



Economic Consequences of the COVID-19 Outbreak: the Need for Epidemic Preparedness

Anton Pak^{1†}, Oyelola A. Adegboye^{1*†}, Adeshina I. Adekunle¹, Kazi M. Rahman^{2,3}, Emma S. McBryde¹ and Damon P. Eisen¹

¹ Australian Institute of Tropical Health and Medicine, James Cook University, Townsville, QLD, Australia, ² North Coast Public Health Unit, New South Wales Health, Lismore, NSW, Australia, ³ The University of Sydney, University Centre for Rural Health, Lismore, NSW, Australia

OPEN ACCESS

Edited by:

Jonathan Ling,
University of Sunderland,
United Kingdom

Reviewed by:

Dimitris Ballas,
University of Groningen, Netherlands
Jacques Oosthuizen,
Edith Cowan University, Australia

*Correspondence:

Oyelola A. Adegboye
oyelola.adegboye@jcu.edu.au

[†]These authors share first authorship

Specialty section:

This article was submitted to
Public Health Policy,
a section of the journal
Frontiers in Public Health

Received: 30 March 2020

Accepted: 18 May 2020

Published: 29 May 2020

Citation:

Pak A, Adegboye OA, Adekunle AI,
Rahman KM, McBryde ES and
Eisen DP (2020) Economic
Consequences of the COVID-19
Outbreak: the Need for
Epidemic Preparedness.
Front. Public Health 8:241.
doi: 10.3389/fpubh.2020.00241

COVID-19 is not only a global pandemic and public health crisis; it has also severely affected the global economy and financial markets. Significant reductions in income, a rise in unemployment, and disruptions in the transportation, service, and manufacturing industries are among the consequences of the disease mitigation measures that have been implemented in many countries. It has become clear that most governments in the world underestimated the risks of rapid COVID-19 spread and were mostly reactive in their crisis response. As disease outbreaks are not likely to disappear in the near future, proactive international actions are required to not only save lives but also protect economic prosperity.

Keywords: SARS-CoV-2, COVID-19, global markets, economy, Coronavirus, pandemic

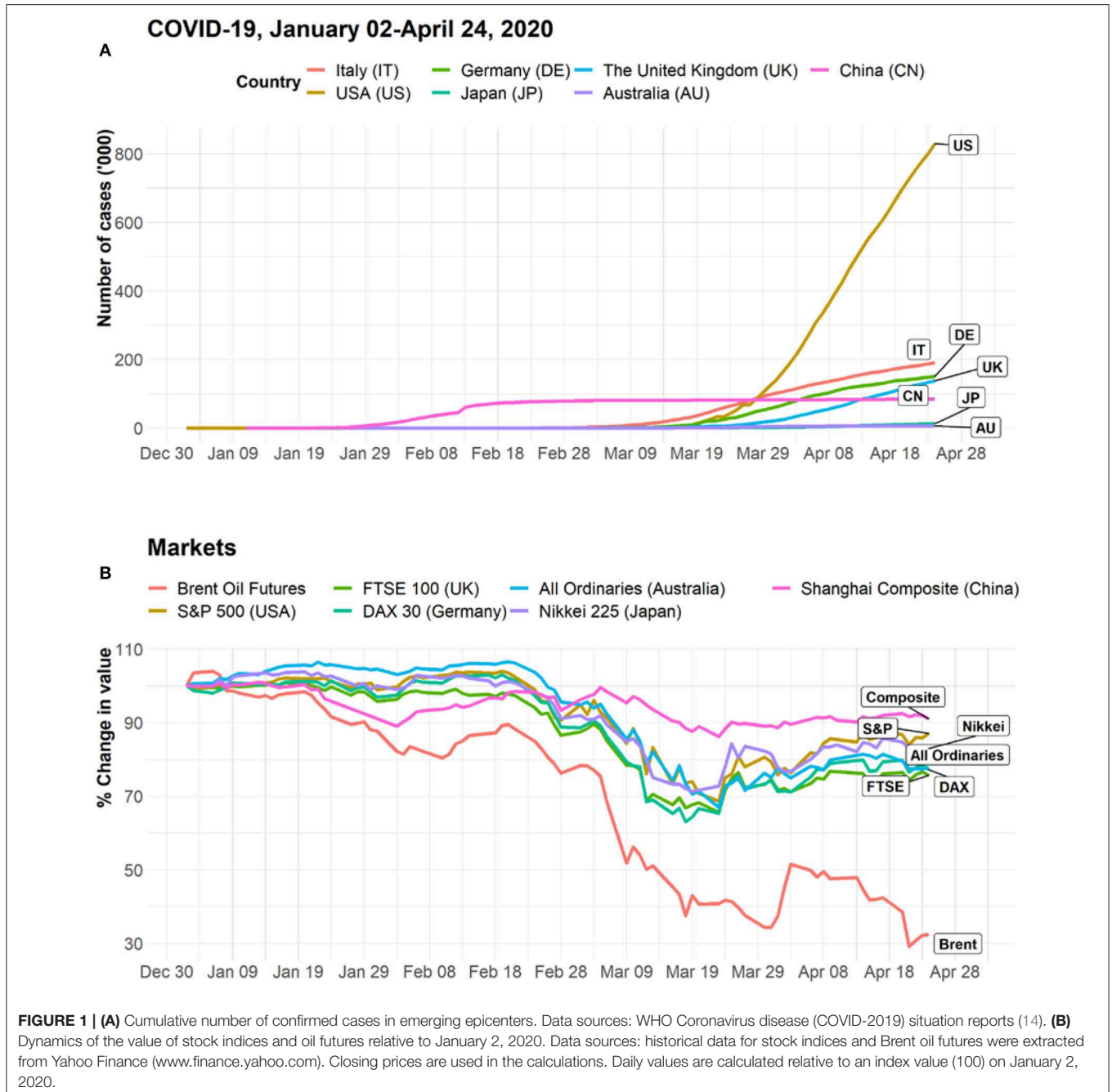
COVID-19 AND THE ECONOMY

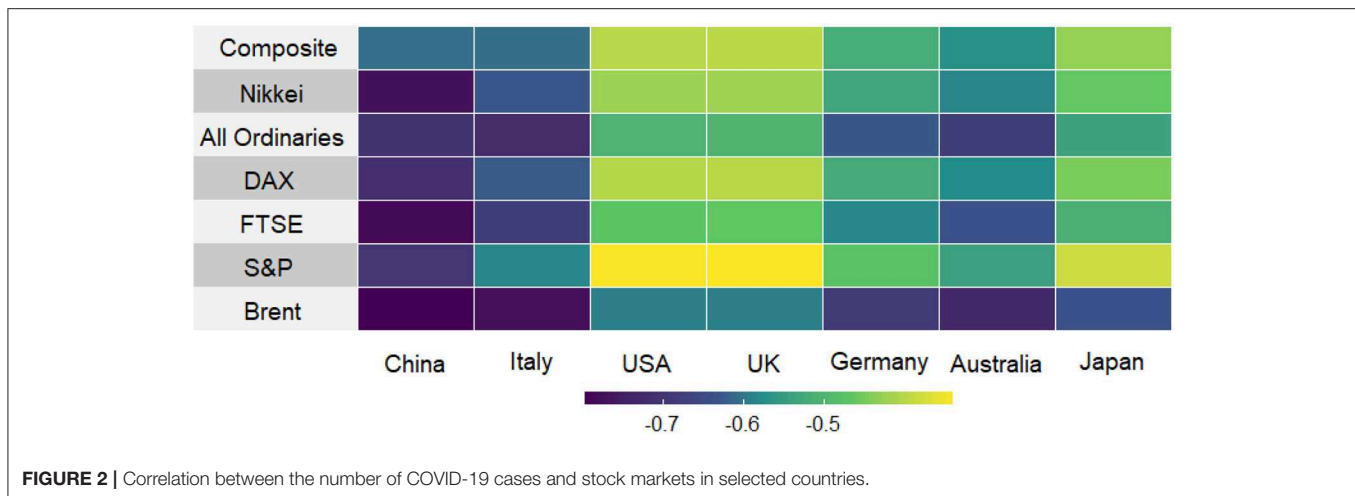
On March 11, 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic, pointing to over 3 million cases and 207,973 deaths in 213 countries and territories (1). The infection has not only become a public health crisis but has also affected the global economy. Significant economic impact has already occurred across the globe due to reduced productivity, loss of life, business closures, trade disruption, and decimation of the tourism industry. COVID-19 may be that a “wake-up” call for global leaders to intensify cooperation on epidemic preparedness and provide the necessary financing for international collective action. There has been ample information on the expected economic and health costs of infectious disease outbreaks (2, 3), but the world has failed to adequately invest in preventive and preparedness measures to mitigate the risks of large epidemics.

With globalization, urbanization, and environmental change, infectious disease outbreaks and epidemics have become global threats requiring a collective response. Although the majority of developed countries, predominantly European and North American, have strong real-time surveillance and health systems to manage infectious disease spread, improvements in public health capacity in low-income and high-risk countries—including human and animal surveillance, workforce preparedness, and strengthening laboratory resources—need to be supported by using national resources supplemented with international donor funding. International collective action among governments, non-government organizations, and private companies has been advocated in building and financing technological platforms to accelerate the research on and development response to new pathogens with epidemic potential (2, 4). In the case of COVID-19, such cooperation is critical, especially for the development and production of a vaccine.

The Coalition for Epidemic Preparedness Innovations (CEPI), a global partnership launched in 2017, has tracked global efforts in COVID-19 vaccine development activity and is advocating for strong international cooperation to ensure that vaccine, when developed, will be manufactured in sufficient quantities and that equitable access will be provided to all nations regardless of ability to pay (5). Furthermore, affected countries may benefit from exchanging technological innovations in contact tracing, such as health Quick Response (QR) codes, to manage the outbreak more effectively. However,

there are important privacy implications that need to be considered (6). In the case of COVID-19, the collective response and adoption of preventive measures to stop the global spread were implemented too late, after COVID-19 had already penetrated other regions through international travel. **Figure 1A** presents the dynamics of confirmed COVID-19 cases and shows that large countries in Europe (e.g., Italy, Germany, and the UK) and the U.S. have already outnumbered China, the origin of epidemic, in the number of confirmed COVID-19 cases.





In addition to the substantial burden on healthcare systems, COVID-19 has had major economic consequences for the affected countries. The COVID-19 pandemic has caused direct impacts on income due to premature deaths, workplace absenteeism, and reduction in productivity and has created a negative supply shock, with manufacturing productive activity slowing down due to global supply chain disruptions and closures of factories. For example, in China, the production index in February declined by more than 54% from the preceding month's value (7). In addition to the impact on productive economic activities, consumers typically changed their spending behavior, mainly due to decreased income and household finances, as well as the fear and panic that accompany the epidemic. Service industries such as tourism, hospitality, and transportation have suffered significant losses due to reduction in travel. The International Air Transport Association projects a loss in airline revenue solely from passenger carriage of up to \$314 billion (8). Restaurants and bars, travel and transportation, entertainment, and sensitive manufacturing are among the sectors in the U.S. that are the worst affected by the COVID-19 quarantine measures (9). The advance seasonally adjusted insured unemployment rate in the U.S. has already reached a record level of 11% for the week ending April 11, 2020 (10).

In addition to marked health inequalities, especially in countries without universal healthcare coverage, the economic impact of the COVID-19 pandemic will be heterogeneous across the country's income distribution. For example, office workers are more likely to transition to flexible working arrangements during the restrictions, while many industrial, tourism, retail, and transport workers will suffer a significant reduction in work due to community restrictions and low demand for their goods and services.

Global financial markets have been heavily impacted by the effects of COVID-19 spread. As the numbers of cases started to increase globally, mainly through the US, Italy, Spain, Germany, France, Iran, and South Korea, the world financial and oil markets significantly declined. Since the start of the year, leading U.S. and European stock market indices (the S&P 500, FTSE

100, CAC 40, and DAX) have lost a quarter of their value, with oil prices declining by more than 65% as of April 24, 2020 (Figure 1B). Daily data on stock market volatility and price movements are good indicators of consumer and business confidence in the economy. There were significant negative relationships between the daily number of COVID-19 cases and various stock indices (Figure 2). The correlation ranges from -0.34 to -0.80 .

Larger economic problems are associated with the current and potential future demand for oil translating into fluctuations in oil prices due to reduced economic activities driven by the COVID-19 pandemic. Expected excess supply was also responsible for significant price reductions. If lower than expected oil prices continue, many oil-dependent economies may contract following reductions in trade and investment. Shocks to the labor markets will be severe, especially for countries dependent on migration. Globally, migrant workers make important contributions to the labor markets, addressing imbalances in both high- and low-skilled occupations (11, 12). As international travel restrictions and quarantine are likely to remain for the foreseeable future as countries try to halt the spread of COVID-19, migration flows will be limited, hindering global economic growth, and development (13).

CONCLUSION

As the spread of the virus is likely to continue disrupting economic activity and negatively impact manufacturing and service industries, especially in developed countries, we expect that financial markets will continue to be volatile. There is still a question as to whether this unfolding crisis will have a lasting structural impact on the global economy or largely short-term financial and economic consequences. In either case, it is evident that communicable diseases such as COVID-19 have the potential to inflict severe economic and financial costs on regional and global economies. Because of high transportation connectivity, globalization, and economic interconnectedness, it has been extremely difficult and costly to

contain the virus and mitigate the importation risks once the disease started to spread in multiple locations. This warrants international collective action and global investment in vaccine development and distribution, as well as preventive measures including capacity building in real-time surveillance and the development of contact tracing capabilities at the national and international levels. As outbreaks of novel infections are not likely to disappear in the near future, proactive international

actions are required not only to save lives but also to protect economic prosperity.

AUTHOR CONTRIBUTIONS

AP and OA conceived and designed the study. AP and OA analyzed the data. AP, OA, AA, KR, EM, and DE contributed to the writing of the manuscript.

REFERENCES

- World Health Organization. *Coronavirus Disease 2019 (COVID-19): Situation Report 100*. Geneva (2020).
- Yamey G, Schäferhoff M, Aars OK, Bloom B, Carroll D, Chawla M, et al. Financing of international collective action for epidemic and pandemic preparedness. *Lancet Global Health*. (2017) 5:e742–4. doi: 10.1016/S2214-109X(17)30203-6
- Global Preparedness Monitoring Board. *A world at Risk: Annual Report on Global Preparedness for Health Emergencies*. Geneva: World Health Organization (2019).
- Katz R, Wentworth M, Quick J, Arabasadi A, Harris E, Geddes K, et al. Enhancing public–private cooperation in epidemic preparedness and response. *World Med Health Policy*. (2018) 10:420–5. doi: 10.1002/wmh3.281
- Le TT, Andreadakis Z, Kumar A, Román RG, Tollefsen S, Saville M, et al. The COVID-19 vaccine development landscape. *Nat Rev Drug Discov*. (2020) 19:305–6. doi: 10.1038/d41573-020-00073-5
- Cho H, Ippolito D, Yu YW. Contact tracing mobile apps for COVID-19: privacy considerations and related trade-offs. *arXiv [preprint]*. arXiv:2003.11511 (2020).
- National Bureau of Statistics of China. *Purchasing Managers Index for February 2020 National Bureau of Statistics of China* [Press Release]. Beijing: Department of Service Statistics of NBS. (2020). Available online at: http://www.stats.gov.cn/english/PressRelease/202003/t20200302_1729254.html (accessed 30 March 2020).
- International Air Transport Association. IATA Economics' Chart of the Week: return to air travel expected to be slow. In: *IATA Economics Report* (2020). Available online at: <https://www.iata.org/en/iata-repository/publications/economic-reports/return-to-air-travel-expected-to-be-slow/> (accessed 23 April 2020).
- Dey M, Loewenstein M. How many workers are employed in sectors directly affected by COVID-19 shutdowns, where do they work, and how much do they earn? *Monthly Labor Rev*. (2020). doi: 10.21916/mlr.2020.6
- U.S.Department of Labour. COVID-19 Impact The COVID-19 virus continues to impact the number of initial claims and insured unemployment. In: *Employment and Training Administration*. Washington, DC (2020).
- Green A. The role of migration in labour-market adjustment: the British experience in the 1980s. *Environ Plann A*. (1994) 26:1563–77. doi: 10.1068/a261563
- Castles S. Migration, crisis, and the global labour market. *Globalizations*. (2011) 8:311–24. doi: 10.1080/14747731.2011.576847
- Food and Agriculture Organisation of the United Nations. *Migrant workers and the COVID-19 Pandemic*. Rome (2020).
- World Health Organization. *Coronavirus Disease (COVID-2019) Situation Reports*. Geneva (2020).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Pak, Adegboye, Adekunle, Rahman, McBryde and Eisen. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.