



CONCLUSIONS

# SARS-CoV-2 Monitoring employing Sewers

*Designing the EU Sewer Sentinel System  
for SARS-CoV-2 (EUS4)*

4<sup>th</sup> Town Hall Meeting

22 March 2021



# SARS-CoV-2 Monitoring employing Sewers

## *Designing the EU Sewer Sentinel System for SARS-CoV-2 (EUS4)*

### *4<sup>th</sup> TOWN HALL Meeting*

WEBEX Meeting – 22<sup>nd</sup> of March, 2021; 14:00-18:10 CET

*Chaired by Bernd Manfred GAWLIK (EC JRC) and Gertjan MEDEMA (KWR, TU Delft)*

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## Context of the Event

The European Commission in close collaboration with representatives from the Sectors of Public Health and Water Supply and Sanitation as well as Academia and Research, successfully demonstrated that untreated wastewater is a good indicator of the circulation of the virus in a population and that this approach is a logistically feasible and financially viable approach to be implemented across the EU. Following an [expert consultation organized by the World Health Organization](#) the additional and complimentary factor from wastewater testing, the European Commission encouraged its Member States to explore a more systematic use of this tool and launched the next phase, i.e. an EU-wide roll out also addressing the use for the detection of variants of concern of the virus. This Town Hall Meeting, indeed, was planned immediately after the publication of the [EC's Recommendation of 17 March 2021 on a common approach to establish a systematic surveillance of SARS-CoV-2 and its variants in wastewaters in the EU](#).

The activity is one of the action areas of the [HERA Incubator](#), which focuses on the swift detection of current and future SARS-CoV-2 variants of concern. Member States' experience in this area have shown that surveillance of SARS-CoV-2 and its variants in wastewaters can provide a cost effective, rapid and reliable source of information on the spread of SARS-CoV-2 in the population and that it can form a valuable part of an increased genomic and epidemiological surveillance.

Wastewater monitoring should be considered as a complementary and independent, objective approach to COVID-19 surveillance and testing strategies. As highlighted in Commission Recommendation of 28 October 2020 on '[COVID-19 testing strategies, including the use of rapid antigen tests](#)', robust testing strategies and sufficient testing capacities are essential aspects of preparedness and response to COVID-19. As also highlighted in the Commission's Communication of 2 December 2020 on '[Staying safe from COVID-19 during winter](#)' and of 19 January 2021 on '[A united front to beat COVID-19](#)', testing remains a crucial element for monitoring, containing and mitigating the COVID-19 pandemic. Therefore, national testing strategies need to be urgently updated to take into account new variants, as they are central to COVID-19 control strategies. Surveillance of SARS-CoV-2 in wastewater can provide important complementary and independent information to public health decision-making process in the context of the ongoing COVID-19 pandemic. As a consequence, waste water monitoring needs to be included more systematically in the national testing strategies for the detection of the SARS-CoV-2 virus.

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## Event Summary

This Fourth Town Hall Meeting took place as WEBEX Web-Conference on the World Water Day, 22 March 2021. It was organized by the European Commission following the publication of the aforementioned recommendation to the EU Member States. The Town Hall was chaired by Bernd Manfred Gawlik (EC JRC) and Gertjan Medema (KWR and TU Delft)

The larger context of the HERA Incubator was presented by Yoline Kuipers (SANTE) followed by closer look into the recommendation itself, provided by Michel Sponar (ENV). The recommendation focuses in particular on the detection of variants of the virus as well as of the creation of an EU Data Platform commissioned to the JRC with the aim to create Sewer Sentinel System, which ultimately should also contribute to increase the Union's preparedness by enabling an early warning for future possible outbreaks of other pathogens of concern or threats from other pollutants of emerging concern.

Therefore, this fourth edition aimed in particular at presenting approaches to compiling and visualizing the data obtained from wastewater-based surveillance of the virus by means of dashboards, GIS tools or similar visualization and decision support tools facilitating the interpretation and use of the data at local, regional or national levels. Since the EU recommendation focuses on variants of concern, also Member States' experience on screening variants of concern via wastewater was compiled.

Starting from the presentation of the data needs in term of epidemiology by Georgios Nikolopoulos (University Cyprus) and the challenges related to create an appropriate mathematical approach by Yvon Maday (Sorbonne University, France), Tarja Pitkänen (Finnish Institute for Health and Welfare, Finland) and Josh Bunce (NHS, UK) informed the attendees about the two national roll out programmes. Amy Kirby (CDC, US) presented then the National Wastewater Surveillance and Systems of the US, which manages to transform the rather heterogeneous incoming data from the various US States into a homogeneous data visualization and decision support tool. Similar insights were shared by Ana Maria de Roda Husman from the Dutch National Institute for Health and Environment (RIVM, The Netherlands). The Netherlands was the first EU Country introducing a systematic use of wastewater-based surveillance an all its territory. Colleen Naughton (UC Merced, US) then provided an insight into the COVIDPoops19 Dashboard, a widely known GIS application visualization at global scale wastewater-based surveillance activities. The WBE Turkish Dashboard was then illustrated by Bilge Alpaslan Kocomemi (Marmara University and SUEN, Turkey), whereas Sabine Thaler from the German Association for Water, Wastewater and Waste introduced the German Umbrella Project CoroMoni. Lian Lundy (Middlesex University, UK) introduced then the NORMAN SCORE Databased on SARS-CoV-2 in sewage, which aims at collecting monitoring data stemming primarily from research activities.

The second part of the Town Hall addressed more specifically the ability of wastewater-based surveillance to correctly spot and identify variants of SARS-CoV-2. Indeed, examples reported from Italy (Giuseppina La Rosa and her team from ISS), Germany (Susanne Lackner's team at the Technical University of Darmstadt), Spain (Margarita Poza Dominguez from , Instituto de Investigación Biomédica (INIBIC) - Complejo Hospitalario Universitario (CHUAC)), Latvia (Talis Juhna from the Technical University in Riga), France (Sebastien Wurster, Eau de Paris), and Slovenia (Ion Gutierrez) illustrated in an impressive way the detectability of the variants, among which in the reported cases

variant B1.1.7 appeared as larger dominating. All groups emphasized on the particular challenges related to gene-sequencing.

Pierre Mongeon (OClair Environnement Inc., Canada) presented an interesting IT tool, which is very useful for a swift recording and communication of in-situ data, necessary to put the measured viral load into context. Oliver Schmoll (WHO) summarized the main findings of the last WHO Expert Consultation, emphasizing the useful, yet supplementary character of wastewater based surveillance.

In the last presentation, Bernd Manfred Gawlik (EC JRC) outlined the next steps in the context of the EU Recommendation and showed a first GIS Data Viewer encompassing the 110 or so municipalities included in the feasibility assessment. Member States are now encouraged to put in place a surveillance system aiming at ca 6000 collection points covering 70% of the population. The forthcoming months will indeed aim at the creation of an IT exchange platform by the EC to support the rapid collection and transfer of the results to health authorities. The respective European Sentinel System Dashboard and Digital Collaboration Platform is to be presented and deployed within this year, while the Commission will continue with its enabling framework aiming at the use of common methods for sampling, analysis and reporting. To accompany this process, Member States have been invited to designate contact points and report on efforts made. Likewise, the EC will create an additional expert pool accompanying the aforementioned methods

The meeting was accessible to the connected community without registration. It started at 14:00 (CET) until 18:15. A total of 368 attendees joined the gathering.

The recording of the meeting as well as the chat registration and presentations (as far as made available) are shared and can be accessed following this link:

<https://jrcbox.jrc.ec.europa.eu/index.php/s/11R2m2P9ek5KKjP> (password: SARS-CoV-2)

The material is made available for download until the 7<sup>th</sup> of May, 2021, data after which this link will expire and download is no longer possible. The material is owned by the respective institutions and explicit consent has to be asked for in case of further use.

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## Conclusions

### From Databases to Decision Support

While wastewater-based surveillance is not suitable to reliably estimate point prevalence or case counts, it can provide indication or confirmation of true increases and decreases in COVID-19 cases. It also can provide infection data for communities where clinical testing data are not available and has a predictive and forecasting ability for case or hospital utilization. Wastewater-based surveillance is independent of human testing behavior, providing an objective image of the virus trends in communities and able to indicate undertesting.

To implement this, wastewater-based surveillance needs to be somehow institutionalized, identifying clearly actors and directors, while maintaining a direct channel of communication with research, the latter ensuring reactivity of the entire system, e.g through the identification of new variants and the (rapid) design of faster detection methods once a potentially spreading variant has been identified.

This can only be obtained if the surveillance system connects municipalities, wastewater treatment plants and laboratories with local or territorial health departments. The latter need to be put into a position to submit data to a central service, which agglomerates and harmonized data of different origin. While standardization and harmonization is certainly useful, the primary focus should be on the harmonization of reporting, which eventually is then also leading to a standardized data analysis and information sharing. The experiences gained so far showed that data comparability can be obtained even if analytical methods are different.

Different approaches to achieve this ambition were presented in the Town Hall, and they share some communalities:

- In order to be easily accessible findings need to be translated into a sort of color-coding or traffic-light system, indicating if a situation deteriorates, improves or is stable. Some limitations arise in particular in the tailing phase of the epidemiological curve. In this sense, negative wastewater surveillance results do not necessarily indicate the absence of cases unless done in high-resolution, as shown for instance by the Australian experience.
- Data need to be presented at local, regional and (supra)national level addressing the specific needs of the data user, i.e. the public health authorities.
- Wastewater-based data are public health data and as such subject to ethical considerations. The need to inform the general public needs to be weighted carefully against the need of the individual or groups to be protected against discrimination. The resolution of wastewater surveillance is usually not compromising privacy. When performed at a very small scale, privacy issues need to be addressed.
- Wastewater data collection needs to meet basic standards of quality assurance and provide sufficient information to be meaningful.
- Activities of research and data deriving from those should find their way into any surveillance system.
- An accompanying and collaborative process is needed in addition to mere data submission and reporting. This is needed to ensure critical and continuous review, but also to grow consensus on best practices and harmonization.

In all of this the outreach to and (leading) involvement of the public health sector emerged as crucial element.

## Detection of variants

Wastewater surveillance can contribute to explore SARS-CoV-2 diversity and track viral variants in an epidemic context. Indeed, the examples presented showed a clear ability of wastewater-based surveillance approaches to detect variants of SARS-CoV-2 using gene sequencing or nested RT-PCR techniques. La Rosa et al. indeed showed that mutations indicative of the main SARS-CoV-2 variants of concern were detectable by the newly designed long nested PCR assay. In addition, to the known variants from UK, South Africa, Brazil, Spain, California, Denmark also variants from Nigeria and India were detectable.

In all applications shown, normalization by Pepper Mild Mottle Virus or Cross-assembly phages resulted in better comparability. A challenge remains the unambiguous confirmation and quality criteria such as proposed by the EC Recommendation are needed. At present, gene-sequencing delivers at best semi-quantitative information, which however equally applies for sputum or feci samples. This does not jeopardize a “traffic-light” system approach expressing the spread of a specific major variants, and can be useful to better target for instance the development of gene-specific PCR tests.

## Implementing the EC Recommendation

### Member States

In light of the ongoing review of Council Directive 91/271/EEC, it is important to gather information from Member States on their experience in monitoring health relevant parameters in their wastewaters. This could help identifying health-related relevant parameters to be regularly monitored in the wastewaters. Member States are now encouraged to take on the more systematic use of wastewater monitoring and inclusion in national testing strategies and should put in place as soon as possible and no later than 1 October 2021 a national wastewater surveillance system targeted at data collection of SARS-CoV-2 and its variants in wastewaters, aiming primarily at larger urban agglomerates as well as specific situations, e.g. related to possible movements of larger part of the population, e.g. in vacation periods or by commuting work forces.

Member States should ensure that the results of the wastewater surveillance are promptly sent by electronic means to the competent public health authorities and then, to the European exchange platform when the platform will be operational (see below).

Attention should be paid to ethical consideration: wastewater surveillance is an integral part of public health surveillance and therefore should comply with the same ethical principles, as set out in the 2017 WHO guidelines on ethical issues in public health surveillance.

The actions encouraged by this Recommendation are to be construed in the context of the wider Union initiative, and will build on the best practice put in place by Member States and countries across the world.

### Commission

The Commission’s Umbrella Project on wastewater surveillance and the outcomes of the WHO consultation on public health needs related to the surveillance of SARS-CoV-2 in wastewater will now evolve further into a European exchange platform including a digital data visualization and dashboard tool. The platform which will be set up by the Commission will focus on:

1. gathering and sharing best practices, from Member States and beyond;

2. collecting results from wastewater surveillance activities;
3. publishing and regularly updating sampling and analysis methods;
4. creating a voluntary list of experts involved in waste water surveillance and disease prevention and control using wastewater surveillance;
5. organising a collaborative environment, promoting the intercalibration of approaches and sharing best practices.

The Commission invites Member States to join its efforts in assisting third countries having limited access to other sources of information to track virus presence in their population through wastewater monitoring as well as to foster permanent cooperation in close coordination with the WHO but also other advanced partners having put in place their own surveillance systems.

### Save-the-Date

- The next tentative dates for forthcoming updates via the TOWN HALL Format have been scheduled for the following dates:
- Town Hall V: 7th of July, 2021: Expert Pool, Viewer Complete, Neighboring Countries
- Town Hall VI: 14th of October, 2021: Launch Platform (tentative), National Viewers
- Town Hall VII: to be determined Dec 2021-Jan 2022

# SARS-CoV-2 Monitoring employing Sewers

## Designing the EU Sewer Sentinel System for SARS-CoV-2 (EUS4)

### 4<sup>th</sup> TOWN HALL Meeting

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#### Agenda of the Meeting

- 14:00      **Welcome and Opening**  
*Jann MARTINSOHN, European Commission JRC*
- 14:05      **The HERA Incubator: Anticipating the threat of SARS-CoV-2 variants**  
*Yoline KUIPERS, European Commission DG SANTE*
- 14:15      **The EC Recommendation on SARS-CoV-2 Sewer Surveillance**  
*Michel SPONAR, European Commission DG ENV*
- 14:25      **The Blue Space: Statements from the European Water Sector**  
*Andrea RUBINI, Water Europe*  
*Bertrand VALLET, EUREAU*  
*Jovana GOJKOVIC, Aqua Publica Europea*
- 14:35      **Wastewater-based surveillance: What does it tell us? - Perspectives from a traditional epidemiologist**  
*Georgios NIKOLOPOULOS, University of Cyprus, CY*
- 14:45      **About the creation of an indicator of SARS COV 2 virus' circulation through wastewater analysis**  
*Yvon MADAY, Sorbonne Université (Member of the OBEPINE Group), FR*
- 14:55      **Development of wastewater-based surveillance as pandemic preparedness tool in the WastPan-project**  
*Tarja PITKÄNEN, Finnish Institute for Health and Welfare, Finland*  
*Sami OIKARINEN, Tampere University*  
*Annamari HEIKINHEIMO, University of Helsinki*
- 15:05      **The JBC/Defra Wastewater Surveillance and Response programme in England**  
*Josh BUNCE, Kelly CLARK, Alwyn HART, Joint Biosecurity Centre, NHS Test and Trace, UK*
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- 15:15      **SPACE TO BREATHE - SPACE TO ASK**
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- 15:30      **CDC's National Wastewater Surveillance System (NWSS)**  
*Amy KIRBY, Centers for Disease Control and Prevention, US*
- 15:40      **Visualizing sewage data on the Dutch SARS-Cov-2 Dashboard - an update**  
*Ana Maria DE RODA HUSMAN, National Institute for Health and Environment*
- 15:50      **COVIDPoops19 and Beyond: Global COVID-19 Wastewater Monitoring Efforts and Data Sharing**  
*Colleen NAUGHTON, University of California – Merced, US*



16:00	<b>The Turkish Dashboard for SARS-CoV-2 Sewer Surveillance: Mega City Istanbul and 21 pilot cities</b> <i>Bilge ALPASLAN KOCAMEMI, Marmara University - Turkish Water Institute ( SUEN)</i>
16:10	<b>CoroMoni – Communication platform and networking on the topic of "Wastewater monitoring to determine the SARS-CoV-2 infection level of the population"</b> <i>Sabine THALER, DWA - German Association for Water, Wastewater and Waste</i>
16:20	<b>The NORMAN SCORE Database - SARS-CoV-2 in sewage</b> <i>Lian LUNDY, Middlesex University, UK</i>
16:30	<b>SPACE TO BREATHE - SPACE TO ASK</b>
16:40	<b>SARS-CoV-2 Variants in Sewage: Findings of the Italian Reference Project SARI</b> <i>Giuseppina LA ROSA, Lucia BONADONNA, Elisabetta SUFFREDINI, Luca LUCENTINI, Italian National Institute of Health, IT</i>
16:50	<b>First insights into SARS-CoV-2 mutations in German wastewater samples</b> <i>Shelesh AGRAWAL, Laura ORSCHLER, Susanne LACKNER, Technical University Darmstadt, DE</i>
17:00	<b>Monitoring SARS-CoV-2 variants in A Coruña wastewater: seqCOVIDBENS</b> <i>Margarita POZA DOMINGUEZ, Instituto de Investigación Biomédica (INIBIC) - Complejo Hospitalario Universitario (CHUAC), A Coruña, ES</i>
17:10	<b>SARS-CoV-2 Sewer Surveillance in Latvia: Towards a wastewater biobank</b> <i>Talis JUHNA, Sandis DEJUS, Technical University Riga, LV</i>
17:20	<b>The computerized wastewater management tool CETO</b> <i>Pierre, MONGEON, OClair Environnement Inc., CAN</i>
17:30	<b>Evaluation of variant spread by monitoring SARS-CoV-2 mutation in wastewater by specific RT-qPCR</b> <i>Sebastien WURTZER, Eau de Paris (Member of the OBEPINE Group), FR</i>
17:40	<b>SARS-CoV-2 variants in Slovenian wastewater – An update</b> <i>Ion GUTIERREZ, National Institute of Biology, SL</i>
17:50	<b>Outcome of the WHO/EC Expert Consultation</b> <i>Oliver SCHMOLL, Kate MEDLICOTT, World Health Organization</i>
18:00	<b>To boldly go ... (the way forward)</b> <i>Bernd Manfred GAWLIK, Simona TAVAZZI, European Commission Michel SPONAR, Trudy HIGGINS</i>
18:10	<b>End of Meeting</b>