TB Surveillance Data from Health Facilities of Department of Health (DoHe-CTA)

A Report (Year 2022 - 2023)

Published by:
Department of Health, Central Tibetan Administration (DoHe-CTA).
Gangchen Kyishong, Dharamsala, 176215, District Kangra (HP), India.

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The publication of this report was sponsored by United State Agency for International Development (USAID). The contents of this report are the sole responsibility of the author and the findings, interpretations and conclusions expressed in this work do not necessarily reflect the views of donors or DoHe-CTA.

FOREWORD

As we present the latest TB report for the Tibetan community, we reflect on our journey in combating this enduring public health challenge. This report provides an essential overview of TB cases recorded from 2022 to 2023, alongside previously published data to illustrate progress and ongoing challenges.

The total TB cases reported over the past two years highlights both the strides we've made and the work that still lies ahead including the need for improved data collection to accurately assess TB incidence rates. While TB cases among the Tibetan refugees have shown remarkable reduction over the years, we recognize the continuing burden, particularly among students and monks, who account for a significant portion of infections. The contribution of environmental factors, such as overcrowding and inadequate ventilation in residential settings, cannot be overlooked and demands our urgent attention.

Over the years, our department continued to support programs & initiatives to reduce & prevent TB in the community, including provision of essential TB services such as screening, diagnostic supplies, treatment & nutritional support for TB patients. The ongoing efforts of health workers, community members, and both governmental and non-governmental organizations have played a pivotal role in addressing TB prevalence within our population. These efforts are vital as we work towards the Indian government's vision of a Zero-TB community.

The commitment to eradicating TB is a collective endeavour. We are grateful for the continued support for TB patients in India through the Indian government's national TB program, and USAID for funding our TB prevention program, which have enabled us to enhance our TB control efforts. Together, we can create a healthier future for all.

Let us reaffirm our commitment to eradicating TB together—with stronger partnerships, increased investment, and a focus on high-risk populations, we can deliver on our shared commitments to end TB.

Mr. Jampa Phuntsok
Health Secretary,
Tibetan Voluntary Health Association
Central Tibetan Administration
Dharamshala.

PREFACE

SECTION 1 & 2 gives an overview of the socio-demographic characteristics of TB patients treated by resident primary care doctors at approximately eight health facilities under the Department of Health, Central Tibetan Administration (DoHe-CTA). The report also attempts a situational analysis of TB management and assesses program performance through standard indicators.

SECTION 3 looks at the data related to TB drug sensitivity testing (DST) and drug resistance patterns based on molecular tests (Gene Xpert/CBNAAT) and sputum smear culture& drug sensitivity testing (C & DST). Four GeneXpert machines (Cephid) are available with DoHe-CTA and they are based at Delek Hospital in Dharamsala, DTR Hospital in Mundgod, Tso-jhe Hospital in Bylakuppe and Dekyiling Health Centre. Culture and Drug Sensitivity Testing (C & DST) is outsourced to Hinduja Hospital in Mumbai.

SECTION 4 attempts a trend analysis of the TB situation at DoHe-CTA Primary Care hospitals for the cohort of 2012 – 2023 TB patients registered at the DoHe-CTA hospitals.

SECTION 5 has the discussion and recommendations. It outlines WHO's "End TB Strategy" and discusses our current status on the milestones and the targets and what additional activities or interventions we can undertake.

SECTION 6 looks at the WHO's ten core TB indicators & targets and examines where we stand in comparison.

The data in this report is cleaned, managed, and analyzed in STATA 11.0 software. STATA "do file" program codes and cleaned database in STATA file and; raw database in MS Excel/CSV format are available for review if anyone wishes to conduct one. Using the STATA software, data is cleaned in two steps. Some of the data (e.g., removing duplications) could be performed without having to refer to the printed database i.e., TB Register and TB Treatment cards. Email and telephone mediums were used for further cleaning e.g., missing values and doubtful data entries.

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1st September 2024
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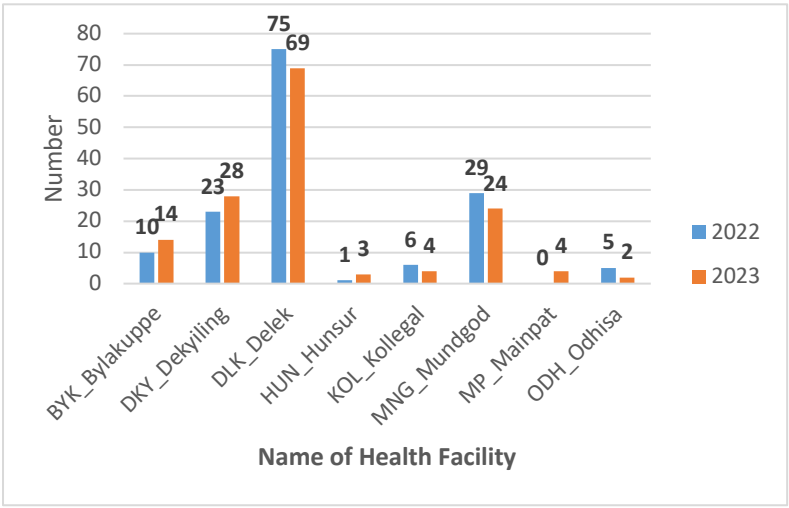
SECTION ONE

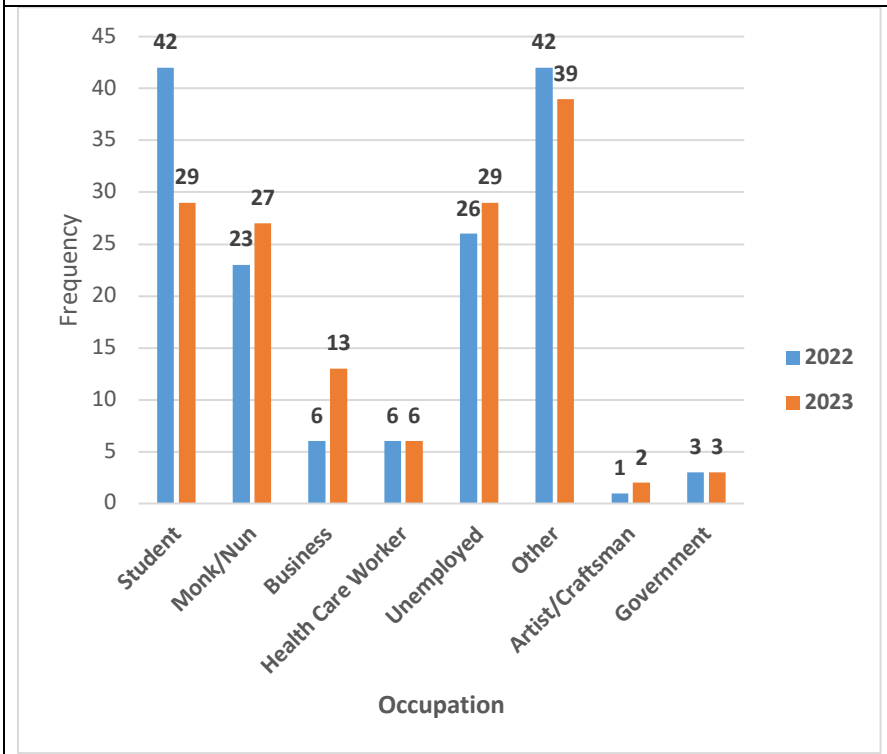
Socio-Demographic Characteristics of TB Patients Reported from Eight Health Facilities of DoHe-CTA (Cohort of 2022 - 2023)

Eight Health Facilities Reporting Routine TB Program Data (All Nationality)
Health Facilities



Health Facilities	Year		
	2022	2023	Total
	n (%)	n (%)	
Bylakuppe	10 (06.71)	14 (09.46)	**24 (08.08)**
Dekyiling	23 (15.44)	28 (18.92)	**51 (17.17)**
Delek	75 (50.34)	69 (46.62)	**144 (48.48)**
Hunsur	1 (00.67)	3 (02.03)	**4 (01.35)**
Kollegal	6 (04.03)	4 (02.70)	**10 (03.37)**
Mundgod	29 (19.46)	24 (16.22)	**53 (17.85)**
Mainpat	0 (00.00)	4 (02.70)	**4 (01.35)**
Odhisa	5 (03.36)	2 (01.35)	**7 (02.36)**
Total	**149**	**148**	**297**

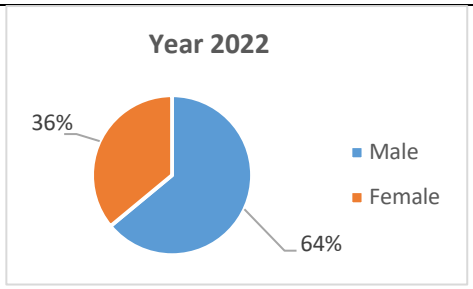
Eight Health Facilities Reporting Routine TB Program Data (All Nationality)
Occupation

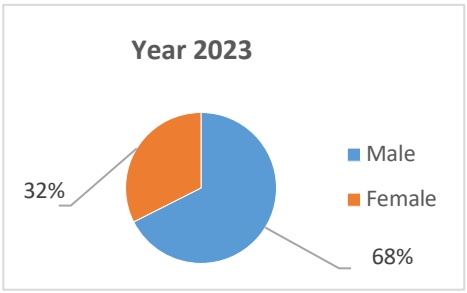


Main Occupation	Year		
	2022	2023	Total
	n (%)	n (%)	
Student	42 (28.19)	29 (19.59)	**71**
Monk/Nun	23 (15.44)	27 (18.24)	**50**
Business	6 (04.03)	13 (08.78)	**19**
Health Care Worker	6 (04.03)	6 (04.05)	**12**
Unemployed	26 (17.45)	29 (19.59)	**55**
Other	42 (28.19)	39 (26.35)	**81**
Artist / Craftsman	1 (00.67)	2 (01.35)	**3**
Government	3 (02.01)	3 (02.03)	**6**
Total	**149**	**148**	**297**

Eight Health Facilities Reporting Routine TB Program Data (All Nationality)

Gender

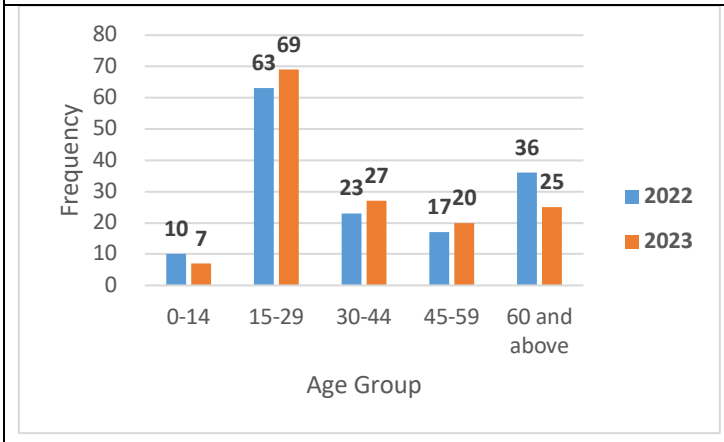




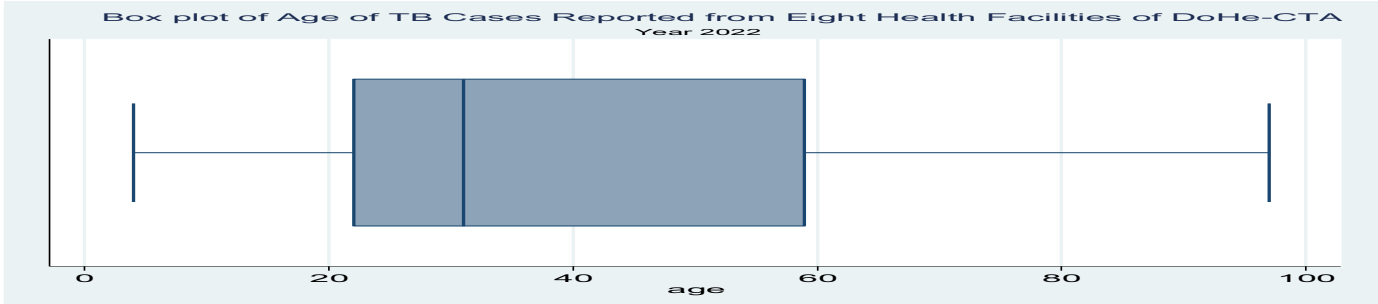
Gender	Year		
	2022 n (%)	2023 n (%)	Total
Male	95 (63.76)	100 (67.57)	195
Female	54 (36.24)	48 (32.43)	102
Total	149	148	297

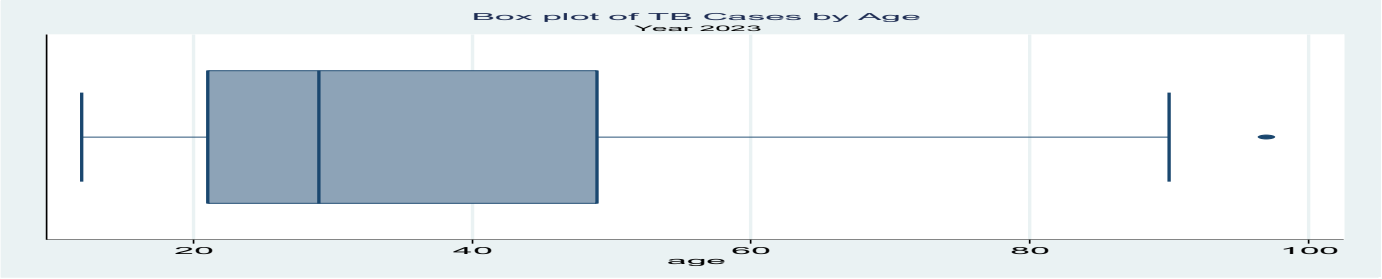
Eight Health Facilities Reporting Routine TB Program Data (All Nationality)

Age



Age Category	Year		
	2022 n (%)	2023 n (%)	Total
0-14	10 (06.71)	7 (04.73)	17
15-29	63 (42.28)	69 (46.62)	132
30-44	23 (15.44)	27 (18.24)	50
45-59	17 (11.41)	20 (13.51)	37
60 and above	36 (24.16)	25 (16.89)	61
Total	149	148	297





variable	Year	N	mean	p50	p25	p75	iqr	max	min	sd
Age	2022	149	40.50	31	22	59	37	97	4	24.41
	2023	148	37.43	29	21	49	28	97	12	21.09

TB Program Performance Indicators & Situation Analysis Eight Health Facilities Reporting Routine TB Program Data - Year 2022 & 2023 (All Nationality)			
2022		**2023**	
HIV Status	**n (%)**	**HIV Status n (%)**	**Total**
Positive	1 (00.67)	2 (01.35)	2
Negative	148 (99.33)	144 (97.30)	292
Not Tested / Missing	0 (00.00)	2 (01.35)	3
TOTAL	**149**	**148**	**297**
Hepatitis B Status	**n (%)**	**Hepatitis B Status n (%)**	**Total**
Positive	3 (02.01)	8 (05.41)	11
Negative	146 (97.99)	138 (93.24)	284
Not Tested / Missing	0 (00.00)	2 (00.67)	2
TOTAL	**149**	**148**	**297**
Blood Sugar Report Status	**n (%)**	**Blood Sugar Report Status n (%)**	**Total**
YES	147 (98.66)	131 (88.51)	278
NO	2 (01.34)	17 (11.49)	19
TOTAL	**149**	**148**	**297**
Nickshay Report Status	**n (%)**	**Nickshay Report Status n (%)**	**Total**
YES	140 (93.96)	136 (91.89)	276
NO	9 (06.04)	12 (08.11)	21
TOTAL	**149**	**148**	**297**
Classification of TB Based on Anatomy	**n (%)**	**Classification of TB Based on Anatomy n (%)**	**Total**
Pulmonary	119 (79.87)	128 (86.49)	247
Extra-Pulmonary	30 (20.13)	20 (13.51)	50
TOTAL	**149**	**148**	**297**
Classification of Extra-Pulmonary TB	**n (%)**	**Classification of Extra-Pulmonary TB n (%)**	**Total**
Abdominal	2 (06.67)	2 (05.00)	4 (08.00)
Neck & other Lymph Node	10 (33.33)	7 (35.00)	17 (34.00)
Other EP Site	3 (10.00)	0 (00.00)	3 (06.00)
Pleural	11 (36.67)	10 (50.00)	21 (42.00)
Spine, bone & joint	0 (00.00)	0 (00.00)	0 (00.00)
Not Specified	4 (13.33)	1 (05.00)	5 (10.00)
TOTAL	**30**	**20**	**50**
Classification of TB Based on Treatment History	**n (%)**	**Classification of TB Based on Treatment History n (%)**	**Total**
New	123 (82.55)	115 (77.70)	238
Previously Treated	26 (17.45)	33 (22.30)	59
Treatment After Failure	0 (00.00)	0 (00.00)	0
TOTAL	**149**	**148**	**297**
Classification of TB Based on Diagnostic Testing	**n (%)**	**Classification of TB Based on Diagnostic Testing n (%)**	**Total**
Microbiologically Confirmed TB	137 (91.95)	137 (92.57)	274
Clinically Diagnosed TB	12 (08.05)	11 (07.43)	23
TOTAL	**149**	**148**	**297**
Classification of TB Based on Treatment Regimen	**n (%)**	**Classification of TB Based on DST n (%)**	**Total**
NonMDR	134 (89.93)	135 (91.22)	269
INH Mono-resistance	6 (04.03)	7 (04.73)	13
MDR/XDR	9 (06.04)	6 (04.05)	15
Not Done	0 (00.00)	0 (00.00)	0
TOTAL	**149**	**148**	**297**
X-pert Diagnosis at Treatment Initiation		**X-pert Diagnosis at Treatment Initiation n (%)**	**Total**
N(MTB_No)	0 (00.00)	0 (00.00)	0
T(MTB_Yes_R_No)	109 (92.37)	108 (92.31)	217
RR(MTB_Yes_R_Yes)	9 (07.63)	9 (07.69)	18
TOTAL	**118**	**117**	**235**
INH Sensitivity at Treatment Initiation		**INH Sensitivity at Treatment Initiation n (%)**	**Total**
Sensitive	107 (87.70)	99 (91.67)	206
Resistant	15 (12.30)	9 (08.33)	24
TOTAL	**122**	**108**	**230**
Rifampicin Sensitivity at Treatment Initiation		**Rifampicin Sensitivity at Treatment Initiation**	
Sensitive	113 (92.62)	103 (94.50)	216

Resistant	9 (07.38)	6 (05.50)	15
TOTAL	**122**	**109**	**231**
Household Contact Tracing	**n (%)**	**Household Contact Tracing n (%)**	**Total**
YES	23	20	43
Under-6 Contact Tracing	**n (%)**	**Under-6 Contact Tracing n (%)**	**Total**
YES	3	1	4
INH Prophylaxis for Under-6 Household Contact	**n (%)**	**INH Prophylaxis for Under-6 Household Contact n (%)**	**Total**
YES	3	4	7
Treatment Outcome (NonMDR-2021)	**n (%)**	**Treatment Outcome (NonMDR-2022) n (%)**	**Total**
Cured	68 (58.62)	83 (61.94)	-
Treatment Completed	29 (25.00)	36 (26.87)	-
Treatment Success	**97 (83.62)**	**119 (88.81)**	-
Died	3 (02.59)	5 (03.73)	-
Lost to Follow-Up	3 (02.59)	3 (02.24)	-
Transfer Out	5 (04.31)	5 (03.73)	-
Treatment Failure	0 (00.00)	1 (00.75)	-
Missing	0 (00.00)	0 (01.50)	-
Treatment Regimen Changed	2 (01.72)	0 (00.00)	-
TOTAL	**110**	**134**	-
Treatment Outcome (MDR-2020)	**n (%)**	**Treatment Outcome (MDR-2021) n (%)**	**Total**
Cured	10 (100.00)	**5 (83.33)**	-
Treatment Completed	0 (00.00	0 (00.00	-
Treatment Success	0 (00.00	**5 (83.33)**	-
Died	0 (00.00	0 (00.00	-
Lost to Follow-Up	0 (00.00	0 (00.00	-
Transfer Out	0 (00.00	0 (00.00	-
Not Evaluated	0 (00.00	1 (16.67	-
TOTAL	**10**	**6**	-
Treatment Outcome (INH Mono-resistant-2021)		**Treatment Outcome (INH Mono-resistant-2022) n (%)**	**Total**
Cured	10 (100.00	3 (50.00)	-
Treatment Completed	0 (00.00	1 (16.67)	-
Treatment Success	10 (100.00	4 (66.67)	-
Died	0 (00.00	2 (33.33)	-
Lost to Follow-Up	0 (00.00	0 (00.00)	-
Transfer Out	0 (00.00	0 (00.00)	-
Treatment Failure	0 (00.00	0 (00.00)	-
Missing	0 (00.00	0 (00.00)	-
TOTAL	**10**	**6**	-

SECTION TWO													
TB Program Performance Indicators and Situational Analysis 2012 – 2023													
TB Surveillance Data from Health Facilities Reporting Routine TB Data (All Nationality)													
Socio-Demographic and Other Characteristics of TB Cases Disaggregated by Year of Treatment Initiation (2012-2023)													
Year	**2012 n (%)**	**2013 n (%)**	**2014 n (%)**	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	**Total n (%)**
Health Facilities													
BYK_Bylakuppe	42 (9.72)	41 (10.38)	32 (09.47)	36 (09.78)	33 (09.59)	32 (10.46)	18 (07.44)	32 (12.50)	13 (09.56)	11 (08.73)	10 (06.71)	14 (09.46)	334 (10.13)
DKY_Dekyiling	45 (10.42)	40 (10.13)	65 (19.23)	64 (17.39)	61 (17.73)	46 (15.03)	43 (17.77)	40 (15.63)	9 (06.62)	11 (08.73)	23 (15.44)	28 (18.92)	475 (14.66)
DLK_Delek	200 (46.30)	222 (56.20)	168 (49.70)	190 (51.63)	183 (53.20)	160 (52.29)	133 (54.96)	120 (46.88)	57 (41.91)	59 (46.83)	75 (50.34)	69 (46.62)	2111(65.15)
HUN_Hunsur	17 (03.94)	16 (04.05)	13 (03.85)	4 (01.09)	7 (02.03)	5 (01.63)	5 (02.07)	8 (03.13)	3 (02.21)	2 (1.59)	1 (00.67)	3 (02.03)	84 (02.59)
KOL_Kollegal	32 (07.41)	7 (01.77)	11 (03.25)	23 (06.25)	9 (02.62)	10 (03.27)	4 (01.65)	10 (03.91)	6 (04.41)	6 (04.76)	6(04.03)	4 (02.70)	128 (03.95)
MNG_Mundgod	84 (19.44)	68 (17.22)	48 (14.20)	49 (13.32)	42 (12.21)	44 (14.38)	32 (13.22)	35 (13.67)	34 (25.00)	27 (21.43)	29 (19.46)	24 (16.22)	516 (15.93)
MP_Mainpat	12 (02.78)	1 (00.25)	1 (00.30)	2 (00.54)	7 (02.03)	4 (01.31)	3 (01.24)	0 (00.00)	3 (02.21)	3 (02.38)	0 (00.00)	4 (02.70)	40 (01.23)
ODH_Odhisa	-	-	-	-	2 (00.58)	5 (01.63)	4 (01.65)	4 (01.56)	4 (02.94)	2 (01.59)	5 (03.36)	2 (01.35)	28 (00.86)
DEL_Delhi	-	-	-	-	-	-	-	-	4 (02.94)	1 (00.79)	-	-	5 (00.15)
LDK_Ladakh	-	-	-	-	-	-	-	7 (02.73)	3 (02.21)	4 (03.17)	-	-	14 (00.43)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Gender													
Male	283 (65.51)	254 (64.30)	221 (65.38)	225 (61.14)	227 (65.99)	198 (64.71)	171 (70.66)	173 (67.58)	91 (66.91)	73 (57.94)	95 (63.76)	100 (67.57)	2111 (65.15)
Female	149 (34.49)	141 (35.70)	117 (34.62)	143 (38.86)	117 (34.01)	108 (35.29)	71 (29.34)	83 (32.42)	45 (33.09)	53 (42.06)	54 (36.24)	48 (32.43)	1129 (34.85)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Age-Group													
0 – 14	29 (06.71)	18 (04.56)	21 (06.21)	29 (07.88)	26 (07.56)	20 (06.54)	16 (06.61)	13 (05.08)	01 (00.74)	6 (04.76)	10 (06.71)	7 (04.73)	196 (06.05)
15 –29	270 (62.50)	240 (60.76)	202 (59.76)	222 (60.33)	215 (62.50)	178 (58.17)	137 (56.61)	128 (50.00)	59 (43.38)	39 (30.95)	63 (42.28)	69 (46.62)	1822 (56.23)
30 – 44	70 (16.20)	60 (15.19)	51 (15.09)	60 (16.30)	41 (11.92)	43 (14.05)	33 (13.64)	52 (20.31)	21 (15.44)	32 (25.40)	23 (15.44)	27 (18.24)	513 (15.83)
45 – 60	19 (04.40)	26 (06.58)	19 (05.62)	19 (05.16)	30 (08.72)	33 (10.78)	23 (09.50)	29 (11.33)	24 (17.65)	11 (08.73)	17 (11.41)	20 (13.51)	270 (08.33)
60 and above	44 (10.19)	51 (12.19)	45 (13.31)	38 (10.33)	32 (09.30)	32 (10.46)	33 (13.64)	34 (13.28)	31 (22.79)	38 (30.16)	36 (24.16)	25 (16.89)	439 (13.55)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Mean Age in year (median)	29.66 (24.00)	31.71 (25.00)	31.32 (23.50)	29.74 (24.00)	29.82 (23.00)	30.87 (22.00)	33.13 (25.00)	34.71 (27.50)	40.76 (34.00)	44.02 (38.00)	40.50 (31.00)	37.43 (29.00)	32.14 (25)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Nationality													
Tibetan	387 (89.58)	337 (85.32)	288 (85.21)	318 (86.41)	287 (83.43)	260 (84.97)	200 (82.64)	196 (76.56)	114 (83.82)	101 (80.16)	112 (75.17)	121 (81.76)	2721 (83.98)
Indian	25 (05.79)	45 (11.39)	42 (12.43)	42 (11.41)	50 (14.53)	40 (13.07)	35 (14.46)	48 (18.75)	19 (13.97)	15 (11.90)	30 (20.13)	24 (16.22)	415 (12.81)
Nepali	15 (03.47)	12 (03.04)	5 (01.48)	7 (01.90)	5 (01.45)	5 (01.63)	5 (02.07)	9 (03.52)	02 (01.47)	9 (07.14)	06 (04.03)	01(00.68)	81 (02.50)
Other	5 (01.16)	1 (00.25)	3 (00.89)	1 (00.27)	2 (00.58)	1 (00.33)	2 (00.83)	3 (01.17)	01 (00.74)	1 (00.79)	01 (00.67)	02 (01.35)	23 (00.71)

Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Country of Birth													
India	255 (59.03)	214 (54.18)	193 (57.10)	229 (62.23)	228 (66.28)	219 (71.57)	164 (67.77)	174 (67.97)	84 (61.76)	69 (54.76)	95 (63.76)	105 (70.95)	2029 (62.62)
Tibet	151 (34.95)	159 (40.25)	126 (37.28)	117 (31.79)	91 (26.25)	65 (21.24)	60 (24.79)	68 (26.56)	46 (33.82)	47 (37.30)	43 (28.86)	33 (22.30)	1006 (31.05)
Nepal	21 (04.86)	19 (04.81)	15 (04.44)	20 (05.43)	22 (06.40)	21 (06.86)	15 (06.20)	11 (04.30)	04 (02.94)	9 (07.14)	10 (06.71)	08 (05.41)	175 (05.40)
Others / Missing	5 (01.16)	3 (00.76)	4 (01.18)	2 (00.54)	3 (00.87)	1 (00.33)	3 (01.24)	03 (01.17)	02 (01.47)	1 (00.79)	01 (00.67)	02 (01.35)	30 (00.93)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Occupation													
Student	163 (37.73)	144 (36.46)	137 (40.53)	164 (44.57)	162 (47.09)	152 (49.67)	94 (38.84)	70 (27.34)	30 (22.06)	20 (15.87)	42 (28.69)	29 (19.59)	1207 (37.25
Monk/Nun	98 (22.69)	88 (22.28)	63 (18.64)	54 (14.67)	64 (18.60)	46 (15.03)	42 (17.36)	64 (25.00)	28 (20.59)	29 (23.02)	23 (15.44)	27 (18.24)	626 (19.32)
Business	33 (07.64)	30 (07.59)	21 (06.21)	25 (06.79)	15 (04.36)	22 (07.19)	19 (07.85)	19 (07.42)	10 (07.35)	10 (07.94)	6 (04.03)	13 (08.78)	223 (06.88)
Government	8 (01.85)	5 (01.27)	5 (01.48)	3 (00.82)	3 (00.87)	8 (02.61)	3 (01.24)	2 (00.78)	1 (00.74)	0 (00.00)	3 (02.01)	3 (02.03)	44 (01.36)
Unemployed	49 (11.34)	43 (10.89)	43 (12.72)	54 (14.67)	32 (09.30)	34 (11.11)	30 (12.40)	51 (19.92)	34 (25.00)	30 (23.81)	26 (17.45)	29 (19.59)	455 (14.04)
Other	61 (14.12)	70 (17.72)	62 (18.34)	54 (14.67)	61 (17.73)	39 (12.75)	48 (19.83)	42 (16.41)	27 (19.85)	31 (24.60)	42 (28.19)	39 (26.35)	576 (17.78)
Health Worker	11 (02.55)	9 (02.28)	6 (01.78)	9 (02.45)	4 (01.16)	2 (00.65)	5 (02.07)	4 (01.56)	3 (02.21)	3 (02.38)	6 (04.03)	6 (04.05)	68 (02.10)
Artist/Craftsman	9 (02.08)	6 (01.52)	1 (00.30)	5 (01.36)	3 (00.87)	3 (00.98)	1 (00.41)	4 (01.56)	3 (02.21)	3 (02.38)	1 (00.67)	2 (01.35)	41 (01.27)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
HIV Status													
Positive	7 (01.62)	0 (00.00)	3 (00.89)	9 (02.45)	2 (00.58)	5 (01.63)	3 (01.24)	1 (00.39)	2 (01.47)	2 (01.59)	1 (00.67)	2 (01.35)	34 (01.05)
Negative	417 (96.53)	393 (99.49)	329 (97.34)	357 (97.01)	336 (97.67)	298 (97.39)	235 (97.11)	255 (96.61)	133 (97.79)	124 (98.41)	148 (99.33)	144 (97.30)	3169 (97.81)
Missing/Not Tested	8 (01.85)	2 (00.51)	6 (01.78)	2 (00.54)	6 (01.74)	3 (00.98)	4 (01.65)	0 (00.00)	1 (00.74)	0 (00.00)	0 (00.000	2 (01.35)	37 (01.14)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Hepatitis B (HBsAg) Status													
Positive	28 (06.48)	34 (08.61)	26 (07.69)	27 (07.34)	24 (06.98)	23 (07.52)	12 (04.96)	14 (05.47)	12 (08.82)	5 (03.97)	3 (02.01)	8 (05.41)	216 (06.67)
Negative	396 (91.67)	358 (90.63)	306 (90.53)	339 (92.12)	317 (92.15)	279 (91.18)	228 (94.21)	242 (94.53)	124 (91.18)	120 (95.24)	146 (97.99)	138 (93.24)	2993 (92.38)
Missing/Not Tested	8 (01.85)	3 (00.76)	6 (01.78)	2 (00.54)	3 (00.87)	4 (01.31)	2 (00.83)	0 (00.00)	0 (00.00)	1 (00.79)	0 (00.00)	2 (01.35)	31 (00.96)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Blood Sugar Status													
YES	0 (00.00)	0 (00.00)	3 (00.89)	184 (50.00)	172 (50.00)	242 (79.08)	218 (90.08)	240 (93.75)	136 (100)	120 (95.24)	147 (98.66)	131 (88.51)	1593 (49.17)
NO	432 (100.00)	395 (100.00)	335 (99.11)	184 (50.00)	172 (50.00)	64 (20.92)	24 (09.92)	16 (06.25)	0 (00.00)	6 (04.76)	2 (01.34)	17 (11.49)	1647 (50.83)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Nickshay Status													
YES	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	82 (26.80)	174 (71.90)	252 (98.44)	128 (94.12)	123 (97.62)	140 (93.96)	136 (91.89)	1035 (31.94)
NO	432 (100.00)	395 (100.00)	338 (100.00)	368 (100.00)	344 (100.00)	224 (73.20)	68 (28.10)	4 (01.54)	8 (05.88)	3 (02.38)	9 (06.04)	12 (08.11)	2205 (68.06)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Classification of TB Based on Anatomy													
Pulmonary TB	330 (76.39)	305 (77.22)	255 (75.44)	273 (74.18)	258 (75.00)	236 (77.12)	197 (81.40)	213 (83.20)	109 (80.15)	106 (84.13)	119 (79.87)	128 (86.49)	2282 (78.06)

Extra-Pulmonary	102 (23.61)	90 (22.78)	83 (25.56)	95 (25.82)	86 (25.00)	70 (22.88)	45 (18.60)	43 (16.80)	27 (19.85)	20 (15.87)	30 (20.13)	20 (13.51)	711 (21.94)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Classification of TB Based on Diagnostic Test													
Clinically Diagnosed	194 (44.91)	175 (44.30)	146 (43.20)	152 (41.30)	120 (34.88)	114 (37.25)	76 (31.40)	75 (29.30)	36 (26.47)	32 (25.40)	12 (08.05)	11 (07.43)	1143
Microbiologically Confirmed	238 (55.09)	220 (55.70)	192 (56.80)	216 (58.70)	224 (65.12)	192 (62.75)	166 (68.60)	181 (70.70)	100 (73.53)	94 (74.60)	137 (91.95)	137 (92.57)	2097
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Classification of TB Based on Past History													
New	334 (77.31)	319 (80.76)	285 (84.32)	309 (83.97)	287 (83.43)	259 (84.64)	196 (80.99)	214 (83.59)	113 (83.09)	99 (78.57)	123 (82.55)	115 (77.70)	2653 (81.88)
Previously Treated	98 (22.69)	76 (19.24)	53 (15.68)	58 (15.76)	54 (15.70)	46 (15.03)	45 (18.60)	42 (16.41)	23 (16.91)	26 (20.63)	26 (17.45)	33 (22.30)	580 (17.90)
Transfer-In	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1 (00.41)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1 (00.03)
Treatment After Failure	0 (00.00)	0 (00.00)	0 (00.00)	1 (00.27)	3 (00.87)	1 (00.33)	0 (00.00)	0 (00.00)	0 (00.00)	1 (00.79)	0 (00.00)	0 (00.00)	6 (00.19)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Treatment Outcome (All Category)													
Cured	211 (48.84)	200 (50.63)	163 (48.22)	198 (53.80)	198 (57.56)	180 (58.82)	163 (67.36)	165 (64.55)	85 (62.50)	77 (61.11)	-	-	1640 (55.73)
Treatment Completed	181 (41.90)	169 (42.78)	149 (44.08)	143 (38.36)	127 (36.92)	109 (35.62)	62 (25.62)	61 (23.83)	36 (26.47)	29 (23.02)	-	-	1066 (36.22)
Treatment Success	**392 (90.74)**	**369 (93.42)**	**312(92.31)**	**341 (92.66)**	**325 (94.48)**	**289 (94.44)**	**225 (92.98)**	**226 (88.28)**	**121 (88.97)**	**106 (84.13)**	**-**	**-**	**2706 (91.95)**
Died	15 (03.47)	10 (02.53)	14 (04.14)	12 (02.26)	8 (02.33)	11 (03.59)	4 (01.65)	8 (03.13)	7 (05.15)	3 (02.38)	-	-	92 (03.13)
Lost to Follow-Up	13 (03.01)	9 (02.28)	6 (01.78)	7 (01.90)	4 (01.16)	2 (00.65)	7 (02.89)	6 (02.34)	3 (02.21)	3 (02.38)	-	-	60 (02.04)
Moved to 2nd line	0 (00.00)	0 (00.00)	0 (00.00)	2 (00.54)	0 (00.00)	1 (00.33)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	-	-	3 (00.10)
Not Evaluated	1 (00.23)	0 (00.00)	0 (00.00)	1 (00.27)	1(00.29)	1 (00.33)	0 (00.00)	2 (00.78)	0 (00.00)	7 (05.56)	-	-	13 (00.44)
Transfer Out	6 (01.39)	4 (01.01)	4 (01.18)	3 (00.82)	2 (00.58)	1 (00.33)	3 (01. 24)	14 (05.47)	2 (01.47)	5 (03.97)	-	-	44 (01.50)
Treatment Failure	5 (01.16)	3 (00.76)	2 (00.59)	2 (00.54)	4 (01.16)	1 (00.33)	3 (01.24)	0 (00.00)	3 (02. 21)	0 (00.00)	-	-	23 (00.78)
Treatment Regimen Changed	0 (00.00)	0 (00.00)	00 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	2 (01.59)	-	-	2 (00.07)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**			**2943**
Year	**2012 n (%)**	**2013 n (%)**	**2014 n (%)**	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	**Total n (%)**
Treatment Outcome (Non-MDR cohort)													
Cured	181 (46.77)	178 (49.17)	146 (46.50)	153 (48.26)	177 (56.19)	173 (58.25)	151 (66.23)	149 (63.68)	75 (59.52)	72 (60.00)	86 (61.43)	-	1541
Treatment Completed	177 (45.74)	164 (45.30)	146 (46.50)	141 (44.48)	121 (38.41)	108 (36.36)	61 (26.75)	58 (24.79)	36 (28.57)	29 (24.17)	37 (26.43)	-	1078
Treatment Success	**358 (92.51)**	**342 (94.47)**	**292 (93.00)**	**294 (92.74)**	**298 (94.60)**	**281 (94.61)**	**212 (92.98)**	**207 (88.47)**	**111 (88.09)**	**101 (84.17)**	**123 (87.86)**	-	6619
Died	9 (02.33)	7 (01.93)	12 (03.82)	8 (02.52)	7 (02.22)	10 (03.37)	3 (01.32)	7 (02.99)	7 (05.56)	3 (02.50)	7 (05.00)	-	80
Lost to Follow-Up	9 (02.33)	7 (01.93)	6 (01.91)	7 (02.21)	4 (01.27)	2 (00.67)	7 (03.07)	5 (02.14)	3 (02.38)	3 (02.50)	3 (02.14)	-	56
Moved to 2nd line	0 (00.00)	0 (00.00)	0 (00.00)	2 (00.63)	0 (00.00)	1 (00.34)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	-	3

Not Evaluated	1 (00.26)	0 (00.00)	0 (00.00)	1 (00.32)	1 (00.32)	1(00.34)	0 (00.00)	2 (00.85)	0 (00.00)	6 (05.00)	1 (00.71)	-	13
Transfer Out	6 (01.55)	3 (00.83)	2 (00.64)	3 (00.95)	1 (00.32)	1 (00.34)	3 (01.32)	13 (05.56)	2 (01.59)	5 (04.17)	5 (03.57)	-	44
Treatment Failure	4 (01.03)	3 (00.83)	2 (00.64)	2 (00.63)	4 (01.27)	1 (00.34)	3 (01.32)	0 (00.00)	3 (02.38)	0 (00.00)	1 (00.71)	-	23
Treatment Regimen Changed	0 ((00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	2 (01.67)	0 (00.00)	-	2
Total	**387**	**362**	**314**	**317**	**315**	**297**	**228**	**234**	**126**	**120**	**140**	**-**	**2840**
Note: Treatment Success = Cured + Treatment Completed. Includes INH Mono-Resistant													
Treatment Outcome (MDR/XDR/NTM cohort)													
Cured	30 (66.67)	22 (66.67)	17 (70.83)	45 (88.24)	21 (72.41)	7 (77.78)	12 (85.71)	16 (72.73)	10 (100.00)	5 (83.33)	-	-	185 (76.13)
Treatment Completed	4 (08.89)	5 (15.15)	3 (12.50)	2 (03.92)	6 (20.69)	1 (11.11)	1 (07.14)	3 (13.64)	0 (00.00)	0 (00.00)	-	-	25 (10.29)
Treatment Success	**34 (75.56)**	**27 (81.82)**	**20 (83.33)**	**47 (92.16)**	**27 (93.10)**	**8 (89.89)**	**13 (92.85)**	**19 (86.37)**	**10 (100.00)**	**5 (83.33)**	**-**	**-**	**210 (86.42)**
Died	6 (13.33)	3 (09.09)	2 (08.33)	4 (07.84)	1 (03.45)	1 (11.11)	1 (07.14)	1 (04.55)	0 (00.00)	0 (00.00)	-	-	19 (07.82)
Lost to Follow-Up	4 (08.89)	2 (06.06)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1 (04.55)	0 (00.00)	0 (00.00)	-	-	7 (02.88)
Transfer Out	0 (00.00)	1 (03.03)	2 (08.33)	0 (00.00)	1 (03.45)	0 (00.00)	0 (00.00)	1 (04.55)	0 (00.00)	0 (00.00)	-	-	5 (02.06)
Treatment Failure	1(02.22)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	-	-	1 (00.41)
Not Evaluated	0 (00.00	0 (00.00	0 (00.00	0 (00.00	0 (00.00	0 (00.00	0 (00.00	0 (00.00	0 (00.00	1 (16.67)	-	-	1 (00.41)
Total	**45**	**33**	**24**	**51**	**29**	**9**	**14**	**22**	**10**	**6**	**-**	**-**	**243**
Proportion of Total TB patients Who were Children Below 14 Years (Pediatric TB)													
TB patients who were children	16 (03.70)	11 (02.78)	17 (05.03)	18 (04.89)	18 (05.23)	15 (04.90)	8 (03.31)	10 (03.91)	01 (00.74)	3 (02.38)	5 (03.36)	5 (03.38)	127 (03.92)
14 & above	416 (96.30)	384 (97.22)	321 (94.97)	350 (95.11)	326 (94.77)	291 (95.10)	234 (96.69)	246 (96.09)	135 (99.26)	123 (97.62)	144 (96.64)	143 (96.6)	3113 (96.08)
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Classification of TB Based on Treatment Regimen (All)													
Non-MDR	373 (86.34)	350 (88.61)	302 (89.35)	300 (81.52)	298 (86.63)	289 (94.44)	220 (90.91)	227 (88.67)	121 (88.97)	116 (92.06)	134 (89.93)	135 (91.22)	2865
MDR/XDR/NTM	45 (10.42)	33 (08.35)	24 (07.10)	51 (13.86)	29 (08.43)	9 (02.94)	14 (05.79)	22 (08.59)	10 (07.35)	6 (04.76)	9 (06.04)	6 (04.05)	258
H Mono-resistant	14 (03.24)	12 (03.04)	12 (03.55)	17 (04.62)	17 (04.97)	8 (02.61)	8 (03.31)	7 (02.73)	5 (03.68)	4 (03.17)	6 (04.03)	7 (04.73)	117
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**	**3240**
Classification of TB Based on Treatment Regimen (New Patient only)													
Non-MDR	307 (91.92)	293 (91.85)	260 (91.23)	265 (85.76)	259 (90.24)	247 (95.37)	182 (92.86)	193 (90.19)	101 (89.38)	93 (93.94)	112 (91.06)	105 (91.30)	2417
MDR/XDR/NTM	15 (04.49)	17 (05.33)	16 (05.61)	29 (09.39)	16 (05.57)	5 (01.93)	8 (04.08)	15 (07.01)	8 (07.02)	3 (03.03)	7 (05.69)	4 (03.48)	143
H Mono-resistant	12 (03.59)	9 (02.82)	9 (03.16)	15 (04.85)	12 (04.18)	7 (02.70)	6 (03.06)	6 (02.80)	4 (03.58)	3 (03.03)	4 (03.25)	6 (05.22)	93
Total	**334**	**319**	**285**	**309**	**287**	**259**	**196**	**214**	**113**	**99**	**123**	**115**	**2653**
Classification of TB Based on Treatment Regimen (Previously Treated Patient only)													
Non-MDR	66 (67.35)	57 (75.00)	42 (79.25)	35 (60.34)	36 (66.67)	42 (91.30)	37 (82.22)	34 (80.95)	20 (86.96)	22 (84.62)	22 (84.62)	30 (90.91)	443
MDR/XDR/NTM	30 (30.61)	16 (21.05)	8 (15.09)	21 (36.21)	13 (24.07)	3 (06.52)	6 (13.33)	7 (16.67)	2 (08.70)	3 (11.54)	2 (07.69)	2 (06.06)	113
H-Mono-resistant	2 (02.04)	3 (03.95)	3 (05.66)	2 (03.45)	5 (09.26)	1 (02.17)	2 (04.44)	1 (02.38)	1 (04.35)	1 (03.85)	2 (07.69)	1 (03.03)	24
Total	**98**	**76**	**53**	**58**	**54**	**46**	**45**	**42**	**23**	**26**	**26**	**33**	**580**

SECTION THREE													
TB Program Performance Indicators and Situational Analysis 2012 – 2023													
Drug Resistant TB (All Nationality)													
Treatment Category and TB Drug Sensitivity Testing (DST) Based on CBNAAT/Gene X-pert and Culture (2012-2023)													
Year	**2012 n (%)**	**2013 n (%)**	**2014 n (%)**	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	**Total n (%)**
TB Drug Sensitivity Testing (DST) All Patients: Culture Rifampicin & INH - Only for cases for which the DST was done and result R or S is available													
H Resistant & R Sensitive	14 (06.83)	12 (06.38)	12 (07.55)	17 (08.67)	17 (08.42)	8 (04.79)	8 (05.93)	6 (06.06)	5 (06.33)	4 (06.06)	6 (04.9)	5 (04.63)	114
H Sensitive & R Resistant	0 (00.00)	1 (00.53)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	2 (01.48)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	2 (01.85)	5
H Resistant & R Resistant	38 (18.54)	28 (14.89)	23 (14.47)	41 (20.92)	26 (12.87)	10 (5.99)	10 (07.41)	18 (13.64)	10 (12.66)	6 (09.09)	9 (07.38)	4 (03.70)	223
H Sensitive & R Sensitive	153 (74.63)	147 (78.19)	124 (77.99)	138 (70.41)	159 (78.71)	149 (89.22)	115 (85.19)	108 (81.82)	64 (81.01)	56 (84.85)	107 (92.62)	97 (95.10)	1417
Total	**205**	**188**	**159**	**196**	**202**	**167**	**135**	**132**	**79**	**66**	**122**	**108**	**1759**
TB Drug Sensitivity Testing (DST) New Patients: Culture Rifampicin & INH - Only for cases for which the DST was done and result R or S available)													
H Resistant & R Sensitive	12 (08.51)	9 (06.43)	9 (06.92)	15 (09.62)	12 (07.23)	7 (04.93)	6 (05.77)	5 (04.59)	4 (06.06)	3 (05.56)	4 (04.04)	4 (05.00)	90
H Sensitive & R Resistant	0 (00.00)	1 (00.71)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1 (00.85)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	2 (02.50)	4
H Resistant & R Resistant	13 (09.22)	16 (11.43)	15 (11.54)	25 (16.03)	14 (08.43)	6 (04.23)	6 (05.77)	13 (11.93)	8 (12.12)	3 (05.56)	6 (06.06)	2 (02.50)	127
H Sensitive & R Sensitive	116 (82.27)	114 (81.43)	106 (81.54)	116 (74.36)	140 (84.34)	129 (90.85)	104 (88.89)	91 (83.49)	54 (81.82)	48 (88.89)	89 (89.90)	72 (90.00)	1179
Total	**141**	**140**	**130**	**156**	**166**	**142**	**117**	**109**	**66**	**54**	**99**	**80**	**1400**
TB Drug Sensitivity Testing (DST) Previously Treated Patients: Culture Rifampicin & INH - Only for cases for which the DST was done and result R or S available													
H Resistant & R Sensitive	2 (03.13)	3 (06.25)	3 (10.34)	2 (05.13)	5 (13.89)	1 (04.17)	2 (11.11)	1 (04.35)	1 (07.69)	1 (08.33)	2 (06.06)	1 (03.57)	24
H Sensitive & R Resistant	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1 (05.56)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	1
H Resistant & R Resistant	25 (39.06)	12 (25.00)	8 (27.59)	15 (38.46)	12 (33.33)	3 (12.50)	4 (22.22)	5 (21.74)	2 (15.38)	3 (25.00)	3 (09.09)	2 (07.14)	94
H Sensitive & R Sensitive	37 (57.81)	33 (68.75)	18 (62.07)	22 (56.41)	19 (52.78)	20 (83.33)	11 (61.11)	17 (73.91)	10 (76.92)	8 (66.67)	18 (54.55)	25 (89.9)	238
Total	**64**	**48**	**29**	**39**	**36**	**24**	**18**	**23**	**13**	**12**	**23**	**28**	**357**

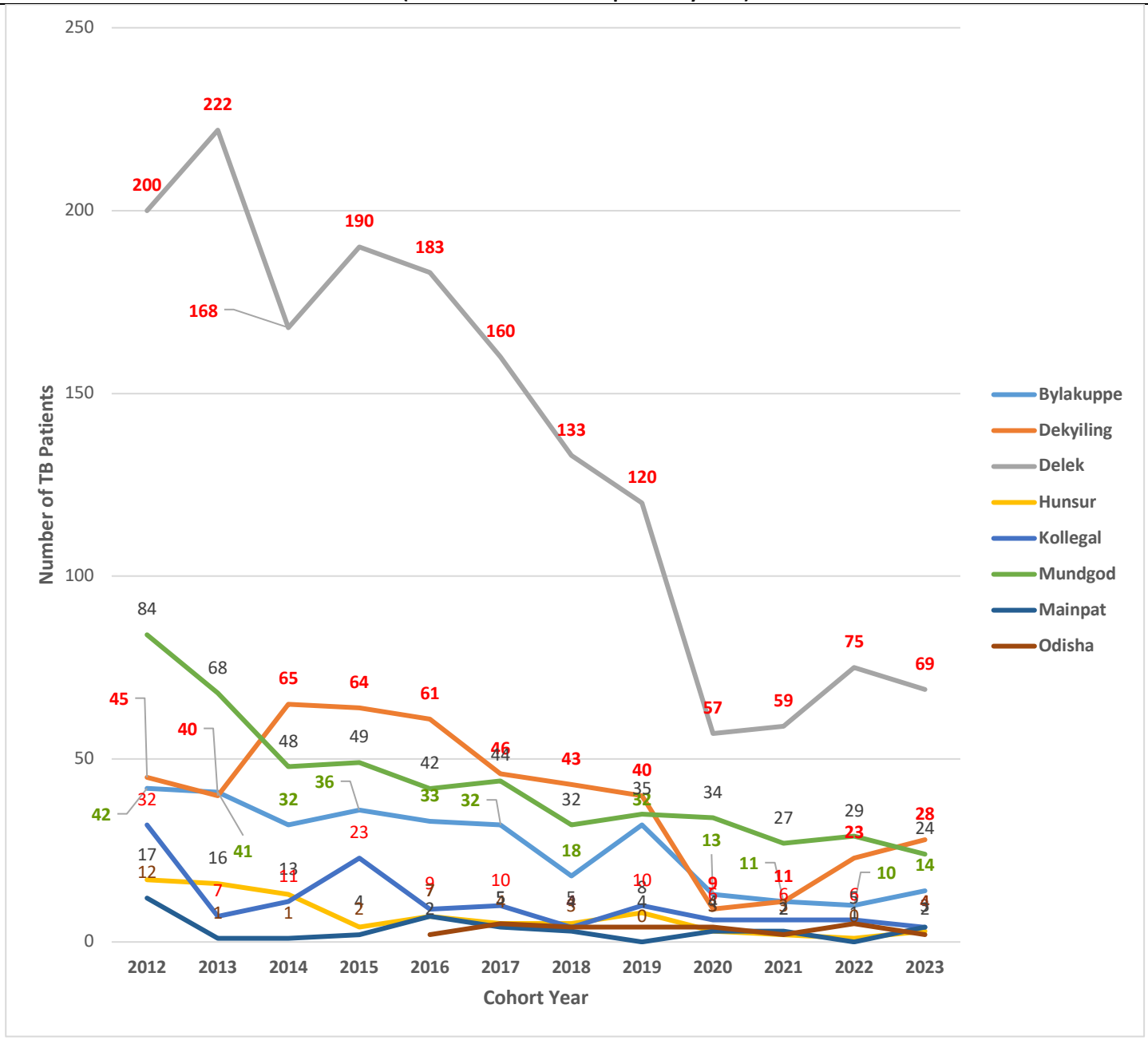
DST (KEPO/MAAC) *	2012 n (%)	2013 n (%)	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)	Total n (%)
TB Drug Sensitivity Testing (DST) Culture Kanamycin MDR/XDR cases - Only for cases for which the DST was done and result available (All Patient)													
R	3 (07.89)	2 (07.14)	2 (10.00)	3 (07.69)	3 (12.50)	1 (12.50)	2 (18.18)	3 (15.79)	1 (11.11)	1 (20.00)	1 (14.29)	0 (00.00)	22 (10.33)
S	35 (92.11)	26 (92.86)	18 (90.00)	36 (92.31)	21 (87.50)	7 (87.50)	9 (81.82)	16 (84.82)	8 (88.89)	4 (80.00)	6 (85.71)	5 (100.00)	191 (89.67)
Total	**38**	**28**	**20**	**39**	**24**	**8**	**11**	**19**	**9**	**5**	**7**	**5**	**213**
TB Drug Sensitivity Testing (DST) Culture Ethionamide MDR/XDR cases - Only for cases for which the DST was done and result available (All Patient)													
R	21 (56.76)	20 (71.43)	8 (40.00)	25 (64.10)	20 (80.00)	7 (87.50)	10 (90.91)	12 (66.67)	7 (77.78)	4 (66.67)	2 (28.57)	4 (80.00)	**140 (65.73)**
S	16 (43.24)	8 (28.57)	12(60.00)	14 (35.90)	5 (20.00)	1 (12.50)	1 (09.09)	6 (33.33)	2 (22.22)	2 (33.33)	5 (71.43)	1 (20.00)	73 (34.27)
Total	**37**	**28**	**20**	**39**	**25**	**8**	**11**	**18**	**9**	**6**	**7**	**5**	**213**
TB Drug Sensitivity Testing (DST) Culture PAS MDR/XDR cases - Only for cases for which DST was done and result available (All Patient)													
R	4 (11.11)	2 (07.14)	2 (10.53)	9 (23.08)	6 (24.00)	0 (00.00)	2 (18.18)	5 (27.78)	0 (00.00)	1 (20.00)	0 (00.00)	0 (00.00)	31 (14.76)
S	32 (88.89)	26 (92.86)	17 (89.47)	30 (76.92)	19 (76.00)	8 (100.00)	9 (81.82)	13 (72.22)	9 (100.00)	4 (80.00)	7 (100.00)	5 (100.00)	179 (85.24)
Total	**36**	**28**	**19**	**39**	**25**	**8**	**11**	**18**	**9**	**5**	**7**	**5**	**210**
TB Drug Sensitivity Testing (DST) Culture Ofloxacin (Moxifloxacin) MDR/XDR cases: Only for cases for which the DST was done and result available (All patient)													
R	18 (47.37)	12 (42.86)	10 (50.00)	19 (50.00)	12 (52.17)	5 (62.50)	3 (27.27)	9 (47.37)	2 (46.39)	3 (60.00)	6 (75.00)	1 (20.00)	99 (46.70)
S	20 (52.63)	16 (57.14)	10 (50.00)	19 (50.00)	11 (47.83)	3 (37.50)	8 (72.73)	10 (52.63)	7 (77.78)	2 (40.00)	2 (25.00)	4 (80.00)	113 (53.30)
Total	**38**	**28**	**20**	**38**	**23**	**8**	**11**	**19**	**9**	**5**	**8**	**5**	**212**
TB Drug Sensitivity Testing (DST) Culture Clofazamine MDR/XDR cases: Only for cases for which the DST was done and result available (All Patient)													
R	1 (04.76)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (00.00)	0 (oo.00)	1 (00.69)
S	20 (95.24)	17 (100.00)	12 (100.00)	25 (100.00)	17 (100.00)	5 (100.00)	8 (100.00)	15 (100.00)	7 (100.00)	6 (00.00)	7 (100.00)	5 (100.00)	144 (99.31)
Total	**21**	**17**	**12**	**25**	**17**	**5**	**8**	**15**	**7**	**6**	**7**	**5**	**145**
TB Drug Sensitivity Testing (DST) MDR/XDR TB Culture Kanamycin & Ofloxacin: Only for cases for which the DST was done and result available (All Patient)													
Km Sensitive & Ofx Sensitive	19 (50.00)	15 (53.57)	9 (45.00)	18 (47.37)	9 (39.13)	3 (37.50)	7 (63.64)	9 (47.37)	6 (66.67)	2 (40.00)	1 (14.29)	4 (80.00)	102 (48.34)
Km Resistant & Ofx Sensitive	1 (02.63)	1 (03.57)	1 (05.00)	1 (02.63)	2 (08.70)	0 (00.00)	1 (09.09)	1 (05.26)	1 (11.11)	0 (00.00)	1 (14.29)	0 (00.00)	10 (04.74)
Km Sensitive & Ofx Resistant	16 (42.11)	11 (39.29)	9 (45.00)	17 (44.74)	11 (47.83)	4 (50.00)	2 (18.18)	7 (36.84)	2 (22.22)	2 (40.00)	5 (71.43)	1 (20.00)	87 (41.23)
Km Resistant & Ofx Resistant	2 (05.26)	1 (03.57)	1 (05.00)	2 (05.26)	1 (04.35)	1 (12.50)	1 (09.09)	2 (10.53)	0 (00.00)	1 (20.00)	0 (00.00)	0 (00.00)	12 (05.69)
Total	**38**	**28**	**20**	**38**	**23**	**8**	**11**	**19**	**9**	**5**	**7**	**5**	**211**

** KEPO = Kanamycin, Ethionamide, PAS, Ofloxacin. * MACC = Moxifloxacin, Amikacin, Clofazimine, Capreomycin*

SECTION FOUR

Trend Analysis of TB Situation in Eight DoHe-CTA Health Facilities 2012 – 2023

Table 4.1: Eight Health Facilities Reporting Routine TB Program Data in 2012 - 2023 (All Nationality)
(Number of TB Cases Reported by Year)



Health Facilities Reporting Routine TB Data (2012 -2023)													
Facility	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Bylakuppe	42	41	32	36	33	32	18	32	13	11	10	14	314
Dekyiling	45	40	65	64	61	46	43	40	9	11	23	28	475
Delek	200	222	168	190	183	160	133	120	57	59	75	69	1636
Hunsur	17	16	13	4	7	5	5	8	3	2	1	3	84
Kollegal	32	7	11	23	9	10	4	10	6	6	6	4	128
Mundgod	84	68	48	49	42	44	32	35	34	27	29	24	516
Mainpat	12	1	1	2	7	4	3	0	3	3	0	4	40
Odisha	-	-	-	-	2	5	4	4	4	2	5	2	28
Total	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**249**	**129**	**121**	**149**	**148**	**3221**

To ensure continuity, data from 2012 to 2021 has been revisited and updated in this report, extending through to 2023. The years 2020 and 2021 were exceptional due to the COVID-19 pandemic. During this period, schools were closed, and students were not residing in school hostels. As a result, students from Dharamsala-Bir-Chauntra, Doon Valley-Poanta, and Bylakuppe returned to their parents' or guardians' homes. Consequently, the TB cases reported by the eight health facilities (Table 4.1) in 2020 and 2021 may not reflect the full student population that would typically be based in these large residential schools. These schools reopened in 2022 as the COVID-19 situation improved.

Table 4.1 shows a drastic decrease in the reporting of TB cases in 2020 and 2021, with the most pronounced drop in the "student" group from Delek, Dekyiling, and Bylakuppe (refer to Tables 4.2 and 4.3). This raises the question: Was the decline due to an actual reduction in TB cases, or was it the result of increased underreporting compared to previous years? The COVID-19 pandemic may have contributed to underreporting, as fear of seeking health services and difficulties in accessing healthcare became widespread. However, as mentioned earlier, many students from large residential schools in Dharamsala-Bir-Chauntra, Doon Valley-Poanta, and Bylakuppe may have been residing in Tibetan settlements that fall outside the catchment areas of the eight health facilities reporting TB cases to the Department of Health-CTA (DoHe-CTA) in 2020 and 2021. A dramatic drop in TB cases reported among students in 2020 and 2021 can be observed from the Delek, Dekyiling, and Bylakuppe health facilities—centers that serve as TB referral hubs for Dharamsala, Bir-Chauntra, Doon Valley, and Bylakuppe residential schools. However, this decline was followed by a noticeable rebound in TB cases in 2022 and 2023 (see Table 4.3).

On the other hand, the decline in TB cases reported by the eight health facilities in 2020 and 2021 could reflect a genuine reduction, as key social determinants that increase TB transmission, such as overcrowding in schools, were mitigated by the COVID-19-related school closures during those years. Additionally, behaviour modifications—either enforced or voluntarily adopted during the pandemic to reduce the risk of SARS-CoV-2 transmission—may have also lowered the risk of TB infection. These observations provide compelling reasons to continue reducing overcrowding in institutions such as schools and monasteries, and to promote behaviours that prevent the transmission of TB, even after the pandemic ends.

There is also evidence to suggest that the drop in TB cases in 2020 and 2021 reflects a continuing downward trend in TB incidence within the Tibetan community in India, in addition to 'missing' students because of the closure of residential schools on account of the COVID-19 pandemic. These 'missing' students would have otherwise presented to the three Tibetan health facilities: Delek, Dekyiling, and Tso-Jhe Hospitals (Bylakuppe).

Table 4.2: Eight Health Facilities Reporting Routine TB Program Data Disaggregated by Occupation (2012-2023 Cohort & All Nationality)													
Occupation	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Artist/Crafts man	9	6	1	5	3	3	1	4	3	3	1	2	
Business	33	30	21	25	15	22	19	17	9	10	6	13	
Government Service	8	5	5	3	3	8	3	2	1	0	3	3	
Health Care Worker	11	9	6	9	4	2	5	4	2	3	6	6	
Monk/Nun	98	88	63	54	64	46	42	64	28	28	23	27	
Other	61	70	62	54	61	39	48	42	25	30	42	39	
Student (n)	**163**	**144**	**137**	**164**	**162**	**152**	**94**	**68**	**29**	**17**	**42**	**29**	**1201**
(row%)	13.57	11.99	11.41	13.66	13.49	12.66	7.83	5.66	2.41	1.42	3.50	2.41	100
Unemployed	49	43	43	54	32	34	30	48	32	30	26	29	
Total (n)	**432**	**395**	**338**	**368**	**344**	**306**	**242**	**249**	**129**	**121**	**149**	**148**	**3221**
(row%)	13.41	12.26	10.49	11.43	10.68	9.50	7.51	7.73	4.00	3.76	4.63	4.59	100

Table 4.3: Eight Health Facilities Reporting Routine TB Program Data (2012-2023 Cohort & All Nationality) (Occupation = Students)													
rx_center	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
BYK_Bylakuppe	19	8	15	20	23	21	12	10	3	1	4	3	
DKY_Dekyiling	25	22	32	36	39	26	21	15	1	4	9	14	
DLK_Delek	88	99	80	92	90	96	55	37	21	8	24	7	
HUN_Hunsur	8	3	4	0	0	1	1	0	0	0	0	0	
KOL_Kollegal	10	3	0	4	4	2	0	3	0	1	1	0	
MNG_Mundgod	11	9	6	11	6	4	5	2	2	2	2	4	
MPT_Mainpat	2	0	0	1	0	0	0	0	0	0	0	1	
ODH_Odhisa	0	0	0	0	0	2	0	1	2	1	2	0	
Total (n)	**163**	**144**	**137**	**164**	**162**	**152**	**94**	**68**	**29**	**17**	**42**	**29**	**1201**
(row%)	13.57	11.99	11.41	13.66	13.49	12.66	7.83	5.66	2.41	1.42	3.50	2.41	100

SECTION FIVE

DISCUSSION & RECOMMENDATIONS

The table 5.1 gives the overview of WHO's End TB strategy, milestones, and their targets. Let us explore our current statuses in terms of the three core indicators.

Table 5.1: The End TB Strategy at Glance (2016–2035)				
VISION	**A WORLD FREE OF TB (Zero deaths, disease and suffering due to TB)**			
GOAL	**END THE GLOBAL TB EPIDEMIC**			
INDICATORS	**MILESTONES**		**TARGETS**	
	2020	**2025**	**SDG 2030a**	**End TB 2035**
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared with 2015 (%)	20% (<85/100000)	50% <55/100 000)	80% <20/100000)	90% (<10/100 000)
TB-affected families facing catastrophic costs due to TB (%)	0	0	0	0

INDICATOR: Reduction in TB deaths as compared to 2015 (%)

Table 5.2 presents the "Treatment Outcome" data reported by health facilities managing routine TB cases among Tibetans living in India. Due to the relatively small population size, the absolute number of TB-related deaths is expected to be low, with significant fluctuations each year. Nonetheless, maintaining a Case Fatality Rate (CFR) below 5% aligns with the WHO's 2025 target and is a reasonable benchmark for success.

Patients with multidrug-resistant TB (MDR-TB), particularly those who are unemployed, require additional support. Beyond free diagnostics and medication, targeted interventions should address critical needs such as adequate shelter and nutrition to improve their overall treatment outcomes.

Table 5.2: Treatment Outcome from DoHe-CTA Surveillance Hospitals Reporting Routine TB Data (2012 – 2021 Cohort) (Reporting Year 2023)				
Treatment Start Year	**Treatment Success n (%)**	**Lost to FU / Treatment Failure n (%)**	**Died n (%)**	**TOTAL n (%)**
2012	392 (90.74)	18 (04.24)	15 (03.47)	**432**
2013	369 (93.41)	12 (03.07)	10 (02.53)	**395**
2014	312 (92.31)	8 (02.40)	14 (04.14)	**338**
2015	341 (92.66)	9 (02.49)	12 (02.26)	**368**
2016	325 (94.48)	8 (02.35)	8 (02.33)	**344**
2017	289 (94.44)	3 (00.99)	11 (03.59)	**306**
2018	225 (92.98)	10 (04.18)	4 (01.65)	**242**
2019	226 (88.28)	6 (02.34)	8 (03.13)	**256**
2020	121 (88.97)	3 (02.38)	7 (05.15)	**136**
2021	106 (84.13)	3 (02.50)	3 (02.38)	**126**

INDICATOR: Reduction in TB incidence rate compared with 2015 (%)

The **incidence rate** of TB is calculated by dividing the number of new and retreatment (relapse) TB cases by the total population, typically expressed per 100,000 individuals. This indicator can be challenging to accurately determine, and we currently lack a reliable baseline for 2015 and subsequent years.

To improve accuracy, better population data on TB cases should be gathered across all settlements through monthly outreach visits as part of the DoHe-CTA CCOCC program. In conjunction with an updated population census, which will serve as the denominator for calculating incidence rates, we should be able to produce more accurate estimates of TB incidence and use statistical modeling to project future trends.

Table 5.3

All TB Cases from DoHe-CTA Surveillance Hospitals Reporting Routine TB Data (2012 – 2023 cohort)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Frequency	432	395	338	368	344	306	242	256	136	126	149	148	**3240**

INDICATOR: TB affected families facing catastrophic costs due to TB (%)

Currently, we lack comprehensive and representative survey data for this indicator. However, a small survey conducted in South India involving 10 patients with multidrug-resistant TB (MDR-TB) revealed that approximately 20% experienced catastrophic out-of-pocket (OOP) costs as a result of their TB treatment. (*considering that we may not get accurate total annual household income through interview, a surrogate information was used in the estimation of catastrophic cost i.e., selling assets/high value household items or incurring debt) despite having, in general, a good social support system*.

This underscores the necessity of including TB under the Universal Health Coverage Scheme. Additionally, it highlights the need to implement a policy that ensures continued access to free diagnostics—including sputum smear, Gene-Xpert, Culture-DST as well as the provision of free TB medications especially for those with MDR.

Recommendations: What More Can Be Done?

It is clear that achieving the WHO's 2025 milestone of a TB incidence rate below 55/100,000 will be challenging. Apart from the interventions listed below, we should focus our attention to the social determinants of TB. In addition to the interventions listed below, greater focus must be placed on addressing the social determinants of TB. Our community in India and Nepal is highly institutionalized, which leads to overcrowding and poor ventilation in living

environments, increasing the risk of both acquiring TB infection and progressing to active TB disease. Past TB outbreaks in residential boarding schools and monasteries are evidence of this heightened risk.

Due to demographic transitions such as lower fertility and birth rates, reduced in-migration into India, and increased out-migration, the student population in Tibetan residential schools has been declining. This should have naturally alleviated overcrowding to some extent without the need for interventions. Unfortunately, some schools repurposed the vacant dormitories and hostels for other uses, missing a valuable opportunity to decongest and address the issue of overcrowding in these schools.

I have written an advocacy paper titled "Social Determinants of Tuberculosis (TB) in Large Tibetan Residential Schools in the Era of COVID-19 Pandemic: An Advocacy Paper." A copy of this paper was included in my "TB Report 2012 – 2020" and is available through the Department of Health, CTA (DoHe-CTA). For a digital copy, interested individuals can also contact me directly via email at ltpekhang@gmail.com.

Another issue specific to our community is the high rate of drug resistance to second-line (MDR) core & traditional K.E.P.O TB medicines i.e. Kanamycin, Ethionamide, PAS and Ofloxacin (refer SECTION 3; page 11-12). It is imperative to conduct second-line TB drug culture and drug sensitivity testing (Culture & DST) for all patients initiated on second-line MDR-TB treatments. Management should be tailored to each individual case rather than following a standardized treatment protocol

Additional Activities/Interventions:

1. Implement Active Case Finding on a regular basis during routine CCOCC outreach visits.
2. Explore & Initiate aggressive Contact Tracing.
3. Ensure Universal Drug Susceptibility Testing (DST) through Gene-Xpert and culture-DST, and expand these services to additional health facilities.
4. Strive for 100% coverage of Latent TB Infection (LTBI) treatment for people living with HIV who are newly enrolled in HIV care, as well as for children under 5 years of age who are household contacts of infectious TB cases—aligning with components of the Government of India's TB program.
5. Address over-crowding and poor air quality (ventilation) in schools and monasteries.

6. Include TB in the Universal Health Coverage Scheme and declare & implement a policy that ensures access to free TB medications & diagnostics (sputum smear, Gene-Xpert, Culture-DST)
7. Explore regular outreach programs to remote settlements operating a mobile service by a team consisting of doctors, technicians with supporting nursing staffs equipped with portable digital x-ray and CBNAAT / GeneXpert diagnostic facilities.
8. Develop and implement a routine TB screening mechanism for students during school admission, school transfers, and after extended vacations to ensure early detection and treatment.
9. Scale-up and upgrade the electronic surveillance and health information system (TB-HIS) to ensure that comprehensive, real-time community-based TB data is collected and accessible from all settlements.
10. Explore means to address the treatment of people with latent TB infection who are confirmed contacts of MDR/XDR cases, in collaboration with multicenter research institutions.

SECTION SIX

Top 10 WHO indicators (not ranked) for monitoring implementation of the End TB Strategy

(Target level is for 2025 at the latest.** Reproduced from WHO TB Report 2018**)

TB Surveillance Data from Health Facilities Reporting Routine TB Data (All Nationality)
DoHe-CTA Status (Reporting Year 2024)

INDICATOR 1: TB treatment coverage rate: Number of new and relapse cases that were notified and treated, divided by the estimated number of incident TB cases in the same yar, expressed as a percentage.

INDICATOR 1: WHO Target 2025 ≥ 90%

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)
DoHe-CTA Status	No data available								
Total TB Cases Reported	**368**	**344**	**306**	**242**	**256**	**136**	**126**	**149**	**148**

INDICATOR 2: TB treatment success rate: Percentage of notified TB patients who were successfully treated. The target is for drug–susceptible and drug-resistant TB combined, although outcomes should also be reported separately.

INDICATOR 2: WHO Target 2025 ≥ 90%

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)
Treatment Success Rate	**341 (92.66)**	**325 (94.48)**	**289 (94.44)**	**225 (92.98)**	**226 (88.28)**	**121 (88.97)**	**106 (84.13)**	**-**	**-**
Total TB Cases Reported	368	344	306	242	256	136	126	-	-

INDICATOR 3: Percentage of TB affected households that experience catastrophic costs due to TB: Number of people treated for TB (and their households) who incur catastrophic costs (direct and indirect combined), divided by the total number of people treated for TB.

INDICATOR 3: WHO Target 2025 = 0%

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)
DoHe-CTA Status	We do not have an accurate data. But a small sample of MDR patients showed that 20% of TB (MDR) affected households experienced catastrophic Out-Of-Pocket (OOP) costs due to TB. *(Selling assets/high value household items or incurring debt used as surrogate to define* catastrophic OOP costs)								

INDICATOR 4: Percentage of new and relapse TB patients tested using a WHO-recommended rapid diagnostic (WRD) at the time of diagnosis: Number of new and relapse TB patients tested using a WRD at the time of diagnosis, divided by the total number of new and relapse TB patients, expressed as a percentage.

INDICATOR 4: WHO Target 2025 ≥ 90%

Note: CBNAAT / GeneXpert

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)
n (%) New & Relapse with WRD	**257 (70.03)**	**265 (77.71)**	**248 (81.31)**	**207 (85.90)**	**225 (87.89)**	**120 (88.4)**	**119 (95.20)**	**118 (79.19)**	**117 (79.05)**
Total New & Relapse	367	341	305	241	256	136	125	149	148

INDICATOR 5: Latent TB infection (LTBI) treatment coverage: Number of people living with HIV newly enrolled in HIV care and the number of children aged <5 years who are household contacts of cases started on LTBI treatment, divided by the number eligible for treatment, expressed as a percentage (separately for each of the two groups).

INDICATOR 5: WHO Target 2025 ≥ 90%

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)
DoHe-CTA Status	No data available								

INDICATOR 6: Contact investigation coverage: Number of contacts of people with bacteriologically confirmed TB who were evaluated for TB, divided by the number eligible, expressed as a percentage.

INDICATOR 6: WHO Target 2025

Year	2015 n (%)	2016 n (%)	2017 n (%)	2018 n (%)	2019 n (%)	2020 n (%)	2021 n (%)	2022 n (%)	2023 n (%)	≥ 90%
DoHe-CTA Status	No data available									
INDICATOR 7: Drug-susceptibility testing (DST) coverage for TB patients: Number of TB patients with DST results for at least rifampicin, divided by the total number of notified (new and retreatment) cases in the same year, expressed as a percentage. DST coverage includes results from molecular (e.g., Xpert MTB/ RIF) as well as conventional phenotypic DST results.										**INDICATOR 6** **WHO Target 2025** ≥ 90%
Year	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	**INDICATOR 7** **WHO Target 2025** 100% Note: Xpert MTB/RIF OR cs_r=" YES"
Number of TB patients (New & Retreatment) with DST results for at least rif (X-pert & Culture/DST)	**271 (73.84)**	**270 (79.18)**	**249 (81.64)**	**207 (85.89)**	**226 (88.28)**	**122 (89.71)**	**120 (96.00)**	**134 (89.93)**	**123 (83.11)**	
Total New & Retreatment TB Cases	367	341	305	241	256	136	125	149	148	
INDICATOR 8: Treatment coverage, new TB drugs: Number of TB patients treated with regimens that include new (endorsed after 2010) TB drugs, divided by the number of notified patients eligible for treatment with new TB drugs, expressed as a percentage.										**INDICATOR 8** **WHO Target 2025** ≥ 90% *Note: Only Non-MDR Cases considered here*
Year	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	
Number of Non-MDR Cases treated with SCC	**All Non-MDR TB Cases (exclude H-Mono-Resistant cases) are treated with short course regiments for 6 or 8 months)**									
Total Non-MDR Cases	**300**	**298**	**289**	**220**	**227**	**121**	**116**	**134**	**135**	
Indicator 9: Documentation of HIV status among TB patients: Number of new and relapse TB patients with documented HIV status, divided by the number of new and relapse TB patient notified in the same year, expressed as a percentage.										**INDICATOR 9** **WHO Target 2025** 100%
Year	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	
Number (%) with HIV Status	**366 (99.46)**	**341 (99.13)**	**302 (98.69)**	**240 (99.17)**	**256 (100)**	**136 (100)**	**125 (99.21)**	**148 (99.33)**	**146 (98.65)**	
Total TB Cases Registered	368	344	306	242	256	136	126	149	148	
INDICATOR10: Case fatality ratio (CFR): Number of TB deaths divided by estimated number of incident cases in the same years, expressed as a percentage.										**INDICATOR 10** **WHO Target 2025** ≤ 5%
Year	**2015 n (%)**	**2016 n (%)**	**2017 n (%)**	**2018 n (%)**	**2019 n (%)**	**2020 n (%)**	**2021 n (%)**	**2022 n (%)**	**2023 n (%)**	
Number (&) of Deaths	**12 (03.27)**	**80 (2.55)**	**11 (03.61)**	**4 (01.66)**	**8 (03.12)**	**7 (05.15)**	**3 (02.40)**	**-**	**-**	
Number of New & Retreatment Cases	367	341	305	241	256	136	125	**-**	**-**	