

## COVID-19 Pandemic: Ways Forward

Raymond L.M. Wong, FCOphthHK, FHKAM(Ophthalmology)\*†‡§  
 Kenny H.W. Lai, FCOphthHK, FHKAM(Ophthalmology)\*†  
 Suber S. Huang, MD, MBA¶||, Jost B. Jonas, MD\*\*, and  
 Dennis S.C. Lam, MD, FRCOphth\*††‡‡‡‡

(Asia Pac J Ophthalmol (Phila) 2020;9:59–60)

The World Health Organization (WHO) declared Coronavirus Disease 2019 (COVID-19) a pandemic on March 11, 2020. This is a problem of all countries and every person in the world. COVID-19 is the pneumonia caused by the novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the seventh coronavirus that is capable to infect humans. The condition was first reported in early December 2019 in Wuhan city, China and subsequently became a pandemic in about 3 months. In addition to the strategy of early identification, contact tracing, isolation, and treatment, China locked down a few major cities despite its negative consequences on the country's economy. These strategies have been proven useful and the infection in China was successfully brought under control from about middle of March 2020. However, major outbreaks were reported in many countries including the United States, Italy, Spain, Iran, South Korea, and Japan. As of April 14, 2020, 210 countries and territories were affected: >1,900,000 confirmed cases worldwide with >110,000 deaths. The United States has >580,000 cases and is currently the country with the largest number of cases; whereas Italy has the highest case fatality rate (CFR) with >20,000 deaths. COVID-19 has an overall CFR of 6.2% (119,718/1,925,571) (as based on the diagnosed cases), which is <9.6% and 34.4% of Severe Acute Respiratory Syndrome and Middle-East Respiratory Syndrome, respectively.<sup>1</sup> Its infectivity, as indicated by Basic Reproduction Number ( $R_0$ ), is estimated to be between 3.3 and 6.6 according to different mathematical models, which is much higher than 0.95 for Severe Acute Respiratory Syndrome and 0.91 for Middle-East Respiratory Syndrome, and even higher than that of influenza.<sup>1–3</sup>

Some countries are considering to treat COVID-19 as that of influenza, without actively identifying the infected, implementing isolation or containment. The logic behind this is to hope that the infection spread to more than half of their citizens (eg, 60%), such that antibodies develop among them and achieve the goal of herd immunity. Although from a society point of view, this strategy might result in faster recovery of the economy; the high CFR would lead to numerous people losing their lives. South Korea has good health care standards, policy, and facility for mass identification of COVID-19; therefore, we can take reference of their CFR when estimating the true mortality rate of COVID-19 when health care system is functioning well. As of April 14, 2020, there were 10,564 confirmed cases in South Korea and 222 patients died of the disease, and the CFR was 2.1%. Taking the United States of America as an example, if herd immunity strategy is to be adopted, by definition, at least 60% of their 328 million population would have to be infected to achieve the goal, making the total case number of 196.8 million. If CFR is 1.6%, 3.1 million US citizens might die from COVID-19. This is already the optimistic situation where local hospitals are not suddenly overwhelmed and supportive care can still be provided to patients. Due to the aforesaid reasons, we believe the herd immunity strategy shall not be implemented in any country.

To reduce the morbidity and mortality, all countries should remain highly vigilant and there is an urgent need for effective national policies to keep their health care system from being overwhelmed. Countries and territories with successful containment of COVID-19 have demonstrated much lower CFR than countries with major outbreaks, probably due to overwhelmed and overstressed health care facilities. Therefore, the key to manage COVID-19 is the prevention of major outbreaks and flattening of the peak of incidence. To achieve this target, early case identification

From the \*C-MER Dennis Lam & Partners Eye Center, C-MER International Eye Care Group, Hong Kong; †C-MER (Shenzhen) Dennis Lam Eye Hospital, Shenzhen, Guangdong, China; ‡Department of Ophthalmology, The University of Hong Kong, Hong Kong; §Department of Ophthalmology and Visual Sciences, The Chinese University of Hong Kong, Hong Kong; ¶Retina Center of Ohio, Cleveland, OH, USA; ||Bascom Palmer Eye Institute, FL, USA; \*\*Department of Ophthalmology, Medical Faculty Mannheim of the Ruprecht-Karls-University Heidelberg, Heidelberg, Germany; ††International Eye Research Institute of The Chinese University of Hong Kong (Shenzhen), Shenzhen, China; and ‡‡Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University, Hong Kong.

Submitted February 6, 2020; accepted March 31, 2020.

The authors have no conflicts of interest to disclose.

Correspondence: Dennis S.C. Lam, C-MER Dennis Lam & Partners Eye Center, C-MER International Eye Care Group, Hong Kong. E-mail: dennislam@hkmer.com.

Copyright © 2020 Asia-Pacific Academy of Ophthalmology. Published by Wolters Kluwer Health, Inc. on behalf of the Asia-Pacific Academy of Ophthalmology. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

ISSN: 2162-0989

DOI: 10.1097/APO.0000000000000283

and isolation of confirmed and suspected cases and their close contacts shall be implemented in a strict and efficient way. As there is no specific treatment yet, supportive measures shall be provided to the sick; infection control with droplet precautions shall remain the most important part in all healthcare policies during this period. Research projects shall also be supported in a national level for the development of medications and vaccines.

Eye care professionals are at particular risk of acquiring COVID-19 due to many reasons such as close contacts with ophthalmology patients. The American Academy of Ophthalmology thus publishes daily updates on COVID-19, which is very relevant to ophthalmologists (see below). However, we have featured an article entitled, “COVID-19: Special Precautions in Ophthalmic Practice and FAQs on Personal Protection and Mask Selection” in the current issue of the *Asia-Pacific Journal of Ophthalmology* (APJO).<sup>4</sup> Furthermore, Lai et al have also recently published an article detailing the precautions needed in ophthalmic practice. All these may serve as a good reference for infection control in ophthalmic clinics and ophthalmology departments in hospitals.<sup>5</sup>

To understand the disease better is the best way to devise infection control strategies. There are a lot of information in the internet regarding the pandemic and the followings are in our opinion, some of the best resources available:

1. The Center for Systems Science and Engineering of John Hopkins has created an excellent website with the most updated number of infected in all countries: <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>
2. WHO has put up on their website a set of Frequently Asked Questions, which target at the general public, to give answers to common enquiries in layman terms: <https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>
3. The American Academy of Ophthalmology also publishes daily updates on their web page, providing information regarding the disease, mode of transmission, updates on case numbers, and new findings: <https://www.aaof.org/headline/d6e1ca3c-0c30-4b20-87e0-7668fa5bf906>
4. The Asia-Pacific Academy of Ophthalmology through its official journal, APJO, has also established a “COVID-19: FAQs” to serve as a resource platform not just for issues related to the understanding and prevention of the disease, but also other things such as humanity, government policy, market response, art, and science of COVID-19: <https://apjo-covid-faqs.org/>
5. The leading journals in the medical field have also established designated sessions for COVID-19 and allow free access to

their articles on this topic, for the easy reference of doctors and researchers:

- *New England Journal of Medicine* - <https://www.nejm.org/coronavirus>
- *LANCET* - <https://www.thelancet.com/coronavirus>
- *JAMA* - <https://jamanetwork.com/journals/jama/pages/coronavirus-alert>

The COVID-19 pandemic has reached a scale that total eradication is unlikely. Recurrence of outbreaks in future is possible. Our ultimate hope would be on effective vaccines for prevention and effective medications for treatment. China and the United States have already started Phase 1 studies respectively in early to mid-March 2020 for COVID-19 vaccines. We hope the vaccines can become available sooner instead of later. As for treatments, Remdesivir, originally designated for treating Ebola, chloroquine, hydroxychloroquine, and some other currently available drugs are being tried to treat COVID-19. Although good results have been claimed in anecdotal case reports, we need robust data including randomized controlled trials to assess the safety and efficacy of the above-mentioned drugs before widespread use can be considered. Before vaccines and/or definitive treatments are available, policy makers and health care providers should try their very best to delay the onset or progression of the outbreaks, as no medical systems would be able to withstand the sudden explosion of demand, especially in intensive care for the critically ill patients.

## REFERENCES

1. Wu JT, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. *Lancet*. 2020;395:689–697.
2. Zhao S, Lin Q, Ran J, et al. Preliminary estimation of the basic reproduction number of novel coronavirus (2019-nCoV) in China, from 2019 to 2020: a data-driven analysis in the early phase of the outbreak. *Int J Infect Dis*. 2020;92:214–217.
3. Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. The Novel Coronavirus, 2019-nCoV, is highly contagious and more infectious than initially estimated. 2020 (Preprint from medRxiv); doi: <https://doi.org/10.1101/2020.02.07.20021154>.
4. Lam DSC, Wong RLM, Lai KHW, et al. COVID-19: special precautions in ophthalmic practice and FAQs on personal protection and mask selection. *Asia Pac J Ophthalmol (Phila)*. 2020;9:67–77.
5. Lai THT, Tang EWH, Chau SKY, Fung KSC, Li KKW. Stepping up infection control measures in ophthalmology during the novel coronavirus outbreak: an experience from Hong Kong. *Graefes Arch Clin Exp Ophthalmol*. 2020; doi: 10.1007/s00417-020-04641-8.