



A call for caution in extrapolating chest CT sensitivity for COVID-19 derived from hospital data to patients among general population

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I congratulate Ai *et al.* for their efforts in analysing a large cohort of corona virus disease 2019 (COVID-19) patients (1). Their results and insights will be helpful for the future in case similar scenario would occur again. However, we need also to re-emphasise the background where and when their data were collected. Their patient data were based in a tertiary hospital in Wuhan and during the period of Jan 6, 2020 to Feb 6, 2020. During this period in Wuhan the attention was mainly paid to the patients with more severe symptoms. While the clinical severity of the patients was not provided in Ai *et al.*'s paper, it is highly probable that a large proportion of their patients had moderate to severe grades severity.

The results from hospital-based patients usually do not represent the patients in general population, where the proportion of asymptomatic virus carrier and milder cases will be much larger. Patients during their latency period will also be CT negative but contagious. COVID-19 does not necessarily have pneumonia, thus the once-used-name of novel coronavirus pneumonia has been replaced with COVID-19. For milder cases, the chest CT positive rate will be much lower (2), and chest CT positive rate among asymptomatic COVID-19 patients remain unknown. For these cases, the role of biological pathogen testing can be more important.

As Ai *et al.* pointed out, their results may only be valid in epidemic areas with high pre-test probability for this disease (1). The current CT application for COVID-19 management in China is graphically shown in *Figure S1*.

When prevalence of COVID-19 is not higher than prevalence of other viral pneumonia, CT's specificity for COVID-19 will be another concern. These days in China we are talking of COVID-19's CT features have been increasingly atypical (personal communication with colleagues). Of note, lately the performance of biological testing for COVID-19 pathogen, including the introduction of 2019-nCoV IgM Detection Kit, has been markedly improved (3,4). Moreover, due to its much lower radiation, serial chest radiograph can be used in the places of CT for monitoring disease regression or progression (5).

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Footnote

Conflicts of Interest: YXW serves as an unpaid Editor-in-Chief of Quantitative Imaging in Medicine and Surgery.

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Supplementary



Figure S1 A diagram of current CT applications for COVID-19 management in China. In some published studies, chest CT studies' limitations have not been explained in detail by the original authors and have not been carefully scrutinized by readers, this has led to a substantial increase of chest CTs. In application-1, it can be seen that if appropriate protocols are followed, then the clinical management for cases in (A) and cases in (B) would be the same. In application-3, chest CT's role in COVID management will be limited by CT's sensitivity and low prevalence of COVID-19 in the targeted population (estimated to be 0.77 % in Wuhan general population, with majority of mild severity; the prevalence is much lower in other parts of China). Note in application-3, due to limited space, the normal cases are vastly under-represented in this graph.