

Time Economics

Challenge: Build a TB CEA tool

- Limited economic evaluation data for TB interventions; TB cost data focused on financial costs and budgeting
 - Needs to be flexible, but link to impact analysis
 - Variety of use cases
 - Investment cases
 - Prioritization and cost effectiveness analyses for NSPs
 - Feed into WHO/CHOICE analyses
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TIME Econ

Strong links to TIME Impact

Flexible and user friendly interface

Goal: fill gap in TB CEA and strategic planning

Build on existing cost databases

Implementable at different levels of customization

Spectrum software

Automatic links with UNPop and UNAIDS data for demographics and HIV dynamics



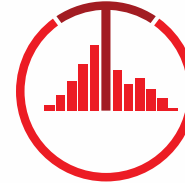
DempProj
Demographic data
(UNpop)

TB
database
(GTB)

AIM
HIV data
(UNAIDS)



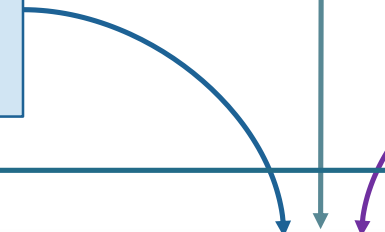
TIME Estimates



TIME Impact



TIME Economics



Builds on existing cost databases

- Incorporates
 - OHT intervention costing databases
 - WHO CHOICE estimates of cost per outpatient visit and inpatient day
 - Flexibility to incorporate GHCC and Value TB data as they become available
 - Review of GHCC database during development to ensure capacity to incorporate them
 - Coordination with Value TB to incorporate results as available
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Flexible and user friendly interface

- Similar interface as rest of spectrum suite allows for easy familiarization
 - Nearly every input is editable for full country customization
 - Strong user support from the Avenir and LSHTM teams
 - Users can rely on defaults for a quick set of ballpark results, or invest more time for precision
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Cost structure and data requirements

Intervention costing

- Costs = **P**rice per unit * **Q**uantities
- Inputs for TIME Econ to calculate costs
 1. Target population
 2. Population in need
 3. Delivery channel
 4. Intervention coverage
 5. Treatment inputs e.g. medicines, health personnel



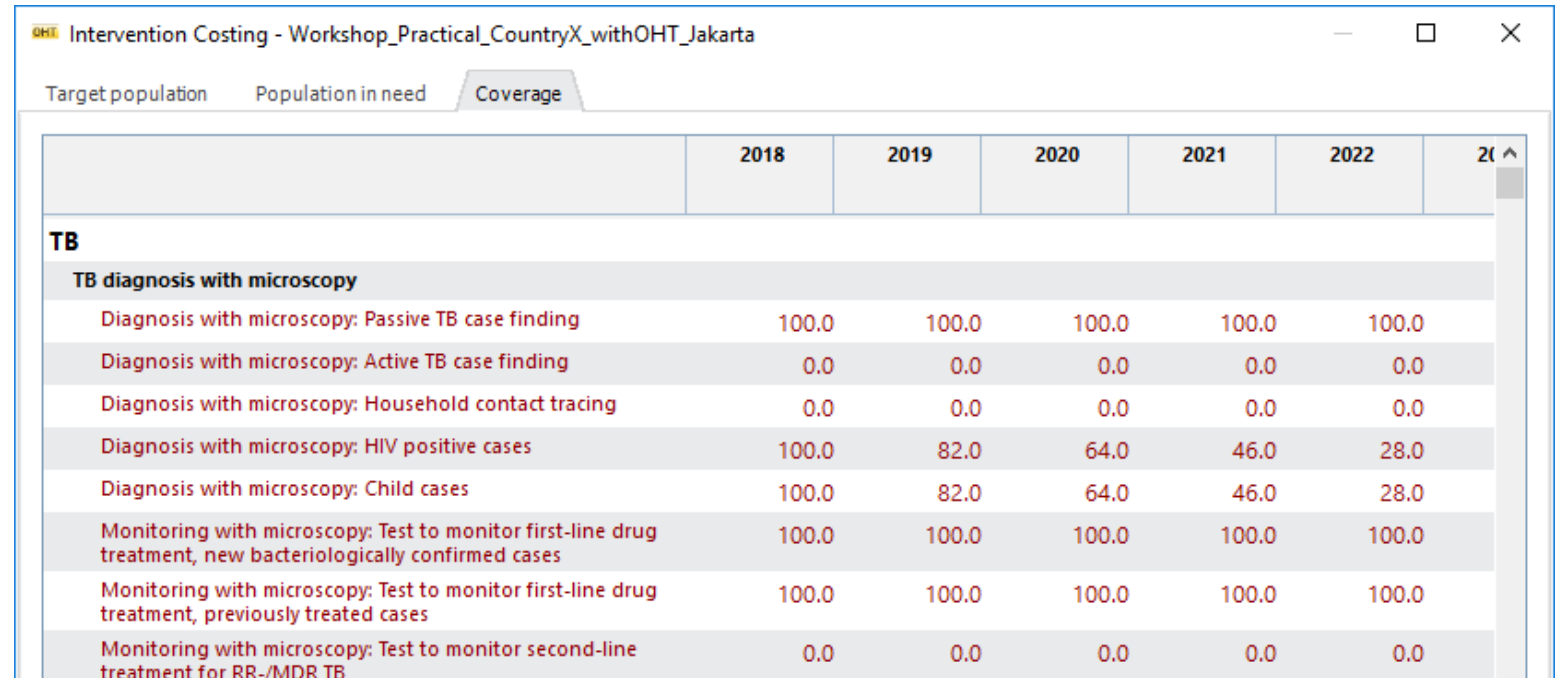
Intervention costing: target populations from TIME

- Drop down lists allow TIME Econ users to select outputs from TIME Impact to use as target populations for costing calculations
- Ensures consistency between costing and impact assumptions
- Adaptations and custom populations also available

Intervention	Target population	
TB		
TB diagnosis: Microscopy		
Diagnosis microscopy: Passive TB case finding	Number of new pulmonary, bacteriologically confirmed TB cases (adults)	▼
Diagnosis microscopy: Active TB case finding	Direct entry	▼
Diagnosis microscopy: Household contact tracing	Number of new pulmonary, bacteriologically confirmed, HIV- TB cases	▼
Diagnosis microscopy: HIV positive cases	Number of new pulmonary, bacteriologically confirmed, HIV+ TB cases (adults)	▼
Diagnosis microscopy: Child cases	Number of new and relapse TB cases under 15 years	▼
Monitoring microscopy: Test to monitor first-line drug treatment, new bacteriologically confirmed cases	Number of new pulmonary, bacteriologically confirmed TB cases	▼
Monitoring microscopy: Test to monitor first-line drug treatment, previously treated cases	Previously treated, including relapse	▼
Monitoring microscopy: Test to monitor second-line treatment for RR-/MDR TB	Non-XDR cases	▼
TB diagnosis: Culture		
Diagnosis culture: Passive TB case finding	Number of new pulmonary, bacteriologically confirmed TB cases	▼
Diagnosis culture: Active TB case finding	Number of new pulmonary, bacteriologically confirmed TB cases	▼
Diagnosis culture: Household contact tracing	Number of new pulmonary, bacteriologically confirmed TB cases	▼
Diagnosis culture: Diagnostic test for smear negative	Number of new pulmonary, clinically diagnosed TB cases	▼
Diagnosis culture: Diagnostic test for Xpert negative	Number of new pulmonary, clinically diagnosed TB cases	▼
Monitoring culture: Test to monitor first-line drug treatment, new bacteriologically confirmed cases	Number of new pulmonary, bacteriologically confirmed TB cases	▼
Monitoring culture: Test to monitor first-line drug treatment, previously treated cases	Previously treated, including relapse	▼
Monitoring culture: Test to monitor second-line treatment for RR-/MDR TB	Non-XDR cases	▼

Coverage

- **Diagnostics:** Reflects distribution of diagnostic methods by risk group
- **Treatment:** Reflects linkage to care of notified cases
- **Monitoring:** Reflects coverage of monitoring tests among population



	2018	2019	2020	2021	2022	2023
TB						
TB diagnosis with microscopy						
Diagnosis with microscopy: Passive TB case finding	100.0	100.0	100.0	100.0	100.0	
Diagnosis with microscopy: Active TB case finding	0.0	0.0	0.0	0.0	0.0	
Diagnosis with microscopy: Household contact tracing	0.0	0.0	0.0	0.0	0.0	
Diagnosis with microscopy: HIV positive cases	100.0	82.0	64.0	46.0	28.0	
Diagnosis with microscopy: Child cases	100.0	82.0	64.0	46.0	28.0	
Monitoring with microscopy: Test to monitor first-line drug treatment, new bacteriologically confirmed cases	100.0	100.0	100.0	100.0	100.0	
Monitoring with microscopy: Test to monitor first-line drug treatment, previously treated cases	100.0	100.0	100.0	100.0	100.0	
Monitoring with microscopy: Test to monitor second-line treatment for RR-/MDR TB	0.0	0.0	0.0	0.0	0.0	

Intervention costing: cost per service

- Ingredients approach
- Default treatment inputs supplied based on WHO/GTB Excel based TB planning & budgeting tool
 - Drugs and supplies
 - Unit costs
 - Personnel time
 - Outpatient visits and inpatient days
- User adaptable to fit with country norms

Program costing: percentage or direct entry

Challenge: manage data gaps in above service delivery costs

- Programme specific HR
- Training
- Supervision
- M and E
- Infrastructure and equipment
- Transport
- Communications, media, outreach, advocacy
- General programme management
- Collaborative TB/HIV activities
- High risk groups
- Infection control
- Childhood TB (excluding treatment)
- PPM/ISTC
- Community involvement
- Partnership initiatives
- TB Research

TIME Econ: data requirements

Model includes default data but should be reviewed and replaced where possible:

- Staffing baseline
- Target populations
- Population in Need
- Coverage estimates
- Treatment inputs
- Cost for inpatient and outpatients days
- Above service delivery costs

Select a target population for each intervention

Intervention	Target population	Sex	Starting age	Ending age
Diagnosis X-rays	Number of chest X-rays	▼		
Monitoring X-rays: Test to monitor treatment for new pulmonary cases	Number of new pulmonary TB cases	▼		
Monitoring X-rays: Test to monitor treatment for previously treated cases	Previously treated, including relapse	▼		
Monitoring X-rays: Test to monitor treatment for MDR or RR-TB	MDR and XDR cases	▼		
First-line TB treatment				
First-line TB treatment: Initial treatment	Number of new non-MDR cases, excluding relapse (adults)	▼		
First-line TB treatment: Initial treatment for children	Number of new non-MDR cases, excluding relapse (children)	▼		
First-line TB treatment: Previously treated	Number of new non-MDR cases, excluding relapse (children)	▼		
First-line TB treatment: Previously treated for children	Number of new MDR cases, excluding relapse Number of new XDR cases, excluding relapse Previously treated, including relapse	▼		
MDR and XDR TB				
MDR, TB treatment	Number of previously treated non-MDR cases, including relapse (adults) Number of previously treated non-MDR cases, including relapse (children) Number of previously treated MDR cases, including relapse	▼		

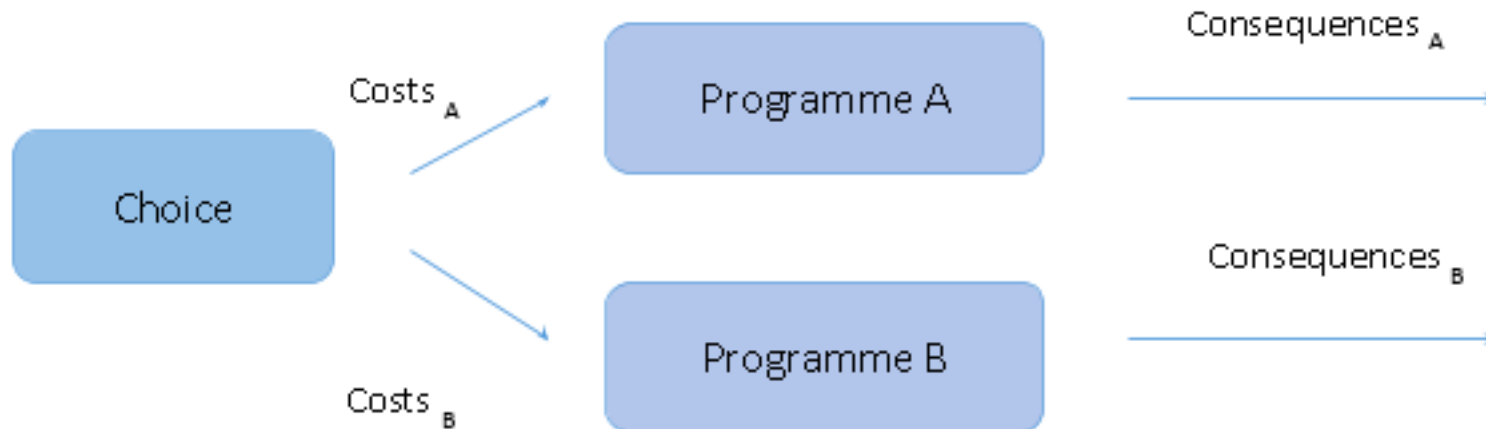
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Enable searching

Results

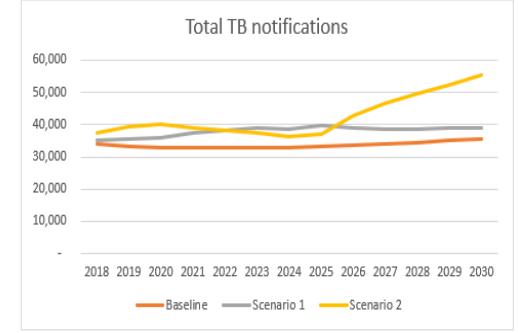
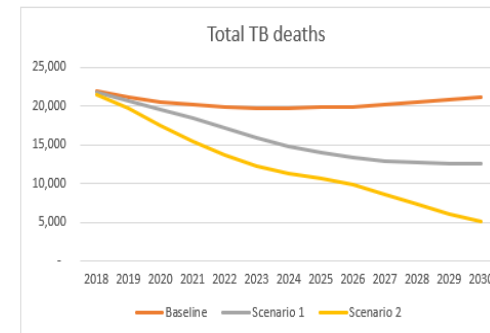
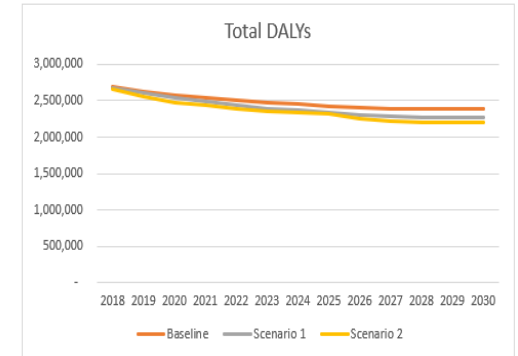
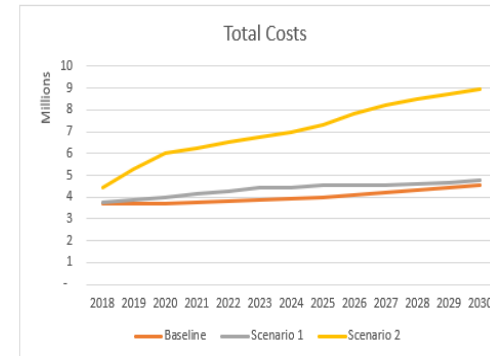
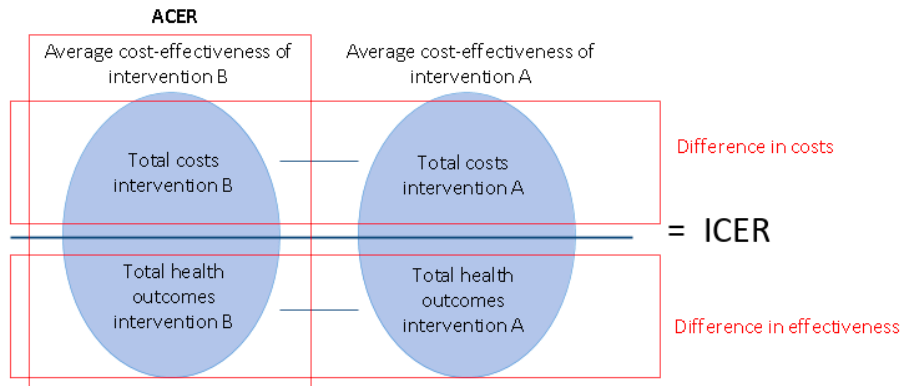
TIME Economics

- Cost-effectiveness of different packages of interventions
- Comparative analysis (i.e. compares two or more different options) in terms of costs and consequences
- Works best with a calibrated TIME Impact file
 - Number of tests by type using Diagnostic Algorithm Tool
 - Coverage of screening
 - Changes in background epidemiology



TIME Economics: outputs

- With TIME Econ we can compare interventions, or sets of interventions, and calculate standard metrics of health economics, such as ICER and ACER



Way forward

- Better data on above service delivery costs
 - PEPFAR Expenditure data
 - WHO TB reporting mechanism
 - Global Fund budgets
 - Activity based NSP budgets
 - Refinement of links between cost and impact for DST, child diagnosis, treatment
 - Country feedback to add features and develop common scenarios
 - Feedback from TB MAC group?
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