Treated	-	76%	-	6%	8%	1%
EPTB	-	81%	-	1%	9%	1%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	100%	67%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	143	120	64
Treatment outcomes			
C		88	63
NC (Not Complete)		30	1
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		2	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1268	910	946
TB / HIV Con infection rate	42%	44%	44%
No on CPT	541	406	420
No on ART	539	405	418

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Elgeyo Marakwet County
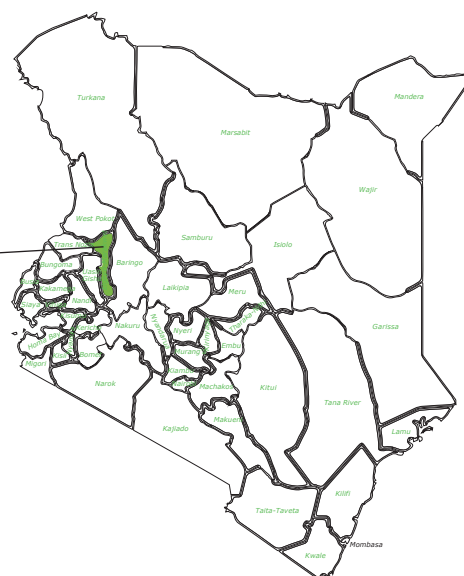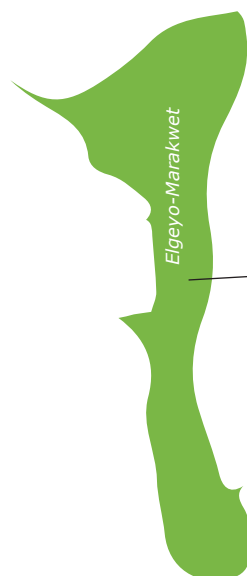
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	358	259	213
Clinically Diagnosed	117	117	106
Previously Treated	30	24	22
EPTB	116	110	85
TB among children all forms (Under 15)	49	59	54

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	1	1
Rifampicin Resistance (Including MDR)	2	1	2
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**3**	**2**	**3**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	43%	84%	0%	7%	4%	2%
Clinically Diagnosed	-	90%	0%	4%	5%	2%
Previously Treated	-	78%	0%	13%	9%	0%
EPTB	-	88%	0%	5%	6%	0%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	100%	67%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	33%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	43	47	30
Treatment outcomes			
C		38	28
NC (Not Complete)		2	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		7	2
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	603	503	402
TB / HIV Con infection rate	20%	20%	23%
No on CPT	124	103	97%
No on ART	123	104	95%

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Embu County
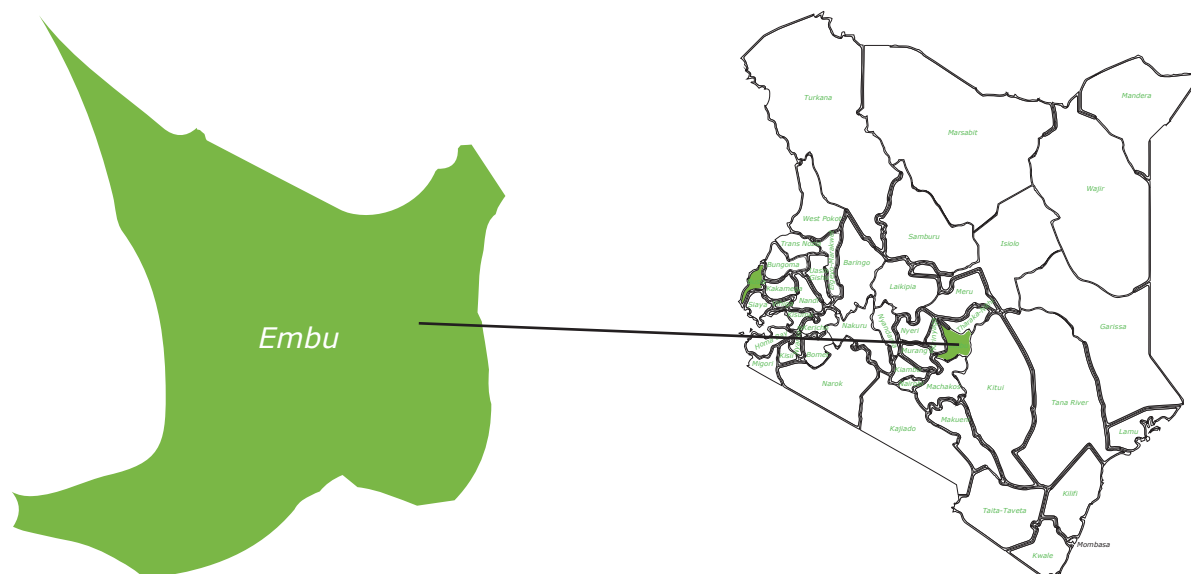
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	780	777	756
Clinically Diagnosed	488	284	471
Previously Treated	106	57	81
EPTB	231	183	177
TB among children all forms (Under 15)	202	130	192

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	8	3	3
Rifampicin Resistance (Including MDR)	6	7	5
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**14**	**10**	**8**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	68%	80%	1%	5%	3%	2%
Clinically Diagnosed	-	75%	-	6%	9%	2%
Previously Treated	-	70%	-	7%	4%	2%
EPTB	-	78%	-	3%	6%	4%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	88%	100%
Failure	0%	0%
LTFU Rate	13%	0%
Death Rate	0%	0%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	30	18	15
Treatment outcomes			
C		7	11
NC (Not Complete)		11	4
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1390	1243	1211
TB / HIV Con infection rate	15%	19%	19%
No on CPT	236	244	228
No on ART	223	243	218

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Garissa County
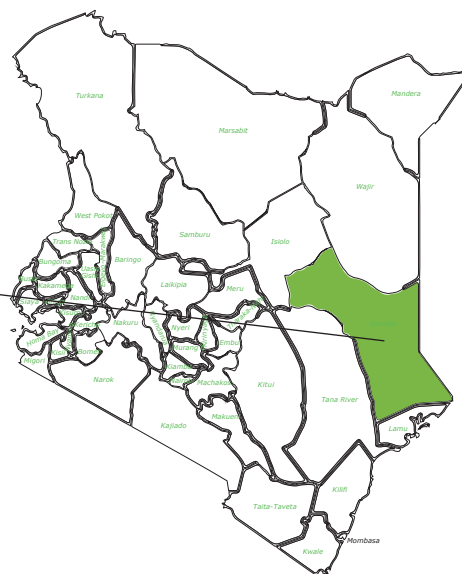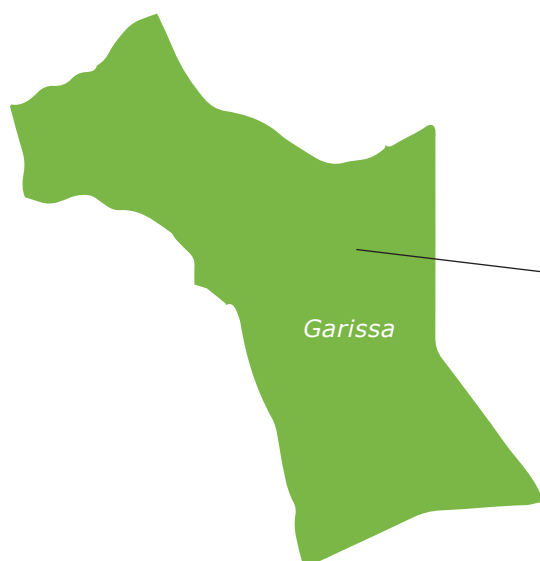
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	385	455	392
Clinically Diagnosed	261	166	210
Previously Treated	39	40	28
EPTB	231	203	210
TB among children all forms (Under 15)	128	109	136

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	3	29
Rifampicin Resistance (Including MDR)	4	2	40
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**5**	**5**	**69**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	76%	87%	0%	5%	4%	4%
Clinically Diagnosed	-	96%	-	0%	1%	3%
Previously Treated	-	78%	0%	10%	5%	5%
EPTB	-	91%	0%	1%	2%	5%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	84%	97%
Failure	0%	0%
LTFU Rate	7%	2%
Death Rate	1%	11%
TO Rate	4%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	28	14	4
Treatment outcomes			
C		11	4
NC (Not Complete)		3	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	882	846	587
TB / HIV Con infection rate	3%	4%	6%
No on CPT	28	32	37
No on ART	23	31	26

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Homa Bay County
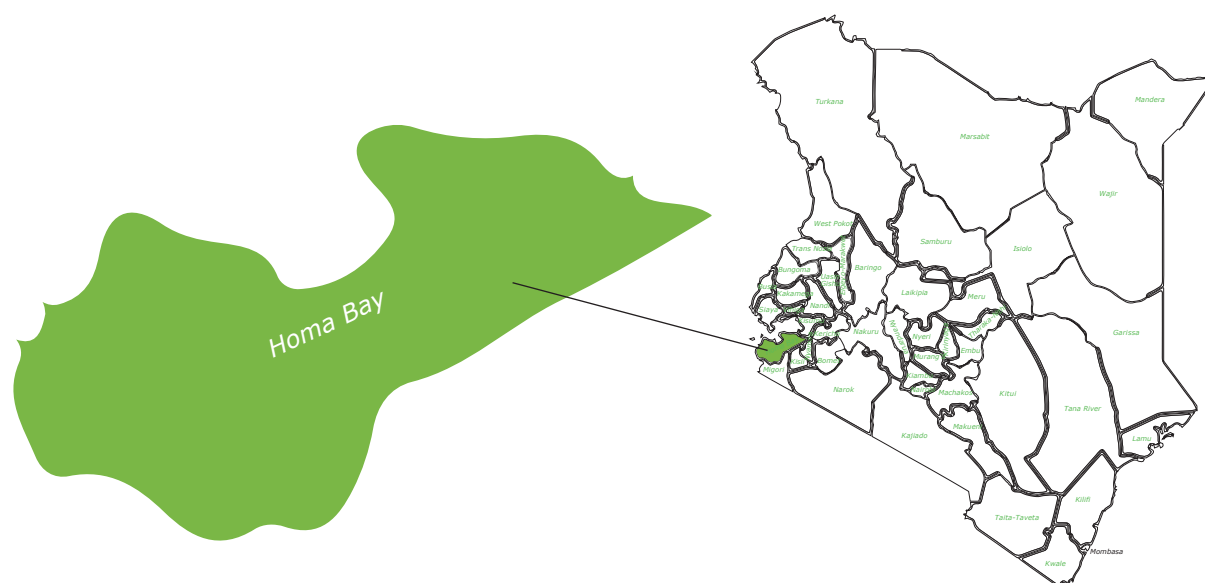
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	907	1006	944
Clinically Diagnosed	677	465	616
Previously Treated	133	90	126
EPTB	417	407	462
TB among children all forms (Under 15)	197	174	169

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	6	6
Rifampicin Resistance (Including MDR)	8	5	9
Pre XDR	0	0	0
PD Resistance	1	0	0
XD Resistance	0	0	0
Total	**9**	**11**	**15**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	64%	85%	0%	4%	7%	3%
Clinically Diagnosed	-	80%	0%	2%	14%	3%
Previously Treated	-	81%	0%	6%	10%	2%
EPTB	-	75%	0%	3%	19%	3%

DR Outcomes

Treatment Sucess Rate	2015	2014
Treatment Sucess Rate	67%	78%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	33%	22%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	199	86	48
Treatment outcomes			
C		48	45
NC (Not Complete)		36	3
DC (Discontinued)		2	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2129	1962	1716
TB / HIV Con infection rate	61%	64%	69%
No on CPT	1295	1252	1186
No on ART	1273	1232	1176

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Isiolo County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	301	285	217
Clinically Diagnosed	163	90	119
Previously Treated	16	24	25
EPTB	147	126	183
TB among children all forms (Under 15)	73	64	83

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	4	4	1
Rifampicin Resistance (Including MDR)	1	1	3
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**5**	**5**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	56%	83%	0%	4%	4%	2%
Clinically Diagnosed	-	76%	0%	9%	2%	1%
Previously Treated	-	83%	0%	13%	0%	4%
EPTB	-	83%	0%	6%	6%	3%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	17	34	0
Treatment outcomes			
C		0	0
NC (Not Complete)		34	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	550	502	399
TB / HIV Con infection rate	15%	21%	27%
No on CPT	91	111	116
No on ART	91	112	114

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kajiado County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	844	795	755
Clinically Diagnosed	458	407	490
Previously Treated	87	90	10
EPTB	174	199	258
TB among children all forms (Under 15)	160	132	171

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	2	2
Rifampicin Resistance (Including MDR)	10	6	2
Pre XDR	1	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**12**	**8**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	87%	1%	6%	2%	3%
Clinically Diagnosed	-	85%	0%	3%	4%	3%
Previously Treated	-	83%	0%	6%	3%	3%
EPTB	-	84%	0%	3%	5%	5%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	0%	50%
Failure	0%	0%
LTFU Rate	50%	17%
Death Rate	0%	17%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	75	24	11
Treatment outcomes			
C		9	3
NC (Not Complete)		15	8
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1522	1434	1126
TB / HIV Con infection rate	27%	30%	30%
No on CPT	412	439	343
No on ART	397	421	330

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kakamega County
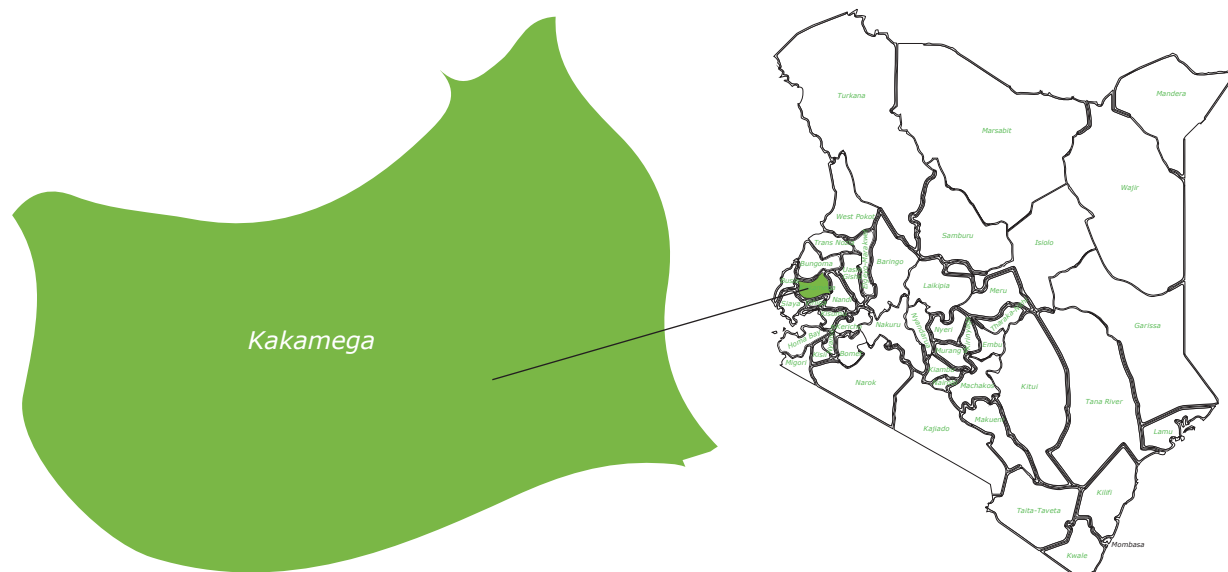
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1074	1066	902
Clinically Diagnosed	899	412	766
Previously Treated	141	66	151
EPTB	323	257	378
TB among children all forms (Under 15)	238	148	210

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	2	1
Rifampicin Resistance (Including MDR)	9	13	3
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**10**	**15**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	70%	83%	1%	5%	6%	0%
Clinically Diagnosed	-	77%	0%	4%	10%	1%
Previously Treated	-	79%	0%	2%	14%	0%
EPTB	-	78%	0%	3%	16%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	50%	50%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	25%	50%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	69	53	20
Treatment outcomes			
C		25	15
NC (Not Complete)		28	3
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	1
D (Death)		0	1

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2420	1770	1296
TB / HIV Con infection rate	33%	37%	35%
No on CPT	812	657	464
No on ART	809	647	447

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kericho County

Kericho

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1123	943	929
Clinically Diagnosed	366	289	431
Previously Treated	61	60	72
EPTB	173	136	259
TB among children all forms (Under 15)	111	126	149

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	3	0	2
Rifampicin Resistance (Including MDR)	3	2	2
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**6**	**2**	**5**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	86%	0%	5%	2%	3%
Clinically Diagnosed	-	94%	0%	3%	2%	0%
Previously Treated	-	83%	0%	7%	8%	2%
EPTB	-	87%	0%	3%	4%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	40%	80%
Failure	0%	0%
LTFU Rate	20%	0%
Death Rate	40%	20%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	167	78	33
Treatment outcomes			
C		41	28
NC (Not Complete)		36	3
DC (Discontinued)		1	0
TO (Transfer out)		0	2
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1623	1385	1359
TB / HIV Con infection rate	24%	24%	29%
No on CPT	416	348	402
No on ART	365	331	385

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kiambu County

Kiambu
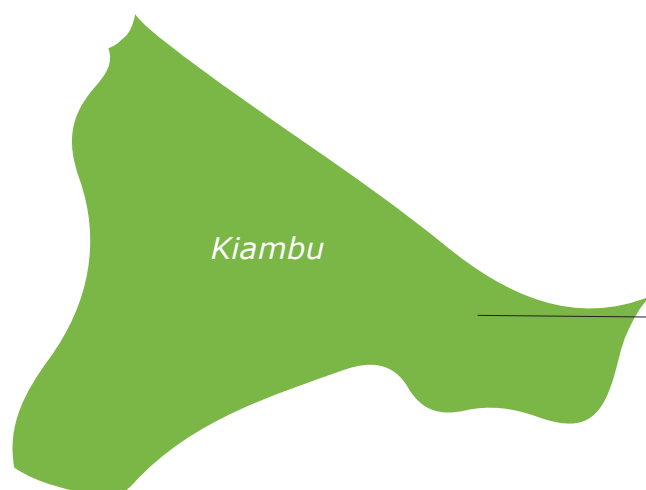
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	2293	2576	1677
Clinically Diagnosed	1027	654	1107
Previously Treated	240	211	341
EPTB	715	606	575
TB among children all forms (Under 15)	325	271	215

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	8	6	2
Rifampicin Resistance (Including MDR)	11	9	9
Pre XDR	0	1	0
PD Resistance	1	0	0
XD Resistance	0	1	0
Total	**20**	**15**	**11**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	48%	65%	1%	4%	3%	27%
Clinically Diagnosed	-	77%	0%	4%	6%	12%
Previously Treated	-	77%	0%	9%	9%	4%
EPTB	-	68%	0%	4%	10%	17%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	91%	63%
Failure	0%	0%
LTFU Rate	9%	13%
Death Rate	0%	25%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	258	85	66
Treatment outcomes			
C		65	53
NC (Not Complete)		14	5
DC (Discontinued)		0	2
TO (Transfer out)		1	2
DF (Done failed)		5	4
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	4198	3720	2758
TB / HIV Con infection rate	27%	26%	29%
No on CPT	1143	928	820
No on ART	1014	854	783

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kilifi County

Kilifi
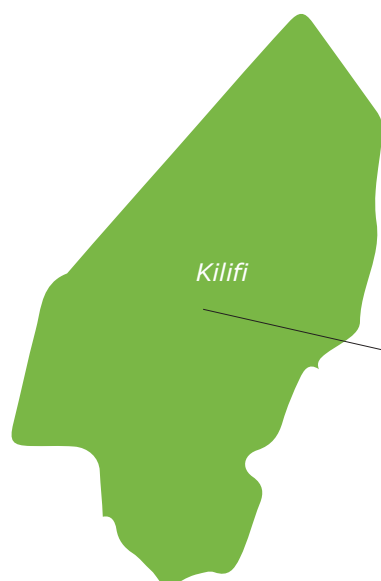
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	922	980	914
Clinically Diagnosed	647	360	582
Previously Treated	140	125	169
EPTB	212	236	228
TB among children all forms (Under 15)	218	186	183

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	6	2	6
Rifampicin Resistance (Including MDR)	8	10	7
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**14**	**12**	**13**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	60%	81%	1%	7%	7%	4%
Clinically Diagnosed	-	84%	0%	4%	9%	4%
Previously Treated	-	78%	0%	10%	9%	2%
EPTB	-	80%	0%	6%	11%	3%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	90%	80%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	20%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	168	79	65
Treatment outcomes			
C		68	65
NC (Not Complete)		8	0
DC (Discontinued)		0	0
TO (Transfer out)		1	0
DF (Done failed)		1	0
D (Death)		1	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1897	1691	1349
TB / HIV Con infection rate	25%	30%	30%
No on CPT	480	517	408
No on ART	462	507	405

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kirinyaga County
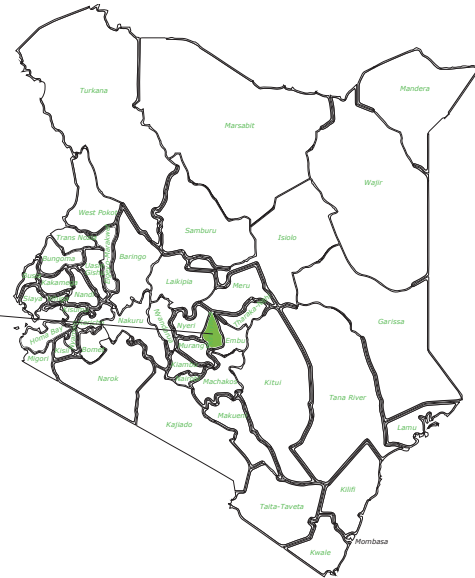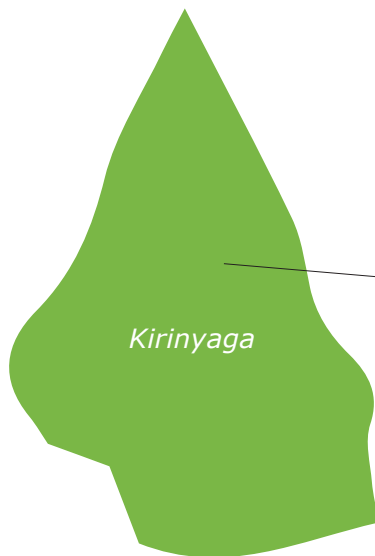
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	635	715	767
Clinically Diagnosed	421	220	246
Previously Treated	128	96	152
EPTB	170	125	176
TB among children all forms (Under 15)	175	82	102

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	6	2	4
Rifampicin Resistance (Including MDR)	6	8	6
Pre XDR	0	0	0
PD Resistance	2	0	1
XD Resistance	0	0	0
Total	**14**	**10**	**11**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	88%	0%	6%	3%	3%
Clinically Diagnosed	-	83%	0%	5%	10%	2%
Previously Treated	-	76%	0%	13%	4%	3%
EPTB	-	82%	0%	4%	7%	6%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	90%	89%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	10%	11%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	91	59	39
Treatment outcomes			
C		41	37
NC (Not Complete)		18	0
DC (Discontinued)		0	1
TO (Transfer out)		0	0
DF (Done failed)		0	1
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1329	1155	1103
TB / HIV Con infection rate	16%	19%	19%
No on CPT	220	216	212
No on ART	208	205	208

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Kisii County
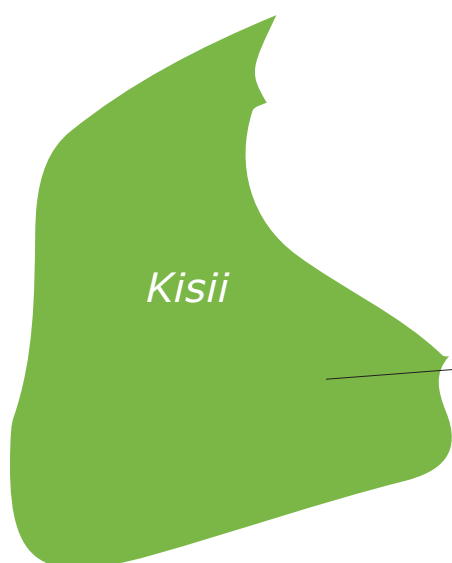
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	948	937	887
Clinically Diagnosed	633	335	520
Previously Treated	60	55	80
EPTB	216	186	174
TB among children all forms (Under 15)	149	128	115

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	3	1	2
Rifampicin Resistance (Including MDR)	6	3	9
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**9**	**4**	**11**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	80%	91%	0%	3%	4%	1%
Clinically Diagnosed	-	92%	0%	2%	6%	0%
Previously Treated	-	87%	0%	4%	5%	0%
EPTB	-	89%	0%	2%	9%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	45%	89%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	45%	11%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	173	153	73
Treatment outcomes			
C		134	72
NC (Not Complete)		19	1
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1835	1512	1338
TB / HIV Con infection rate	35%	35%	36%
No on CPT	651	532	482
No on ART	615	530	478

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kisumu County
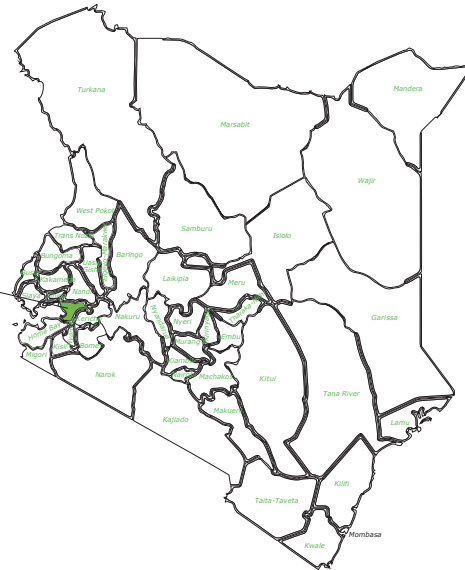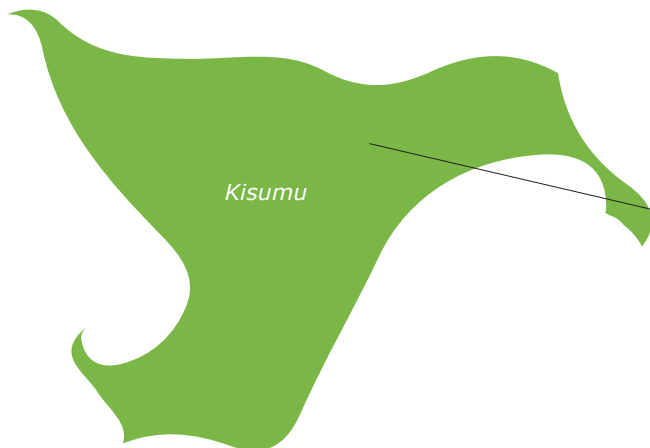
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1363	1544	1463
Clinically Diagnosed	734	541	804
Previously Treated	126	156	240
EPTB	230	342	423
TB among children all forms (Under 15)	152	177	239

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	6	9	4
Rifampicin Resistance (Including MDR)	7	8	11
Pre XDR	0	0	0
PD Resistance	0	1	1
XD Resistance	0	0	0
Total	**13**	**17**	**15**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	65%	84%	0%	4%	6%	5%
Clinically Diagnosed	-	82%	0%	5%	10%	3%
Previously Treated	-	74%	0%	6%	10%	8%
EPTB	-	75%	0%	2%	14%	8%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	38%	42%
Failure	0%	0%
LTFU Rate	6%	8%
Death Rate	44%	42%
TO Rate	6%	8%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	196	165	76
Treatment outcomes			
C		146	42
NC (Not Complete)		1	29
DC (Discontinued)		2	0
TO (Transfer out)		9	1
DF (Done failed)		7	3
D (Death)		0	1

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2316	2528	2292
TB / HIV Con infection rate	52%	59%	61%
No on CPT	1258	1521	1433
No on ART	1197	1414	1369

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kitui County
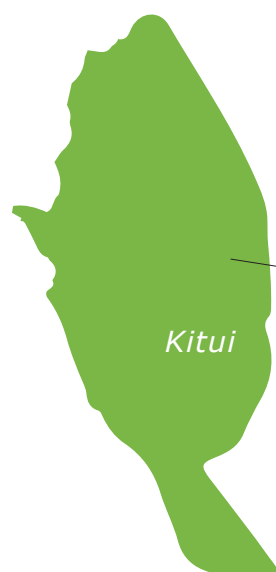
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1412	1238	1087
Clinically Diagnosed	360	174	396
Previously Treated	105	103	145
EPTB	336	270	377
TB among children all forms (Under 15)	125	112	129

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	4	2	3
Rifampicin Resistance (Including MDR)	7	6	8
Pre XDR	0	0	0
PD Resistance	0	1	1
XD Resistance	1	0	0
Total	**12**	**9**	**12**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	176	77	47
Treatment outcomes			
C		63	47
NC (Not Complete)		12	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		2	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	81%	87%	1%	4%	4%	3%
Clinically Diagnosed	-	82%	0%	2%	16%	1%
Previously Treated	-	76%	0%	11%	9%	1%
EPTB	-	81%	0%	2%	14%	3%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	75%	86%
Failure	0%	14%
LTFU Rate	17%	0%
Death Rate	8%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2213	1779	1643
TB / HIV Con infection rate	21%	22%	26%
No on CPT	471	399	419
No on ART	464	397	417

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Kwale County
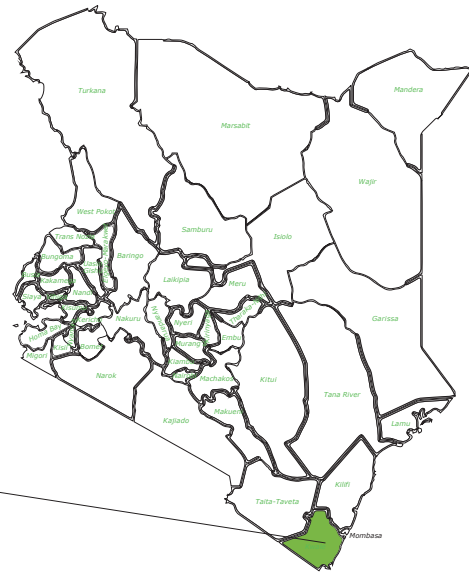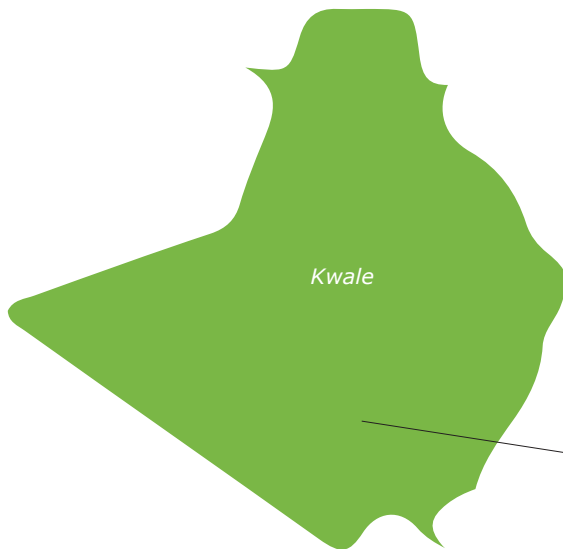
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	395	492	431
Clinically Diagnosed	357	321	460
Previously Treated	34	75	71
EPTB	102	183	192
TB among children all forms (Under 15)	122	126	134

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	1	0
Rifampicin Resistance (Including MDR)	2	4	4
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**2**	**5**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	59%	77%	0%	4%	5%	6%
Clinically Diagnosed	-	81%	0%	3%	9%	4%
Previously Treated	-	75%	0%	7%	11%	4%
EPTB	-	77%	0%	3%	13%	4%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	25%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	50%	0%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	36	59	11
Treatment outcomes			
C		20	11
NC (Not Complete)		37	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		1	0
D (Death)		1	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	831	1025	802
TB / HIV Con infection rate	22%	24%	29%
No on CPT	192	251	237
No on ART	180	228	222

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Laikipia County
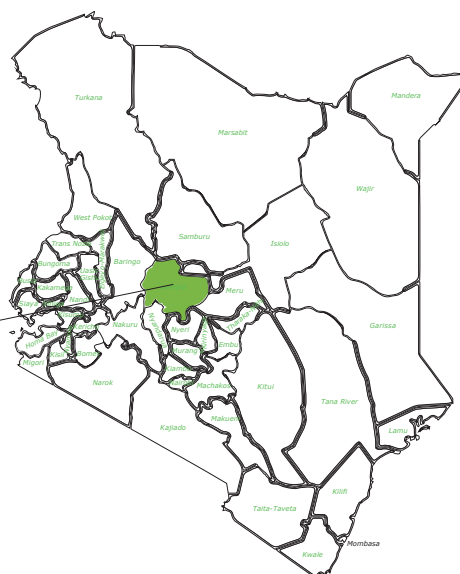
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	541	420	390
Clinically Diagnosed	296	151	172
Previously Treated	66	70	65
EPTB	108	101	103
TB among children all forms (Under 15)	94	69	51

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	3	3	0
Rifampicin Resistance (Including MDR)	6	5	4
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**9**	**8**	**4**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	79%	85%	2%	5%	6%	0%
Clinically Diagnosed	-	89%	0%	2%	9%	0%
Previously Treated	-	87%	0%	7%	4%	0%
EPTB	-	89%	0%	2%	9%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	60%	-
Failure	0%	-
LTFU Rate	0%	-
Death Rate	0%	-
TO Rate	0%	-

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	72	48	14
Treatment outcomes			
C		40	14
NC (Not Complete)		7	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		1	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	991	735	623
TB / HIV Con infection rate	23%	30%	29%
No on CPT	222	222	180
No on ART	205	220	175

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Lamu County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	138	144	121
Clinically Diagnosed	138	86	52
Previously Treated	10	12	10
EPTB	40	41	27
TB among children all forms (Under 15)	48	55	16

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	0	0
Rifampicin Resistance (Including MDR)	1	0	1
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**1**	**0**	**1**

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	65%	84%	0%	1%	4%	3%
Clinically Diagnosed	-	92%	0%	1%	2%	5%
Previously Treated	-	67%	0%	8%	17%	0%
EPTB	-	85%	0%	2%	7%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	68	12	5
Treatment outcomes			
C		6	5
NC (Not Complete)		6	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	314	280	156
TB / HIV Con infection rate	13%	16%	26%
No on CPT	41	44	41
No on ART	40	44	40

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Machakos County

Machakos
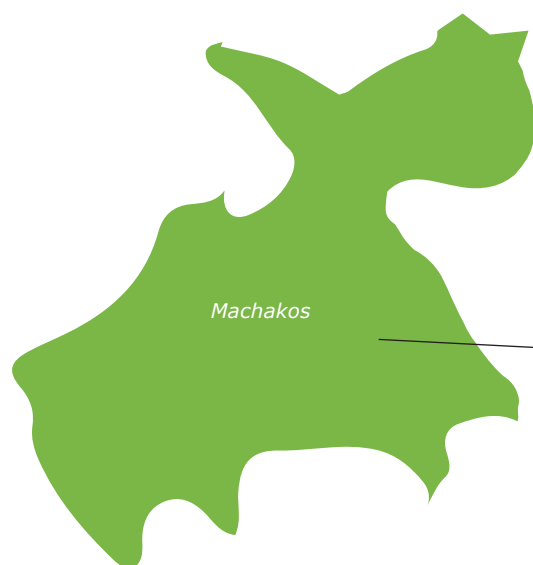
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1583	1452	1214
Clinically Diagnosed	411	172	418
Previously Treated	166	103	145
EPTB	479	401	446
TB among children all forms (Under 15)	130	127	126

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	9	2	2
Rifampicin Resistance (Including MDR)	11	13	5
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**20**	**15**	**7**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	168	94	37
Treatment outcomes			
C		52	24
NC (Not Complete)		41	13
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		1	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	76%	86%	1%	5%	5%	0%
Clinically Diagnosed	-	88%	-	3%	7%	0%
Previously Treated	-	79%	0%	9%	4%	0%
EPTB	-	85%	0%	1%	11%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	60%	60%
Failure	0%	0%
LTFU Rate	10%	20%
Death Rate	30%	20%
TO Rate	30%	20%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2587	2105	1766
TB / HIV Con infection rate	24%	24%	28%
No on CPT	639	499	492
No on ART	618	488	479

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Makueni County
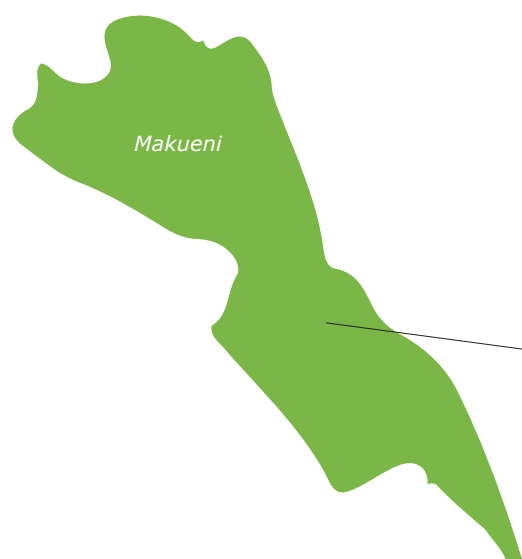
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1128	938	868
Clinically Diagnosed	250	166	384
Previously Treated	110	82	129
EPTB	244	272	248
TB among children all forms (Under 15)	90	76	88

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	7	0	2
Rifampicin Resistance (Including MDR)	9	7	4
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**16**	**7**	**6**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	171	41	56
Treatment outcomes			
C		28	35
NC (Not Complete)		11	18
DC (Discontinued)		1	0
TO (Transfer out)		0	2
DF (Done failed)		1	1
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	82%	88%	1%	4%	4%	2%
Clinically Diagnosed	-	84%	0%	1%	14%	1%
Previously Treated	-	83%	0%	4%	8%	0%
EPTB	-	81%	0%	2%	14%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	57%	-
Failure	0%	-
LTFU Rate	0%	-
Death Rate	43%	-
TO Rate	0%	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1699	1439	1099
TB / HIV Con infection rate	26$	28%	28%
No on CPT	448	406	313
No on ART	435	398	308

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Mandera County
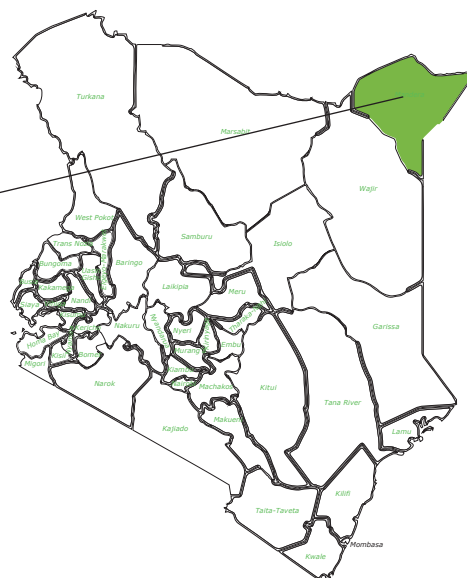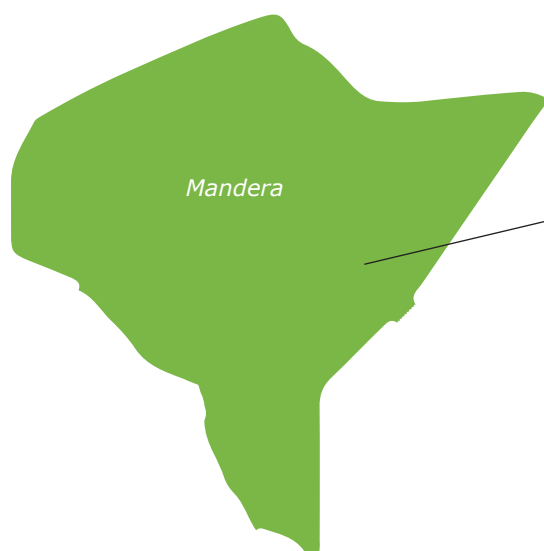
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	256	262	246
Clinically Diagnosed	198	124	196
Previously Treated	21	13	34
EPTB	128	145	130
TB among children all forms (Under 15)	86	85	77

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	0	0
Rifampicin Resistance (Including MDR)	0	0	0
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**2**	**0**	**0**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	25	2	0
Treatment outcomes			
C		2	0
NC (Not Complete)		0	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	79%	92%	0%	1%	2%	4%
Clinically Diagnosed	-	98%	0%	1%	2%	0%
Previously Treated	-	92%	0%	8%	0%	0%
EPTB	-	97%	0%	1%	1%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	-	-
Failure	-	-
LTFU Rate	-	-
Death Rate	-	-
TO Rate	-	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	589	530	448
TB / HIV Con infection rate	3%	2%	1%
No on CPT	13	9	6
No on ART	15	7	6

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Marsabit County
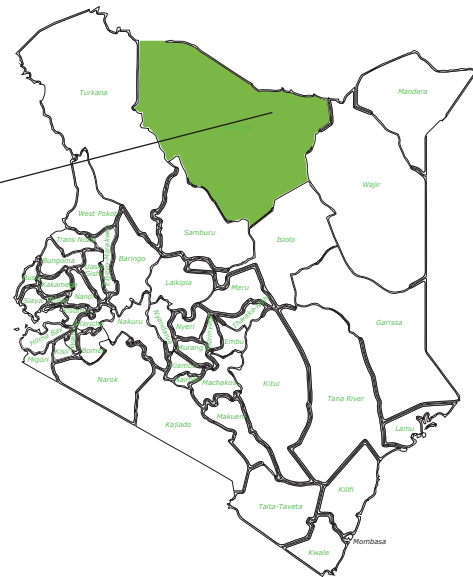
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	407	331	310
Clinically Diagnosed	167	163	234
Previously Treated	29	14	23
EPTB	72	56	78
TB among children all forms (Under 15)	76	55	63

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	1	1
Rifampicin Resistance (Including MDR)	1	3	2
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**1**	**4**	**3**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	33	7	9
Treatment outcomes			
C		7	7
NC (Not Complete)		0	2
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	71%	91%	0%	1%	2%	4%
Clinically Diagnosed	-	88%	0%	3%	1%	5%
Previously Treated	-	86%	0%	0%	14%	0%
EPTB	-	86%	0%	5%	7%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	67%	-
Failure	0%	-
LTFU Rate	0%	-
Death Rate	33%	-
TO Rate	0%	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	609	491	280
TB / HIV Con infection rate	11%	10%	8%
No on CPT	71	57	30
No on ART	70	57	28

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Meru County
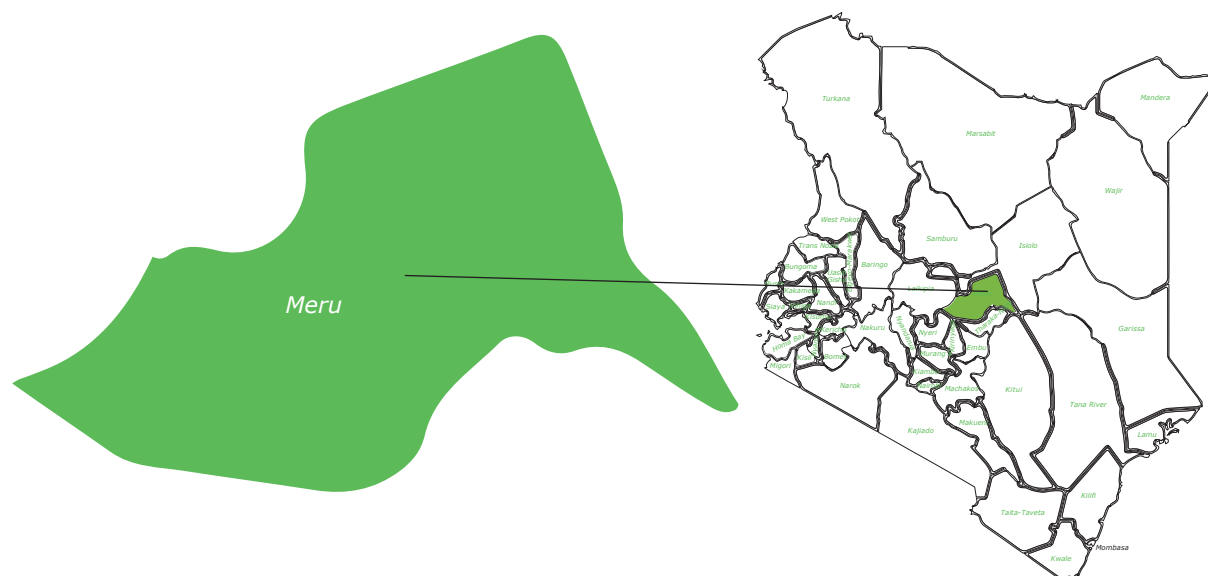
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	2655	2208	2211
Clinically Diagnosed	706	365	430
Previously Treated	389	167	228
EPTB	599	442	544
TB among children all forms (Under 15)	316	289	249

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	16	2	5
Rifampicin Resistance (Including MDR)	12	18	3
Pre XDR	1	1	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**28**	**21**	**8**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	270	168	64
Treatment outcomes			
C		86	63
NC (Not Complete)		76	1
DC (Discontinued)		0	0
TO (Transfer out)		3	0
DF (Done failed)		3	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	69%	84%	1%	7%	4%	3%
Clinically Diagnosed	-	86%	0%	4%	7%	2%
Previously Treated	-	85%	0%	7%	3%	2%
EPTB	-	83%	0%	4%	11%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	75%	100%
Failure	0%	0%
LTFU Rate	13%	0%
Death Rate	13%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	3980	3145	2705
TB / HIV Con infection rate	18%	18%	18%
No on CPT	734	550	482
No on ART	686	529	467

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Migori County
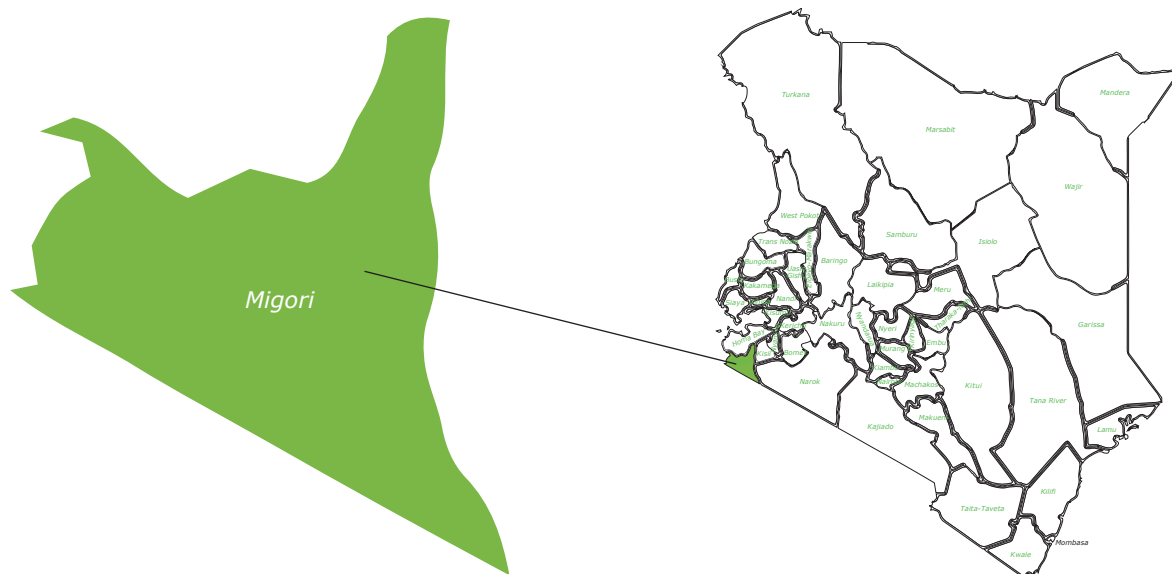
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	790	917	752
Clinically Diagnosed	406	418	784
Previously Treated	55	22	81
EPTB	261	301	308
TB among children all forms (Under 15)	117	129	145

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	2	0
Rifampicin Resistance (Including MDR)	16	8	7
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**17**	**10**	**7**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	189	125	8
Treatment outcomes			
C		104	8
NC (Not Complete)		15	0
DC (Discontinued)		0	0
TO (Transfer out)		2	0
DF (Done failed)		3	0
D (Death)		1	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	64%	90%	0%	2%	7%	0%
Clinically Diagnosed	-	86%	0%	5%	9%	1%
Previously Treated	-	81%	0%	10%	10%	0%
EPTB	-	84%	0%	2%	14%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	86%	50%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	50%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1510	1651	1354
TB / HIV Con infection rate	48%	52%	56%
No on CPT	721	861	756
No on ART	720	845	743

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Mombasa County
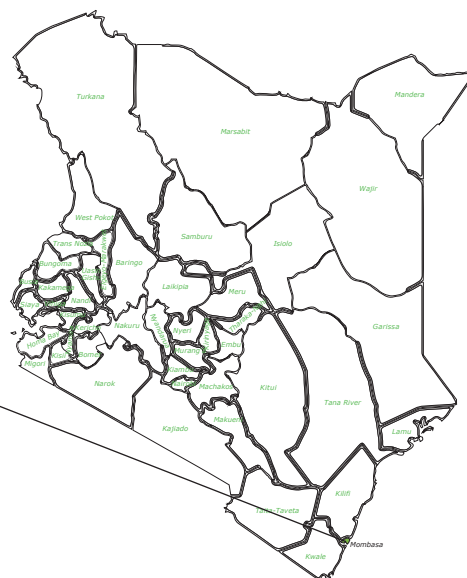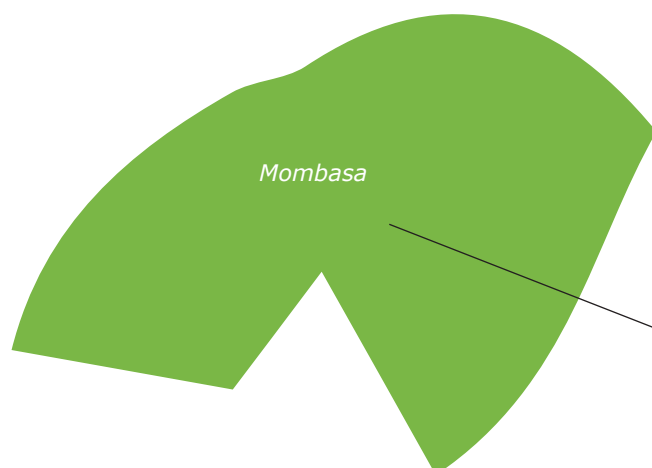
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	2305	2297	2089
Clinically Diagnosed	680	481	914
Previously Treated	336	246	468
EPTB	533	588	752
TB among children all forms (Under 15)	232	228	311

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	4	6	5
Rifampicin Resistance (Including MDR)	22	13	11
Pre XDR	0	0	0
PD Resistance	0	0	1
XD Resistance	0	0	0
Total	**26**	**19**	**17**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	145	119	110
Treatment outcomes			
C		70	73
NC (Not Complete)		46	35
DC (Discontinued)		1	0
TO (Transfer out)		1	1
DF (Done failed)		1	0
D (Death)		0	1

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	73%	84%	0%	5%	2%	6%
Clinically Diagnosed	-	83%	0%	5%	6%	4%
Previously Treated	-	76%	0%	10%	7%	5%
EPTB	-	82%	0%	3%	8%	3%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	35%	93%
Failure	0%	0%
LTFU Rate	6%	0%
Death Rate	6%	7%
TO Rate	18%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	3706	3521	3134
TB / HIV Con infection rate	28%	29%	28%
No on CPT	1069	1043	907
No on ART	1044	1027	892

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Murang'a County
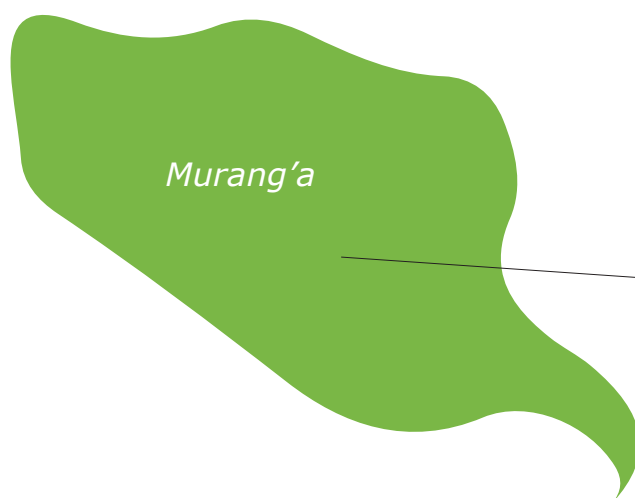
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1165	968	1072
Clinically Diagnosed	524	192	366
Previously Treated	155	105	170
EPTB	218	222	264
TB among children all forms (Under 15)	171	98	89

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	4	4	2
Rifampicin Resistance (Including MDR)	10	14	6
Pre XDR	0	0	0
PD Resistance	0	0	3
XD Resistance	0	0	0
Total	**14**	**18**	**11**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	175	118	125
Treatment outcomes			
C		111	118
NC (Not Complete)		0	0
DC (Discontinued)		1	1
TO (Transfer out)		1	1
DF (Done failed)		5	5
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	75%	86%	1%	5%	5%	1%
Clinically Diagnosed	-	88%	0%	1%	9%	1%
Previously Treated	-	88%	0%	8%	3%	0%
EPTB	-	86%	0%	2%	11%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	64%	80%
Failure	0%	0%
LTFU Rate	9%	20%
Death Rate	9%	0%
TO Rate	9%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2017	1480	1863
TB / HIV Con infection rate	20%	22%	23%
No on CPT	394	331	434
No on ART	387	320	419

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Nairobi County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	5894	5924	5416
Clinically Diagnosed	2916	2658	2939
Previously Treated	831	848	1131
EPTB	3220	3164	2942
TB among children all forms (Under 15)	953	908	806

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	13	13	20
Rifampicin Resistance (Including MDR)	65	37	46
Pre XDR	12	1	0
PD Resistance	1	2	8
XD Resistance	1	1	1
Total	**92**	**54**	**65**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	535	470	228
Treatment outcomes			
C		247	216
NC (Not Complete)		205	0
DC (Discontinued)		1	7
TO (Transfer out)		8	2
DF (Done failed)		9	2
D (Death)		0	1

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	63%	78%	1%	5%	3%	11%
Clinically Diagnosed	-	70%	0%	3%	4%	19%
Previously Treated	-	77%	0%	8%	4%	8%
EPTB	-	64%	0%	3%	5%	23%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	69%	65%
Failure	0%	0%
LTFU Rate	4%	12%
Death Rate	13%	18%
TO Rate	8%	5%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	11906	11697	9415
TB / HIV Con infection rate	30%	32%	35%
No on CPT	3757	3971	3376
No on ART	3461	3789	3190

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Nakuru County
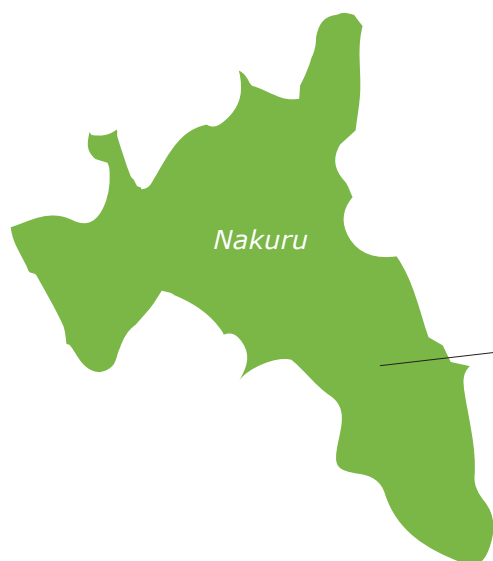
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1742	1636	1621
Clinically Diagnosed	967	750	1145
Previously Treated	218	210	303
EPTB	551	569	571
TB among children all forms (Under 15)	265	190	265

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	11	1	4
Rifampicin Resistance (Including MDR)	28	14	13
Pre XDR	1	0	0
PD Resistance	1	0	1
XD Resistance	0	0	0
Total	**41**	**15**	**18**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	245	84	46
Treatment outcomes			
C		37	44
NC (Not Complete)		41	1
DC (Discontinued)		3	0
TO (Transfer out)		0	0
DF (Done failed)		3	0
D (Death)		0	1

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	61%	85%	0%	4%	5%	4%
Clinically Diagnosed	-	81%	0%	6%	8%	4%
Previously Treated	-	78%	0%	7%	11%	2%
EPTB	-	83%	0%	4%	7%	5%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	61%	100%
Failure	0%	0%
LTFU Rate	6%	0%
Death Rate	17%	0%
TO Rate	11%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	3414	3110	2660
TB / HIV Con infection rate	30%	32%	35%
No on CPT	1028	1018	958
No on ART	1000	1000	897

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Nandi County
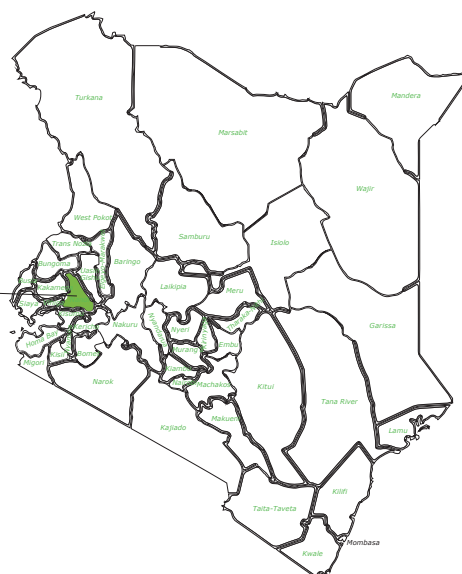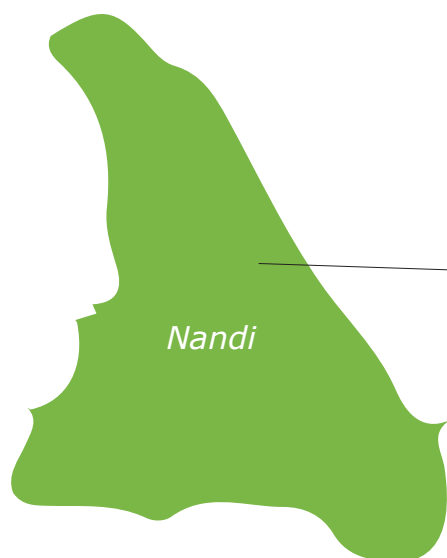
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	441	457	359
Clinically Diagnosed	168	88	162
Previously Treated	50	41	48
EPTB	110	102	144
TB among children all forms (Under 15)	64	54	62

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	3	1
Rifampicin Resistance (Including MDR)	3	1	0
Pre XDR	1	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**4**	**4**	**1**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	97	64	29
Treatment outcomes			
C		41	27
NC (Not Complete)		20	0
DC (Discontinued)		1	1
TO (Transfer out)		0	0
DF (Done failed)		2	1
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	72%	89%	0%	4%	6%	1%
Clinically Diagnosed	-	83%	0%	6%	10%	0%
Previously Treated	-	83%	0%	7%	7%	0%
EPTB	-	89%	0%	2%	7%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	723	676	565
TB / HIV Con infection rate	26%	30%	34%
No on CPT	202	202	195
No on ART	183	198	193

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Narok County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	740	723	739
Clinically Diagnosed	442	341	574
Previously Treated	87	57	75
EPTB	170	213	236
TB among children all forms (Under 15)	180	156	187

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	4	3	8
Rifampicin Resistance (Including MDR)	6	5	1
Pre XDR	0	0	0
PD Resistance	0	1	3
XD Resistance	0	0	0
Total	**10**	**8**	**9**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	57	30	13
Treatment outcomes			
C		14	3
NC (Not Complete)		16	10
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	58%	83%	0%	8%	3%	2%
Clinically Diagnosed	-	81%	0%	8%	6%	1%
Previously Treated	-	70%	0%	14%	11%	0%
EPTB	-	83%	0%	4%	4%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	75%	40%
Failure	0%	0%
LTFU Rate	0%	40%
Death Rate	8%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1404	1300	1247
TB / HIV Con infection rate	21%	24%	27%
No on CPT	293	321	344
No on ART	279	311	326

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Nyamira County
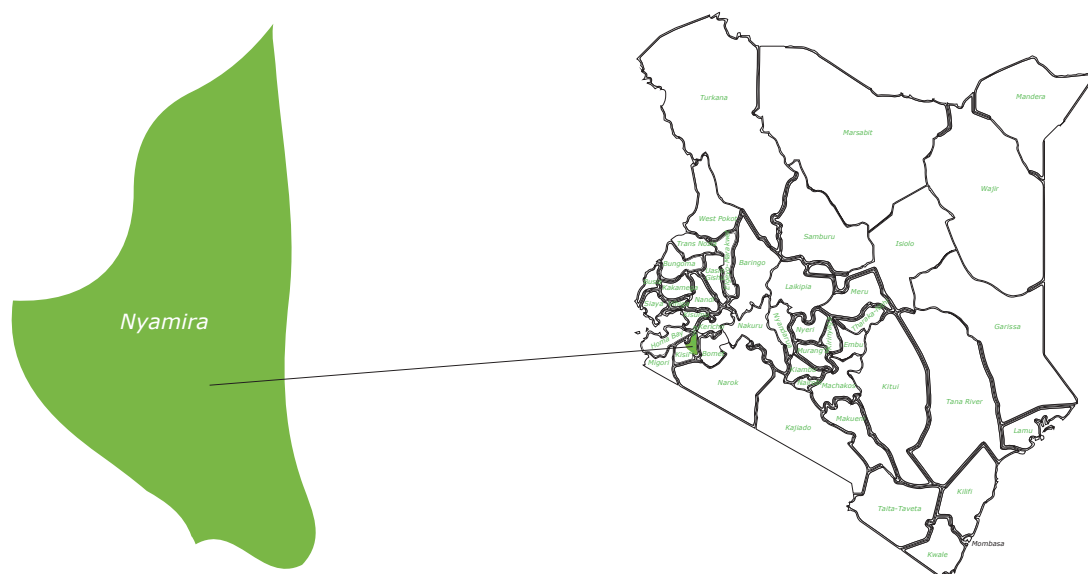
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	432	478	388
Clinically Diagnosed	236	172	231
Previously Treated	27	27	21
EPTB	72	97	90
TB among children all forms (Under 15)	54	44	45

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	2	0
Rifampicin Resistance (Including MDR)	4	1	5
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**5**	**4**	**5**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	83	74	26
Treatment outcomes			
C		68	21
NC (Not Complete)		6	5
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	80%	92%	0%	2%	5%	0%
Clinically Diagnosed	-	86%	0%	2%	11%	0%
Previously Treated	-	85%	0%	15%	0%	0%
EPTB	-	87%	0%	3%	10%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	80%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	763	769	566
TB / HIV Con infection rate	32%	35%	38%
No on CPT	243	274	215
No on ART	241	274	212

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Nyandarua County
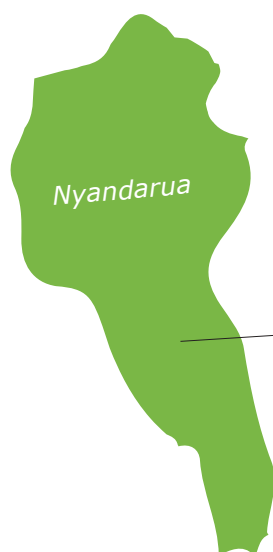
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	320	366	314
Clinically Diagnosed	297	127	221
Previously Treated	53	35	63
EPTB	138	110	146
TB among children all forms (Under 15)	95	51	53

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	0	0
Rifampicin Resistance (Including MDR)	2	2	5
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**3**	**2**	**5**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	54	34	7
Treatment outcomes			
C		16	7
NC (Not Complete)		17	0
DC (Discontinued)		1	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio- logically Confirmed	74%	86%	1%	5%	7%	1%
Clinically Diagnosed	-	83%	0%	1%	14%	0%
Previously Treated	-	86%	0%	6%	9%	0%
EPTB	-	85%	0%	4%	11%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	80%	-
Failure	0%	-
LTFU Rate	0%	-
Death Rate	0%	-
TO Rate	20%	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	804	635	568
TB / HIV Con infection rate	32%	33%	37%
No on CPT	253	214	212
No on ART	234	212	206

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Nyeri County
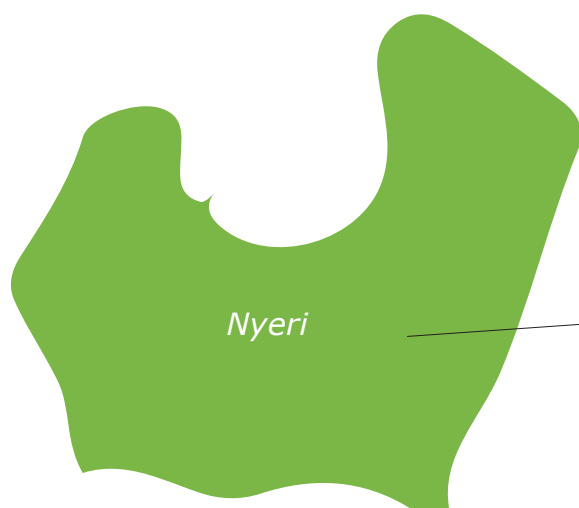
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	671	618	592
Clinically Diagnosed	366	131	313
Previously Treated	114	93	162
EPTB	167	177	253
TB among children all forms (Under 15)	144	59	66

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	11	0	2
Rifampicin Resistance (Including MDR)	11	6	3
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**22**	**6**	**5**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	82	68	42
Treatment outcomes			
C		46	20
NC (Not Complete)		16	14
DC (Discontinued)		1	1
TO (Transfer out)		2	2
DF (Done failed)		3	5
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	70%	86%	0%	3%	4%	3%
Clinically Diagnosed	-	85%	0%	2%	9%	3%
Previously Treated	-	71%	0%	11%	11%	3%
EPTB	-	82%	0%	2%	11%	4%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1281	1002	1019
TB / HIV Con infection rate	28%	29%	30%
No on CPT	357	292	308
No on ART	332	280	296

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Pokot County
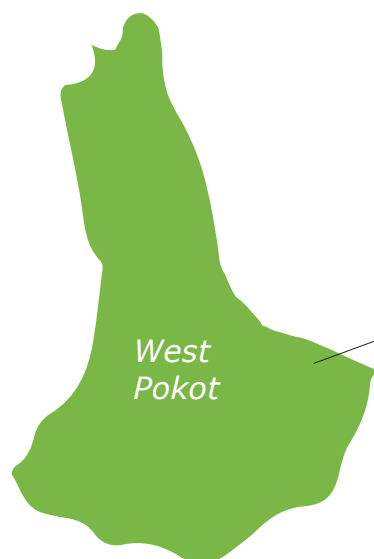
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	834	730	609
Clinically Diagnosed	364	326	386
Previously Treated	141	95	129
EPTB	257	237	269
TB among children all forms (Under 15)	268	229	246

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	2	4
Rifampicin Resistance (Including MDR)	14	4	6
Pre XDR	0	0	0
PD Resistance	1	2	0
XD Resistance	0	0	0
Total	**15**	**6**	**10**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	51	61	7
Treatment outcomes			
C		29	5
NC (Not Complete)		32	2
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	46%	78%	1%	13%	3%	1%
Clinically Diagnosed	-	80%	0%	13%	7%	0%
Previously Treated	-	69%	0%	18%	3%	0%
EPTB	-	82%	0%	13%	3%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	70%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	20%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1546	1338	811
TB / HIV Con infection rate	10%	9%	11%
No on CPT	154	119	99
No on ART	150	118	94

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Samburu County
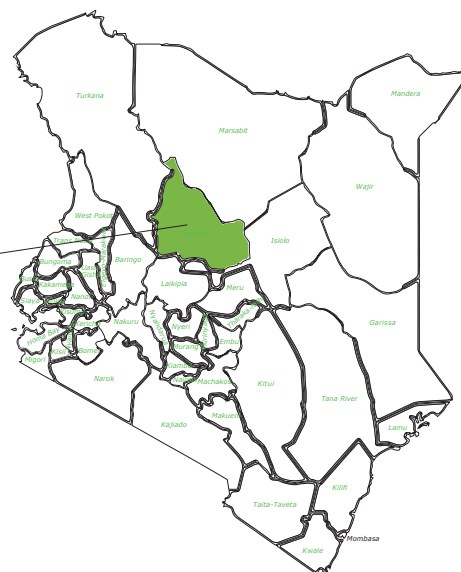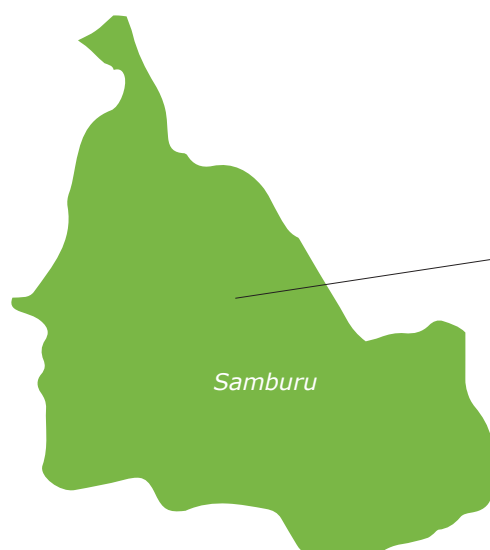
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	263	287	287
Clinically Diagnosed	227	206	201
Previously Treated	34	20	33
EPTB	61	70	69
TB among children all forms (Under 15)	88	72	69

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	1	0
Rifampicin Resistance (Including MDR)	5	7	0
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**5**	**8**	**0**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	4	19	0
Treatment outcomes			
C		19	0
NC (Not Complete)		0	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	70%	91%	0%	5%	4%	0%
Clinically Diagnosed	-	92%	0%	3%	5%	0%
Previously Treated	-	75%	0%	20%	0%	0%
EPTB	-	87%	0%	6%	7%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	0%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	454	558	465
TB / HIV Con infection rate	19%	21%	20%
No on CPT	107	119	97
No on ART	100	119	93

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Siaya County
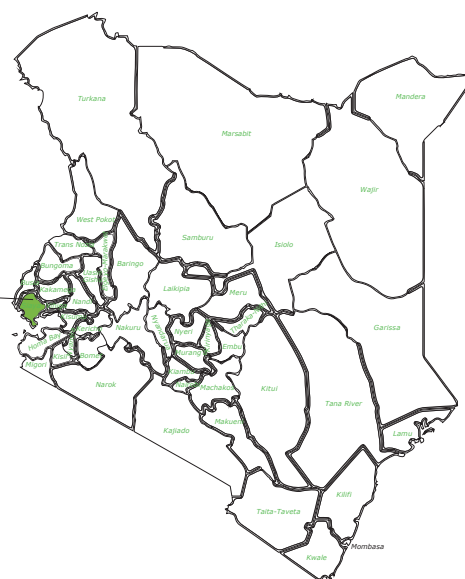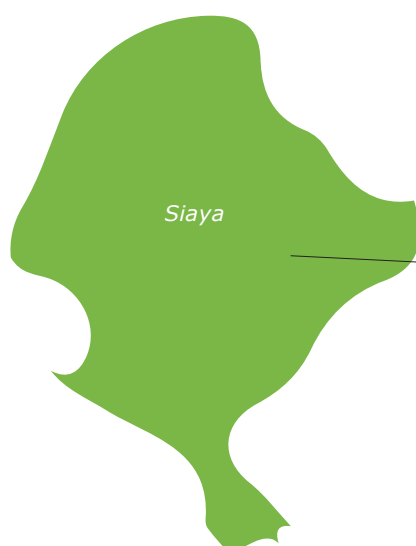
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	903	1034	881
Clinically Diagnosed	511	261	522
Previously Treated	123	117	157
EPTB	274	264	343
TB among children all forms (Under 15)	154	111	151

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	5	6	7
Rifampicin Resistance (Including MDR)	10	8	2
Pre XDR	0	0	0
PD Resistance	1	0	0
XD Resistance	0	0	0
Total	**15**	**14**	**10**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	207	178	50
Treatment outcomes			
C		19	50
NC (Not Complete)		155	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		4	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	66%	81%	1%	6%	7%	3%
Clinically Diagnosed	-	75%	0%	6%	16%	3%
Previously Treated	-	74%	0%	11%	6%	5%
EPTB	-	69%	0%	6%	20%	3%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	56%	60%
Failure	0%	0%
LTFU Rate	11%	0%
Death Rate	22%	40%
TO Rate	0%	50%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1798	1673	1301
TB / HIV Con infection rate	57%	63%	66%
No on CPT	1032	1054	869
No on ART	989	1035	854

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Taita Taveta County

Taita-Taveta
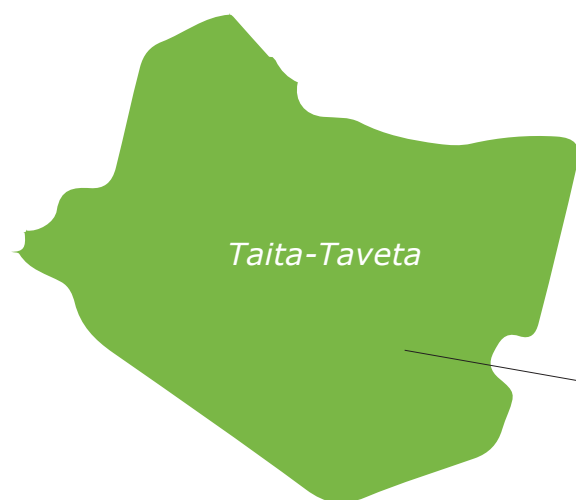
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	288	343	245
Clinically Diagnosed	108	97	153
Previously Treated	47	28	34
EPTB	73	60	72
TB among children all forms (Under 15)	43	50	58

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	1	1
Rifampicin Resistance (Including MDR)	4	4	6
Pre XDR	0	0	0
PD Resistance	0	1	0
XD Resistance	0	0	0
Total	**6**	**5**	**7**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	19	19	1
Treatment outcomes			
C		0	0
NC (Not Complete)		19	1
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	55%	82%	2%	5%	7%	0%
Clinically Diagnosed	-	81%	0%	1%	9%	0%
Previously Treated	-	89%	0%	0%	4%	0%
EPTB	-	73%	0%	3%	20%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	29%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	14%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	483	512	338
TB / HIV Con infection rate	23%	28%	30%
No on CPT	112%	150%	103
No on ART	104	144	94

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Tana River County
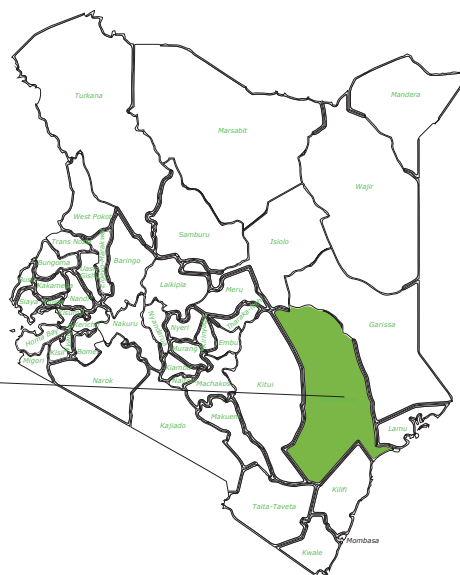
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	208	266	177
Clinically Diagnosed	157	97	141
Previously Treated	10	8	32
EPTB	40	58	57
TB among children all forms (Under 15)	65	48	58

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	0	0
Rifampicin Resistance (Including MDR)	3	2	0
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**3**	**2**	**0**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	66	52	9
Treatment outcomes			
C		23	7
NC (Not Complete)		29	2
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	68%	88%	0%	3%	3%	3%
Clinically Diagnosed	-	86%	0%	3%	10%	1%
Previously Treated	-	38%	0%	13%	13%	0%
EPTB	-	86%	0%	2%	10%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	0%	0%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	402	418	325
TB / HIV Con infection rate	8%	11%	11%
No on CPT	34	47	34
No on ART	33	45	34

*Where proportions do not add up to 100%, it means some patients had not been evaluated

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Tharaka Nithi County

Tharaka-Nithi
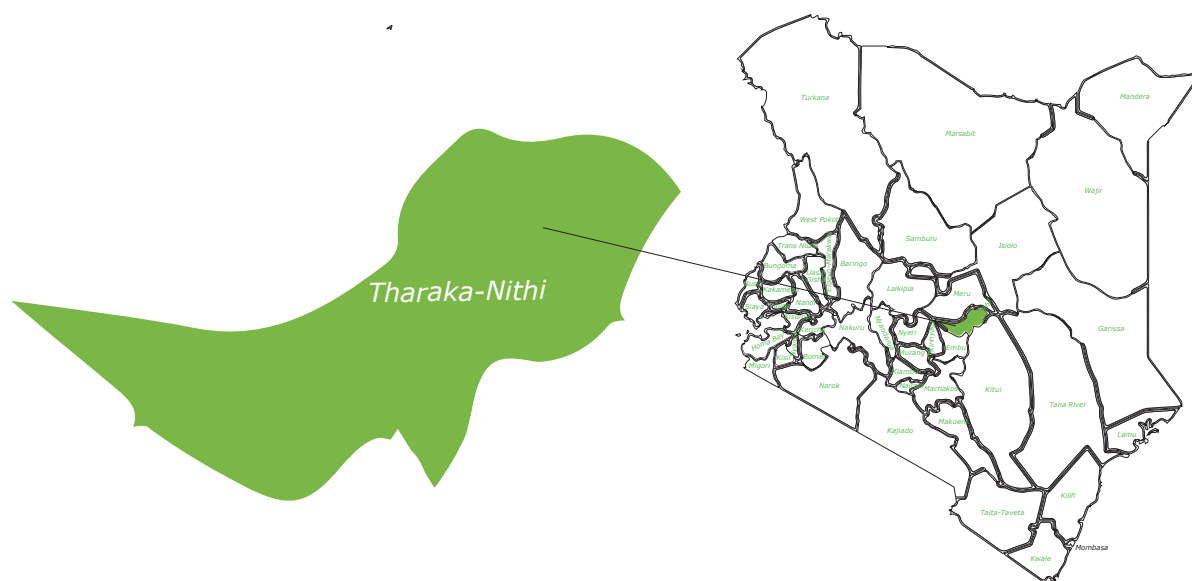
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	624	498	457
Clinically Diagnosed	351	247	271
Previously Treated	42	53	54
EPTB	231	210	208
TB among children all forms (Under 15)	179	150	114

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	1	1	1
Rifampicin Resistance (Including MDR)	2	3	2
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**3**	**4**	**3**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	58	14	17
Treatment outcomes			
C		10	15
NC (Not Complete)		4	1
DC (Discontinued)		0	0
TO (Transfer out)		0	1
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	81%	89%	0%	4%	2%	3%
Clinically Diagnosed	-	87%	0%	5%	6%	0%
Previously Treated	-	87%	0%	2%	8%	0%
EPTB	-	95%	0%	1%	4%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	-
Failure	0%	-
LTFU Rate	0%	-
Death Rate	0%	-
TO Rate	0%	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1179	978	751
TB / HIV Con infection rate	20%	23%	25%
No on CPT	249	229	189
No on ART	245	227	190

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Trans Nzoia
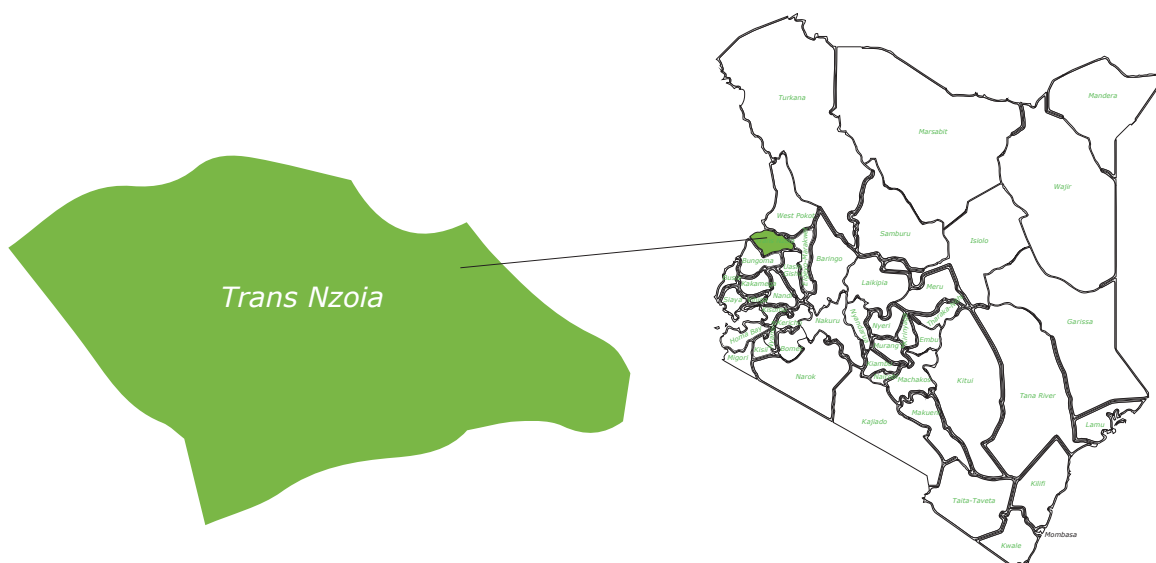
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	631	534	510
Clinically Diagnosed	511	310	587
Previously Treated	45	49	70
EPTB	119	184	162
TB among children all forms (Under 15)	117	91	176

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	1	1
Rifampicin Resistance (Including MDR)	1	2	1
Pre XDR	0	0	0
PD Resistance	0	1	0
XD Resistance	0	0	0
Total	**3**	**3**	**2**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	113	101	45
Treatment outcomes			
C		77	41
NC (Not Complete)		22	0
DC (Discontinued)		2	1
TO (Transfer out)		0	0
DF (Done failed)		0	1
D (Death)		0	2

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	59%	84%	0%	7%	5%	2%
Clinically Diagnosed	-	85%	0%	2%	9%	2%
Previously Treated	-	92%	0%	4%	2%	2%
EPTB	-	78%	0%	5%	14%	2%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	100%	100%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	0%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1268	1056	1258
TB / HIV Con infection rate	31%	30%	34%
No on CPT	382	317	432
No on ART	377	298	393

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Turkana

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	1182	1035	972
Clinically Diagnosed	765	520	1020
Previously Treated	107	64	77
EPTB	220	171	179
TB among children all forms (Under 15)	433	233	397

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	8	4
Rifampicin Resistance (Including MDR)	21	11	2
Pre XDR	0	0	0
PD Resistance	0	1	0
XD Resistance	0	0	0
Total	**21**	**19**	**6**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	76	58	-
Treatment outcomes			
C		40	-
NC (Not Complete)		16	-
DC (Discontinued)		1	-
TO (Transfer out)		0	-
DF (Done failed)		1	-
D (Death)		0	-

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	44%	79%	1%	13%	2%	3%
Clinically Diagnosed	-	85%	0%	7%	3%	3%
Previously Treated	-	73%	0%	13%	3%	3%
EPTB	-	88%	0%	7%	1%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	33%	80%
Failure	0%	0%
LTFU Rate	17%	20%
Death Rate	17%	0%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	2151	1749	2161
TB / HIV Con infection rate	21%	28%	28%
No on CPT	451	476	610
No on ART	441	468	602

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Uasin Gishu County
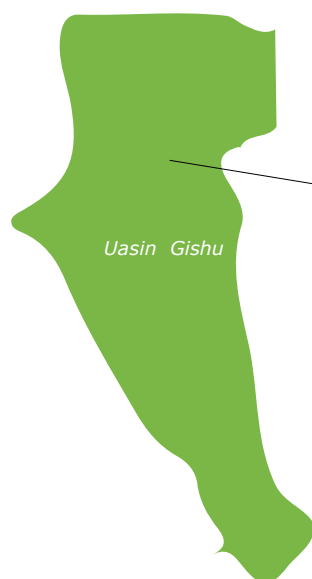
TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	856	826	746
Clinically Diagnosed	342	306	464
Previously Treated	75	65	72
EPTB	324	287	343
TB among children all forms (Under 15)	136	121	117

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	2	0
Rifampicin Resistance (Including MDR)	7	8	5
Pre XDR	0	0	0
PD Resistance	0	1	0
XD Resistance	0	0	0
Total	**7**	**10**	**5**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	110	76	96
Treatment outcomes			
C		24	33
NC (Not Complete)		52	60
DC (Discontinued)		0	0
TO (Transfer out)		0	2
DF (Done failed)		0	1
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	55%	82%	0%	5%	3%	1%
Clinically Diagnosed	-	83%	0%	7%	5%	2%
Previously Treated	-	80%	0%	6%	3%	3%
EPTB	-	85%	0%	2%	6%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	40%	89%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	20%	11%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	1535	1428	1156
TB / HIV Con infection rate	33%	33%	40%
No on CPT	525	480	480
No on ART	510	473	461

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Vihiga County

Vihiga

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	401	501	326
Clinically Diagnosed	345	173	245
Previously Treated	61	48	86
EPTB	73	100	161
TB among children all forms (Under 15)	65	62	57

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	2	1	1
Rifampicin Resistance (Including MDR)	3	2	3
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**5**	**3**	**4**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	84	38	12
Treatment outcomes			
C		27	12
NC (Not Complete)		10	0
DC (Discontinued)		1	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	73%	83%	1%	4%	10%	1%
Clinically Diagnosed	-	88%	0%	2%	8%	0%
Previously Treated	-	81%	0%	4%	13%	0%
EPTB	-	77%	0%	4%	17%	0%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	25%	75%
Failure	0%	0%
LTFU Rate	0%	0%
Death Rate	50%	25%
TO Rate	0%	0%

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	846	812	650
TB / HIV Con infection rate	32%	43%	41%
No on CPT	280	352	276
No on ART	275	348	271

*Where proportions do not add up to 100%, it means some patients had not been evaluated

Wajir County

TB Type per year

Type of TB	2017	2016	2015
Bacteriologically Confirmed	333	316	227
Clinically Diagnosed	115	109	137
Previously Treated	28	9	28
EPTB	101	113	97
TB among children all forms (Under 15)	66	67	61

DR TB Case Management

Type of resistance	2017	2016	2015
Mono Resistance	0	0	0
Rifampicin Resistance (Including MDR)	0	0	0
Pre XDR	0	0	0
PD Resistance	0	0	0
XD Resistance	0	0	0
Total	**0**	**0**	**0**

IPT Indicators

Type of resistance	2017	2016	2015
IPT % under 5	44	4	1
Treatment outcomes			
C		2	1
NC (Not Complete)		2	0
DC (Discontinued)		0	0
TO (Transfer out)		0	0
DF (Done failed)		0	0
D (Death)		0	0

Type Of TB and their outcomes in 2016

Type of TB	CR (%)	TSR (%)	Failure (%)	LTFU (%)	Death (%)	TO (%)
Bacterio-logically Confirmed	83%	87%	1%	2%	5%	2%
Clinically Diagnosed	-	99%	0%	0%	0%	1%
Previously Treated	-	100%	0%	0%	0%	0%
EPTB	-	96%	0%	0%	3%	1%

DR Outcomes

Treatment Success Rate	2015	2014
Treatment Success Rate	-	-
Failure	-	-
LTFU Rate	-	-
Death Rate	-	-
TO Rate	-	-

TB/HIV Indicators

HIV Tests	2017	2016	2015
Number Tested for HIV	556	511	337
TB / HIV Con infection rate	1%	2%	2%
No on CPT	6	9	8
No on ART	6	9	8

*Where proportions do not add up to 100%, it means some patients had not been evaluated