

SUPPLEMENTARY MATERIAL TABLE 1. Definitions, operationalization, data sources, and limitations of the ten selected indicators used to assess TB preventive treatment implementation in the state of Amazonas, Brazil.

Domain	Indicator	Operational definition	Formula	Numerator/Denominator	Comments/Adjustments	Limitations
Implementation	1. Time to local implementation of 3HP (number of municipalities by time to implementation, months)	Months between Oct/2021 and the first m with ≥1 3HP initiation in the municipality/CNES.	$\text{local_implementation_month} - \text{Oct}/2021$ (in months)	—	Sensitivity using thresholds of ≥1 ≥5; useful for diffusion maps.	May overestimate adoption settings with small caseloads.
Access	2. TPT initiations among contacts of new bacteriologically confirmed pulmonary TB cases, relative to registered contacts	Proportion of contacts initiating TPT among registered contacts of notified new bacteriologically confirmed pulmonary TB cases.	$\text{contacts_started_period} / \text{contacts_registered_period} \times 100$	$\frac{\text{Number of contacts initiating TPT (IL-TB)}}{\text{Number of registered contacts of bacteriologically confirmed pulmonary TB cases (SINAN-TB)}}$	Best proxy for contact surveillance performance; consider quality of contact recording.	Underreporting of contacts may distort the indicator.
Access (PLHIV)	3. TPT initiations among PLHIV per 1,000 ART initiators	Subanalysis among PLHIV: TPT initiation relative to the number of individuals initiating ART.	$(\text{PLHIV_started_TPT} / \text{ART_initiated}) \times 1,000$	$\frac{\text{PLHIV initiating TPT (IL-TB)}}{\text{Number of PLHIV initiating ART (Ministry of Health HIV Panel)}}$	Requires linkage by municipality/period; interpret as a programmatic proxy for new HIV infection cases.	Coverage and periodicity of data may vary.
Access (PLHIV)	4. TPT initiations among PLHIV per 1,000 PLHIV currently on ART	Subanalysis among PLHIV: TPT initiation relative to the annual prevalence of individuals currently on ART (compensates for missing values in ART initiation data).	$(\text{PLHIV_started_TPT} / \text{PLHIV_on_ART}) \times 1,000$	$\frac{\text{PLHIV initiating TPT (IL-TB)}}{\text{Number of PLHIV currently on ART annual prevalence estimate (Mini Health HIV Panel)}}$	Useful for long-term monitoring.	Differences in care coverage may confound interpretation.
Diagnosis/Process	5. Proportion of TPT initiators with IGRA performed	Proportion of TPT initiators who underwent IGRA.	$(\text{IGRA_performed} / \text{total_started}) \times 100$	$\frac{\text{Number of TPT initiators with IGRA performed (IL-TB)}}{\text{Total number of TPT initiators (IL-TB)}}$	Stratify pre-2022 vs post-2022; no concentration in referral services in 2022.	Indication/service bias in the incorporation period.
Diagnosis	6. Proportion of TPT initiators with TST performed	Proportion of TPT initiators in whom a TST was performed.	$(\text{TST_performed} / \text{total_started}) \times 100$	$\frac{\text{Number of TPT initiators with TST recorded in mm (IL-TB)}}{\text{Total number of TPT initiators (IL-TB)}}$	Useful for understanding the TST IGRA transition.	Missing data or reading recording may limit analysis.
Implementation	7. 3HP uptake among TPT initiators	Proportion of TPT initiators receiving the regimen.	$(\text{started_3HP} / \text{total_started}) \times 100$	$\frac{\text{Number of TPT initiators receiving 3HP regimen (IL-TB)}}{\text{Total number of TPT initiators (IL-TB)}}$	Add separate curves for 4R and 3RH.	Short follow-up for 3RH in the recent period.
Implementation/Decentralization	8. Proportion of TPT initiations occurring in PHC settings	Proportion of TPT initiations occurring in facilities.	$(\text{started_PHC} / \text{total_started}) \times 100$	$\frac{\text{Number of TPT initiators in PHC facilities (IL-TB)}}{\text{Total number of TPT initiators (IL-TB)}}$	Assess interaction with the 'nurse prescriber' milestone (from Apr/2020 onward).	CNES classification may require cleaning/validation.
Adherence/Comparison	9. Difference in TPT completion rates: PHC facilities vs. referral hospitals/specialized services	Absolute difference in TPT completion proportions between initiators in PHC facilities and those in referral hospitals/specialized services.	$\% \text{completion_PHC} - \% \text{completion_specialized_services}$ (percentage points)	—	Present with 95% CI; adjust by region and period.	Differences in 'case-mix' between levels of care.
Adherence/Effectiveness	10. TPT completion rate (overall cohort and by regimen, excluding individuals with no recorded outcome)	Proportion of individuals in a cohort who completed the TPT regimen.	$(\text{completed_cohort} / \text{started_cohort}) \times 100$	$\frac{\text{Number of individuals with recorded TPT completion (IL-TB)}}{\text{Total number of initiators in the cohort (IL-TB)}}$	Stratify by regimen (3HP, 4R, 3RH, 6H/9H) and type of service.	Delays in outcome closure may underestimate completion in most recent cohorts.

Notes: Indicators were organized across the domains of access, implementation, decentralization, adherence, and diagnostic practices. Numerators and denominators were defined according to the nature of the measure and data source. Proportion-based indicators were derived from routine surveillance data, whereas population-based indicators used annual denominators such as ART stock.

Abbreviations: IL-TB, Information System for notification of people undergoing treatment for TB; SINAN-TB, Notifiable Diseases Information System for tuberculosis; PIMC, HIV/AIDS Clinical Monitoring Panel, Ministry of Health, Brazil; TPT, TB preventive treatment; LTBI, latent tuberculosis infection; TB, tuberculosis; PLHIV, people living with HIV; ART, antiretroviral therapy; PHC, primary health care; IGRA, interferon-gamma release assay; TST, tuberculin skin test; CI, confidence interval; CNES, National Registry of Health Establishments; **6H/9H**, daily doses of isoniazid for six or nine months; 4R, daily doses of rifampicin for four months; 3HP, weekly doses of rifampentine plus isoniazid for three months; 3RH, daily doses of rifampicin plus isoniazid for three months.

Source: Developed by the authors based on IL-TB and SINAN-TB systems, the HIV/AIDS Clinical Monitoring Panel, Ministry of Health technical documents, and programmatic records from the State Tuberculosis Programme of Amazonas, Brazil.