BIOLOGICS UTILISATION AND ITS EFFICIENCY THROUGH A HOSPITAL PHARMACY CENTRALISED MANAGEMENT SYSTEM

Feio J[1], Poitier S[1], Machado F[1], Vandewalle B[2], Andreozzi V[3], Félix J[3]

1. Centro Hospitalar e Universitário de Coimbra, Serviços Farmacêuticos, Coimbra, Portugal; 2. Exigo Consultores, External Affairs and Market Intelligence, Lisbon, Portugal; 3. Exigo Consultores, Lisbon, Portugal

INTRODUCTION / OBJECTIVES

In October 2017 the Centro Hospitalar e Universitário de Coimbra (CHUC) implemented a new policy for biologics' utilisation. Efficient implementation of biologics policies at hospital level involves different internal and external stakeholders. The pharmaceutical services were responsible for the management and control of the new policy, creating the Fully Integrated Biosimilars utilisation management System (FIBS). This research aims to provide an efficiency assessment of FIBS.

METHODS

The new policy was coincident with the introduction of biosimilars in the market, so no control group was available. In this context the FIBS system efficiency was defined as the ratio between the observed and optimal (simulated) biosimilars utilisation levels over time.

Optimal biosimilars utilisation was estimated by mapping the FIBS process, from prescription to dispensing of biologics. The step-by-step process, including timelines and inter-dependencies between stakeholders were modelled using the Anylogic software [1], to simulate a counterfactual optimal level of biosimilars utilisation over time for all patients on infliximab, etanercept and rituximab between October 2017 and September 2018 (cut-off date).

FIBS was initiated in three different phases: on October 25th, 2017 for infliximab, on November 1st, 2017 for etanercept and on November 13th, 2017 for rituximab. FIBS relies on acquisition, prescription and dispensing of biologics by international non-proprietary name and recommends:

- For naïve patients, the prescription and dispensing of the most economically accessible biologic (brand or biosimilar) is mandatory.
- Maintaining the same biologic brand in patients for a period of no less than 12 months. After this period, conditions exist to transition to the economically most accessible biologic available.

Exceptions require a clinical justification on a patient-by-patient basis by prescribing physicians and need to be validated by the Hospital Pharmacy, Hospital Medicines and Therapeutic Committee (HMTC) and Hospital Board.

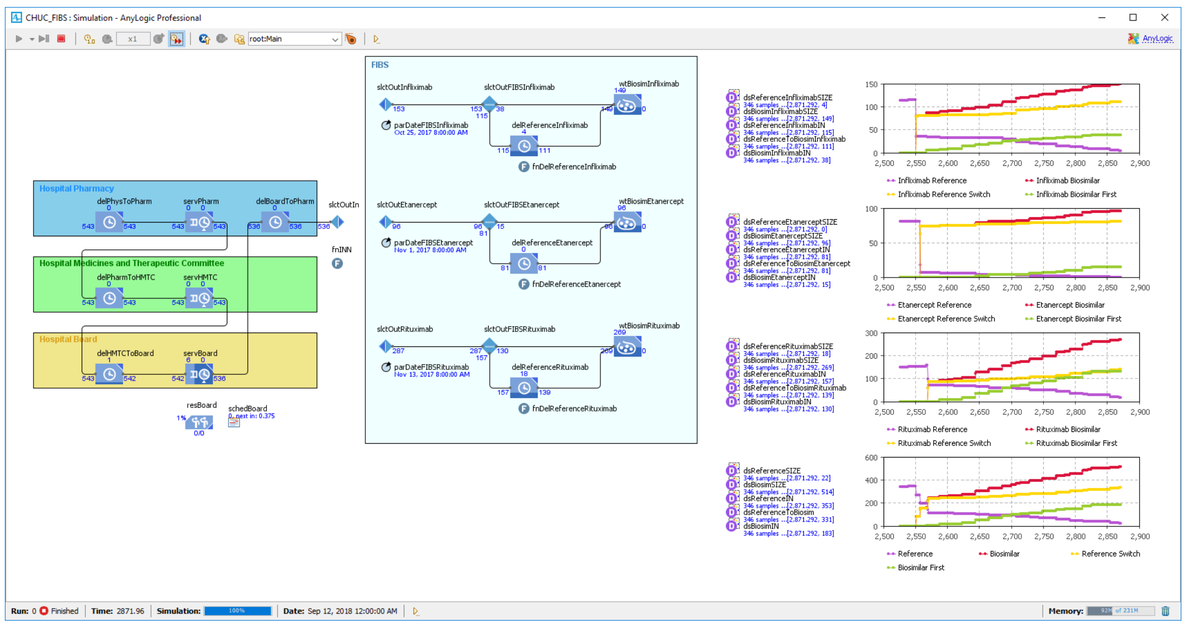
RESULTS

Anylogic model

Within Anylogic, the Process Modelling Library allows for the modelling of real-world systems in terms of agents (e.g.: clinical justifications, patients), processes (e.g.: Hospital Pharmacy, HMTC and Hospital board authorizations, HMTC recommendations) and resources (e.g.: monthly Hospital Board meetings).

The developed model simulates the path of individual patients from initial clinical justification for biologic therapy initiation, over time, until September 2018. The simulated path includes validation of clinical justifications by the Hospital Pharmacy, HMTC and Hospital board (at set monthly meetings) and policy changes set in place by FIBS implementation starting October 2017 (Figure 1).

Figure 1 Anylogic simulation model of FIBS at CHUC, using a process-centric modelling approach



RESULTS (CONT.)

FIBS Efficiency

For 543 patients the clinical process could be traced back to the initial clinical justification for biologic therapy initiation, hence allowing for the identification of total biologic therapy duration until the last cut-off date. For these patients, the earliest initial clinical justification was registered at November 25th, 2010, whereas the most recent clinical justification was registered at September 6th, 2018. Patient characteristics in terms of age, gender and disease area are presented in Table 1.

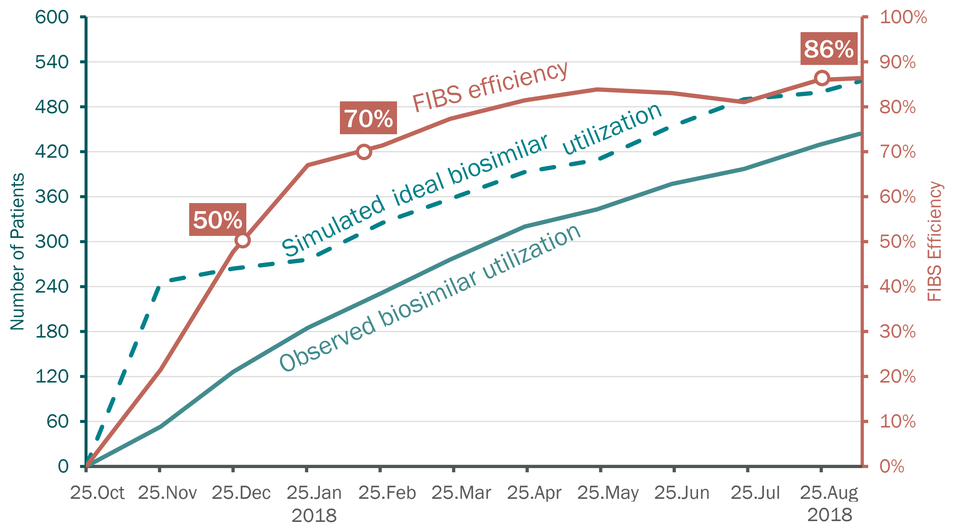
Table 1 Patient characteristics for the patients on etanercept, infliximab or rituximab at CHUC between October 2017 and September 2018.

Patient characteristics	N=543
Age in years, mean (SD)	52.0 (17.6)
Male, n (%)	257 (47.3)
Disease area, n (%)	
Haematology	187 (34.4)
Gastroenterology	145 (26.7)
Rheumatology	107 (19.7)
Neurology	80 (14.7)
Other	24 (4.4)

The characteristics of these patients, including initial clinical justification date and INN of requested biologic therapy were fed to the Anylogic model which simulated the potentially ideal level of biosimilars utilisation over time, including switching from reference products to biosimilars and initiation of biologic therapy with biosimilars after FIBS implementation (Figure 2).

Confronting the observed level of biosimilars utilisation with the simulated potentially ideal level of utilisation (Figure 2), the level of FIBS system efficiency increased very rapidly: 50% at 2 months and 80% at 5 months. System efficiency of FIBS has been increasing steadily since then, reaching levels above 85% in September of 2018. This means that 85% of patients eligible (optimal) for biosimilar utilisation were on biosimilar therapy 11 months after policy initiation and FIBS implementation.

Figure 2 Primary axis: Observed biologic therapy and biosimilars utilisation and simulated potentially ideal biosimilars utilisation for CHUC between October 2017 and September 2018. Secondary axis: Corresponding FIBS efficiency estimates.



Much of the remaining 15% efficiency gap is suspected to have its origin in factors external to the FIBS process (e.g. related to timing of physician visits) and is expected to resolve itself over time. Indeed, numerous patient processes have been identified meeting - since the time of FIBS implementation - the condition of maintenance of reference therapy for over 12 months, but only switching to biosimilars later in time at previously set physician visits.

CONCLUSION

The Fully Integrated Biosimilars utilisation management System demonstrates high levels of system efficiency in the utilisation of biologic therapy at hospital level, less than one year after its implementation.

http://www.eahp.eu/24-1ISG-030

References: [1] Borshchev, A. (2013). The Big Book of Simulation Modeling. Multimethod Modeling with AnyLogic 6. AnyLogic North America.