Medical Xpress

Wastewater viral loads can provide advance warning of COVID-19 outbreaks

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Wastewater sample being collected from a manhole in the village. Credit: Masaaki Kitajima

Scientists show that there is a close association between clinical cases of

COVID-19 and viral loads in wastewater, with the viral loads picking up to two days before the cases were detected.

The Tokyo 2020 Olympics and Paralympics were held during July 21 and September 21, 2021, a time when the incidence and spread of COVID-19 was prevalent. Thus, a rigorous and multi-pronged testing approach was enacted in order to limit the spread of the virus while allowing the Games to proceed.

Following from previous research, a team lead by Associate Professor Masaaki Kitajima at Hokkaido University has shown the association between SARS-CoV-2 viral loads in wastewater and cases reported at the Olympic and Paralympic Village. Their findings were published in the journal *JAMA Network Open*.

The athletes and support staff at the Olympic and Paralympic Village were tested daily; in addition, wastewater in the sewage system was also sampled and tested (wastewater-based epidemiology, WBE) daily to determine viral loads. The results were reported to the Tokyo 2020 Organizing Committee.

In this study, the authors wanted to examine the association between clinically reported cases and viral loads in wastewater. They correlated the results of 360 samples collected from manholes in seven distinct areas of the village with confirmed COVID-19 cases obtained from the Organizing Committee, and with data of close contacts tests from a previous report.

The researchers found that SARS-CoV-2 was present in 151 wastewater samples—53 from the Olympics and 98 from the Paralympics. The number of confirmed cases was also higher in the Paralympics. The strongest correlation between SARS-CoV-2 RNA load in wastewater and the presence of clinical positive areas was found in areas that had

maximum [viral loads](#) in [wastewater](#) in a three-day span (two days before to the day of clinical positive area).

The study suggests that WBE and [clinical tests](#) are complementary, and that the testing strategy played a role in preventing COVID-19 clusters in the Village. This study of one of the world's largest mass gatherings provides novel evidence on the implementation and use of WBE in communities where all members undergo daily testing, and could be used to trace and control COVID-19 clusters in the future.

 More information: Association of SARS-CoV-2 Load in Wastewater With Reported COVID-19 Cases in the Tokyo 2020 Olympic and Paralympic Village From July to September 2021, *JAMA Network Open* (2022). [DOI: 10.1001/jamanetworkopen.2022.26822](#)

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