CCMB Press Release

COVID-19 Surveillance Using Sewage Samples in Hyderabad

Individuals who are infected by SARS-CoV-2 shed virus not only through nasal and oral routes but also through faeces. This provides an opportunity to use sewage/wastewater samples to estimate the spread of the infection in a given locality or area. The SARS-CoV-2 in sewage samples is non-infectious, thus making sewage samples suitable for epidemiological studies. Estimating the spread is very important in identifying the affected areas, and controlling the pandemic. Since an infected person sheds viral material in faecal samples for up to ~35 days, these studies will provide an overall estimate of the situation in a window of one month.

Of the 1800 million litres water used daily in Hyderabad, 40% is processed at different sewage treatment plants (STPs). In a collaborative effort, CSIR-CCMB and CSIR-IICT harvested the sewage samples to estimate the number of potentially infected individuals in the city. Sewage samples from major STPs were processed for detecting presence of SARS-CoV-2 viral RNA. While viral RNA is detectable in the inlet samples, the outlet (after treatment) samples of STP were largely clean (free from viral RNA) in this regard, indicating efficient treatment practices at STP.

Collection of sewage sample from a sewage treatment plant in Hyderabad

Testing of sewage samples in lab

This study covers about 80% of the STPs in Hyderabad revealed that there are nearly 2 lakh people who are shedding viral materials. Since only 40% of the Hyderabad sewage reaches STPs, this data can be used to extrapolate the overall number of potentially infected people, which turned out to be approximately 6 lakhs, that is, around 6% of the city's population, which includes symptomatic, asymptomatic, and also recently recovered individuals in a time window of about 35 days. The findings are posted on preprint server, MedRxiv, which is yet to be peer reviewed.

"Our finding clearly indicates that a large proportion of the affected individuals are asymptomatic and did not need hospitalization. This is also in agreement with the observation that hospitalization rush or mortality is way lower than otherwise expected with such a large infection rates at a given time. It explains why our healthcare system has been able handle reasonably well the situation during the pandemic. Such studies if carried out in coordination with civic bodies to identify the hotspots in the city and monitor the dynamics of the infection rate can assist the system in taking necessary measures", Dr. Rakesh Mishra, Director, CCMB explained.

All the experiments were conducted at the CSIR-CCMB COVID-19 testing facility and the teams included Hemalatha Manupati, Kopperi Harishankar and S.Venkata Mohan from CSIR-IICT and Uday Kiran, C.G. Gokulan, Santosh Kumar Kuncha and Rakesh K Mishra from CSIR-CCMB.