

Wastewater-based surveillance for SARS-CoV-2 in The Netherlands was implemented on a nation-wide scale at the Dutch National Institute of Public Health and the Environment (RIVM) during the pandemic, complementing the existing wastewater-based systems which serve as an early warning system for the re-introduction of polio and monitor antimicrobial resistance.

The nationwide wastewater-based surveillance programme was set up in cooperation with the Dutch Water Authorities and arranges for regular sampling of all 313 Dutch public wastewater treatment plants (WWTPs). During the height of the pandemic, the RIVM received four samples per WWTP each week, while currently approximately 450 wastewater samples are analysed for SARS-CoV-2 each week at the RIVM. Each sample is obtained by sampling 0.5 mL of the daily wastewater flow (up to 50 ML) in multiple steps, which is in turn quantified using qPCR.

The (sub)sampling of the wastewater flow is a random process, thus the outcome of the qPCR is distributed around the latent virus concentration in the wastewater. Occasionally, the measured concentration of a sample might thus be improbable. To ensure good data quality, we exclude those improbable values from the samples we report. For this, we have a process in place to identify samples which are potential improbable values.

However, this process is rather time consuming, and further complicated due to the fact that the underlying latent virus concentration changes over time. For instance, an outcome that is classified as a potential improbable value, could also be the result of a change in the epidemiological situation. For this project, we are interested in having a fast, reliable, and interpretable process to classify samples as potential improbable values, while taking the underlying, potentially unknown, epidemiological situation into account.