Local transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus in Singapore has been reported.1 As the pandemic spreads globally, increased utilization and shortages of personal protective equipment (PPE) are expected. Although extended PPE use would mitigate utilization rate, its safety is unknown. At the National Centre for Infectious Diseases, recommendations for healthcare workers (HCWs) in contact with known or suspected patients are in concordance with the US Centers for Disease Control and Prevention, which recommends gloves, gown, respiratory protection (eg, disposable N95 respirator), and eye protection (eg, goggles or disposable face shield), without the use of shoe covers.2

An initial pilot study showed no contamination of N95 and disposable face visors after patient care, although in 1 instance, SARS-CoV-2 nucleic acid was detected on the front surface of an HCW’s shoe.3 To evaluate the safety of extended PPE use, we conducted a 1-day PPE sampling study on HCWs caring for confirmed COVID-19 patients to ascertain the per contact episode risk of PPE contamination with SARS-CoV-2.

### Methods

The PPE samples were collected by 5 trained personnel using a standardized technique with Puritan EnviroMax Plus premoistened sterile swabs (Puritan Medical Products, Guilford, ME) from the entire front of goggles, the front surface of N95 respirator, and the front surfaces of shoes of 30 HCWs (Table 1) exiting patient rooms. Gloves and gowns were not swabbed because these are disposed after each use. Data on HCW category and details of activity in the room were recorded. Patients with positive SARS-CoV-2 PCR assays within the prior 48 hours were selected, and clinical data (ie, day of illness, presence of symptoms, and cycle threshold [Ct] value of clinical PCR) were obtained from the medical record. Environmental samples were tested using specific real-time RT-PCR methods targeting the SARS-CoV-2 RNA-dependent RNA polymerase (RdRp) and E genes.4

### Results

In total, 15 patients (7 women and 8 men) were selected. Patient characteristics varied by day of illness (median, day 14; interquartile range [IQR], 8.25–17.25), presence of symptoms (63% symptomatic), and clinical PCR Ct value (median, 30.08; IQR 28.85–30.86). No patient required ventilatory support and no aerosol-generating procedures were carried out prior to or during sampling. All 90 samples from 30 HCWs (doctors, nurses, and cleaners) were negative (Table 1). The median time spent in the patient’s room overall was 6 minutes (IQR, 5–10): 8 minutes for doctors, 7 minutes for nurses, and 3 minutes for cleaning staff. Activities ranged from casual contact (eg, administering medications or cleaning) to closer contact (eg, physical examination or collection of respiratory samples).

### Discussion

Our study had several limitations. One limitation of our study was the use of surface swabs for sampling the surface of N95 masks rather than processing masks in extraction buffers with detergents, which is a method that has been used for isolation of influenza from N95 respirators.5 Surface swabbing may be insufficient for the detection of entrapped viral particles. Second, all patients were in airborne infection isolation rooms with 12 air exchanges per hour, and these results may not be generalizable to other room configurations. Third, we did not assess the concomitant level of viral contamination of the environment in this study to correlate with the level of PPE contamination.

Previous laboratory studies have demonstrated that viruses, such as SARS-CoV and human coronavirus 229E, can remain...
viable on PPE items, including latex gloves and disposable gowns, but these studies were not performed in clinical settings. Despite the potential for extensive environmental contamination by SARS-CoV-2, we did not find similar contamination of PPE after patient contact. These results provide assurance that extended use of N95 and goggles with strict adherence to environmental and hand hygiene while managing SARS-CoV-2 patients could be a safe option.

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A set of environmental measures to control a *Fusarium* outbreak in an oncohematologic ward: An interrupted time series study

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Fungal infections in immunocompromised patients constitute a challenge. *Fusarium* spp are widely distributed in the environment. In oncohematologic and hematologic patients, especially those with prolonged periods of neutropenia, *Fusarium* spp can disseminate, causing invasive fusariosis with mortality rates of up to 75%. Previous studies assessing *Fusarium* outbreaks have identified environmental sources. Here, we describe an outbreak in our institution and the bundle we implemented to contain it.

**Materials and methods**

**Study design and setting**

We conducted an interrupted time series study from December 2018 to June 2019 at Hospital Universitario Austral. The institution is a 209-bed private tertiary-care teaching hospital in Buenos Aires, Argentina. The bone marrow transplant (BMT) ward has 8 individual rooms with an antechamber, high-efficiency particulate air (HEPA) filters, and positive pressure airflow, and the hematology ward has 8 private rooms. The rooms have bathrooms with showers, and a window, which does not open to the exterior. Plants are not allowed in the premises. Floors and surfaces are cleaned twice daily with a quaternary ammonium compound solution (Surfanios, Laboratories Anios, France), or 10% bleach in distilled water. Specimens were obtained with sterile swabs presoaked in distilled water.

**Environmental sampling**

One-liter water samples were collected from taps, showers, and the central reservoirs in accordance with the protocol of the National Institute of Farming Technology, ISO 7954. Air IDEAL 3P Traceability (bioMérieux, Marcy-l’Étoile, France) was placed at 1.5 m above the floor for 10 minutes (volume, 1,000 m³) using agar Sabouraud dextrose 2% medium plastic strips. The interior surfaces of faucets and the drains of sinks, showers, bidets, and toilets were swabbed. Other samples included stains from walls and floors. Specimens were obtained with sterile swabs presoaked in distilled water.

**Culture and identification**

Samples were seeded in Sabouraud dextrose agar culture plates and tubes and incubated at 28°C and 37°C. After 3 days, the culture plates were evaluated. If negative, incubation was maintained for an additional 7 days.