



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.

infected with SARS-CoV-2 will deepen our understanding of the whole process of occurrence, development, and transformation of COVID-19.

Acknowledgments

We thank the patients, the nurses, and the clinical staff who provided for taking good care of the patients.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.ajic.2020.03.017>.

References

1. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel corona virus from patients with pneumonia in China, 2019. *N Engl J Med*. 2020;382:727–733.
2. World Health Organization. Coronavirus disease (COVID-2019) situation reports-63. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/>. Accessed March 24, 2020.
3. Chen D, Xu W, Lei Z, Huang Z, Liu J, Gao Z, et al. Recurrence of positive SARS-CoV-2 RNA in COVID-19: a case report. *Int J Infect Dis*. 2020;93:297–299.
4. General Office of National Health Commission, General Office of National Administration of Traditional Chinese Medicine. Diagnostic and treatment protocol for Novel Coronavirus Pneumonia (Trial version 7, revised form). Available at: http://www.gov.cn/zhengce/zhengceku/2020-03/04/content_5486705.htm. Accessed March 3, 2020.
5. Chen L, Xiong J, Bao L, Shi Y. Convalescent plasma as a potential therapy for COVID-19. *Lancet Infect Dis*. 2020;20:398–400.
6. He Y, Wang Z, Li F, Shi Y. Public health might be endangered by possible prolonged discharge of SARS-CoV-2 in stool. *J Infect*. 2020;80:e18–e19.
7. Ong SWX, Tan YK, Chia PY, Lee TH, Ng OT, Wong MSY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. [e-pub ahead of print]. *JAMA*. <https://doi.org/10.1001/jama.2020.3227>. Accessed April 15, 2020.
8. Xie C, Jiang L, Huang G, Pu H, Gong B, Lin H, et al. Comparison of different samples for 2019 novel coronavirus detection by nucleic acid amplification tests. *Int J Infect Dis*. 2020;93:264–267.
9. Xiang Y, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiat*. 2020;7:228–229.
10. National Health Commission of the People's Republic of China: the phenomenon of human-to-human transmission did not appear in the discharged patients whose nucleic acid retest were positive. Available at: http://news.cnr.cn/dj/20200228/t20200228_524995969.shtml. Accessed February 28, 2020.

Conflict of interest statement: None to report.

Author contributions: P.-J.H. participated in the data collection and coordination and analyzed the clinical data. L.-E.Y. participated in the data collection. W.-M.K. and Z.-G. Q. conceived the study, participated in its design and coordination, and analyzed the clinical data. All authors helped draft the manuscript.

Patient consent: Written consent for publication was obtained from the patients.

Jianhui Peng, MD

Department of Quality Management, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

Mingke Wang, PhD*

Department of Epidemic Prevention, No. 92371 Unit Hospital of PLA, Fuding, Fujian, China

Gangqing Zhang, PhD**

Department of Hospital Affairs, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

Eying Lu, MD

Department of Infectious Disease, Guangdong Second Provincial General Hospital, Guangzhou, Guangdong, China

* Address correspondence to Mingke Wang, PhD, Department of Epidemic Prevention, No. 92371 Unit Hospital of PLA, No.21, Haida Rd, Fuding, Fujian, 355200, China.

** Address correspondence to Gangqing Zhang, PhD, Department of Hospital Affairs, Guangdong Second Provincial General Hospital, No.466, Xingangzhong Rd, Haizhu District, Guangzhou, Guangdong, 510317, China

E-mail addresses: wmke020@sina.com (M. Wang), 15813368002@163.com (G. Zhang).

<https://doi.org/10.1016/j.ajic.2020.03.017>

Low-cost production of handrubs and face shields in developing countries fighting the COVID19 pandemic



To the Editor(s):

The COVID-19 caused by the novel coronavirus now known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), has spread worldwide with its first reported case in late December 2019 in Wuhan city of China.¹

This rapidly growing pandemic has also affected many healthcare workers. A recent report from China classified an overall 14.8% of confirmed cases among health workers as severe or critical and 5 deaths were observed.²

Presently, the clinical spectrum of the disease is being defined including the potential for asymptomatic spread.³ So far, no specific treatment and prevention strategies like targeted antiviral drugs and vaccines are available for COVID-19. Thus, we can only depend on the traditional public health outbreak response practices— isolation, quarantine, social distancing, and community containment.⁴

Such times call for judicious and appropriate use of personal protective equipment (PPE)—gloves, masks, face shields, and handrubs among healthcare workers. In populous countries like India, judicious use of PPE can be a game-changer. Thus, the Infection Control Team at the JPNA Trauma Center, AIIMS, New Delhi has taken measures such as in-house production of the WHO-recommended handrubs on a large scale and indigenous face shields to be used by the healthcare workers in the hospital (Fig 1).⁵

The usefulness of both the in-house developed PPE has been tested by the treating clinicians at the Center. Both the formulations of handrubs—ethanol & isopropyl alcohol, have proved to be effective. The in-house made face shields were prepared using the readily available materials like foam, transparency sheets, and elastic bands. The cost of each face shield was just 15 Indian rupees INR. It took us approximately 2 minutes to make each face shields. The residents wore the face shield for almost 4 hours without discomfort. Such cost-effective measures towards preparedness to battle the pandemic could be taken by all healthcare facilities across the globe, to overcome the expected crises of PPE and halt the outbreak. With the expected shortage of masks, we are also looking at the option to make triple-layered masks using indigenous materials.



Fig 1. (A) Indigenously prepared WHO-recommended alcohol based handrubs. (B) In-house low-cost face shields made in the laboratory using readily available raw materials.

ACKNOWLEDGMENT

We acknowledge the support of the JPNA Trauma Center, AIIMS for providing us with the raw materials to produce these in-house PPE.

ETHICAL APPROVAL

Not applicable.

References

1. The Lancet Infectious Diseases. Challenges of coronavirus disease 2019. *Lancet Infect Dis* [Internet]. 2020;20:261. Available at: <https://linkinghub.elsevier.com/retrieve/pii/S1473309920300724>. Accessed March 30, 2020.
2. Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. Vital surveillances: the epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. *China CDC Wkly* [Internet]. Available at: <http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-fea8db1a8f51>. Accessed March 30, 2020.
3. Bai Y, Yao L, Wei T, et al. Presumed asymptomatic carrier transmission of COVID-19. *JAMA* [Internet]. 2020. Available at: <https://jamanetwork.com/journals/jama/fullarticle/2762028>. Accessed March 30, 2020.
4. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *Jama* [Internet]. 2020;2019:3–6. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/32091533>. Accessed March 30, 2020.
5. World Health Organization. *Guide To Local Production: Who-Recommended Handrub Formulations*. 2015;2015:1–9. Available at: https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf. Accessed March 30, 2020.

Conflict of Interest: None to report.

Surbhi Khurana, PhD
Parul Singh, MD
Laboratory Medicine, JPNA Trauma Center, All India Institute of Medical Sciences, New Delhi, India

Tej Prakash Sinha, MD
Sanjeev Bhoi, MD
Emergency Medicine, JPNA Trauma Center, All India Institute of Medical Sciences, New Delhi, India

Purva Mathur, MD*
Laboratory Medicine, JPNA Trauma Center, All India Institute of Medical Sciences, New Delhi, India

* Address correspondence to: Purva Mathur, MD, Laboratory Medicine, Jai Prakash Narayan Apex Trauma Center, All India Institute of Medical Sciences, Ansari Nagar, New Delhi 110029, India.

<https://doi.org/10.1016/j.ajic.2020.03.016>

Transfer of bacteriophage MS2 by handshake versus fist bump



To the Editor

The threat of emerging viral pathogens highlights the need for practical measures to reduce the risk for transmission. Contaminated hands are a common vector for transfer of viruses.¹ Consequently, some experts have called for a ban on the handshake in health care