Fever clinics in China at the early stage of the COVID-19 pandemic

1 | INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as a novel coronavirus causes the outbreak of Coronavirus Disease 2019 (COVID-19) leading to over 70.4 million confirmed infected cases and approximately 1.6 million deaths worldwide, as of Dec 14, 2020. The COVID-19 also yields severe nosocomial infection, with an astonishing amount of 230 000 infections globally in healthcare workers. At the early stage of COVID-19 in China, to triage the potential infected cases and prevent nosocomial infection, whoever has symptoms including fever, cough and shortness of breath, will be first sent to special fever clinics. Fever clinics were initially established for the combat of severe acute respiratory syndrome (SARS) outbreak in 2002. They are designed to provide prompt assessment, management, laboratory examination and decision-making for the potential infected cases especially at the early stage of an unknown epidemic, which serves as the crucial frontline of defence to control nosocomial infection. China has set up approximately 15 000 fever clinics so far. As of February 3, 2020, data from the National Health Commission of the People’s Republic of China showed that a total of 220 865 people had visited fever clinics across the Chinese mainland. Guided by the primary principle of “early assessment, early detection, and early isolation,” fever clinics played a significant role in triaging suspected cases and minimise the risk of nosocomial infection especially at the early stage of the COVID-19 combat in China. However, fever clinics failed to function normally as expected; for instance, a total of 1101 healthcare providers in Wuhan had been infected as of February 6, 2020. In this comment, we systematically evaluated the current limitations of fever clinics and provided several potential solutions, aiming to enhance and maximise the capability and capacity of fever clinics at the early stage of acute infectious diseases. Main results are summarised in Figure 1 for an easy-to-use purpose.

2 | LIMITATIONS OF FEVER CLINICS IN CHINA

2.1 | Insufficient quantity

Compared with other countries, the number of fever clinics is substantially insufficient to triage patients and prevent nosocomial infection in China. For example, Singapore that has a population of 5.7 million, sets up a total of approximately 900 public health preparedness clinics (similar to fever clinics in China). All of them were activated to fight the COVID-19. In contrast, Wuhan, once the epicentre of the pandemic in China, has only 61 fever clinics to serve over 9 million residents (as of January 20, 2020), which is far from meeting the public needs. For instance, on February 3, the peak number of outpatient visits in fever clinics across Wuhan reached 12 568, which severely exceeded the maximum load of fever clinics. Insufficient quantity of fever clinics led to a sizable proportion of suspected cases who were not examined, diagnosed or isolated, which, therefore, increased the risk of widespread SARS-CoV-2 in hospitals and communities especially at the early stage of COVID-19.

Lack of infectious disease professionals in fever clinics is another major problem in this pandemic. Given the high risk of exposure to SARS-CoV-2, healthcare providers in fever clinics are required to be skilled and experienced in infectious disease or related specialties. However, since fever clinics were substantially overloaded, physicians and nurses from other departments who did not receive formal training or expertise in infectious diseases had to be deployed for support, thus having a considerably high risk of being infected. It was even the first time for some healthcare professionals to put on and take off protective equipment when on duty in fever clinics at the early stage of COVID-19, especially in rural and remote areas in China. The shortage of adequately skilled professionals, therefore, compromised the anticipated function of fever clinics against the COVID-19 outbreak.

2.2 | Poor quality

Most fever clinics have established a relatively complete infection management system in China. Nevertheless, the system could not be fully implemented in the pandemic because of insufficient professional management personnel, which resulted in the shortage of services. Even worse was the lack of formal training for the management personnel in fever clinics; for example, it was reported that 28% of the infection management staff never received professional training in public health or infectious disease. Moreover, the healthcare professionals in fever clinics were not fully aware of their work responsibilities at the early stage of COVID-19. They simply considered that the role of fever clinics was similar to general clinics that were meant to mainly determine the treatment plan for the patients. Indeed, healthcare workers in...
fever clinics are expected to sensitively detect potential patients with infectious diseases and distribute them accordingly. While infected patients should be isolated immediately and guided to receive further examinations and diagnosis, the non-infected patients are transferred to other outpatient clinics as needed. In addition, the healthcare professionals were not sufficiently qualified to communicate or manage patients in fever clinics. For instance, it was not uncommon that they ignored the patients’ overwhelming stress and anxiety while in communication, which may increase undue panic of the patients and their families especially at the early stage of the pandemic.

Another major limitation relied on that most existing fever clinics did not have standardised procedures that guided healthcare workers to practice in a concise and effective fashion. Furthermore, a considerable proportion of fever clinics did not meet the construction standards including lack of quarantine facilities and poor ventilated condition. All these limitations led to the poor quality of fever clinics to triage patients and control nosocomial infection.

2.3 | Shortage of protective equipment

Healthcare workers in fever clinics require adequately protective equipment to ensure their safety because of the high transmissibility of SARS-CoV-2. However, as the number of COVID-19 cases rocketed in China, frontline healthcare workers faced a critical shortage of protective equipment. Taking the supply of protective clothing as an example, the minimum daily demand for protective clothing in Hubei Province was 59 400 on February 7, 2020. In contrast, only 48 500 protective clothing could be collected from all sources including national and international supplies, making a significant gap of close to 11 000. Consequently, some healthcare workers had to wear raincoats and disposable garbage bags to protect themselves and some had to repeatedly use the same surgical masks and protective suits at the early stage of COVID-19. Although there was no official statistic of healthcare workers infected in fever clinics because of the shortage of protective equipment, lack of personal protective equipment uncontestedly increased the risk of nosocomial infection and compromised the expected function of fever clinics in the pandemic.

2.4 | Lack of self-protection awareness

The transmissibility of SARS-CoV-2 was significantly underestimated initially, mainly because of our poor understanding of the novel virus. Therefore, albeit on the alert, no sufficient attention from the policy-makers or frontline healthcare workers was paid to self-protection in fever clinics. For instance, it was not upgraded to first-class protection level until the end of January 2020 in fever clinics of Wuhan, before when there had been clear evidence showing the high transmissibility of virus and elevated risk of nosocomial infection. Similarly, healthcare workers lacked self-protection awareness at the early stage of the pandemic to fully ensure their safety in fever clinics, including failing to keep physical distancing.
in communication with patients, inadequate disinfection and failing to keep wearing protective equipment constantly.

3 | SUGGESTED SOLUTIONS TO ENHANCING THE CAPABILITY AND CAPACITY OF FEVER CLINICS

To improve the capability and capacity of fever clinics in China at the early stage of the pandemic combat, we recommended several countermeasures accordingly. First, more fever clinics are expected to be established and activated promptly as a strong first line of defence for the fight against pandemic. To enhance the service quality, formal and professional training should be strictly and regularly implemented before healthcare workers are sufficiently educated and allowed to appear in fever clinics. Before deciding to set up fever clinics, constructive demands and adequate budgets also need to be taken into account, especially given their specific purposes of triaging potentially infected patients and minimising the nosocomial infection risk that requires quarantine spaces and high-standard ventilated condition. Moreover, how to standardise the evidence-based procedures in fever clinics requires further research. It is of great importance for the policy-makers to fully ensure the sufficient supplies of personal protective materials in fever clinics, which essentially is an ethical requirement. Notwithstanding being challenging, how to reserve and allocate the equipment in a state of preparedness becomes an urgent topic for the government and healthcare system to address such pandemic in the future. Likewise, how to promote self-protection awareness of the healthcare system and individuals warrants further investigation, training and endeavours to ensure occupational safety and control nosocomial infection risk. Furthermore, efforts to adequately guide the surge of patients into fever clinics and to rapidly expand the capacity of existing fever clinics when needed may be another worthwhile exploration to further enhance their functional roles in triaging patients and control nosocomial infection risk.

In this comment, however, we only discussed the significant role of fever clinics at the early stage of COVID-19. Fever clinics, as part of the response to a pandemic, will be changed and adapted accordingly to be coordinated with other medical supplies while the pandemic situation is evolving. Therefore, fever clinics should be evaluated differently at different stages of the pandemic. Furthermore, community health service centres in China share a large part of the tasks that should be undertaken by fever clinics, which was not detailed in this comment. Instead, we emphasised the surge of patients because of public panic into hospitals at the early stage of an unknown pandemic, in which fever clinics serve as the frontline of defence for hospitals. Therefore, how to maximise the function of community health service centres to recognise patients who truly require further examination and diagnoses and how to cooperate community health service centres with fever clinics especially at the early stage of a pandemic, would be a worthwhile endeavour and investigation in the future to fight against acute infectious diseases.

DISCLOSURE
The authors declared no conflict of interest.

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