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be.Prepared to increase Belgian integration of health data as a way of strengthening preparedness for infectious diseases

H. Masset[1] • A. Van Laer[1] • M. Kelchtermans[2] • K. Milis[2] • A-S. Gori[2] • S. De Keersmaecker[2] • P. Herman[2] • N. Roosens[2] • R. Winand[2] • K. Vanneste[2] • K. De Ridder[1] • R. Brondeel[1] • K. Blot[1] • D. Van Cauteren[1] • Members of the HERA-BE-WGS initiative

[1] Service Epidemiology of Infectious Diseases, Department Epidemiology and Public Health, Sciensano • [2] Service Transversal activities in Applied Genomics (TAG), Department Biological Health Risks, Sciensano

The **Belgian Preparedness Architecture for Infectious Diseases** (be.Prepared) is an overarching Belgian infrastructure that facilitates the integration of health data from different sources in order to strengthen preparedness for infectious diseases. The initial microbial study cases are: *Listeria*, *Mycobacterium tuberculosis*, *Neisseria meningitidis*, *Salmonella,* Influenza and SARS-CoV-2. Here, we present an overview of the components of the be.Prepared architecture: the central bioinformatics (BioIT) platform, the central National Reference Centre (NRC) platform and the healthdata.be platform (**Fig. 1**).

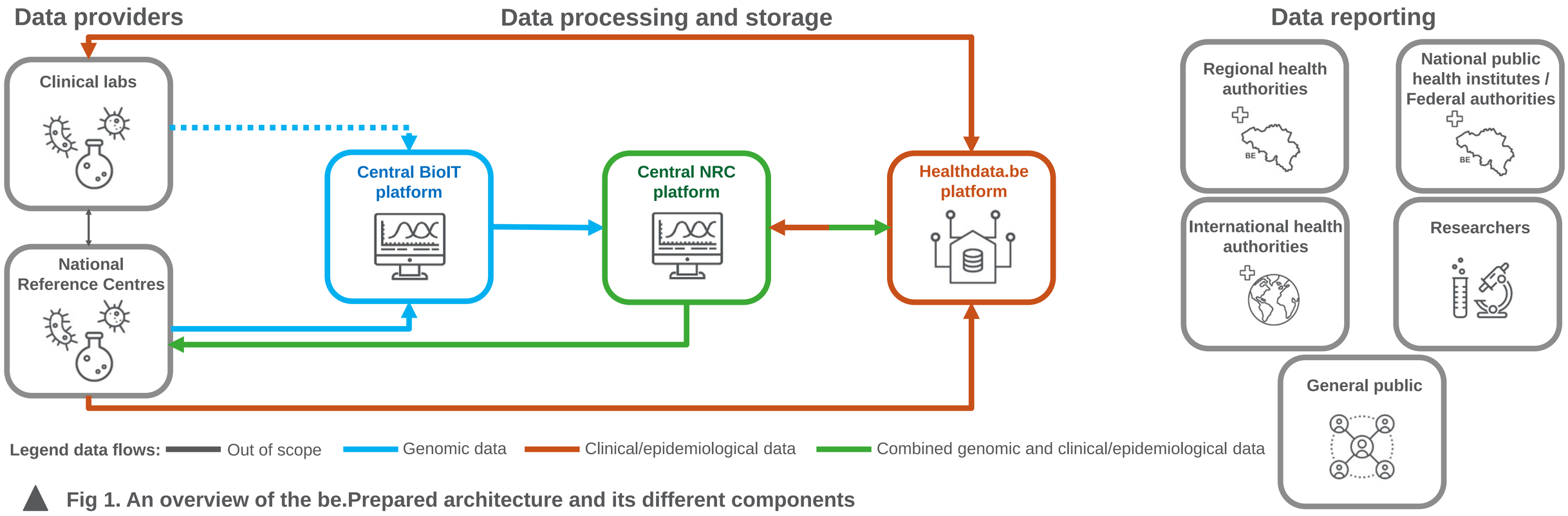


Fig 1. An overview of the be.Prepared architecture and its different components

Central BioIT platform

- Cloud-based (Azure), **fully-automated**, and isolated solution to process microbial isolate sequencing data into genomic indicators
- Using state-of-the-art **pathogen-specific bioinformatics pipelines**
- Facilitates **outbreak detection**
- Genomic indicators and clustering results are stored in a **genomic database** accessible by the NRC platform(s)

Genomic database

Healthdata.be platform

- **Pseudonymized** and centralised data management and analysis platform (HD-DWH)
- Clinical and epidemiological data **combined** with genomic indicator data.
- **Facilitated reporting** to various stakeholders at a national and international level.
- **Secured** platform

Central NRC platform

- **Centralised** place where clinical/epidemiological data and genomic indicators are aggregated together
- Hosted in-house to ensure data **safety and confidentiality**
- A separate NRC platform for **each pathogen**
- User-friendly interface based on BIGSdb to support NRC scientists in **pathogen surveillance**

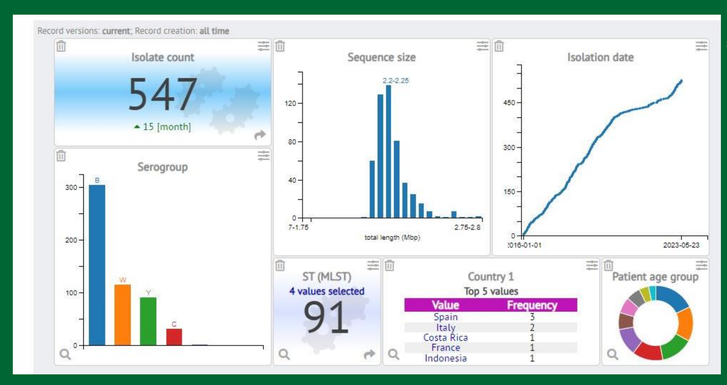
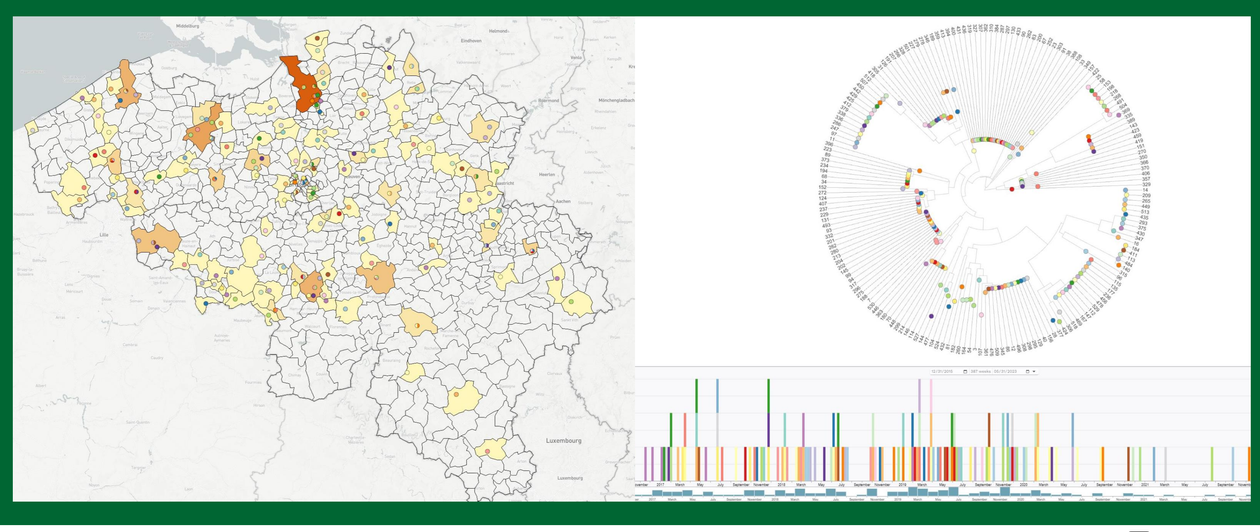


Fig 2. BIGSdb dashboard Toolbox enabling detection of potential pathogen outbreaks using graphical overview of the data

Fig 3. MicroReact visualisation Connected to an internal secure instance of MicroReact for spatial and temporal visualisation of infections



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Sciensano • Heleen.Masset@sciensano.be • **www.sciensano.be**