## ABSTRACT

Wastewater-based epidemiology (WBE) has emerged as an effective environmental surveillance tool in monitoring fecal-oral pathogen infections within a community. Congruently, SARS-CoV-2, the etiologic agent of COVID-19, has been demonstrated to infect the gastrointestinal tissues, and be shed in feces. In the present study, SARS-CoV-2 RNA was concentrated from wastewater, sludge, surface water, ground water, sediment, and soil samples of municipal and hospital wastewater systems and related environments in Wuhan during the COVID-19 middle and low risk periods, and the viral RNA copies quantified using reverse transcription quantitative polymerase chain reaction (RT-qPCR). From the findings of this study, during the middle risk period, one influent sample and three secondary effluents collected from waste water treatment plant 2, as well as two samples from Jinyintan Hospital wastewater system influent were SARS-CoV-2 RNA positive. One sludge sample collected from Guanggu Branch of Tongji Hospital, which was obtained during the low risk period, was also positive for SARS-CoV-2 RNA. These study findings demonstrate the significance of WBE in continuous surveillance of SARS-CoV-2 at the community level, even when the COVID-19 prevalence is low. Overall, this study can be used as an important reference for contingency management of wastewater treatment plants and COVID-19 prevention and control departments of Wuhan.