

Synopsis: LongCOVID Trajectory Modeling

Objectives

The primary objective of this study is to analyze pseudonymized longitudinal patient data from the ComPaRe Long COVID cohort to characterize disease progression patterns. Specifically, the study aims to:

- Identify distinct trajectories of Long COVID severity over time using latent class mixed models (LCMM).
- Quantify heterogeneity in symptom evolution, including persistence, recovery, and recurrence.
- Assess associations between patient characteristics (e.g., age, sex, comorbidities) and trajectory group membership.
- Estimate the long-term healthcare burden associated with different disease trajectories.

These objectives are grounded in the overall goal of improving understanding of Long COVID progression and informing clinical and public health strategies.

Research Questions

The study addresses the following key research questions:

- What distinct longitudinal trajectories of Long COVID symptoms can be identified in the cohort?
- How do symptom clusters co-evolve over time, and what patterns of persistence or recovery emerge?
- Which demographic and clinical factors are associated with specific trajectory memberships?
- How do trajectories differ in terms of quality of life, mental health, and treatment burden?
- What implications do these trajectories have for estimating long-term healthcare needs?

Selected Data

The analysis is based on pseudonymized individual-level longitudinal data collected within the ComPaRe cohort. The selected data include:

Sociodemographic and baseline characteristics:

- Sex at birth, year of birth
- Tobacco and alcohol consumption (all follow-ups)

Clinical and health record data:

- Diagnoses, comorbidities, number of diseases
- Medication treatments, hospitalizations, health events

Longitudinal patient-reported outcomes:

- Symptom severity (MYMOP)
- Treatment burden (TBQ), anchor question (PABS)
- Quality of life (EQ-5D-5L, EQ-VAS)
- Physical activity (IPAQ)
- Mental health (PHQ-9, GAD-7)
- Sleep quality (PSQI)
- Medication adherence

Long COVID-specific data:

- Symptom timelines, episodes, and positive tests
- Hospitalization history
- Long COVID symptom and impact tools (ST, IT)
- Dyspnea scale (MRC)