

TrajectoryViz: Interactive visualization of treatment trajectories

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METHODS

TrajectoryViz can visualize trajectories based on **discrete treatment periods** with following data structure: SUBJECT_ID, STATE, STATE_START_DATE and STATE_END_DATE.

Based on this it produces an interactive R Shiny application that displays **interactive sunburst plot** of the sequential ordering of the states and **patient level visualizations of the state sequences selected from the sunburst plot.**

The patient level sequences can be filtered, shown **with the gaps in treatment and without**, and **aligned** by different events. All these visualizations are interactive allowing both quantifying the interesting aspects or zooming into particular patterns.

To make the visualization compatible with any **OMOP formatted database** TrajectoryViz relies on Cohort2Trajectory package in R github.com/HealthInformaticsUT/Cohort2Trajectory. This package summarizes multiple cohorts defined in ATLAS into linear event sequences, required by TrajectoryViz.

RESULTS

To illustrate the capabilities of the TrajectoryViz package we consider two applications:

1. **Treatment of asthma patients** (based on cohorts from Markus et al) and
2. **Diagnostic procedures on cervical cancer patients** before and after the diagnosis.

In both cases we utilize the data from **Estonian Health Insurance Fund** and **Estonian Health Information System**.

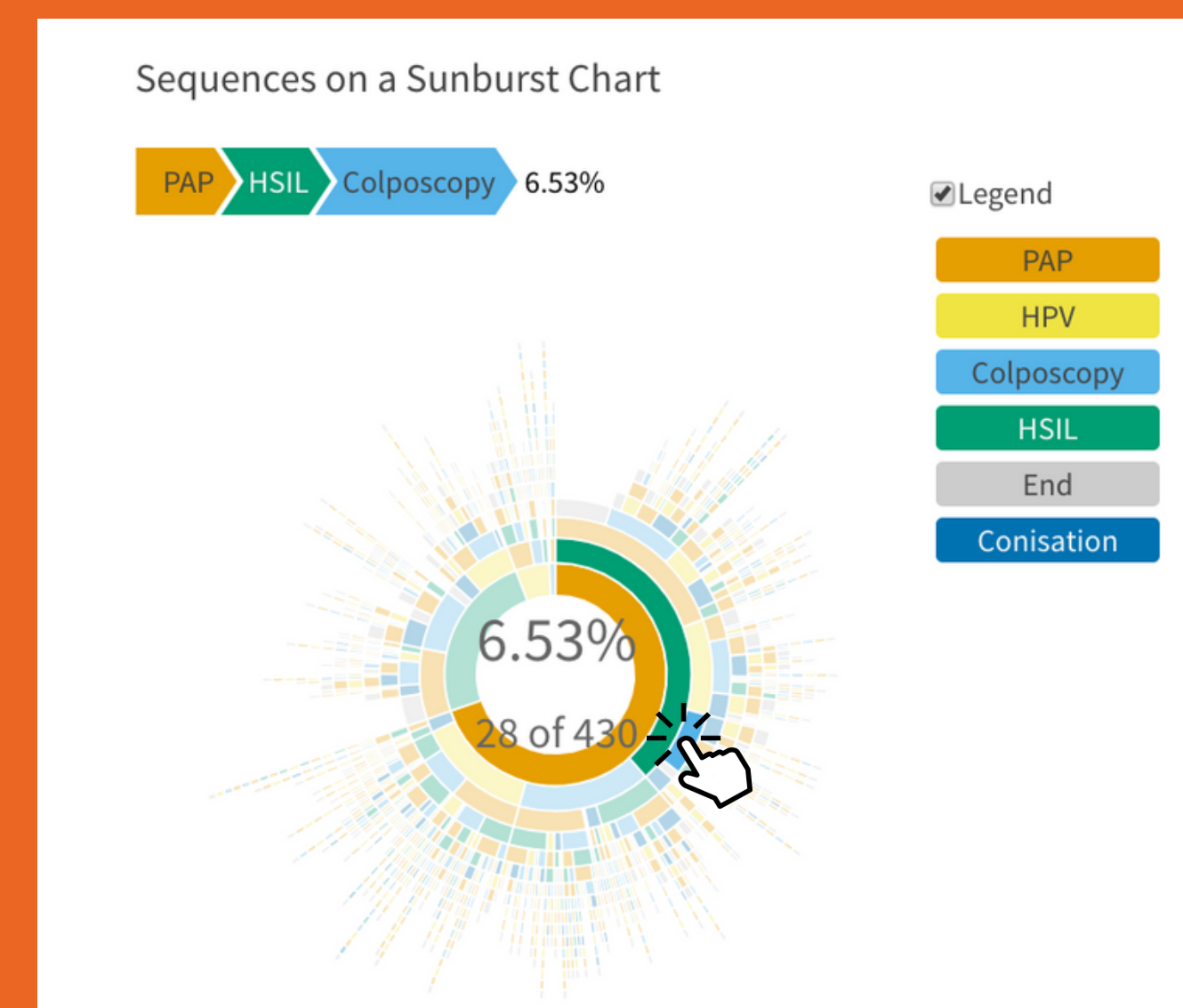


github.com/HealthInformaticsUT/TrajectoryViz

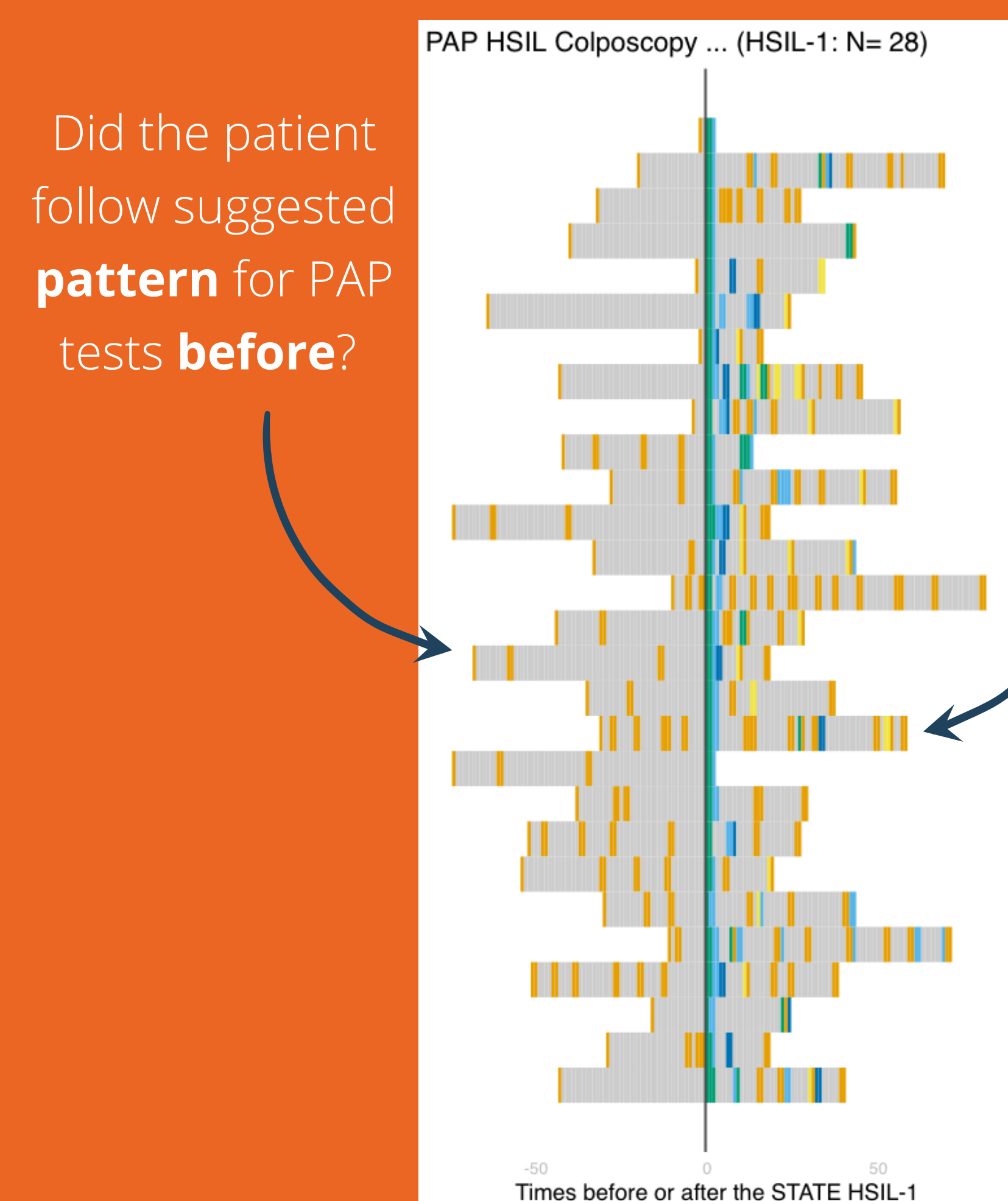
Explore the **temporal patterns** of the sequences, **understand the data** better, **spot problems** with analysis setup and **generate novel hypotheses** with the help of **TrajectoryViz** R package.

Use Case 1: Cervical Cancer patients

Zoom in from the Sunburst:
the patients with procedure/result
sequence starting with
PAP-HSIL-Colposcopy



In this particular set of patients, we can see clustering of the sequences - **keeping the gaps** between prescriptions enables looking at the **length of periods between procedures and results**

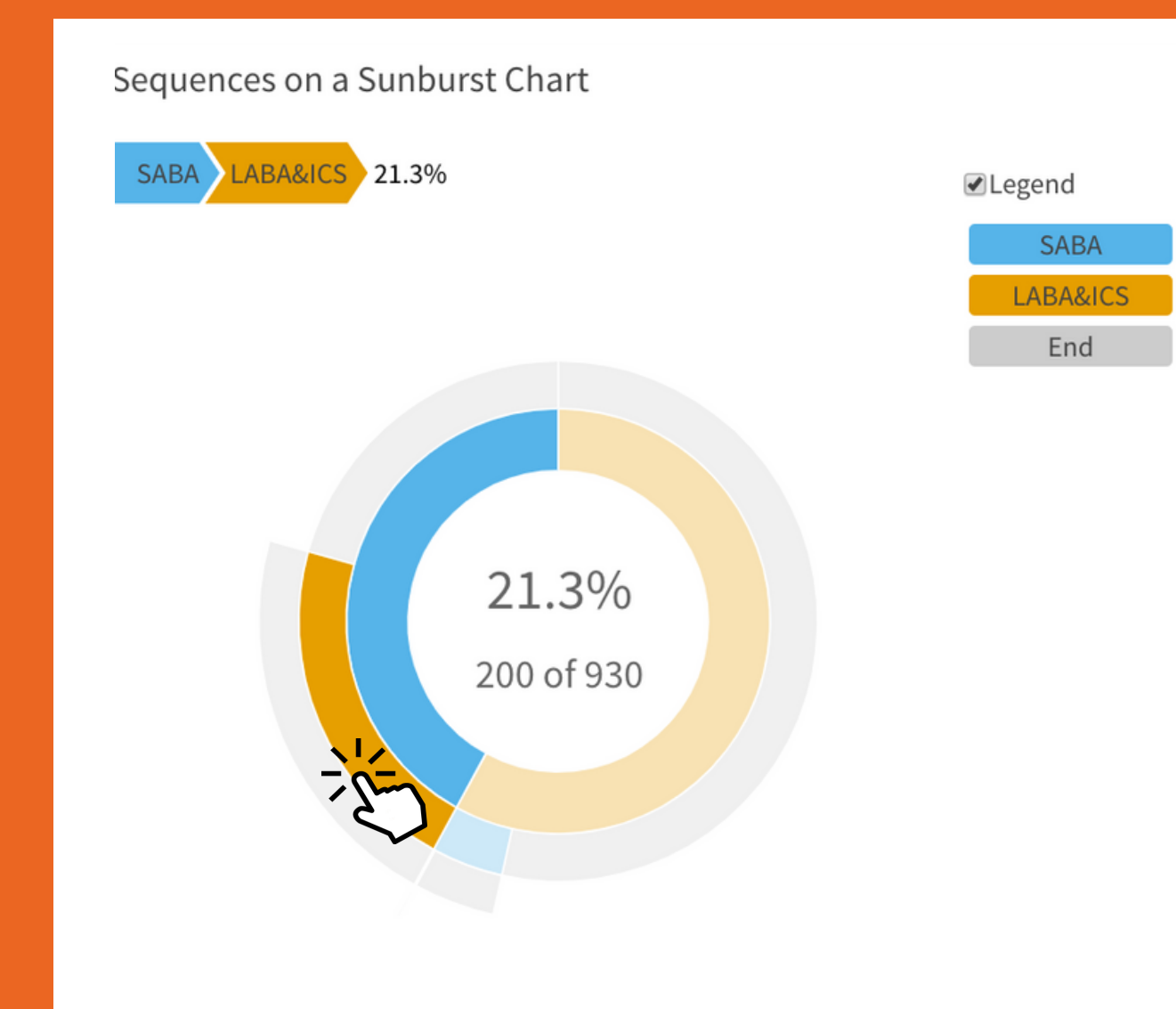


Did the patient follow suggested **pattern** for PAP tests **before**?

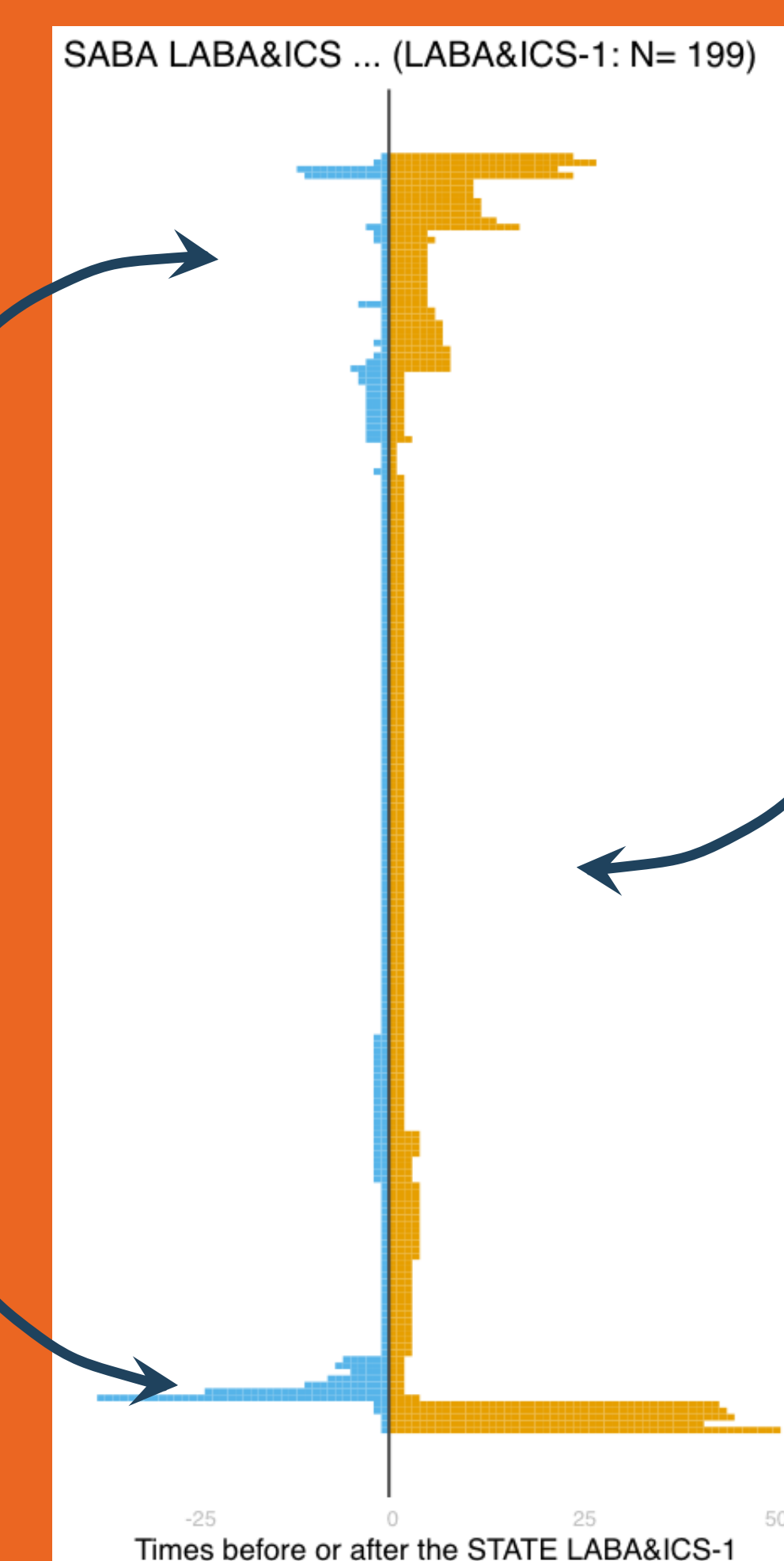
Did the patient follow suggested **pattern** for PAP tests **after** **selected** diagnosis?

Use Case 2: Asthma patients

Zoom in from the Sunburst:
the patients from SABA and LABA&ICS
cohorts with treatment sequence
SABA-LABA&ICS

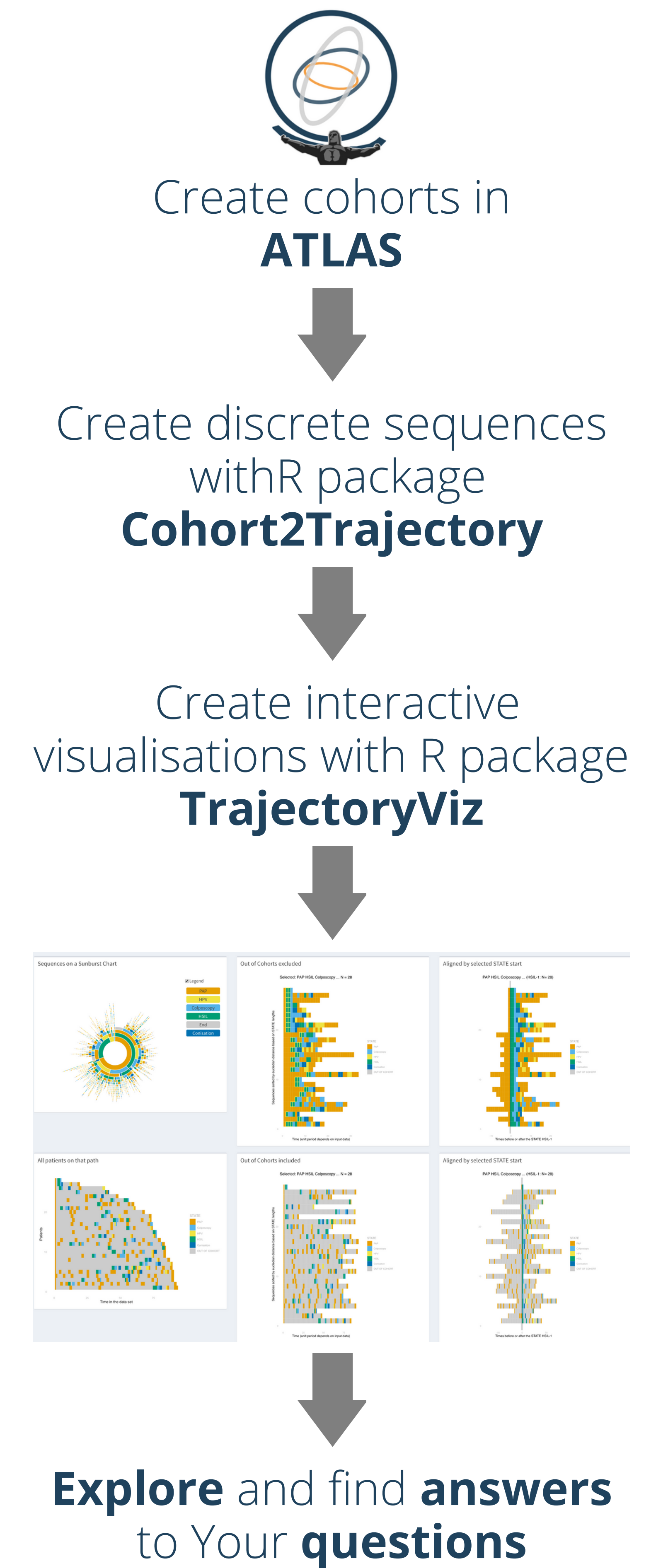


In this particular set of patients, we can see clustering of the sequences - **removing the gaps** between prescriptions enables looking at the **treatment as a continuous period**



There was a subset of the **patients who spent much more time** taking the drugs

Most of the patients spent **only 1-2 months** (prescriptions) on either of the drugs



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Aniek F. Markus, Peter R. Rijnbeek, Jan A. Kors, Katia Verhamme. TreatmentPatterns: An R package to analyze treatment patterns of a study population of interest. OHDSI 2020 Global Symposium. ohdsi.org/2020-global-symposium-showcase-92



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