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A British Society of Thoracic Imaging statement: considerations in designing local imaging diagnostic algorithms for the COVID-19 pandemic.

A reply



Sir—We thank Khan *et al.* for their interest in our statement.¹ We agree that there is a discrepancy in the article by Huang *et al.* between the results and Table 2.² We should point out that the data collection section of the Methods in that paper states “We reviewed clinical charts, nursing records, laboratory findings and chest X-rays for all patients with laboratory confirmed 2019-nCoV infection”; there is no mention of computed tomography (CT) in the methods, although they mention CT in their results and their images, while Table 2 mentions “bilateral involvement of chest radiographs” (CXRs). Given these discrepancies, we could only infer that Huang *et al.* “found bilateral radiographic abnormalities in 40/41 (98%) of cases”. We note that an erratum to Huang *et al.* has been published³ but does not address this point.

As the authors of the letter state, there are different rates of CXR abnormality that have been reported in the literature. The authors quote the rates found by Guan *et al.* (59.1%, which we have referenced) and Wong *et al.* (68.8%)^{4,5}; both studies demonstrated that the majority of CXRs were abnormal, a simple majority being over 50%.

The authors mention more recent evidence that a CXR could be normal. To this we would add further data from Liang *et al.*, which has shown in a cohort of 1,590 confirmed COVID-19 patients, only 243 (15.3%) had CXR abnormality, while 1,130 (71.1%) had CT abnormality.⁶ The differences in reported abnormalities between studies will undoubtedly reflect differences in the prevalence of disease, stages of presentation, and interobserver variability for image interpretation.

Mindful of these differences and the relative immaturity of data on COVID-19, we stated that a CXR may be normal or abnormal, which is indeed why Question 2 in our statement has two components exploring both possibilities. We thank Khan *et al.* for reinforcing our case.

The prevalence of radiographic abnormality notwithstanding, it is becoming increasingly clear that the humble CXR has a powerful predictive role in COVID-19. In the study by Liang *et al.*, the simple presence or absence of a CXR abnormality in COVID-19 was one of only 10 variables independently predicting a composite critical end-point of admission to the intensive care unit (ICU), invasive ventilation, or death (odds ratio 3.39; 95% confidence interval: 2.14–5.38; $p < 0.001$).⁶ In a cohort of 338 young patients

(aged 21–50 years old) with COVID-19 in an emergency department at New York City, Toussie *et al.* showed that a simple six-zone CXR severity score was an independent predictor of admission and intubation.⁷

Given that the premise of our article was to explore how CT thorax would fit into diagnostic algorithms relative to CXR and laboratory investigation (with high pre-test probability assumed), our original contentions seem strengthened: high clinical suspicion, laboratory findings and chest radiograph abnormality is useful in determining if a patient should be admitted, and whether their illness will have a critical course.

Conflict of interest

The authors declare no conflict of interest.

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