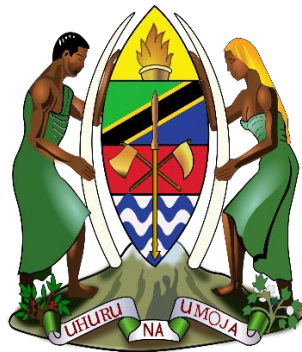


United Republic of Tanzania
Ministry of Health
National Tuberculosis and Leprosy Programme
Epidemiological Review in the United Republic of
Tanzania

January 15-25, 2023

Mission Report



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List of abbreviations

ART	anti-retroviral treatment
ARV	anti-retroviral
CMU	common management unit
CPT	cotrimoxazole preventive treatment
DHIS2	district health information system 2
DHO	district health office
DS-TB	drug-susceptible tuberculosis
DR-TB	drug-resistant tuberculosis
DC	district council
EPTB	extrapulmonary tuberculosis
JPRM	join programme review mission
M&E	monitoring and evaluation
MDR	multidrug-resistant
NTLP	national tuberculosis and leprosy programme
RR	rifampicin-resistant
SDG	sustainable development goal
TB	Tuberculosis

Executive summary

A review of the surveillance systems in place that generate and use data on TB cases and deaths, was performed from 15th to 25th January 2023. This comprised an epidemiological analysis of key routinely collected TB surveillance data at national and sub-national levels, as well as the implementation of the second edition of the WHO surveillance checklist of standards and benchmarks. Results of this review will be used to inform the Joint Programme Review Monitoring (JPRM), the mid-term review of the current National Strategic Plan for TB, and the new Global Fund application for Tanzania.

The National TB and Leprosy Programme (NTLP) Tanzania provided aggregated TB surveillance data for 2018-2022 to the review team. These were quarterly level data, disaggregated at the district level. Data were uploaded onto the tbhistoric.org platform to populate standardised analytical dashboards. Data from previous years were already available in the platform for Tanzania for the years 2015-2017. Case-based level data for 2021 and 2022 were also analysed to address hypotheses that were developed during the in-country mission. Also, during the in-country mission, site visits and interviews were also conducted by the review team to inform the surveillance assessment and the epidemiological review. Meetings with national stakeholders were also organized.

The number of TB case notifications was relatively constant over the years until 2015 (between 60 000 and 65 000 cases) and then increased slowly until 2018 where it reached for the first time more than 70 000 TB cases notified. In 2019, a 15% increase was observed as compared to 2018, and another 15% increase was observed between 2021 and 2022 where more than 100 000 TB cases were notified. The increase in TB notification since 2018 was mainly due to an increase in clinically diagnosed TB, although the number of bacteriologically confirmed TB remained constant over time. Another shift was observed in 2022 where the number of clinically diagnosed TB increased much faster than the number of bacteriologically confirmed TB. That could be partly explained by the algorithm used to diagnose TB where presumptive TB cases with a negative Xpert result go for a clinical assessment and chest X-Ray and if the outcome of this assessment is likely TB, they are starting on treatment while waiting for culture results. Since 2015, the proportion of notified TB cases who are children less than 15 years old increased and was 17% in 2022. At national level, the proportion of treatment success for patients started on DS-TB treatment was continuously increasing since 2000 and reached 93.5% for new and relapse TB cases, 91.4% in previously treated cases, in 2022. Among HIV-positive patients, the treatment success rate was also very high, 92.5% in 2022.

During this review, WHO piloted the second edition of the surveillance checklist assessment, in which benchmarks for 5 standards were revised and new standards were proposed to increase the scope of the assessment to prevention and treatment outcomes. In summary, 5 standards were met, 7 were partially met and 3 were not met. The following standards were partially met: (B1.3) All scheduled periodic data submissions have been received and processed at the national level; (B1.4) Data in quarterly reports (or equivalent) are accurate, complete, and internally consistent (For paper-based systems only); (B1.5) Data in national database are accurate, complete, internally consistent, and free of duplicates; (B1.7) Number of reported TB cases is internally consistent; (B1.8) All diagnosed cases of TB are reported; (B2.3) Surveillance data for children reported with TB (defined as ages 0-14 years) are reliable and accurate AND all diagnosed childhood TB cases are reported; (B4.1) Data for Programme Management of TB Preventive Therapy (PMTPT) are accurate, complete, and consistent. The following standards were not met: (B1.6) TB surveillance data are externally consistent; (B1.9) Population has good access to health care; (B1.10) Vital registration system has high national coverage and quality.

The main high-level recommendations from this review were:

(1) Strengthening coordination and collaboration with MoH ICT and the PORALG as the various digital health platforms are being developed and rolled out; (2) Strengthening data linkages with laboratory data; (3) Establishment of a unique ID for the health system; (4) Strengthening data quality assessment; (5) Measuring TB under-reporting with record linkage exercises; (6) Establish a national data working group with all relevant stakeholders; (7) Conduct data analysis and use workshops at all levels; (8) Increase screening and testing coverage at the health facility; (9) Review the algorithm and in particular the use of CXR reading in the diagnosis of TB; (10) Expand the collaboration for the provision of TB care with the private and mining sectors and ensure adherence to national guidelines; (11) Measure burden in general population through a national TB prevalence survey; (12) Take a multisectoral approach to advocate for the rollout of the piloting of the vital registration ICD-10 system. A costed activity plan to address these recommendations should be developed and funded through upcoming funding opportunities for the NTLP.

Introduction

The United Republic of Tanzania is one of the 30 highest tuberculosis (TB) burden countries in the world. In 2021, the estimated TB incidence was 208 (uncertainty interval, 93-370) per 100 000 populations which corresponded to an estimated number of TB cases of 132 000 (59 000-253 000). TB mortality was estimated at 29 (13-51) per 100 000 population in HIV-negative people and 12 (6-21) per 100 000 population in HIV-positive people.

The United Republic of Tanzania reduced the TB deaths by 55% in 2021 and the TB incidence rate by 32% compared to 2015 as reported in the 2022 WHO Global TB report. The treatment coverage was 65% in 2021 meaning that 35% of the incident TB cases were still missed. The top risk factor for TB in the country included undernutrition followed by HIV, alcohol use disorders, smoking and diabetes.

An in-depth epidemiological analysis of TB surveillance data at the national and the sub-national level and a further review of the systems in place that collect and generate data on TB cases and deaths, were performed. The assessment of the TB surveillance and VR systems was conducted using a second edition of standardized WHO checklist of TB surveillance standards and benchmarks. The expectation was that the results could be used to develop a monitoring and evaluation (M&E) investment plan designed to strengthen TB surveillance and VR systems to better measure trends in TB disease burden.

The United Republic of Tanzania can use the findings and recommendations of the TB surveillance system assessment to inform targeted M&E investments to strengthen underlying systems for data collection and systematically assess trends in disease burden and program impact. Results of this review will also be used to inform the upcoming Joint Programme Review Monitoring (JPRM) and the mid-term review of the National strategic plan and Global Fund application.

Objectives

The objectives of this TB epidemiological review were to:

1. Describe and assess current national TB surveillance and vital registration systems, with particular attention to their capacity to measure the level of and trends in TB disease burden (incidence and mortality) using the Standards and Benchmarks Checklist.
2. Assess the level of, and trends in, TB disease burden (incidence, prevalence, mortality) using available surveillance, survey, programmatic and other data. Assess whether recent trends in TB disease burden indicators are plausibly related to changes in TB-specific interventions taking into account external factors including economic or demographic trends.
3. Define the investments needed to directly measure trends in TB disease burden in future by developing an M & E investment plan consisting of required interventions to address gaps and an indication of whether and if so, what kind of technical assistance or additional funding is required and characterize the proportion represented by vertical TB, TB/HIV, or integrated health M&E activities.
4. Provide feedback to the WHO regional and country office and funding agencies such as Global Fund or USAID on recommendations and prioritisation, following approval by the NTP.
5. Build capacity for epidemiological reviews in country by involving members of the NTP to actively participate in objectives 1 – 4.

Methods

The TB surveillance assessment and epidemiological review were conducted during an in-country mission by Babis Sismanidis and Mathieu Bastard, Global TB Programme WHO, supported by Johnson John Lyimo, WHO Country Office Tanzania and Jean de Dieu Iragena, WHO African Region. The review team also included Emmanuel Nkiligi, Robert Balama, Glory Thadei, Paschal Seleman from the Strategic Information and Research Unit of NTLP and Pamela Kisoka from the President's Office Regional Administration and Local Government (PO RALG). A briefing presentation, followed by discussion, at the beginning of the visit (16 January 2023) was held to establish the purpose of the checklist and the logistics of carrying out the assessment. A final debriefing presentation was delivered on the last day of the in-country mission (25 January 2023).

During the in-country mission, these were the site visits and interviews conducted by the review team to inform the surveillance assessment and the epidemiological review (see Appendix 1 for the agenda of activities).

- Health facility site visits:
 - Urban PHC Mnazi Mmoja (Dar Es Salaam)
 - Regional tertiary hospital Amana (Dar Es Salaam)
 - Regional medical offices Dar Es Salaam & Dodoma
 - National TB refence lab (Dar Es Salaam)
 - Regional/zonal TB reference lab (Dodoma)
- Meetings with national stakeholders:
 - Implementing partners: THPS, Deloitte, MDH
 - DHIS2 lab, University of Dar Es Salaam
 - RITA (agency responsible for registration of deaths)
 - MoH, HMIS
 - MoH, ICT (part of MoH responsible for developing & maintaining data systems e.g. eHMIS)
 - National Bureau of Statistics, MoH Epidemiology unit, IHI, NIMR (asked for meetings but did not meet)

Prior to the review, NTLP has provided 5 years surveillance data (2018-Q3 2022) to the review team. These data were uploaded to the <https://tbhistoric.org/> platform (developed using DHIS2) by the support of WHO/GTB (Peter Nguhiu). This process has greatly facilitated national and subnational level data analysis during the review.

A complete list of data sources and other information required for the review are provided in Appendix 2. The completed checklist is available in Appendix 4.

Epidemiology of Tuberculosis

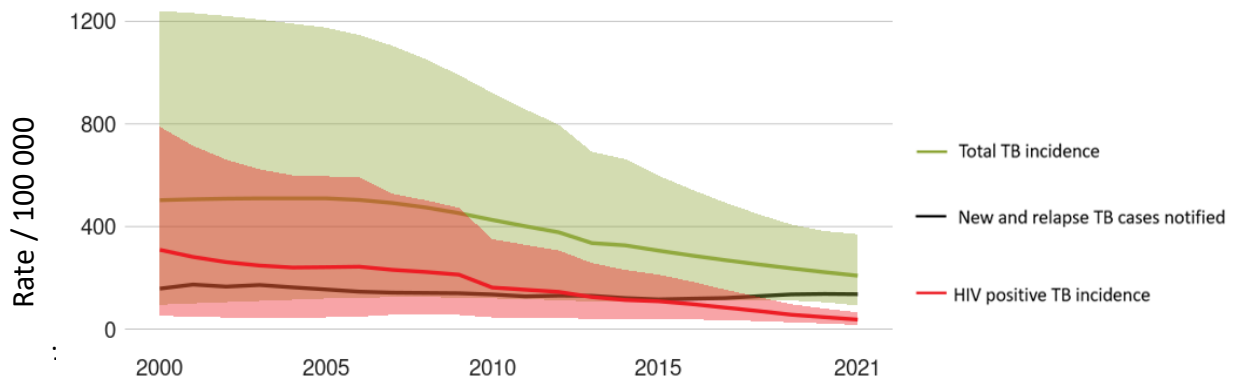
Burden of TB

Incidence of TB

The estimates of TB incidence and case notification rate are presented in Figure 1. From 2000 to 2006, TB incidence was relatively stable around 500 TB cases per 100 000 population, and then slowly decrease since 2006. In 2021, the estimated TB incidence was 208 (93-370) per 100 000 population. The incidence of TB in people living with HIV followed a similar trend and was estimated in 2021 at 37 (17-66) per 100 000 population.

The TB notification rate is constant over the year and was not impacted during COVID-19 pandemic in 2020 and 2021, where even a slight increase in the TB notification rate was observed.

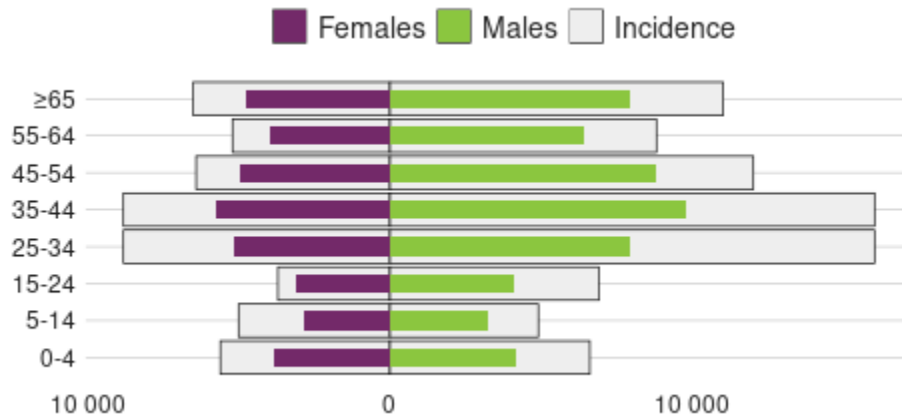
Figure 1 - Estimated TB incidence rate trend and case notification rate trend for the period 2000-2021 (Global TB report 2022)



The estimated number of incident cases and the number of notified TB cases disaggregated by age and sex are shown in

Figure 2. Overall, women aged > 15 years accounted for 32% of total notification, men > 15 years for 52% and children < 15 years for about 16% of the total number of notified TB cases.

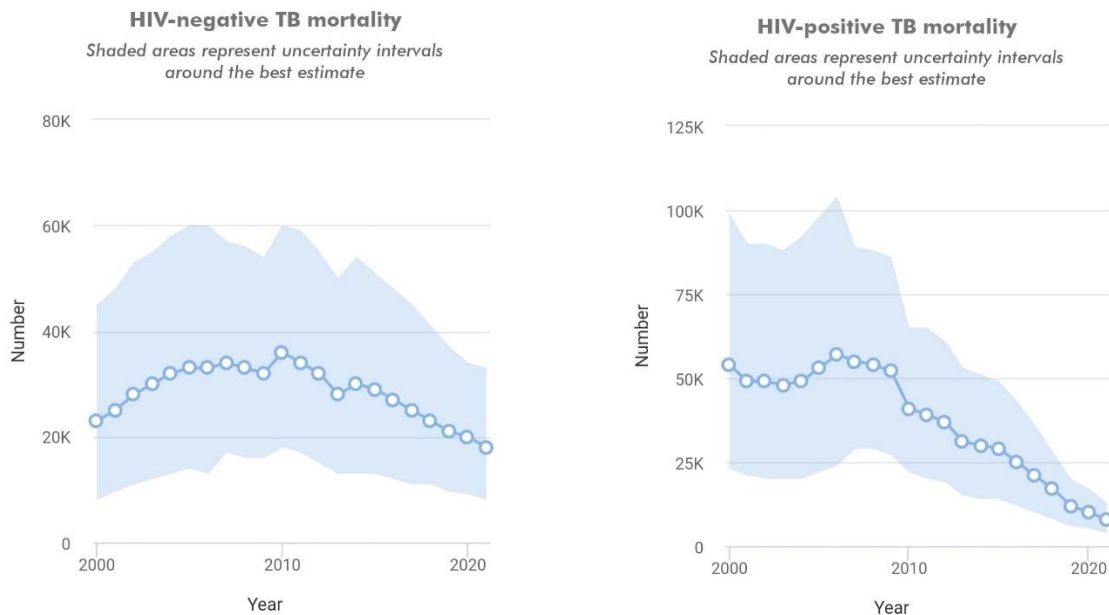
Figure 2 - Estimated incident TB cases and notified TB cases by age and sex in 2021.



TB mortality

The estimated number of deaths from TB stratified by HIV status from 2000 to 2021 is shown in Figure 3. Among HIV-negative TB cases, mortality increased from 2000 to 2007, reached a peak in 2010, and then continuously declined to reach an estimated 18 000 deaths (8 100-33 000) in 2021. Mortality from TB in HIV-positive people reached a peak in 2006 with an estimated 57 000 deaths from TB (24 000-104 000) and then a continuous linear declined was observed. In 2021, the estimated number of HIV infected people who died from TB was 7 800 (3 800-13 000).

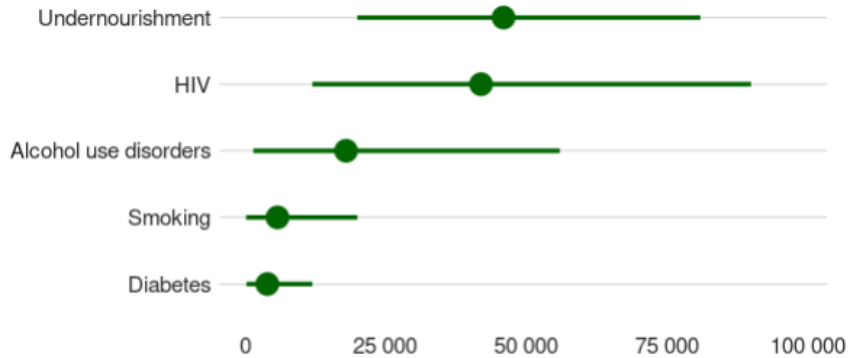
Figure 3 - Trends in the estimated number of deaths from all forms of TB in HIV-negative and HIV-positive people, 2000-2021 (Global TB report 2022)



Attributable risk factors for TB

Estimates of the number of incident TB cases attributable to five health-related risk factors for TB in 2021 are presented in Figure 4. In the United Republic of Tanzania, about 45,000 TB cases were attributable to undernourishment and 42,000 were attributable HIV co-infection.

Figure 4 - Estimates of the number of TB cases attributable to selected risk factors in 2021



TB case notifications

Annual number and rates of notified TB cases

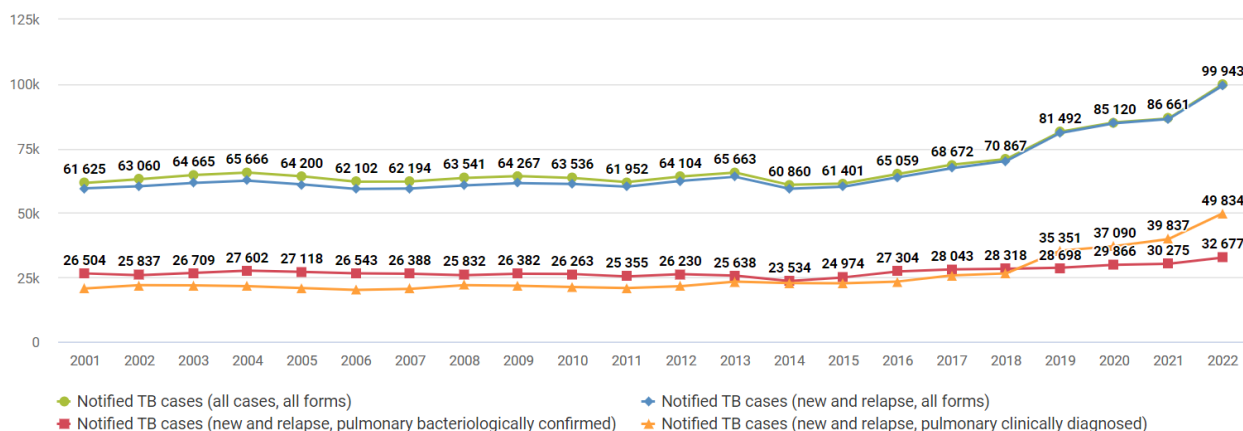
The total number of TB case notifications from 2001 to 2022 are displayed in Figure 5. The number of TB case notifications was relatively constant over the years until 2015 (between 60 000 and 65 000 cases) and then increased slowly until 2018 where it reached for the first time more than 70 000 TB cases notified. In 2019, a 15% increase was observed as compared to 2018, and another 15% increase was observed between 2021 and 2022 where almost 100 000 TB cases were notified.

The increase in TB notification since 2018 was mainly due to an increase in clinically diagnosed TB, although the number of laboratory-confirmed TB remained constant over time. Another shift was observed in 2022 where the number of clinically diagnosed TB increased much faster than the number of bacteriologically confirmed TB.

In 2022, only 2.3% of the notified TB cases were previously treated (including relapse) TB cases.

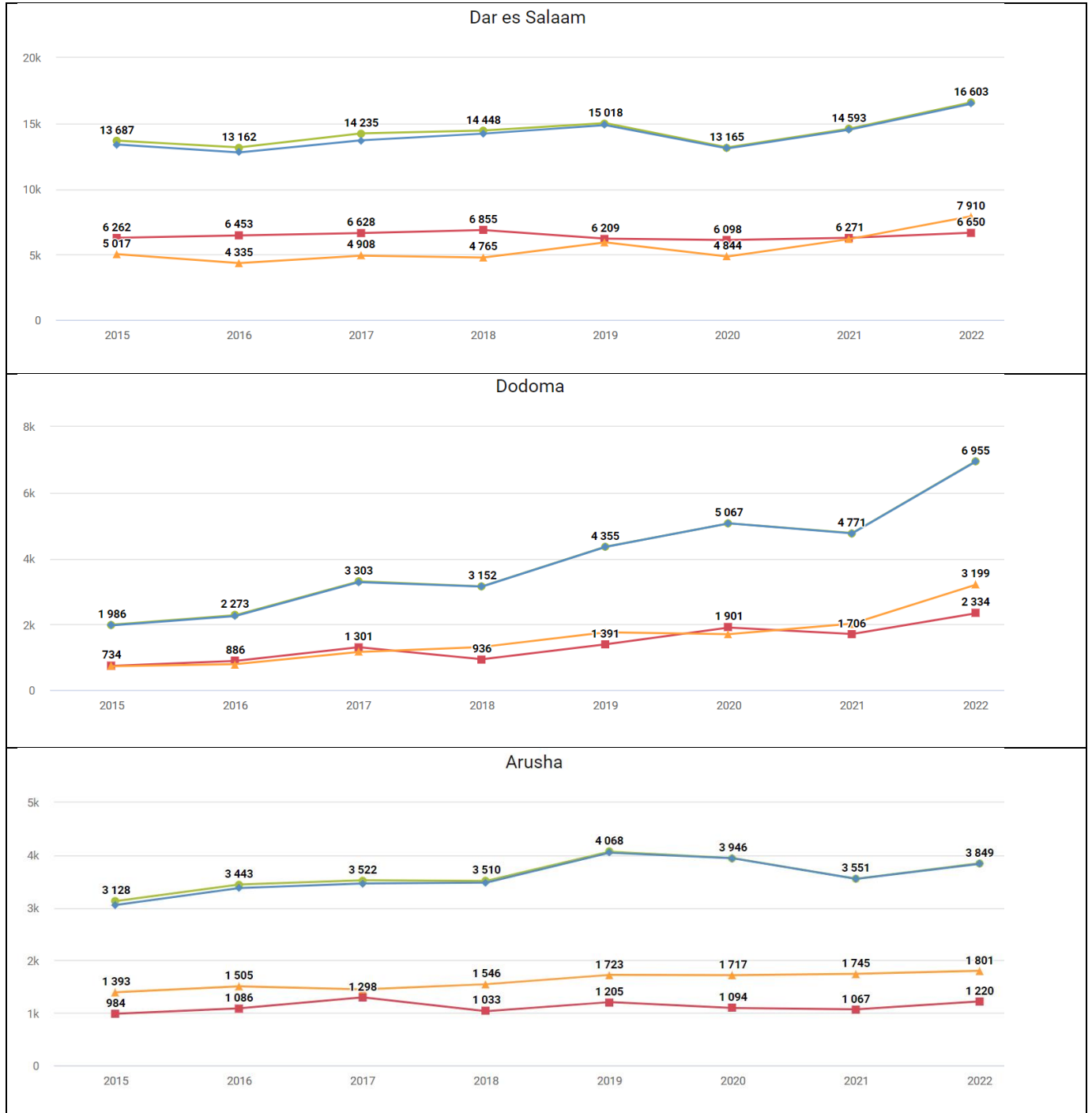
That could be partly explained by the algorithm used to diagnose TB where presumptive TB cases with a negative Xpert result go for a clinical assessment and chest X-Ray and if the outcome of this assessment is likely TB, they are starting on treatment while waiting for culture result. An in-depth analysis was conducted to describe this on page 32.

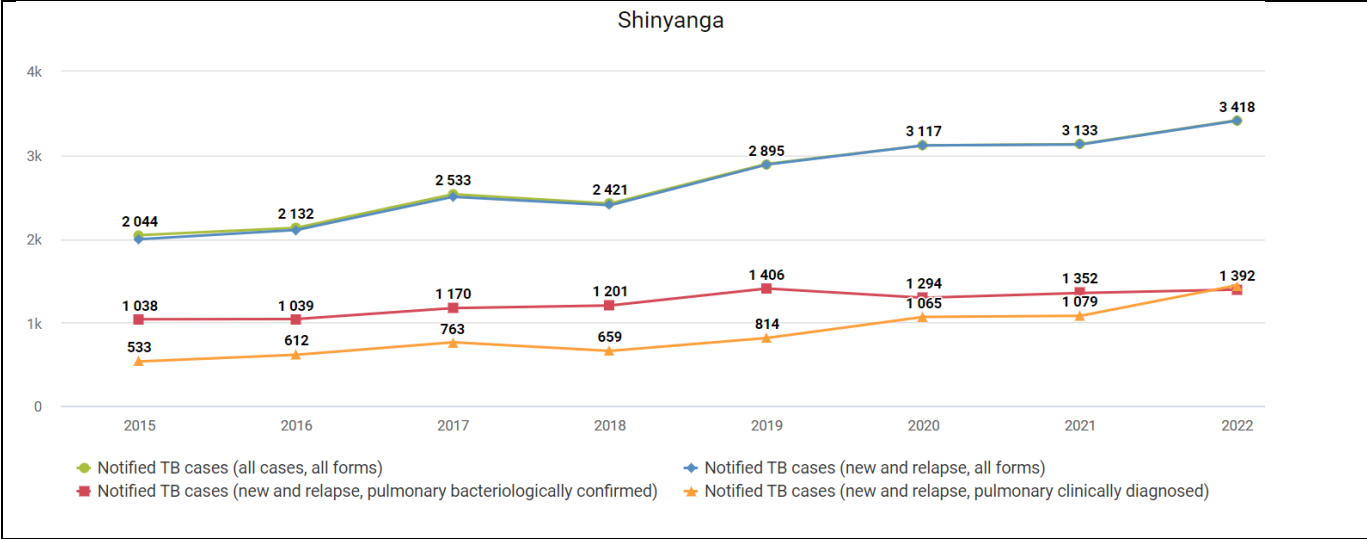
Figure 5 - Trends in annual absolute number of TB cases notifications, overall, new and relapse all forms of TB, pulmonary bacteriologically confirmed and clinically diagnosed



Trends in TB case notifications for 4 regions (Dar es Salaam, Dodoma, Arusha and Shinyanga) are shown in Figure 6.

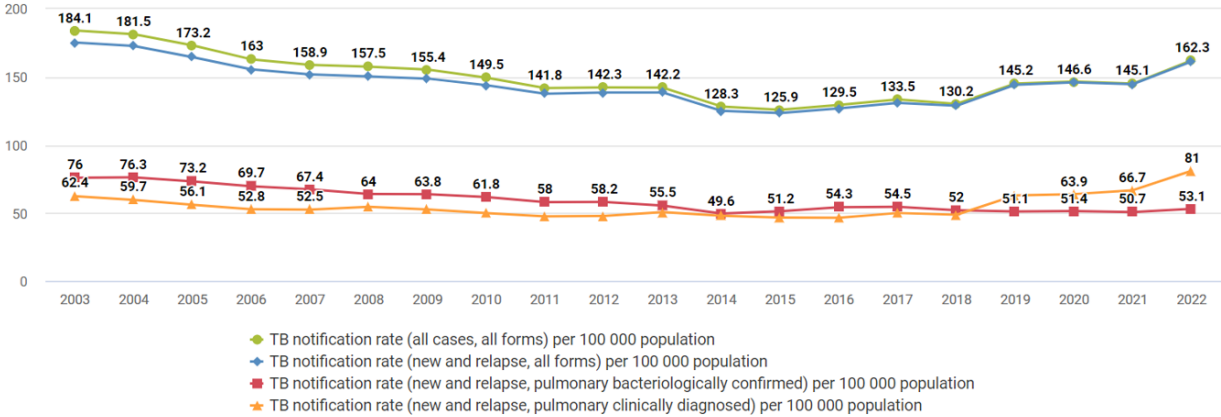
Figure 6 - Trends in annual absolute number of TB cases notifications, overall, new and relapse all forms of TB, pulmonary bacteriologically confirmed and clinically diagnosed in 4 regions, 2015-2022.





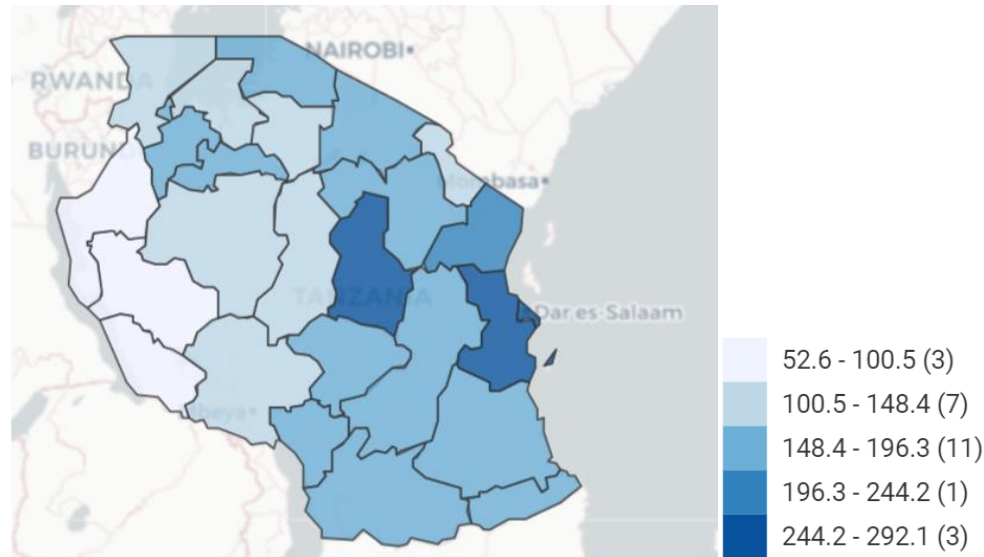
The annual rates of TB notification (Figure 7) declined over time until 2018 and then increased in 2019. After a plateau in 2019-2021, the rate of TB notification increased strongly from 145.1/100 000 population in 2021 to 162.3/100 000 population in 2022.

Figure 7 - Trends in annual rates (per 100 000 population) of TB cases notifications, overall, new and relapse all forms of TB, pulmonary bacteriologically confirmed and clinically diagnosed



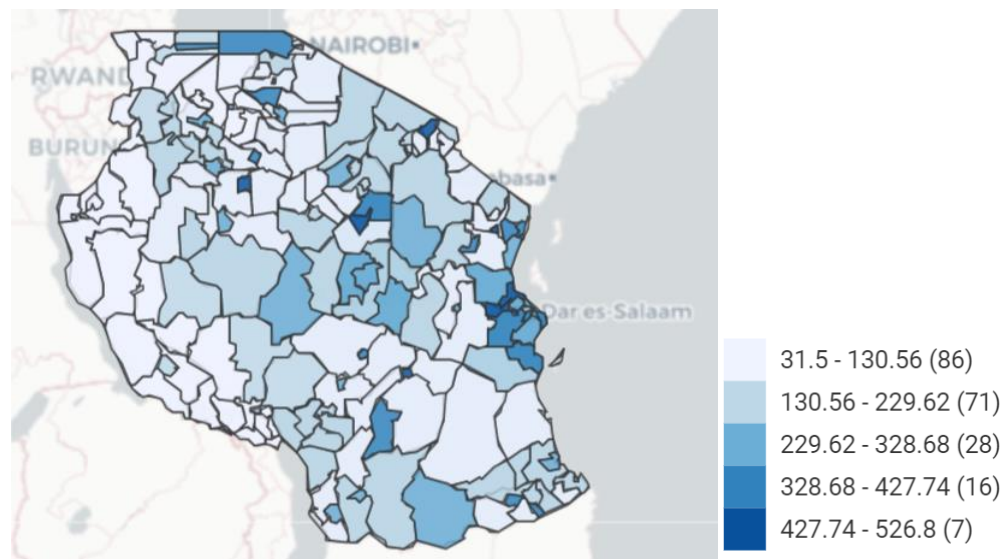
In Figure 8 and Figure 9, TB notification rates are shown by region and district, respectively. An important heterogeneity across the country could be observed, with a higher notification rate in the eastern regions. The region of Dar es Salaam had the highest notification rate in 2022 (292.1/100 000 population), followed by the region of Pwani (287.5/100 000) and the region of Dodoma (246.7/100 000), all three regions in dark blue in Figure 8.

Figure 8 - TB notification rate in 2022 (/100 000 population) by region.



An important heterogeneity could also be noticed by district council.

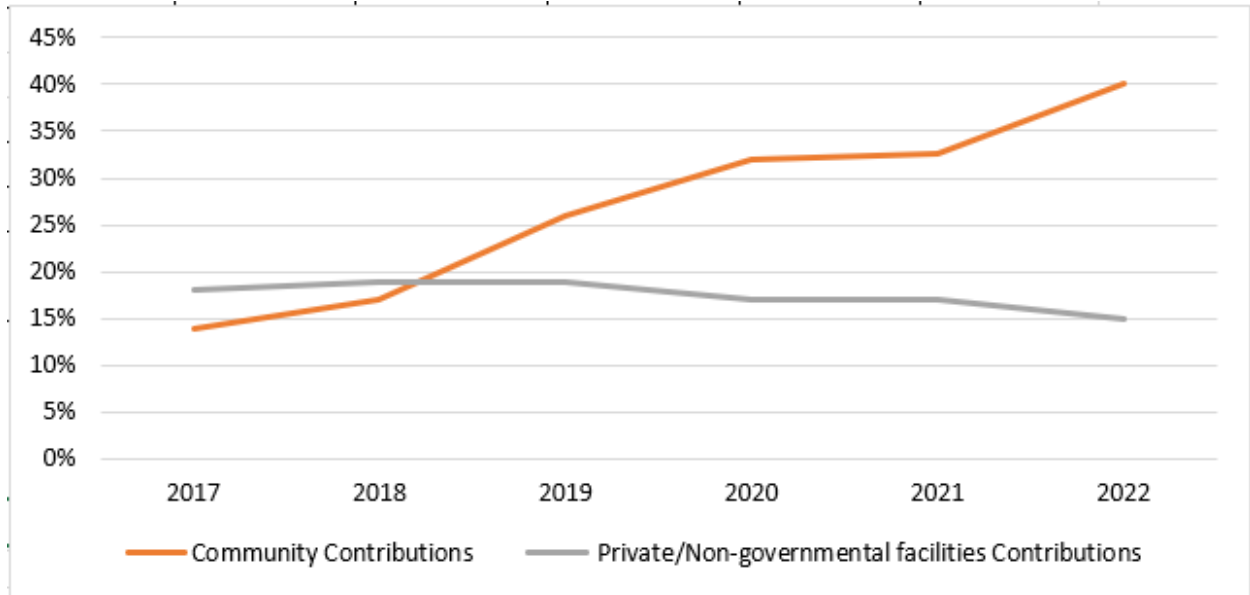
Figure 9 - TB notification rate in 2022 (/100 000 population) by district council.



Private sector contributions

Since 2018, the community contributions to TB case finding increased constantly and reached 40% in 2022. While at the same time, the private and non-governmental contributions remained stable between 15% and 20% (Figure 10).

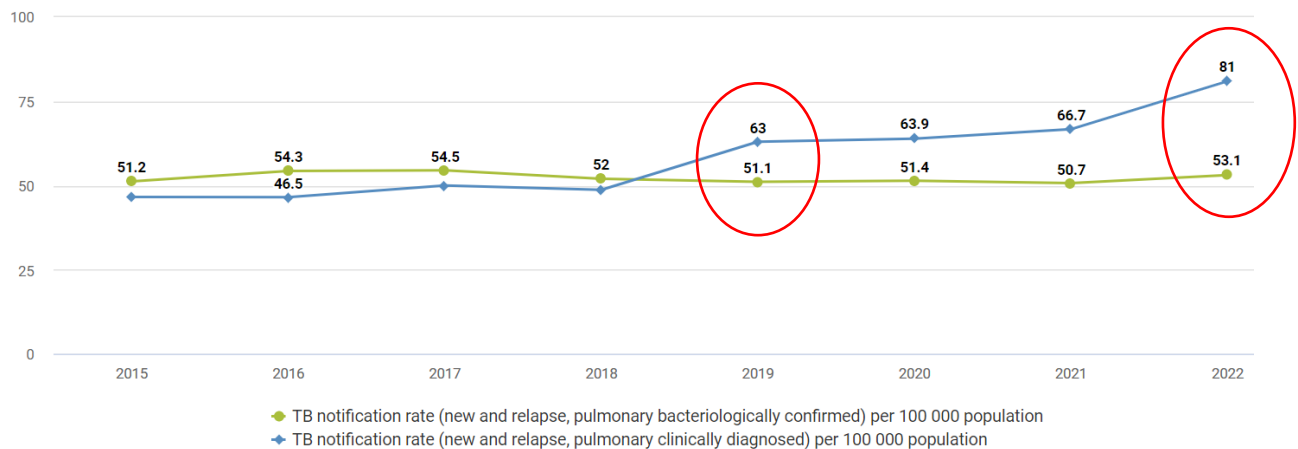
Figure 10 - Contributions of community and private sector to TB case finding at national level.



TB diagnosis types

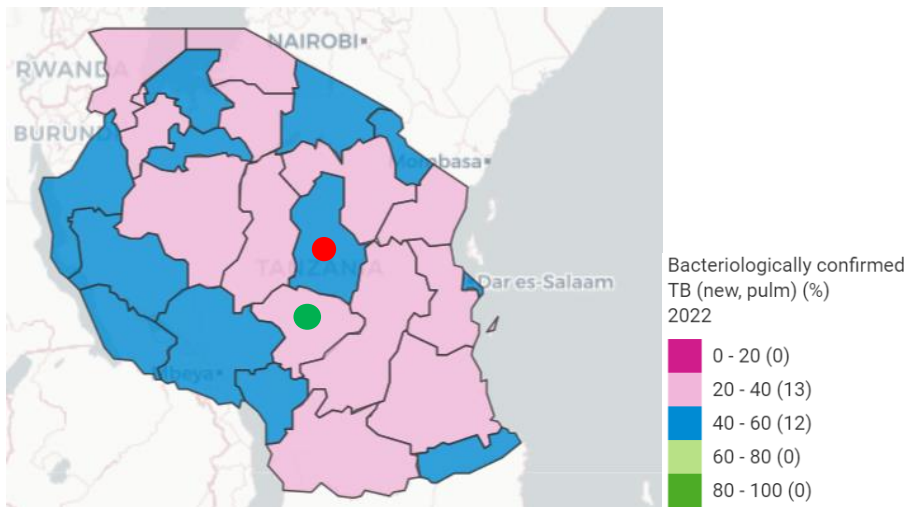
Until 2018, the rate of clinically diagnosed TB was similar to the rate of bacteriologically confirmed TB (Figure 11). However, in 2019, a first shift in the curves was observed and the rate of clinically diagnosed TB was 63/100 000 population as compared to 51.1/100 000 population for the bacteriologically confirmed TB. This gap remained stable until 2021. In 2022, a second shift happened and the rate of clinically diagnosed TB increased from 66.7 to 81/100 000 population while at the same time, the rate of bacteriologically confirmed TB remained the same despite a small increase.

Figure 11 - TB notification rate (/100 000 population) of pulmonary bacteriologically confirmed and clinically diagnosed TB, 2015-2022



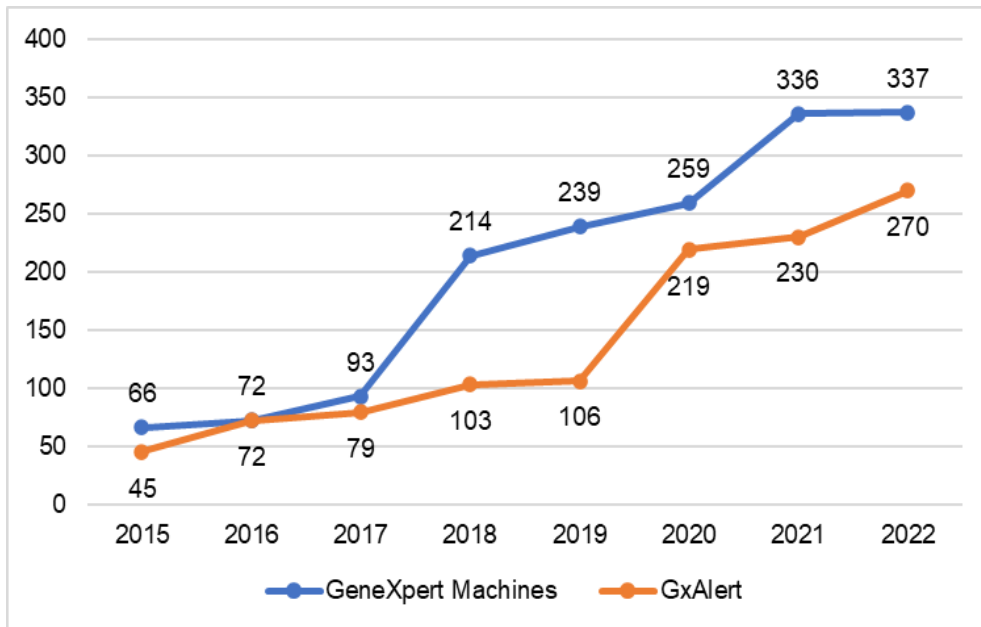
As shown in Figure 12, the proportion of bacteriologically confirmed among new TB cases varied widely by region: 45.4% in Dar es Salaam, 42.2% in Dodoma (red dot) and only 29% in Iringa (green dot).

Figure 12 - Regional distribution of the proportion of bacteriologically confirmed among new pulmonary TB cases in 2022.



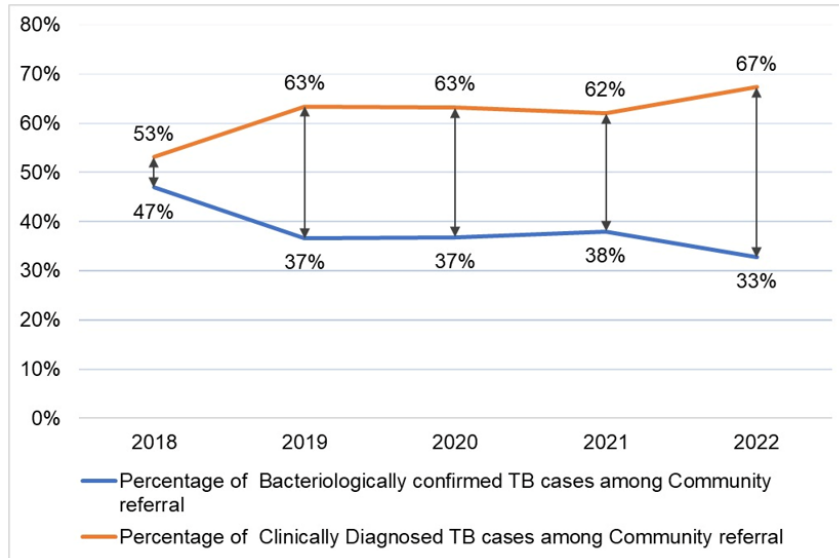
Interestingly, while the proportion of bacteriologically confirmed TB was constantly low (about 50%), the number of GeneXpert machines available in the country greatly increased from 93 machines in 2017 to 337 machines in 2022 (Figure 13). In 2021, the utilization percentage was 48% due to tock-out of cartridges. However, this alone could not explain the sustainable low proportion of bacteriologically confirmed TB.

Figure 13 - Number of GeneXpert machines available in the country, 2015-2022.



In Figure 14, we can see that the proportion of clinically diagnosed TB cases among community referral increased from 53% in 2018 to 63% in 2019, and after a stationary level, increased to 67% in 2022.

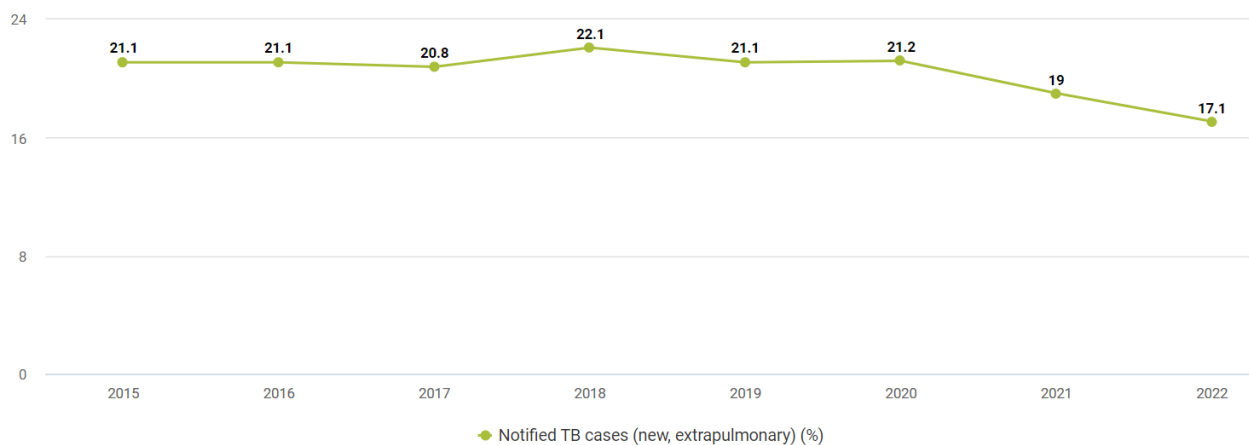
Figure 14 - Contributions of community referral by case type at national level.



Site of TB disease

Despite a slight decrease the last two years, the proportion of patients newly diagnoses with extra-pulmonary TB remained high, 17.1% in 2022 (Figure 15).

Figure 15 - Proportion of extra-pulmonary TB among new TB cases, 2015-2022

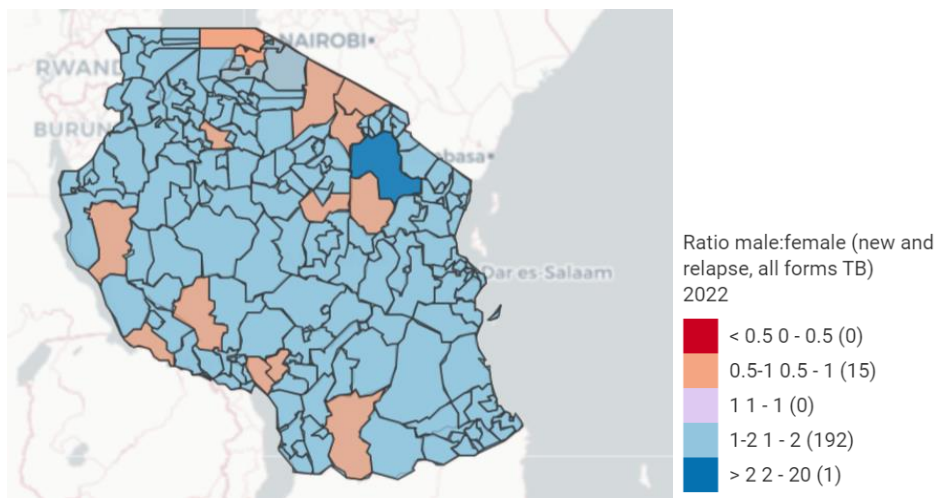


Gender

In 2022, the male to female ratio in notified new and relapse TB cases was 1.2. However, estimates of incidence in 2021 (Figure 2) showed a higher gap in incidence among males, particularly in the age between 25 and 45 years old, suggesting a much higher underreporting or underdiagnosing among males of 25-45 of age.

The male to female ratio was relatively homogeneous across the country, except in 15 districts were more females than males were notified (in orange in Figure 16). In Simanjiro DC (dark blue), the male to female ratio was 2.2, much higher than at national level.

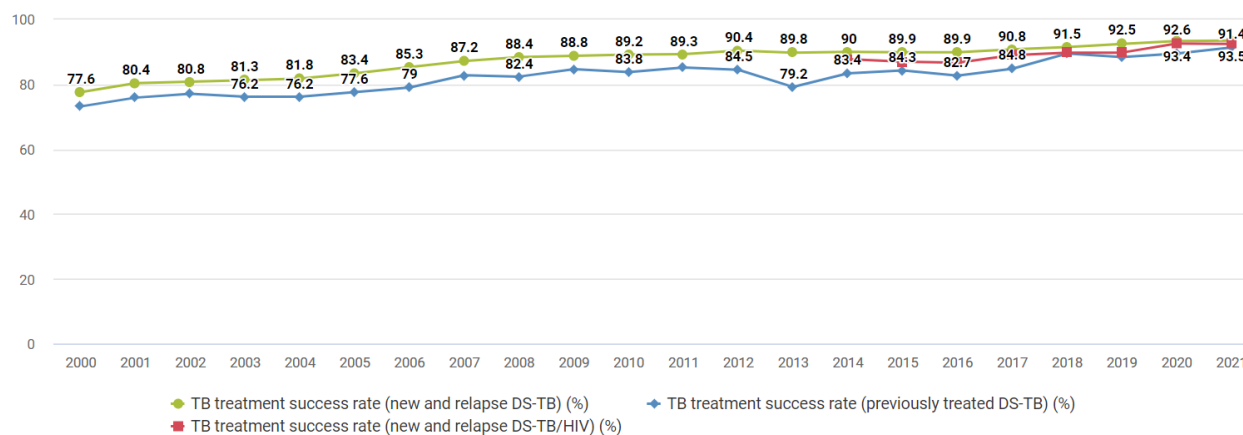
Figure 16 - Male to female ratio at district council level, 2022



DSTB Treatment outcomes

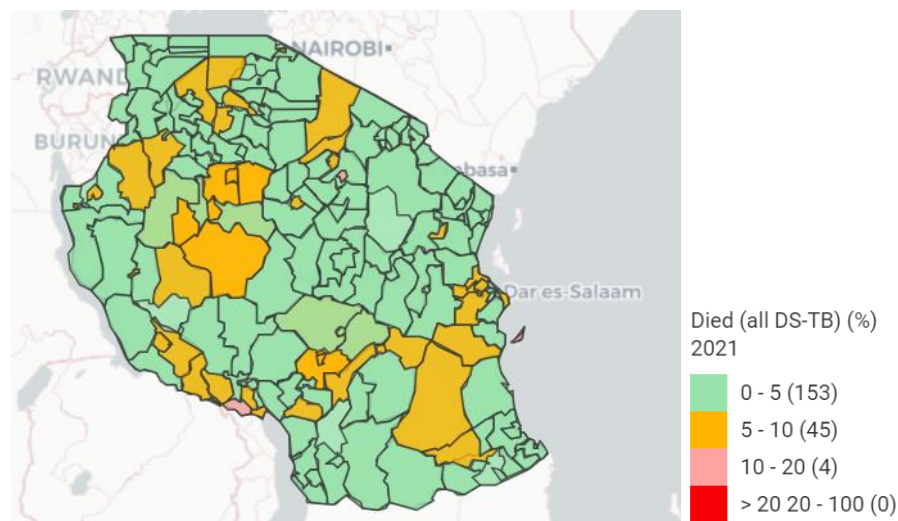
At national level, the proportion of treatment success for patients started on DS-TB treatment was continuously increasing since 2000 and reached 93.5% for new and relapse TB cases, 91.4% in previously treated cases, in 2022 (Figure 17). Among HIV-positive patients, the treatment success rate was also very high, 92.5% in 2022.

Figure 17 - Treatment success rate (%) in DS-TB, 2000-2021



This increase in treatment success is mainly driven by the decrease in the proportion of deaths: from 12% in 2000 to 5.9% in 2015 and to 3.2% in 2021. However, there is heterogeneity in death rate across the country. As shown in Figure 18, in 2021 45 DC had a death rate between 5 and 10%, and 4 between 10 and 20%.

Figure 18 - Proportion of TB cases who died after starting DS-TB treatment in 2021



The lost to follow-up rate was relatively low, accounting for less than 1% for those who started DS-TB treatment in 2021.

Childhood TB

Since 2015, the proportion of notified TB cases who are children less than 15 years old increased and was 17% in 2022 (Figure 19). However, disparities across regions existed (Figure 20): the highest proportion was observed in Simiyu with 25% of notified TB cases < 15 years old, 23% in Dodoma, 15% in Dar es Salaam and only 9% in Mbeya and Njombe.

Figure 19 - Proportion of children < 15 years old among new and relapse TB cases, 2015-2022

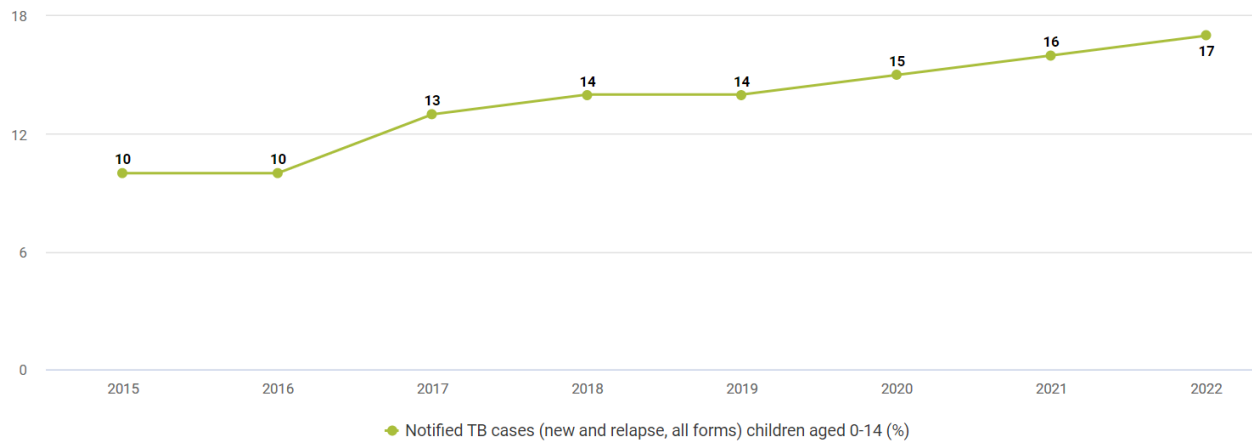
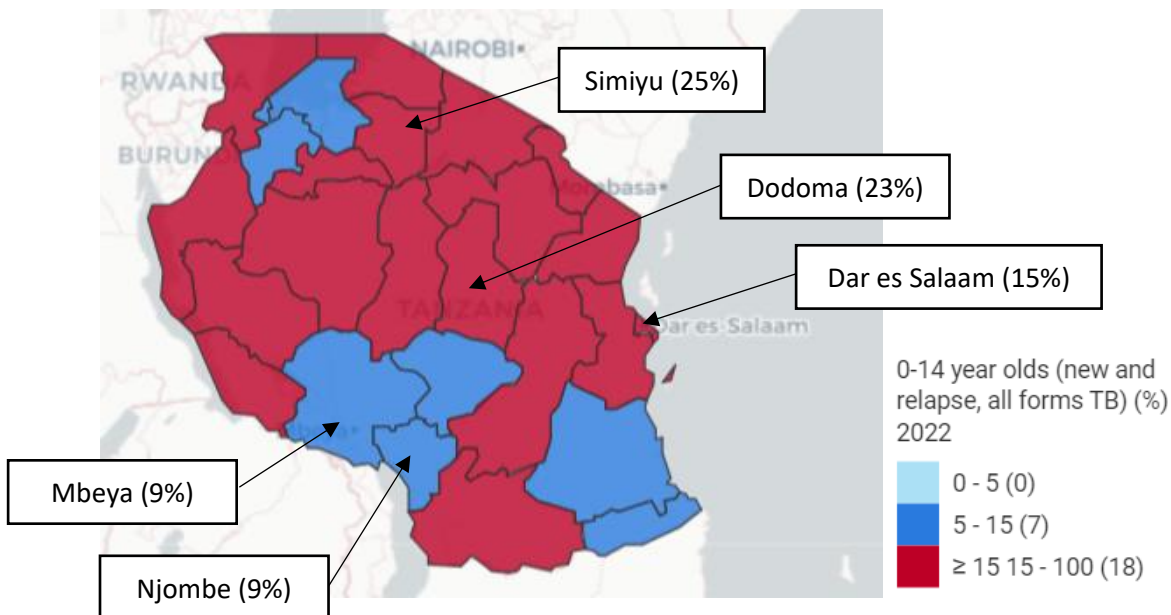


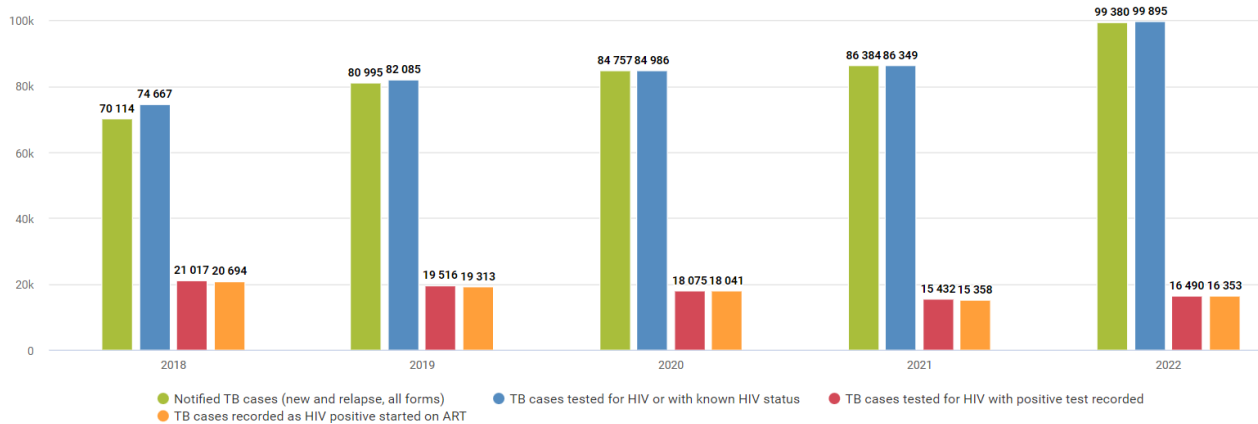
Figure 20 - Proportion of children < 15 years old among new and relapse TB cases by regions



HIV-associated TB

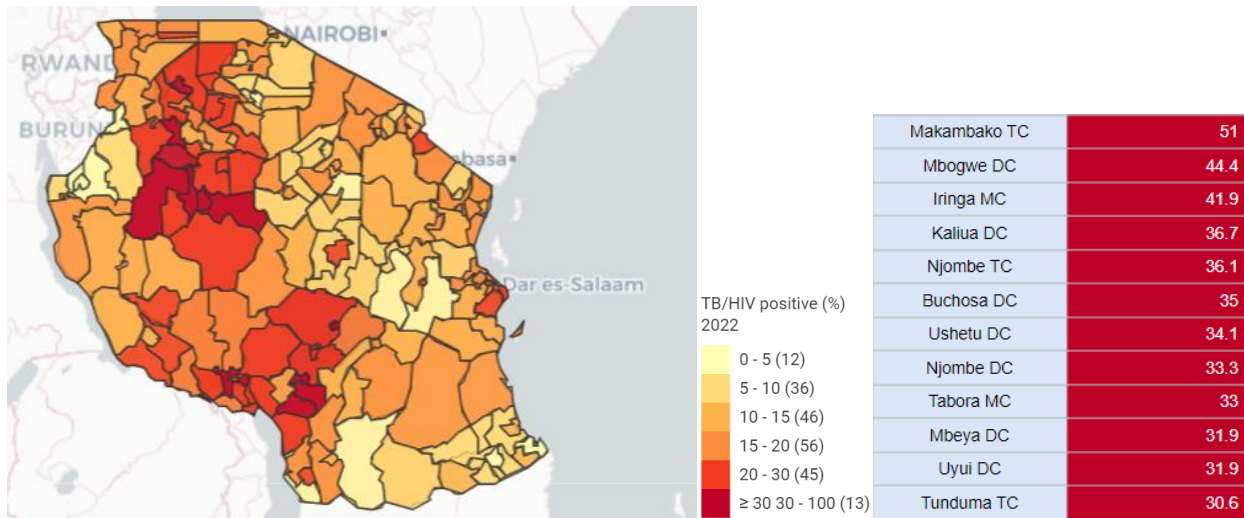
The cascade of care for people co-infected with TB and HIV (Figure 21) shows that most of TB cases were tested for HIV and that almost all people co-infected with HIV started in ART. In 2022, 16 353/16 490 (99.2%) notified TB cases were started on ART.

Figure 21 - Cascade of care for TB cases tested and co-infected with HIV, 2018-2022



The proportion of TB cases tested positive for HIV varied widely between DC (Figure 22). There were 12 DC where the proportion of HIV-positive among TB cases was < 5%, while this proportion was > 30% in 13 other DCs.

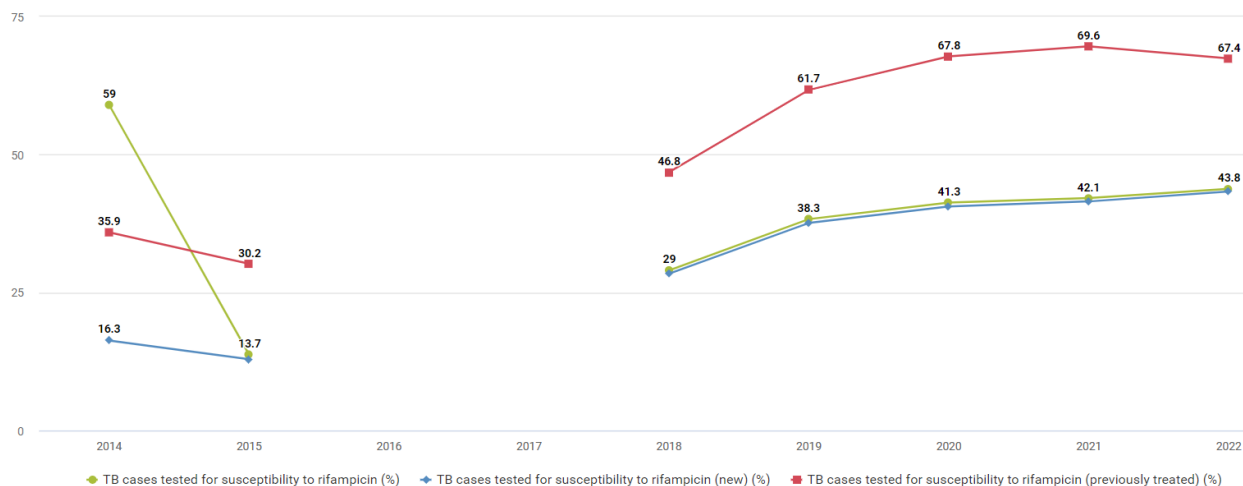
Figure 22 - Proportion of TB cases co-infected with HIV at district council level in 2022 and the 13 district councils where HIV-positive was > 30%



Rifampicin resistant TB and multidrug resistant TB

In 2017-2018, the second national anti-tuberculosis drug resistance survey revealed an estimated 0.85% (95%CI 0.4-1.3) prevalence of RR/MDR-TB among new cases and 4.6% (95%CI 1.1-8.2) among previously treated cases. Given the low level of bacteriological confirmation, the coverage for resistance testing is low: 43.8% of notified new TB cases were tested for rifampicin resistance in 2022 (Figure 23).

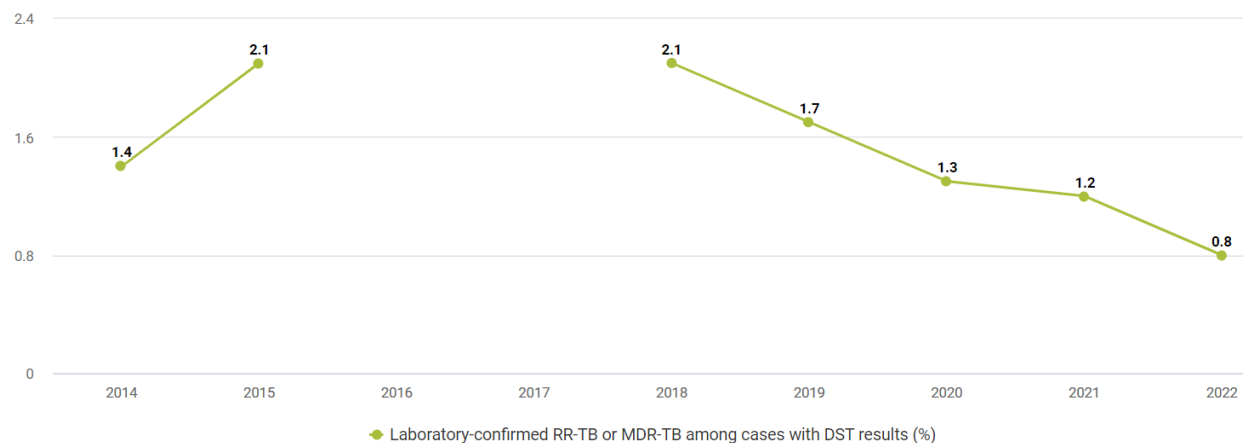
Figure 23 - Proportion of notified TB cases tested for rifampicin resistance at national level, 2014-2022



Note: data were missing for 2016 and 2017

The proportion of TB cases with laboratory confirmed RR/MDR-TB decreased from 2.1% in 2018 to 0.8% in 2022 (Figure 24). However, these numbers should be considered with caution since less than half of the TB cases were bacteriologically confirmed. The proportion of laboratory confirmed RR/MDR-TB cases who started on MDR-TB treatment was constant over the last 4 years and was 87.7% in 2022 (88.7% in 2019).

Figure 24 - Proportion of TB cases with laboratory confirmed RR/MDR-TB, 2014-2022



Note: data were missing for 2016 and 2017

The recommended treatment regimens for multidrug-resistant TB in the United Republic of Tanzania are:

Longer regimen 18 - 20 Months, started being used in December 2019.

Initial 6 months: Bedaquiline, Levofloxacin, Linezolid, Clofazimine, Cycloserine

Continuation phase 12-14 months: Levofloxacin, Clofazimine, Cycloserine

Shorter regimen 9 - 11 months, started being used in June 2020.

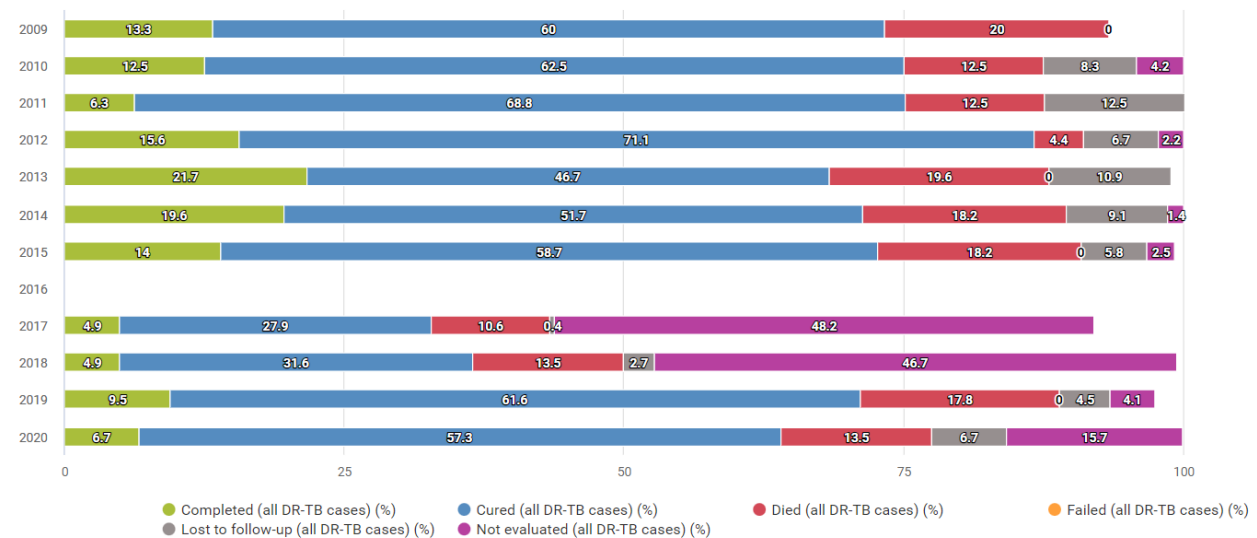
Initial 6 months: Bedaquiline, Levofloxacin, Linezolid, Clofazimine, Cycloserine, Pyrazinamide

Continuation phase 3 - 5 months: Levofloxacin, Clofazimine, Cycloserine, Pyrazinamide

Among RR/MDR-TB cases who started MDR-TB treatment in 2020, the success rate was 64%. However, 15.7% of those had no outcome evaluation at the time the report was written which might underestimate the true success rate.

In 2017 and 2018, 48.2% and 46.7% of RR/MDR-TB cases who started MDR-TB treatment had no end of treatment outcome (Not evaluated). A review of those cases would be needed to update the data. The same process should be repeated for each cohort on a yearly basis.

Figure 25 - Treatment outcomes of patients started on MDR-TB treatment, 2009-2020



Note: data were missing for 2016

Analysis of the level of clinical diagnosis

Data available

Export of raw data from ETL were provided by the NTLP for the region of Dar es Salaam for year 2022 and for all regions for the year 2021.

Methods

Only adults (>15years old) TB cases who started treatment were included in this analysis. Laboratory confirmation was defined as: Xpert positive or sputum smear microscopy positive or culture positive. TB cases registered in ETL who had no data on proof of laboratory confirmation were considered as clinically diagnosed TB cases.

Proportion of clinically diagnosed and laboratory confirmed TB cases were described and proportions were stratified by type of TB disease and HIV status. In addition, clinically diagnosed TB cases were stratified in sub-categories: with negative bacteriological evidence (Xpert or sputum smear microscopy negative) and without negative bacteriological evidence.

Results

Dar es Salaam region for 2022

A total of 13 975 adult TB cases who started on treatment in 2022 were included in this analysis. Among them, 6 262 (44.8%) were bacteriologically confirmed: 4 055 (64.8%) had a positive Xpert and 2 206 (35.2%) had a positive smear microscopy. A total of 7 713 (55.2%) TB cases were clinically diagnosed and among them 4 578 (59.4%) had a negative Xpert and 1 205 (15.6%) had a negative smear microscopy while only 1 930 (25.0%) had no evidence of a negative bacteriological test (Table 1). These proportions did not vary strongly according to the type of TB disease and HIV status. Despite an expected higher proportion of clinically diagnosed EPTB, we still observed a high rate of clinically diagnosed PTB in cases with evidence of a negative bacteriological test.

Table 1 – Type of TB diagnosis in Dar es Salaam region, 2022

	Bacteriologically confirmed N=6262	Clinically diagnosed N=7713		
		Xpert negative N (%)	Sputum smear microscopy negative N (%)	No evidence of negative bacteriological result N (%)
Overall	6262 (100)	4578 (59.4)	1205 (15.6)	1930 (25.0)
Type of disease				
EPTB	37 (0.6)	981 (21.4)	189 (16.7)	483 (25.0)
PTB	6179 (98.7)	3589 (78.4)	1015 (84.2)	1437 (74.5)
Both	46 (0.7)	8 (0.2)	1 (0.1)	10 (0.5)
HIV-status				
Negative	5140 (82.1)	3558 (77.7)	874 (72.5)	1448 (75.0)
Positive	1119 (17.9)	1019 (22.3)	331 (27.5)	482 (25.0)
Missing	3	1	0	0

National level for 2021

At national level, 71 726 adult TB cases were notified and started on treatment in 2021. Among them, 28 328 (39.5%) were bacteriologically confirmed: 17 377 (61.3%) had a positive Xpert and 10 949 (38.7%) had a positive smear microscopy. A total of 43 398 (60.5%) TB cases were clinically diagnosed and among them 15 058 (34.7%) had a negative Xpert and 9 444 (21.8%) had a negative smear microscopy while the remaining 18 896 (43.5%) had no evidence of a negative bacteriological test (Table 2). A higher proportion of EPTB was observed among those clinically diagnosed, while no difference was found according to HIV-status. These results at national level pointed out that about 60% of the patients initiated on TB treatment while no bacteriological evidence and that among them, 56.5% initiated treatment while they had evidence of a negative bacteriological test (Xpert negative or smear microscopy negative).

Table 2 - Type of TB diagnosis at national level, 2021

	Bacteriologically confirmed N=28328	Clinically diagnosed N=43398		
		Xpert negative N (%)	Sputum smear microscopy negative N (%)	No evidence of negative bacteriological result N (%)
Overall	28328 (100)	15058 (34.7)	9444 (21.8)	18896 (43.5)
Type of disease				
EPTB	206 (0.7)	3089 (20.5)	1935 (20.5)	6755 (35.8)
PTB	28012 (98.9)	11943 (79.3)	7498 (79.4)	12097 (64.0)
Both	110 (0.4)	26 (0.2)	11 (0.1)	44 (0.2)
HIV-status				
Negative	23066 (82.1)	12115 (80.9)	7336 (78.1)	14575 (78.3)
Positive	5034 (17.9)	2852 (19.1)	2055 (21.9)	4049 (21.7)
Missing	228	91	53	272

Regional differences in clinical diagnosis

There was a high heterogeneity in the type of diagnosis and particularly in the level of adult notified TB cases who started on treatment clinically diagnosed with evidence of Xpert or smear microscopy negative. In some regions, more than 50% of notified TB cases starting on treatment had bacteriological evidence of a negative Xpert or smear microscopy (Figure 26). The median [IQR] proportion of TB cases started in treatment with bacteriological evidence of a negative Xpert or smear microscopy over region was 33.1% [IQR 26.2-41.1], showing that half of the regions started on TB treatment a third of people although they had bacteriological evidence of a negative Xpert or smear microscopy.

Figure 26 - Distribution of the type of diagnosis by region, 2021

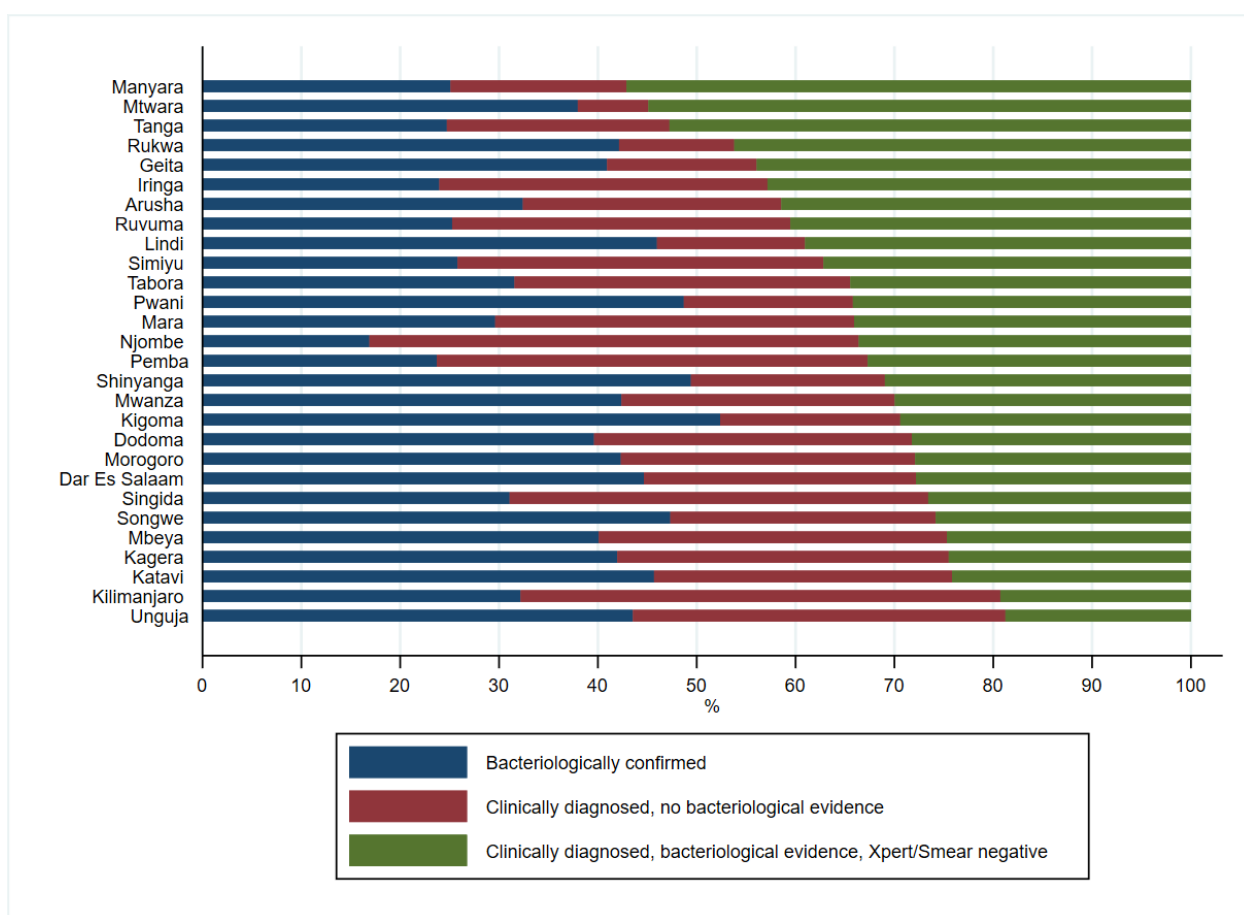
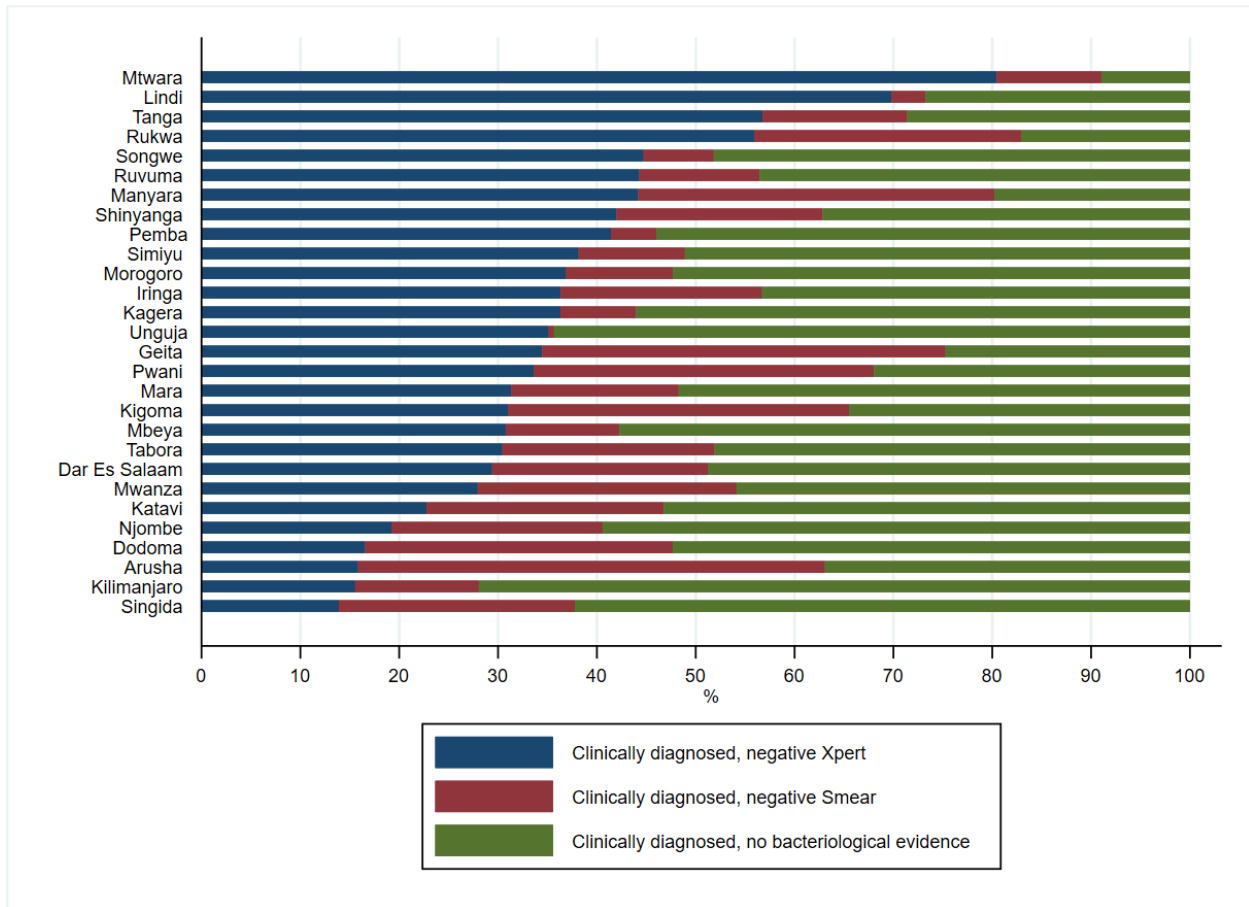


Figure 27 shows the proportion of TB cases clinically diagnosed stratified by bacteriological results documented (Xpert negative, smear microscopy negative, or no documented result) per region, sorted by the highest proportion of clinically diagnosed TB cases with documented evidence of a negative Xpert. Again, an important heterogeneity between regions existed: some regions at the top had more than 50% of clinically diagnosed TB cases started on treatment despite a negative Xpert result, while for the regions at the bottom, this proportion fell to < 20%. The median [IQR] proportion of clinically diagnosed TB cases started on treatment with a negative Xpert over region was 34.8% [IQR 28.7-43.1], showing that half of the regions started on TB treatment a third of people although they had a negative Xpert result.

Figure 27 - Distribution of the type of clinical diagnosis by region, 2021



Highlight from health facility visits

During the review, an urban primary health care facility Mnazi Mmoja (Dar Es Salaam) and a regional tertiary hospital Amana (Dar Es Salaam) were visited and registers for TB cases, presumptive TB cases and laboratory, as well as patient cards, and sputum specimen request forms for Q4 2022 were reviewed. Both facilities had multiple possible entries where people with presumptive TB can be identified through symptom screening for further examination. Both facilities had identified, and are screening for TB, clients attending outpatient departments, maternal & child health services, TB clinic and HIV clinic.

In Mnazi Mmoja, on average, per month (for Q3 and Q4 2022), there were 10 000 clients attending the facility, of which 9 000 were screened for TB, 100-200 identified with presumptive TB and 25%-50% confirmed with TB disease. Numbers based on OPD, maternal and child health, HIV and TB departments of the facility. Very well performing facility in terms of screening for TB (about 90% of people attending), and very high levels of TB diagnosis among those presumptive.

On the other hand, in Amana hospital for the same period, on average, per month, there were 15 000 clients attending the facility, there were no data reported for number screened (because there was no dedicated person for this), but the total number of TB cases was about 30-40 per month. Why is a hospital, serving the same community (same background prevalence) and seeing 50% more people from that community, only detect about 50% of the number of TB cases found in a PHC facility?

Further investigation is warranted, as well as similar data collected in other facilities (Table 3) to be able to monitor and strengthen the effort in screening for TB among people who are self-presenting for health care.

Table 3 - Cascade of TB cases diagnosed from OPD visits in mainland Tanzania, 2022

Number	Attended OPDs (visits)	Screened for TB (visits)	Presumptive TB (cases)	Tested for TB (cases)	Diagnosed TB (cases)
Q1	10,306,503	No data source	158,372	138,093	16,174
Q2	10,706,120		177,888	156,042	18,892
Q3	9,929,968		211,060	177,385	18,682
Q4	10,328,416		196,474	168,333	13,629
Total	41,271,007		743,794	639,853	67,377

Summary of standard and benchmarks checklist for TB surveillance

TB surveillance system data quality

(B1.1) Case definitions are consistent with WHO guidelines

Result: Met

NTLP forms and registers are consistent with WHO guidelines for reporting and within the country they are well recognised and used by all facilities offering TB services, as well as implementing partners.

(B1.2) TB surveillance system is designed to capture a minimum set of variables for reported TB cases

Result: Met

Paper forms and registers (2020 edition):

- TB01: TB treatment card
- TB02: TB identity card (with the patient)
- TB03: TB unit register
- TB05: TB laboratory register
- TB06: request and reporting form for TB culture and drug susceptibility testing
- TB10: IPT register for children under 5
- TB16: presumptive TB register (at TB point and other entry points e.g. OPD, HIV, maternal & child health)

Data collection system:

- ETL user guide (June 2022) for digital data capturing

There is a need to strengthen the definition and use of the patient identifier which now is not national. Currently this does not exist at the national level. People with TB disease are allocated as an ID number, the code for the health facility followed by the serial number (this is reset every year for each facility).

The NTLP should be part of the technical working group convened by MoH HMIS department on the establishment of a unique ID for health.

(B1.3) All scheduled periodic data submissions have been received and processed at the national level

Result: Partially met

There are no more paper reports sent from the health facility upwards. Case based data is captured digitally, either real-time in all BMUs and some of the smaller health facilities with data entry capacity, or during DTLC visits in all the rest of the health facilities (monthly or quarterly).

However, there is currently no check available in ETL for data entered by health facility. One simple check to include could be checking monthly or quarterly reports by facility and for those facilities with 0 case reported, to follow up and confirm if this is indeed 0 cases diagnosed or no data entered and reported.

(B1.4) Data in quarterly reports (or equivalent) are accurate, complete, and internally consistent (For paper-based systems only)

Result: **Partially met**

A SARA exercise was completed in 2020.

There is a lot of effort put into reviewing the accuracy and completeness of TB data captured in TB patient cards and all TB registers, as well as completeness of data capturing from paper registers into ETL/DHIS. This is part of the routine data quality assessments (RDQA) that are completed in randomly selected health facilities.

(B1.5) Data in national database are accurate, complete, internally consistent, and free of duplicates (For electronic case-based or patient-based systems only)

Result: **Partially met**

RDQA/EQA reports are currently about programmatic performance and not data quality in terms of completeness (missingness), accuracy (consistency checks) and timeliness, but they could be revised to do so.

There is NTLF guidance on data verification exercises and data quality assessments at facility, district, and regional levels.

No de-duplication exercises done today other than deterministically based on the district TB number (which is not national level).

(B1.6) TB surveillance data are externally consistent

Result: **Not met**

Percentage of bacteriologically confirmed TB is 43% in 2021.

Case notifications are increasing but exclusively due to an increase in clinically diagnosed TB. The decrease in percentage of bacteriologically confirmed TB over the last 5 years is about 10% (from 52% in 2017).

(B1.7) Number of reported TB cases is internally consistent

Result: **Partially met**

There is no national vital registration system with standard coding of cause of death data. The male to female ratio and the proportion of childhood TB are consistent over the last 5 years.

(B1.8) All diagnosed cases of TB are reported

Result: Partially met

TB reporting is a legal requirement.

Drug-resistant TB is included in the overall number of TB cases reported.

An inventory study was conducted in 2016 to measure underreporting from the lab data, excluding the private sector. A new inventory study should be conducted, supplemented by record linkage exercises.

(B1.9) Population has good access to health care

Result: Not met

The UHC service coverage index score was 46% in 2019.

(B1.10) Vital registration system has high national coverage and quality

Result: Not met

An interview was conducted with the civil registration agency: Registration Insolvency and Trusteeship Agency (RITA, responsibility for CRVS with the Ministry of Constitution and Legal Affairs).

There is a pilot that started in 2020 and has been carried out in 4 regions to collect cause of death data using ICD-10 coding. But collaboration with Ministry of Health is limited, hence data collected have not been coded or analysed. This effort should be revitalised.

A high-level intergovernmental collaboration and national consultation could be considered to define roles and responsibilities of the different actors and define a plan for the expansion of CRVS based on findings from the pilot.

Special populations

(B2.1) Surveillance data provide a direct measure of drug-resistant TB in new cases

Result: Met

Data on people diagnosed with drug resistant TB are captured digitally in ETL, the same system for people with drug susceptible TB, but with additional data elements.

Percentage of new pulmonary bacteriologically confirmed TB cases tested for rifampicin susceptibility is 90% (2021).

(B2.2) Surveillance data provide a direct measure of the prevalence of HIV infection in TB cases

Result: Met

Percentage of new and relapse TB cases with known HIV status is 99% (2021), consistently over the last 5 years.

(B2.3) Surveillance data for children reported with TB (defined as ages 0-14 years) are reliable and accurate AND all diagnosed childhood TB cases are reported

Result: Partially met

Rate ratio of age groups 0-4 to 5-14 years is 1.3 and has been consistent over time, within the recommended range in three of the last five years.

There is no direct measure of underreporting in children available.

However, tracing of household contacts of bacteriologically confirmed TB cases is taking place and children with TB disease are identified, while those eligible are put on IPT.

TB treatment outcome

(B3.1) Reporting of TB treatment outcomes are accurate, complete and consistent

Result: Met

Treatment outcome definitions are consistent with WHO guidelines.

Outcomes are reported per cohorts and disaggregated by new & relapse TB cases, HIV-positive TB cases, previously treated TB cases, DR-TB.

Cohort vs. number of notifications is part of regular reports generated by ETL.

Programme management of TB preventive therapy (PMTPT)

(B4.1) Data for Programme Management of TB Preventive Therapy (PMTPT) are accurate, complete, and consistent

Result: Partially met

Household contacts of bacteriologically confirmed TB cases are enumerated in the patient card, screened, eligible, start IPT, but not completion of IPT.

At the moment, the focus is children under five for the NTLTP, only IPT regimen (child formulation) is available.

Summary of progress: 2014-2023

During this review, WHO piloted the second edition of the surveillance checklist assessment, in which benchmarks for 5 standards were revised (B1.6, B1.8, B1.9, B1.10, B2.3), and new standards were proposed to increase the scope of prevention and treatment outcomes (B3.1 for treatment outcomes and B4.1 for TB prevention).

The summary of assessment results is presented in Table 4. According to this, 5 standards have been met, 7 partially met and 3 have not been met.

Table 4 - Standards & benchmarks assessment results: summary of the progress

Standards		2014	2018	2023 ^a
B1.1	Case definitions	Met	Met	Met
B1.2	Minimum set	Met	Met	Met
B1.3	Scheduled submissions	Not met	Partially met	Partially met
B1.4	Paper (quality)	Not met	Partially met	Partially met
B1.5	Electronic (quality)	Partially met	Partially met	Partially met
B1.6	External consistency ^b	Met	Met	Not met
B1.7	Internal consistency	Met	Met	Partially met
B1.8	All cases reported ^b	Not met	Partially met	Partially met
B1.9	Access to health care ^b	Not met	Not met	Not met
B1.10	VR coverage	Not met	Not met	Not met
B2.1	Drug-resistant TB	Not met	Partially met	Met
B2.2	TB-HIV	Met	Met	Met
B2.3	TB in children ^b	Not met	Not met	Partially met
B3.1	Treatment outcomes ^c			Met
B4.1	TB prevention therapy ^c			Partially met

^a 2023 assessment is preliminary, with some additional checks outstanding

^b updated benchmarks

^c new standards to increase scope for prevention and treatment outcomes

Met
Partially met
Not met
Not applicable
TBA – To be assessed

Recommendations

Integrated routine health information system

Digital health and information systems architecture

- Strengthen coordination and collaboration with MoH ICT and the PORALG as the various digital health platforms are being developed and rolled out, ensuring:
 - The TB programme’s needs are met in terms of data capturing for surveillance and M&E.
 - TB-related business processes remain intact.
 - Confidentiality of individual data is maintained.
- MoH M&E technical working group, supported by WHO CO: agenda item to engage with NTLP and other vertical programmes
- Follow closely the work of MoH on the establishment of a unique ID for the health system: advocate for participation of NTLP to the relevant working group.
- Strengthen data linkages with laboratory data: interoperability solution between DHIS2 and GX 360 software (savings from license fees for GX alert)

Routine TB surveillance system

Surveillance system strengthening (ETL/DHIS2)

- Review the WHO TB tracker (including lab and household modules) and use for local adaptation.
- Upload all shape files to allow GIS mapping (at least district, health facility coordinates).
- Upload new census data and projections of population estimates, at least district level, by age & sex.
- Strengthen data quality:
 - Develop a data quality app to monitor completeness and outliers (by type of facility).
 - Differentiate no reporting from 0 cases reported.
 - Implement a probabilistic approach for deduplication of the national ETL dataset (new WHO guidance).
 - Investigate simplification of data entry at the facility level through small scale OR E.g. consider the phase out of paper TB03, with the presumptive register TB16, lab register TB05 and treatment cards TB01 as backups. Define what “high” data quality is and monitor it in the pilot facilities.

System coverage

- Measure TB under-reporting with record linkage exercises (annually): e.g. record linkage between ETL and national level laboratory data.
- Repeat of the TB inventory study to map and measure under-reporting from the private sector.

Data use and dissemination for programme planning

Establish a national data working group with all relevant stakeholders

- Define clear terms of reference, roles & responsibilities.
- Recommended ToRs:
 - Develop a master analysis plan using the raw ETL, and other relevant, data. Plan should describe data collected, the objectives of routine surveillance and programmatic needs the analyses address. Redesign ETL dashboards according to this analysis plan.
 - Review and update score cards to include additional indicators to address gaps e.g. % bact.-conf. TB.
 - Develop an impact framework for all the programmatic interventions implemented by NTLP and IPs.

Promote routine use of ETL dashboards among all users through workshops, trainings, meetings

- Conduct data analysis and use workshops at all levels.
 - Make ETL dashboards available at all administrative units for subnational analyses (e.g. zone, region, district, health facility).
- Complete the subnational analysis and use of tuberculosis and leprosy data guideline. Develop associated training material.

Service delivery, case finding and quality of care

Reduce TB under-diagnosis

- Increase screening and testing coverage at the health facility, ensuring that the facility will have the resources to accommodate the added testing and patient management.
 - Intensified integration and monitoring of TB screening among OPD clients, and other relevant entry points of health facilities.
 - Consider using the laboratory component of DHIS2 tracker to capture data on presumptive TB.

Diagnostic algorithm, definition of clinically diagnosed using CXR reading

- Review the algorithm and in particular the use of CXR reading in the diagnosis of TB. Is “Suggestive for TB” specific enough to treat in a population with a lot of transmission and hence high prevalence of lung abnormalities even if healed TB?
 - Small scale OR study, review of medical records, re-reading of CXRs.
 - Further analyses of ETL data, since 2018, also disaggregated by region.

Private and mining sectors

- Expand the collaboration for the provision of TB care with the private and mining sectors and ensure adherence to national guidelines.
 - Strengthen the implementation of the national strategic plan for TB components on the private sector.

Understanding TB burden

Measure burden in general population

- National TB prevalence survey: plan a protocol development workshop, for key design and implementation decisions for the survey. E.g. GeneXpert use, CAD for TB, digital data management.

Vital registration of deaths with standard coding of cause of death

- Take a multisectoral approach to advocate for the rollout of the piloting of the vital registration ICD-10 system. A high-level, national, intergovernmental consultation to review progress from the piloting phase results and action plan for further roll-out.

Appendices

Appendix 1 – List of the persons met during the review

- Dr Moses Ringo - Results management office director-USAID Afya yangu Southern Zone
- Dr Leonard Benedict - Senior TB Manager USAID Afya Yangu Southern Zone
- Dr Goodluck Iyatuu - Director of Program MDH
- Dr Anna kiravu - TBHIV Manager MDH
- Mr Nicodem mgina - ITF GHS Laboratory Manager MDH
- Mr Frank Ntogwisangu - senior M&E MDH
- Mr Mura Ngowi - Laboratory Officer WHO
- Mr Claud Kumalija - Head HMIS MOH
- Mr Jackson Shayo - Senior ICT MOH
- Mr Henry Kalisti - Administrator UDSM DHIS 2 Lab
- Mr Ibrahim Wickama - Senior System Developer UDSM DHIS 2 Lab
- Mr Josephat Mwakuya - Senior System Developer UDSM DHIS 2 Lab
- Ms. Lilian Mkonyi - Senior system Analyst
- Mr Anthony Mugode - Laboratory Scientist-Dodoma Zonal Lab
- Mr Joseph Mawila - Laboratory Scientist Dodoma Zonal Lab
- Godwill Sanga - Laboratory Scientist Dodoma Zonal Lab
- Dr. Peres Lukango - RTLC Lukango
- Dr. Fatma Kibao - Acting Medical Officer Incharge Amana Regional Referral Hospital
- Dr.Magreth Ibobo - DTLC Amana TB and Leprosy District
- Sr. Hollo Kipole - TBHO Amana TB and Leprosy District
- Dr. Rashid Mfaume - RMO Dar es Salaam
- Dr. Ayoub Kibao - Zonal RTLC Dar es Salaam
- Dr. Shija Maganga - Zonal MDR TB Coordinator Eastern Zone
- Dr. Elizabeth Nyema - DMO Ilala Municipality
- Amri Kingalu - Laboratory Manager Central TB Reference Laboratory
- Stella Mwanjute - Assistant Data Manager Central TB Reference Laboratory

Appendix 2 – Agenda

DATE	Time	SCHEDULE	V
16 th Jan. 23	11:00 to 16:00	<ul style="list-style-type: none"> • Briefings with WHO CO, NTP on plans for the mission. • Meeting (WHO team & M&E NTLP) - CTRL <ul style="list-style-type: none"> ✓ PPT on “Overview of TB epidemiology and TB response in Tanzania” & Presentation on TB surveillance system, including digital solutions used. ✓ Overview of epi and TB Surveillance Assessment ✓ finalization of the agenda and site visits. 	WHO CO Dar es salaam
17 th Jan. 23	9:00 to 13:30	<ul style="list-style-type: none"> • Site visit <ul style="list-style-type: none"> ✓ RMO – Dar es Salaam ✓ Amana RR Hospital ✓ Mnazi mmoja Health Centre 	Dar es salaam
	14 to 16hrs	<ul style="list-style-type: none"> ✓ National reference lab – CTRL ✓ Regional medical offices 	
18 th Jan. 23	9:00 to 14:00	<ul style="list-style-type: none"> • Key partners implementing TB activities supporting the NTLP <ul style="list-style-type: none"> ✓ MDH ✓ Deloitte ✓ THPS 	Dar es salaam
	15:00 to 1630	<ul style="list-style-type: none"> • UDSM-COICT DHIS2 Team AFTERNOO 	Dar es salaam
19 th Jan. 23	9:00 to 13:00	<ul style="list-style-type: none"> • Interview with Institutions conducting studies/surveys on Health and TB in particular. <ul style="list-style-type: none"> ○ RITA (agency responsible for registration of deaths) 	Dar es salaam
20 th Jan. 23	9:00 to 12:00	<ul style="list-style-type: none"> • Travel to Dodoma (WHO team) 	
	13:00 to 17:00	<ul style="list-style-type: none"> • Interview with KVPs <ul style="list-style-type: none"> ✓ Miners Association Secretary ✓ Prisons - CMO • Interview with NTLP staff: <ul style="list-style-type: none"> ✓ PMDT (DR-TB) Coordinator, ✓ TB/HIV, Comorbidities Coordinator, ✓ Childhood TB Coordinator, ✓ PPM & Mining Coordinator, ✓ Research Coordinator. ✓ CTBC Coordinator (ACF) ✓ QI TB Coordinator (ACFs) 	Dodoma, Dodoma Kilimani

DATE	Time	SCHEDULE	V
		✓ + NTLP staff will be at the Office	
21 ST & 22 nd Jan. 2023		<ul style="list-style-type: none"> (weekend): analyses and synthesis of findings 	
23 rd Jan. 23	9:00 to 12:30	<ul style="list-style-type: none"> Visit and Interview with: <ul style="list-style-type: none"> ✓ MoH, Head of HMIS ✓ MoH, ICT Unit ✓ Regional/zonal TB reference lab ✓ Regional medical offices 	Dodoma,
	13:30 to 17:00	<ul style="list-style-type: none"> Interview with M&E Staff: <ul style="list-style-type: none"> ✓ Filling in of the TB Surveillance System Assessment checklist 	Dodoma, Kilimani
24 th Jan. 23	9:00 to 16:00	<ul style="list-style-type: none"> Visit missed appointment in Dodoma Analyses and synthesis of findings (cont.) <ul style="list-style-type: none"> ✓ Spillover from site visits and interviews, Completing surveillance checklist. 	Dodoma
25 th Jan. 23	9:30 to 12:30	<ul style="list-style-type: none"> Debriefing session with NTLP Staff & WHO. <ul style="list-style-type: none"> ✓ Physical & Virtual (CTRL) 	Dodoma Kilimani
	13:30 to 15:00	<ul style="list-style-type: none"> Debriefing session with NTLP and relevant stakeholders. <ul style="list-style-type: none"> ✓ Physical & Virtual 	Dodoma Kilimani
	17 to 19:30	<ul style="list-style-type: none"> Travel to Dar es Salaam 	

Appendix 3 – Data sources and documents required for the review

- TB care and prevention manual/guidelines, including for TB/HIV, MDR-TB and paediatric TB
- Previous TB Epi-review reports
- Documents related to TB surveillance and M&E
 - All SOPs (e.g. data recording, reporting, data quality checks and validation)
 - Case definitions, data dictionary
 - National TB surveillance database
 - Analytical plan
 - SOPs for supervision of health facilities and feedback procedures (e.g. checklists)
 - Confidentiality procedures
 - DQA reports
- Policy statement/law for mandatory reporting of TB cases
- Blank documents related to recording and reporting of TB data, for example:
 - Treatment registers
 - Treatment cards
 - Quarterly report forms
 - Lab register (including National Reference Laboratory)
 - HIV register
 - Etc...
- Most recent annual report
 - Including Quarterly reports sent to NTP from BMU over the period of one year
 - Routine quarterly reports received from NGOs, and non-NTP providers
- Documents related to training on TB surveillance and M&E
- List of all health facilities in the country (public, private, NGO etc)
- Latest National Strategic Plan
- National TB treatment guideline
- National MDR TB treatment guideline/manual
- National Strategic Plan - M&E plan
- GLC Mission report
- Reports from programme review or any other type of review conducted related to TB
- Reports from surveys/studies done in the last 10 years
- Reports from any audits of TB surveillance/studies/evaluation of data quality (especially one that was nationally representative)
- Document describing the overview of HMIS structure in the country, e-Health plan
- Documents related to HR (staffing and structure) for TB surveillance / M&E.
- Documents related to civil registration and vital statistics (e.g. national coverage of system, quality)

Additional data provided

- Extraction of the DHIS2 2022 data for Dar es Salaam (all TB cases)
- Extraction of the DHIS2 2021 data for all regions (all TB cases)
- Number of Xpert machines available per year (2015-2022)

Appendix 4 – Completed checklist

PART A: CHARACTERISTICS OF THE TB SURVEILLANCE SYSTEM

Before completing the checklist, it is important to characterise the national TB surveillance system. Please provide answers to the following questions.

COUNTRY NAME: Tanzania, United Republic of
2023

DATE OF ASSESSMENT: 16-25 January

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
<p>A1. How are data recorded for individual TB cases at the service delivery level (e.g. in TB diagnostic units, health centres, clinics)? <i>(Tick all that apply)</i></p>	<input checked="" type="checkbox"/> Data are recorded electronically on a national internet-based system <input type="checkbox"/> Data are recorded electronically on a state/provincial/regional internet-based system <input type="checkbox"/> Data are recorded electronically on a local system <input checked="" type="checkbox"/> Data are recorded on paper <input type="checkbox"/> Data are not recorded	<p>In BMUs (n=214) data are entered directly into the ETL/DHIS2 digital system.</p> <p>In some health facilities (n=300) with access to ETL, data are first captured in the primary paper sources - paper registers (presumptive TB (only monthly totals), TB register for those diagnosed with TB) and patient cards – and then entered into ETL/DHIS2.</p> <p>In the rest of the facilities (n=2500) that provide TB services, data are captured in paper registers and patient cards. District/Council level TB coordinators captures these data into ETL during their regular visits. For facilities that offer diagnosis and</p>	

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
		treatment these are monthly visits, for facilities that only offer treatment services these are quarterly visits.	
<p>A2. Do all service delivery points systematically use standardised TB data collection forms and tools?</p>	<p><input checked="" type="checkbox"/> Yes, completely <input type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all</p>	<p>Registers and forms are provided by NTLP free of cost (in addition to treatment and diagnosis consumables).</p> <p>All implementing partners carrying out case finding activities in facilities and the community are also using NTLP registers and forms.</p>	
<p>A3. Which TB cases are included in the national TB surveillance data? <i>(Tick all that apply)</i></p>	<p><input checked="" type="checkbox"/> All TB cases from all parts of the country <input type="checkbox"/> Some TB cases are excluded <input type="checkbox"/> Some part(s) of the country are excluded <input type="checkbox"/> Some case types are excluded <input type="checkbox"/> Some care providers, e.g. non-NTP providers, prisons, private practitioners, are excluded. <input type="checkbox"/> Others:</p>	<p>While no specific types of TB cases nor parts of the country are excluded, some sectors offering TB services might not be fully covered.</p> <p>District health office is responsible for licensing health facilities and maintain master facility lists. The DTLC</p>	

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
		<p>(district TB and leprosy coordinator) has access to this list, but it is unclear how they use it.</p> <p>TB treatment can only be accessed through the NTLP.</p> <p>Remote parts of the country have little to no access to health services.</p> <p>District military coordinators for TB are responsible for entering data into ETL from military hospitals.</p> <p>Some of the small mines are covered.</p> <p>Prisons with hospitals are also reporting data into ETL. Smaller prisons(?)</p> <p>Refugee camps also exist, with IOM support. They report people diagnosed with TB.</p>	
<p>A4. What types of TB data are available at the national level? <i>(Tick all that apply)</i></p>	<p><input type="checkbox"/> Patient level data that allow multiple episodes of TB in the same person to be identified are available</p> <p><input checked="" type="checkbox"/> Case level data are available for all of the country</p>	<p>No unique ID available for the health system. Use of national health insurance number is very limited (national health insurance coverage of the population is</p>	<p>Carry out record linkage exercises, probabilistic and deterministic, to deduplicate ETL data and also link with other TB databases.</p>

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
	<input type="checkbox"/> Case level data are available for parts of the country <input type="checkbox"/> Aggregated data are available, i.e. summaries for groups of cases	<p>currently at 15%). Coverage of national ID number is equally limited (and only restricted in adults).</p> <p>MoH HMIS department is leading a technical group on the development and implementation of a unique ID for health purposes.</p>	
A5. What is the expected frequency of data transmission from the first sub-national administrative level to the national level? <i>(Tick all that apply)</i>	<input checked="" type="checkbox"/> Real-time <input type="checkbox"/> More often than monthly <input checked="" type="checkbox"/> Monthly <input checked="" type="checkbox"/> Quarterly <input type="checkbox"/> Less often than quarterly	<p>Facilities with access to ETL; real-time</p> <p>For the rest it is either monthly or quarterly (during the DTLC visits).</p>	
A6. At what levels of the system are TB data systematically verified for accuracy, timeliness and completeness? <i>(Tick all that apply)</i>	<input checked="" type="checkbox"/> From the service unit upwards <input type="checkbox"/> From the 1 st administrative level upwards <input type="checkbox"/> From the 2 nd administrative level upwards <input type="checkbox"/> Only at the national level <input type="checkbox"/> Not at any level	<p>ETL has built in data quality and completeness checks. Data queries are generated automatically by ETL.</p> <p>For the rest of the facilities, as part of supervisory visits, DTLC checks for completeness and data queries. DTLC is responsible for resolving data queries from these facilities.</p>	<p>Is there a way for the national team to monitor if ETL data quality reports are run regularly?</p> <p>Is there a way in ETL to differentiate no data entry from reporting 0 cases?</p> <p>Review and update the cross-consistency checks in ETL.</p>

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
A7. What types of quality assurance procedures are systematically undertaken for TB data? (<i>Tick all that apply</i>)	<input checked="" type="checkbox"/> Quality controls are in place for the electronic surveillance system (automated checks at data entry and batch checking, plus SOPs) <input checked="" type="checkbox"/> Data are reviewed during supervisory monitoring visits to service units and sub-national levels (How often?) <input type="checkbox"/> Data are reviewed during meetings with TB staff (How often? _____) <input type="checkbox"/> Other (specify: _____)	ETL has built-in checks (see data quality document) Monthly or quarterly by DTLCs. DQA happen nationally once a year (see standard questionnaire)	
A8. Is feedback on TB data quality systematically provided to all lower reporting levels?	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all	Uncertain if DTLCs provide feedback to all health facilities. Data use at these facilities is also not done routinely. National level communicates to regions and districts. Communication to most facilities (that do not have access to ETL) is the responsibility of DTLCs.	Promote and strengthen the use of subnational data and ETL dashboards at all levels. Build capacity for interpretation of data visualizations, though the development of training material and delivery of workshops.
A9. When are national TB case data for a given calendar year considered ready for national analyses and reporting?	<input type="checkbox"/> Before April the following calendar year <input checked="" type="checkbox"/> Before May the following calendar year <input type="checkbox"/> Before June the following calendar year <input type="checkbox"/> On or after beginning of June the following calendar year	15 February most of the data are cleaned. By end of April the mop-up of a small amount of data cleaning to do with small facilities.	
A10. Are there national guidelines for recording and	<input type="checkbox"/> Yes. They are posted on the internet.	SOPs for data recording in forms and registers. Registers have	<i>Post on the website.</i>

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
reporting of TB data e.g. documentation or instructions? <i>(Tick all that apply)</i>	<input checked="" type="checkbox"/> Yes. They are available in a manual or other reference document, e.g. training materials <input type="checkbox"/> No	instructions on how to complete on the first page, that is not the case for forms. ETL manual on how to enter data, generate reports and implement data visualizations.	
A11. Does the national TB programme have a training plan which includes staff involved in data collection and reporting at all levels of the reporting process?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	NTLP has developed training material for recording and reporting, but there is no funding for regular trainings. Some funding is available for short courses for national and regional(?) staff	Develop a training plan for staff involved in data collection and reporting at all levels.
A12. How often do TB programme staff receive training specifically on TB surveillance (i.e. recoding and reporting of TB data)? <i>(Tick all that apply)</i>	<input type="checkbox"/> Training is routinely received at national and sub-national levels (How often?) <input checked="" type="checkbox"/> Training is received on an ad hoc basis <input checked="" type="checkbox"/> Staff receive training when they are hired <input type="checkbox"/> No routine training is received	Induction training is offered to new staff for M&E and when there are major changes in the surveillance system e.g. introduction of ETL or new features in ETL.	
A13. How many staff work on TB surveillance at the national level? <i>(Tick all that apply)</i>	<input type="checkbox"/> Epidemiologist, full-time () <input type="checkbox"/> Epidemiologist, part-time (_____) <input type="checkbox"/> Statistician, full-time / data manager <input type="checkbox"/> Statistician, part-time (_____)	NTLP has Strategic Information and Research Full time positions: 1 Head of Unit 2 M&E Officers	Number of staff is sufficient, additional skills would benefit the work of the team, such as data analysis and use, maintenance of ETL.

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
	<input type="checkbox"/> Data manager, full-time (_____) <input type="checkbox"/> Data manager, part-time (_____) <input type="checkbox"/> Data quality officers, full-time planned but not currently in post. Data quality officers, part-time (_____) <input type="checkbox"/> Other (specify:)	1 Data Manager (+2 assistants) 1 Data analytics 2 Data quality officers 6 Data clerks 1 Research coordinator 1 IT officer + Senior M&E officer 1 (seconded from the President's office)	Only one of these staff is a government employee, the rest are contractors (supported by GF, CDC and USAID). Sustainability of the team is a concern.
A14. Is a national TB surveillance report routinely produced and disseminated on an annual basis?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2021 report is published, 2022 will be available in October 2023. Delays are due to the lack of protected time from key staff or coordination with and contribution from stakeholders.	Consider if there are parts of the report that could be automated as part of digital visualization in ETL and elsewhere? Is all the content of the report being used? Is it worth considering a hybrid (digital and print) version e.g. Global TB Report
A15. Are there written goals of the surveillance system?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	National Strategic Plan for TB and Leprosy 2020-2025 "To ensure implementation of evidence-based interventions and decision making though institutionalized efficient M&E system, and coordination of researches by 2025"	

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
A16. Policies and procedures are in place to protect the confidentiality of all surveillance data e.g. records, registers.	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly (names only appear on TB registers/treatment cards/lab registers at facility level) <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all	<p>Last available guidance from the MoH on data confidentiality was developed in 2016.</p> <p>“Electronic data sharing and exchange guideline”</p> <p>Not since the introduction of ETL.</p>	
A17. Is there a long-term financial plan and budget in place to support TB surveillance activities?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<p>There is an associated to the NSP for TB financial plan and costing exercise that is partially funded.</p>	<p>Ensure availability of funding for maintaining and further strengthening according to identified needs, the SI team and</p>
A18. When was the last time the TB surveillance system was evaluated?	<input checked="" type="checkbox"/> Within the past 5 years <input type="checkbox"/> Within the past 5-10 years <input type="checkbox"/> Never (in a systematic and standardised way, but as part of programme reviews)	<p>2018 was the last implementation of the surveillance checklist of standards and benchmarks.</p>	
A19. Are standardised forms available at the service delivery level for recording cased-based data on number of contacts identified, number of contacts screened, number of contacts enrolled on	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all	<p>Patient cards have a section on listing household contacts, eligibility and TPT start, but not outcome of TPT.</p> <p>IPT paper register also exists, started IPT and outcome.</p> <p>ETL does not have date on completion of IPT.</p>	<p>When the forms are updated, include completion of TPT data element.</p>

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
preventive treatment and associated TPT outcomes?			
A20. Are standardised forms available at the service delivery level for recording case-based data on number of PLHIV screened for TB, number enrolled on preventive TB treatment and associated TPT outcomes?	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all	<p>CTC2 card from the HIV clinic, capturing screening for TB, started TB treatment and started TPT.</p> <p>TPT completion ?</p>	
A21. Are quality assurance SOPs and mechanisms in place to systematically verify reported TPT data?	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all	<p>During data quality assessments, there is a check of number of children identified equals to those who started IPT.</p> <p>Number of household contacts is difficult to establish from ETL.</p> <p>There is an issue with section I from the summary ETL report for TB and TB/HIV</p> <p>Add an element on households visited</p> <p>Calculate household coverage for contact tracing</p>	

QUESTIONS	OUTCOMES (Best practises are in bold)	Description details	KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
A22. Are quality assurance SOPs and mechanisms in place to systematically verify and validate the assigned treatment outcomes?	<input type="checkbox"/> Yes, completely <input checked="" type="checkbox"/> Mostly <input type="checkbox"/> Partially <input type="checkbox"/> No, not at all		

PART B (Section 1): CHECKLIST FOR TB SURVEILLANCE AND VITAL REGISTRATION SYSTEMS

For each standard, please assess whether the system is able to satisfy the associated benchmark(s), using the methods recommended in the user guide. Indicate ‘Met’, ‘Partially met’, ‘Not met’ or ‘Not applicable’ in the results column. Describe the key results and any action recommended to improve the quality of the system in the last two columns.

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
TB SURVEILLANCE SYSTEM DATA QUALITY			
B1.1 Case definitions are consistent with WHO guidelines	<p>All three benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> Laboratory-confirmed casesⁱ are distinguished from clinically diagnosed cases New cases are distinguished from previously treated cases Pulmonary cases are distinguished from extra-pulmonary cases 	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>NLP forms and registers are consistent with WHO guidelines for reporting and within the country they are well recognised and used by all facilities offering TB services, as well as implementing partners.</p>
B1.2 TB surveillance system is designed to capture a minimum set of variables for reported TB cases	<p>Data are routinely collected for at least each of the following variables:</p> <ul style="list-style-type: none"> Age or age group Sex Year of registration Bacteriological results History of previous treatment Anatomical site of disease For case-based systems, a patient identifier 	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>2020 edition of paper forms and registers. TB01: TB treatment card TB02: TB identity card (with the patient) TB03: TB unit register TB05: TB laboratory register TB06: request and reporting form for TB culture and drug susceptibility testing TB10: IPT register for children under 5 TB16: presumptive TB register (at TB point and other entry points e.g. OPD, HIV, maternal & child health)</p> <p>ETL user guide (June 2022) for digital data capturing.</p> <p>Strengthen the definition and use of the patient identifier which at the moment is not national. Currently this does not exist at the national level. People with TB disease are allocated as an ID number, the code for the health facility followed by the serial number (this is reset every year for each facility).</p> <p>How do you link information on one individual across the different forms and registers? Lab register does not have the “National ID number”. What are the “TB number” (district TB number is</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
			<p>automatically generated), “DR-TB number” (district DR-TB number is automatically generated) and “lab serial number”?</p> <p>What about NIDA – National Identification Authority?</p> <p>NTLP to be part of the technical working group convened by MoH HMIS department on the establishment of a unique ID for health.</p>
<p>B1.3 All scheduled periodic data submissions have been received and processed at the national level</p>	<p><i>For paper-based systems:</i></p> <ul style="list-style-type: none"> 100% of expected reports from each TB basic management unit have been received and data aggregated at national level <p><i>For national patient-based or case-based electronic systems that import data files from sub-national (e.g. provincial or regional) electronic systems:</i></p> <ul style="list-style-type: none"> 100% of expected data files have been imported 	<p><input type="checkbox"/> Met</p> <p><input checked="" type="checkbox"/> Partially met</p> <p><input type="checkbox"/> Not met</p> <p><input type="checkbox"/> Not applicable</p>	<p>There are no more paper reports sent from the health facility upwards. Case based data is captured digitally, either real-time in all BMUs and some of the smaller health facilities with data entry capacity, or during DTLC visits in all the rest of the health facilities (monthly or quarterly).</p> <p>However, there is currently no check available in ETL for data entered by health facility. One simple check to include could be checking monthly or quarterly reports by facility and for those facilities with 0 cases reported, to follow up and confirm if this is indeed 0 cases diagnosed or no data entered and reported.</p>
<p>B1.4 Data in quarterly reports (or equivalent) are accurate, complete, and internally consistent (<i>For paper-based systems only</i>)</p>	<p>All benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> Sub-totals of the number of TB cases by age group, sex, and case type equals the total number of reported TB cases in $\geq 95\%$ of quarterly reports (or equivalent) from BMUs. The number of TB cases in $\geq 95\%$ of quarterly reports (or equivalent) matches the number of cases recorded in BMU TB registers and source documents (patient treatment cards and laboratory register) Data for a minimum set of variables are available for $\geq 95\%$ of the total number of 	<p><input type="checkbox"/> Met</p> <p><input checked="" type="checkbox"/> Partially met</p> <p><input type="checkbox"/> Not met</p> <p><input type="checkbox"/> Not applicable</p>	<p>A SARA exercise was completed in 20xx including</p> <p>There is a lot of effort put into reviewing the accuracy and completeness of TB data captured in TB patient cards and all TB registers, as well as completeness of data capturing from paper registers into ETL/DHIS. These exercises are part of the routine data quality assessments (RDQA) that are completed in randomly selected health facilities.</p> <p>RDQA unit selection: From data review they identify units they would like to assess. NTRL supervises regions, districts and facilities (2 per day).</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
	reported TB cases in quarterly reports.		
B1.5 Data in national database are accurate, complete, internally consistent, and free of duplicates (<i>For electronic case-based or patient-based systems only</i>)	<p>All benchmarks should be met to reach this standard:</p> <ul style="list-style-type: none"> Data validation checks are in place at national level to identify and correct invalid, inconsistent, and missing data in the minimum set (B1.2) For each variable in the minimum set (standard B1.2), > 90% of case records are complete, valid and internally consistent for the year being assessed <1% of case records in the national dataset for the year being assessed are unresolved potential duplicates. 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Partially met <input type="checkbox"/> Not met <input type="checkbox"/> Not applicable	<p>RDQA/EQA reports are currently about programmatic performance and not data quality in terms of completeness (missingness), accuracy (consistency checks) and timeliness, but they could be revised to do so.</p> <p>There is NTLP guidance on data verification exercises and data quality assessments at facility, district and regional levels: NTLP_DQA_orientation_manual.</p> <p>No de-duplication exercises, other than deterministically based on the district TB number (which is not national level).</p>
B1.6 TB surveillance data are externally consistent	<p>All benchmarks should be met to reach this standard:</p> <ul style="list-style-type: none"> % of bacteriologically confirmed among pulmonary new and relapse cases ranges between 70 and 90%. Year-to-year change of TB notification rates (new relapse, all forms) is consistent with the year-to-year change of pulmonary bacteriologically confirmed notification rates (the trajectories follow the same direction). Overall percentage of decline in proportion of bacteriologically confirmed 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Not met	<p>Percentage of bacteriologically-confirmed TB is 43% (2021). Case notifications are increasing but exclusively due to an increase in clinically-diagnosed TB.</p> <p>The decrease in percentage of bacteriologically-confirmed TB over the last 5 years is about 10% (from 52% in 2017).</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
	pulmonary TB cases over the five years preceding the year of the assessment does not exceed 5%		
<p>B1.7 Number of reported TB cases is internally consistent</p>	<p><i>If vital registration data are available, then the following benchmark should be satisfied for this standard to be met:</i></p> <ol style="list-style-type: none"> 1. Year-to-year change in the national number of reported TB cases is consistent with year-to-year change in national TB mortality (HIV-negative, from national vital registration) i.e. trajectories with the same direction. <p><i>If vital registration data are not available, then the following benchmarks should be satisfied for this standard to be met:</i></p> <ol style="list-style-type: none"> 2. Ratio of notified pulmonary to extra-pulmonary TB cases 3. Ratio of male to female TB cases 4. Proportion of childhood TB out of all TB cases 5. Year-to-year change in the case notification rate for all forms of TB 6. Year-to-year change in the case notification rate for new smear-positive TB <p>and if data are available,</p> <ol style="list-style-type: none"> 7. Ratio of the number of people with presumptive TB to total notifications of TB cases 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>There is no national vital registration system with standard coding of cause of death data.</p> <p>Ratio of male:female, proportion of childhood TB are consistent over the last 5 years</p>
<p>B1.8 All diagnosed cases of TB are</p>	<p>All benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> • TB reporting is a legal requirement. 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Partially met	<p>TB reporting is a legal requirement. Drug-resistant TB is included in the overall number of TB cases reported.</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
reported	<ul style="list-style-type: none"> All case types, including drug-resistant TB, are included in the overall number of cases reported. ≥90% of TB cases are reported to national health authorities, as determined by a national-level investigation (e.g. inventory study) conducted in last 10 years 	<input type="checkbox"/> Not met	An inventory study was conducted in 2016 to measure underreporting from the lab data, excluding the private sector. A new inventory study should be conducted, supplemented by record linkage exercises.
B1.9 Population has good access to health care	<ul style="list-style-type: none"> UHC service coverage index score is >80 (SDG indicator 3.8.1) 	<input type="checkbox"/> Met <input type="checkbox"/> Partially met <input checked="" type="checkbox"/> Not met	46% for 2019.
B1.10 Vital registration system has high national coverage and quality	<ul style="list-style-type: none"> Vital registration data provided by CVRS is evaluated as either “1-High” or “2-Medium” <p>ghe2019_cod_methods.pdf (who.int)</p>	<input type="checkbox"/> Met <input type="checkbox"/> Partially met <input checked="" type="checkbox"/> Not met	<p>Interview with civil registration agency = Registration Insolvency and Trusteeship Agency (responsibility for CRVS with the Ministry of Constitution and Legal Affairs). There is a pilot that started in 2020 and has been carried out in 4 regions to collect cause of death data using ICD-10 coding. But collaboration with Ministry of Health is limited, hence data collected have not been coded or analysed. This effort should be revitalised.</p> <p>A high-level intergovernmental collaboration and national consultation could be considered to define roles and responsibilities of the different actors and define a plan for the expansion of CRVS based on findings from the pilot.</p>
Part 2			
STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
B2.1 Surveillance data provide a direct measure of drug-resistant	<p>One of the two benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> Rifampicin susceptibility status (positive/negative) documented for ≥75% of new pulmonary 	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>Data on people diagnosed with drug resistant TB are captured digitally in ETL, the same system for people with drug susceptible TB, but with additional data elements.</p> <p>Percentage of new pulmonary bacteriologically confirmed TB cases tested for rifampicin susceptibility is 90% (2021).</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
TB in new cases	<p>bacteriologically confirmed TB cases</p> <ul style="list-style-type: none"> Rifampicin susceptibility status (positive/negative) documented for a nationally representative drug resistance survey of new pulmonary TB cases 		
B2.2 Surveillance data provide a direct measure of the prevalence of HIV infection in TB cases	<p>One of the two benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> HIV status (Positive/Negative) documented for >80% of all notified TB cases HIV status is available from a representative sample from all TB cases notified in settings with a low-level epidemic state where it is not feasible to implement routine surveillance. 	<input checked="" type="checkbox"/> Met <input type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>Percentage of new and relapse TB cases with known HIV status is 99% (2021), consistently over the last 5 years.</p>
B2.3 Surveillance data for children reported with TB (defined as ages 0-14 years) are reliable and accurate AND all diagnosed childhood TB cases are reported	<p>Both of the benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> Rate Ratio of age groups 0-4 to 5-14 years is in the range 1.5-3.0 >90% of childhood TB cases are reported to national health authorities, as determined by a national-level investigation (e.g. inventory study) conducted in last 10 years 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>Rate ratio of age groups 0-4 to 5-14 years is 1.3 and has been consistent over time, within the recommended range in three of the last five years.</p> <p>There is no direct measure of underreporting in children available.</p> <p>However, tracing of household contacts of bacteriologically confirmed TB cases is taking place and children with TB disease are identified, while those eligible are put on IPT.</p>
Part 3			
STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
B3.1 Reporting of TB	<p>All of the benchmarks should be satisfied to meet this standard:</p>	<input checked="" type="checkbox"/> Met	<p>Yes, treatment outcome definitions are consistent with WHO guidelines.</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
treatment outcomes are accurate, complete and consistent	<ul style="list-style-type: none"> • Treatment outcome definitions are consistent with WHO guidelines. • Treatment outcomes of TB patients at national level can be disaggregated by at least the following variables: New and relapse; HIV status; laboratory confirmed RR-TB. • Reported number of patients with treatment outcomes matches the number of patients notified in the cohort, accounting for the number of patients enrolled onto RR-TB treatment (new and relapse, TB/HIV, RR-TB). • Assignment of treatment outcomes among bacteriologically confirmed TB cases in at least 95% of patients is correct as determined by Primary health Care Assessment Report (former SARA). 	<input type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>Outcome reporting cohorts: new & relapse TB cases, HIV-positive TB cases, previously treated TB cases, DR-TB</p> <p>Cohort vs. number of notifications is part of regular reports generated by ETL.</p>
Part 4			
B4.1 Data for Programme Management of TB Preventive Therapy (PMTPT) are accurate, complete and consistent	<p>All of the benchmarks should be satisfied to meet this standard:</p> <ul style="list-style-type: none"> • M&E indicators for PMTPT is consistent with WHO guidelines: <ol style="list-style-type: none"> 1. Contact investigation coverage, 2. TPT coverage (disaggregated by PLHIV, contacts < 5 years of age and 5 years and older), 3. TPT completion (disaggregated by regimens lasting 6 months or more and others lasting less than 6 months). • PMTPT dataset contains the minimum variables for monitoring TPT at three important instances of PMTPT: 	<input type="checkbox"/> Met <input checked="" type="checkbox"/> Partially met <input type="checkbox"/> Not met	<p>Household contacts of bact-conf TB cases are enumerated in the patient card, screened, eligible, start IPT, but not completion of IPT.</p> <p>At the moment the focus is children under five for the NTLT, only IPT regimen (child formulation) is available.</p>

STANDARD	BENCHMARK(S)	RESULTS	RESULTS (DESCRIPTION) INCLUDING KEY ACTION(S) REQUIRED TO ADDRESS THE GAPS
	<ol style="list-style-type: none"> 1. Assessment of contacts of TB patients 2. Assessment of PLHIV and other at-risk groups. 3. Initiation and completion of TPT. <ul style="list-style-type: none"> • TPT registers and individuals forms (paper or electronic) are complete and accurate as determined by Primary Health Care Assessment Report (former SARA) 		

ⁱ i.e. by smear, culture or WHO-endorsed molecular test (e.g. Xpert MTB/RIF).