

Estimation of TB Score and Incidence Calculation from Base Line Year 2015 to Year 2021 in Central India**Shobhana Yadav¹, Yogesh Shukla², Anirudh Nayak³, Sanjay Agarwal⁴**¹Demonstrator, Department of Community Medicine, Atal Bihari Vajpayee Government Medical College, Vidisha, Madhya Pradesh, India²Associate Professor, Department of Community Medicine, Government Medical College, Satna, Madhya Pradesh, India³Demonstrator, Department of Community Medicine, Atal Bihari Vajpayee Government Medical College, Vidisha, Madhya Pradesh, India⁴Professor and Head, Department of Community Medicine, Atal Bihari Vajpayee Government Medical College, Vidisha, Madhya Pradesh, India

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Conflict of interest: Nil

Abstract:**Background:** Government of India (GOI) has set an ambitious goal for ending Tuberculosis (TB) by reducing the incidence of new TB cases by 80 % by 2025 compared with 2015. There is wide variation in TB burden across the country. The Central TB Division (CTD) of the Ministry of Health and Family Welfare, GOI decided to incentivize State/Union Territories(UTs)/District for their progress towards TB free status.**Aims and Objectives:** the Aims and objectives of this study was estimation of reduction in Tuberculosis incidence by using TB score method from base year 2015 to year 2021 in Shajapur district of Madhya Pradesh.**Materials and Method:** Secondary data verification was done from December 2021 to March 2022 in Shajapur District, Madhya Pradesh under sub-national claim for TB-free status. Decline in incidence from the base year 2015 to year 2021 was estimated through TB score which comprised of 9 parameters. For calculation and verification of TB score we had done real time review of data in Nikshay portal along with cross-checking of Nikshay data with physical notification register of various Tuberculosis Unit(TU),laboratory register, TB treatment cards including DR-TB cards.**Results:** The incident cases as per district notification are increasing from 113.7/lakh population from 2015 to 151.5/lakh population in year 2021. TB score was obtained 77 in year 2018, 80 in the year 2019, 75 in the year 2020 and 80 in the year 2021.**Conclusion:** for claim of sub national TB free status pre-requisite 80 % TB score is mandatory which was achieved by district Shajapur which cross the cut off value of 80% TB score. But other criteria like Number Needed Test (NNT) and patient moths was also considered to verified the claim by district Shajapur for sub-national TTB free status.**Keywords:** Tuberculosis, TB score, sub national, TB claim, verification.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Tuberculosis is a major global public health challenge. In 2014, 6.3 million cases of tuberculosis worldwide were reported to WHO, with India accounting for over a quarter of these cases, the highest of any country. The Government of India (GoI) has set an ambitious goal for ending tuberculosis (TB) by reducing the incidence of new TB cases by 80% by 2025 compared with 2015[1]. India has a high TB burden (2.69 million cases in 2019), with a notification rate of approximately 159 cases/100 000 population[2]. There is a wide variation in TB burden across the country. The efforts toward ending TB also vary across states/union territories (UTs) and districts of India.

It is, therefore, crucial to monitor the progress towards the elimination goal at the subnational level. The Central TB Division (CTD) of the Ministry of Health and Family Welfare, GoI decided to incentivise states/ UTs/districts for their progress towards TB- free status.[3] [4]. Under this initiative, the CTD sought claims from states/ UTs/districts for achievements in reducing TB incidence in 2020 compared with 2015. These achievements were considered under four categories: 20%–39% (bronze), 40%–59% (silver), 60%–79% (gold) and ≥80% (TB free)[5].

Aims and Objectives: The Aims and objectives of this study was estimation of reduction in Tuberculosis incidence by using TB score method from base year 2015 to year 2021 in Shajapur district of Madhya Pradesh.

Material and Method: Secondary data verification was done from December 2021 to March 2022 in Shajapur District, Madhya Pradesh under sub-national claim for TB-free status. Shajapur district claim for 20 % reduction in TB incidence as compared to 2015 incidence rate for 'Bronze' category award.

We had selected as verification team of IAPSM members for the verification of the claim. TB score which is a pre-requisite for claim is a composite score of 9 parameters. These 9 parameters includes: 1. TB notification 2. TB notification with known HIV status. 3. Universal Drug Susceptibility Testing (UDST) 4. Treatment success rate 5. Beneficiaries paid under Nikshay poshan yojna 6. Drug-resistant (DR) – TB treatment initiation 7. Expenditure: 8. Chemoprophylaxis for children 9.

TB preventive therapy (TPT) for People living with HIV (PLHIV). TB score ranges from 0-100. For eligibility to file a claim for any district/State there is 3 eligibility criterias: 1. TB score for the latest year is $\geq 80\%$ 2. Increase Number needed to test (NNT) 3. Percentage decline in patient month's $\geq 20\%$ (based on drug sale/consumption data). For calculation & verification of TB Score, our team had done real time review of data in Nikshay portal along with cross checking of Nikshay data with physical notification registers of various TUs/PHIs, laboratory registers, TB treatment cards including DR TB cards. In this article we are showing the result of TB score.

Ethical approval: Ethical approval granted by ICMR-NIE, Central TB Divison and DTO Shajapur district Madhya Pradesh.

Result: Table no. 1 depicts TB notification from the year 2018 to year 2021 by district Shajapur. Points on TB notification achieved were 13.5, 11.23, 8.53 and 11.13 in 2018, 2019, 2020 and 2021 respectively.

Table 1: TB Notification verified by Verification team

TB notification				
As verified by verification team	2018	2019	2020	2021
Annual Target Patients to be notified	2600	2750	2700	3200
TB cases notified - Both Public and Private	1775	1544	1151	1781
Percentage (%) of Target achieved in TB Notification	68.27%	56.15%	42.63%	55.66%
Points on TB notification achieved (20 points)	13.65	11.23	8.53	11.13

Table no. 2 is Showing TB notification with known HIV status. Points on TB notified patients with known HIV was 6.47, 7.52, 8.81 and 7.6 in year 2018, 2019, 2020 and 2021 respectively.

Table 2: TB notified patients with known HIV verified by Verification team

Screened for HIV	2018	2019	2020	2021
As verified by verification team				
1.Total TB notified cases (notified cases based on current PHI)	1817	1828	1367	1784
2.Number of TB notified patients screened for HIV	1210	1375	1205	1356
3.Percentage (%) of patients with known HIV testing	64.71	75.22%	88.15%	76.01%
4.Points on TB notified patients with known HIV status (10 points)	6.47	7.52	8.81	7.6

Table no. 3 is Showing Universal Drug Susceptibility test (UDST). Points on Universal Drug Susceptibility test (UDST) was 10 for each year 2018, 2019, 2020 and 2021 respectively.

Table 3: Universal Drug Susceptibility test (UDST) verified by Verification team

UDST	2018	2019	2020	2021
As verified by verification team				
Total TB Cases notified (Based on current PHI)	1870	1828	1367	1784
Target TB notified cases eligible for UDST (please calculate as per % benchmark set for the State)	70%	70%	81%	81%
UDST tested	325	1028	913	721
Points on UDST (10 points)	10	10	10	10

Table no. 4 shows treatment success rate. Points on treatment success rate were 12.28, 10.66, 8.44 and 9.99 for year 2018, 2019, 2020 and 2021 respectively.

Table 4: Treatment success rate verified by Verification team

Success rate	2018	2019	2020	2021
As verified by verification team				
TB notified patients (Both Public and Private)	1870	1831	1786	1346
Number of TB notified patients with treatment outcome - Success (Both Public and Private)	1531	1301	1005	896
Success percentage (%) (Both Public and Private)	18.87	71.05%	56.27%	66.57%
Points on treatment success rate (15 Points)	12.28	10.66	8.44	9.99

Table no. 5 is showing details of beneficiaries paid under Nikshay poshan yojna. Points on Beneficiaries paid under Nikshay PoshanYojana were 7.84, 8.95, 9.23 and 9.53 in the year 2018, 2019, 2020 and 2021 respectively.

Table 5: Beneficiary paid verified by Verification team

Beneficiaries Paid	2018	2019	2020	2021
As verified by verification team				
NikshayPoshanYojana - Total beneficiaries eligible - Data as per Nikshay	1858	1827	1363	1778
NikshayPoshanYojana - Beneficiaries paid (at least one payment)	1457	1636	1258	1694
Percentage (%) of beneficiaries paid under NikshayPoshanYojana	78.42	89.55%	92.3%	95.28%
Points on Beneficiaries paid under NikshayPoshanYojana (10)	7.84	8.95	9.23	9.53

Table no. 6 is showing details of Drug resistant TB status. Points on DRTB patients treatment initiation regimen was 14.56, 14.68, 14.38 and 14.25 in the year 2018, 2019, 2020 and 2021 respectively.

Table 6: Drug resistant TB (DRTB) verified by Verification team

DRTB	2018	2019	2020	2021
As verified by verification team				
MDR patients diagnosed	34	47	24	40
DRTB regimen initiated	33	46	23	38
Percentage (%) DRTB patients initiated on treatment	97.06%	97.87%	95.83%	95%
Points on DRTB patients treatment initiation regimen (15 points)	14.56	14.68	14.38	14.25

Table no. 7 shows that expenditure details. Points on expenditure were 7.51, 9.59, 7.97 and 9.14 in the year 2018, 2019, 2020 and 2021 respectively.

Table 7: Expenditure done by district verified by Verification team

Expenditure	2018	2019	2020	2021
As verified by verification team				
Finance ROP to the State (in lakhs)	5566500	8458050	8277950	7342430
Expenditure (in lakhs) (Data of FY to be entered)	4180000	8107810	6595550	6709310
Percentage (%) Expenditure	75.09%	95.86%	79.68%	91.38%
Points (Expenditure - 10)	7.51	9.59	7.97	9.14

Table no. 8 is showing Chemoprophylaxis details given for children under 6years of age. Points on chemoprophylaxis were 0.24, 2.31, 3.45 and 3.32 in the year 2018, 2019, 2020 and 2021 respectively.

Table 8: Chemoprophylaxis verified by Verification team

Chemoprophylaxis	2018	2019	2020	2021
As verified by verification team				
Children <6 yrs identified	749	295	207	148
Children diagnosed with TB	0	1	1	2
Children eligible for Chemoprophylaxis	749	294	206	146
Children given chemoprophylaxis	36	136	142	97
Percentage (%) Children given chemoprophylaxis	4.81%	46.26%	68.93%	66.44%
Points on chemoprophylaxis (5 points)	0.24	2.31	3.45	3.32

Table no. 9 shows details of TB preventive therapy given for people living with HIV (PLHIV). Points on TPT for PLHIV were 4.68, 4.57, 4.06 and 4.71 in year 2018, 2019, 2020 and 2021 respectively.

Table 9: TB Preventive Therapy (TPT) for PLHIV verified by Verification team

PLHIV	2018	2019	2020	2021
As verified by verification team				
PLHIV on active care	31	47	32	34
PLHIV eligible for TPT	31	47	32	34
PLHIV initiated on TPT out of eligible	29	43	26	32
Percentage (%) eligible PLHIV received TB preventive therapy	93.55%	91.49%	81.25%	94.12%
Points on TPT for PLHIV (5 points)	4.68	4.57	4.06	4.71

TB score was 77 in 2018, 80 in the year 2019, 75 in the year 2020 and 80 in the year 2021. Fig. no. 1 shows that the incident cases as per district notification are increasing from 113.7/lakh population from 2015 to 151.5 lakh population in

year 2021. So there is increasing trend of Tuberculosis cases in the district in current year as compared to baseline year 2015. The fall during 2019 and 2020 may be due to underreporting of cases during the Covid pandemic.

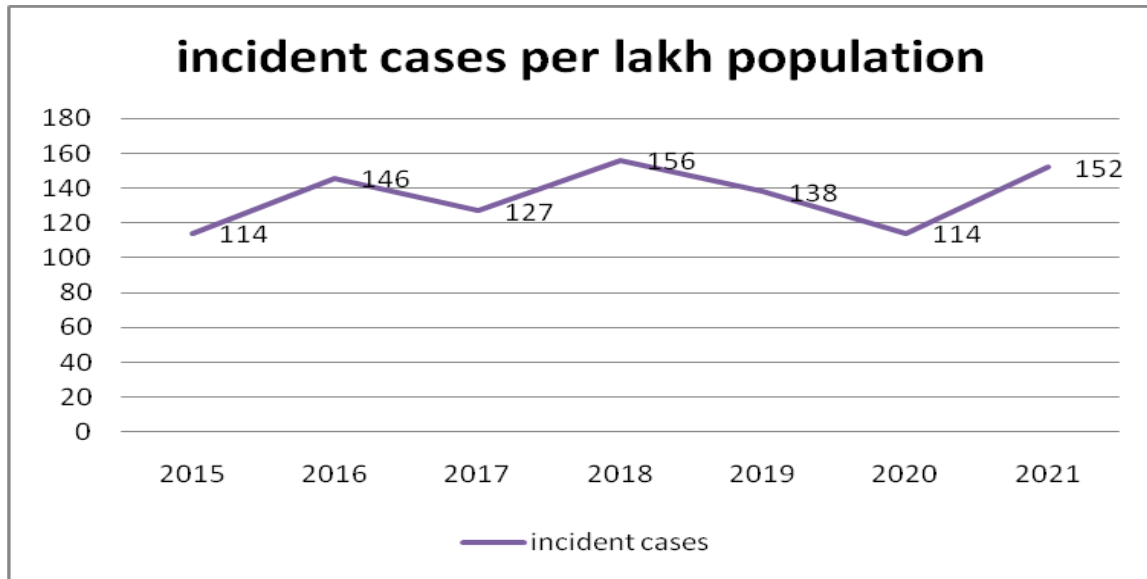


Figure 1: Incident Cases per Lakh Population

Discussion

TB score was 77 in 2018, 80 in the year 2019, 75 in the year 2020 and 80 in the year 2021. The incident cases as per district notification are increasing from 113.7/lakh population from 2015 to 151.5/lakh population in year 2021.

So there is increasing trend of tuberculosis cases in the district in year 2021 compared to baseline year 2015. May be due to Covid pandemic case were decreased during 2020 [6,7,8]. Sub-national verification of claim, used three methods to verification of find out incident cases namely TB notification rate, Survey and by patient months using drug sales/consumption data. So that the strength of one method shall overcome the limitation of another [9,10].

A comprehensive estimation of the burden of the TB, especially in a high TB burden should account for all patients with TB irrespective of their place of diagnosis and compliance with treatment [11,12].

Conclusion:

Prerequisite: MThe state has submitted and fulfilling the below mentioned prerequisite criteria for claim submission:-

1. NNT is increased by 24.1% (from 11.2 in year 2015 to 13.9 in the year 2021)
2. Total T.B. Score is 80 % as verified by the verification team for current year 2021.

3. Percentage of decline in patient months calculated using Anti T.B. drug data (from both public & private) from 2015 is not submitted by the district at the time of claim.

Criteria for certification TB free status as achievement of reduction in T.B. incidence as compared to 2015 in incidence rate. The total Annual Notification rate by the district was 113.7/lakh population in the year 2015 while it was 151.5/ lakh population.

So there is increased incidence by 37.8 cases/ lakh population (33.24%) during this time period.

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