



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Journal Pre-proof

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

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



PII: S0033-3506(20)30072-X

DOI: <https://doi.org/10.1016/j.puhe.2020.03.008>

Reference: PUHE 3766

To appear in: *Public Health*

Received Date: 8 March 2020

Accepted Date: 12 March 2020

Please cite this article as: Feng Z-h, Cheng Y-r, Ye L, Zhou M-Y, Wang M-W, Chen J, Is home isolation appropriate for preventing the spread of COVID-19?, *Public Health*, <https://doi.org/10.1016/j.puhe.2020.03.008>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2020 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

Title page

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

Zhan-hui Feng,MD,PhD^{1#}, Yong-ran Cheng,MS^{2,3#}, Lan Ye,PhD⁵, Meng-Yun Zhou,MB³, Ming-Wei Wang,MD,PhD⁴, Juan Chen,MD^{2,4}

¹Department of Neurology, Affiliated Hospital of Guizhou Medical University, Guiyang, China

²Zhejiang Academy of Medical Sciences, Hangzhou, 310012, China

³Hangzhou Medical college, Hangzhou, 311300, China

⁴Affiliated Hospital of Hangzhou Normal University, Hangzhou, 310015, China.

⁵Basic 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

Journal Pre-proof

At the end of 2019, the coronavirus disease (COVID-19) epidemic broke out in Wuhan, China.¹ 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.² 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 Festival³ 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.^{4,5} 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.⁶ 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.⁷ 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.

References

- 1 Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, Zhao X, Hung B, Shi W, Lu R, Niu P, Zhan F, Ma X, Wang D, Xu W, Wu G, Gao GF, Tan W. China Novel Coronavirus Investigating and Research Team. A Novel Coronavirus from Patients with Pneumonia in China, 2019. *N Engl J Med* 2020;382(8):727-733.[PubMed:31978945]
- 2 Hui DS, I Azhar E, Madani TA, Ntoumi F, Kock R, Dar O, Ippolito G, Mchugh TD, Memish ZA, Drosten C, Zumla A, Petersen E. The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health - The latest 2019 novel coronavirus outbreak in Wuhan, China. *Int J Infect Dis* 2020;91:264–266.[PubMed:31953166]
- 3 Special Expert Group for Control of the Epidemic of Novel Coronavirus Pneumonia of the Chinese Preventive Medicine Association. An update on the epidemiological characteristics of novel coronavirus pneumonia (COVID-19). *Zhonghua Liu Xing Bing Xue Za Zhi* 2020;41(2):139–144.[PubMed:32057211]
- 4 Davis W. U.S. To Evacuate Americans From Virus-Struck Diamond Princess Cruise Ship. <https://www.whqr.org/post/us-evacuate-americans-virus-struck-diamond-princes-s-cruise-ship>.
- 5 Tan KW. Canada to evacuate passengers from virus-hit Diamond Princess cruise

ship.<https://klse.i3investor.com/blogs/kianweiaritcles/2020-02-16-story-h1483824197>

-Canada_to_evacuate_passengers_from_virus_hit_Diamond_Princess_cruise_sh.jsp.

6 Wang J. Hospital to add 1,000 beds for 2019-nCoV

patients.http://www.eyeshenzhen.com/content/2020-02/19/content_22881763.htm.

7 Lim J, Jeon S, Shin HY, Kim MJ, Seong YM, Lee WJ, Choe KW, Kang YM, Lee B,

Park SJ. Case of the Index Patient Who Caused Tertiary Transmission of COVID-19

Infection in Korea: the Application of Lopinavir/Ritonavir for the Treatment of

COVID-19 Infected Pneumonia Monitored by Quantitative RT-PCR. J Korean Med

Sci 2020;35(6):e79.[PubMed: 32056407]

