State-of-play of the COVID-19 Health Information System
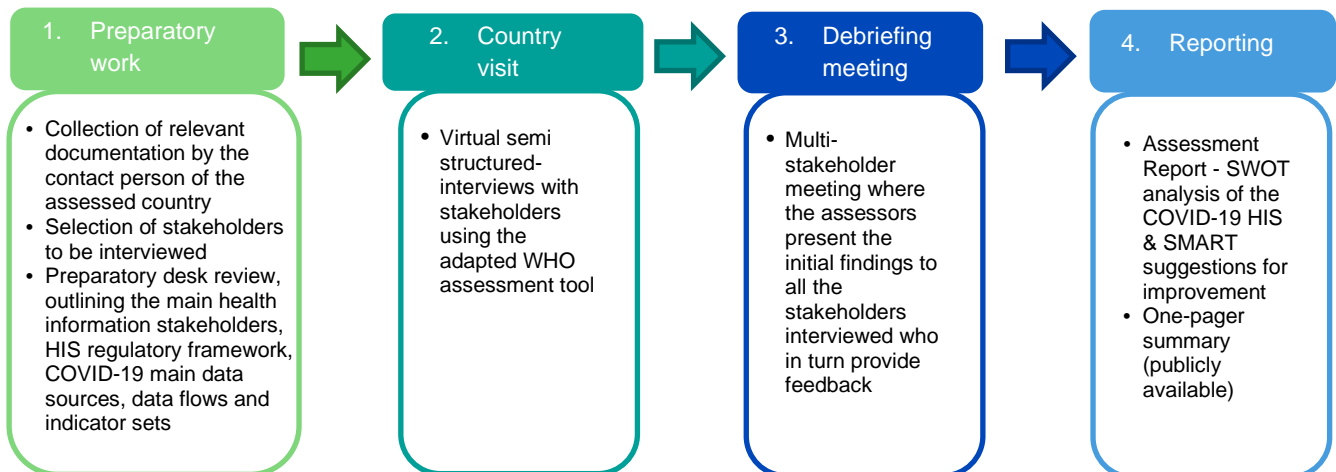## *Hungary*

The Population Health Information Research Infrastructure (PHIRI) carries out COVID-19 Health Information System (HIS) assessments in selected countries that are part of the PHIRI consortium, mapping the Health Information System behind the data and information flows that monitor the effects of COVID-19 on population health.

AIMS OF THE COVID-19 HIS ASSESSMENTS

1. **Identify strengths and weaknesses** of the different data flows across Health Information Systems, whilst monitoring the (broader) effects of COVID-19 in the examined countries.
2. Provide opportunities for other countries to **learn from the experiences** gained during the assessments, and build on these when assessing their own Health Information systems and/or data flows.
3. Potentially **identify data sources** that may not have been used or fully exploited yet and feed them to the Health Information Portal.

4. **Create opportunities** for **engagement** and **knowledge exchange** with national stakeholders and authorities.
5. Contribute to **capacity building** across Europe, which in turn can contribute towards reducing health information inequalities within and between countries.
6. Identify key recommendations for **resilient Health Information Systems** and towards **increased preparedness** for future crisis.

METHODOLOGY OF THE COVID-19 HIS ASSESSMENTS

Each country is assessed by experts from another country within the PHIRI consortium. A detailed manual explains the procedure followed in the assessments, with the steps summarised below.

1. Preparatory work	2. Country visit	3. Debriefing meeting	4. Reporting
• Collection of relevant documentation by the contact person of the assessed country • Selection of stakeholders to be interviewed • Preparatory desk review, outlining the main health information stakeholders, HIS regulatory framework, COVID-19 main data sources, data flows and indicator sets	• Virtual semi structured-interviews with stakeholders using the adapted WHO assessment tool	• Multi-stakeholder meeting where the assessors present the initial findings to all the stakeholders interviewed who in turn provide feedback	• Assessment Report - SWOT analysis of the COVID-19 HIS & SMART suggestions for improvement • One-pager summary (publicly available)

An adapted version of the Health Information System assessment tool developed by the WHO Regional Office for Europe (2015), including the add-on module on Infectious Diseases (2021), is used to guide the interviews. The assessment covers data collections and data sources, data analysis, reporting, knowledge translation, governance and resources, best practices and identified gaps.

COUNTRIES INVOLVED IN THE PHIRI COVID-19 HIS ASSESSMENTS

The assessments were performed in Belgium, Italy, Hungary, Ireland, Malta, the Netherlands, Norway and Portugal between January 2022 and May 2023.

Health Information System (HIS)

The Hungarian healthcare system is funded through a single payer, the National Health Insurance Fund (NEAK). Every registered citizen possesses a social security number that is utilized for healthcare purposes and almost all citizens have access to healthcare services. A HIS for notifiable diseases has been in place in Hungary since 2014; physicians are obliged to report any new cases online within 24hours.

Data sources

The main health data sources in Hungary are the: National E-Health Infrastructure (EESZT), National Health Insurance Fund (NEAK), National Public Health Centre (NPHC/ NNK) and the Hungarian Central Statistical Office data. During COVID-19, EESZT collected data on tests, vaccinations and medical care centrally. Results of PCR tests were automatically transmitted to the (NPHC/ NNK). Data were reported to TESSY and the country actively participated in COVID-19 specific surveys, mostly issued by NPHC/ NNK and some with the support of universities.

Data Analysis

Cooperation was established with university researchers for data analysis. Modelling was performed at the NPHC. Preparations are underway for the design of the sectoral data center, which will allow anonymous research queries based on EESZT during the pandemic. The server was planned to be established at the Ministry of the Interior and managed by government IT agencies such as the Government IT Development Agency and Cyber Security agency.

Reporting and knowledge translation

- The country had a centralized communication channel, the Coronavirus.gov and daily press conferences by the Operational Corps, streamed on television and on social media. In the course of the pandemic, communication was reduced to weekly reports.
- A free phone call number, offering information on COVID-19 was set up.
- A dedicated team, mainly coordinated by government actors and members of the Ministry of Interior, with multidisciplinary experts was allocated to reporting to understand and process the new results for the daily reports.

Governance and resources

- In January 2020, the Hungarian government established an 11-member Operational Corps led by the Interior Minister and the Minister of Human Capacities. The Operative Corps was responsible for organizing the medical and epidemiological measures taken in response to the COVID-19 pandemic such as testing and allocating physical and human resources.
- The legislation in place allowed to introduce new mandatory diseases for reporting.
- The legislation for the implementation of public health and social measures had to be developed.
- Centralized oversight of health care services enabled effective implementation of health system directives, e.g. for the dedication of hospital beds to COVID-19 patients.
- At the healthcare providers level, students and volunteers were involved to decrease the lack of specialized human resources.
- Screening buses were repurposed as testing and vaccination buses.

Best practices

- A unique person identifier is used for the patients allowing linkage of data across different databases.
- A COVID-19 Data Lake containing data that is depersonalized in a standard manner, was established and coordinated by the Ministry of the Interior.
- An increase in the use of telemedicine was recorded: currently it is mandatory for GPs to make digital prescriptions.
- Quick adaptive capacity in the development of new tools, such as the Business Intelligence (BI) platform that provided information on multiple data collection (e.g. protective equipment, bed occupancy), was registered. Such information allowed the government to react quickly when needed i.e. emerging of new variants.
- Existing legislation supported the country to quickly react and set up new data flows instead of working under emergency legislation.
- Identification of groups and areas in which the vaccination hesitancy was higher led to the organisation of national events, such as hackathons in collaboration with universities, to create targeted campaigns.
- Successful collaboration with the private sector: an agreement with all the Hungarian mobile providers (e.g. Vodafone, Telecom) was set up to obtain depersonalized aggregated mobile cell data, allowing the generation of a stay-at-home and mobility index and information on compliance with restrictions on mobility.
- Attention to testing of hard-to-reach population groups via the organisation of "screening buses" strategically located.

Identified gaps

- Shortage of human resources with regards to IT capacities, reporting and knowledge translation. Despite a team being in place for such tasks, the resources of HIS stakeholders were insufficient to process all the requests for reports they received.
- Due to the increase in data input during the pandemic, continuous long-lasting ICT updates became necessary to ensure proper functioning of the system.
- National reference labs became overburdened, due to the rapid increase in demand for laboratory services.
- Manual data entry was required for the recording of antigen tests, followed by manual submission to the NPHI, resulting in prolonged waiting times for data availability and introduced a heightened risk of errors during the data input phase.

Assessment performed in:
October 2022