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## Letter to the Editor

## Dramatically improved hand hygiene performance rates at time of coronavirus pandemic

S. Israel<sup>1,\*</sup>, K. Harpaz<sup>1</sup>, E. Radvogin<sup>1</sup>, C. Schwartz<sup>1</sup>, I. Gross<sup>1</sup>, H. Mazeh<sup>2</sup>, M.J. Cohen<sup>3</sup>, S. Benenson<sup>1</sup><sup>1</sup>) Department of Clinical Microbiology and Infectious Diseases, Hadassah-Hebrew University Medical Centre, Jerusalem, Israel<sup>2</sup>) Department of General Surgery, Hadassah-Hebrew University Medical Centre, Jerusalem, Israel<sup>3</sup>) Clalit Health Services, Associated with the Hadassah-Hebrew University Medical Centre, Jerusalem, Israel

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## To the Editor,

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), first isolated in December 2019 in China, causes coronavirus disease 2019 (COVID-19). As of May 11, 2020, Israel has experienced more than 16 000 COVID-19 cases (1870 cases/million) and more than 250 deaths (27 deaths/million) [1].

At the start of the COVID-19 outbreak, the Hadassah Mount Scopus Medical Centre, a 330-bed university hospital in Jerusalem, Israel, established a biological emergency department for individuals with suspected COVID-19. The staff in the biological emergency department use surgical masks, face-shields, gloves and gowns during patient care. Individuals with confirmed COVID-19 requiring hospitalization are transferred from the emergency department to the second Hadassah Campus in Jerusalem. Hence, the Mount Scopus Campus inpatient facilities stayed free of COVID-19 patients. Regular hospitalized patients are treated according to standard precautions and since the emergence of a SARS-CoV-2, surgical masks are routinely used during patient care.

Poor hand hygiene (HH) practice by health-care workers is well established as an important factor of cross-transmission of health-

care-associated infections. Despite intensive education of medical teams, HH performance rates remain low.

We raised the hypothesis that performance rates might improve during the emerging pandemic.

To improve staff awareness of HH in our hospital, many campaigns have been launched in the past. These included posters at the hospital entrances and across the hospital, involvement of clowns to promote HH, mandatory performance of an HH e-learning programme, participation in the annual global hand washing day and prize-awarding contests between departments. Bi-monthly staff meetings with the Unit of Infection Prevention and Control take place to discuss HH performance and additional aspects of infection prevention.

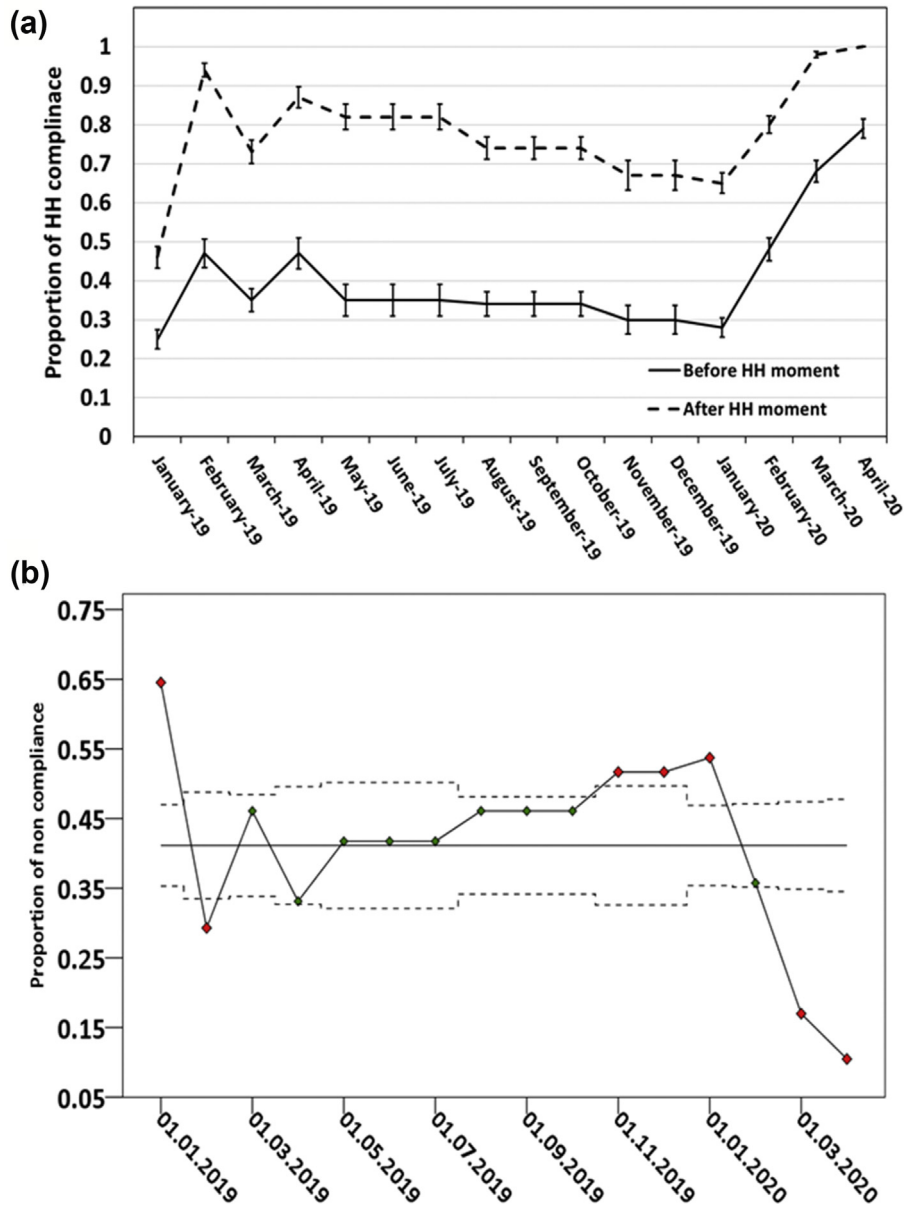
Audits of HH compliance are performed by infection prevention nurses, based on the model of five-moments developed by the WHO [2]. On-site interventions, including immediate feedback of performance and brief sessions of instruction, were added to the observations in January 2018. Each month we perform an average of 600 observations in 15 departments. Monthly and annual compliance reports, per department and for the hospital in general, are presented to the hospital management and the departments' managers and head nurses. To simplify feedback and reports, we sum up the five moments into two entities, 'before patient contact' (moments 1 and 2) and 'after patient contact' (moments 3–5).

We aimed to determine the impact of the SARS-CoV-2 pandemic on HH performance rates in departments free of SARS-CoV-2 cases. Compliance rates of 'before patient contact' and 'after patient contact' HH moments were calculated with 95% CI per calendar months. Additionally, we generated a p-control chart with 3- $\sigma$  upper and lower control limits for total compliance.

From January 2019 to January 2020, the average compliance rate ranged from 35% to 71%, and was mostly unchanged since March 2019. From January to April 2020, the all-hospital average compliance rate increased from 46% to 89%. Hand hygiene 'before patient contact' increased from 28% to 79%, and 'after patient contact' from 65% to 100% (Fig. 1a). The control chart (Fig. 1b) demonstrates the magnitude of the effect, whereby divergent non-compliance

\* Corresponding author. S. Israel.

E-mail address: [sarahi@hadassah.org.il](mailto:sarahi@hadassah.org.il) (S. Israel).



**Fig. 1.** Monthly hand hygiene compliance rates. (a) Compliance stratified to before and after hand hygiene moments; (b) p-control chart of total non-compliance rates.

estimates above the 3- $\sigma$  control limits changed drastically since January 2020.

For years, we invested much effort to improve HH compliance. These efforts led to an initial improvement in compliance up to 71%, but the upward trend stopped for a long period despite additional interventions. Interestingly, during the SARS-CoV-2 outbreak, the compliance rates improved dramatically within a short time. This was true for average compliance rates as well as for 'before patient contact' and 'after patient contact' opportunities.

Compliance rate was shown in many studies to be significantly lower before patient contact as opposed to after patient contact [3]. The gap between 'before patient contact' and 'after patient contact' compliance rates is generally explained by the health-care workers concern regarding their risk of acquisition of infections and resistant bacteria from patients. This concern leads to higher HH performance, specifically after patient contact. Hand hygiene before patient contact is performed with the purpose of protecting the patients.

A recent Cochrane review explored factors that influence health-care workers to follow infection prevention guidelines for respiratory infectious diseases. They found that some health-care workers felt motivated to follow the guidance because of fear of infecting themselves or their families [4]. A recent psychosocial study also found that there was a notable moderate positive correlation between increased change in behaviour and fear of COVID-19, suggesting that those with higher fear scores were those who were engaging with more public health behaviours [5].

An increase in HH practice in the public since the COVID-19 outbreak has been shown in a recent survey in the USA [6]. The majority of the participants stated that concern for contracting the virus was the main reason for the change of practice. In our report we see that 'before patient contact' compliance rate also improved, even more than 'after patient contact', suggesting that increased awareness probably plays an additional factor in staff behaviour, but a longer monitoring period is needed.

The results of our report show that health-care workers can change their behaviour promptly. We believe this change during the COVID-19 pandemic is mostly the result of the health-care workers' personal fear of being infected. But the dramatic improvement in compliance rates even before patient contact, does express an overall rise in awareness and enhanced motivation to create a safe environment for patients. We should find ways to maintain and still improve these rates once the COVID-19 pandemic abates.

#### **Transparency declaration**

The authors declare that they have no conflicts of interest. Financial support: None reported.

#### **Author contributions**

All authors have made substantial contributions to this work and have approved the final manuscript. Concept and design: SI, HM, MC

and SB. Acquisition, analysis and interpretation of data: SI, KH, ER, CS, IG, HM, MC and SM. Writing original draft: SI, CS, MC and SM.

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