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.

In the specific example presented in the referenced article,[1] we examined patients in the hours just before going on extracorporeal membrane oxygenation therapy for respiratory failure, the overwhelming majority of whom will have been receiving supplemental oxygen titrated to pulse oximetry. The letter writer hypothesizes a greater rate of arterial hypoxemia in Black patients. We note that such greater arterial hypoxemia might be caused by Black patients' pulse oximeters being less effective in warning their bedside clinicians of dangerous hypoxemia and consequent under titration of supplemental oxygen. Because any differential prevalence in hypoxemia is plausibly a consequence of bias in pulse oximetry, controlling for this (as suggested by the letter writer) could obscure the effects of measurement bias that are under investigation.

We hope we can all agree that rigorous postmarketing surveillance of pulse oximeters is necessary to assess which devices result in racially differential functioning as used in real-world practice and in the rapid development and dissemination of devices that meet the needs of clinicians who take care of all patients.

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Reference

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A Nonrigorous and Incorrect Evaluation of the Fast Fit Test

To the Editor:

In the article published in *CHEST* (June 2022), Regli et al[1] present data for health care personnel wearing a duckbill N95 filtering facepiece respirator, the BSN Medical ProShield, with a standard quantitative fit-testing method and then, approximately 1 year later, with a quantitative fast fit-test protocol.[1] Among the 19 individuals tested at each time point, 42% passed the standard protocol and 74% the fast fit protocol. The authors state that employees should have received better fits 1 year later, being more experienced wearers, which is what happened. Surprisingly, Regli et al[1] conclude that the higher pass rates are attributable to a flaw in the fast fit-test protocol. There is no evidence to support this conclusion.

The study[2] validating the fast fit-test protocol followed a national consensus standard,[3] which requires testing the new and control protocols in random order, one immediately following the other, without removing or changing the fit. The new protocol must be tested on a wide range of respirator models with subjects having a wide range of face sizes. We were contracted by the Project Enhancement Corporation to review the validation data as part of the Occupational Safety and Health Administration (OSHA) vetting process and concluded that the method met the performance criteria. OSHA accepted the new protocol despite a few negative comments in the regulatory docket.

Regli et al[1] did not follow the consensus standard requirements for comparing fit test protocols, and their study does not offer a methodologically robust critique. Overall, they showed the two methods were concordant for 74% of participants (nine passed and five failed both

tests). The five participants that failed the standard fit-test and passed the fast fit-test approximately 1 year later may have gained more experience with respirators (though hopefully were not wearing the tested respirator in the meantime). These results are consistent with research that observed individuals with prior respirator experience were more likely to don their respirator correctly.[4] The pass rates observed by Regli et al[1] are better than those of Low et al,[5] who found a pass rate of only 34% with the same BSN N95 filtering facepiece respirator.

This research letter communicates the observations of fit-testing protocols for one respirator model at one health care organization and extends those observations to an unsound conclusion. Implementation of effective respiratory protection programs in health care organizations is of critical importance to occupational health and should be advanced through rigorous inquiry.

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Response

To the Editor:

We thank Drs Brosseau and Jones for the opportunity to clarify a few points. Our letter outlined the performance of the fast fit-testing protocol for the first time in a "real world" setting.

The standard protocol detected a leak with five (26%) health care workers not detected with modified fast protocol.[1] All staff fit-tested were experienced anesthesia personnel familiar with personal protective equipment before the pandemic. Before fit-testing, staff received additional training in correct donning of personal protective equipment, and experienced personnel ensured proper N95 mask donning on both occasions. Therefore, it is unlikely that the higher fit-pass rate in the fast protocol was solely attributable to an improved donning technique.

Concerns regarding the fast fit-testing protocol were raised before our letter. According to Dr McKay, Richardson's fast fit-testing protocol was not compared with the current Occupational Safety and Health Administration (OSHA) protocol. It did not follow all American National Standards Institute Z88.10 criteria for new fit test methods.[2] Rather, the fast fit-testing protocol was compared with the Richardson reference method, which is not equivalent to the standard reference method. It cannot be concluded that the "fast" exercise protocols are equivalent to the OSHA protocol if only a selection of OSHA required exercises were included. Richardson et al[3] also eliminated data sets in which the ratio of the maximum to minimum of baseline fit factors was greater than 100.[3] Thus, respirators that slipped between the two exercise protocols were not assessed. Elimination of data points in this way is not in line with American National Standards Institute Z88.10 criteria.[2] The OSHA evaluation[4] also questioned whether the modified fast fit-testing protocol was representative of the "real world," because test chambers used in the three Richardson studies were "too controlled," meaning ambient gas sampling times may be too short, and the creation of exclusion zones eliminated some additional data.