

Background

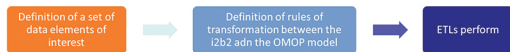
The Hospital 12 de Octubre and Madrid Primary Care have been working in the reuse of clinical data since 2007 with the development of an **i2b2 repository** for centralizing information of both institutions systems. It was implemented within the Insite project (IMI) and, nowadays, "it is the *largest (data volume, scope and standardization) in this European network*". This achievement is mainly due to:

- Being connected in real time with the hospital's information system; data is **refreshed daily**.
- It contains information of about **2.800.000 patients**.
- It integrates diagnoses, procedures, clinical findings, laboratory tests, medications and histopathology data.
- All data contained is encoded in different terminology and classification standards. For instance, laboratory tests make use of **LOINC** codes while clinical findings of **SNOMED** codes .

Hospital's next step is the implementation of an OMOP repository , in which the whole i2b2 is used as data source. Furthermore, the fight against SARS-CoV-2, in which efficiency and speed are critical, has led to new ways of collaboration between institutions. For this reason, it is also intended to generate an OMOP repository from the Hospital and Madrid Primary Care systems. For carrying out both projects, **EDHEN** (European Health Data Evidence Network) has been chosen as framework of support.

OMOP first experience: HONEUR

The Hospital 12 de Octubre is taking part in HONEUR (Hematology Outcomes Network in Europe) by transforming the **i2b2 data of patients with multiple myeloma into an OMOP instance**. The process followed has been:



At this moment, data of about 600 patients is successfully integrated in the network, and the next step is to include data for patients with chronic lymphocytic leukemia.

- **What helps in the transformation:**
 - The cohort that wanted to be included was well identified.
 - Data source was **structured and standardized**.
- **Major difficulties found in this transformation:**
 - Additional mappings were required for medication, which is represented with ATC codes in our i2b2 and OMOP requires RxNorm ones. Unlike RxNorm, ATC represents mostly base ingredients and does not distinguish between base and precise ingredients, which made the transformation rough in some cases.

New challenge: EDHEN Data Partner

Two new directions are taking Hospital 12 de Octubre and Madrid Primary Care, both supported by EDEHN:

- A first OMOP instance will be built using as source the **whole i2b2 repository**. As the OMOP created for the HONEUR network will be taken as start point, the current dimensions of the database are not considered a major difficulty. Mappings and equivalences will be reused reducing the number of tasks to be carried out.
- A second OMOP instance is planned to be generated for **COVID-19 data**. In this case, the primary data source will be the Hospital and Madrid Primary Care systems, in which the cohort can be identified thanks to the alert system developed by the hospital IT group. Despite the fact that this will require an initial bigger effort since there are no previous work done, the results obtained will have **less data transformations** and, as a result, a **higher quality**.

Both developments will be executed in parallel, however, the one based on COVID-19 will be taken as a priority, due to the necessity of contributing in the fastest way possible to stop this illness.

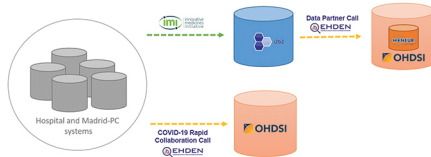


Figure 1. Hospital 12 de Octubre and Madrid Primary Care strategy for secondary use of data

Conclusions

The advent of new environments where rapid evidence generation at scale is required for decision making, whether in healthcare, regulation or drug development, has become a reality with coronavirus pandemic. **Exploiting our data efficiently is the best way to address this threat and the upcoming ones.**

Following this vein, Hospital 12 de Octubre and Madrid Primary Care have now become part of the EDHEN project and are working in the development of two OMOP instances, one related with COVID-19 data, and another with the data of their i2b2 repository. Not only will it increase the learning and results exchange with other institutions, but also the interoperability between the hospital's own systems and the reutilization of the data in a wide range of use cases.