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RNA; however, one patient each in the moderate and severe groups had SARS-CoV-2 RNA in the urine. Thus, we showed that SARS-CoV-2 RNA could be excreted in the urine for at least 4 days. This duration is relatively short compared with those of other specimens, such as pharyngeal swabs (up to 30 days) and stools (14–18 days).^{4–6} COVID-19 transmission among health care workers has become a major problem worldwide⁸; thus, health care workers should carefully handle urine samples from patients with the moderate to severe disease.

There were several limitations to this study. First, because of the small number of patients enrolled, the relationship between clinical severity and SARS-CoV-2 RNA detection in the urine could not be established. Second, we did not evaluate the infectious potential of the virus in the urine. However, a previous study indicated that SARS-CoV-2 RNA isolated from urine might be infectious.⁹ An autopsy case suggesting direct infection of the renal tubular epithelium was also reported.¹⁰ Together, these reports indicate that SARS-CoV-2 RNA in the urine is infectious.

In conclusion, our results suggest that SARS-CoV-2 RNA may be excreted in the urine depending on the severity of COVID-19. Although the period of viral shedding in the urine is relatively short, HCWs should also take infection prevention and control measures when handling urine, particularly samples from patients with moderate to severe COVID-19.

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Mobile phones: A forgotten source of SARS-CoV-2 transmission



Dear editor,

The emergence SARS-CoV-2, a novel coronavirus, has become a global health and economic concern, embodying one of the most disruptive pandemics in more than a century. SARS-CoV-2 is highly contagious via droplets and could be spread by human contact as well as contaminated surfaces causing high morbidity and mortality burden.¹ Consequently, the world's economy has shut down, and nearly one-third of the world's population has been forced to home confinement. With the deconfinement phase to start soon in different countries, educating the population to adopt preventive measures has become crucial to limit a second wave of SARS-CoV-2 infection. These measures include physical distancing, washing hands regularly with soap and water or sanitizers, avoid face-touching, and wearing face-mask especially in public and crowded places. In addition, the use of mobile phone (MP) applications has been proposed to help track infected individuals. However, there is 1 caveat. MP could be a source

of contagion higher than expected. In our opinion, there is very little warning regarding this subject from public-health experts.

In fact, it has been shown that MP could be colonized by microorganisms, including bacteria, fungi^{2,3} and even RNA viruses,⁴ as it could be the case with the SARS-CoV-2 which is also an RNA virus. Some authors have proposed that MP had amplified previous virus outbreaks like Ebola.⁵ SARS-CoV-2 is not an exception. In fact, it has been shown that this new virus can persist on inanimate surfaces like metal, glass, or plastic for up to 9 days.¹ Due to their excessive use,⁶ added to the fact that they are rarely cleaned after handling, MP could become a source of virus transmission through repetitive cyclic hand-face contamination.⁷ In addition, health care professionals do frequently use MP during their shifts, searching for medical information that could help them in their daily work. This could also be a source of nosocomial infection even in intensive care units.^{3,8} To our knowledge, no study has yet addressed the issue related to SARS-CoV-2 transmission through MP. It could indeed explain an important part in the transmission of the infection to patients who claim adopting recommended safety measures.

Hence, several measures should be endorsed to tackle the MP-related SARS-CoV-2 transmission risk. Disinfection with bactericidal wipes adapted to MP could not be completely effective, and specific sanitization protocols should be developed especially for health care workers.³ Until then, it is crucial during the deconfinement phase to educate the population to limit the use of MP as much as possible, especially in public places and health care institutions. To our opinion, this procedure should be included in the recommended safety measures that are widely broadcasted through the media and science information thread.

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Microbical actives with virucidal efficacy against SARS-CoV-2



To the Editor,

Given the practical importance of microbicides having efficacy against SARS-CoV-2 in home, community, and health care settings, we report evidence of the virucidal efficacy of a number of formulated microbical actives against SARS-CoV-2, as evaluated per ASTM International^{1,2} and EN³ standards.

Dissemination of SARS-CoV-2 from infected to susceptible individuals is believed to occur directly, via respiratory droplets and droplet nuclei/aerosols, and indirectly through contaminated high-touch environmental surfaces (HITES).⁴ SARS-CoV-2 has been reported to remain infectious on contaminated HITES for hours to days,⁵ allowing for onward self-infection of new individuals when contaminated hands come into contact with susceptible tissues (mucous membranes of the nose, eyes, and mouth). This *Droplets-HITES-Hands* nexus⁶ is central to the chain of infection with SARS-CoV-2, and highlights the critical role that targeted application of effective microbicides against potentially contaminated HITES and hands plays in infection prevention and control during the ongoing COVID-19 pandemic.

Fortunately, enveloped viruses such as SARS-CoV-2 are among the most susceptible of pathogens to formulated microbical actives and detergents (including personal care soaps and liquid hand washes).^{7,8} Inactivation of such viruses by formulated microbical actives and detergents is believed to occur as a result of disruption of the virally modified, host-cell-derived, phospholipid bilayer glycoproteinaceous envelope, and the associated spike glycoproteins that interact with the angiotensin-converting enzyme receptor required for infection of host cells.⁸

Virucidal efficacy of a selection of formulated microbical actives against SARS-CoV-2 has, to date, been assumed based on efficacy data obtained using other coronaviruses^{8,9} or, as reported recently,⁵ based on nonstandardized methods of assessing viral inactivation (ie, log₁₀ reduction in infectious titer) in suspension without details of the testing method used including appropriate controls. To date, virucidal activity against SARS-CoV-2 has not been demonstrated definitively through testing conducted per standardized surface² and suspension^{1,3} methodologies. In **Table 1**, we provide definitive evidence of efficacy for inactivation of SARS-CoV-2, on contaminated prototypic HITES and suspensions, of products formulated with the following microbical actives: ethyl alcohol, para-chloro-meta-xyleneol, salicylic acid, and quaternary ammonium compounds. All of the microbical actives were effective for inactivating SARS-CoV-2, demonstrating ≥ 3.0 to ≥ 4.7 log₁₀ reduction of infectious virus within the tested 1 to 5 minutes contact time in virucidal efficacy testing conducted per applicable ASTM International and EN standards.

To our knowledge, this is the first report of the virucidal efficacy of formulated microbical actives, determined using industry/regulatory-relevant global standardized (ASTM International, EN) methodologies, for inactivating SARS-CoV-2. Products formulated with the microbical actives studied here should be useful for healthcare workers, researchers, and the public at large as critical interventions for infection prevention and control of SARS-CoV-2 and the ongoing COVID-19 pandemic.