







# Personal protective equipment: Shortage or waste?

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*To the Editor*—With the progression of the coronavirus disease 2019 (COVID-19) pandemic, the personal protective equipment (PPE) shortage has been highlighted.<sup>1</sup> The sudden increase in demand for PPE due to the number of COVID-19 cases, misinformation, panic buying, and stockpiling resulted in global shortages. The World Health Organization (WHO) published a guideline for the rational use of PPE for coronavirus disease in healthcare and home-care settings during severe shortages.<sup>2</sup> Despite the importance of this topic, observational studies that evaluate the use of PPE during the pandemic by healthcare workers (HCWs) are scarce. A Chinese cross-sectional survey using a self-administered questionnaire included 1,357 HCWs and showed that 89% had sufficient knowledge and 89.7% followed correct practices concerning severe acute respiratory coronavirus virus 2 (SARS-CoV-2).<sup>3</sup>

Researchers in the division of infection control and hospital epidemiology of a teaching hospital in Brazil observed compliance regarding additional transmission-based precautions in exclusive care units for patients suspect or confirmed to COVID-19 from April 1 to May 15, 2020. The institutional protocol to control the coronavirus disease was developed based on guidelines of the World Health Organization (WHO) and the National Health Surveillance Agency (ANVISA), a regulatory body of the Brazilian government.<sup>4,5</sup> Prior to the onset of observations, healthcare professionals (HCPs) received face-to-face or video training on SARS-CoV-2 precautions. In assistance activities, HCPs and support teams should follow contact and droplet precautions or contact and airborne precautions for aerosol-generating procedures.

Compliance was considered as satisfactory when the HCPs wore all 5 proper PPE (ie, gown, eye protection, head cap, mask, and gloves) recommended for each specific procedure. During the study, 260 observations were performed and the compliance rate was 31.5% (n = 82). The compliance rate was 22% (2 of 9) among physiotherapists, 29% (15 of 52) among physicians, 31% (56 of 182) in the nursing team, and 53% (9 of 17) among all others (ie, nutrition team, occupational therapists, X-ray technicians, and cleaning staff). More than 1 improper PPE use was identified in each observation, totaling 322 failures, of which 40% (n=129) were practices that could have resulted in self- and/or environmental contamination. Furthermore, 60% of these failures (n=193) were practices that resulted in waste of PPE (Table 1).

These preliminary results suggest unnecessary consumption of PPE by HCPs, contributing the shortage of these products, which may put the safety of professionals and patients at risk. Therefore, determining the cause of this behavior is crucial to developing

**Table 1.** Distribution of Noncompliance to PPE Use in Exclusive Care Units for Patients Suspect or Confirmed to COVID-19 in a Teaching Hospital in Brazil, 2020

Variable	No.	%
<b>Practices that could have resulted in self and/or environmental contamination</b>	129/322	40
Use of potentially contaminated PPE outside the assistance area	44	34.1
Professional did not use available PPE	63	48.9
Overuse of PPE with risks of exposure to microorganisms <sup>a</sup>	7	5.4
Inappropriate PPE with risks of exposure to microorganisms <sup>b</sup>	12	9.3
Inadequate handling of PPE <sup>c</sup>	3	2.3
<b>Practices that resulted in waste of PPE</b>	193/322	60
Overuse of PPE	84	43.5
Inappropriate and more expensive PPE than indicated <sup>d</sup>	109	56.5
<b>Total</b>	322	

Note. PPE, personal protective equipment.

<sup>a</sup>Surgical mask under FFP2/N95.

<sup>b</sup>Gowns had less protection than recommended.

<sup>c</sup>Adjusted the mask in the assistance area.

<sup>d</sup>An N95/FFP2 mask instead of a surgical mask; gowns had higher protection than recommended.

targeted interventions to increase precaution compliance to control the spread of SARS-CoV-2.

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## References

1. Ranney ML, Griffith V, Jha AK. Critical supply shortages—the need for ventilators and personal protective equipment during the COVID-19 pandemic. *N Engl J Med* 2020;382:e41.
2. Rational use of personal protective equipment for coronavirus disease (COVID-19) and considerations during severe shortages: interim guidance, 6 April 2020. World Health Organization website. <https://apps.who.int/iris/handle/10665/331695>. Published April 6, 2020. Accessed May 25, 2020.
3. Zhang M, Zhou M, Tang F, *et al*. Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China. *J Hosp Infect* 2020;105:183–187.
4. Infection prevention and control during health care when COVID-19 is suspected: interim guidance, 19 March 2020. World Health Organization

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website. <https://apps.who.int/iris/handle/10665/331495>. Published March 19, 2020. Accessed May 25, 2020.

5. Nota técnica GVIMS/GGTES/ANVISA No 04/2020. Orientações para serviços de saúde: medidas de prevenção e controle que devem ser adotadas durante a assistência aos casos suspeitos ou confirmados de infecção pelo

novo Coronavírus (SARS-CoV-2). Atualização 4: 08 de maio de 2020. Agência nacional de vigilância sanitária (ANVISA) website. <https://www2.anvisa.gov.br/segurancadopaciente/index.php/alertas/item/nota-tecnica>. Published May 8, 2020. Accessed May 25, 2020.

## Impact of COVID-19 second wave on healthcare worker staffing levels

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*To the Editor*—The coronavirus disease 2019 (COVID-19) pandemic prompted mass restructuring of the NHS workforce, the scale of which was unprecedented in its 72-year history. Like many others, Imperial College Healthcare Trust rolled out expanded emergency COVID-19 rotas, with built-in shadow cover in response to the expected high rates of staff absence.<sup>1</sup> To meet the heavy staffing requirement of these COVID-19 rotas, healthcare workers (HCWs) from nonemergency, surgical, community, allied health, and academic posts were temporarily redeployed.<sup>2</sup> But with the second peak of COVID-19 predicted in November 2020, during a time of yearly maximal pressure on the NHS, will we be able to maintain safe staffing levels?

To better understand the impact of COVID-19 on staffing levels, we undertook a survey of 167 healthcare workers (HCWs) at St Mary's Hospital. Overall, 44% reported that they had had symptoms of COVID-19 and had self-isolated at some point over the previous 4 months. Among responders, 18% reported self-isolating while asymptomatic due to a symptomatic member of their household. The median isolation period was 10–14 days, which is in line with Public Health England (PHE) guidance. Moreover, 48% of staff reported living with at least 1 other HCW. Therefore, a positive swab in a singular household, on average, affected 2 HCWs in our surveyed group.

The advent of high-sensitivity antibody test in May 2020 was widely seen as a vital turning point in the COVID-19 response. Many NHS trusts have now rolled out staff-wide antibody testing. As of June 2020, Imperial College Healthcare Trust reported that 25% of staff tested had positive IgG, with other trusts reporting similar rates.<sup>3</sup>

However, antibody testing has yet to produce a tangible impact on staffing. Discussions around the degree and length of immunity a previous infection provides remain largely speculative. Research to address these vital questions is ongoing. Presently, NHS England advises that staff should continue following PHE isolation guidance even if they have a positive antibody test. Thus, for the foreseeable future, individuals who have already been infected and have a positive antibody test will need to isolate if a member of their household becomes symptomatic. Furthermore, they will need to isolate if contacted as part of the 'test and trace' strategy despite having recovered from the virus and working on the frontline. As such, the rollout

of antibody testing does not stop the domino effect on HCW staff depletion in the event of a second wave.

A second wave will also bring new challenges. Previous pandemics, such as the swine flu pandemic in 2009, have exhibited second waves deadlier than the first. Meeting the demand for HCWs during a winter spike, at which time the NHS is already under tremendous seasonal pressure, will be a mammoth task. We expect HCWs to be extra vigilant for COVID-19 symptoms, potentially increasing the numbers of HCWs self-isolating while awaiting a swab test. The government 'test and trace' strategy asks anyone who has had a confirmed interaction with a person who tests positive for COVID-19 to isolate for 14 days. Given the backlog and increasing patient waiting lists as a result of the first wave, there is likely to be resistance to redeployment on the same scale to cope with further waves.

We are faced with the question of how we can be better prepared to staff the second wave. Up to one-quarter of the HCWs at our London trust have had positive antibody tests. We need to have clear guidelines on how we use these data and what they mean for HCWs. Crucially, is there a way we can to avoid the same workforce depletion we experienced during the first wave? We need a clear strategy to maintain safe levels of HCW staffing in a second wave that has the potential to be more complex than the first. These issues need to be addressed by PHE, and we feel that a special set of guidance should be created for frontline HCWs.

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### References

1. Black JRM, Bailey C, Przewrocka J, Dijkstra KK, Swanton C. COVID-19: the case for health-care worker screening to prevent hospital transmission. *Lancet (Lond)* 2020;395:1418–1420.
2. Dunhill L. Intensive care staffing ratios dramatically diluted. *Health Service Journal* website. <https://www.hsj.co.uk/exclusive-intensive-care-staffing-ratios-dramatically-diluted/7027214.article>. Published March 25, 2020. Accessed July 20, 2020.
3. Houlihan C, Vora N, Byrne T, et al. SARS-CoV-2 virus and antibodies in front-line healthcare workers in an acute hospital in London: preliminary results from a longitudinal study. *medRxiv* 2020 June 9. doi: [10.1101/2020.06.08.20120584](https://doi.org/10.1101/2020.06.08.20120584).

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