Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Detection of SARS-CoV-2 on high-touch surfaces in a clinical microbiology laboratory

Sir,

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a new human betacoronavirus responsible for coronavirus disease 2019 (COVID-19), which is an ongoing pandemic worldwide. This pandemic outbreak has resulted in a massive demand for healthcare services. Healthcare workers (HCWs) are one of the most affected groups, accounting for 10% of all confirmed cases. Infected HCWs with symptoms and, particularly, those who are asymptomatic represent a high risk for hospital-acquired COVID-19 [1,2]. It is well known that the virus is mainly transmitted through droplets when an infected person sneezes, coughs or talks. These droplets land on the floor or other surfaces where the virus may survive for some time and constitute a major source of infection.

Our aim was to evaluate the presence of viral RNA in fomites in our microbiology laboratory, particularly in the area used for SARS-CoV-2 diagnosis during this pandemic outbreak. We sampled 22 locations inside the laboratory, selecting surfaces subject to frequent contact (high-touch surfaces). Details about sampling features are given in Table I. World Health Organization guidelines were followed for collection of samples [3]. NucliSENS EasyMAG (bioMérieux, Marcy l'Etoile, France) was used for nucleic acid extraction. TaqMan 2019-nCoV Assay Kit v1 (Thermo Fisher Scientific Inc., Franklin, MA, USA) was used for detection of viral RNA. This kit targets ORF1ab, gene N and gene S, and uses human RNase P as the internal control. In addition, an environmental control sample and a positive control sample were included. The environmental control sample was SARS-CoV-2 and RNase P negative. Within the 22 samples, four were positive (one sample for two genes and three samples for one gene). RNase P was detected in all samples (Table I).

Our data confirm the presence of SARS-CoV-2 on fomites and suggest that environmental contamination might play a role in its transmission among HCWs. In this study, samples were obtained from working areas that are not accessed by patients, but where a high density of respiratory samples were tested for diagnosis of COVID-19. Despite this, the environmental control sample was negative. Samples obtained from personal objects were negative, suggesting that measures in place to avoid transmission (minimum safety distance, handwashing and surface decontamination) are effective. We detected viral RNA on the surfaces of commonly used objects, such as keyboards, telephones and scanners, and they could represent sources of infection for laboratory personnel [4,5].

Human RNaseP RNA was detected on most high-touch surfaces, and the RNaseP threshold cycles (Ct) tended to be higher than those of respiratory samples. This must be taken into account in the interpretation of viral target results, as they could also be higher. Amplification of all three targets (ORF1ab, gene N and gene S) was not achieved in any sample. In one sample, two targets were amplified but in high Ct. Another sample amplified one target in an early cycle (Ct: 30). The two remaining samples had late amplifications.

The design of this study includes some limitations that may lead to bias. As we based our detection on quantitative reverse transcriptase polymerase chain reaction, it was not possible to differentiate between infectious and non-infectious virus present on fomites. It is important to highlight that three of the four surfaces that tested positive were inside the COVID-19 diagnostic area, and the fourth surface was the laboratory mobile phone used by the microbiologist on call. In that context, we have to consider the possibility of cross-contamination with extracted RNA or amplified DNA.

These findings highlight the need for frequent disinfection of shared objects for the safety of all HCWs. It has been reported that ethanol 61—72% and sodium hyplochlorite 0.5% are effective against other coronaviruses, and this is also expected for SARS-CoV-2 [6].

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Table I
Samples collected and results

Sample number	Sample type	Location	ORF1ab gene (Ct) IC: Ct	Gene S (Ct) IC: Ct	Gene N (Ct) IC: Ct
1	Landline	COVID-19 diagnostic box	NA	NA	NA
			IC: 35.14	IC: 36.46	IC: 35.97
2	Barcode scanner	COVID-19 diagnostic box	NA	NA	NA
			IC: 38.04	IC: NA	IC: 38.02
3		Blood culture box	NA	NA	NA
			IC: NA	IC: 38.49	IC: 36.93
4		Respiratory culture box	NA	NA	NA
			IC: 39.25	IC: 39.78	IC: 38.05
5		COVID-19 thermocycler	NA	NA	NA
			IC: 35.35	IC: 34.30	IC: 34.79
6	Mobile phone	Laboratory	NA	NA	A (38.80)
			IC: NA	IC: 35.96	IC: 36.07
7			NA	NA	NA
			IC: 34.86	IC: 35.01	IC: 34.14
8		Personal	NA	NA	NA
			IC: 35.46	IC: 34.60	IC: 35.00
9			NA	NA	NA
			IC: 33.29	IC: 33.82	IC: 33.75
10			NA	NA	NA
			IC: 34.45	IC: 34.00	IC: 34.48
11			NA	NA	NA
			IC: 34.89	IC: 35.51	IC: 34.23
12			NA	NA	NA
			IC: NA	IC: NA	IC: 35.88
13			NA	NA	NA
			IC: 32.09	IC: 36.38	IC: 36.25
14			NA	NA	NA
			IC: 31.49	IC: 30.97	IC: 31.25
15	Mouse	COVID-19 diagnostic box	A (38.98)	NA	A (37.55)
			IC: 34.49	IC: 34.82	IC: 34.23
16		Blood culture box	NA	NA	NA
			IC: 34.56	IC: 34.44	IC: 34.65
17		Respiratory culture box	NA	NA	NA
			IC: 36.17	IC: 38.10	IC: 36.71
18		COVID-19 thermocycler	NA	NA	A (38.33)
			IC: 34.27	IC: 34.98	IC: 35.31
19	Keyboard	COVID-19 diagnostic box	NA	NA	NA
			IC: 34.92	IC: 36.89	IC: 35.00
20		Blood culture box	NA	NA	NA
			IC: 32.62	IC: NA	IC: 31.85
21		Respiratory culture box	NA	NA	NA
			IC: 32.54	IC: 32.51	IC: 32.87
22		COVID-19 thermocycler	NA	NA	A (30.32)
			IC: 30.43	IC: 29.82	IC: 30.39
23	Environmental	COVID-19 diagnostic box	NA	NA	NA
			IC: NA	IC: NA	IC: NA

A, amplified; NA, not amplified; IC, internal control; Ct, cycle threshold.

Conflict of interest statement
None declared.

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