Differentiating COVID-19 Response Strategies

Huipeng Liao,1 Lei Zhang,2,3,4,5 Gifty Marley,1,6 and Weiming Tang1,7,8,*

Globally, the COVID-19 pandemic brings different challenges to the impacted countries. To combat this pandemic, different strategies need to be tailored and implemented in countries with different situations. First, in countries with an ongoing explosion of the outbreak (i.e. the USA, Spain, and Italy), strategies suggested by the World Health Organization (WHO) which have been proven useful in China should be adopted for implementation. Secondly, countries in the regions that are still at the early stages of the outbreak (i.e., the Africa region, where many countries have only found imported cases) should further strengthen travel restrictions to reduce the risk of imported cases as well as the risk of developing local transmission. Furthermore, countries that have achieved great success in COVID control (i.e. China, South Korea, and Singapore) should continue implement the successful strategies and further roll-out strengthened new strategies to prevent new imported cases. In addition, surveillance on the genomic changes of SARS-CoV-2 is in need in all countries as some studies have found multiple mutants of SARS-CoV-2, although the impact of the mutation on the infectivity and lethality of the virus was still unclear.

By May 4th, 2020 around 3.5 million cases of COVID-19 had been reported outside China, with 62,514 new cases reported on a single day.1 European regions have contributed to more than half of the confirmed cases globally, with reports from Italy, Spain, Germany, France, the United Kingdom, and Switzerland accounting for about 10,000 of these cases by March 28 (Figure 1), thereby making the European region the largest COVID-19 pandemic center. This was very different from the situation on March 14 when Italy was the only European country with over 10,000 cases.1 In addition to Europe, North America has become the second-largest battlefield, and the number of confirmed cases in the United States rapidly increased to 124,739 on March 28.2 Although Iran has also been another epidemic center since early March, development of the disease outbreak in the Eastern Mediterranean Region has been slow and most of Iran's neighboring countries had reported less than 1,000 cases by March 28.3

The pattern of the global epidemic has changed dynamically from the first stage of a single epidemic center (China) in January and February to the second stage of multiple epidemic centers (Italy, Iran, and South Korea) in March. Toward the end of March, however, the world began experiencing a rapidly increasing number of cases with an estimated 50,000 cases confirmed globally per day. To combat this pandemic, different strategies need to be tailored and implemented in countries with different situations.
First, in countries with an ongoing explosion of the outbreak (i.e., the USA, Spain, and Italy), strategies suggested by the World Health Organization that have been proven useful in China should be adopted for implementation. For example, with China’s implementation of strict lockdown and social distancing during the onset of the outbreak, it only took 1 week for the number of new cases in Hubei province to reach a peak and to start declining.\(^3\)\(^4\) Although countries such as Italy adopted a similar lockdown strategy on March 8, the loose restrictions (i.e., allowing restaurants and bars to open during the day) still made the country lose most valuable time for containing the outbreak.\(^1\)\(^5\)\(^6\) As more nations began to lock down parts or the whole country in mid- and late-March, it became imperative that more rigorous restrictions with longer duration be followed, especially for countries that may have already been late in response to disease control.

Second, countries in the regions that are still at the early stages of the outbreak (i.e., Africa, where many countries have only found imported cases) should further strengthen travel restrictions to reduce the risk of imported cases as well as the risk of developing local transmission. In addition, based on the lessons learned from the countries that have experienced the severity of this pandemic, countries in the African region should implement stricter strategies in preventing the establishment of local transmission, allocating resources to improve testing and facilitating their preparation in response to any potential rapid local transmission. In addition, strategies aimed to reduce hospital-acquired infection, which usually happens at the early stage of the outbreak, should be emphasized. Given the limited resources in the region, researchers in the region should also focus on identifying the most cost-effective COVID-19 prevention and control strategies and facilitate the rapid implementation of these strategies to prevent the eruption of an epidemic center in the region.

Furthermore, countries that have achieved great success in COVID control (i.e., China, South Korea, and Singapore) should continue to implement the successful strategies suggested by the World Health Organization that have proven useful in China.

---

**Figure 1: Global Distribution of the COVID-19 Pandemic, 2020**

Transmission type was defined and classified by the World Health Organization.\(^1\) Data source: World Health Organization and 1Point3Acres.com. All the data are publicly available.
strategies and further roll out strengthened new strategies to prevent new imported cases. This also holds true for China, because most of its newly identified cases since March 16 have been imported. This triggered concerns about a possible outbreak resurgence, thereby prompting China to temporarily restrict the entry of foreigners and the number of international airlines from March 28.

In addition, surveillance on the genomic changes of SARS-CoV-2 is needed in all countries, because some studies have found multiple mutants of SARS-CoV-2, although the impact of the mutation on the infectivity and lethality of the virus is still unclear. We, therefore, recommend national laboratories keep track of the mutations of SARS-CoV-2, especially the genes determining the ability to infect humans and leading to death. Effective strategies of disease control that deal with the evolution of SARS-CoV-2 with higher infectivity or lethality should also be prepared in advance to prevent large-scale infections and high mortality.

The COVID-19 pandemic is the first pandemic in the twenty-first century. It has brought and will continue to bring many new changes to the world. While the implementation of some basic strategies (such as population sensitization about preventive measures) should be global, countries in different regions should consider their specific situations and develop effective tailored prevention strategies, based on the price China has already paid and the lessons learned.

Acknowledgments
This study was supported by the National Nature Science Foundation of China (81903371), the National Key Research and Development Program of China (2017YFE0103800), NIMH (R34MH119963), and the special fund for COVID-19 of Guangdong (2020KZDZX1047).

References
1. WHO. (2020). Novel Coronavirus (2019-nCoV) situation reports (World Health Organization). https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports.
2. 1Point3Acres.com (2020). COVID-19 in US and Canada: real time updates with credible sources. https://coronavirus.1point3acres.com.
3. China’s National Health Commission (2020). Epidemic notification. http://www.nhc.gov.cn/xcs/yqtb/list_gzbd.shtml.
4. Lin, F., and Han, J. (2020). 76 days, 14 days, 14 days, the key figures for Wuhan’s lifting the “lockdown” strategy. Nanfang Metropolis Daily http://news.southcn.com/china/content/2020-03/25/content_190642927.htm.
5. Donato, V., Reynolds, E., and Picheta, R. (2020). All of Italy Is in Lockdown as Coronavirus Cases Rise (CNN). https://edition.cnn.com/2020/03/09/europe/coronavirus-italy-lockdown-intl/index.html.
6. Amaro, S. (2020). No Weddings or Funerals: Here Are the New Coronavirus Restrictions in Italy (CNBC). https://www.cnbc.com/2020/03/10/italy-in-national-lockdown-heres-what-it-means.html.
7. Ministry of Foreign Affairs of the People’s Republic of China National Immigration Administration (2020). Announcement on the temporary suspension of entry by foreign nationals holding valid Chinese visas or residence permits. https://s.nia.gov.cn/mps/tztg/202003/t20200327_1194.html.
8. CAAC (2020). Notice on further reducing international passenger flights during the epidemic prevention and control period. http://www.caac.gov.cn/PHONE/XXGK_17/XXGK/TZTG/202003/P020200326766958017420.pdf.
9. Zhang, L., Shen, F.M., Chen, F., and Lin, Z. (2020). Origin and evolution of the 2019 novel coronavirus. Clin. Infect. Dis. https://doi.org/10.1093/cid/ciaa112.
10. Wang, M., Li, M., Ren, R., Brave, A., van der Werf, S., Chen, E.-Q., Zong, Z., Li, W., and Ying, B. (2020). International expansion of a novel SARS-CoV-2 mutant. medRxiv. https://doi.org/10.1101/2020.03.15.20035204.