

CoVid19-Wastewater Epidemiology – first results and future perspectives

H Insam, N Kreuzinger, W Rauch, H Kinzel,
R Markt, M Mayr, H-P Stüger, M Wögerbauer

www.coron-A.at



First steps

» Methods optimization

- w/o particulate matter
- PEG-precipitation vs. Ultrafiltration

» Study concerning stability/sample storage

- Freezing/thawing → lowers the signal (Samples from (first) lockdown phase still frozen)

» First phase: monitoring of 15 plants in Austria

- With decreasing cases the signal dropped below the detection limit
→ Now about 30 plants are monitored



Sewage water examination

Number of virus particles in one milliliter of sewage water, collected from about 300 sites in the Netherlands. The national value is based on the total number of virus particles that is found in a week, divided by the number of sites where the data is collected.



Value of 13 September. Obtained: 15 September. Is updated on a weekly basis.



Source: [RIVM research into sewage water](#)

Netherlands ... 300 WWTP under study

Calculation of the average number of virus particles in one milliliter of sewage water

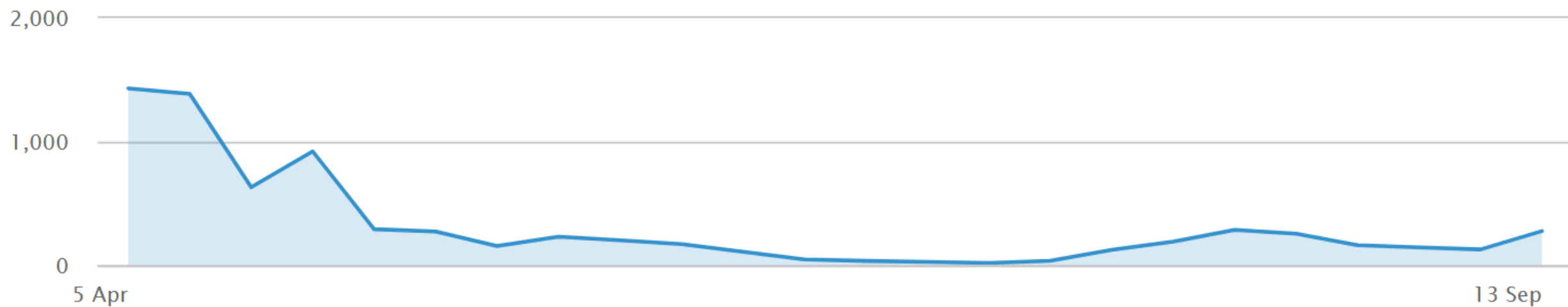


The national value is based on the total number of virus particles that is found in a week, divided by the number of sites where the data is collected.

Progression over time

Show everything

Past 5 weeks



- Research not monitoring project

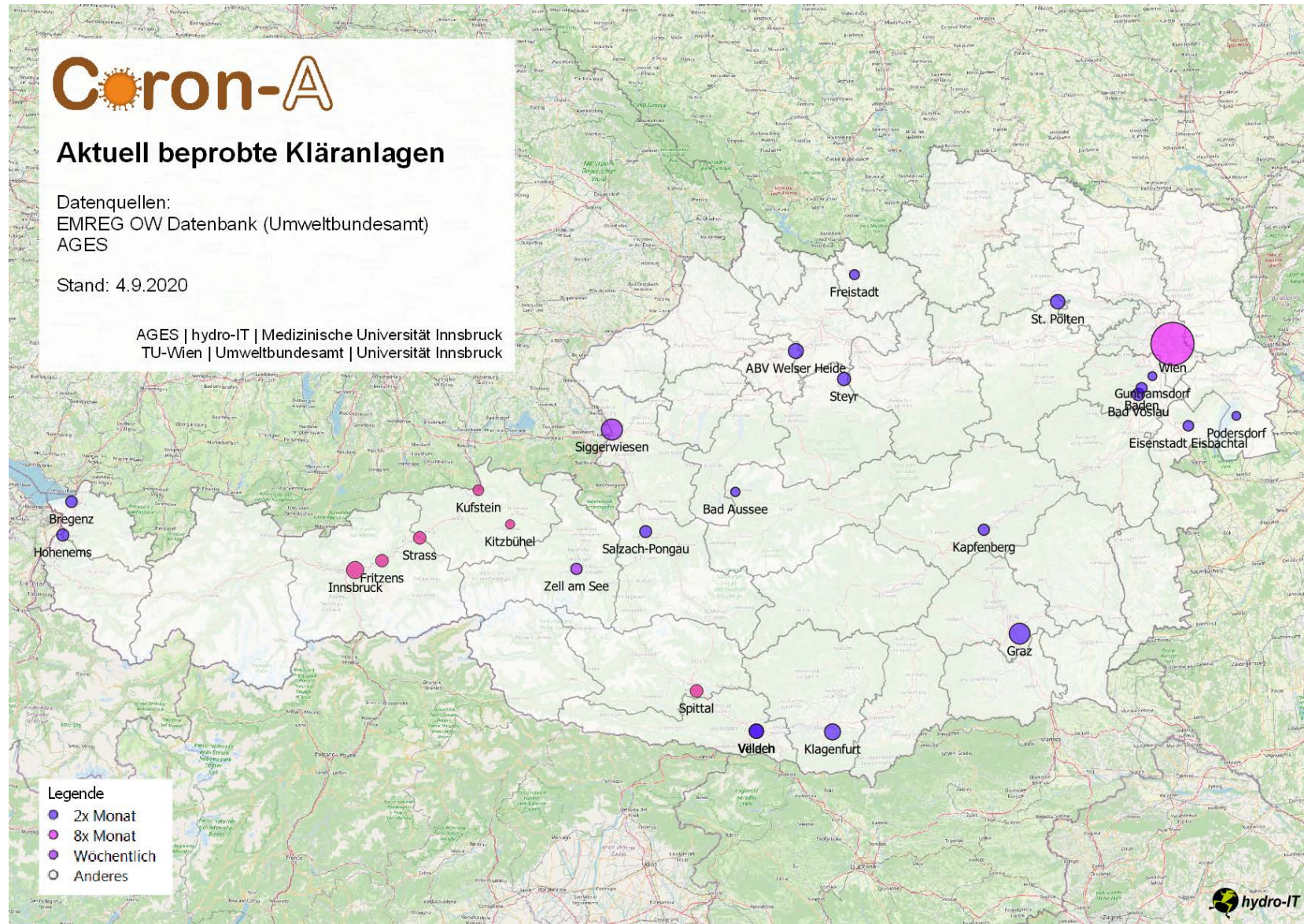
- Methods

- Availability of consumables
- Methods development
(comparability of long-term data)
- Inter-laboratory comparability
- Bottlenecks (concentration and extraction protocols)
- Sampling and logistics

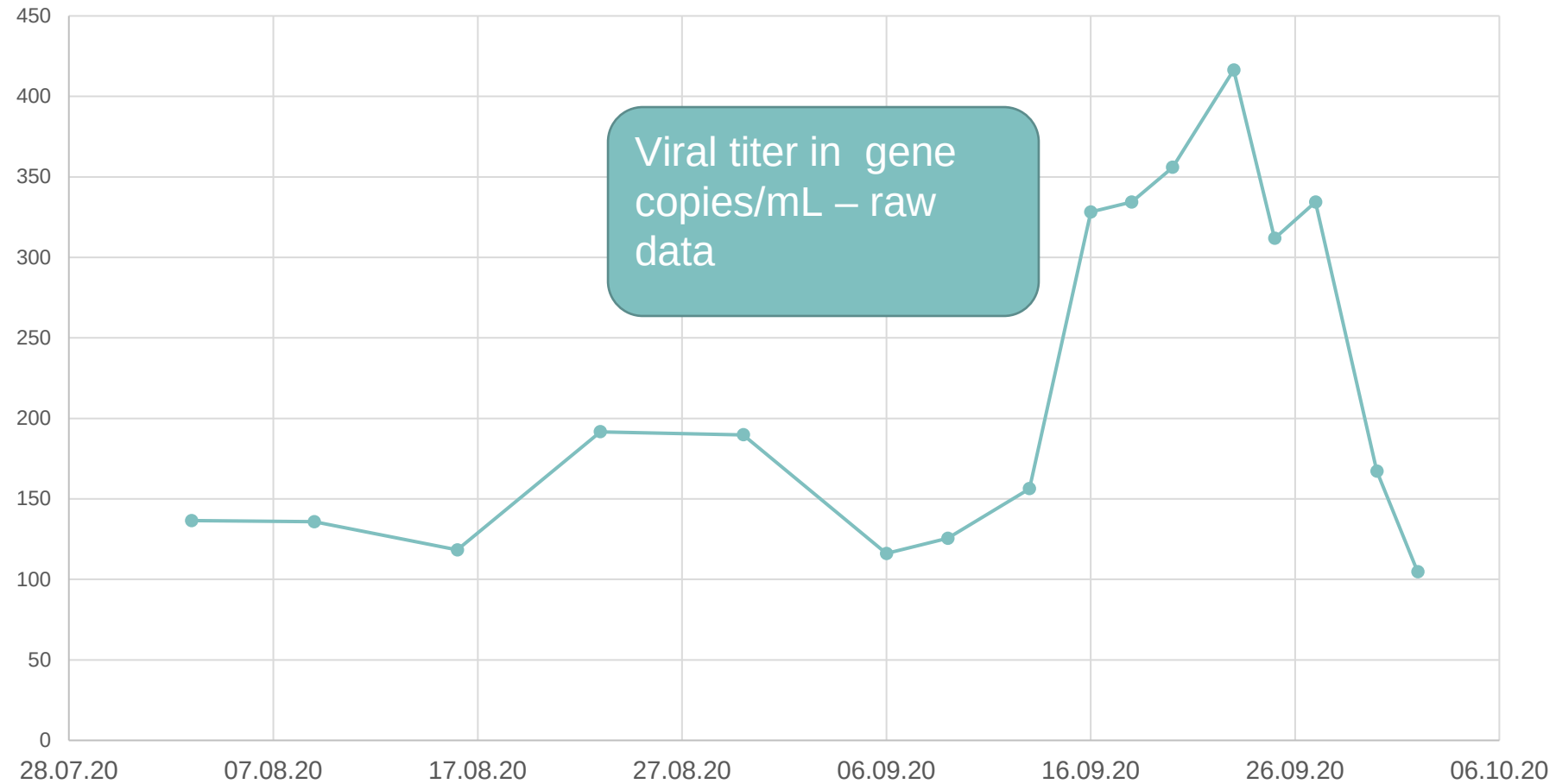
- Modelling

- Data availability (prevalences, excretion properties – who and when; etc.)
- Prevalence data = how real is the reality?
- Highly dynamic system (weekends, commuters, precipitation, temperature etc.)

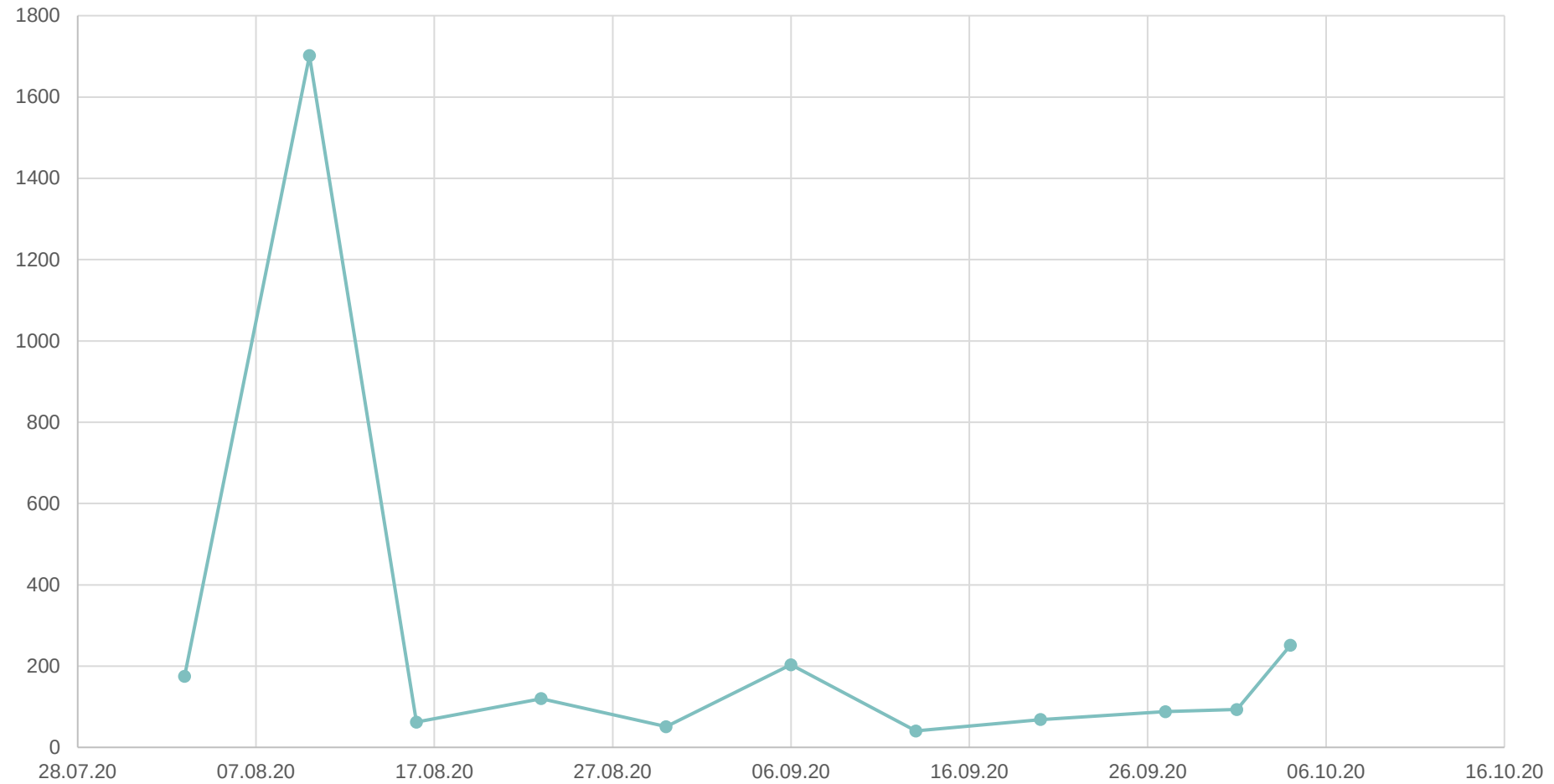
27 WWTPS WITHIN THE CORON-A STUDY

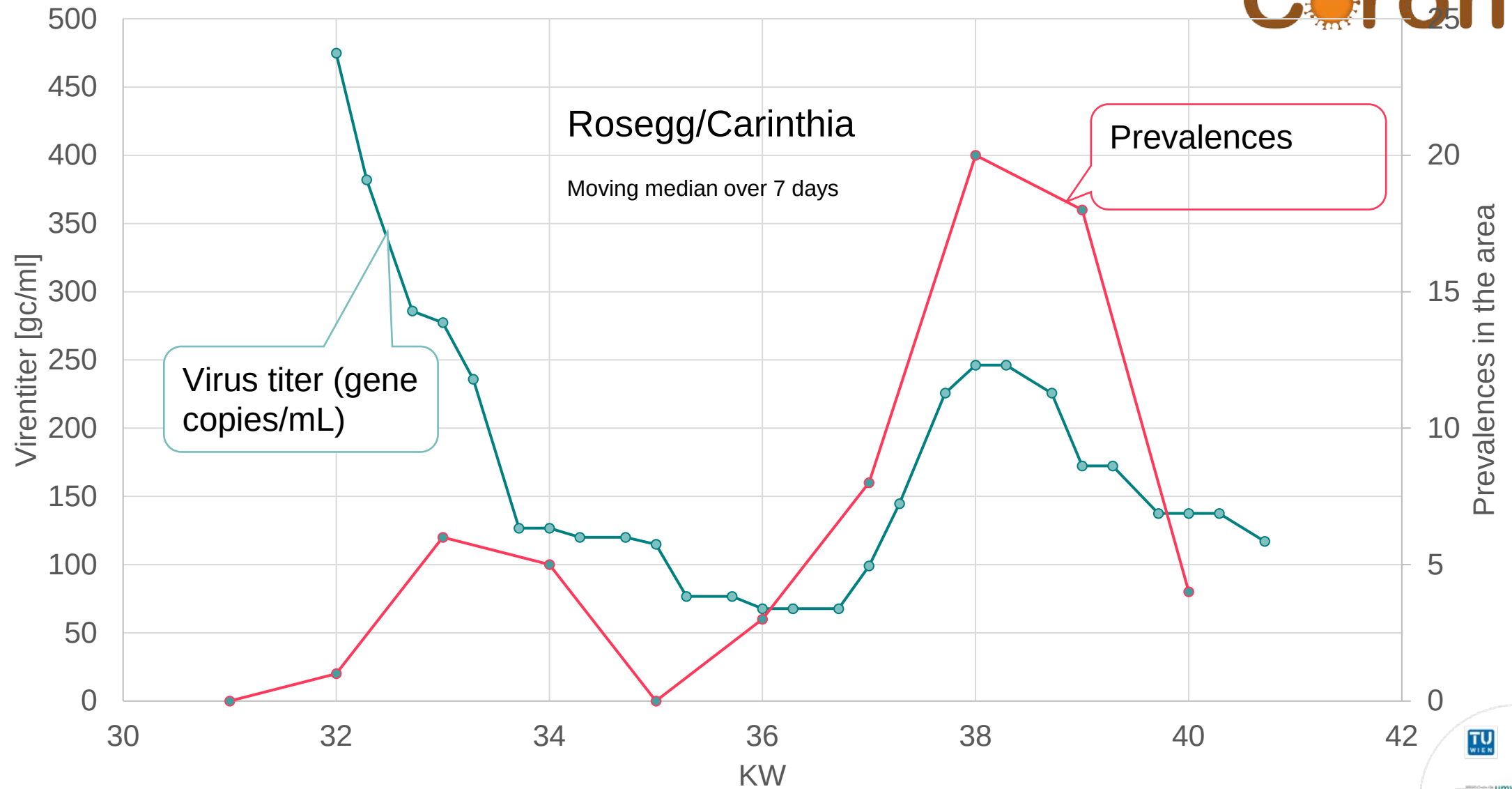


Salzburg



Zell am See



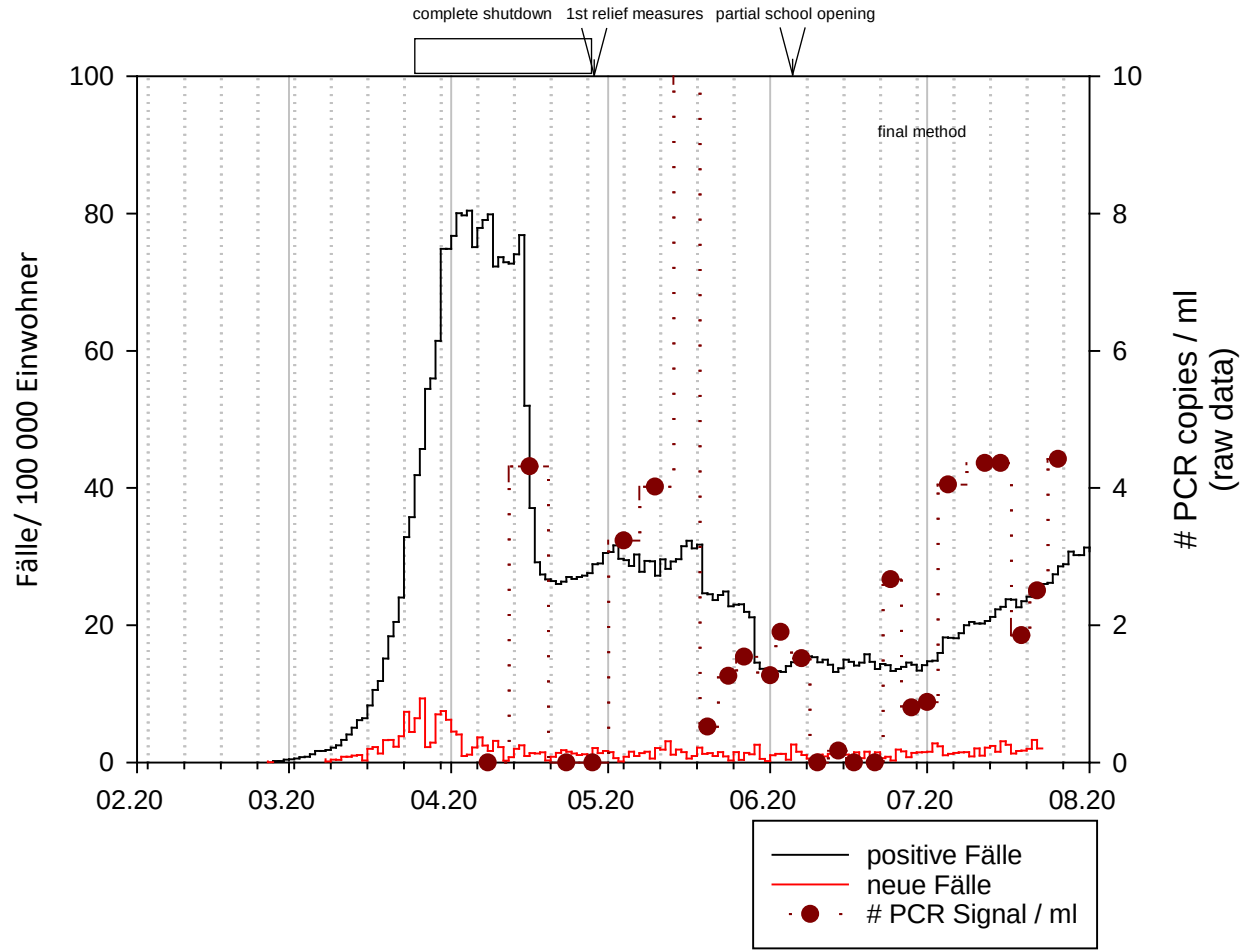


„PROOF OF CONCEPT“

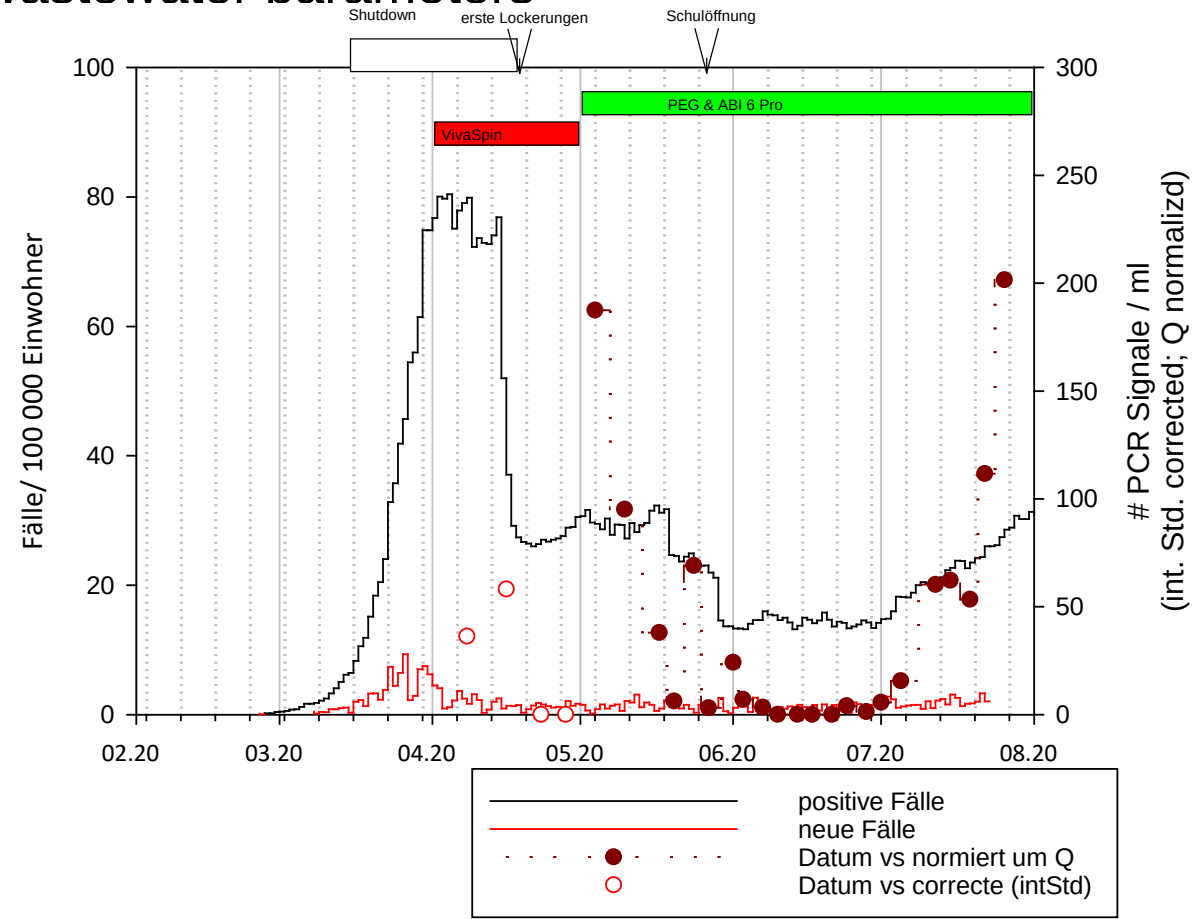
WASTEWATER MONITORING AND PREVALENCE DATA



- Raw data



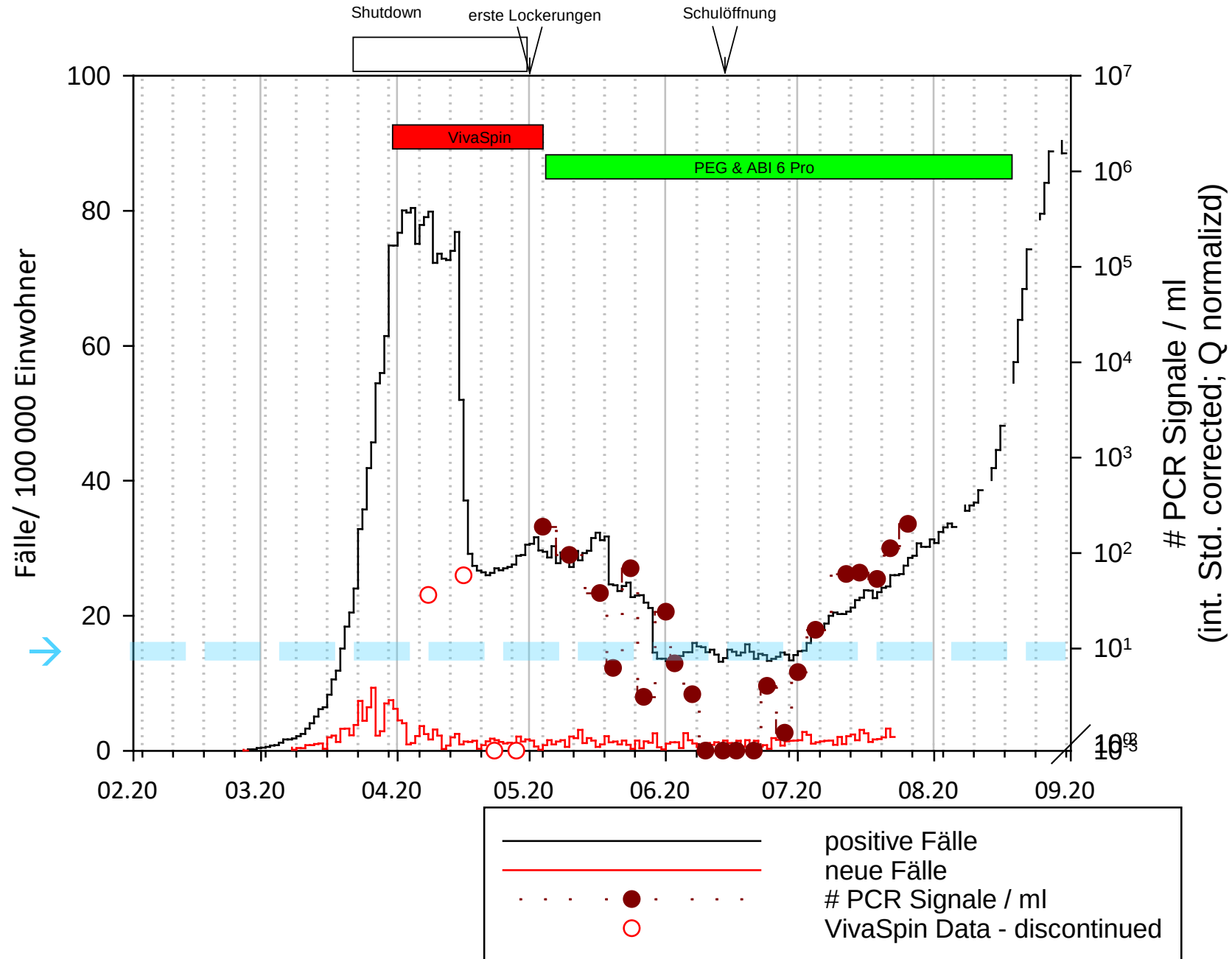
- Validated data & preliminary consideration of wastewater parameters



„PROOF OF CONCEPT“

Validated data
& preliminary consideration
of wastewater parameters
& ,optimized‘ graphics

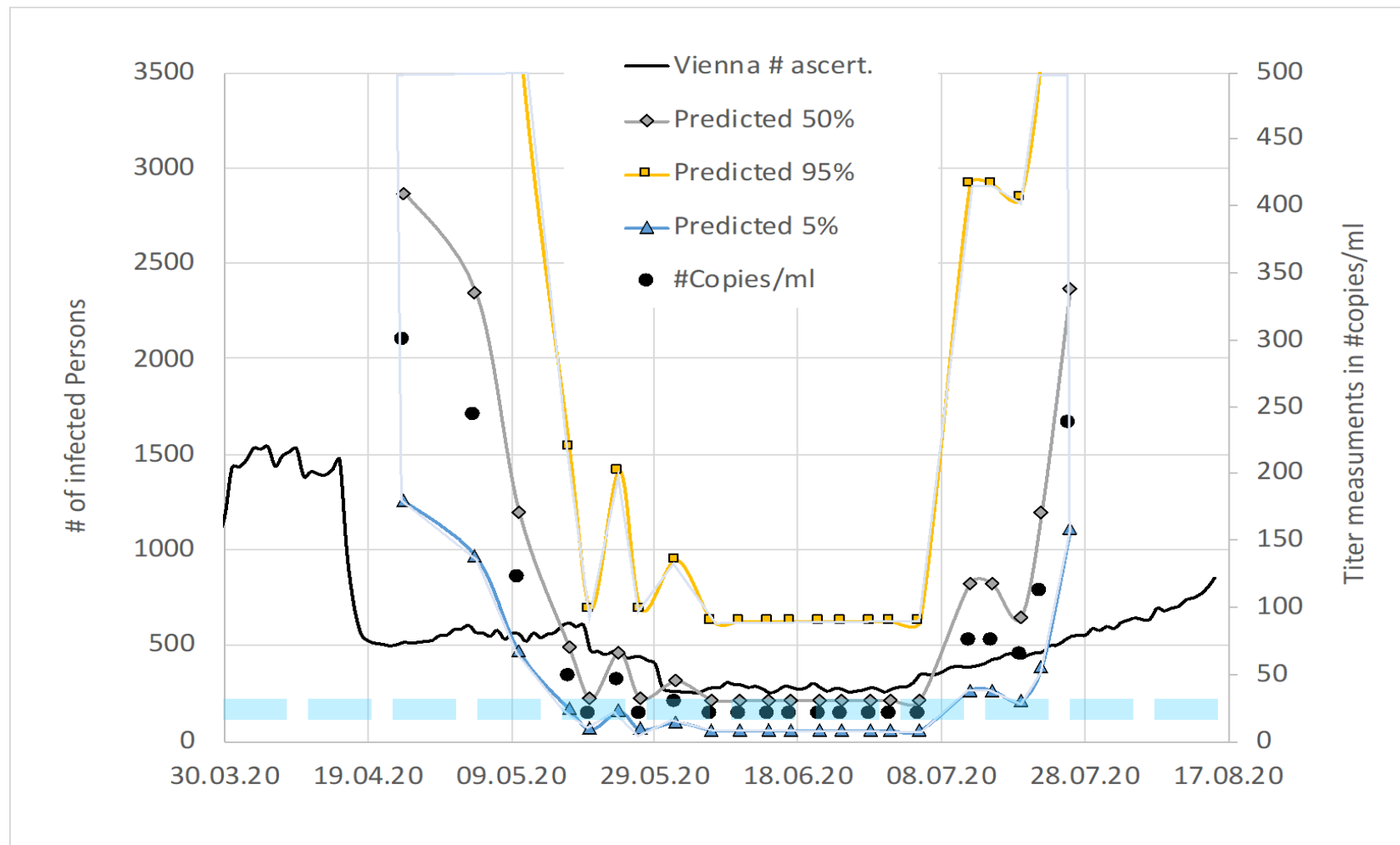
Detection limit
approx. 18 cases/100,000



PREVALENCE MODEL CONCEPT - EXAMPLE



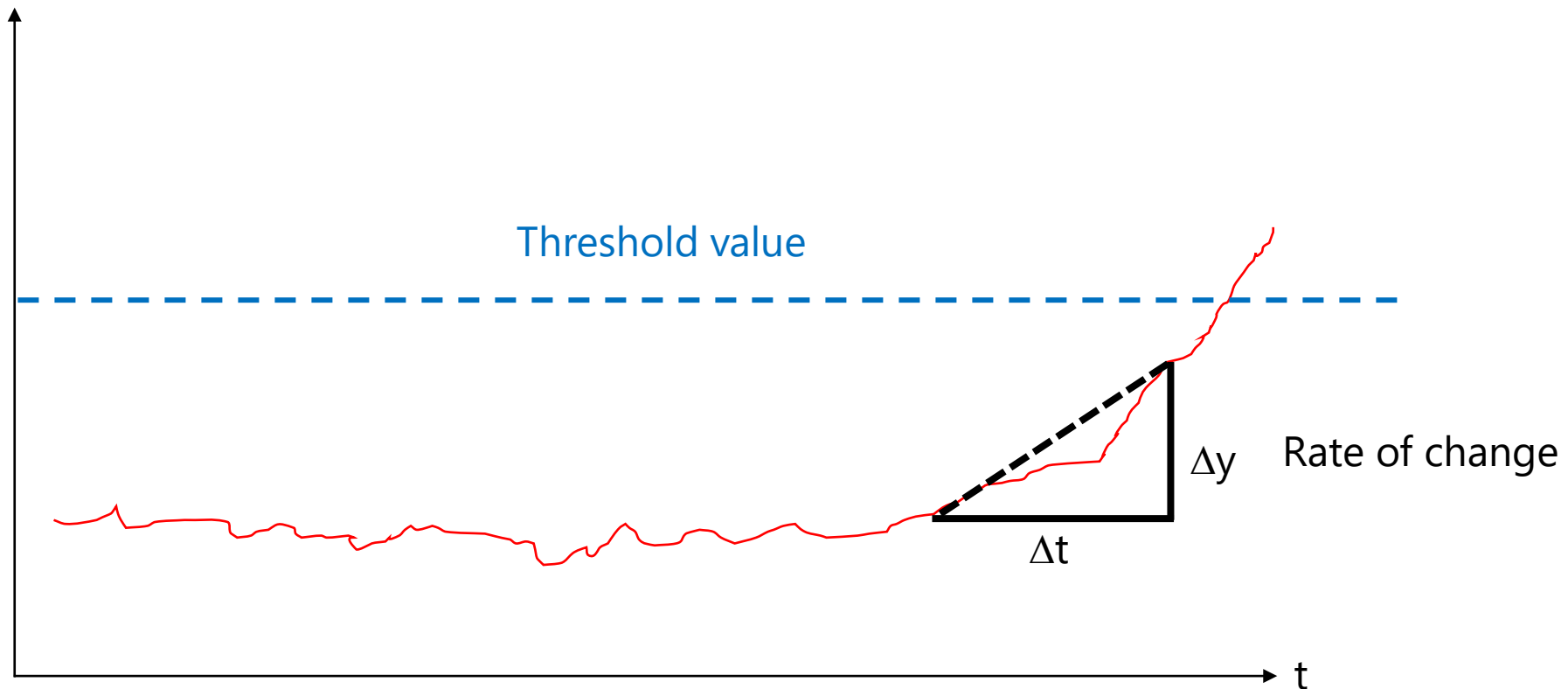
- WWTP Vienna (ebswien): Prediction of the total number of infested persons



CONCEPT FOR AN EARLY WARNING SYSTEM

Abwasser-basiertes **Corona-Frühwarnsystem** = ACoFrüWaS
(Wastewater-based early warning system)

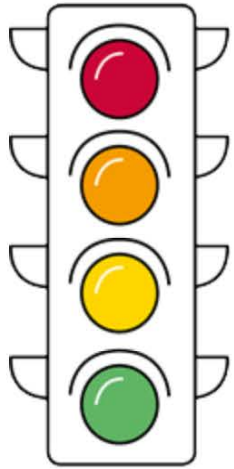
Covid-Wastewater indicator



Traffic light system for risk assessment

On the level of political districts

Close to 100 political districts
Around 2000 WWTPs

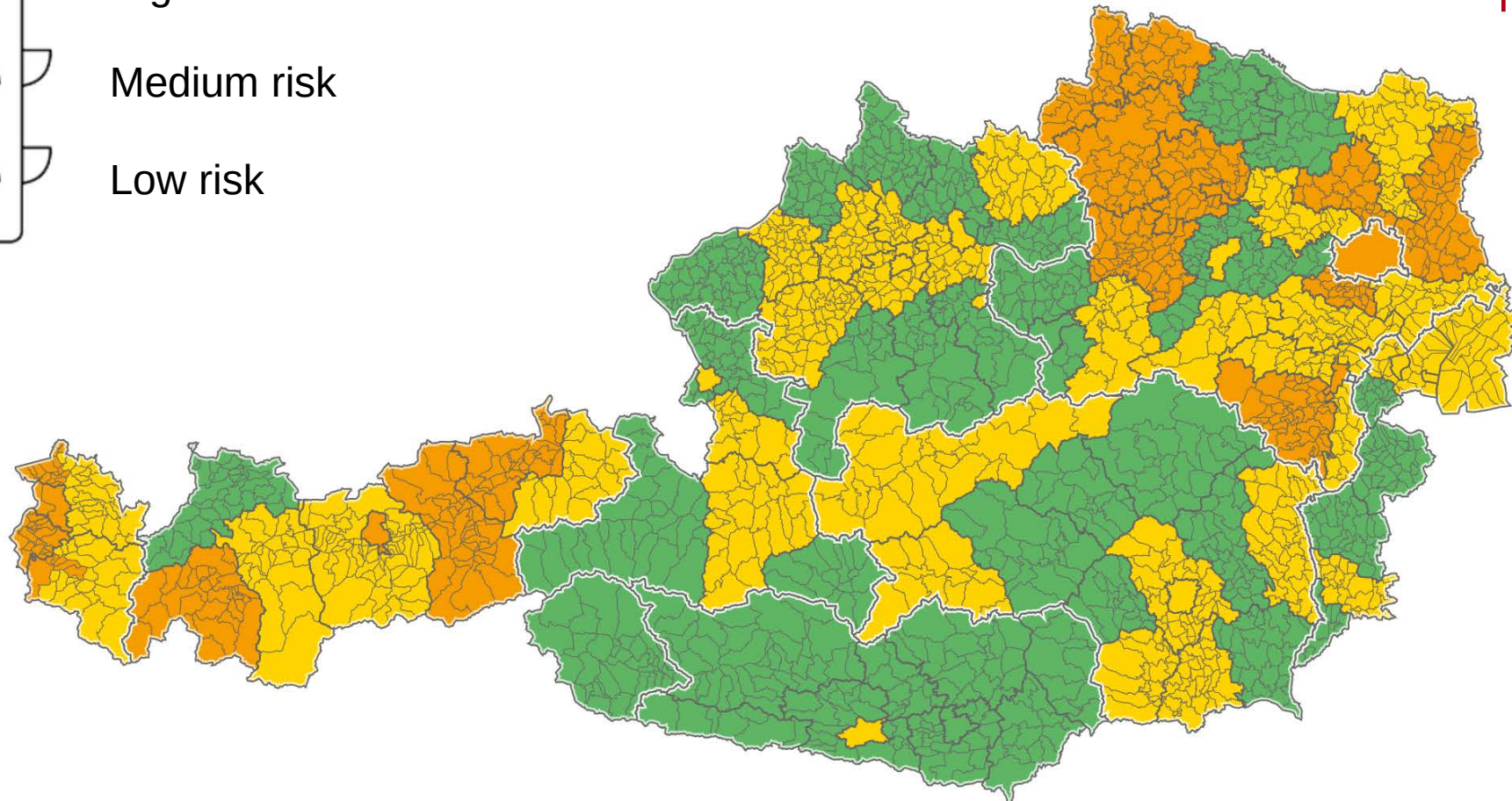


Very high risk

High risk

Medium risk

Low risk



Idea:

Volume-proportional
pooling of samples
from WWTPs within a
political district →
fewer samples to
analyse, congruency
of data with the
traffic-light system

- **Improvement of standardisation and inter-laboratory comparability**
- **Improvement of data base by including more WWTPs and more frequent sampling**
- **Improvement of models**
- **Publicity of data (open science, open society)**
- **Incorporation into traffic-light system for early warning ?**
- **Usability of knowledge for post-corona wastewater epidemiology**



Thank you for your attention

Thanks go to our sponsors,
the Federal Ministries of Agriculture and Education,
the nine provincial governments,
the Förderkreis 1669 and the
FFG.

www.coron-a.at

