



$r = -0.02$ ; and *E* gene  $r = -0.16$ ), whereas the correlation of the *Ct* values with duration of faecal sample positivity was only significant for *RdRp* ( $p = 0.033$ ; *N* gene  $p = 0.91$ ; *E* gene  $p = 0.33$ ).

Our data suggest the possibility of extended duration of viral shedding in faeces, for nearly 5 weeks after the patients' respiratory samples tested negative for SARS-CoV-2 RNA. Although knowledge about the viability of SARS-CoV-2 is limited,<sup>1</sup> the virus could remain viable in the environment for days, which could lead to faecal-oral transmission, as seen with severe acute respiratory virus CoV and Middle East respiratory syndrome CoV.<sup>2</sup> Therefore, routine stool sample testing with real-time RT-PCR is highly recommended after the clearance of viral RNA in a patient's respiratory samples. Strict precautions to prevent transmission should be taken for patients who are in hospital or self-quarantined if their faecal samples test positive.

As with any new infectious disease, case definition evolves rapidly as knowledge of the disease accrues. Our data suggest that faecal sample positivity for SARS-CoV-2 RNA normally lags behind that of respiratory tract samples; therefore, we do not suggest the addition of testing of faecal samples to the existing diagnostic procedures for COVID-19. However, the decision on when to discontinue precautions to prevent transmission in patients who have recovered from COVID-19 is crucial for management of medical resources. We would suggest the addition of faecal testing for SARS-CoV-2.<sup>3</sup> Presently, the decision to discharge a patient is made if they show no relevant

symptoms and at least two sequential negative results by real-time RT-PCR of sputum or respiratory tract samples collected more than 24 h apart. Here, we observed that for over half of patients, their faecal samples remained positive for SARS-CoV-2 RNA for a mean of 11.2 days after respiratory tract samples became negative for SARS-CoV-2 RNA, implying that the virus is actively replicating in the patient's gastrointestinal tract and that faecal-oral transmission could occur after viral clearance in the respiratory tract.

Determining whether a virus is viable using nucleic acid detection is difficult; further research using fresh stool samples at later timepoints in patients with extended duration of faecal sample positivity is required to define transmission potential. Additionally, we found patients normally had no or very mild symptoms after respiratory tract sample results became negative (data not shown); however, asymptomatic transmission has been reported.<sup>4</sup> No cases of transmission via the faecal-oral route have yet been reported for SARS-CoV-2, which might suggest that infection via this route is unlikely in quarantine facilities, in hospital, or while under self-isolation. However, potential faecal-oral transmission might pose an increased risk in contained living premises such as hostels, dormitories, trains, buses, and cruise ships.

Respiratory transmission is still the primary route for SARS-CoV-2 and evidence is not yet sufficient to develop practical measures for the group of patients with negative respiratory tract sample results but positive faecal samples. Further research into the

viability and infectivity of SARS-CoV-2 in faeces is required.

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