



CASUS

CENTER FOR ADVANCED
SYSTEMS UNDERSTANDING

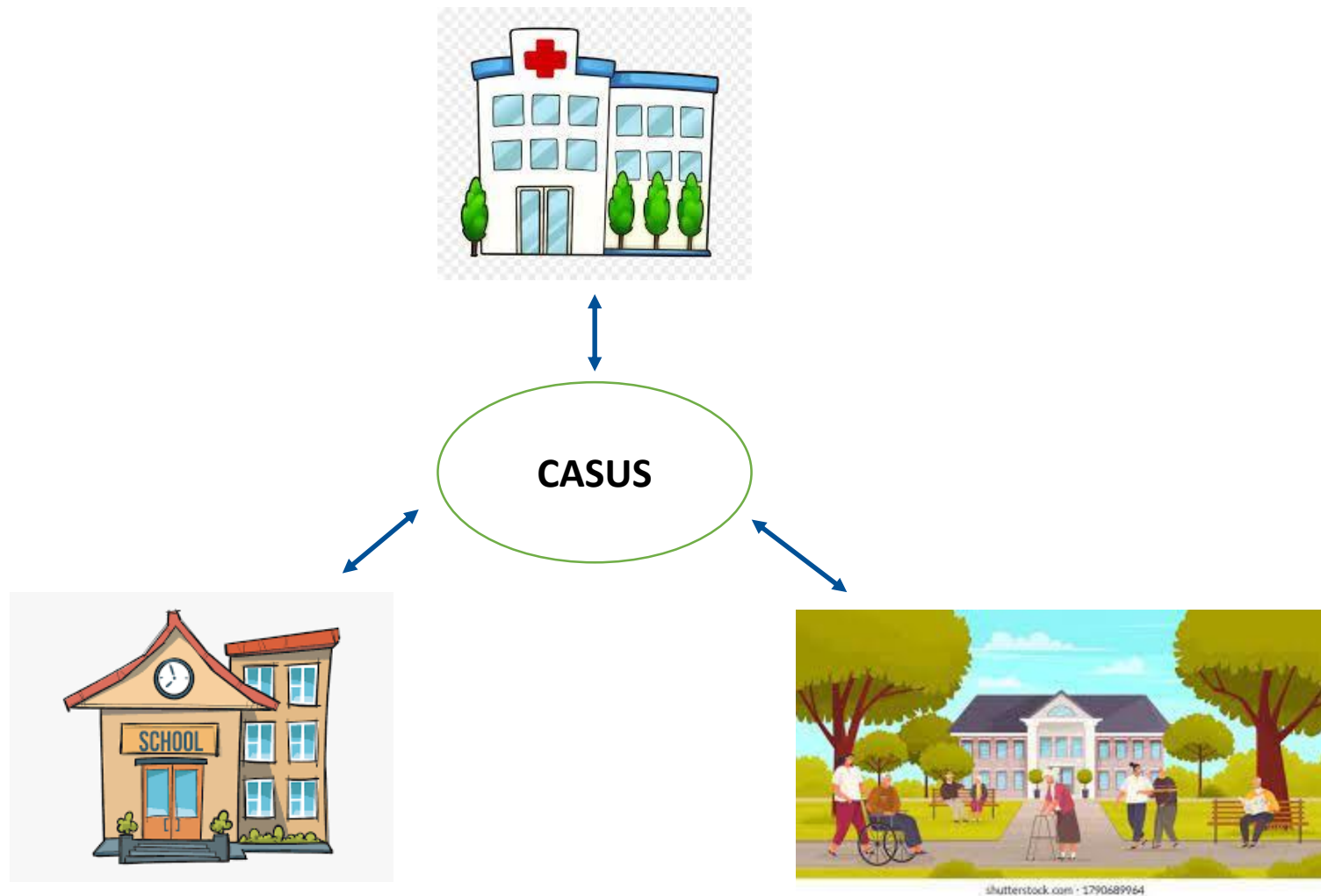
A scalable pipeline for effective forecast of COVID-19 in Germany, Czechia and Poland.

www.casus.science



Digital Health

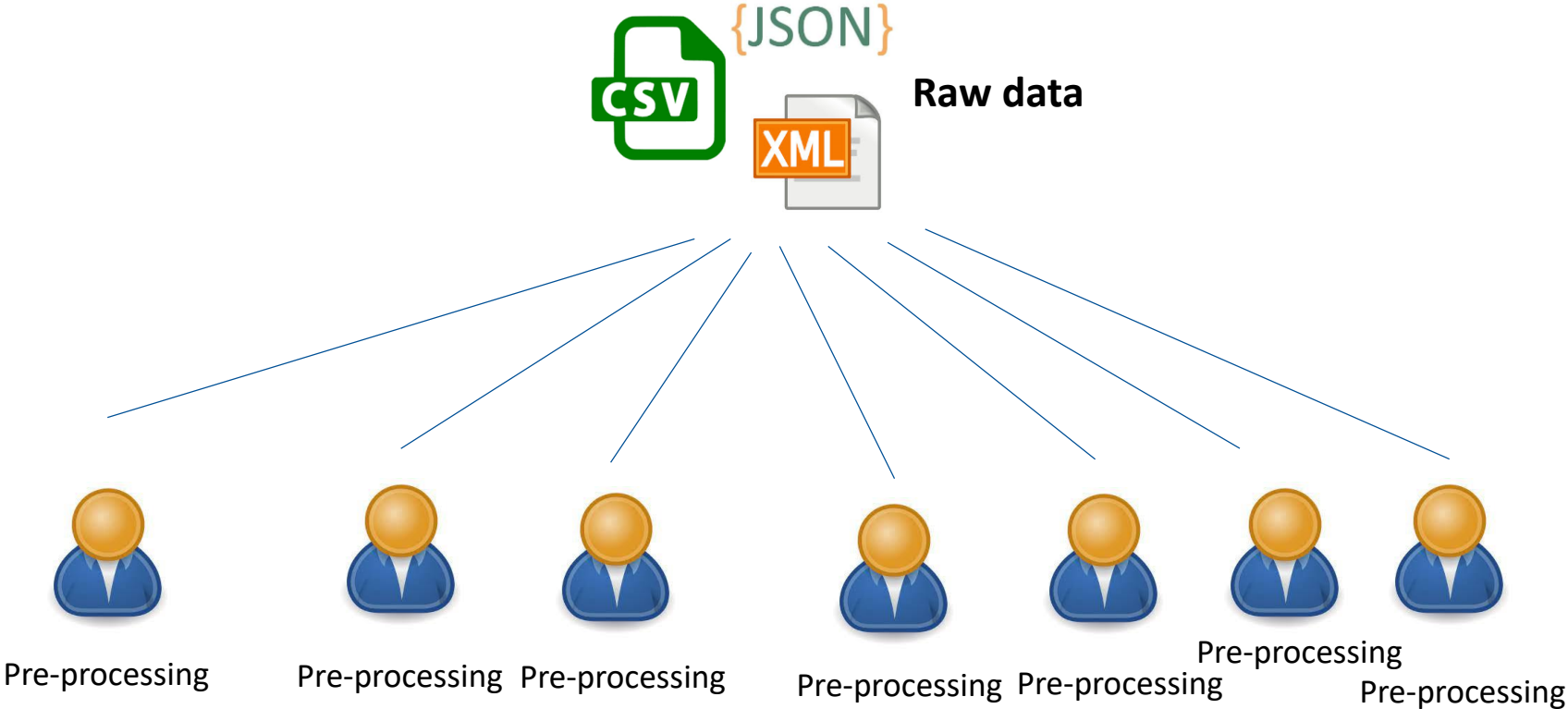
Datasets Pre-requisites



Data science activities

An example of analysing COVID-19 cases.

Repository of Robert Koch Institute



Thanks To



Pros cons of the previous slide

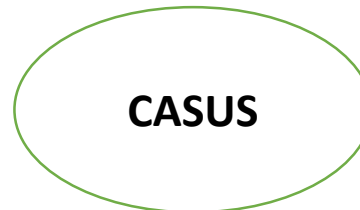
csv, xml and json

Pros	Cons
Used everywhere	Not inherently secure
Large user community	Susceptible to trivial human errors
Familiar User interface	Difficult to troubleshoot & test
Many built-in and 3rd party functions	Not designed for collaborative work
Easy learning curve	Trouble in handling large datasets
Independent work	Not built with Business Continuity in Mind
quick analysis of smaller datasets	Expensive in pre-processing datasets.

Digital Health

Datasets Pre-requisites

- ✓ Collaborative work
- ✓ Data security
- ✓ Large datasets
- ✓ Continuity
- ✓ Less data pre-processing for users
- ✓ Data Synchronization



SQL:

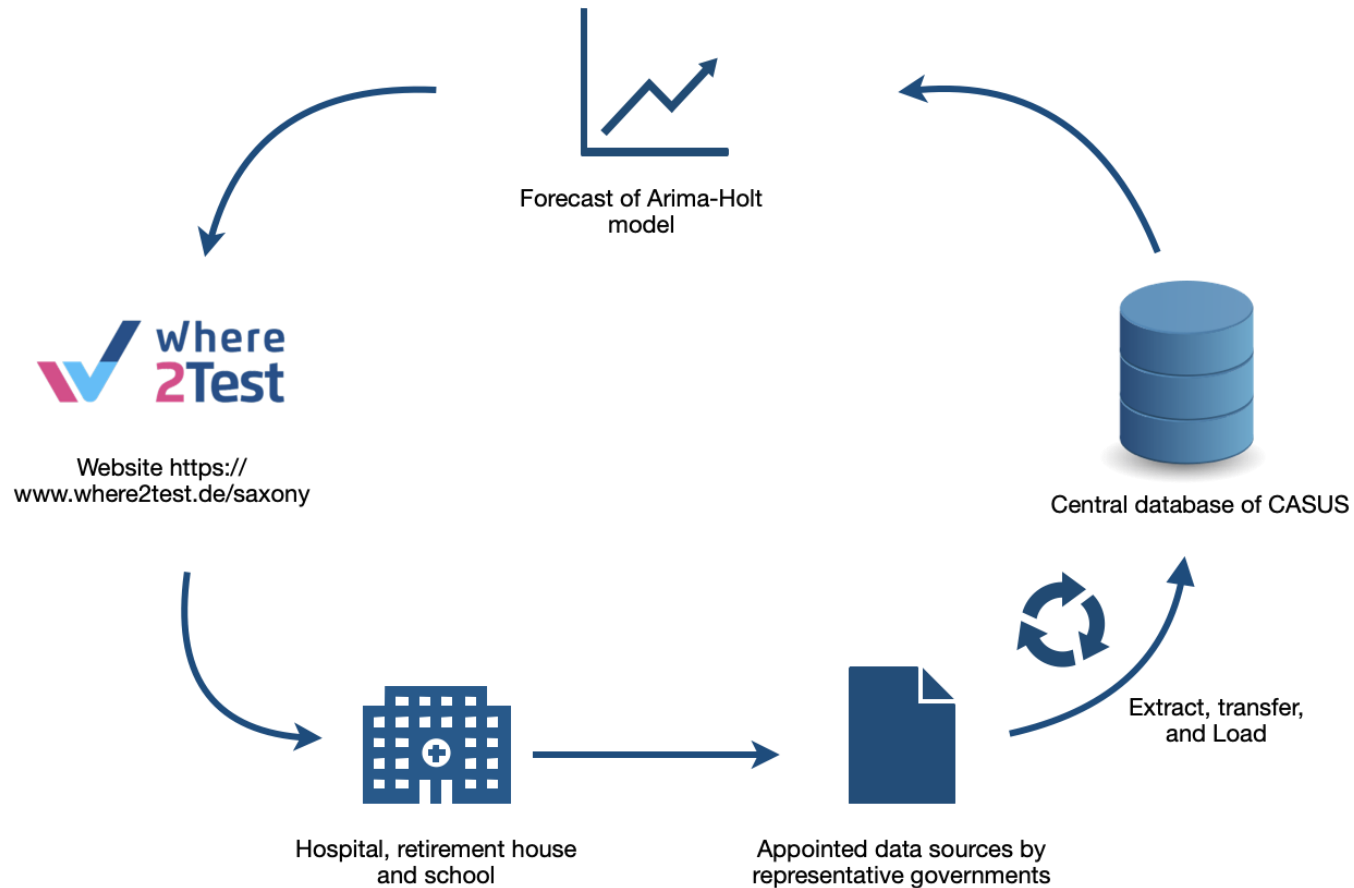
- ✓ Preserve data integrity
- ✓ Process data quickly
- ✓ Store data securely
- ✓ Store large datasets
- ✓ Have an audit trail on the database



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Objective

Data Integration Pipeline of COVID-19



Challenges

Data Integration of COVID-19 datasets

01

Various table
structures of
datasets

02

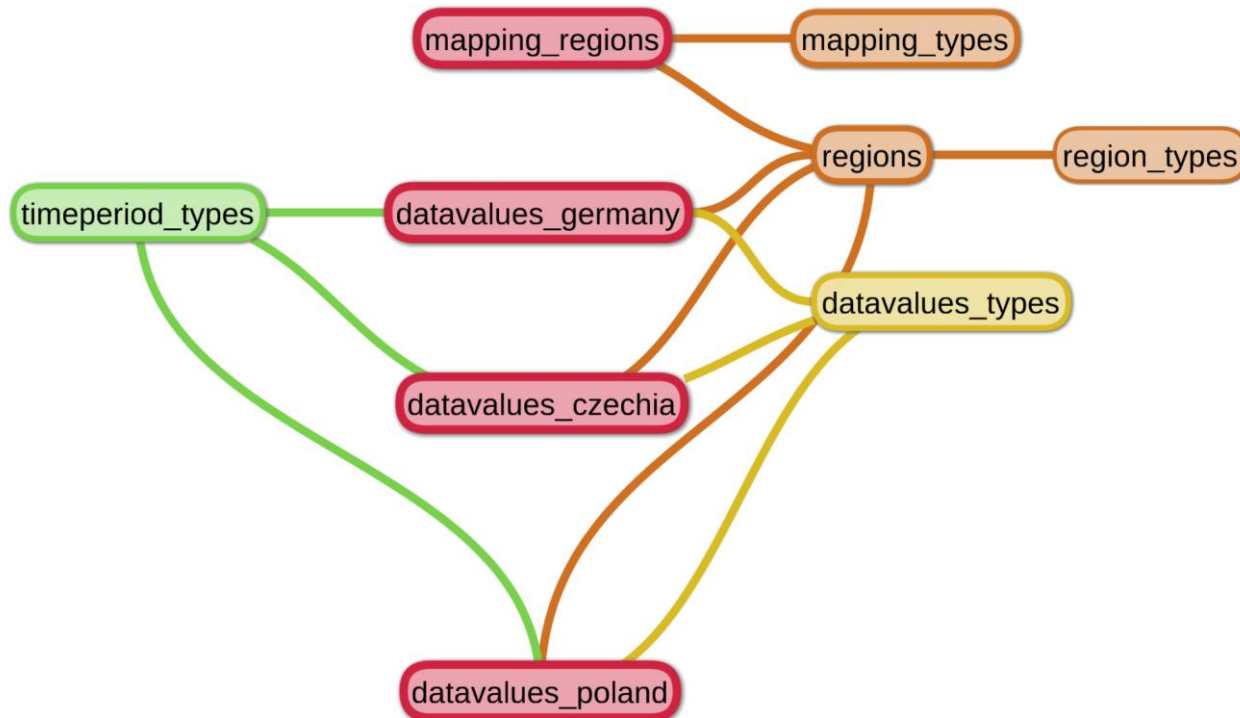
Various
datafile
formats

03

Data
synchronizati
on

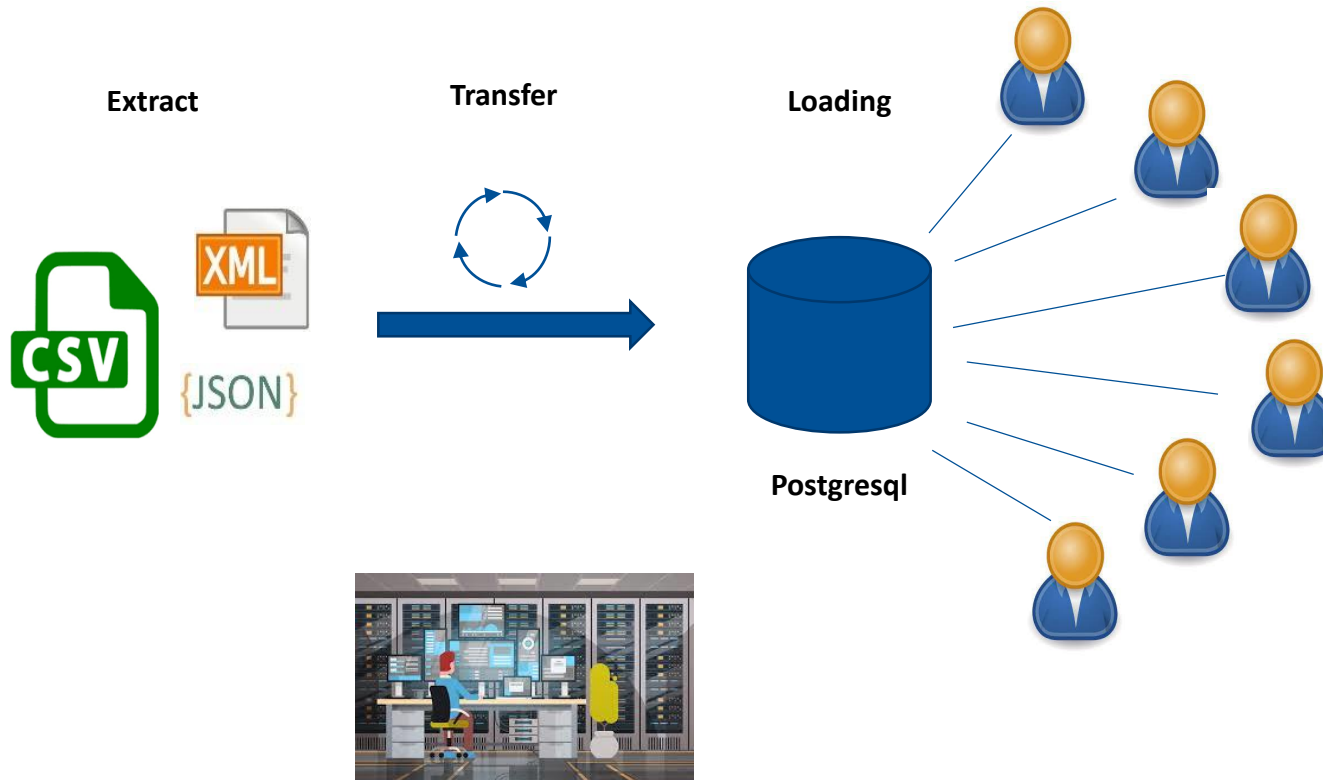
Model

Synchronization of different table structures from data sources.



Extract and transfer

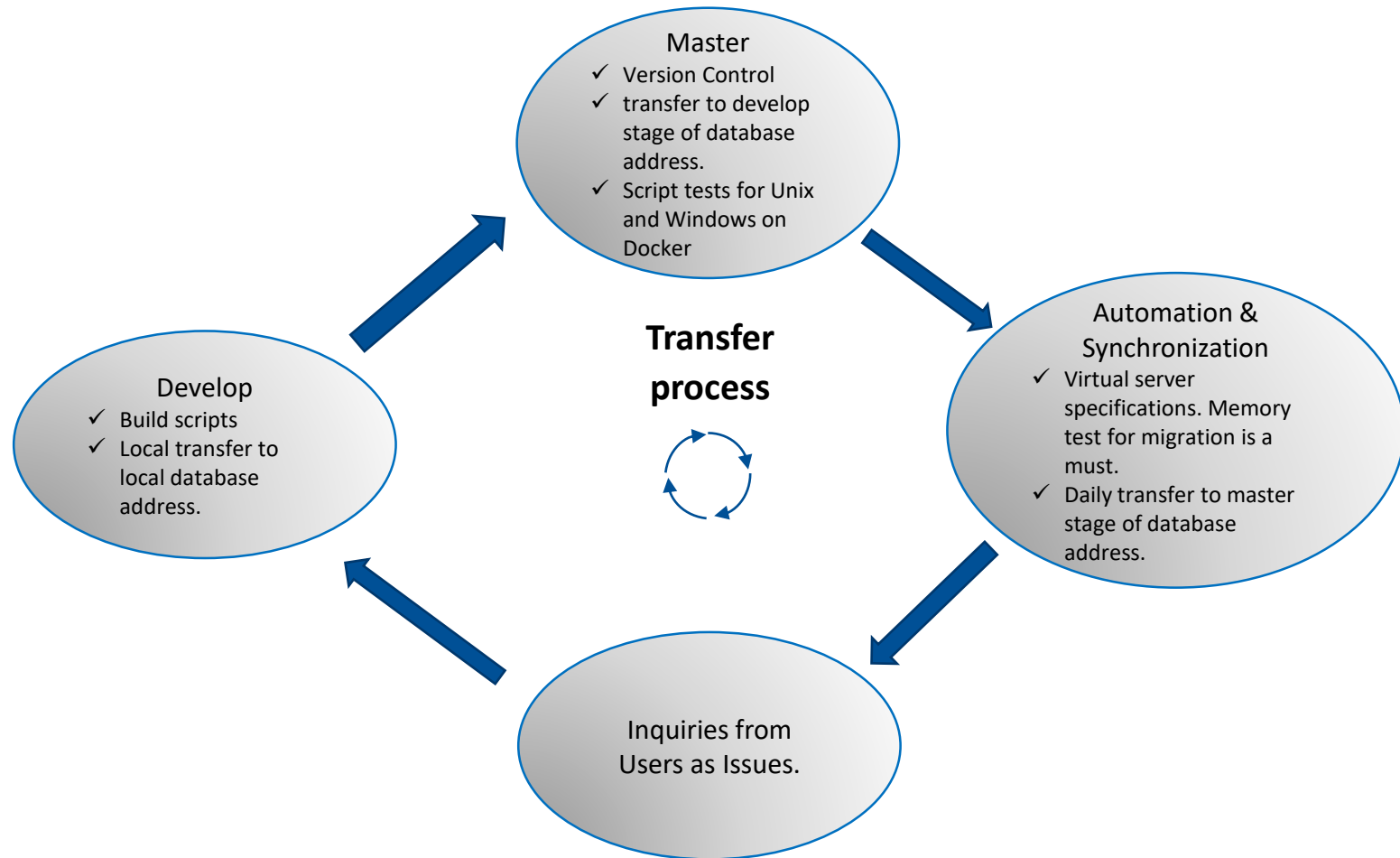
Transferring datasets from xml, csv and json to postgresql



Pre-processing data
by database admin.

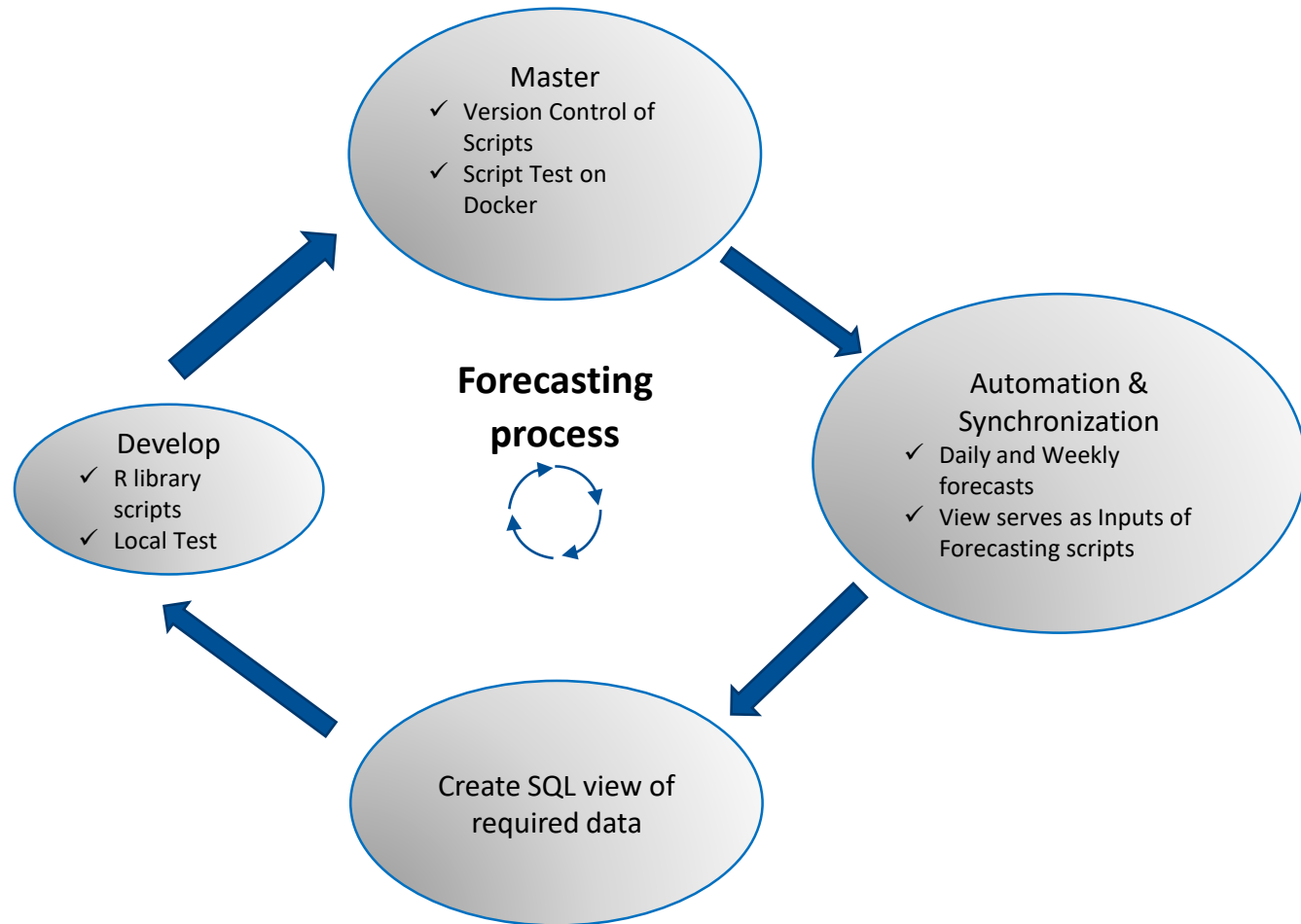
Data transfer workflow

Transfer process



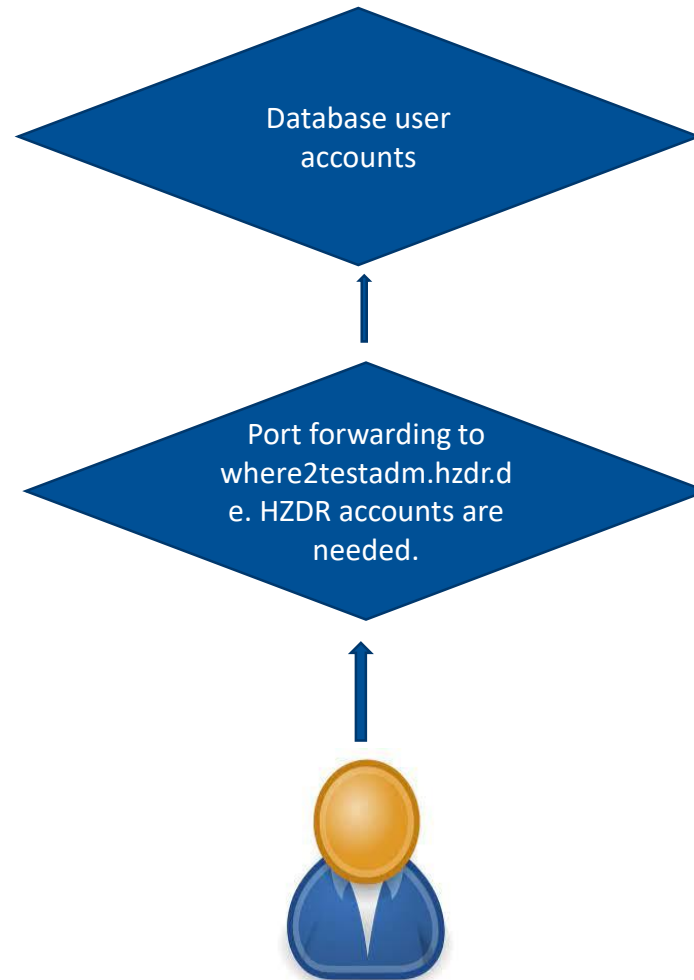
Forecasting model workflow

Arima Holt-Winters model



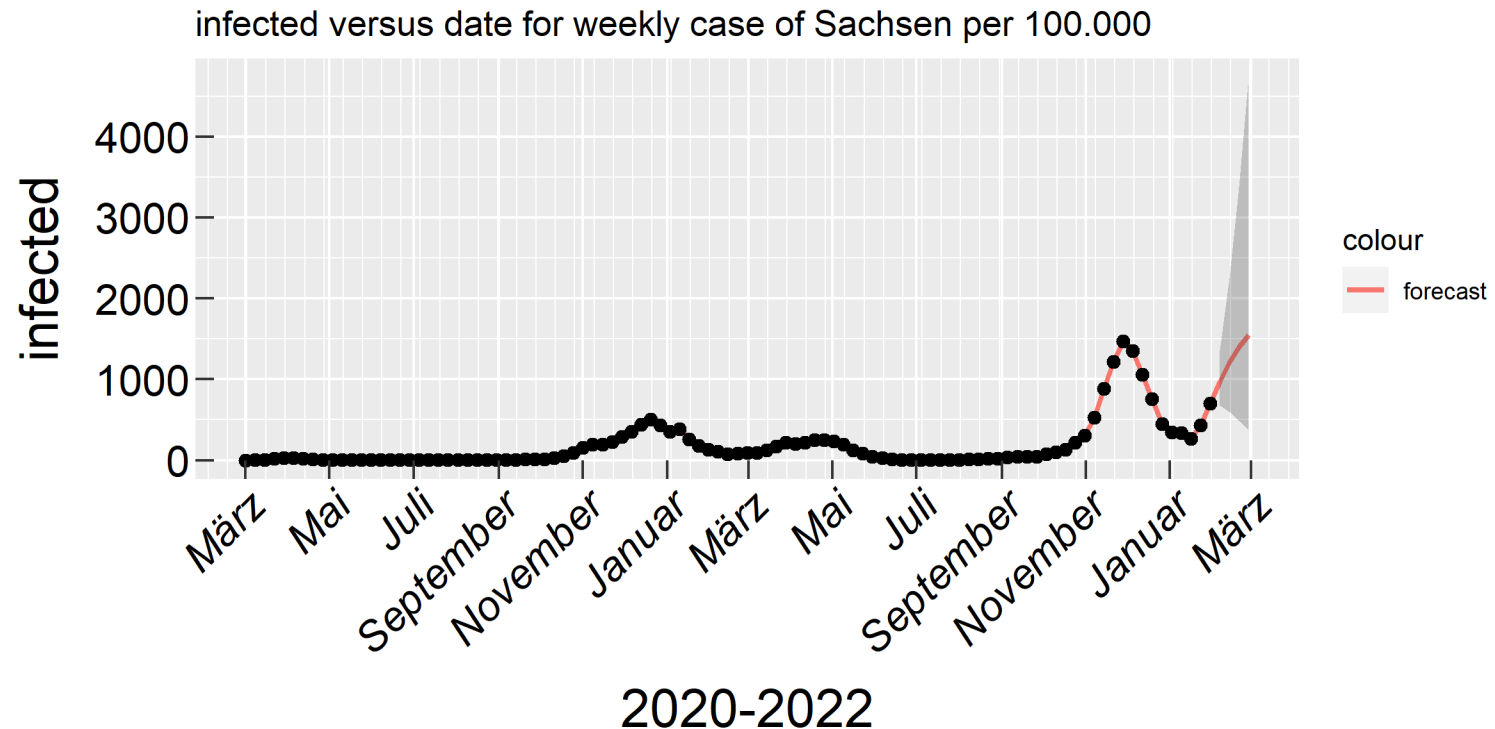
Data security

User access



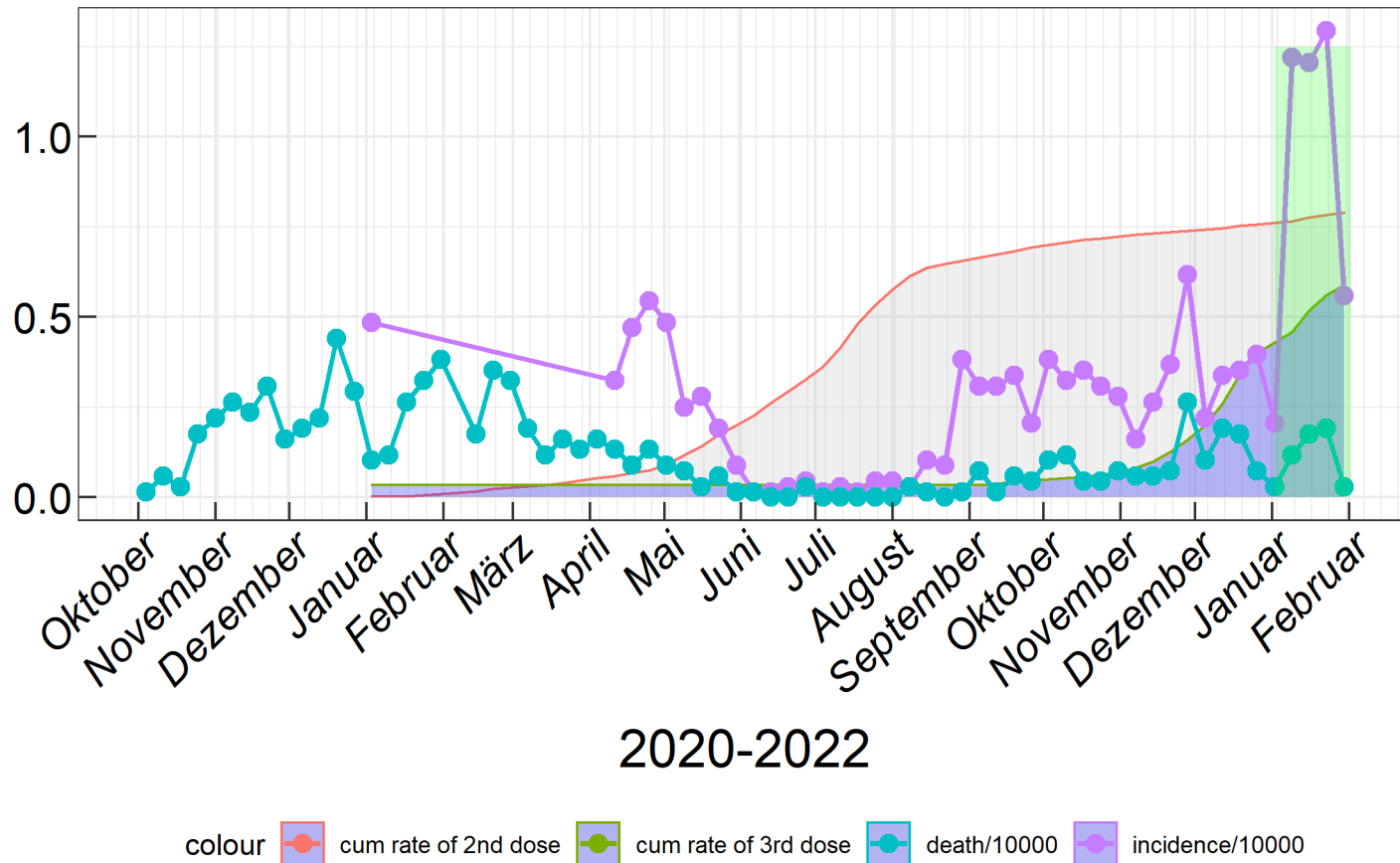
Database usage for frontend COVID-19 cases in Sachsen

<https://www.where2test.de/saxony> 7 days incidence per 100.000 people



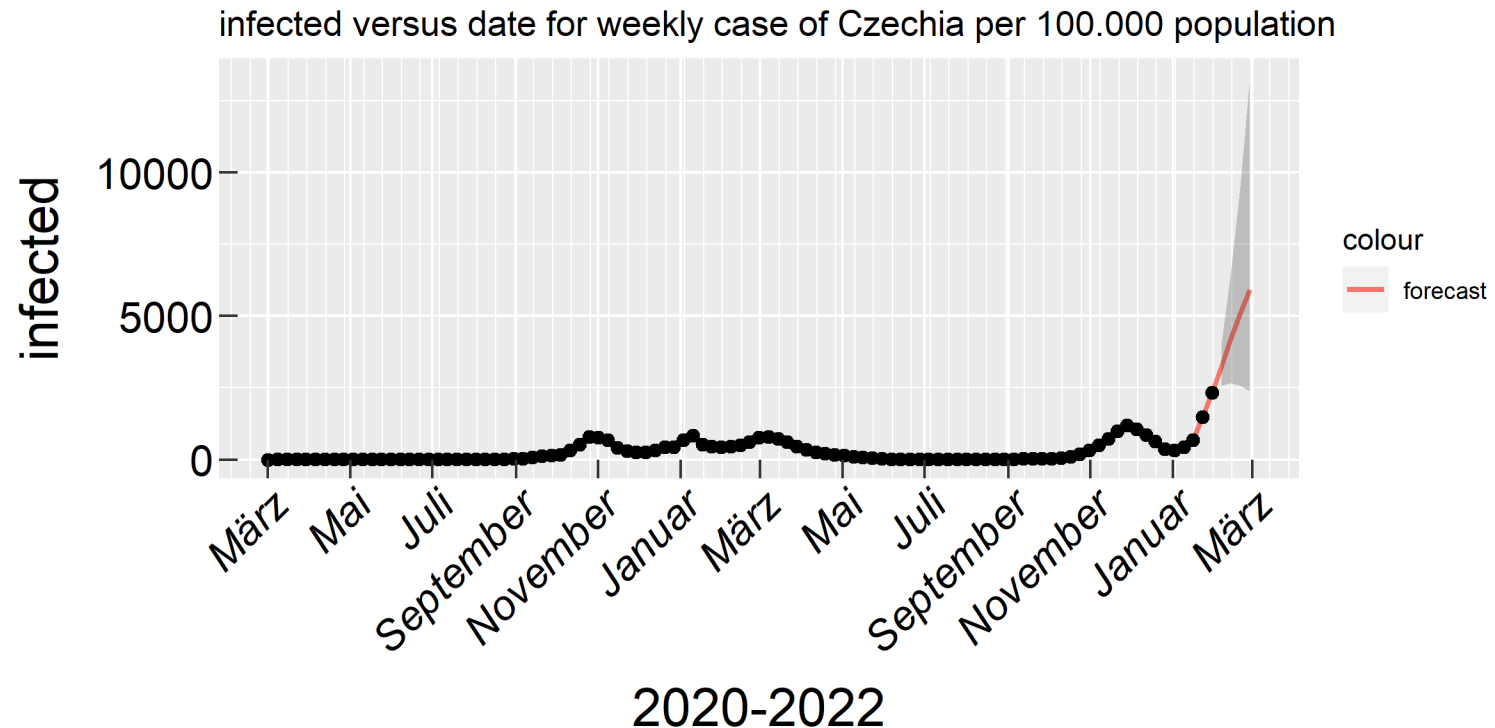
Interactive process with data scientists

Actual COVID-19 situation in State Bremen



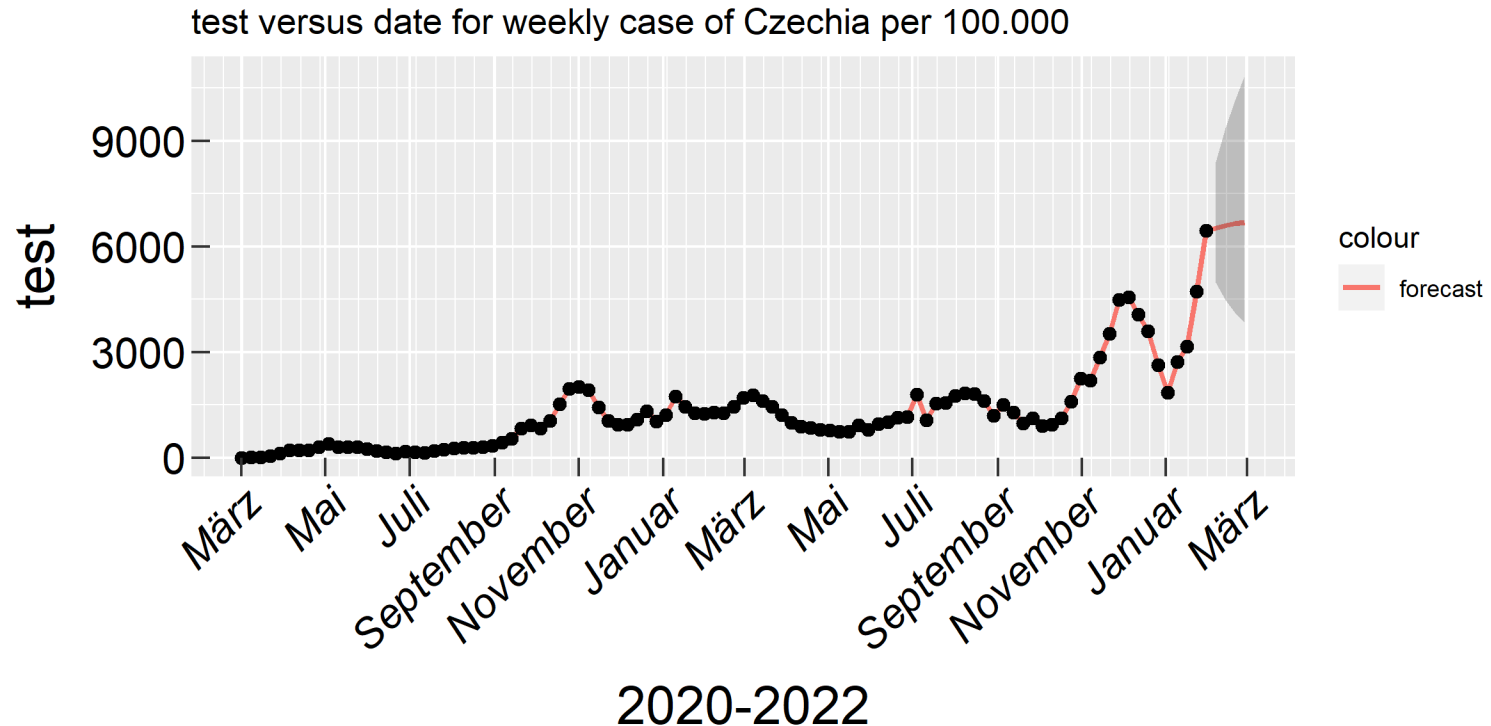
Interactive process with data scientists

Actual COVID-19 situation in Czechia with forecast



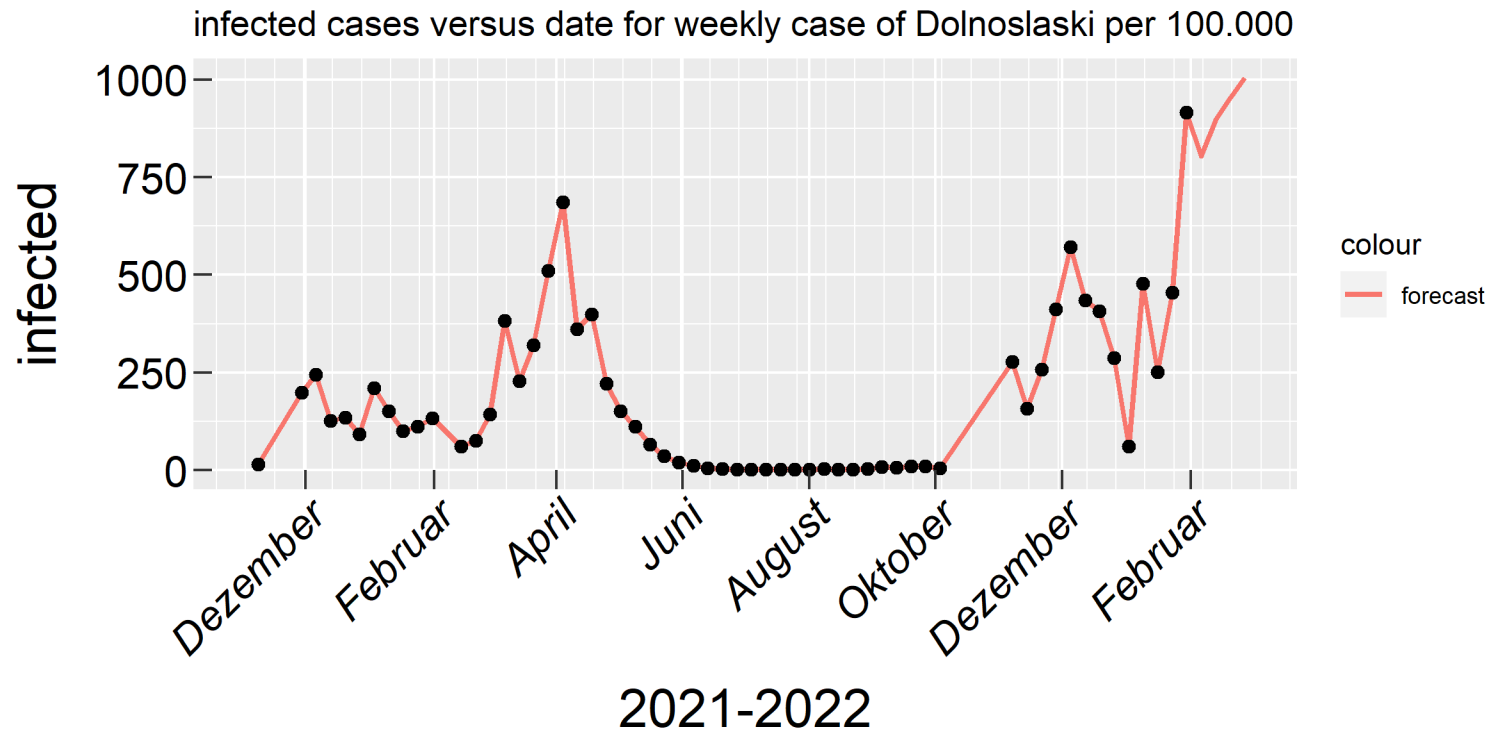
Interactive process with data scientists

Actual COVID-19 situation in Czechia with forecast



Interactive process with data scientists

Actual COVID-19 situation in Dolnoslaski with forecast





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Model

Synchronization of different table structures from data sources.

