

# Journal Pre-proof



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Zhan-hui Feng, MD, PhD, Yong-ran Cheng, MS, Lan Ye, PhD, Meng-Yun Zhou, MB, Ming-Wei Wang, MD, PhD, Juan Chen, MD

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**Title page**

**Is home isolation appropriate for preventing the spread of COVID-19?**

Zhan-hui Feng,MD,PhD<sup>1#</sup>, Yong-ran Cheng,MS<sup>2,3#</sup>, Lan Ye,PhD<sup>5</sup>, Meng-Yun Zhou,MB<sup>3</sup>, Ming-Wei Wang,MD,PhD<sup>4</sup>, Juan Chen,MD<sup>2,4</sup>

<sup>1</sup>Department of Neurology, Affiliated Hospital of Guizhou Medical University, Guiyang, China

<sup>2</sup>Zhejiang Academy of Medical Sciences, Hangzhou, 310012, China

<sup>3</sup>Hangzhou Medical college, Hangzhou, 311300, China

<sup>4</sup>Affiliated Hospital of Hangzhou Normal University, Hangzhou, 310015, China.

<sup>5</sup>Basic medical college, Guizhou Medical University, Guizhou, 550004, China

Zhan-hui Feng and Yong-ran Cheng contributed equally to this work

\*Corresponding Author: Juan Chen, E-mail:chenjuan564453@163.com, Tel:086-0571-88303590

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At the end of 2019, the coronavirus disease (COVID-19) epidemic broke out in Wuhan, China.<sup>1</sup> In the early stages, it was thought that the epidemic could be controlled; however, on January 20 2020, a Chinese expert group confirmed that the spread of the virus is characterised by human-to-human transmission.<sup>2</sup> The spread of COVID-19 cannot be prevented by simply wearing facial masks. The only way to control this disease is to cut-off the route of transmission. After the confirmation of human-to-human transmission, the Wuhan Municipal Government announced travel restrictions in Wuhan, and population migration in Hubei Province continues to be monitored. The entire country is actively trying to prevent the spread of the epidemic.

The outbreak of COVID-19 occurred during the Chinese Spring Festival<sup>3</sup> when large numbers of Wuhan's population travelled to other areas, resulting in extensive spread of the infection. However, with the active efforts of the Chinese government, the epidemic has been well controlled, and the overall situation of the epidemic has improved in China.

At the beginning of the epidemic, there were insufficient hospital beds for the patients in Wuhan, and a large number of patients were required to self-isolate at home. However, patients with COVID-19 under home isolation will transmit the virus to other people in the house via human-to-human transmission. This can lead to the entire household being infected with COVID-19. Therefore, home isolation poses significant risks to the population.

The recent incident of the Diamond Princess cruise ship has served as an unintended case study.<sup>4,5</sup> The cruise ship has 1337 rooms and was carrying 2666

passengers from more than 50 different countries, as well as 1045 crew members. When an 80-year-old passenger was diagnosed with novel coronavirus pneumonia on February 1 2020, all passengers and crew (> 3700 people) on the ship were ordered to remain on board in quarantine. By February 17 2020, 1219 people on board had been tested for the virus, of which 355 were infected. Of the 355 confirmed patients, 111 were asymptomatic. The number of infected persons accounted for 29% of the total population on the ship. This result suggests that if both infected and uninfected people are isolated in the same space, transmission cannot be prevented.

The Chinese government found that home isolation was not the best course of action in Wuhan, and that all patients should be brought to a hospital for further treatment. Therefore, the government quickly built two large hospitals within a matter days, namely Leishenshan Hospital and Huoshenshan Hospital.<sup>6</sup> Since then, mobile cabin hospitals have also been established. Chinese medical staff from outside of Wuhan continue to arrive in Wuhan to help in these new medical facilities (Figure.1). There are currently sufficient beds and medical staff to provide the best conditions for the infected population and the route of transmission from person-to-person has been cut off. At present, the number of infections in China is gradually declining.

China's COVID-19 epidemic prevention and control is currently in a relatively good situation. However, this epidemic has now spread to other countries. At present, the number of COVID-19 patients in Korea and Japan is gradually increasing.<sup>7</sup> It is suggested that mobile cabin hospitals are rapidly established in countries with

insufficient hospital beds to treat the infected population and that home isolation should not be implemented for patients. All suspected patients should be sent to a hospital for further confirmation, monitoring and treatment.

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