L. Staessens*, S. Vermeersch*, R. Demeester°, L. Annemans#

# Genvoya cost-effectiveness for first-line HIV treatment

Assessing the cost-effectiveness of first line treatment options using a patient-level simulation model designed to integrate the impact of adherence and non-aids related morbidities on long-term cost-effectiveness

*hict, Bruges, Belgium; °Dept. of Internal Medicine and Infectious Diseases, CHU Charleroi, Charleroi, Belgium; #Dept. of Public Health, Ghent University, Gent, Belgium

## Context and Objectives

Few models have **concurrently** integrated the impact of treatment **adherence** on HIV infection outcomes and the impact of HIV and its treatment on **non-AIDS related morbidities** (NARMs). These elements may have an **important influence** on long-term cost-effectiveness.

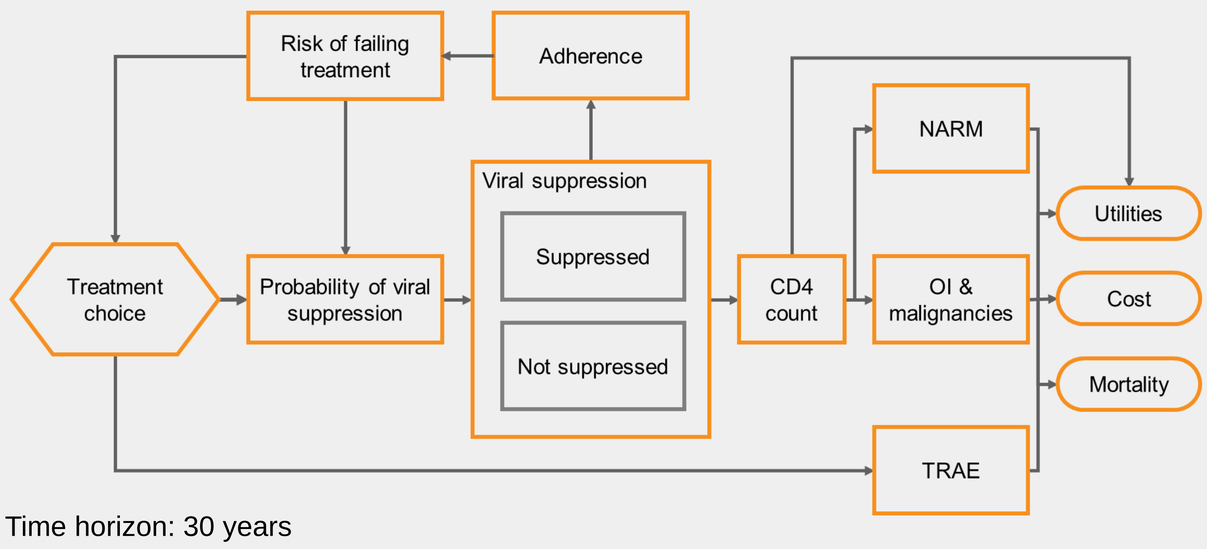
We adapted a previously developed model to the Belgian context in order to **compare the cost-effectiveness of first-line treatment** of a **TAF/FTC backbone**-based single tablet therapy (Genvoya) to **commonly used non-TAF/FTC backbone single tablet regimens** (EVG/TDF/FTC - Stribild, DTG/ABC/3TG - Triumeq, RPV/TDF/FTC - Eviplera) in **treatment naïve patients newly diagnosed with HIV** starting ART.

## Modeling approach

The model design corresponds to a **discrete time individual patient simulation model**. In a patient-level model **costs and outcomes are modeled for individual patients**. Model results are calculated from averaging the results across a sufficiently large sample of patients.

This approach **allows to take into account patient histories and patient characteristics**. This is important as **baseline characteristics and previous experiences are important to predict future clinical events and treatments**. Furthermore, there is likely to be **considerable heterogeneity** between model outcomes for patients with differing starting characteristics. This makes a more traditional cohort modeling approach less suitable.

## Model structure

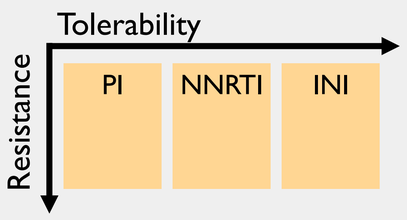



Time horizon: 30 years

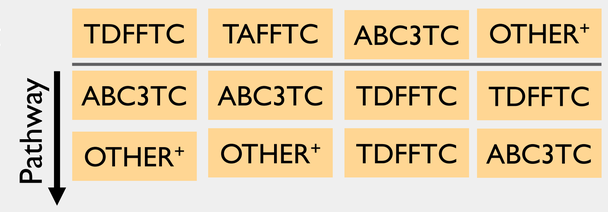
## (Post first line) treatment algorithm

3rd agent and backbone selected taking into account previous treatments, past resistance and past tolerability.

- **3rd agent:**
  - Patients start in a "bin" corresponding to their initial treatment (PI, NNRTI, INI);
  - Failure due to resistance → go down in the bin;
  - Failure due to tolerability → move to the next bin.




- **Backbone:**
  - Failure → Patients move to the next backbone in the pathway;
  - Movement between backbones is considerably more rare than between 3rd agents.




## Model inputs

### Model transitions

- **Probability of viral suppression:**
  - Based on NMA.
- **Adherence**
  - Estimated from viral suppression (suppressed/unsuppressed) + STR benefit.
- **Risk of failure**
  - Calculated taking into account:
    - Adherence;
    - Number of previous failures due to resistance;
    - Drug class.
- **CD4 count – virally suppressed patients**
  - Based on model fitting to cohort of antiretroviral naïve patients starting ART treatment
- **CD4 count – unsuppressed patients**
  - monthly decline in CD4 count with rates taking into account baseline viral load
- **TRAE**
  - Based on categories of AE (central nervous system, gastrointestinal, hepatic, renal, metabolic, skin, respiratory, other)
  - Estimated per component integrating different literature sources
- **NARMs**
  - HIV specific risk equations for cardiovascular disease, chronic kidney disease, diabetes, hypertension and bone fracture.
- **OI & malignancies**
  - Calculated from fitting to COHERE data

### Mortality

- Independently modeled for
  - OI & malignancies;
  - NARMS;
  - General population mortality.

### Utilities

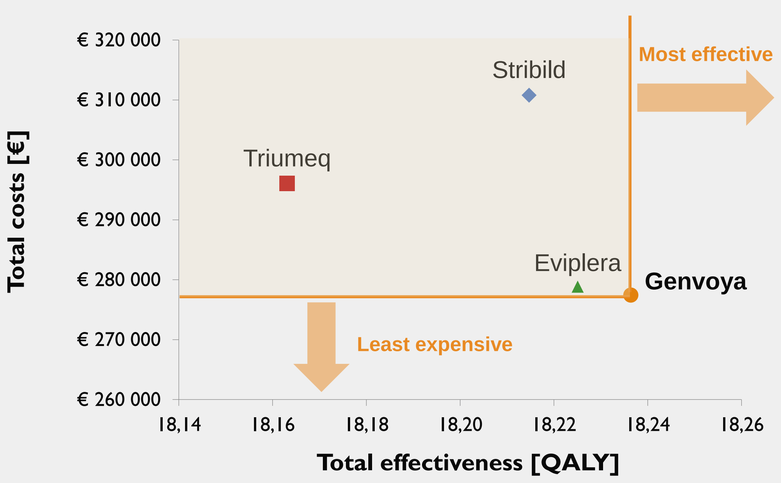
- Calculated utilities for HIV patients;
- Disutilities associated with NARMs, TRAEs and OI & malignancies

### Costs

- Belgium specific costs for drugs (*RIZIV/INAMI*), NARMs, OI & malignancies and TRAE (*literature and/or assumptions*)

## Results

### Genvoya Dominates (less expensive, more effective)

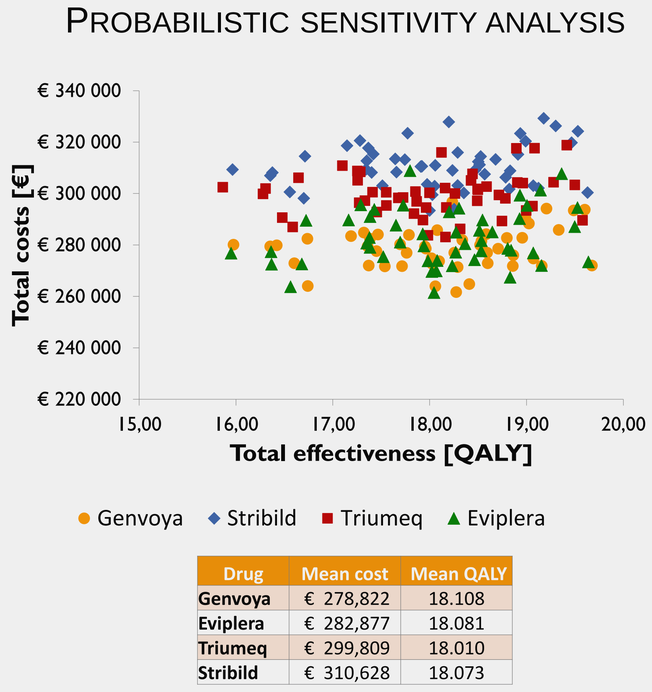



| Drug | Cost | QALY |
|---|---|---|
| Genvoya | € 277,440 | 18.236 |
| Eviplera | € 278,851 | 18.225 |
| Triumeq | € 296,060 | 18.163 |
| Stribild | € 310,809 | 18.215 |

| Compared to Genvoya | Incremental Cost | Incremental QALY |
|---|---|---|
| Stribild | € 33,369 | -0.022 |
| Triumeq | € 18,620 | -0.073 |
| Eviplera | € 1,411 | -0.011 |

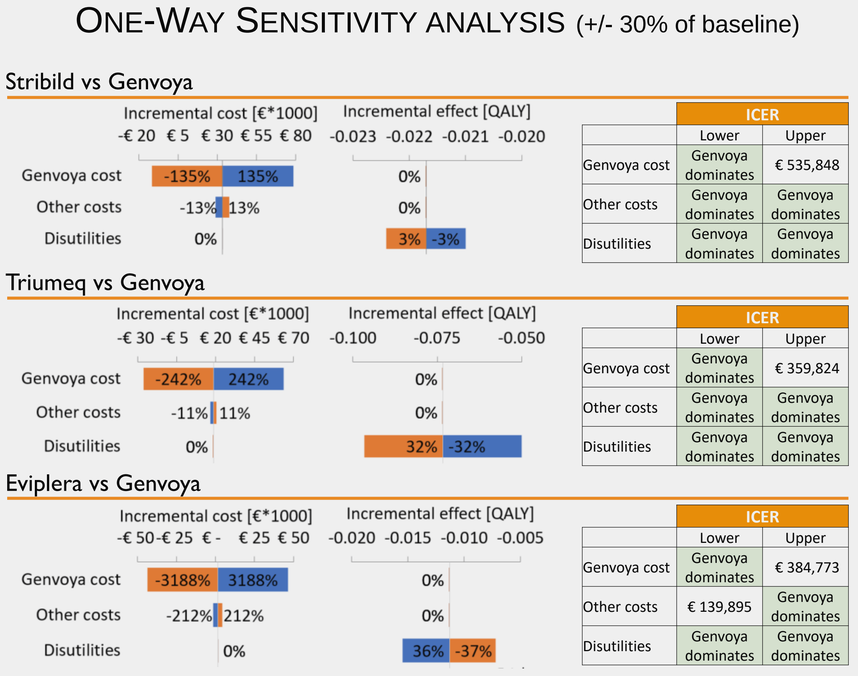
### The model is fairly robust other than its sensitivity to the cost of treatment

#### Probabilistic sensitivity analysis




| Drug | Mean cost | Mean QALY |
|---|---|---|
| Genvoya | € 278,822 | 18.108 |
| Eviplera | € 282,877 | 18.081 |
| Triumeq | € 299,809 | 18.010 |
| Stribild | € 310,628 | 18.073 |

#### One-Way Sensitivity analysis (+/- 30% of baseline)




| | ICER Lower | ICER Upper |
|---|---|---|
| Genvoya cost | Genvoya dominates | € 535,848 |
| Other costs | Genvoya dominates | Genvoya dominates |
| Disutilities | Genvoya dominates | Genvoya dominates |

| | ICER Lower | ICER Upper |
|---|---|---|
| Genvoya cost | Genvoya dominates | € 359,824 |
| Other costs | Genvoya dominates | Genvoya dominates |
| Disutilities | Genvoya dominates | Genvoya dominates |

| | ICER Lower | ICER Upper |
|---|---|---|
| Genvoya cost | Genvoya dominates | € 384,773 |
| Other costs | € 139,895 | Genvoya dominates |
| Disutilities | Genvoya dominates | Genvoya dominates |

**This study demonstrates that Genvoya can be a cost-effective 1st line treatment option. In our long-term cost-effectiveness analysis taking into account the cost and impact of NARMs, Genvoya resulted in a lower total cost and a higher total effectiveness when compared against common single-tablet comparators with a lower per-day cost of treatment.**

Contact | Lieve Staessens | lieve.staessens@hict.be | www.hict.com

Disclosure | This study was funded by Gilead Sciences Belgium bvba/sprl