PREPARE-Rehab helps establish best practices for applying OHDSI tools in rehabilitation, and the extension of standardized vocabularies and CDM domains to increase its usefulness for applications in biopsychosocial domains

Personalized rehabilitation via novel AI patient stratification strategies using the OMOP-CDM standard

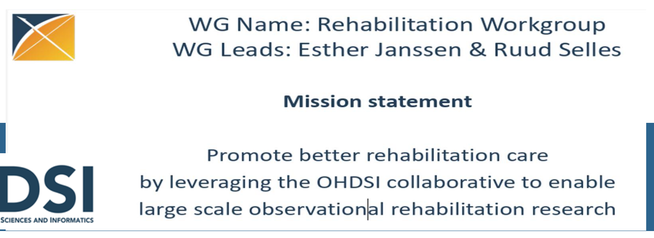
- **Rehabilitation** is a complex, multimodal, collaborative person-centered process.
- Clinical decision support systems (**CDSSs**), like prediction models, aid shared decision-making (clinicians and patients).
- Many health conditions lack validated **prediction models**; existing models often use simple statistics and small datasets.
- Current **models lack Application Programming Interface** for integration of new data and continuous improvement.

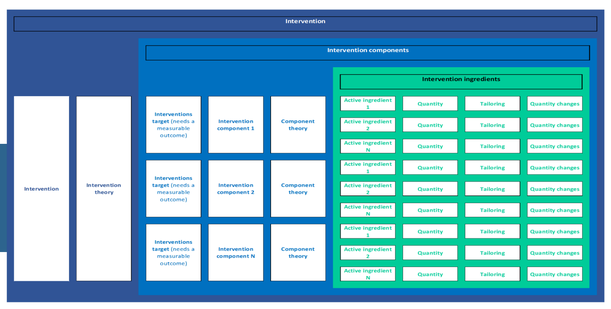
Results

- Many clinical rehabilitation variables lack appropriate concepts in existing vocabularies, indicating the need to extend current libraries.
- Overlapping data across clinical cases offers a chance to establish uniform mapping for rehabilitation data.
- The WHO's International Classification of Functioning, Disability and Health (**ICF**) framework supports the extension of existing vocabularies and class hierarchy tailored to rehabilitation.
- Extending CDM domains may improve mapping of rehabilitation data, including (PROMs) and long-term treatment.
- These extensions can significantly enhance data mapping accuracy in rehabilitation and for many chronic conditions.
- Comparisons between different cases will guide the newly developed Rehabilitation OHDSI workgroup.

Lessons learned from the OMOP CDM implementation in pilot case "Scoliosis during growth (ISICO)"

- Extending the ETL (Extract, Transform,Load) to transform data from MySQL to **PostgreSQL** was crucial for OHDSI tool compatibility and long-term maintainability.
- Many rehab-specific concepts need to be added to **OHDSI Athena,** after discussion and consensus in our community.
- Recording **therapy sessions and other rehabilitation interventions**, including compliance or device changes was challenging, as well as results of questionnaires.
- A dedicated OHDSI CDM set of concepts for **non-pharmacological prescriptions** is lacking.
- The **rehabilitation processes and the databases** used to construct the CDSS were compared for commonalities and distinctions, using Excel files and piloting **GUIDE-Rehab.**

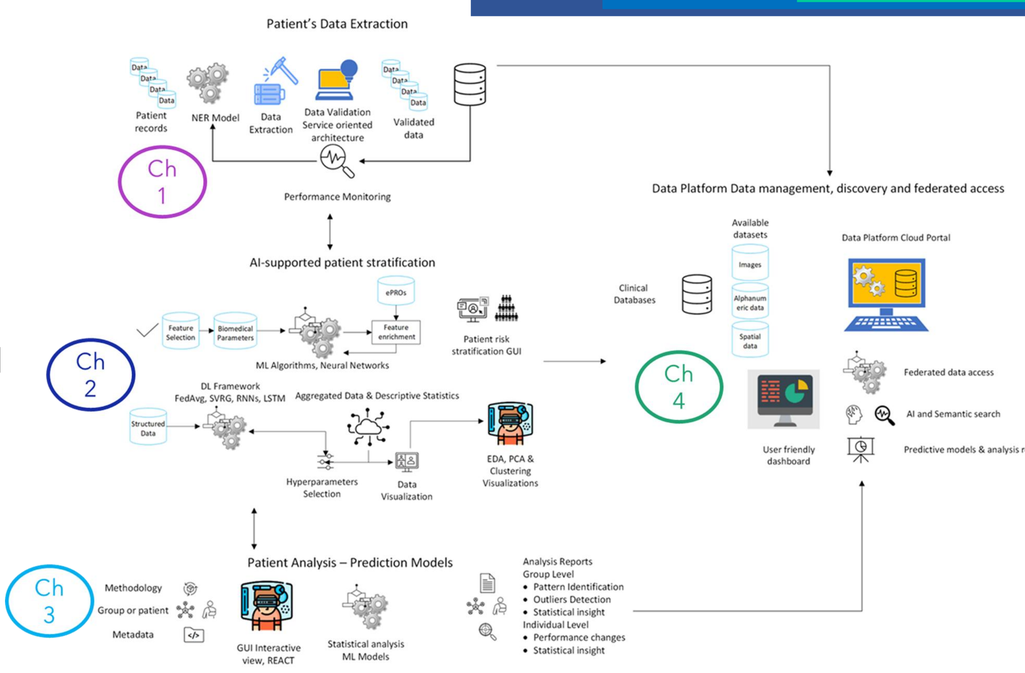




Methods

PREPARE is a €7 million HaDEA-Horizon European project (4 years; 20 partners - 9 countries)

- Applies machine learning (ML) to 9 large-scale patient datasets.
- Uses federated approach for real-world, routinely collected data.
- Develops a platform for sharing model results, based on the OMOP CDM (Observational Medical Outcomes Partnership Common Data Model) standard through the OHDSI collaborative.
- Creates prediction and stratification Machine Learning strategies for rehabilitation data.
- Validates models through nine clinical demonstration pilots.
- Investigates research questions on: changes in clinical decisions, clinician adoption and patient experiences with AI-based CDSSs



PREPARE-Rehab leverages the OMOP-CDM standard to develop and validate AI-driven CDSSs tailored to the complexities of rehabilitation care.

By addressing gaps in existing vocabularies and fostering collaboration within the OHDSI community, this project advances standardized data mapping and machine learning applications in rehabilitation.

The initiative lays a foundation for scalable, interoperable solutions that enhance personalized patient stratification and prediction models to ultimately improve clinical outcomes across diverse **rehabilitation** settings.

This may be of interest for other fields dealing with chronic conditions.

Carlotte Kiekens*, Esther Janssen, Lisa Hoogendam, Ruud Selles, Philip van der Wees, Alberto Negrini, Stefano Negrini and the PREPARE group *IRCCS Galeazzi-Sant'Ambrogio Hospital/ISICO – Milan, Italy; carlotte.kiekens@isico.it

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