



TIME ESTIMATES IN ONEHEALTH TOOL: TARGET POPULATION ESTIMATES AND IMPACT ASSESSMENT (SESSION 4)

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Course overview

SESSION 1

OneHealth Tool overview

SESSION 2

OneHealth Tool TB specific content

SESSION 3

OneHealth Tool special features

SESSION 4

TIME Estimates

- Learning objectives
 - **These learning objectives are presented in detail in 6 mp4 format demonstration files**
- **Overview: Using TIME Estimates to produce Target Populations (TP) for costing in OneHealth Tool (OHT):**
 - **Objective/Step 1:** Overview of TIME Estimates and its uses (and what it cannot be used for)
 - **Objective/Step 2:** Review TB program statistics
 - **Objective/Step 3:** Fit TIME model
 - **Objective/Step 4:** Produce Target Populations using the model and edit them directly if needed
 - **Objective/Step 5:** Using Target Populations from TIME Estimates to cost TB interventions
 - **Objective/Step 6:** Using TIME Estimates to produce projections of TB burden and estimate the impact on TB mortality of scaling-up TB notification. Brief introduction to TIME Impact.

Learning objectives

- Objective/Step 1)-> Understand the TIME Estimates model, its relation to OHT and other Spectrum models and its main uses.
- Objective/Step 2)-> Understand the data review and data entry processed.
 - Most of this happens in the Program Statistics editor
- Objective/Step 3)-> Understand and be able to complete the TIME Estimates model fitting process
- Objective/Step 4)-> Understand how Target Populations (TPs) are produced
- Objective/Step 5)-> Understand how to use TPs for costing in OneHealth (OHT).
 - Examples of the use of TPs in OHT
- Objective/Step 6a)-> Be able to produce estimates of TB burden, such as TB incidence and mortality and to estimate the impact on TB mortality when TB notifications are scaled up.
- Objective/Step 6b)-> Be familiar with the TIME Impact model, which is a more technical way of producing Target Populations for costing in OHT than TIME Estimates.

Objective 1: Overview of TIME Estimates

- TIME stands for: TB Impact model and Estimates. In this session we will use the Estimates part of TIME called TIME Estimates.
- Four main elements of TIME Estimates:
 - **TB program statistics/data** – This comes from public WHO databases ([Tuberculosis data \(who.int\)](https://data.who.int))
 - **Model fitting** – Cubic splines are used to project TB Incidence, Notification and Mortality into the future. This is a statistical and not a dynamical model. Therefore, intervention impacts are not explicitly accounted for in the projected trends.
 - **Producing Target Populations (TPs)** – Most TPs are derived by applying the 2019 case split to total notifications. TPs associated with TB prevention (TPT) are constructed explicitly by the user and are not based on WHO data
 - **Other results** are also important and used:
 - TIME Estimates projects TB incidence and mortality and the impact on TB mortality when notifications are scaled up.

Objective 2: Review of TB data under Program Statistics

- Data provided from WHO databases
- Default projections through data provided by Avenir Health.
 - These are used for global studies and it is recommended that the user runs the fitting process to replace these default projections.
- Incidence and total notification data is entered for the period 2000-2019, or what ever final year of WHO data may be. Default data is updated annually by Avenir Health.
- The notification split (e.g. into bac-pos, extra-pulmonary and so on) is entered for 2019.
 - These splits are critical for diagnostic costing work.
- MDR burden data is entered for 2019. Some MDR data entered for past years, but emphasis is on final year of WHO data.
- TB preventive therapy (TPT) is entered for the period 2019-final year of costed plan.

Objective 3: Model fitting

- Trends or projections of TB indicators are produced by cubic-spline methods, which is represented in the model by a user-defined number of parameters. The split of incidence by HIV status requires additional fitting parameters.
- Generally, the **Fit All** option, using default fitting parameters of the fitting editor, produces a good fit to the data and therefore good projections of trends for future years.
 - Goodness-of-fit principles will be discussed
- The user can control the number of future years of the projection. It is recommended that projections are restricted to 3-5 years into the future.
 - This is due to assumptions for projections generally not holding over many years. This assumption does not hold for long-term projections.

Objective 4: Producing target populations for OneHealth costing applications.

- One of the main purposes of TIME Estimates is to produce Target Populations (TPs) for costing applications.
- The most important user inputs for TPs are:
 - The split of TB notifications by different case types
 - MDR burden and DST coverage data
 - TB prevention inputs for households, high risk groups and ART cohorts.
- Target populations associated with TB prevention (TPT) are new in the latest version of OHT and will be discussed in detail.

Objective 5: Using target populations for OneHealth costing applications.

- There is a large number of target populations produced by the TIME Estimates model.
- The user can use these TPs in OHT for costing work. The user can also replace these TPs with TPs that are produced outside of TIME Estimates.
 - Settings that control which TPs are used will be discussed in detail
 - The large number of TPs means this replacement is not a simple process.
- We will look closely at two examples, studying the links between TIME Estimates and OHT
 - Example 1: Diagnosis with smear microscopy
 - Example 2: Diagnostic and treatment costs for TPT

Objective 6a: Using TIME Estimates to produce impact estimates and a few other results

- TIME Estimates is a statistical model for TB indicators. This means that the role of TB epidemiology and interventions are not explicitly accounted for in the projected trends.
- This limits the ability of TIME Estimates to produce reliable estimates for the impact on TB burden of TB interventions.
- However, it is possible to obtain an estimate for the impact on TB mortality for scaling up TB notification. This calculation is based simply of the difference between case fatality ratios of notified versus non-notified cases, with the former being lower than the latter.
- Other results, like projections of TB incidence, are also available.

Objective 6b: An overview of the TIME Impact model

- TIME Impact is a dynamical model for TB indicators. This means that the role of TB epidemiology and TB interventions are explicitly accounted for in the projected trends.
- TIME impact can be used to study in significant detail the impact on TB burden of different types of TB interventions including:
 - Changes in diagnostic algorithms
 - TB prevention
 - ART scale-up
- We will do a brief review of the TIME Impact model. Default model are not available and must be produced via consultation.



THANK YOU