

Fever clinics in China for the COVID-19 pandemic

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Abstract

Fever clinics are designed to provide prompt assessment, management, laboratory examination and decision-making for the potential infected cases, which serves as the crucial first-line of defense to control nosocomial infection. Guided by the primary principle of ‘early assessment, early detection, and early isolation’, fever clinics played a significant role in triaging suspected cases and minimize the risk of nosocomial infection during the Coronavirus Disease 2019 (COVID-19) combat in China. However, fever clinics failed to function normally as expected, with an astonishing number of healthcare workers infected. In this comment, we systematically evaluated the current limitations of fever clinics and recommended several countermeasures, aiming to enhance and maximize the capability and capacity of fever clinics for acute infectious diseases.

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Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as a novel coronavirus, causes the outbreak of Coronavirus Disease 2019 (COVID-19) leading to approximately 1.86 million confirmed infected cases and over 702,642 deaths worldwide, as of Aug 6, 2020¹. The COVID-19 also yields severe nosocomial infection, with an astonishing amount of 230,000 infections globally in healthcare workers². 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 2002³. They are designed to provide prompt assessment, management, laboratory examination and decision-making for the potential infected cases, which serves as the crucial first-line of defense to control nosocomial infection⁴. China has set up approximately 15,000 fever clinics so far⁵. 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 mainland⁶. Guided by the primary principle of 'early assessment, early detection, and early isolation', fever clinics played a significant role in triaging suspected cases and minimize the risk of nosocomial infection during the COVID-19 combat in China⁴. However, fever clinics failed to function normally as expected; for instance, a total of 1,101 healthcare providers in Wuhan had been infected as of February 6, 2020⁷. In this comment, we systematically evaluated the current limitations of fever clinics and provided several potential solutions, aiming to enhance and maximize the capability and capacity of fever clinics for acute infectious diseases. Main results were summarized in Figure 1 for an easy-to-use purpose.

Limitations of fever clinics in China

Insufficient quantity

Compared to 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. By contrast, Wuhan, once the epicenter of the pandemic in China, has only 61 fever clinics to serve over nine 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 clinics⁸. 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 of SARS-CoV-2 in hospitals and communities.

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 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, especially in rural and remote areas in China⁹. The shortage of adequately skilled professionals therefore compromised the anticipated function of fever clinics against the COVID-19 outbreak.

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 due to insufficient professional management

personnel, which resulted in 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 disease¹⁰.

Moreover, the healthcare professionals in fever clinics were not fully aware of their work responsibilities. 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 patients¹¹. 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 clinics¹⁰. 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.

Another major limitation relied on that most existing fever clinics did not have standardized 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 poor quality of fever clinics to triage patients and control nosocomial infection.

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. By contrast, only 48,500 protective clothing could be collected from all sources including national and international supplies, making a significant gap of close to 11,000¹². 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. Although there was no official statistic of healthcare workers infected in fever clinics due to 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.

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 end of January, 2020 in fever clinics of Wuhan, before when there had been evidence showing the high transmissibility of virus and elevated risk of nosocomial infection. Similarly, healthcare workers lacked self-protection awareness in 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.

Suggested solutions to enhancing the capability and capacity of fever clinics

To improve the capability and capacity of fever clinics in China for the combat of pandemic, we recommended several countermeasures accordingly. First, more fever clinics are expected to be established and activated promptly as a strong first-line of defense for the fight against pandemic. To enhance the service of 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 minimizing the nosocomial infection risk that require quarantine spaces and high-standard ventilated condition. Moreover, how to standardize 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 endeavors 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.

Conflict of Interest : None declared.

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Figure Legend:

Figure 1. Limitations of fever clinics in China and suggested solutions

