



MINISTRY OF HEALTH

NATIONAL TUBERCULOSIS AND LEPROSY PROGRAMME

2021 ANNUAL REPORT

EXECUTIVE SUMMARY

Zambia has completed the implementation of the National TB Strategic Plan (2017-2021) that set in motion the TB elimination agenda in Zambia through coordinated and accelerated TB response. During this period, the National TB and Leprosy Programme (NTLP) registered tremendous success. The NTLP is poised to attain the ambitious goal pronounced by the government of eliminating TB by 2030, in line with the Sustainable Development Goals (SDGs) and the World Health Organization End TB Strategy. The programme exponentially increased TB notifications from as low as 35,922 people with TB in 2018 to 40,726 in 2020 and in 2021 the TB notifications rose to 50,825 (a 25% increase against 2020 performance). The NTLP also registered incredible success in sustaining high TB Preventive Treatment (TPT) initiations among persons living with HIV and a high TB treatment success rate among drug-susceptible TB cases. New and relapse TB notifications in children below 15 years increased by 43%, from 2,724 in 2020 to 3,890 in 2021. TB notifications ratio between children aged 0-4 and 5-14 was 0.9, an improvement from what we achieved in 2018 (the ratio was 0.7). The proportion of TB patients who are HIV positive continued to decrease, reaching 34% in 2021 from 39% in 2020. Sustained increases in TB notifications, treatment success rate, and TPT initiations have resulted in a rapid decrease in the TB incidence rate that reached 307 per 100,000 population in 2021 against a rate of 391 in 2015.

Zambia has reduced TB incidence by 18%, close to achieving the 2020 Global End TB Strategy Milestone of 20% compared to the 2015 baseline. Globally, TB incidence declined by 11% in the same period. We sustained the weekly TB surveillance. Data from the weekly surveillance is discussed during the weekly TB situation room every Thursday. Staff from the national, provinces, districts and health facilities participate in these weekly TB situations. Cooperating and implementing partners, community-based organizations, and TB and HIV patient groups also participate in the TB situation room.

Despite the outstanding achievements the NTLP registered in several core indicators in 2021, we encountered some challenges and gaps. The number of multi-drug resistant and rifampicin resistance TB (MDR/RR-TB) who started second-line treatment declined to 420. Factors leading to this decline are being investigated, considering that the sum total of bacteriologically confirmed drug-sensitive TB patients increased. Most of our drug-resistant TB is detected through GeneXpert. In 2021, data capturing, and reporting were still paper-based, making it difficult for the programme to access patient-level data.

The focus in 2022 is to sustain or exceed the performance of 2021 regarding TB notifications and treatment success for drug-susceptible and drug-resistant TB in children and adults. Contact investigations among contacts of bacteriologically confirmed TB patients will remain a priority intervention. The goal in 2022 is to reach saturation of TB preventive treatment (TPT) among people living with HIV and increase the coverage of TPT in the under-five contacts to at least 50% from 28% in 2020. Transitioning to a digital, case-based TB surveillance from the paper-based system for TB will receive attention in 2022.

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List of Acronyms

6H:	Six months of Isoniazid
ART:	Antiretroviral Treatment
CDC:	Centres for Disease Control and Prevention
CHAZ:	Churches Association of Zambia
CIDRZ:	Centre for Infectious Disease Research in Zambia
CITAM plus:	Community Initiative for tuberculosis, HIV/AIDS and malaria
DNA:	Diagnostic network assessment
DOT	Directly Observed tuberculosis treatment
DQA.	Data quality assessment
DRS:	Drug-resistant survey
DR-TB:	Drug-resistant tuberculosis
DST:	Drug susceptibility testing
DS-TB:	Drug Sensitive tuberculosis
ECR:	Expanded Churches' response
EPTB:	Extra pulmonary tuberculosis
EQA:	External quality assessment
HIV:	Human Immunodeficiency Virus
INH:	Isoniazid

JATA:	Japanese anti-Tuberculosis Association
LMIS:	Logistic management information system
LPA:	Line probe Assay
LTFU:	Loss to follow-up
MAF:	Multisectoral accountability framework
MDR/RR-TB:	Multi and rifampicin resistance
MDR-TB:	Multi-drug resistant tuberculosis
MTB:	Mycobacterium tuberculosis
NSP:	National Strategic Plan
NTLP:	National Tuberculosis and Leprosy Programme
NTRL:	National Tuberculosis Reference Laboratory
PLHIV:	People Living with HIV
SDGs:	Sustainable Development Goals
TB:	Tuberculosis
TB LON:	Tuberculosis Local Organization network
TPT:	TB Preventive treatment
USAID:	United States Agency for International Development

1. Introduction

This annual report presents the performance of the TB and Leprosy Programme (NTLP) in 2021. We have prioritized the review of the national key performance indicators (KPI). In some instances, we have highlighted provincial KPIs. During the year under review, the programme continued with weekly TB surveillance, where data from all facilities across the country are discussed during Thursday's TB situation room. At the end of the report, we have inserted a table highlighting achievements, challenges/gaps, and priority areas for 2022.

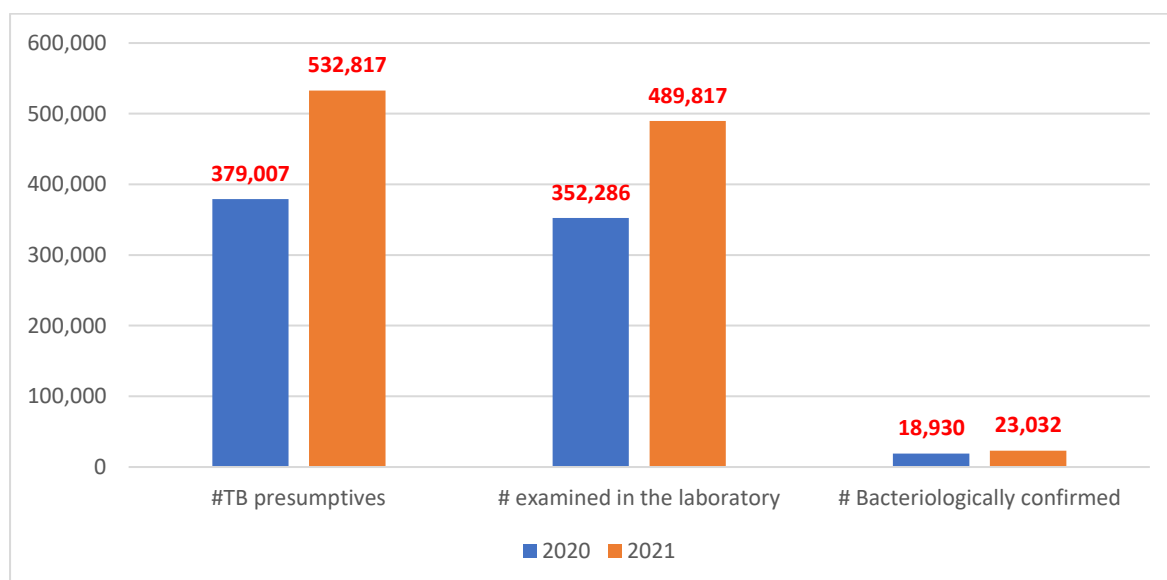
2. NTLP Performance in 2021

This section outlines the performance of various indicators against the targets of 2021.

2.1 Presumptive TB cases

In 2021, TB presumptive cases increased by 40.5% compared with the performance of 2020. There was also an increase in the number of presumptive examined in a laboratory (39%) and those bacteriologically confirmed (21.9%). The number of presumptive TB cases directly correlates with TB notifications. When presumptive TB cases increased, the same was true with notified TB cases. Some health facilities might not have systematically reported presumptive TB cases because they had no registers. The number could have been higher than what we have reported if all health facilities and service points had presumptive registers.

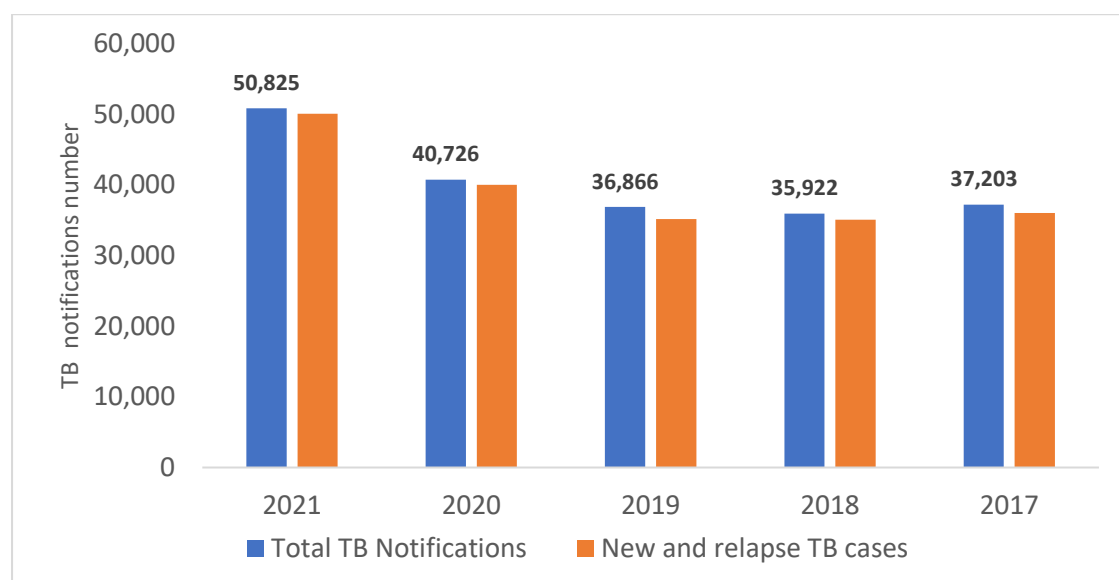
Figure 1. Number of presumptive recorded in 2021



2.2 Drug-sensitive TB (DS-TB) notifications

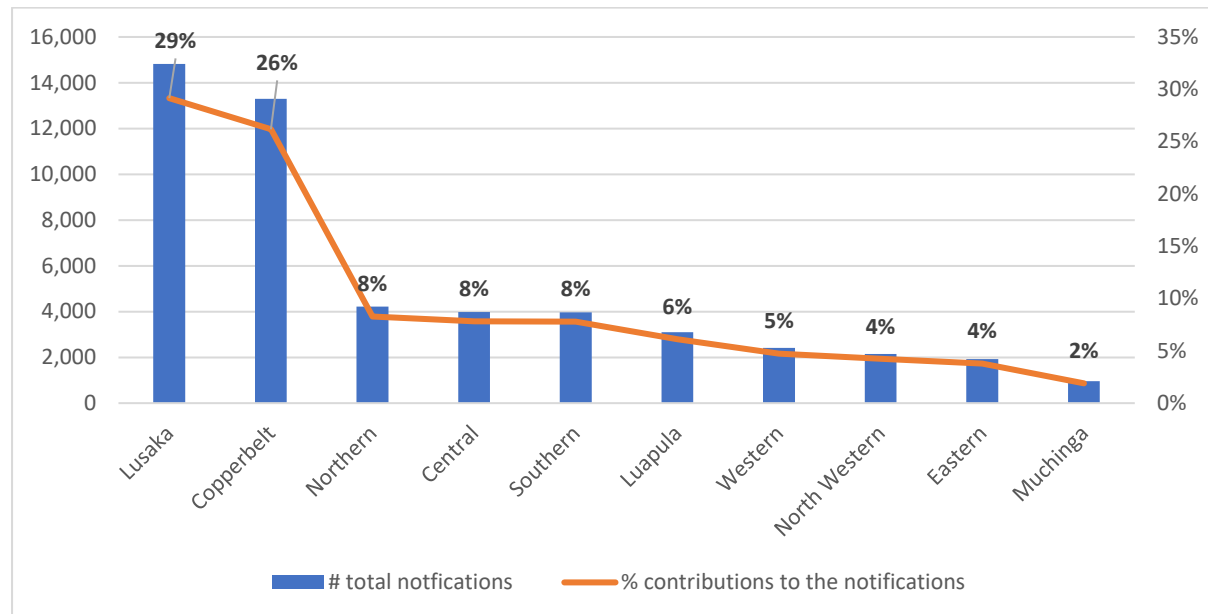
Despite the devastating COVID 19 pandemic experienced in 2021, the programme maintained its resilience by increasing total TB notifications and new and relapse TB cases by 25% relative to the 2020 performance. In the past five years, the programme reported the lowest TB notifications in 2018. Comparing the performance of 2021 and 2018, we registered a 41% increase in total TB notifications. The 2021 total TB notifications target highlighted in the previous National TB Strategic Plan (2017-2021) was 62,562, indicating that we achieved 81% of the target during the year under review.

Figure 2. Trends of Total TB notifications and new and relapse TB cases (2017-2021)



In 2021, Lusaka and Copperbelt provinces combined contributed 55% of the total TB notifications. In 2021 the provincial contributions to the overall national total TB notifications mirrored the findings of the National TB Prevalence Survey of 2014. The prevalence rate showed that Copperbelt and Lusaka provinces had the highest notifications and prevalence rate while Eastern and Muchinga had the lowest. (See figure 3)

Figure 3. Provincial contributions to the total national TB notifications



2.2.1 New and relapse TB cases stratified by gender and age

In 2021, the programme notified 50,075 new and relapse TB cases, up from 40,000 in 2020. By gender, 35% and 65% were females and males, respectively. A total of 47,337 (95%) were pulmonary TB cases with 41,438 (88%) and 5,899 (12%) being new and relapse TB cases respectively. Of the new and relapse TB cases notified in 2021, children accounted for 3,890 (8%), up from 2,724 in 2020, representing a 43% increase. Historically, the programme was notifying more childhood TB cases in the age group of 5-14 than in the 0-4 age band. Children diagnosed with TB in the 0-4 age bracket increased. In 2018, the ratio of children with TB in the 0-4 against 5-14 age groups was 0.7. In 2021 the ratio rose was 0.9, but still below the expected benchmark of at least 1.5. (See table 1).

Figure 4: Trends of TB notifications (2000-2021)

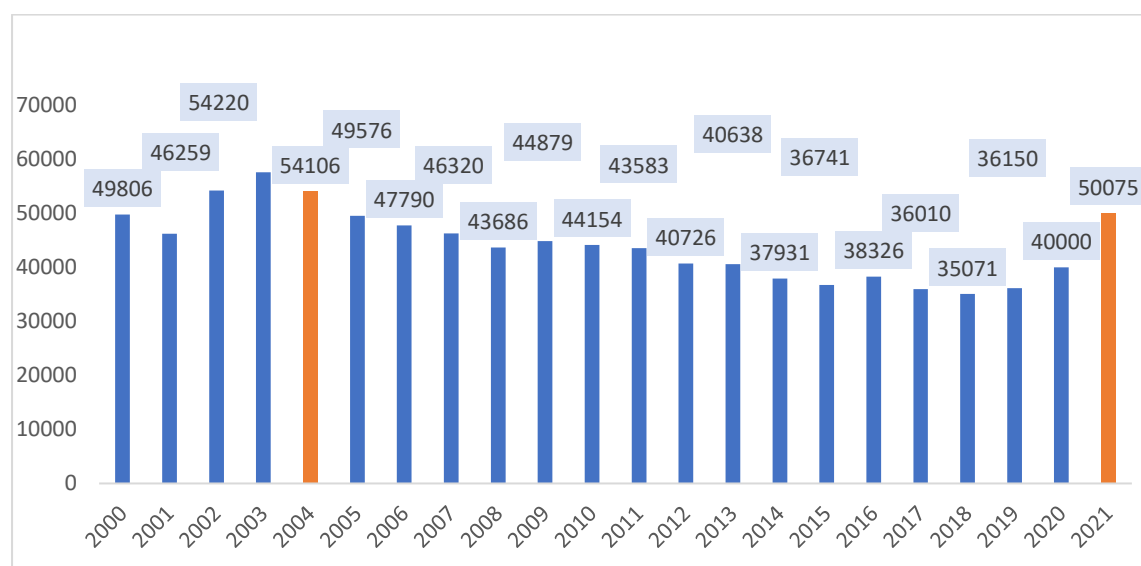


Table 1. New and relapses TB cases stratified by gender and age

	0 - 4 yrs	5 - 14 yrs	15 - 24 yrs	25 - 34 yrs	35-44 yrs	45-54 yrs	55-64 yrs	≥ 65 yrs	Total
Female	920	954	2,032	3,484	3,708	2,779	1,889	1,922	17,688
Male	999	1017	2,517	7,496	8,654	5,711	2,979	3,014	32,387
Grand	1,919	1,971	4,549	10,980	12,362	8,490	4,868	4,936	50,075

Figure 5. Number of new and relapse TB cases (2019-2020 and 2021) by age

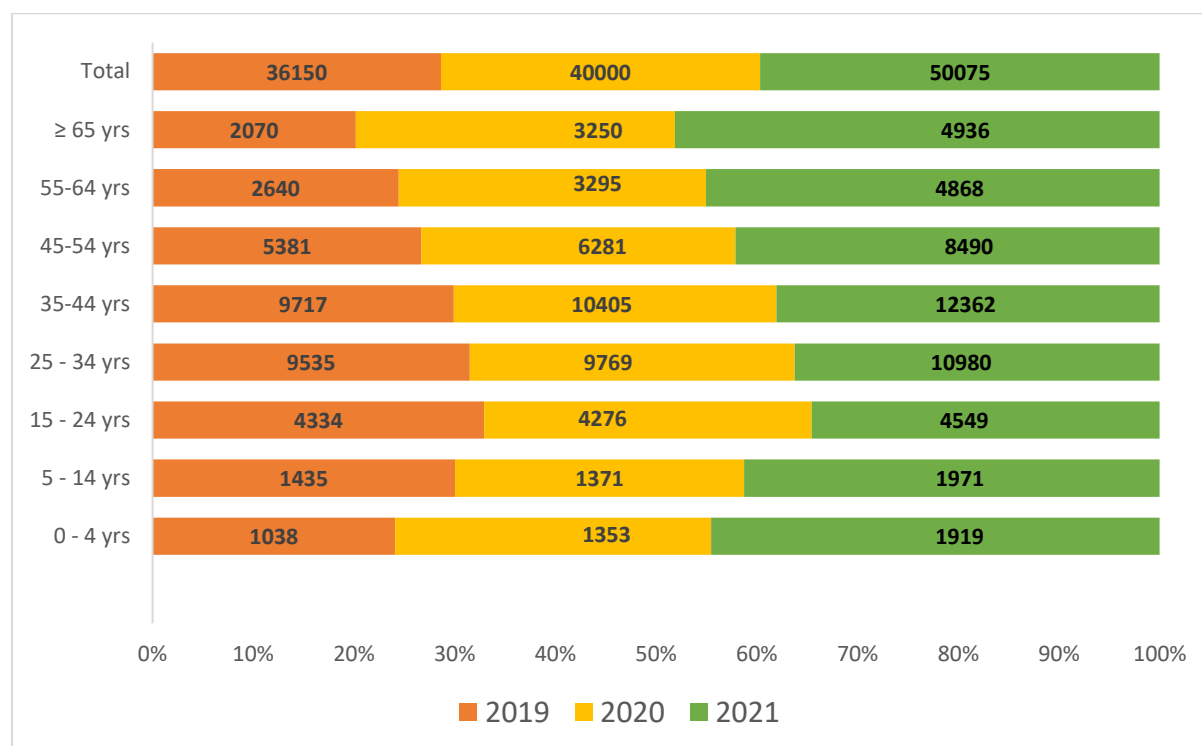


Figure 6: Total TB notifications stratified by province in 2019,2020 and 2021

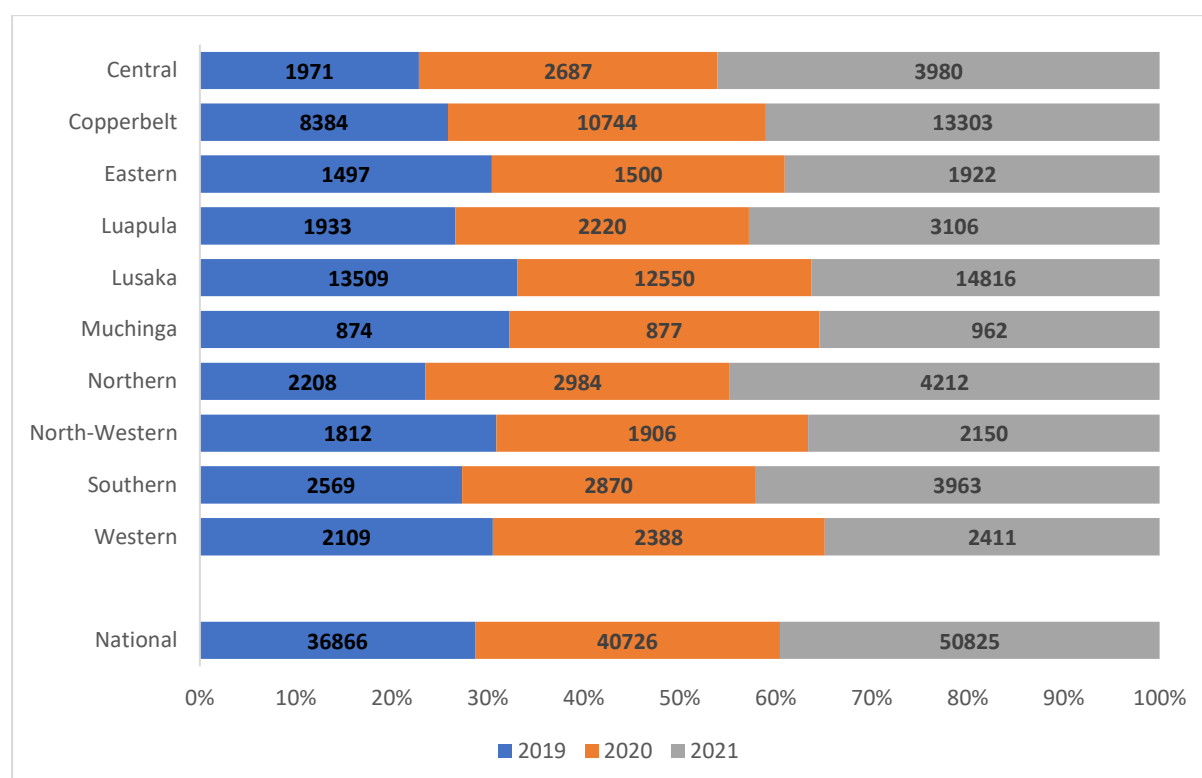
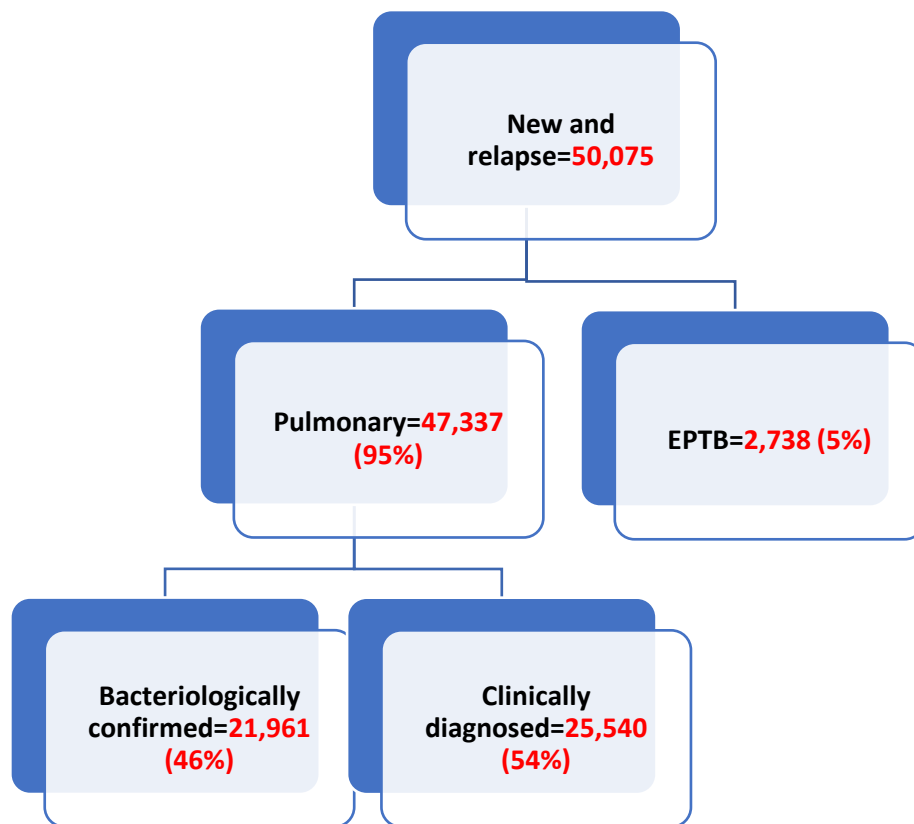


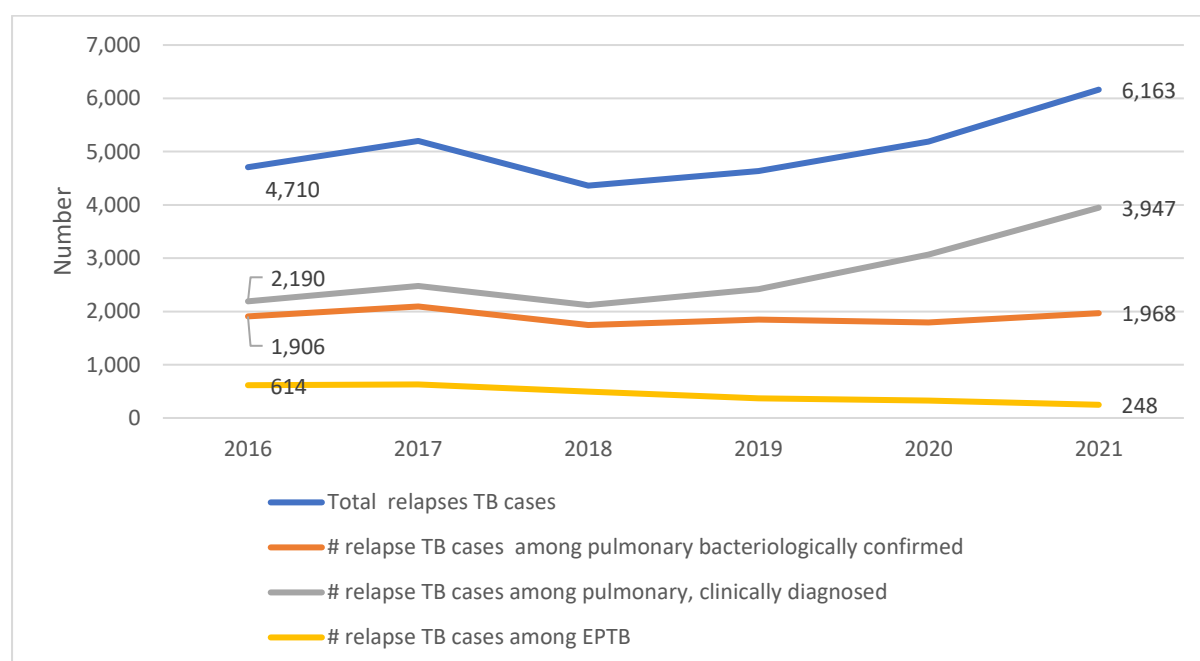
Figure 7. 2021 Number of New and relapses stratified by site of disease and diagnosis method



2.2.2 Relapses TB cases

Relapse TB cases have been on the rise since 2016. In 2021, there were 6,163 relapse TB cases, 12% of the total notifications. Sixty-four per cent of the relapse TB cases were among pulmonary, clinically diagnosed TB cases. Factors contributing to this sharp rise in relapse TB cases are unknown, requiring operation research.

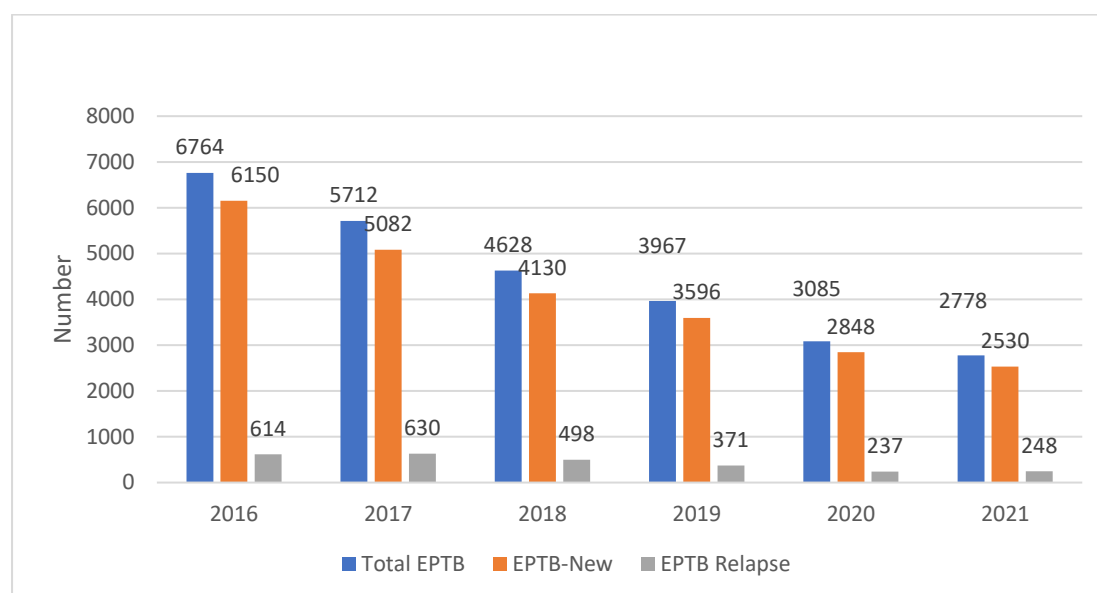
Figure 8: Trends of relapse TB cases (2016-2021)



2.2.3 Extrapulmonary TB cases

In 2021, of the 50,075 new and relapsed TB cases, 2,778 (6%) were extrapulmonary TB (EPTB) cases. In 2016, the proportion of EPTB among new and relapse TB cases was 19%, indicating a steady decline in EPTB cases over the years. The reason for this decline is not known. However, there are some theories for the decline. First, HIV-positive individuals are more likely to have EPTB than HIV-negative persons. The proportion of TB patients who are HIV positive is also declining sharply, from 60% in 2015 to 34% in 2021. This steep decline in the HIV-TB co-infection rate can explain the decline in the number of EPTB. Secondly, skills and tools to diagnose EPTB are limited, especially at the primary health care level. With all these unanswered questions, operational research and clinical audit are needed.

Figure 9: Trends of EPTB (2016-2021)



2.2.4 treatment outcomes

In 2021, the treatment success rate (91%) was the highest since 2015. Loss to follow and not evaluated TB treatment outcomes decreased compared with the 2020 performance, while death and failure rates remained at 5% and 0.4%, respectively like the level of 2020 (see table 3)

Table 2: Trends of treatments outcomes (2015-2021)

Year	Treatment Success rate (%)	% Died	% LTFU	%Failed	% Not evaluated
2015	85	5	4	0.6	5
2016	85	6	4	0.4	4
2017	88	6	3	0.5	3
2018	90	6	2	0.4	2
2019	90	6	2	0.4	2
2020	89	5	3	0.4	2
2021	91	5	2	0.4	1

2.3 DR-TB notifications

In 2021, there were one hundred DR-TB treatment sites, up from just two centres in 2017. The focus in 2021 was to increase DR-TB notifications; however, while drug-sensitive TB detected through GeneXpert increased, we saw a downward trend in our DR-TB notifications. From the

laboratory information system, in 2021, we detected 447 rifampicin resistance cases with 420 linked to care and commenced one second-line treatment. While the World Health Organization has classified Zambia as one of the world's highest MDR/RR-TB countries, the recent drug resistance survey (DRS) shows a different picture. Compared with the 2008 DRS, the 2019 findings showed a slight decline in the burden of TB. There is a possibility that the low DR-TB notifications are due to the under-reporting, hence a need to conduct a comprehensive countrywide laboratory Data quality assessment (DQA). Further, our data also show that 27 MDR/RR-TB cases did start treatment. We suspect this variance can be attributed to a repeat Xpert test on some patients diagnosed with rifampicin-resistant TB in one facility but referred to another facility for treatment.

Figure 10: DR-TB patients notified, and the number linked to care

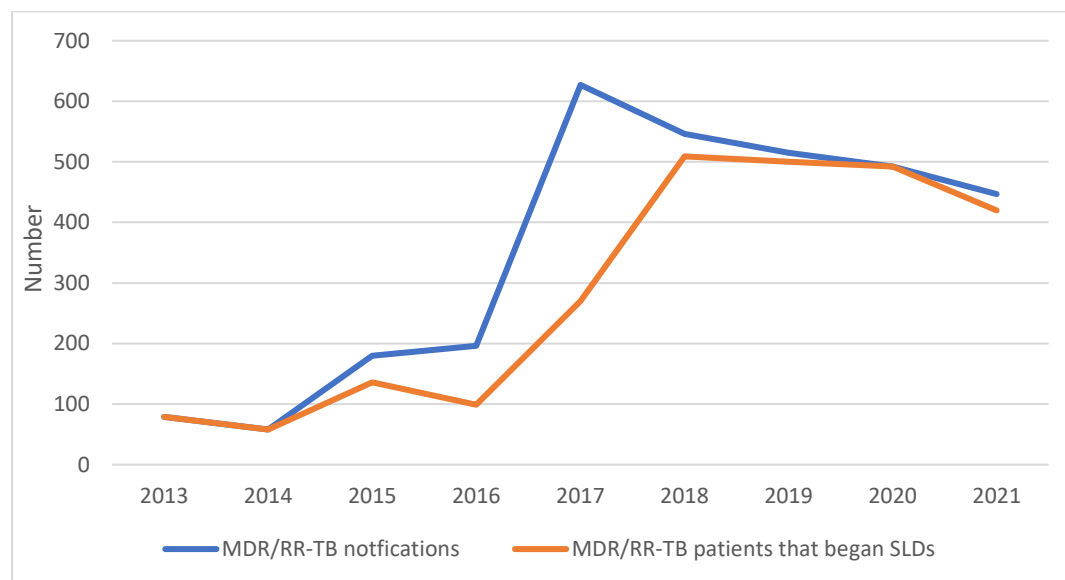
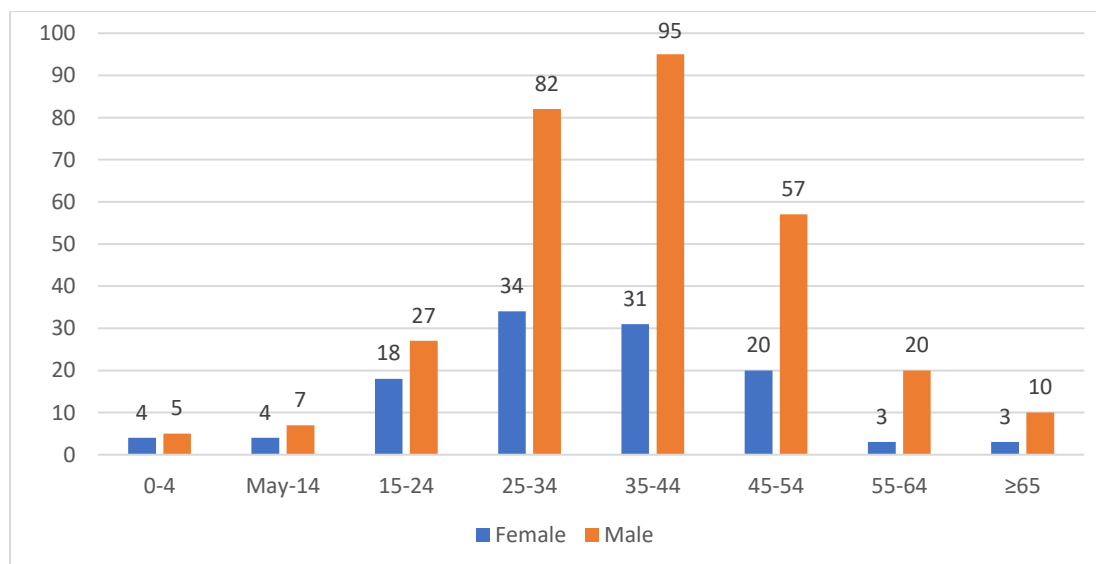


Table 3: DR-TB regimen by age and gender

Patient Type of regimen	Gender	Notified DR-TB Patient by regimen, age and gender								
		0 to 4yrs	05 to 14 yrs.	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	≥ 65	Total
Patients on shorter Regimen	Male	0	0	0	4	9	5	2	1	21
	Female	0	0	1	1	1	0	1	0	4
Patients on longer treatment	Male	5	7	27	75	85	51	18	9	277
	Female	3	3	17	33	30	20	1	3	110
patients on Individualized treatment	Male	0	0	0	3	1	1	0	0	5
	Female	1	1	0	0	0	0	1	0	3

Figure 11: A Summary of DR-TB patients who commenced on second-line drugs in 2021 by age group



2.3. 1 Drug-resistant Survey results

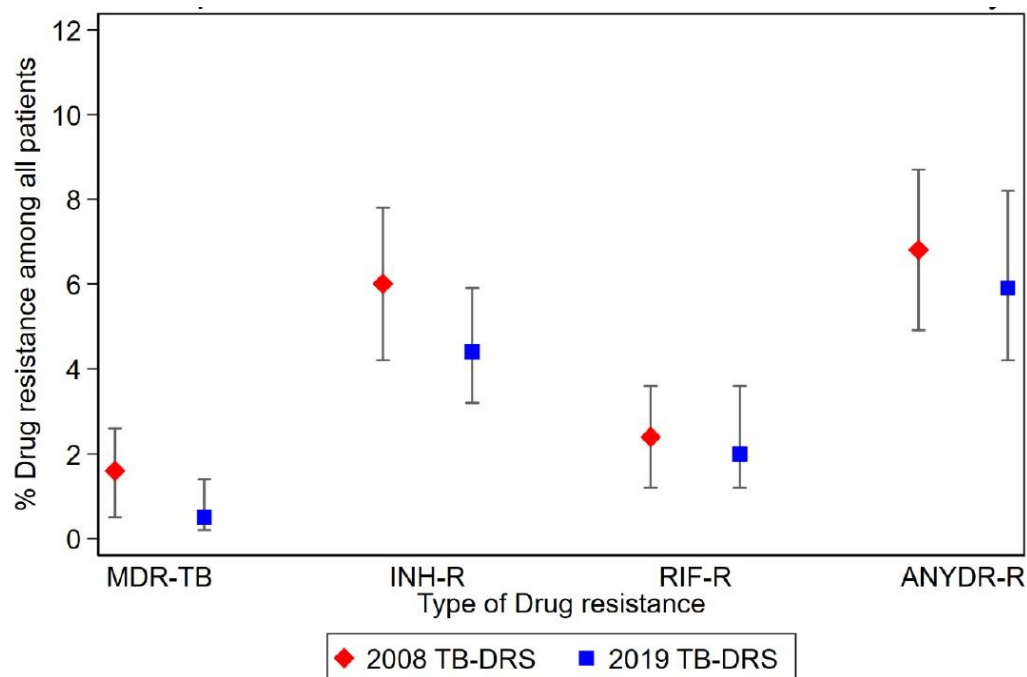
The programme conducted a third DRS in 2019. Due to the COVID 19 pandemic, the final report was only released in 2021. The survey was conducted on 1,065 patients with bacteriologically confirmed TB. Overall we identified 11 cases of MDR-TB, six by line probe assay (LPA), and seven by phenotypic DST (p-DST), giving overall proportions of 0.5% (95%CI 0.2-1.4) by LPA and 1.1% (95%CI 0.5-2.7) by p-DST. For rifampicin-resistant (RR-TB), we identified a total of 28 patients with RR-TB by any method, 3% (95%CI 1.8-5.1), and we identified 60 patients with isoniazid resistance, 6.2% (95%CI 4.6-8.2).

Interestingly, even with the expanded use of INH in TPT, there is no corresponding increase in INH resistance compared to the DRS of 2008. Compared with the 2008 DRS, the 2019-2021 DRS revealed a marginal decline in RR, MDR-TB, INH resistance, and all forms of drug resistance. To this effect, the NTLP has revised the DR TB targets for 2022.

Table 4: Overall resistance for 2019 compared to the 2008 survey results.

Resistance	2008 Results (95% CI)	2019 Results (95% CI)
MDR	1.6% (0.5.- 2.6)	0.5% (0.2 – 1.4)
INH resistance (all)	6.0% (4.2-6.8)	4.4% (3.2 – 5.9)
Rifampicin resistance (RR-TB)	2.4% (1.2-3.6)	2.0% (1.2-3.6)
Any resistance	6.8% (4.9 – 8.7)	5.9% (4.2 – 8.2)

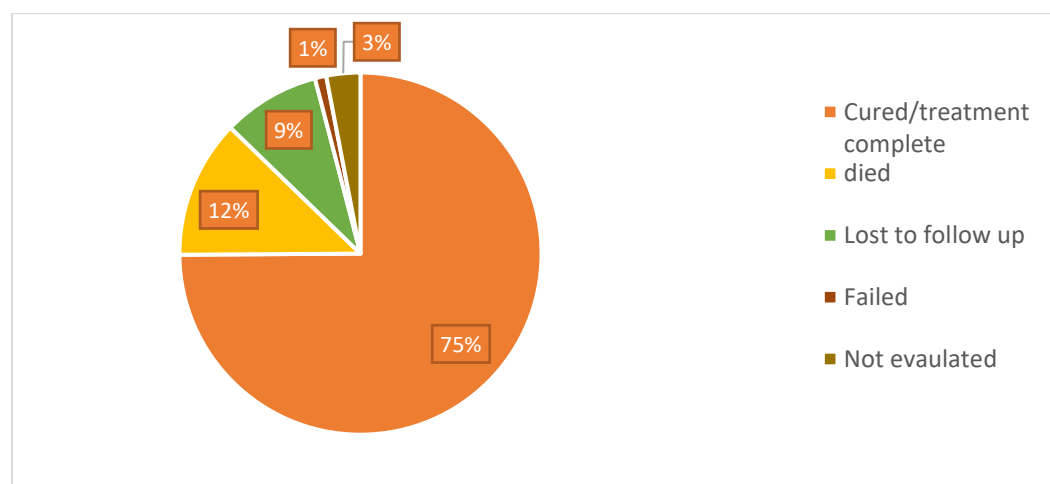
Figure 12: Type of drug resistance (2008 and 2019 DRS)



2.3.2 MDR/RR-TB treatment outcomes

In the 2019 cohort, 494 MDR/RR-TB patients started on second-line treatment. A total of 370 (75%) patients were successfully treated, a slight decrease compared with the 2018 cohort, which had a treatment success rate of 78%. The decline was attributed to a high death rate of 12%. Loss to follow up also went high at 9% (see figure 12). The programme should prioritize good treatment support and psychosocial support, including nutritional support for all MDR/RR-TB patients.

Figure 13: MDR/RR-TB treatment outcomes (2019 cohort)



Summary:

- 94% of DR-TB patients were linked care. The variance can be attributed to repeat Xpert tests on some patients
- Of the 420 DR-TB patients who began second-line treatment
 - 25 (6%) were on a shorter regimen
 - 45% of the DR-TB patients notified were HIV positive
 - 20 (5%) were children under 15 years of age
- Like DS-TB, most DR-TB patients were in the age band 25-44 years
- The treatment success rate declined to 75% from 78 in 2020

2.4: Laboratory

2.4.1 GeneXpert testing

Zambia continued to expand and strengthen the TB laboratory network. GeneXpert remained the first test for all presumptive TB cases. In facilities without GenXpert, smear microscopy was used, with another sample sent to a nearby GeneXpert site. Seventeen sites have TB LAMP. In 2021 Urine LAM was scaled up in specific populations per the new Consolidated TB guidelines.

Table 5: Xpert testing performance for 2021

	Total Samples tested	MTB+/Rif-	MTB+/Rif+	MTB+/Rif Indeterminate	MTB Negative	Error	Invalid	No Result
Central	28,948	1,158	33	50	26773	665	102	163
copperbelt	55,786	4,052	104	390	47090	2868	197	748
Eastern	34,075	883	16	41	31,915	700	163	327
Luapula	22,512	865	14	5	20,450	804	80	146
Lusaka	102,715	6,147	201	466	93,072	2832	416	1258
Muchinga	10,609	272	9	5	9893	301	36	88
Northern	12,581	386	12	35	11558	329	92	160
North-Western	16,762	780	19	46	15079	4800	71	162
Southern	40,191	1,029	27	84	37499	1012	365	276
Western	17,356	565	12	104	15993	550	63	69
Grand Total	341,535	16,137	447	1,226	309,322	14,861	1,585	3,397

In 2021, total Xpert testing and those testing positive increased by 41% and 8%, respectively, compared to the performance of 2020. Rifampicin resistance decreased by 1 (447 in 2021 and 448 in 2020). A significant increase in the MTB Indeterminate was mainly from the MTB Trace call result from the ultra-cartridges (389 in 2020 to 1,040 in 2021).

In the year under review, Zambia Medicines, and Medical Supplies Authority (ZAMMSA) issued 464,200 cartridges to the facilities, with 342 963 (74%) consumed by the end. For 2022 the forecasted quantities required are 436,450.

We expanded stool testing implementation to all facilities in 2021. However, some health facilities with GeneXpert have not fully adopted stool testing. In the first six months of 2021. Table 6 shows that 79 patients aged 0-4 years were diagnosed with TB through stool testing representing a 4% contribution of this tool to overall notification of TB in this age group. 15 and 21 TB patients were diagnosed with TB among children aged 5-14 years and in adolescents and adults, respectively

Table 6: 2021 Stool testing performance in the first 06 months of 2021

Province	Children 0-4 years			Children 5-14years			Adults		
	# Received	# Tested	MTB detected	# Received	# Tested	MTB detected	# Received	# Tested	MTB detected
Central	899	899	11	340	340	2	51	51	7
Copperbelt	998	998	18	621	621	3	45	45	1
Eastern	710	710	5	154	154	1	66	66	1
Luapula	545	545	6	88	88	1	101	101	4
Lusaka	350	350	8	91	91	2	80	80	4
Muchinga	300	300	5	120	120	0	39	39	0
Northern	467	467	9	118	118	3	32	32	1
North Western	330	330	5	98	98	1	65	65	0
Southern	467	467	8	101	101	1	71	71	2
Western	200	200	4	66	66	1	51	51	1

2.4.2 Smear Microscopy and Urine LAM testing

Of the 21,961 bacteriologically confirmed TB cases in 2021, smear microscopy contributed 454 (2%) with urine LAM contributing 6, 109 (28%). Take caution when interpreting the Urine LAM figures because some patients might have also tested Xpert positive. We cannot confidently confirm the proportion of TB patients concurrently tested using Urine LAM and Xpert testing. The programme should conduct a TB laboratory data quality audit to answer this question.

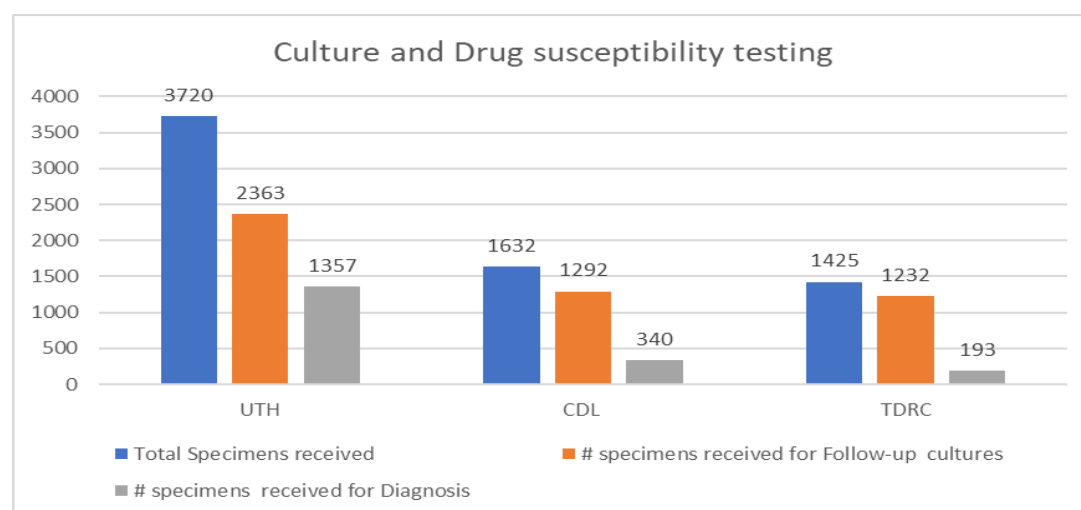
Table 7: Microscopy and Urine LAM testing performance in 2021

Province	Microscopy			Urine LAM		
	Total	Positive	Negative	Total	Positive	Negative
Central	2167	45	2122	1200	301	899
copperbelt	2672	85	2587	3727	2,236	1491
Eastern	1856	51	1805	1500	457	1043
Luapula	2542	66	2476	1000	311	689
Lusaka	3734	101	3633	5435	1011	4424
Muchinga	1132	21	1111	800	222	578
Northern	1960	11	1949	750	196	554
North-Western	1734	23	1711	950	367	583
Southern	2880	27	2853	3675	766	2909
Western	1451	24	1427	780	242	538
Grand Total	22128	454	21674	19817	6109	13708

2.4.3. Culture and drug susceptibility testing

The three culture and DST laboratories received 6,777 specimens in 2021. The graph below shows the distribution of specimens and requested testing by the laboratories.

Figure 14: Distribution of specimens by laboratory



The estimated number of specimens expected for culture and DST for all patients indicated for culture and DST in 2021 was 19,200 (National forecasting and quantification report). This finding means that the three culture laboratories only received 35% (6777/19,200) of specimens. Suboptimal specimen courier services and the incorrect use of diagnostic algorithms for patients indicated for culture and DST contributed to the underutilization of culture and DST services. There is a need, therefore, to strengthen specimen referral systems and the utilization of diagnostic algorithms. The programme plans to establish additional three Line Probe Assay laboratories in provinces without a culture laboratory.

2.4.4 Types of DR TB diagnosed

A total of 258 patients had their MTB isolates successfully profiled for susceptibility to first-line anti-TB drugs. Of these 258 patients, 70% (180) were fully susceptible, while 30% (78) showed drug resistance. Table 8 below shows the drug resistance patterns observed.

Table 8: Types of Drug resistance patterns

Types of DR TB identified	# of patients	Proportion
Total patients with any drug resistance	78	
Number of patients with confirmed MDR-TB patients	34	44%
Number of patients with Poly drug-resistant with RIF	6	8%
Number of patients with Poly drug-resistant with INH	2	3%
Number of patients with mono Rifampicin resistance	6	8%
Number of patients with mono Isoniazid resistance	25	32%
Number of patients with mono Ethambutol resistance	1	1%
Number of patients with mono Streptomycin resistance	4	5%

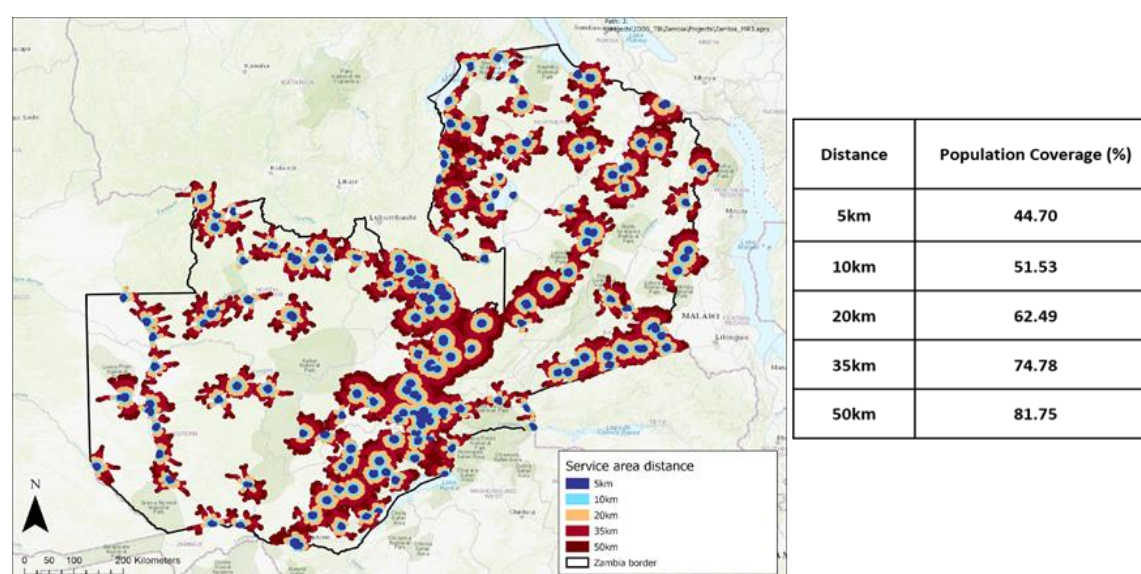
Eighty-three patients with MDR/RR TB were tested for susceptibility to 2nd line anti TB drugs, out of which 06 had Pre-XDR TB with fluoroquinolone resistance. Of the 06 patients with Pre-XDR TB, 02 tested for resistance to Bedaquiline, and both were susceptible.

2.4.5 Diagnostic Network Assessment (DNA) findings

The NTLP, with support from the United States Agency for International Development (USAID), assessed the current national TB diagnostic network. Findings of the assessment showed that the existing network of molecular diagnostic services covers much of the dense and urban population areas. However, there are gaps along some population corridors, and coverage is less in areas with sparser road networks.

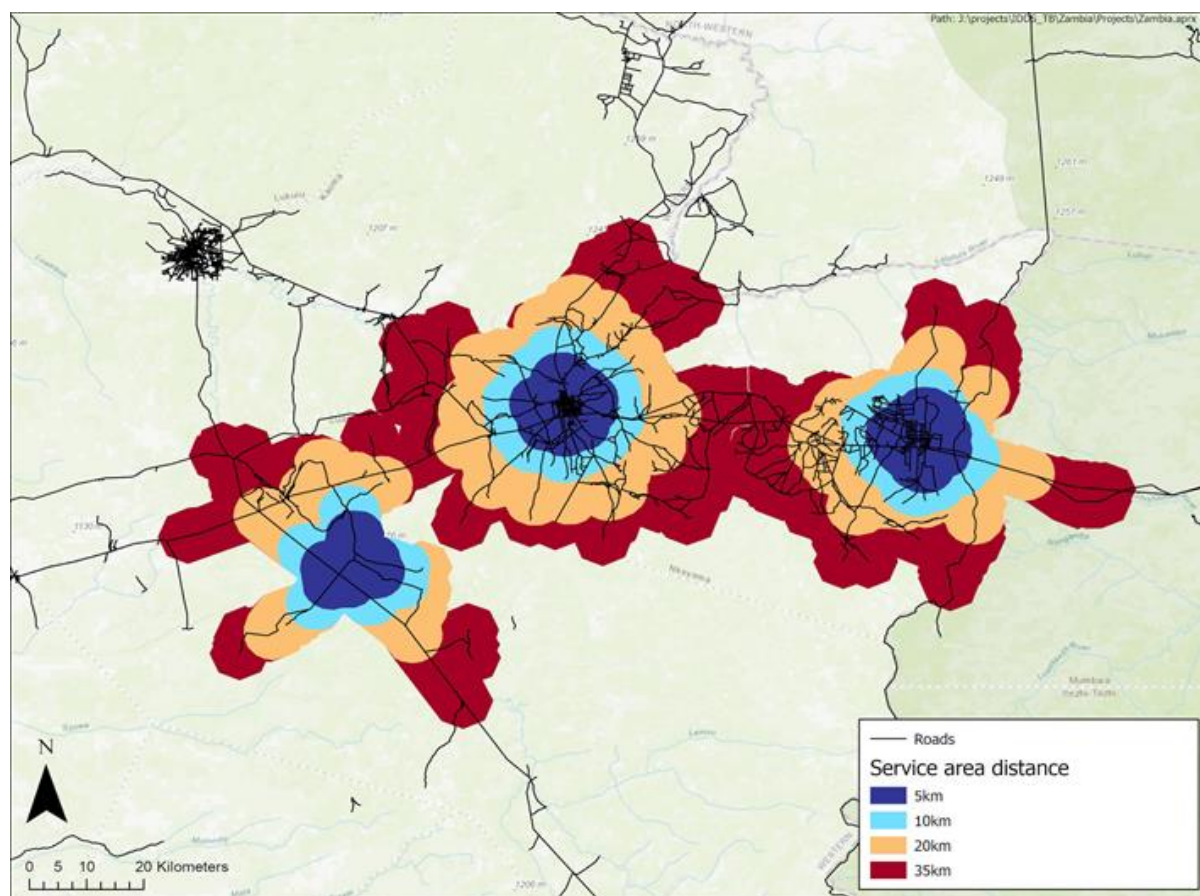
The current network covers only 62% of the population within a walking or maximum driving distance of 20km (see figure 14).

Figure 15: Molecular diagnostic service areas



The remaining 38% of the population must drive more than 35km or use courier services to access molecular diagnostic services. However, a sparse road network results in inaccessible areas and impacts efforts to optimize courier services.

Figure 16: Distance from service area and associated sparse road network



Access to molecular and rapid TB diagnostics services remains limited in rural areas. Therefore, the NTLP plans to expand the diagnostic coverage of molecular diagnostics further to bring the service closer to the populations that are not adequately covered.

2.4.6 External Quality Assessment (EQA)

With support from partners, the NTLP and the National TB Reference Laboratory (NTRL) conducted microscopy EQA including blinded rechecking and onsite evaluation. Findings were that 99% of facilities that participated in blinded rechecking scored a pass (>80% agreement between assessor and Laboratory result), and 75% of facilities evaluated on smear preparation indicators scored a pass (>80%). However, 30 facilities recorded errors in smear examination, and 15 sites failed on smear preparation. Additionally, regarding coverage of microscopy EQA in 2021, only 59% (307/518) of all facilities are eligible for EQA participation. The diagnostic coverage was affected by funding gaps and periods of lockdown due to the COVID 19 pandemic.

GeneXpert EQA panel testing is available and provided bi-annually by Centres for Disease Control and Prevention (CDC) Atlanta. However, only 32% (84/262) of Xpert sites were enrolled in the EQA programme in 2021. Of 84 sites enrolled in EQA programme, ten were not evaluated due to failure to report panel testing results. Of the 74 that were reported, 70 (95%) passed while 4 (5%) failed.

All three culture and DST laboratories participated and scored a pass in panel testing for microscopy, Xpert, LPA, Culture, and phenotypic DST.

The NTLP and the National TB Reference Laboratory (NTRL) have prioritized onsite technical support for all sites failing smear examination, preparation, and Xpert PT. The programme will also prioritize mapping resources to increase coverage of microscopy EQA for 2022. Additionally, in collaboration with the NTRL, the programme is working on modalities to ensure that all Xpert sites are participating in panel testing.

2.5 TB-HIV collaborative services

The programme sustained outstanding performance in core TB-HIV indicators. Of significance, is the sharp decline of TB-HIV infection from 60% in 2015 to 39% in 2020, which further went down to 34%. These results epitomized great efforts to reduce HIV infection in the general population. Antiretroviral Treatment (ART) uptake among HIV positive TB patients remained very high at 98%. The proportion of TB patients with documented HIV status in 2021 was 95% against a target of 100%. Weak documentation of patients who tested for HIV may be a reason for not achieving the target.

Figure 17: Showing the Key performance TB-HIV indicators

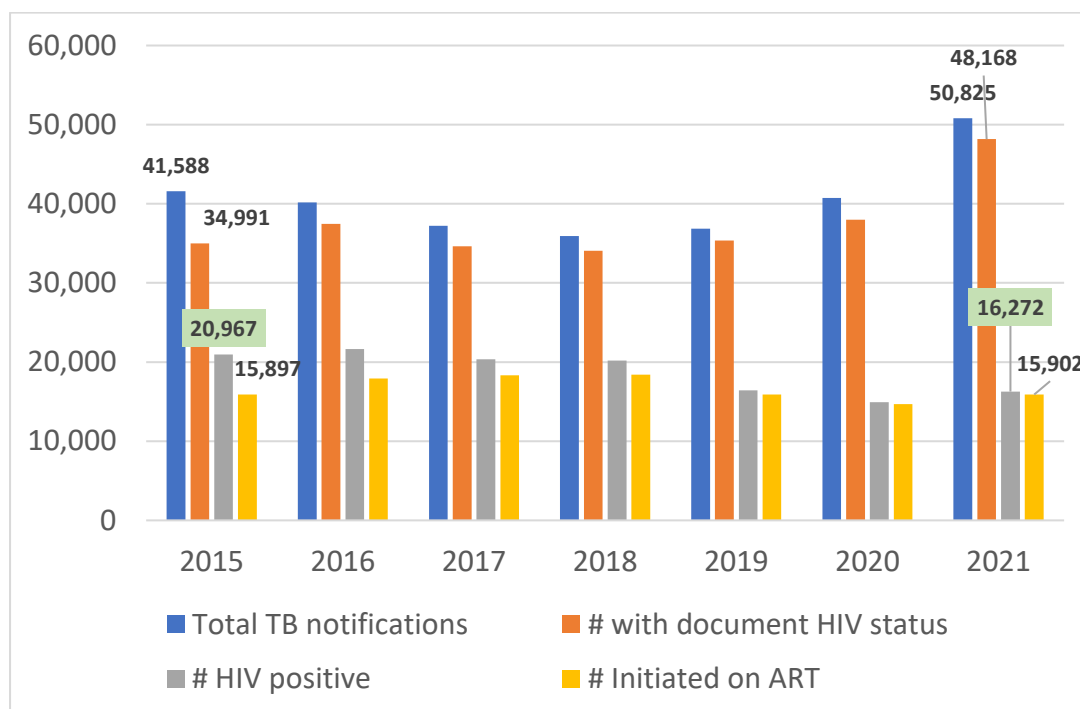
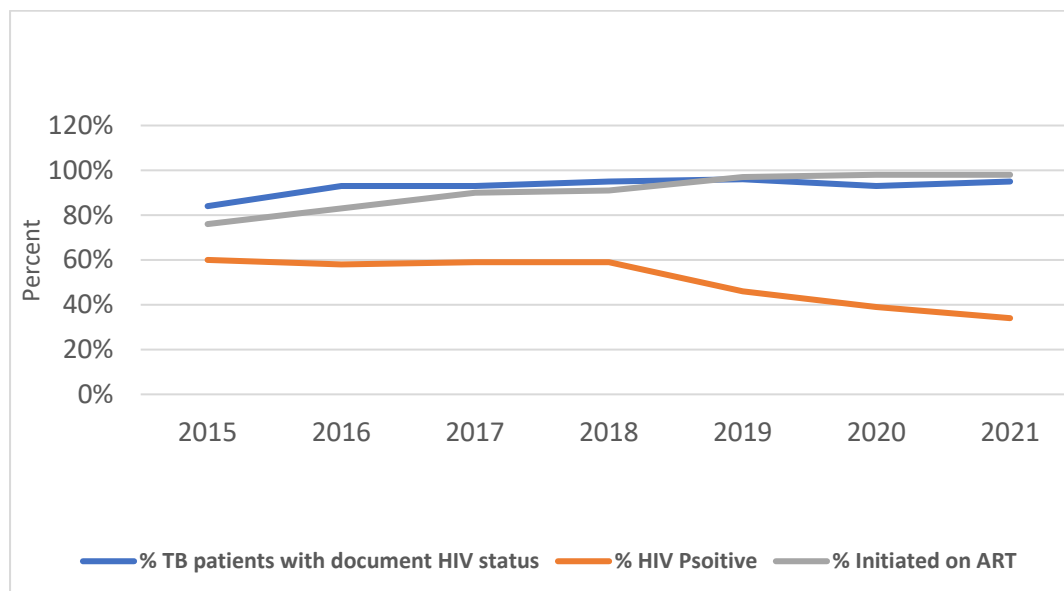
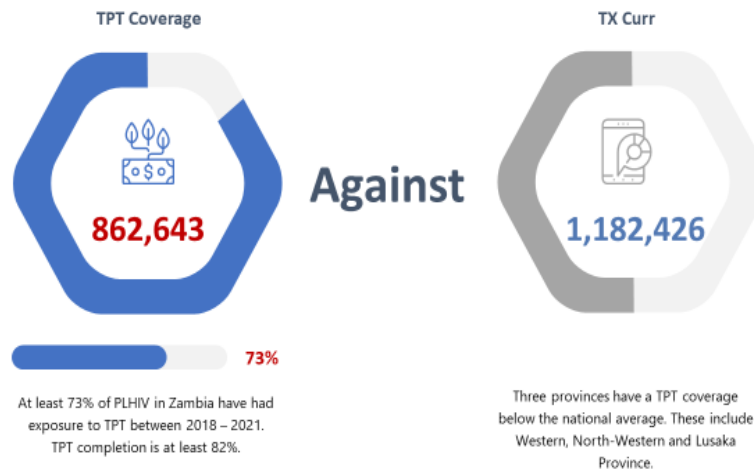


Figure 18: TB-HIV coverage trend 2015-2021



COVERAGE OF TPT IN PLHIV



2.6 TB Prevention and Contact Investigations

The programme has placed a premium on intensifying contact investigation as one of the strategies for finding the missing people with TB. In 2021, we heightened contact investigation activities prioritizing contacts of bacteriologically confirmed index TB patients. Some health facilities extended contact investigation to contacts of clinically diagnosed TB patients. We estimated contact investigation coverage at about 80%. The contribution of contact investigations to the overall TB notification is around 1-2%. The NTLP has made tremendous progress in increasing TPT coverage in the under-five contacts from 28% in 20120 to 35% in 2021.

Table 9: Programme Performance against the target

Indicator	2021 target	Performance in 2021
Estimated TB incidence rate per 100,000 population	313/100,000	307/100,000
Number of deaths due TB in the population	10,200	40
Percentage of TB-affected households that experience catastrophic costs due to TB	Not known	Awaiting Out Pocket Expenditure Study results
TB treatment coverage	80%	85%
Total TB notifications drug sensitive TB (DS-TB)	62,562	50,825
New and relapse TB cases DS-TB	59,413	50,075
% Bacteriologically confirmed among pulmonary TB cases	30,326	21,961
Childhood TB notifications (new a relapse)	5,900	3,890
MDR/RR-TB notifications	1,208	420
TB treatment success rate (DS-TB)	90%	91%
TB treatment success rate (MDR/RR-TB)	80%	75%
% TB patients with documented HIV status	100%	95%
% TB patients with known HIV status who are HIV positive	No target	34%
% HIV-positive TB patients on ART	100%	98%
TPT coverage in PLHIV		90%
TPT coverage in the under contacts	No target in 2021	35%
Number of GeneXpert machines	490	320

3. Leprosy

There has been a resurgence of Leprosy in most of our neighbouring countries. Against this background, NTLP prioritizes Leprosy case detection and treatment, including providing preventive treatment using a single rifampicin dose. These efforts have been hampered by limited funding for leprosy response and poor clinical skills among health care workers to make a diagnosis of Leprosy. In 2021, a total of 193 leprosy cases were notified, 17% lower than the performance in 2020. Of the 193 leprosy cases notified in 2021, 179 (93%) were multibacillary. Forty-one per cent of the leprosy cases were from the Northern province. Western, Lusaka, Lupaula in that order, also notified high leprosy cases.

4. Community and Advocacy Communication and Social Mobilization (ACSM)

The NTLP recognizes the community as a vehicle for ensuring TB services are accessible and available at the community and family levels. In the year under review, the NTLP collaborated with several partners, including local and international non-government organizations (NGOs), community-based organizations, and TB and HIV-affected patient groups. Under the current Global Fund Grant Churches Association of Zambia (CHAZ) coordinates community activities. CHAZ has further engaged two local community organizations [CITAM plus and Expanded Church Response (ECR)] as sub-recipients in implementing community TB care activities. CHAZ has recruited 559 community volunteers and deployed them in 95 health facilities to implement community TB care activities that include community sensitization about TB, contact investigation, and treatment support in the catchment areas of these supported health facilities. USAID, through implementing partners within the framework of TB Local Organization Network (TB LON) and Eradicate TB Projects managed by CIDRZ and PATH, respectively. JATA is also supporting community interventions in the Lusaka district.

In 2021 the programme in collaboration of its stakeholders conducted several community activities. These activities included:

- TB awareness, demand creation for TB services
- Providing treatment support through directly observed treatment (DOT)
- Adherence counselling to patients on TPT and TB treatment
- contact investigation
- active case finding
- Referral presumptive TB cases for further TB investigations in health facilities
- Follow-up of patients who miss clinical reviews or pill pick

Notwithstanding these achievements, community TB response faced several challenges (see annex I).

5. Procurement and supply chain management

5.1 Procurement and Supply Management (PSM) For TB Drugs

The NTLP has continued to provide oversight on the management of TB medicines and commodities. In 2021 QuanTB software remained the only reliable Early Warning System (EWS), quantification, and supply planning tool currently used to inform the procurement of TB medicines and stock status monitoring. The programme also continued to receive technical assistance from GDF on Procurement and Supply chain management.

5.2 Stock Availability

Over the years, adequate capacity has been maintained within the NTLP for the quantification of TB medicines. QuanTB software remains the only reliable Early Warning System (EWS), quantification, and supply planning tool currently used to inform the procurement of TB medicines. Regular stock status monitoring and frequent updating of TB medicines supply plans have helped the country to record an uninterrupted supply of TB medicines throughout the COVID-19 pandemic period. No treatment interruptions were reported in 2021. However, due to increasing DS-TB children notifications and prolonged procurement lead times including delayed funding disbursement, low stock levels were observed for ethambutol100mg and RHZ 75/50mg.

5.3 TB Medicines Logistics Management

The NTLP was being supported by JSH-Z (John Snow Health-Zambia) to transition the TB medicines Logistics Management Information System (LMIS) into the national electronic Logistics Management Information System (eLMIS). By the end of December 2021 consultants were engaged to finalize the process. This was meant to ensure the TB logistics are aligned with other essential medicines thus enhancing the ordering, scheduling, and distribution of anti-TB medicines.

5.4 Distribution of TB drugs

While ZAMMSA does the distribution of TB drugs on a quarterly basis, provinces did some self-collection at times due to emergency orders experienced because of overconsumption. As usual, Copperbelt and Lusaka received more drugs because of the high TB cases treated during the year.

Figure 19: First-line drugs districted to various provinces in 2021

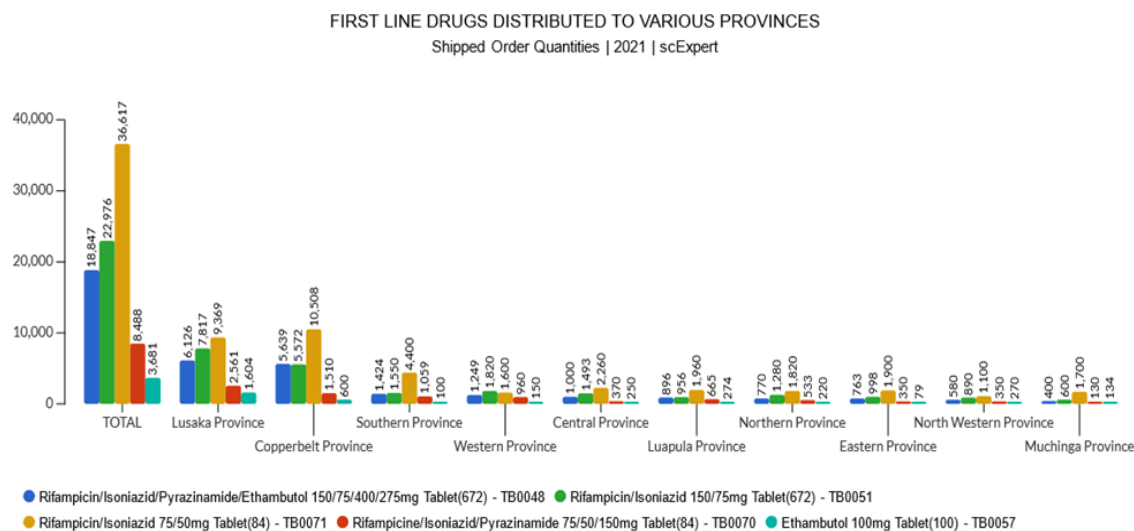


Figure 20: Second-line drugs distributed to various provinces in 2021

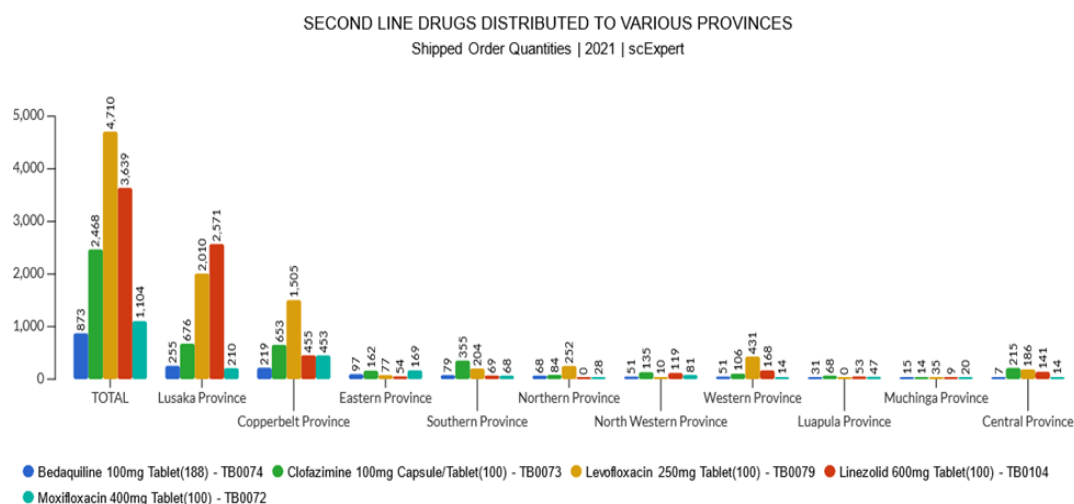
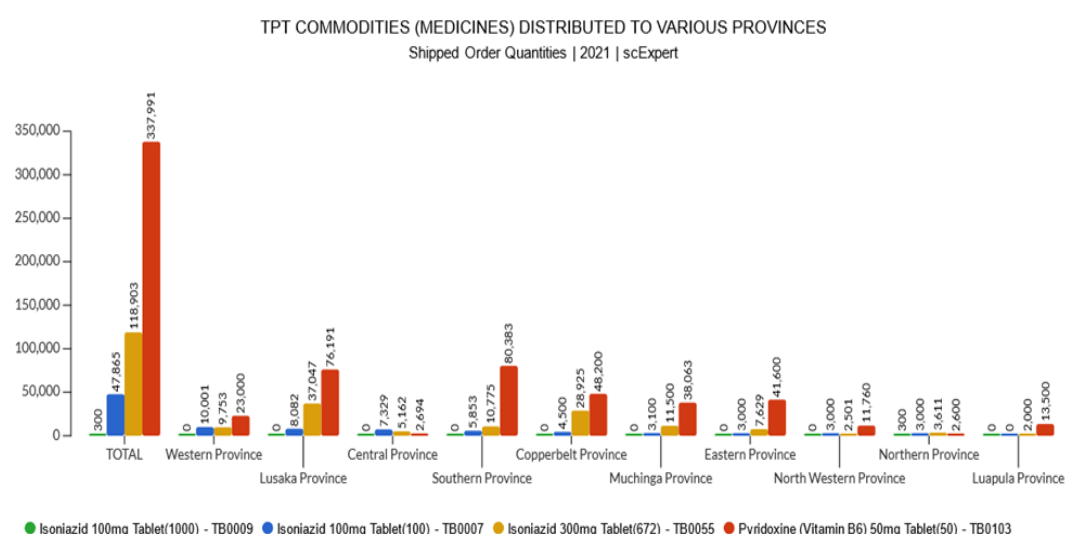


Figure 21: TPT commodities (medicines) distributed to various provinces in 2021



5.5 TB Drug Management Assessment

Drug audits were done regularly to ascertain TB drug management in all the provinces. The aim was to determine the efficiency in the supply chain of TB drugs, stock availability and the challenges faced in TB commodity management at various levels. The information was used to:

- Provide timely mitigation actions at various levels of the supply chain.
- Build capacity in the health workers on stock management
- Inform forecasting, quantification, and supply planning
- To determine the funding gap

6. NTLN Cooperating and implementing Partners

The programme is funded through domestic and international sources. Significant international TB financing comes from the USAID, The Global Fund, Centres of Disease Prevention and Control (CDC) and the World Health Organization. The Current Global Fund Grant expires in 2023. The USAID funding is channeled through implementing partners, Government to Government mechanisms and Core funds through USAID Washington. USAID currently supports four advisors who are seconded to the NTLN in the Ministry of Health (these include a Senior TB and Global Fund Grant Advisor, M&E Advisor, TB laboratory Advisor and MDR-TB Advisor). CDC through Cooperative agreements support the Ministry of Health Headquarters and provinces.

Figure 22: TB financing (2016-2021)

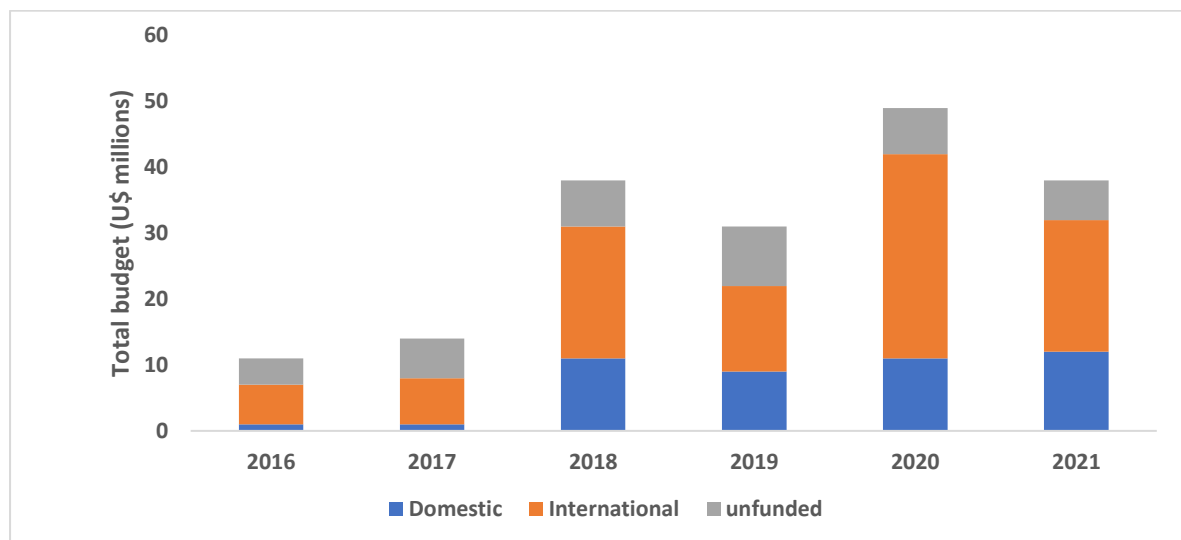


Table 10: NTLP Partners by area of focus, province and district supported

#	Name of a partner	Areas of focus (e.g., TB case findings, treatment, treatment support)	Name of Provinces Supported	# Of districts of supported
1	TB LON (CIRDZ)	Full compliments of TB interventions	2	9 (4 in Lusaka and 5 in Southern province)
2	Eradicate TB (PATH)	Full compliments of TB interventions	6	63 districts and 342 facilities

3	CHAZ	Full compliments of TB interventions	10	They are in 101 health facilities in several districts
4	CITAM plus	TB case finding, Treatment Support, and TB awareness raising	Southern, Eastern, Muchinga, Lusaka, Western and Northwestern	11 districts
5	ZATULET	TB case finding, treatment support and TB awareness raising	One (Lusaka province)	Lusaka urban, Chilanga and Kafue
6	JATA	Community TB care, case finding and support to TB diagnostics	Lusaka	Lusaka (operated in 7 health facilities)

7. multisectoral collaboration

With support from our implementing partners (Eradicate TB project and TB LON), the programme started developing the guiding document on the Multisectoral Accountability Frame for TB (MAF for TB).

The rationale for having the MAF-TB is that several of the risk factors for TB are beyond the health sector, such as alcohol misuse, and smoking. Additionally, the active involvement of other sectors will ensure domestic financing for TB increases to a level where the high-impact interventions currently being implemented are sustained.

7.1 Monitoring, Evaluation, Surveillance and Research

The programme continued with weekly TB surveillance and the TB situation room. Zambia conducted the 3rd national drug resistance survey in 2019. The study's inception was in 2019 and was completed in 2021. The COVID-19 pandemic disrupted timelines for completing the survey. Several studies by the programme and partners were implemented which include a flagship TB Mortality Study. Using study findings several papers were published and can be accessed from various journal sites or by request from the NTLP Manager.

Annex I: Summary of achievements, challenges/gaps, and the focus areas of 2022

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
Drug Susceptible TB (DS-TB),	- Total TB notifications increased to 50,825 from 40,726 in 2020 (translating to treatment coverage of 85%) - Four mobile digital x-rays mobile vans procured and deployed to Southern, Northern, Eastern and Northwestern Provinces - Several facilities activated ACF to optimize TB case finding - Treatment success rate for DS-TB rose to 91% from 89% in 2020	- We are still missing 15% of the TB cases - Rural health facilities not adequately covered with ACF activities - Suboptimal Contact investigation coverage - TB mortality remains high. In 2021 the national average of mortality rate was 5%, but over 10% in some provinces 3 provinces do not have a mobile digital x-rays van	- Complete and implement the ACF scale up plan - Activate additional health facilities to implement ACF. These will include rural health facilities - Increase contact investigation coverage from 80% to 100% - Mobilize additional resources to procure digital x-rays - Build capacity of health care workers in TB case finding and management based of the current TB guidelines - Intensify TB awareness campaigns - Develop SOPs for Advocacy, Communication and Social Mobilization

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
Drug-Resistant TB	• Number of MDR-TB sites increased to 100 from 2 centres in 2017 • All oral MDR-TB regimens fully rolled out • DRS completed and a final report available • Ultra Xpert cartridge fully rolled out	• MDR/RR-TB notifications decreased to 420 from 492 in 2020 • About 27 MDR/RR-TB patients were not linked to care • Only 6% of MDR/RR-TB patients were initiated on all oral shorter regimen • Stock out of culture/DST reagents • Only 80 Community DR-TB nurses were supported resulting in some MDR/RR-TB patients not receiving treatment support • DR-TB data capturing, and reporting remained paper-based	• Finalize the consolidated TB guidelines that align with the current World Health Organization DR-TB diagnosis and treatment recommendations • Conduct a laboratory audit to assess the potential primary loss to follow up among patients diagnosed with DR-TB • Roll out a DR-TB electronic case base platform (YATHU) and ensure the DR-TB module in the smart care is fully functional • Conduct a clinical evaluation to ascertain the regimen that each DR-TB patient was assigned. • Train health care workers on DR-TB management that include diagnosis, treatment and care and follow up

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
			• Mobilize resource to provide nutritional support to DR-TB patients • Find ways to sustain Community MDR-TB nurses • Implement Bpal (M) in XDR-TB patients under operational research • All contacts of DR-TB patients should be for active TB
Childhood TB	• Childhood TB notifications equally increased from 2,724 in 2020 to 3,890 in 2021 • A ratio of children with TB in 0-4 and 5-14 age groups rose to 0.9 from 0.7 in 2018 • Stool testing using Xpert rolled to all provinces • Urine LAM available in most of level 3,2 1 hospitals • Health care workers trained in conducting gastric lavage	• Low skill set to interpret radiological images • Hesitancy by clinical teams to diagnose childhood, this hesitancy is pronounced at primary health care levels • Low coverage of TPT in the under-five contacts	• Conduct a cascade training on childhood TB focusing on case finding, treatment and prevention. This training should include chest x-ray interpretation • Decentralize Childhood TB services to primary health care level to address the issue of hesitancy to make a

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
			diagnosis of TB or refer a patient to a higher level • Introduce 04 months treatment regimen in children and adolescents aged 3-16 years with non-severe TB • Intensify contact investigation
TB Diagnostics (laboratory and Imaging services)	• 15 GeneXpert machines added to the network • Use of Urine LAM expanded • No national stockouts of MTB cartridges • Various lab SOPs were distributed • Improved integrated intra-district courier • Migration of lab data to DISA in a phased approach started • DNA successfully conducted • The first Laboratory operation plan produced	• Lack of specimen packaging materials for courier • stock-outs of frosted microscopy slides • Long TAT for module replacement • inadequate Human Resources in most labs • inadequate Lab registers • stock-outs of culture reagents	• Expansion of TB diagnostic network through the placement of LAMP and Xpert machines • Roll electronic laboratory reporting system DISA to 100 facilities • conduct Laboratory training • Expand GeneXpert PT coverage • Printing of lab registers • Conduct lab DQA • Conduct lab data review

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
TB-HIV and Including TB Preventive Therapy (TPT)	• ART coverage in HIV positive TB patients reached 98% • Coverage of TB Preventive Treatment in PLHIV was high close to reaching 90% • Proportion of TB patients who test HIV positive continued to decrease (in 2021 the rate was 34% compared with 39% in 2020)	• 5% of TB patients were not tested for HIV • Frequent stock outs of Pyridoxine 3HP not rolled out countrywide	• Sustain high TPT initiation in PLHIV towards reaching saturation • Orient Chest clinic staff to ensure all TB patients are tested for HIV • Update the TPT guidelines • Develop TPT implementation road map • Develop and disseminate TPT communication materials
TB in Prison	• The NTLP developed a scorecard for use by the ZCS Regional Health Coordinators to monitor key performance indicators for TB • Quarterly virtual meetings were held between ZCS/NTLP to review Data and discuss ways to improve • Mass Screening was conducted in all the provinces	• Inadequate health workers employed in the ZCS. As most prisons do not have stand-alone clinics this makes the provision of TB services difficult • The few health workers in ZCS have not been trained in TB Management • There's low uptake of TPT amongst inmates	• Conduct TB training for ZCS Health Workers based on the new TB guidelines • Conduct Bi-annual mass screening

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
Community TB care and Public and Private Mix	• A total of 559 Community-Based Volunteers were hired to support 95 health facilities and implement wide-ranging community activities in the catchment areas of these health facilities. • The integration of TB screening services in the child health week outreach activities, and TB screening in the Maternal and Child health outreach services • Improved capacity of community volunteers to deliver on their mandate. Through CHAZ the programme conducted quarterly mentorship visits that were extended to the community. A total of 559 CBVs were trained on the provision of community TB services • The programme through the SATBHSS project: a. Procured job enablers for community volunteers that included TB branded umbrellas, bags, cooler boxes, gum boots, and rain coats. b. Supported eighty DR-TB community nurses to provide treatment support to DR-TB patients c. Supported MDR/RR-TB patients with home care, counselling, nutritional	• The programme has been experiencing high attrition of CBVs and this has led to challenges in the coordination and structuring of community TB services. • Unpredictable funding of community TB service • Non-availability of data source documents such as community registers, and community referrals forms • Inadequate resources for training or orientation of key health facility and community health workers • Some Community MDR-TB nurses were not supported due to a reduction in budgetary support from SATBHSS because the project started a process of closeout • Lack of M&E framework with standardized indicators to track direct and indirect	• Mobilize resources to recruit existing community health care workers • Develop train materials (including for contact investigation) for community health care workers • Finalize and disseminate the community monitoring and evaluation plan including defining parameters to track the direct and indirect contributions of the community • Map all community Actors. • Improve Advocacy Communication and Social mobilization • Complete ACSM strategy

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
	support, and transport refund support to enable them to travel to health facilities for their monthly clinical reviews. 2. Increased TB awareness through various methods that include the production of two documentaries, development and distribution of brochures, leaflets, and other IEC Materials, radio and TV interviews, and talks. 3. Successfully commemorated the 2021 World TB Day. Due to COVID-19 preventive measures that restricted public gatherings the commemoration was conducted virtually.	contributions of the community • Lack of community referral and reporting forms • Weak coordination of community TB players • Most of the government health facilities do not have community volunteers who are on stipends	
PSM	• No stock of anti-TB Medicines • All oral MDR/RR-TB regimen rolled • 3HP rolled out • New pediatric formulations for DR-TB have also been adopted including child friendly bedaquiline 20mg and delamanid 25mg • Functional PSM TWG at the national level	• Slow uptake of STR and new child-friendly DR-TB formulations. In 2021, only 6% of DR-TB patients were on all oral shorter regimen • Inadequate patient level data for accurate quantification of SLDs and stock status monitoring • Lack of refresher trainings on pharmaceutical management	• Fully integrate TB Medicines into the existing general distribution system and e-LMIS • Deploy additional staff to support PSM related activities at NTLP Central Unit • The new Consolidated TB guidelines should explicitly highlight criteria for

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
		and aDSM (last one was in 2019) • Low drug adverse events reporting	patients DR-TB eligible for shorter regimen
Leprosy	• Conducted Webinars to develop health workers' knowledge in the management of leprosy • Introduced prophylaxis for household contacts of new leprosy patients	• Few health workers have clinical skills to diagnose leprosy	• Conduct leprosy assessment to identify areas in need of more trained health workers and set up leprosy diagnostic centres and referral systems. • Conduct training for health workers in the management of leprosy • Continue holding leprosy webinars
TB and COVID	• Additional funding to mitigate the impact of COVID-19 were available through the COVID 19 Response Mechanism (C19RM) • Bi-directional screening implemented in some health facilities	• COVID-19 samples of patients accessing TB services needed to be referred to another centre because not all TB centres have a capacity to test COVID-19	• Continue implementing activities to mitigate the impact of COVID 19 on TB services

Technical area	Achievements/Innovations	Challenges/Gaps	Focus areas for 2022
Monitoring and Evaluation, Surveillance, and Research	- Weekly TB surveillance and TB Situation Room sustained - Critical studies conducted (e.g., TB Mortality Study) - Some papers published in peer reviewed journals	- Date capturing and reporting still paper based - Delay in receiving treatment outcome data from provinces - Some facilities do not have infrastructure such as computers to fully implement electronic case platforms	- Roll out DSHIS 2, Smart care and YATHU Platforms - Launch a TB Situation Room Dashboard - Establish a scientific sub-group of the TWG - Conduct structured technical support supervision at all levels - Conduct research - Finalize and disseminate Out of Pocket Expenditure study
Cross Cutting	- Domestic funding increased to 36% in 2021 from 31% in 2020 - A Draft MAF TB guiding document available - TWG meetings held monthly	- International funding decreased to 50% from 52% in 2020 - We had a funding gap of about 15% in 2021	- Print and disseminate the new NSP for TB and Leprosy - Mobilize both domestic and international funding - Finalize and disseminate MAF-TB guiding document