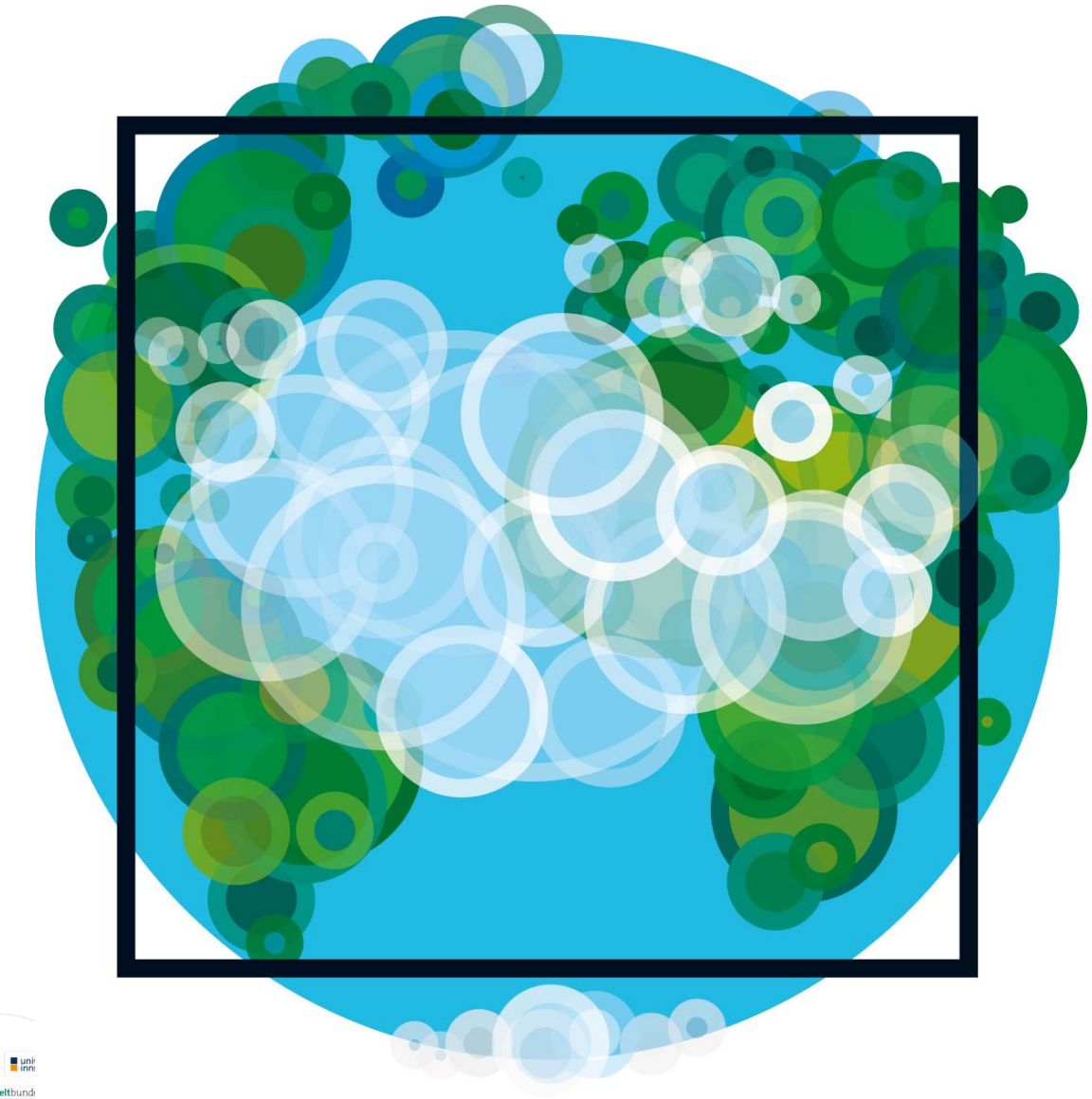

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Coron-A

AUSTRIAN

UMBRELLA-RESEARCH PROJECT

DETECTION AND MONITORING OF

SARS-COV-2 INFECTIONS

IN THE AUSTRIAN POPULATION

USING WASTEWATER ANALYSES

PERSPEKTIVEN FÜR UMWELT & GESELLSCHAFT umweltbundesamt

MAIN OBJECTIVES

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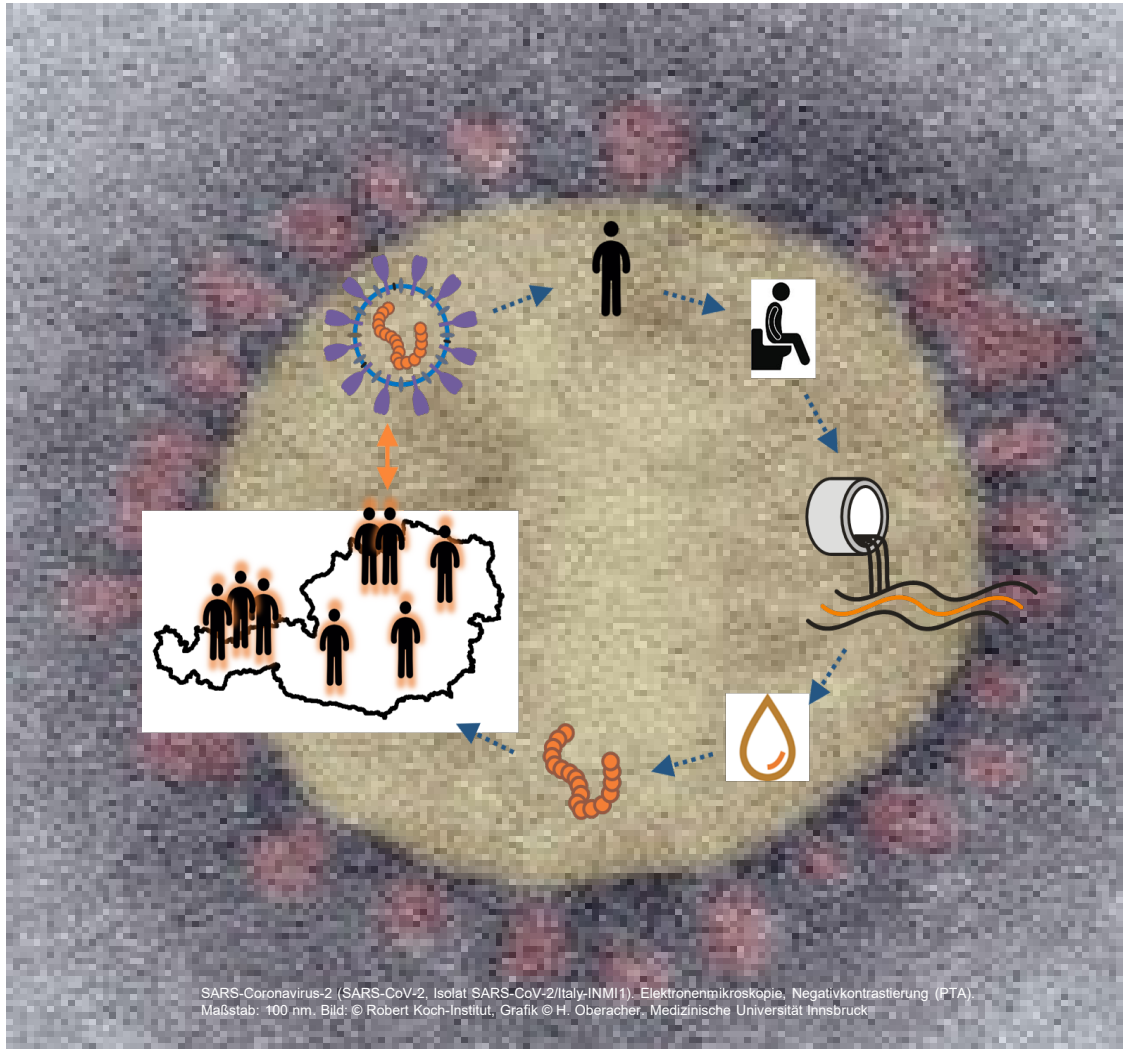
► **Support COVID Task Forces (national and regional) for public health decision making**

Development of the basics for a wastewater epidemiological early warning and de-warning system for viral RNA in Austria



SARS-Coronavirus-2 (SARS-CoV-2, Isolat SARS-CoV-2/Italy-INMI1). Elektronenmikroskopie, Negativkontrastierung (PTA). Maßstab: 100 nm. Bild: © Robert Koch-Institut, Grafik © H. Oberacher, Medizinische Universität Innsbruck

Initially <u>not</u> intended:

► **Area-wide, high-frequency monitoring of all > 600 Austrian wastewater treatment plants > 2,000 p.e., or all sewer lines**

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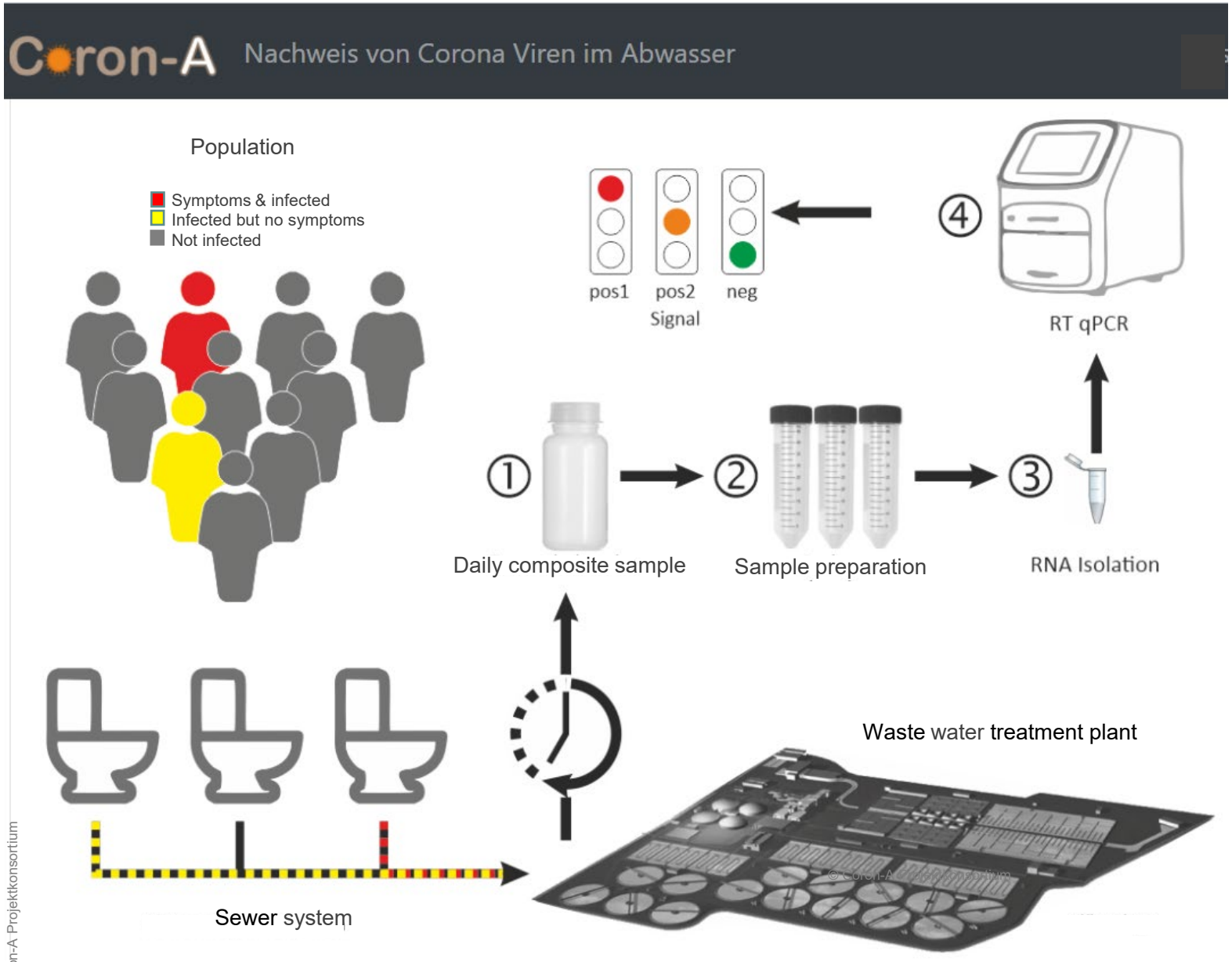
OBJECTIVES

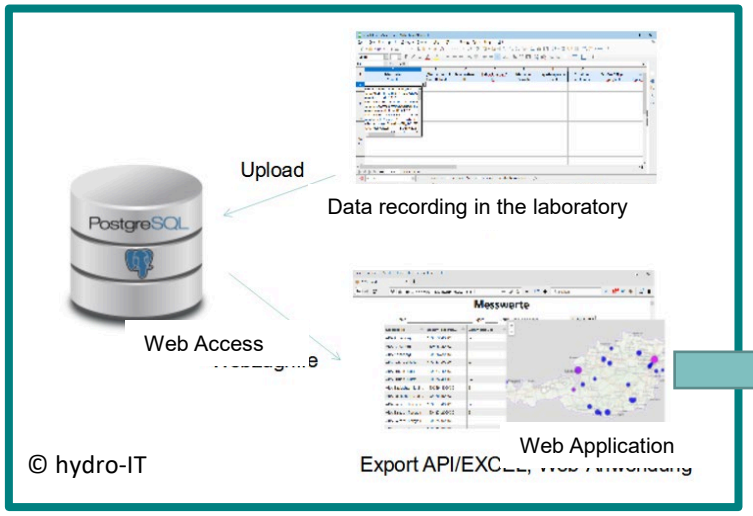
Coron-A

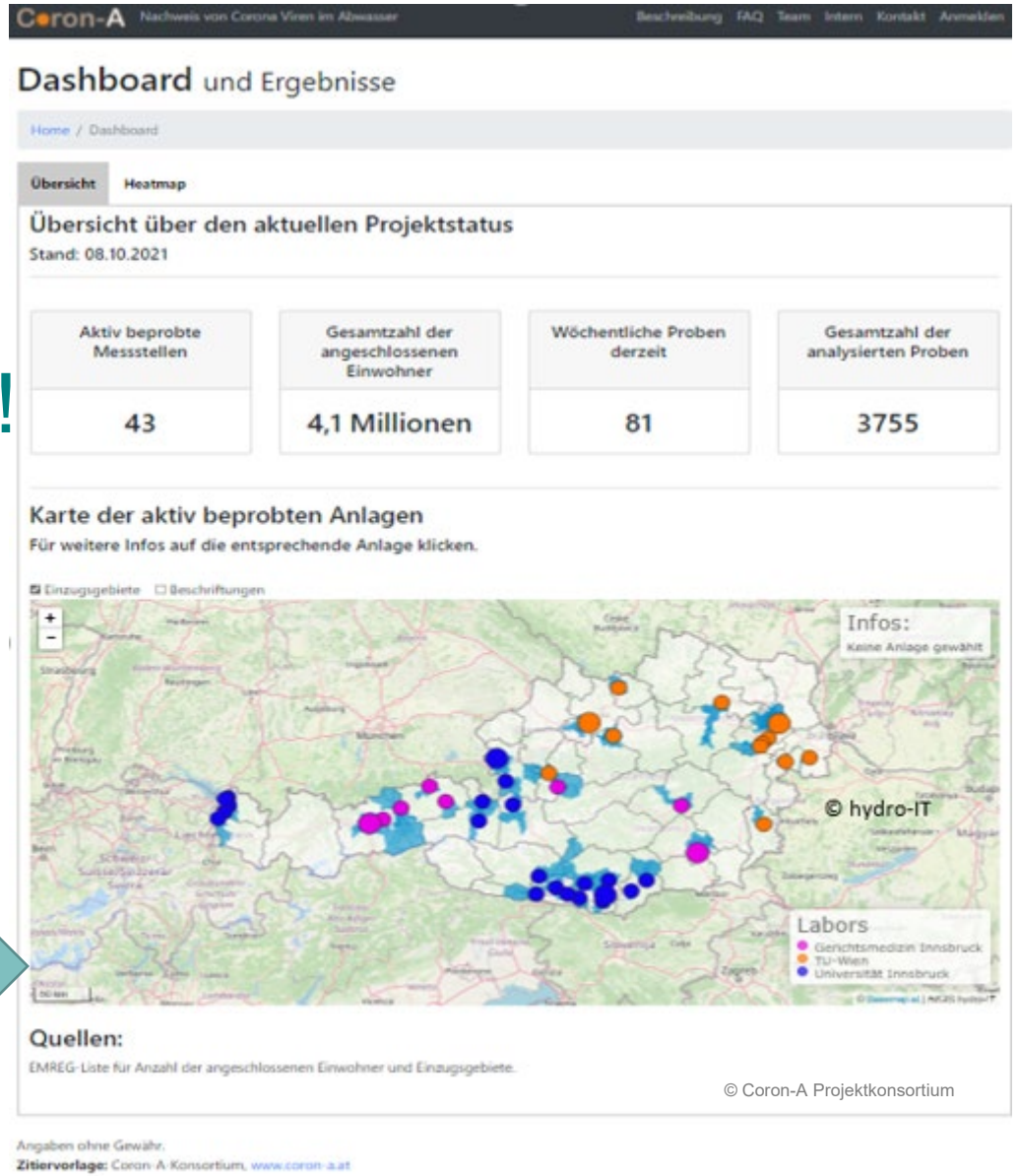


- **Proof of Concept:**
  can we in Austria detect SARS COV-2 virus in waste water scientifically sound?
- **Logistics:** Development of standard procedures for sampling, storage and transport
- **Analytics:** Establish a highly sensitive, selective and reliable analytical method for the detection of SARS-CoV-2 RNA in wastewater samples
- Establish **Interfaces with the authorities** (water & public health)
- **Modelling:** Examine by models the emission & behvavoiur of the virus in the wasterwater channels
- Create a **Statistical prognosis tool**
- **Data transfer/storage and processing**
- **International networking**

DATA, DATA, DATA, DATA, DATA, DATA, DATA,…. & VISUALIZATION #1!

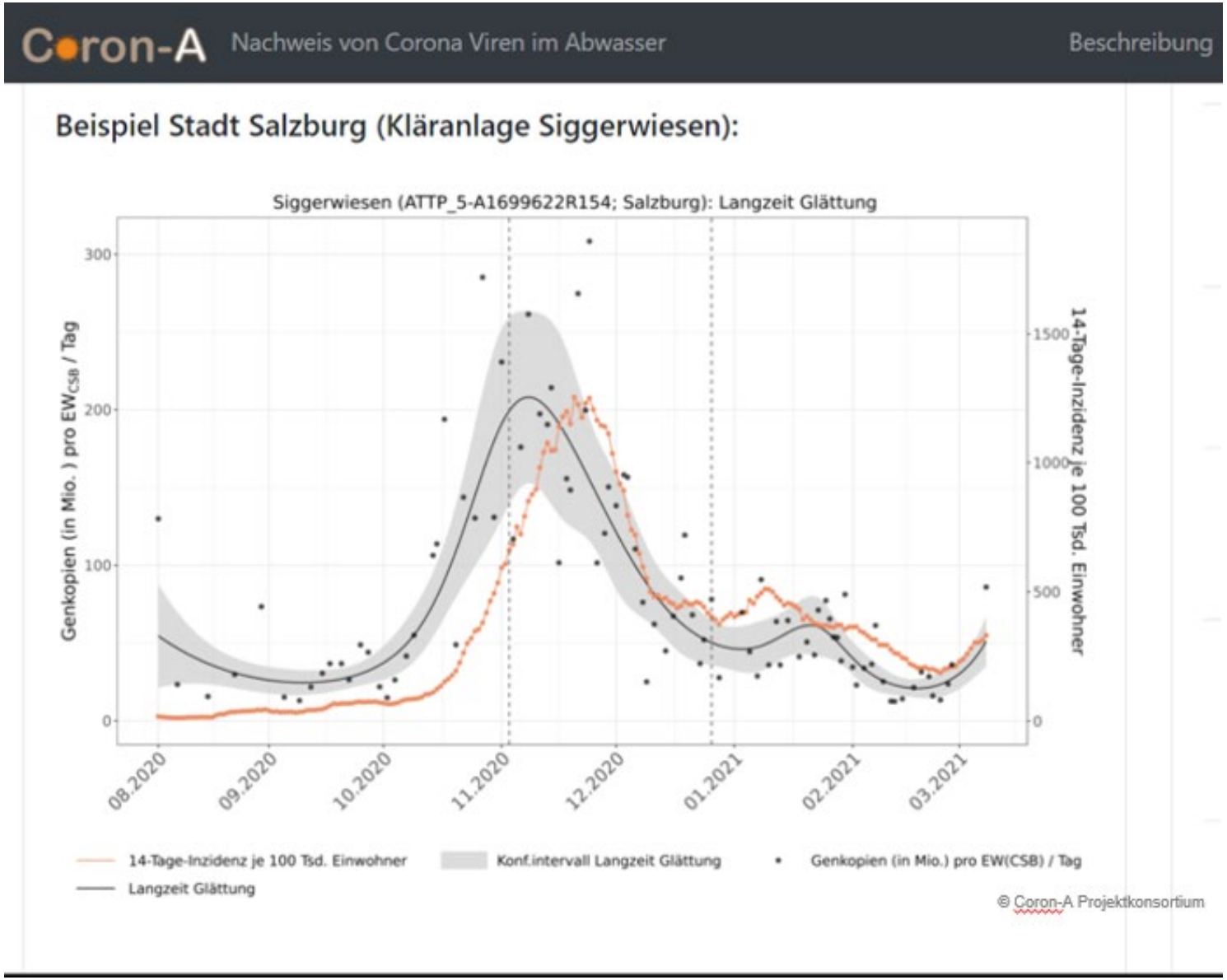
Upload & Web Access via PostgreSQL:





DATAVISUALISATION #2

Coron-A



DATAVISUALISATION #3

Coron-A

Coron-A Nachweis von Corona Viren im Abwasser

Beschreibung FAQ Team Intern Kontakt Anmelden

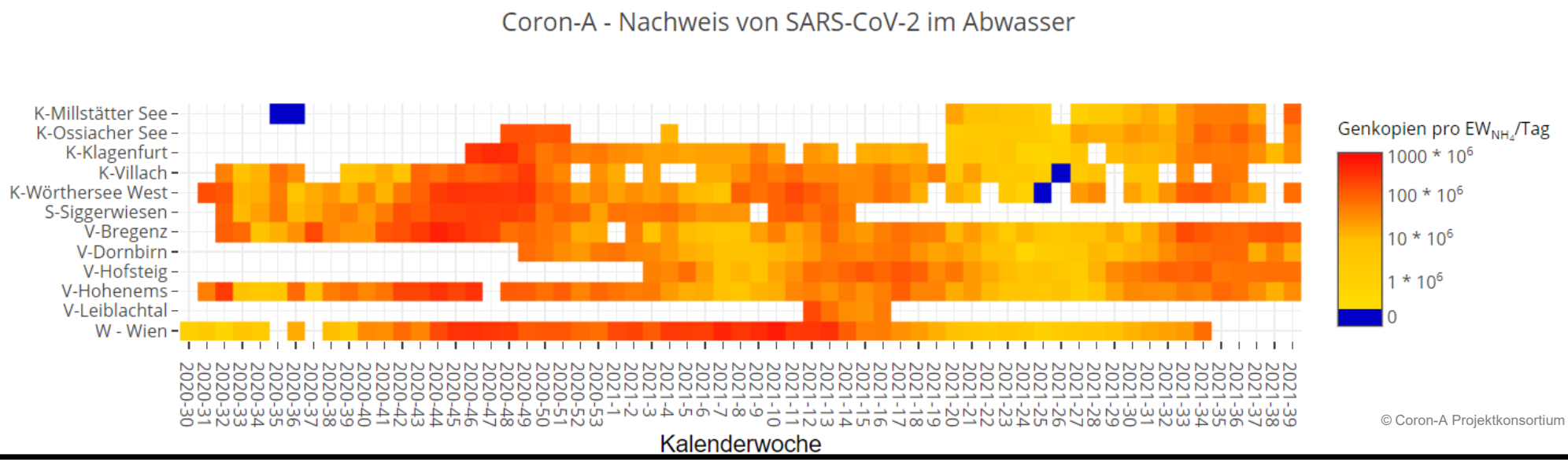
Dashboard und Ergebnisse

Home / Dashboard

Übersicht **Heatmap**

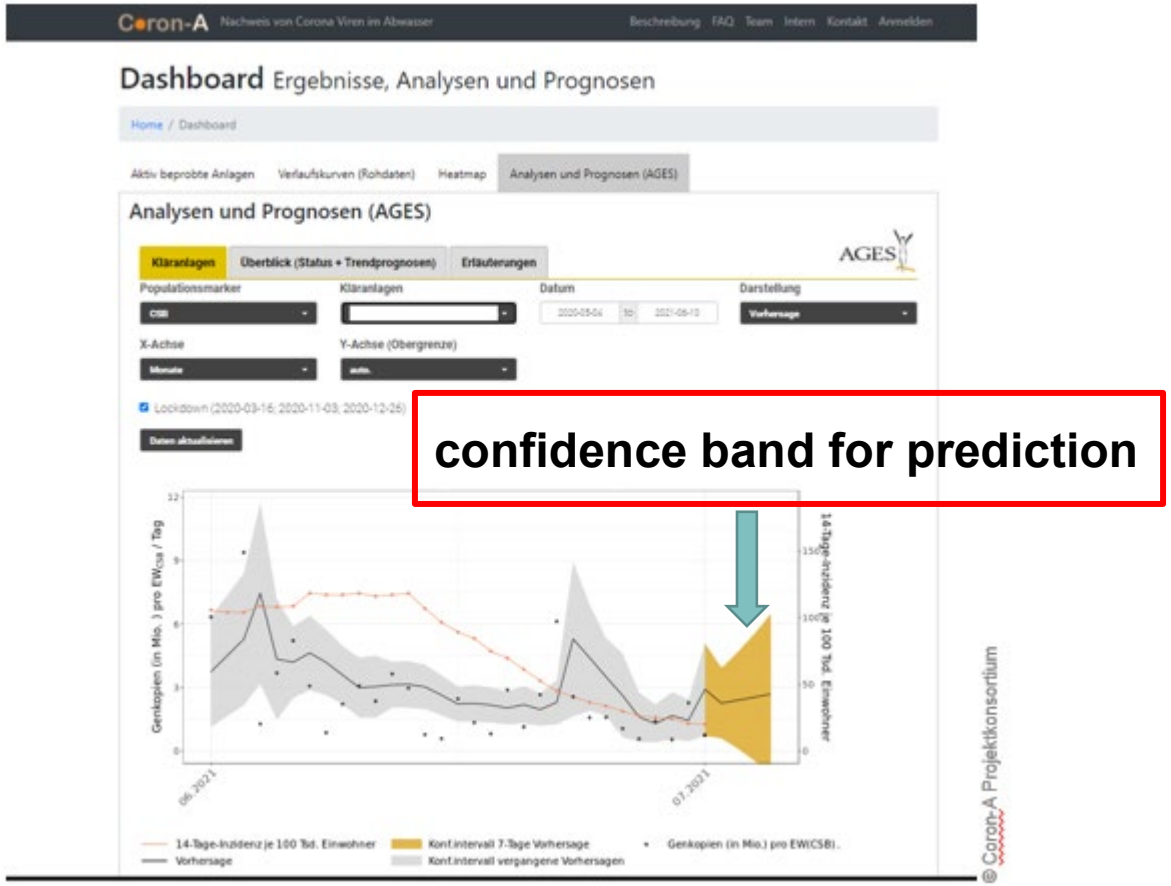
Heatmap

Populationsmarker: Ammonium



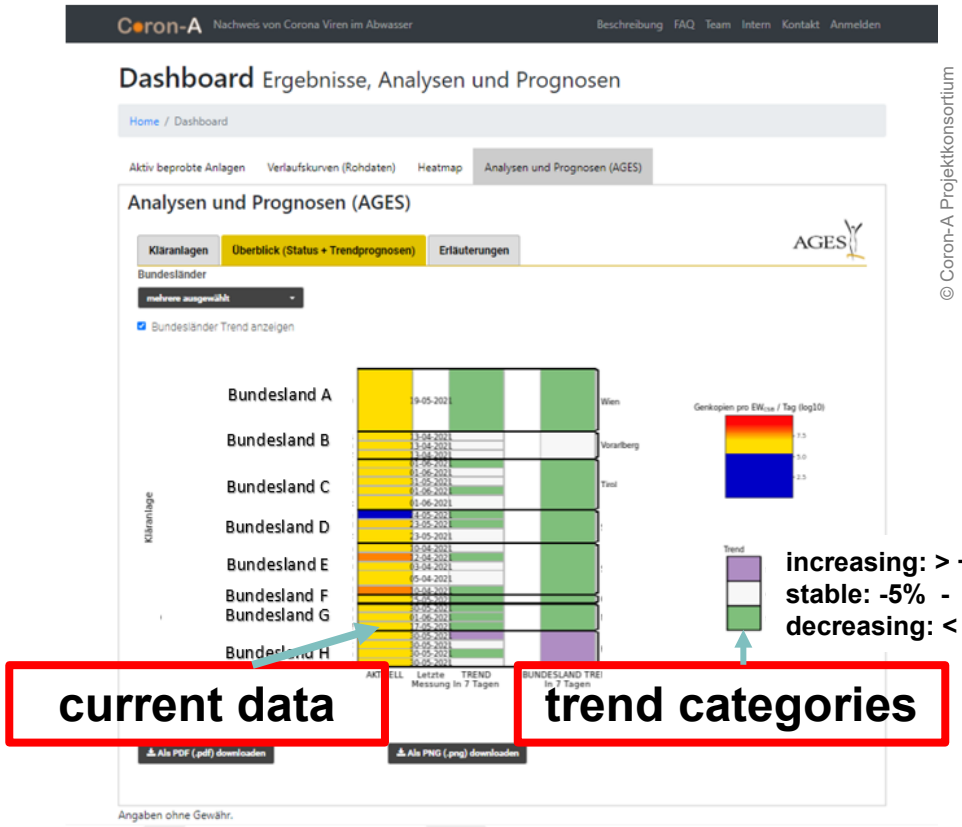
TRENDS & PROGNOSIS – VISUALIZATION #5

- **Wastewater treatment plant trends** - development in the next 7 days



confidence band for prediction

- **Regional trends** - development in the next 7 days



current data

trend categories

increasing: > +5%
stable: -5% - +5%
decreasing: < -5%

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FIRST RESULTS

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- Proven feasibility of a **Time advantage** (approx. 3 - 7 days) for virus detection in wastewater compared to clinical diagnostics
- Advantage to observe **non invasive, not dependent on consent** the **entire population in the catchment area** of a wastewater treatment plant - as opposed to only the sample of the tested population
- Sample **Logistics/Analytics established**
- Sample **Database operative**
- First input (models) - and **Prognosis models** in place
- successful **Mutation detections**
- **Visualisation**: internal & public dashboard available & Heatmap of the progressions for Public Health information

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LESSONS LEARNT

Coron-A

1. Due to an **early consideration** of this approach and **a bundled support** of the Austrian administration the foundations have been laid for Austria to be among others one of the international pioneers of this new method
2. **Early warning is possible**
3. Also a **„De-warning“ function is enabled**
4. The field of **wastewater epidemiology goes beyond the COVID-pandemic** (covers also other pathogens and alo forthcoming ones)
5. **Communication with the public health sector** is essential for adequate quick responses (interpretation & visualization of data are at the core of the communication)
6. **Establish a commitment** by the authorities (national & regional) and the plant operators
7. For a success **bundle the expertise** and resources in the fields of **wastewater** & **epidemiology, microbiology** & **molecular biology, statistics** & **data management**
8. **Select carefully the catchment areas** to get a representative coverage (consider temporal activities within the catchment like tourism)
9. **Monitor also variants** (mutations) of virus – (full sequencing) for early tracing their origins and dissimination pathways
10. **Establish a proper dataflow**
11. **Use proper register** (national register on wastewater facilities & catchment areas, official incidential survey-registry, trace substances,..)
12. **Inform the public** via dashboards/homepage via properly released data (quality asured, commented – e.g restrictions)
13. **Engage in international capacity building activites** (WHO, EC Initiative) to **exchange constantly knowledge** in this novel field

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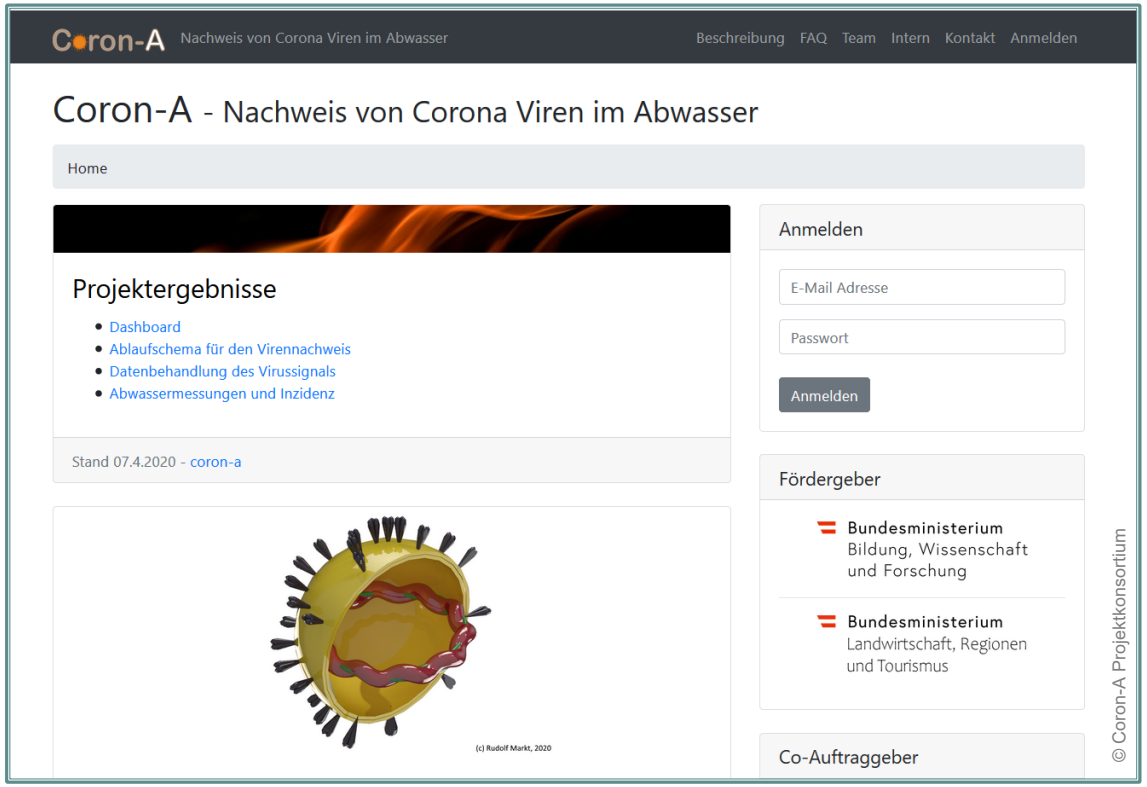
PROJECT WEBPAGE: www.coron-a.at

Coordinating partner: Environment Agency Austria - Coordination & Laboratory Analytics for anthropogenic markers

Partners:

- University Innsbruck
- Medical University Innsbruck
- Technical University Vienna
- Austrian Agency for Health and Food Safety – Data, Statistics & Risk Assessment
- hydro-IT



Funding sources:

- Austrian Federal Ministry of Agriculture, Regions and Tourism
- Austrian Federal Ministry of Education, Science and Research,
- 8 Provincial Governments
- Austrian Association of Towns & Municipalities

Established international contacts:

- WHO- Europe Branch
- European Commission (JRC-Initiative)
- German CoroMoni-Research Initiative
- NORMAN - Network of reference laboratories, research centres and related organisations for monitoring of emerging environmental substances

CONTACT & INFORMATION

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