

Development Of A Web Application For Self-Assessment And Monitoring Of Colorectal Surgery Outcome Indicators In The ESCA Study

HTA160

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Objective

ESCA is an observational, multicentric, retro-prospective study carried out by **7 hospitals** in the Emilia-Romagna region, evaluating the **performance indicator** results of colorectal surgery.

This project aims to address surgeons' need for timely feedback on their performance and patient enrollment, facilitating quick identification of areas for improvement. Currently, the research group provides anonymous reports to each center every year, allowing comparison of pre-defined indicators. To overcome this limitation, we developed a web application to enable near-real-time **self-assessment** and **monitoring**.

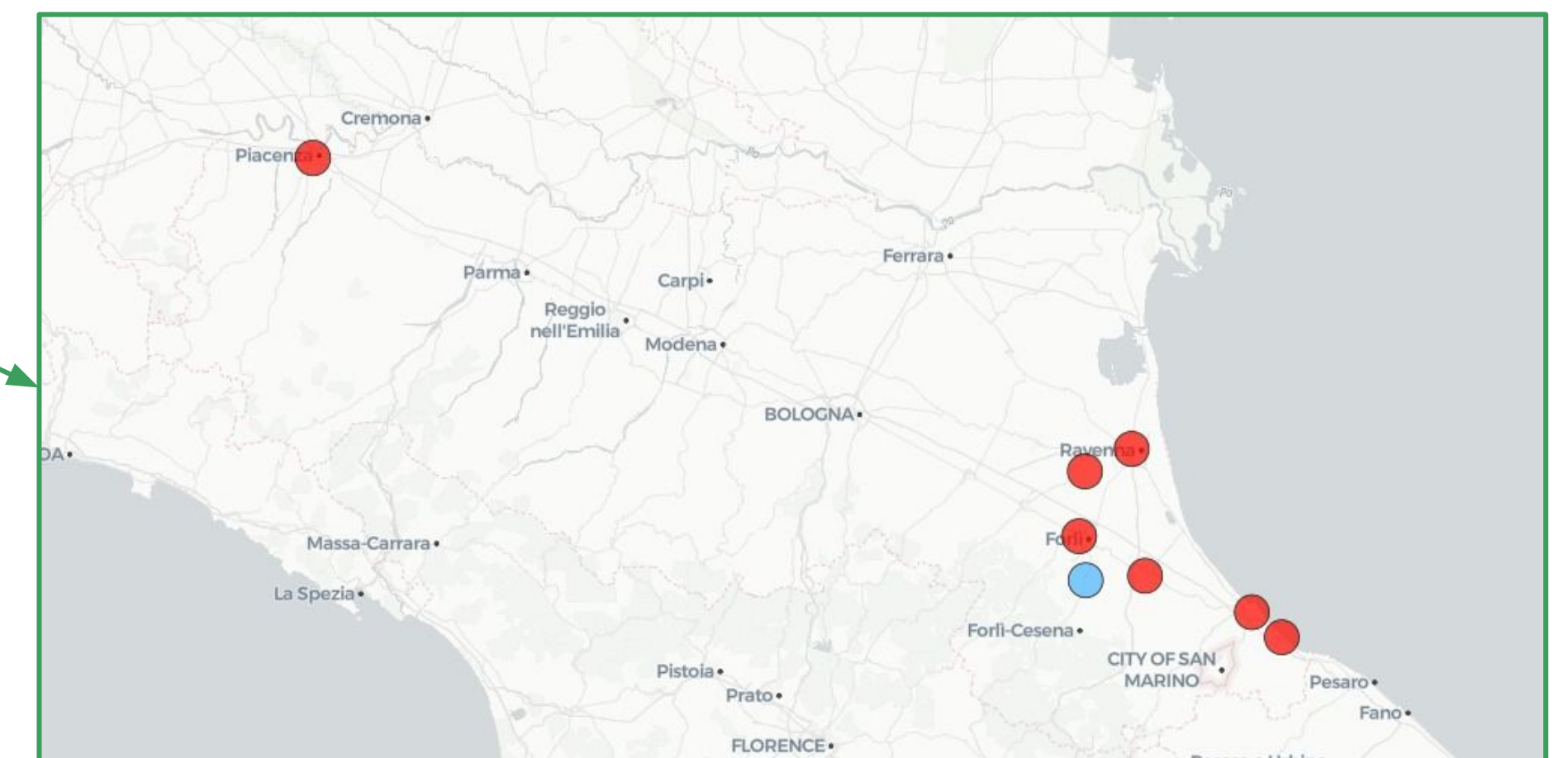
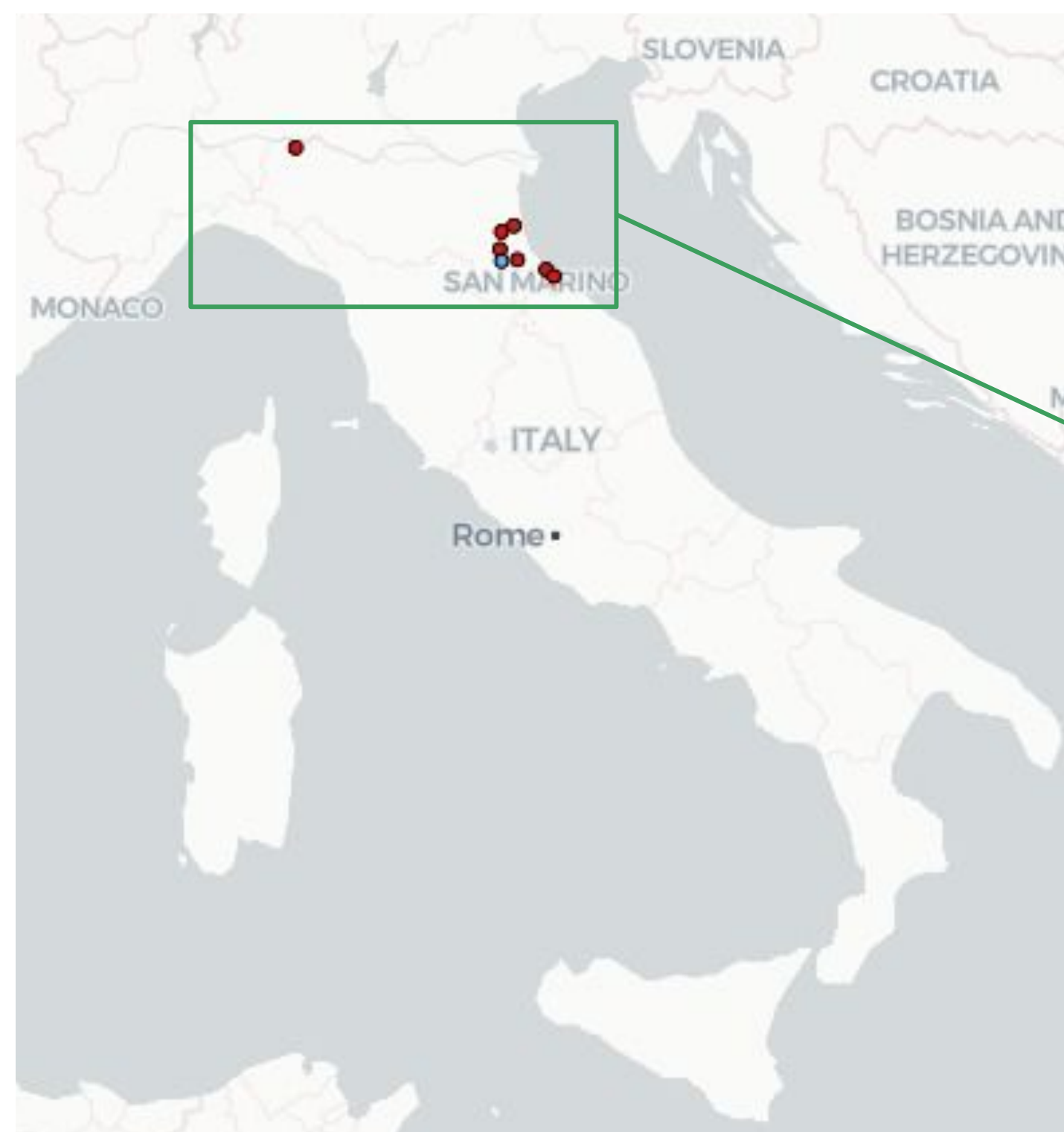


Figure 1. Location of the centers involved in the ESCA study. In red the surgeries participating in the study, in blue the coordination center (IRST).

Methods

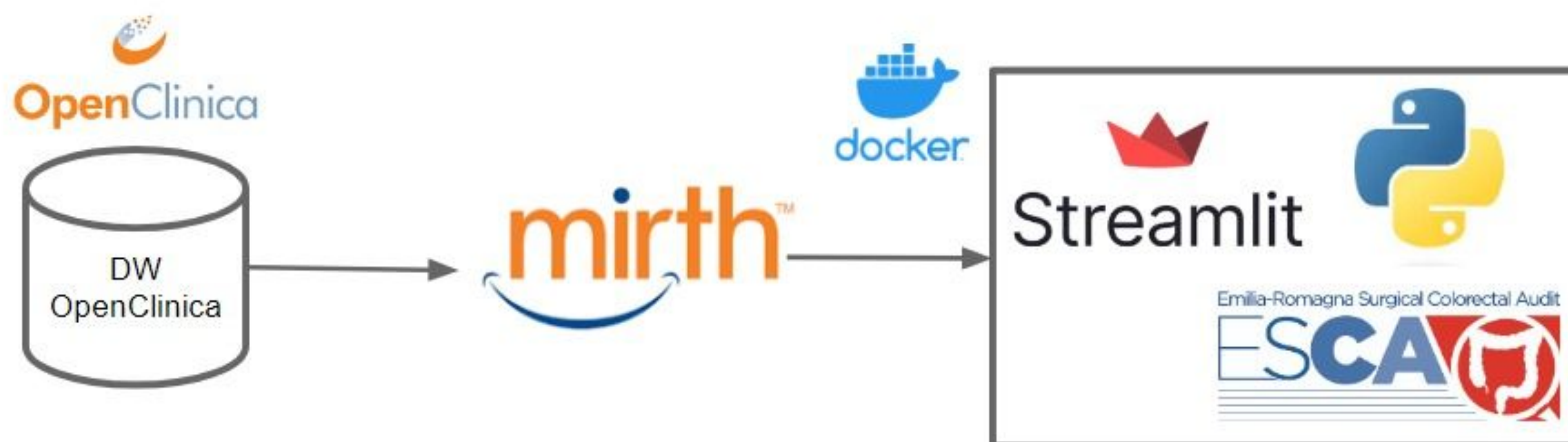


Figure 2. System architecture for the creation of the app released to the centers.

The web application was constructed within a Docker environment using **Streamlit** (Python framework). The application operates by querying a dedicated data warehouse for regular updates. Systematic queries were transmitted through a Mirth channel, leveraging a queue-based mechanism for **efficient data retrieval**. The application incorporated robust security measures, allowing external access while maintaining data confidentiality.

Results

The developed web application successfully provides participating centers with real-time self-assessment and monitoring capabilities.

It incorporates features that allow **temporal filtering** of analyses, detailed **patient analysis**, monitoring of **indicator trends**, self-assessment of indicator cases, and real-time updates on the count of evaluable patients. The application's secure implementation and the restricted visualizations limited to each center guarantee data privacy and confidentiality.

By prioritizing user experience, the application enables non-experts in data reports to effectively utilize the tool for data analysis and decision-making. Including a plan for improvement proposals ensures ongoing application refinement based on the needs and feedback of end users, particularly surgeons.

Conclusions

The application overcomes the limitations of annual reports by delivering timely and updated information to participating centers. The application enables centers to track their **performance**, access **patient statistics**, monitor **indicator trends**, and centralize the collection of study-related **documents** and **reports**.

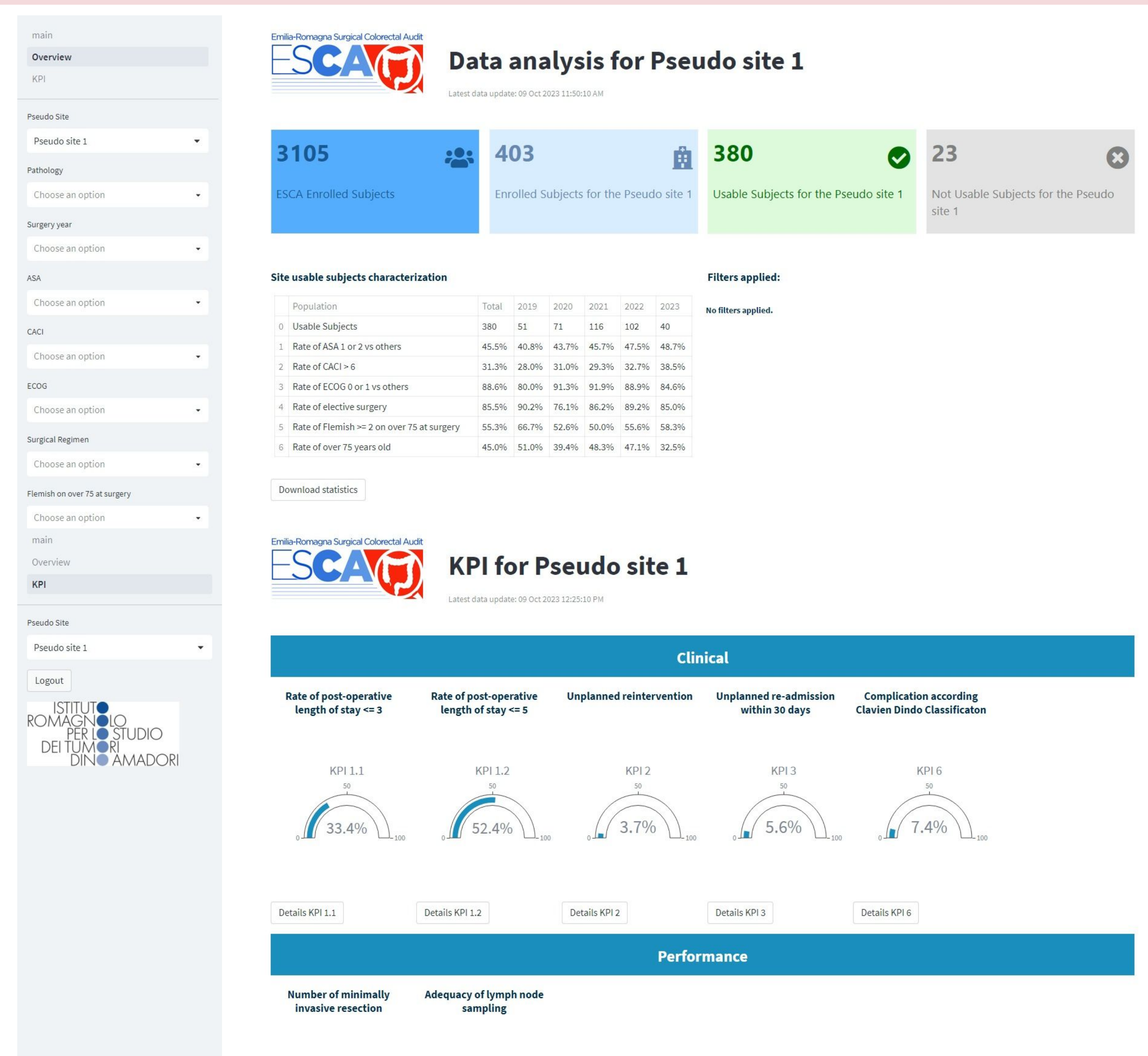


Figure 3. Web app's screenshots: at the top the data analysis page, which allows monitoring the number of patients enrolled per center and their characteristics. Below, KPIs evaluation page divided into clinical, performance, rectal and mortality.