

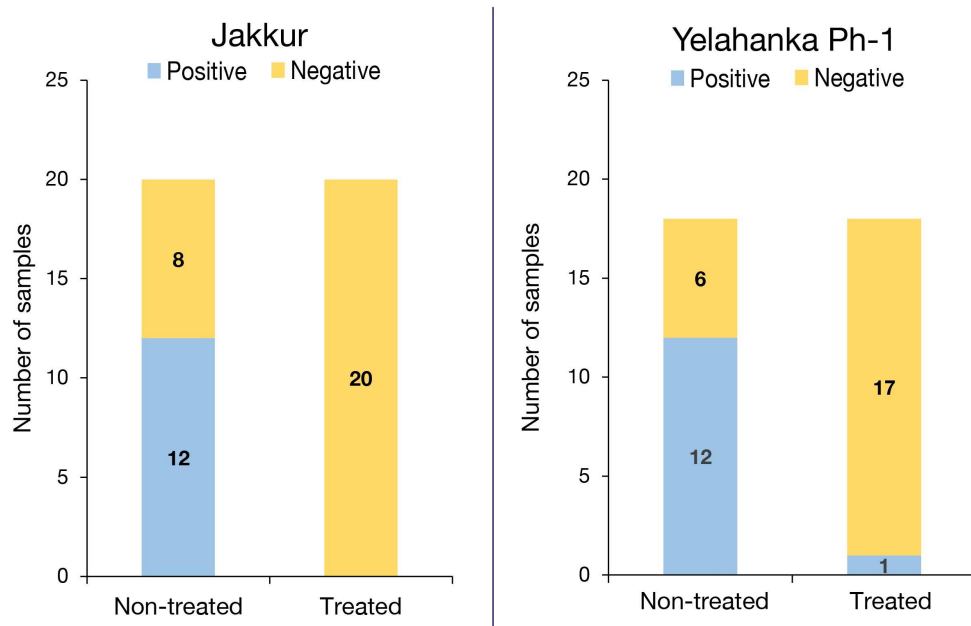
### ***Testing prevalence of SARS CoV-2 in municipal wastewater treatment plants in Bangalore as an indicator of infection levels in the city***

Wastewater epidemiology is a fast-developing science with tremendous potential to understand the dynamics of emerging pathogens and monitor the population's health. It takes advantage of the fact that specific pathogens enter the wastewater system through the faeces of infected patients, thereby allowing to estimate the spread of the given pathogen in a specific catchment area. Following this idea, the Bengaluru Sustainability Forum supported researchers from NCBS Bangalore (<https://www.ncbs.res.in>) and Biome (<https://biometruster.org>) to initiate wastewater surveillance in collaboration with BWSSB, for SARS-CoV-2, in Bangalore City. The initial focus of the surveillance was at Jakkur and Yelahanka-Phase-1 STPs (Figure-1). Researchers systematically collected non-treated (inflow) and treated (outflow) every two weeks for three months and tested for the presence of SARS-CoV-2 RNAs.



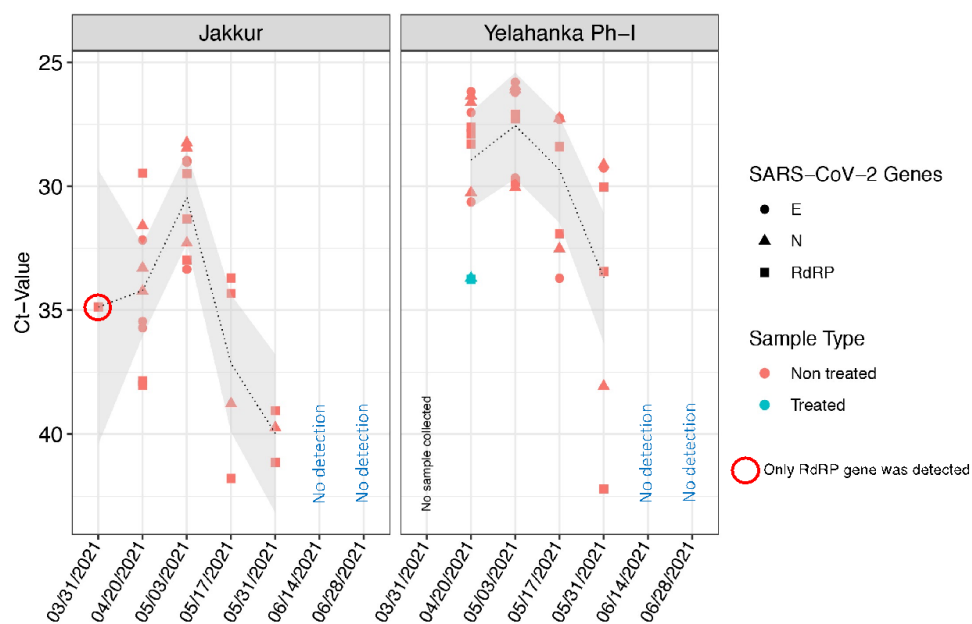
**Figure 1:** Sampling locations. Map showing Jakkur and Yelahanka STPs

During the sampling period (31st March- 12th July), 88 samples (treated and non-treated) were collected, and 76 of them were tested for SARS-CoV-2. SARS-CoV-2 RNAs were detected in samples collected between 31st March and 31st May. The majority of the samples that tested positive were non treated wastewater samples. All the treated samples except one collected during this period were negative (N=38, Figure 2). Sixty percent of non-treated samples were positive for SARS-CoV-2 RNA (N=38).



**Figure 2:** Summary of sample testing. All the treated (outflow) samples, except one, tested negative for SARS-CoV-2 RNA.

The screening results show a sharp decrease in Ct-values between 20th April and 03rd May. A decreasing trend was also observed in Ct-Value post-May third (Figure 3). This trend in Ct-value variation corresponds to the rise and fall of the overall cases in the city. Low Ct value in mid-April to early May indicates the peak of the second wave and case burden in the catchment area during that period. High Ct-value in late May is indicative of a reduction in case burden in the catchment area. No samples were detected positive in June and July 2021.



**Figure 3:** Ct-Value trend of samples collected from Jakkur and Yelahanka STPs between 31<sup>st</sup> March – 28<sup>th</sup> June 2021.

These results became a proof of concept for using wastewater screening as a tool for disease surveillance in the city. The same approach is replicable not just for SARS-CoV-2 but also to monitor the dynamics of several other potential pathogens and population health. The multi-institutional nature of this project became the first step towards building strong collaborations across sectors and stakeholders. The project is in its second phase, managed by researchers from NCBS and TIGS using financial support from the Rockefeller Foundation. They are actively screening hundreds of samples from multiple STPs across the city and trying to sequence genomes for detecting SARS-CoV-2 variants. The project continues to engage with BWSSB and Biome, hoping to strengthen the collaboration and knowledge transfer for evidence-based wastewater management in the city.