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.

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OPINION

Ongoing Challenges Faced in the Global Control of COVID-19 Pandemic

Guillermo I. Perez Perez[a] and Amin Talebi Bezmin Abadi[b]

[a]*Langone Medical Center, New York University, New York, USA*
[b]*Department of Bacteriology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran*

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The recent pandemic caused by SARS-CoV-2 has now spread worldwide and caused more than 51,000 deaths, by April 2nd 2020. As predicted, there are several obstacles for medical and governmental authorities to efficiently manage this respiratory illness. In spite of appropriated supplies, most hospitals are suffering from a scarcity of free beds, protective masks, sanitizing liquids and even ECMO machines for patients with severe cases. Defeating this pandemic is impossible without united and coordinated international attempts shaped by all countries of the world. We believe that an international scaled-determination is required to diminish the complex impacts of pandemic. The most important priorities are supposed to be i) The development of potential vaccine candidates to provide protection and interrupt the transmission of SARS-CoV-2, ii) To ensure enough supplies for hospitals and their homogeneous distribution among the countries with the worst number of severe cases, iii) There is a need for more studies to identify potential treatments that are effective for the control of this viral infection and iv) It is imperative to provide easy access to diagnostic kits for all countries affected by this pandemic. In the light of these suggestions, it would be recommendable to at least temporarily abandon the political checkouts in both national and international levels; therefore, all partners will be potentially able to efficiently enforce their strategies for the elimination of this unique threat to the human populations.

Key Words: Challenge, SARS-CoV-2, COVID-19, Pandemic, WHO, Wuhan.

COVID-19 Pandemic

Following an early report of a series of patients with atypical pneumonia in Wuhan, China, a new emerging threat to public health was gradually discovered (1). This new outbreak caused by Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in the past, termed as 2019 novel coronavirus (2019-nCoV) later expanded from Wuhan to other regions in China and from there to almost all the countries in the world within a period of 3 months and accumulating more than two million cases and over 130,000 deaths by the time of writing this paper according to the Johns Hopkins University Coronavirus map (2–4). Since the predictable impact of any pandemic depends on the total number of infected cases and until now, we are unaware of correct estimate due to the lack of diagnostic tests, we are unable to assess the potential severity that would be faced by the different clinical settings around the world. Noted, high transmissibility of the SARS-CoV-2 and the less-recognized aspects of viral pathogenesis alongside its complex spectrum of clinical outcomes in infected cases are additional hampering elements complicating the puzzle of controlling the pandemic. On the March 11th 2020, after daily escalating rates of COVID-19 cases, the World Health Organization (WHO) assessed the outbreak as a pandemic to call for further coordinated attempts to decrease the medical and economic consequences of this pandemic as soon as possible (5). Over an eleven day period from March 19–30, 2020, the death toll due to Coronavirus increased 3.3 folds. In addition, the number of cases increased 2.9 folds in the same period of time (WHO situation reports 60 and 70) (4,6). The current pandemic is provoking many shortages in clinical settings, independently of the impact on the economic power of the countries affected, for example Italy and The United States (7,8). These shortages are a long list of items including: plastic gloves, surgical masks, sanitizing liquids, disposable lab coats. However, this shortage is even worse among specialized medical equipment and devices, including

Address reprint requests to: Amin Talebi Bezmin Abadi, Department of Bacteriology, Faculty of Medical Sciences, Tarbiat Modares University, P.O. Box 14115-111, Tehran, Iran; Phone: (+98) 21 8288 4883; FAX: (+98) 21 8288 4803; E-mail: Amin.talebi@modares.ac.ir

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intensive care unit (ICU) space, hospital beds, ventilators and extracorporeal machine oxygenation (ECMO) (8,9). On March 30rd 2020, WHO called for interrupt transmission chain among human to human and reduce transmission from the animal transporters (4). Talking together, authorities have recognized that they are unable to control the pandemic without shutting down normalized public life, following the strict behavior measurements established at global level by countries and people such as social distancing, in-house quarantine (self-isolation) and interruptive actions against the transmission chain. As such measurements are established, the expectation is to reduce the transmission rate and learn more to efficiently handle the ongoing pandemic and the next epidemic caused by this novel virus at national levels. In the next paragraph, we discuss the forthcoming challenges to prevent, control and eliminate the COVID-19 pandemic.

Forthcoming Challenges

a) From a microbiological and epidemiological point of view, vaccine and antiviral agents remain the first options to treat the COVID-19. Currently, there is no specific effective treatment against this viral infection. Recently, investigators have suggested that remdesivir could be one of the most promising agents to reduce the severity of the COVID-19 patients; however, the findings just raised initial hopes after the first round of trials and further examinations and rigorous clinical trials are required (10,11). In addition, many other potential treatments are included in clinical trials around the world.

No prophylactic or therapeutic vaccine has been validated yet. There are some laboratories working in at least seven possible vaccines, such as a new vaccine approach as Moderna has indicated (12). In addition, different research groups are working in utilizing the measles vaccine as the vehicle to deliver coronavirus antigens that may induce protection (13). Presumably, successful development of a vaccine or even antiviral drug may take several months and we do not have this amount of time to control the current pandemic. Our lack of knowledge to address the viral pathogenesis and genomic recombination has made us unable to talk fearlessly about recommendations of these approaches in the case of production of any preventive vaccine or effective drug). Therefore, a new generation of researchers should be specifically devoted to elucidate the molecular aspects of viral pathogenesis and the continuous whole genome sequencing of the isolates. There is an urgency in novel scientific information to help us to design a better roadmap to conquer this pandemic.

b) The rapid diagnosis tests of COVID-19 remain another challenge for health-related decision makers around the world. There are reliable approaches including RT-PCR and serological tests to facilitate and speed the diagnosis of the illness, but the problem is the limited access to these diagnostic assays in regions with a low socioeconomic level, mostly developing countries. We should not forget that successful diagnosing of COVID-19 is bound to case-tracing as the main policy in surveillance of the illness, especially in those countries in where there are low number of cases. We must determine exactly the number of people that are infected either with mild, subclinical or even influenza-like manifestations which may be under reported. These asymptomatic or non-classic cases also transmit the virus to new subjects and early testing could help to identify those cases and limit their exposure to new susceptible individuals. The availability of those rapid diagnosed kits will dramatically help all countries to quickly start to respond against any outbreak caused by the virus now as well in the future. The possibility of having these kits should not be called ‘‘idealistic’’, but necessary.

c) A surge of new patients is a looming event since naïve subjects who are exposed to asymptomatic cases will be at risk to acquire the infection and if clinical manifestations develop, they will end up being admitted to hospitals. This calls for more hospital facilities and equipment to host those patients. This is a major challenge for health systems all over the world. Even now, many countries are suffering shortages in ICU beds, ECMO machines and also free clear space for admitted patients. This problem requires immediate action to remedy worse scenarios that are possible for new positive cases with COVID-19 in developed countries.

Internationally-scaled Determination Required

There are some clear examples of how efficient some measures have been working in the control of COVID-19 pandemic, such as aggressive testing or house quarantine which has helped to decrease and/or stop the progression of COVID-19 outbreak in South Korea and China. The problem to stop the progression of this pandemic in other parts of the world has been the combination of several factors including lack of testing, economic fears, lack of interruption of social motility due to travel to touristic destinations and fear of social instability. Nowadays, we are facing an uncontrolled pandemic that would cause severe troubles for countries across the world. The problem is global, there is no time to create new obstacles or limiting actions imposed on certain countries based on politically different views. To be honest, COVID-19 poses a global threat and has created worldwide panic, thus solutions should be generalizable to larger scale rather than being

regional. Following the WHO declaring this situation a pandemic, all countries should be responsible and be committed to respond in a united and coordinated manner to reduce the further non-compensable costs imposed by COVID-19 to our lives. Last but not least, during the COVID-19 pandemic, it is recommended to temporarily abandon the political checkouts in both national and international levels; therefore, all partners would be able to focus on efficiently eliminating this furious threat.

Conflict of Interest

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