EDITORIAL

Experiences of surveillance, influential factors, and prevention to end the global coronavirus disease 2019 (COVID-19) pandemic

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The coronavirus disease 2019 (COVID-19) is a highly contagious respiratory disease. COVID-19 is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, previously provisionally named 2019 novel coronavirus or 2019-nCoV).[1] This positive and enveloped single-strain RNA virus shares many similarities with two other coronavirus, including the Middle East respiratory syndrome coronavirus (MERS-CoV) and the severe acute respiratory syndrome coronavirus (SARS-CoV).[2] On December 31, 2019, the WHO China Country Office was informed of cases of pneumonia of unknown etiology (unknown cause) detected in Wuhan City, Hubei Province of China.[3] As of 4:45 pm CET, February 7, 2021, COVID-19 cases were confirmed in almost all countries in the world with a total of 105 394 301 infected and 2 302 302 deaths.[4]

Like many infectious disease pandemics in the history, sudden attack of the COVID-19 presents a strict and fair test for human kind as a whole.[5-8] The pandemic can attack any person with any racial and socioeconomic backgrounds, and living in any areas of a country. Everyone is at risk for infection, regardless of age, gender, race, physical and mental health status, cultural and religious beliefs, and political positions.[7] Likewise any country can be affected no matter if it is an industrialized with high income, freedom and technologies; or in the process to achieve industrialization; or remaining as agricultural economy with limited resources.[8]

It is anticipated that the COVID-19 pandemic will not end any time soon. To enhance global efforts to end the pandemic, in this thematic issue of *Global Health Journal*, "Dynamics, impact, and prevention of the coronavirus disease 2019 (COVID-19) pandemic", we have collected and published 9 papers from different countries in Africa, Asian, America and Europe. These papers provide a glimpse of several key issues around the COVID-19. The purpose is to provide scientific evidence informing global health practice to end the COVID-19 epidemic across the globe.

To facilitate readers, we arranged the 9 papers in a logic order as follows. We present first two papers on dynamics of the COVID-19 pandemic, followed by two papers regarding influential factors at the national level and two papers on mental and physical health impact from the pandemic. After the pandemic dynamics and impact, two papers are presented describing risk factors at the national/state levels, followed by one paper on risk communication for COVID-19 control, and one on vaccination. The last paper is regarding China experience and lessons from other countries in controlling the pandemic.

1. Measuring the dynamics of COVID-19 pandemic

Effective control any pandemic of an infectious disease requires timely and detailed data on the daily dynamics and cross-geographic transmission.[6,9-10] Such surveillance data will inform the current status and time trends of the epidemic, evaluate the effectiveness of massive anti-epidemic actions and predict future trends. Two papers are included as examples for surveillance. One paper contributed by Bin Yu, Xinguang Chen, Shannan Rich, Qiqing Mo and Hong Yan focuses on the COVID-19 during the first 85 days in China using the second derivative model. This method was developed by two of the authors to monitor the COVID-19 epidemic during the first two months in China.[5]

To provide data on the COVID-19 in resource limited settings, a paper on the dynamics of COVID-19 in Kenya is included. The paper was contributed by Israel Nyaburi Nyadera, Francis Onditi, Moses Madadi Obimbo and Samson Kinyanjui Muchina. Detailed data on the pandemic from March 2020 to January 2021 were presented, including daily and weekly changes and differences across jurisdictions, and governmental response to the pandemic.

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2. Understanding influential factors at the national level

Knowledge about factors related to a pandemic is a pre-requisite for effective control of the epidemic.[10] To gain knowledge on factors that might have fueled the pandemic of COVID-19 at the national level, two papers are included. The first paper entitled "State fragility and the coronavirus disease 2019 (COVID-19) pandemic: an ecologic analysis of data from 146 countries" is contributed by Yuqi Duan, Junxiong Ma, Yangmu Huang, Xinguang Chen and Zhi-Jie Zheng. This is the first study to examine the socioeconomic, cultural and ideological vulnerability to COVID-19 of individual countries capitalizing on the Fragile States Index from the Fund for Peace.[11] The authors detected an array of country-level factors contributing to the differences in total confirmed COVID-19 cases and the attributed deaths.

The second paper was contributed by Lauren Aycock and Xinguang Chen. The paper is entitled "Levels of economic developement and the spread of coronavirus disease 2019 (COVID-19) in 50 U.S. States and territories and 28 European countries: an association analysis of aggregated data". With national data for countries in the Europe and state-level data in the U.S., this study revealed a significant and positive relation between total GDP and COVID-19 infections using a log linear model. Evidence presents in this paper highlights the importance of balance between development and human health with regard to the control of infectious disease pandemic.

3. Direct and indirect impacts from the COVID-19 pandemic

In addition to causing disease and death, COVID-19 may lead to other consequences in humans such as psychosocial environment for stress, drinking and suicide,[12] as well as in physical environment such as plastic and chemical pollutions.[13] As an integrative part of this thematic issue, we including two papers, with one on mental health impact from the pandemic and another on physical environmental impact from anti-epidemic measures. The mental health impact is a review paper entitled "The coronavirus disease 2019 (COVID-19) and global mental health", and contributed by Klaus W. Lange. The physical environmental impact is an empirical analysis of environmental data, contributed by Foued Chabane and Ali Arif. The paper is entitled "Determining the environmental and atmospheric effects of coronavirus disease 2019 (COVID-19) quarantining by studying the total aerosol optical depth (AOD), black carbon, organic matter, and sulfate in Blida City of Algeria".

4. Anti-epidemic measures for COVID-19 control

To end the COVID-19 effectively, all stockholders must be informed to enhance coordinated actions, particularly decision-makers in the government, public health agencies and healthcare providers, local communities, health professionals and the general public.[14-17] A paper by a group of authors led by Ernset Tambo is included to address this issue. The paper is entitled "Early stage risk communication and community engagement (RCCE) strategies and measures against the coronavirus disease 2019 (COVID-19) pandemic crisis" and it provides an overview of strategies for risk communication during the early stage of the pandemic to strength public trust and promote national response.

Historical experiences in public health practice repeatedly demonstrate the role of vaccine in the prevention and control of infectious disease pandemic.[11,18] An effective vaccine can show its power in control a disease only if it is accepted by an adequate number of persons who are at risk of infection.[11,19] As the last paper on prevention intervention, we included a paper "Barriers to vaccination for coronavirus disease 2019 (COVID-19) control: experience from the United States" by Rebecca J. Fisk. In this paper, the author summarized structural (or hard) as well attitudinal (or soft) barriers in detail based on past experience in the U.S. The author further pointed out that if not well addressed, these barriers may interfere with planned actions to distribute approved vaccines

to the general public. These U.S. experiences may be useful for other countries to plan and implement their vaccination programs.

5. China experiences

China is the country where COVID-19 cases were first reported probably due to the vigilance and public health capacity; and China is also the country that first brought the COVID-epidemic under control within a short period.[5,20] Experiences gained in China may be useful for other countries, particularly the low- and mid-income countries with limited sources. In this thematic issue, we include a review paper that discussed China experiences in contrast to the failure of COVID-19 controls in a few rich countries. The paper is contributed by a group of authors led by Isaac Iyinoluwa Olufadewa.

In conclusion, ending the COVID-19 pandemic requires collaboration and mutual support from all individuals at the family, school, neighborhoods, county, state, country and global levels. Pandemic attacks are often chaotic and catastrophic. There is no silver bullet and no one can predict its beginning and ending with accuracy. There is no use to blame anyone and it is never too late to take evidence-based actions. In addition to expand the knowledge basis with the 9 papers, this thematic issue offers a guidance to digest and translate the knowledge in the literature into effective actions against and ultimately ending the COVID-19 pandemic.

Competing interests

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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