

viruses in nasal washes, saliva, urine and feces for up to 8 days after infection, and a few naive ferrets with only indirect contact were positive for viral RNA, suggesting airborne transmission⁷⁸. In addition, transmission of the virus through the ocular surface and prolonged presence of SARS-CoV-2 viral RNA in fecal samples were also documented^{101,102}. Coronaviruses can persist on inanimate surfaces for days, which could also be the case for SARS-CoV-2 and could pose prolonged risk of infection¹⁰³. These findings explain the rapid geographic spread of COVID-19, and public health interventions to reduce transmission will provide benefit to mitigate the epidemic, as has proved successful in China and several other countries, such as South Korea^{89,104,105}.

Diagnosis

Early diagnosis is crucial for controlling the spread of COVID-19. Molecular detection of SARS-CoV-2 nucleic acid is the gold standard. Many viral nucleic acid detection kits targeting ORF1b (including RdRp), N, E or S genes are commercially available^{11,106-109}. The detection time ranges from several minutes to hours depending on the technology^{106,107,109-111}. The molecular detection can be affected by many factors. Although SARS-CoV-2 has been detected from a variety of respiratory sources, including throat swabs, posterior oropharyngeal saliva, nasopharyngeal swabs, sputum and bronchial fluid, the viral load is higher in lower respiratory tract samples^{11,96,112-115}. In addition, viral nucleic acid was also found in samples from the intestinal tract or blood even when respiratory samples were negative¹¹⁶. Lastly, Viral load may already drop from its peak level on disease onset^{96,97}. Accordingly, false negatives can be common when oral swabs are used, and so multiple detection methods should be adopted to confirm a COVID-19 diagnosis^{117,118}. Other detection methods were therefore used to overcome this problem. Chest CT was used to quickly identify a patient when the capacity of molecular detection was overloaded in Wuhan. Patients