The COVID-19 epidemic, which is attributed to a novel coronavirus of zoonotic origin (SARS-CoV-2), has endured for 3 months (1). Globally, over 80,000 people have been infected, with more than 3,000 resulting deaths. China has borne most of the disease burden, especially Hubei province, the epicenter of the outbreak. On January 23, 2020, China implemented strict measures in an effort to control the epidemic; these included a quarantine of the Greater Wuhan area, the extension of national holidays, and rigorous monitoring of civilian activities. These interventions have effectively restricted population migration and movement and have caused significant social, economic, and psychological disruption across the country. It is imperative to know if these measures have proved effective and for how long they should remain in place. However, their study used data only up to January 21, and was in no way able to account for the impact of the control measures implemented on January 23.

The impact of the control measures is reflected in the current epidemic situation. Although Hubei, and in particular Wuhan, is still suffering disproportionately, outbreaks in other cities have largely been brought under control, with cases outside of Hubei accounting for only 20% of the total number reported nationally. In this issue of *Journal of Thoracic Disease* (JTD) (3), Yang et al., attempted to provide a prediction of the epidemic trends based on the current situation in China (i.e., after the implementation of control measures). They used a dynamic Susceptible-Exposed-Infectious-Recovered model incorporating the population migration data before and after January 23 to reflect the impact of the national intervention. Based on our more recent understanding of the virus’s transmissibility, they included a key assumption: that the disease is transmissible during the incubation period, which is a key difference between SARS-CoV-2 and SARS-CoV. Their model also accounts for the reduced contact rate resulting from quarantining and social-distancing measures.

As China is currently experiencing a downward trend in new COVID-19 infections, we are able to see that their prediction so far has fairly accurate. The epidemic peak time and size predicted by their model have closely reflected the current actual reported data, particularly for Guangdong and Zhejiang. The situation in Hubei has been complicated by the change in the reporting process. Even so, Yang et al.’s prediction still remains within reasonable range of the actual situation. Importantly, their model predicted...
that we are on a downward trend and, with the exception of Hubei, the epidemic should settle down by the end of April. This observation was supported by their use of an artificial-intelligence (AI) machine learning-based prediction.

In any modelling study, accurate epidemiological data and assumptions are critical. Early understanding of an epidemic progression is important for timely intervention, but model predictions are less robust due to the lack of solid epidemiological data. Perhaps the use of AI technology, which can take past experiences into account, can be harnessed to overcome this pitfall and improve our response to outbreaks in the future.

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Footnote

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Ethical Statement: The author are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References


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