

Isaac Iyinoluwa Olufadewa<sup>1,2</sup>, Miracle Ayomikun Adesina<sup>1,2</sup>, Ruth Ifeoluwa Oladele<sup>1,2</sup>, Moyinoluwa Joshua Oladoye<sup>1,3</sup>, Temiwunmi Akinmuleya<sup>1</sup>, Eric Ogunleye<sup>1,4</sup>

<sup>1</sup>Slum and Rural Health Initiative Research Academy, Ibadan, Nigeria, Nigeria <sup>2</sup>College of Medicine, University of Ibadan, Nigeria, Nigeria <sup>3</sup>Faculty of Veterinary Medicine, University of Ibadan, Nigeria, Nigeria <sup>4</sup>Department of Nursing, University of Ibadan, Ibadan, Oyo State, Nigeria, Nigeria

# **COVID-19 and the economy: job loss and economic shutdown**

#### Corresponding author:

Moyinoluwa Joshua Oladoye, e-mail: oladoyemoyinoluwalogo@gmail.com

Medical Research Journal 2021; Volume 6, Number 2, 125–130 DOI: 10.5603/MRJ.a2021.0019 Copyright © 2021 Via Medica ISSN 2451-2591 e-ISSN 2451-4101

#### ABSTRACT

The COVID-19 pandemic devastated several countries across the globe, having economic, social, and health impacts on all nations, some more than others with over 31 million infection cases and almost 1 million deaths as a result of the pandemic. This has caused a ripple effect on the agricultural sector as seen by the food scarcity and the increase in food spoilage ravaging the sector as many local farmers are unable to transport their produce to consumers. The pandemic has also confronted the hospitality industry with an unprecedented challenge as a result of the temporary closure they had to experience due to the lockdown imposed in affected countries. The transport sector is not excluded though to the positive side as there has been a decrease in air pollution within some countries due to the various travel restrictions and bans placed on the movement of people. Another sector seriously hit by the pandemic is the tourism sector as there has been a projected loss of about \$1.2 trillion equivalent to 1.5% of the global Gross Domestic Product (GDP). The same goes for the sports sector as major tournaments have either been cancelled or postponed. This paper discusses the impact of COVID-19 on the global economy and its corresponding implication on job loss in various sectors. With the daily increase in the number of infected cases globally, systems and structures which will be able to neutralize the effects of future pandemics need to be put in place and reviewed from time to time.

Key words: COVID-19, Economy, Agriculture, Tourism, Travel, Sports

Med Res J 2021; 6 (2): 125-130

#### Introduction

The Coronavirus (COVID-19) pandemic devastated several countries across the globe, having economic, social and health impacts on all nations, some more than others. According to the World Health Organization, over 31 million people have been infected and almost 1 million have died as a result of the pandemic. With a fast transmission rate and increased mortality, it became imperative for government to place restrictions on travelling, close borders and put structures in place for a lockdown [1]. While these stringent measures were necessary, they were not without several implications on the global economy. In several countries, particularly major economies, there were predictions about economic recessions as a result of lockdown measures and travel restrictions [2]. The pandemic dealt a strong blow to the economies of several countries across the globe and several sectors of the economy. The pandemic has drastically affected daily operations and the conduct of routine activities including many businesses. There has been a sharp decline in product manufacturing in most countries [3]. Some of the sectors that have been affected by these drastic changes include but are not limited to: Healthcare, Tourism, Agriculture, Sports, Entertainment, Hospitality and Restaurants [4].

The strong interconnectivity of the world points to the fact that the implications of a pandemic would not only be medical but also economic. China serves as a major source of raw materials but with the pandemic beginning in Wuhan, China, a sharp decline in productivity ensued, followed by a decline in consumption and an ultimately negative downturn of the economy [5].

This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

Such a downturn has affected the global economy and the finance of countries around the world. COVID-19 is having major influences on the world economy, and experts have projected that COVID-19 will lower global gross domestic product growth by one-half a percentage point for 2020 (from 2.9% to 2.4%) [6]. There have also been reports showing the negative effects of the pandemic on mental health and psychosocial wellbeing [7]. While this has been strongly linked to several factors such as false news, restrictions on travels, gatherings and education, the financial markets have been hit hard with fake news having effects on stocks [8]. The news of new infections increases the volatility of the financial markets in the US, causing remarkable fluctuations in the financial market [9]. Certainly, the pandemic is accompanied by serious consequences for the global economies. Financial institutions such as banks have experienced severe setbacks in the form of elevated levels of liquidity risk, loan defaults and loss of intermediation revenues [10]. Such volatility eventually tends to have a ripple effect on businesses and individuals alike.

With the inevitable bans placed on travel and movement, both between countries and within countries, there is much impact on the wellbeing of people and their daily lives. Several businesses have had to shut down operations during the pandemic while some have had to downsize staff strength to accommodate changes in the economy. A 2020 study carried out showed that high income earning customers decreased spending, harming small businesses [11]. Several studies examine such negative impact of the pandemic on businesses. One of such studies carried out in the US showed that there were increases in layoffs and closures occurring only a few weeks into the pandemic [12]. Consequently, the closures lengthened as the infection spread. Another study carried out in Canada showed that there was a 32% decrease in working hours as a result of the pandemic, the majority of the workers who lost their jobs earned the lowest [13]. Other evidence shows that unemployment rates increased in the US to 12.99% in workers aged 25-44, with women being more affected by the pandemic-induced unemployment [14]. With the drop in business activity, there was a rise in unemployment.

The economic implication of the pandemic on the health sector has been quite significant. It is estimated that a single symptomatic COVID-19 infection costs about \$3045 in direct medical costs [15]. Health care systems need to be able to access extra funding to cover such costs and to withstand the increasing future demands on health care services [16]. Countries having a high burden of COVID-19 will benefit from such expansions. To control the infection rates, movement restrictions included restricted visits to the hospital and cancellation of elective surgeries resulting in a financial downturn for hospitals carrying out these procedures [17, 18]. In the face of these challenges, health innovations such as telemedicine have expanded and there is a greater demand for virtual technologies in health care delivery [19]. The pandemic also decreased access to healthcare and medicines for people living in rural communities in Bangladesh, Kenya, Pakistan and Nigeria [20]. Drastic reduction in the supply of medical devices and Personal Protective Equipment (PPE) reguired for managing COVID-19 patients and performing routine medical procedures has been reported due to increased demands [21]. The pandemic has equally had significant effects on the retail industry. The report shows panic buying amongst consumers, particularly for food, and supplies such as hand sanitisers [22]. There has been increased spending amongst people for food, while spending on hospitality has decreased drastically [23]. This paper discusses the impact of COVID-19 on the global economy and its corresponding implication on job loss in various sectors.

#### Review

## The Impact of COVID-19 on various sectors of the economy

As with any pandemic, the COVID-19 virus has had a huge effect on the various aspects of human living and the economy. The various strategies such as quarantines, bans on public gatherings and lockdown of various business enterprises among many are some of the strategies which have greatly slowed down the economic growth of various countries of the world. With the virus infecting residents of most continents in the world, its effects are sure to be numerous and well spread. In a publication released by the World Bank, Global Gross Domestic Product (GDP) is expected to decline by 2.1%, while developing countries' GDP is expected to decline by 2.5% and high-income countries by 1.9%. East Asia and Pacific (EAP) countries have been hinted to experience the biggest GDP losses under the global pandemic scenario due to their relatively deep relation through trade and direct impact on tourism, e.g., Cambodia (3.2 %), Singapore (2.1%), Hong Kong SAR, China (2.3%), Thailand (3%), Vietnam (2.7%), and Malaysia (2.1%) [22].

#### Impact of COVID-19 on agriculture

A release by the Food and Agriculture Organization stated that COVID-19 has affected agriculture in two significant aspects: the supply and demand for food, which is directly related to food security, hence putting food security at risks [23]. Food supply chain refers to a network that connects an agricultural system (the farm) with the consumer's table, including processes such as manufacturing, packaging, distribution, and storage [24]. Initially, the problem of food insecurity began with the announcements of social isolation which made people go to the supply centres hence generating a shortage of certain products. The food supply has stabilized due to the activities of various non-governmental organizations (NGOs) because it is one of the systems that must be maintained to ensure food security [25]. Food safety was among the four pillars of the food systems affected in the era of the coronavirus (COVID-19) pandemic [26, 29].

Another area which has been greatly affected is the demand for food. Demand generally refers to the willingness and ability of consumers to pay money for a particular good or service, during any particular period [26]. During the COVID-19 pandemic, the demand for food was found to have greatly reduced due to the uncertainty and the reduction of people's spending capacity, although this decrease is still slight; the situation is expected to worsen if the pandemic continues for a long time, due to reduced income and job losses [27]. China where the COVID-19 disease started, represents an important market in world trade; this experience has shown an increase in online demand in the food and beverage sector, due to the guarantine policies [23]. In situations like these, where the mode of transmission of the virus is by contact, contactless delivery services have been embraced by consumers. Some start-up companies and big corporations have adopted the use of drones and online retail stores in reaching their customers. Also, food security ensures that everyone within the society has access to adequate feeding and nutrition. This implies that everyone has unrestricted access to food that allows them to satisfy their basic needs [28]. With the outbreak, this has been difficult to attain as a result of the various travel bans imposed by many countries, as most countries rely on produce from other nations in feeding their citizens. This in the long-run has led to food scarcity at one time or the other during the pandemic. Another negative impact of the COVID-19 outbreak is the increase in food spoilage as many local farmers are unable to transport their produce to consumers.

Little is still understood about the nature of the spread of the virus through food despite the precautionary measures (e.g., during food preparation) being applied at the consumption stage. For example, at the beginning of the crisis, many restaurants, cafeterias, and health authorities in Central Europe stopped serving rare steaks and meats as a general precaution measure [30] against viruses and pathogens even though foodborne transmission of SARS-CoV-2 is yet to be backed up by scientific evidence. Also, in the United States, some of the largest beef-packing and meat processing companies announced plant closures [31]. Nonetheless, the closure of these plants was only affected when employees started testing positive for COVID-19 and not because of the virus transmission from raw meat, which is why FDA did not anticipate that food products need to be recalled from the market [32].

#### Impact of COVID-19 on restaurant businesses

As a result of the COVID-19 pandemic, the world's economy was put to a halt almost overnight [33]. The pandemic has since then confronted the hospitality industry with an unprecedented challenge. Strategies put in place in an attempt to flatten the COVID-19 curve such as community lockdowns, social distancing, stayat-home orders, travel and mobility restrictions have resulted in a temporary closure of many hospitality businesses and significantly decreased the demand for businesses that were allowed to continue to operate [34]. Almost all restaurants were asked to limit their operations to only take-outs. This has been an aftermath of the stay-at-home orders issued by the authorities resulting in a rapid decline in hotel occupancies and revenues. However, despite the reopening process which has slowly begun which authorities have started to ease restrictions, for example, allowing dine-in restaurants to reopen at a reduced capacity with strict social distancing guidelines, and gradually reduce restrictions on domestic and international travel [35]. The loss in terms of revenues and income cannot be easily forgotten.

Reports from previous outbreaks (MERS and SARS-CoV) [32, 36] show no evidence that validates food as a means of transmission for the viruses while a study reveals that the acidic status of the stomach (pH < 3.5) inactivates the coronavirus [37]. The MERS and SARS-CoV, which possibly originated from bats, crossed the species barrier and infected humans through an intermediate host which could be a domestic animal, a wild animal, or a domesticated wild animal suggesting that transmission of SARS-CoV-2 could eventually occur in like manner [38, 39]. Based on this fact, some cooking and eating habits may be risk factors for the re-emergence of the virus into the human population [40].

Evidence shows that the Coronavirus may reach fresh food products (e.g., vegetables, fruits, or bakery) or food packaging through an infected person who sneezes or coughs directly on them [41]. Transmission may therefore be possible if the virus is transferred shortly afterwards via the hands or the food itself to the mucous membranes of the mouth, throat, or eyes [42]. With such a protracted impact, many studies have observed that despite the recent easing of lockdown regulations and bans, it would still be difficult for people to eat together in numbers at restaurants as a lot of fear and panic still surrounds the spread of the virus. For example, a study indicates the psychological acceptance of a good number of customers to the old strategy of restaurant operation only when COVID-19 conditions improve [35]. In a random survey with customers of a restaurant and a hotel, it was discovered that limiting the number of customers served, social distancing implementation, regular cleaning of high-touch surfaces in common areas, and employee training of health and safety protocols are considered as the most important safety precautions, this underscores the need for more behavioural research in determining the effects of these operational strategies on customers' attitudes and behaviours [43]. However, the fact remains that without a cure or definite treatment, owners of food service companies would continue to feel the financial implications of the virus.

Finally, even though the COVID-19 pandemic has dealt with the hospitality industry and academia with uncharted challenges, it has also presented great research opportunities for hospitality scholars [43]. Also, it has provided restaurants with the opportunity to experiment with various forms of digital and social marketing strategies. It has provided them with an avenue to experiment with the latest trends in food delivery service and packaging.

## Impact of COVID-19 pandemic on the transport industry

In a study carried out in the UK aimed at exploring the impact of the COVID-19 pandemic on transport concerning the health sector, it was observed that there was a considerable decrease in air pollution within the country due to the various travel restrictions and bans placed on the movement of people. This has been attributed to the reduced use of automobiles during the pandemic lockdown [44]. According to data from Google mobility reports, there is an 80% decrease in the number of passengers that patronize public transit locations in many countries.

Another effect of the movement restrictions and travel ban on transportation during the COVID-19 pandemic is the reduction in the migration of people from a country to another. This in a way has proven to be of importance to maximum utilization of resources available within the country. Another study concluded that the various lockdown responses to coronavirus disease 2019 (COVID-19) have resulted in an unprecedented reduction in global economic and transport activity [45]. Some of the lockdown measures included partial or complete closure of international borders, schools, and non-essential businesses and, in some cases, restricted citizen mobility.

#### Impact of COVID-19 pandemic on tourism

About a decade ago, a study revealed perceptively that crisis events in tourism were likely to increase in size and frequency as a result of tourism becoming more hypermobile and the global economy ever more intertwined [46]. This has become the case in the situation we've now found ourselves in a vastly diversified and rich economy where over 100 countries have recovered cases of the much-dreaded virus with many of them having imposed inter-country travel bans and local restrictions. In time past, it has been found that the tourism sector is highly vulnerable to disruption by natural hazard events in terms of localized phenomenon such as earthquakes, bushfires, volcanic explosions, tsunamis or floods as well as global events such as disease pandemics [47, 48].

It has also been argued that in a highly connected and globalized world marked by high levels of mobility, the human networks for the diffusion of COVID-19 are vast and open. The spatial spread of the coronavirus is already destroying national and local economies and more so triggering the worst economic and humanitarian crisis since the Second World War. In the tourism sector, the appearance of the COVID-19 pandemic represents an exceptional shock event posing its greatest challenge since the 2008 global financial crisis [49].

The tourism industry contributed the US \$8.9 trillion to the world's total gross domestic product (GDP) which represents 10.3% of global GDP, and also equivalent to 330 million jobs (1 in 10 jobs around the world), estimated as the US \$948 billion in capital investment (4.3% of global investments) and about US\$1.7 trillion of visitor exports, as reported in 2019. [50]. On the 1<sup>st</sup> of July 2020, the United Nations (UN) conference for Trade and Development revealed that the world's tourism sector is at risk of losing at least \$1.2 trillion equivalent to 1.5% of the global GDP, owing to the 4-month shutdown of activities in a bid to mitigate the pandemic spread [51].

The UN's trade and development body also warned against a looming loss of \$2.2 trillion equivalent to 2.8% of the world's GDP if the suspension of activities in the tourism industry extends beyond eight months as projected by the UN World Tourism Organization (UNWTO) [51]. According to the UNWTO, this poses the risk of increased poverty in most low and middle-income countries (LMICs) where economic growth rests solely on tourism activities having experienced an increase in value from \$490 billion to \$1.6 trillion in the last 20 years [51]. It is no surprise that African countries would be some of the most heavily hit by these losses as already revealed in a study carried out in South Africa. According to the study, in an annual report released by the South African Tourism in 2016, the tourism market reached a record level of R102 billion, which comprised

of R26.5 billion from domestic tourism and R75.5 billion from international tourism making about 6.1% of the country's GDP [47]. With the pandemic, it is expected that about 200 municipalities within the country would be hit by the reduction in tourism activities during the lockdown caused by the COVID-19 outbreak. In another study, a critical reconsideration of the exponential growth model for tourism has been suggested; this is in tandem with the risks incurred in global travels and its overall effect on climate change [49].

#### Impact of COVID-19 pandemic on sports

In a report by United Nations, the global value of the sports industry is estimated at the US \$756 billion annually. With the current COVID-19 outbreak, several jobs are at risk globally, not only for sports professionals but also for those in related industries in close partnership with sports events [52]. In another report, it was predicted that if sports remain shut down for a total of three months or more, there might be a projected total loss of \$12.3 billion in earnings by mid-June which equates to an average of \$133.4 million in earnings every day, or \$92.6K every minute [53].

Despite the severity of past infectious cases such as the H1N1 influenza pandemic two mega-sport events still took place: the Vancouver 2010 Winter Olympics and the 2010 Fédération Internationale de Football Association (FIFA) World Cup in South Africa. Also, during the outbreak of the Ebola virus disease in West Africa, the 2015 Africa Cup of Nations (in Equatorial Guinea) took place, along with the Rio 2016 Olympics in Brazil, during the outbreak of the Zika virus, although some athletes refused to attend because of the threat of infection [54]. However, this has not been the case with the COVID-19 virus outbreak. All major sporting tournaments such as the Union of European Football Associations (UEFA) EURO 2020, Summer Olympics in Tokyo, football leagues, tennis tournaments and other contact sports had to be cancelled or postponed. This has mainly resulted in a loss of revenue and investments in economies that are mainly driven by sports. Sports are one of the unifying human activities where everyone can participate and a major form of entertainment.

### **Recommendation and conclusion**

Daily reports show that the number of people infected with the COVID-19 virus continues to rise with total infected cases expected to rise further. Despite the various easing on lockdown restrictions and lifting of bans, it is expected that it would take a while for the world economy to bounce back to normal. The impacts of the COVID-19 virus will still be felt years to come especially in many developing economies and low resource areas. The best we can all do is to provide a helping hand to those that are much more affected by the outbreak, governments and organizations need to direct efforts towards relief plans which will help people gain their footings and proper reseach funding to come up with therapeutic solutions to the virus [55, 56]. To prevent a future breakdown in our economy, we must all be prepared to battle any unforeseeable outbreak by adopting the 'One Health' approach [57, 58]. Systems and structures which will be able to neutralize the effects of future pandemics need to be put in place and reviewed from time to time.

Conflict of interests: The authors received no financial support for the research and/or authorship of this article. There is no conflict of interest. Ethical approval: Not applicable. Funding: None.

#### References

- Al Jazeera. Coronavirus: travel restrictions, border shutdowns by country | Coronavirus pandemic News. 2020. https://www.aljazeera. com/news/2020/6/3/coronavirus-travel-restrictions-border-shutdownsby-country (2020 Dec 19).
- Nicola M, Alsafi Z, Sohrabi C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. Int J Surg. 2020; 78: 185–193, doi: 10.1016/j.ijsu.2020.04.018, indexed in Pubmed: 32305533.
- Haleem A, Javaid M, Vaishya R. Effects of COVID-19 pandemic in daily life. Curr Med Res Pract. 2020; 10(2): 78–79, doi: 10.1016/j. cmrp.2020.03.011, indexed in Pubmed: 32292804.
- Maital S, and Ba. The Global Economic Impact of COVID-19: A Summary of Research. Samuel Neaman Institute for National Policy Research.; 2020: 1–12.
- Gupta M, Abdelmaksoud A, Jafferany M, et al. COVID-19 and economy. Dermatol Ther. 2020; 33(4): e13329, doi: 10.1111/dth.13329, indexed in Pubmed: 32216130.
- Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review. Int J Emerg Med. 2020; 13(1): 40, doi: 10.1186/s12245-020-00299-5, indexed in Pubmed: 32689925.
- Ashraf BN. Economic impact of government interventions during the COVID-19 pandemic: International evidence from financial markets. J Behav Exp Finance. 2020; 27: 100371, doi: 10.1016/j. jbef.2020.100371, indexed in Pubmed: 32835011.
- Albulescu CT. COVID-19 and the United States financial markets' volatility. Financ Res Lett. 2021; 38: 101699, doi: 10.1016/j.frl.2020.101699, indexed in Pubmed: 32837380.
- Rizwan MS, Ghufran A, Dawood A. Systemic Risk: The Impact of COVID-19. SSRN Electronic Journal., doi: 10.2139/ssrn.3615161.
- Chetty R, Friedman JN, Hendren N, et al. How did COVID-19 and stabilization policies affect spending and employment: A New Real Time Economic Tracker based on private sector data. NBER Working paper.; 2020(w27431).
- Bartik AW, Bertrand M, Cullen Z, et al. The impact of COVID-19 on small business outcomes and expectations. Proc Natl Acad Sci U S A. 2020; 117(30): 17656–17666, doi: 10.1073/pnas.2006991117, indexed in Pubmed: 32651281.
- Lemieux T, Milligan K, Schirle T, et al. Initial Impacts of the COVID-19 Pandemic on the Canadian Labour Market. Canadian Public Policy. 2020; 46(s1): S55–S65, doi: 10.3138/cpp.2020-049.
- Bui T, Button P, Picciotti E. Early Evidence on the Impact of COVID-19 and the Recession on Older Workers. National Public Policy & Aging Report. 2020; 30(4): 154–159, doi: 10.3386/w27448.

- Bartsch SM, Ferguson MC, McKinnell JA, et al. The potential health care costs and resource use associated with COVID-19 in the United States. Health Aff (Millwood). 2020; 39(6): 927–935, doi: 10.1377/hlthaff.2020.00426, indexed in Pubmed: 32324428.
- Carter P, Anderson M, Mossialos E. Health system, public health, and economic implications of managing COVID-19 from a cardiovascular perspective. Eur Heart J. 2020; 41(27): 2516–2518, doi: 10.1093/eurheartj/ehaa342, indexed in Pubmed: 32320040.
- Anoushiravani AA, O'Connor CM, DiCaprio MR, et al. Economic impacts of the COVID-19 crisis: an orthopaedic perspective. J Bone Joint Surg Am. 2020; 102(11): 937–941, doi: 10.2106/JBJS.20.00557, indexed in Pubmed: 32496743.
- Iyengar K, Mabrouk A, Jain VK, et al. Learning opportunities from COVID-19 and future effects on health care system. Diabetes Metab Syndr. 2020; 14(5): 943–946, doi: 10.1016/j.dsx.2020.06.036, indexed in Pubmed: 32599533.
- Ahmed SA, Ajisola M, Azeem K, et al. Improving Health in Slums Collaborative. Impact of the societal response to COVID-19 on access to healthcare for non-COVID-19 health issues in slum communities of Bangladesh, Kenya, Nigeria and Pakistan: results of pre-COVID and COVID-19 lockdown stakeholder engagements. BMJ Glob Health. 2020; 5(8), doi: 10.1136/bmjgh-2020-003042, indexed in Pubmed: 32819917.
- Gereffi G. What does the COVID-19 pandemic teach us about global value chains? The case of medical supplies. Journal of International Business Policy. 2020; 3(3): 287–301, doi: 10.1057/s42214-020-00062-w.
- Ayati N, Saiyarsarai P, Nikfar S. Short and long term impacts of CO-VID-19 on the pharmaceutical sector. Daru. 2020; 28(2): 799–805, doi: 10.1007/s40199-020-00358-5, indexed in Pubmed: 32617864.
- Hobbs JE. The Covid-19 pandemic and meat supply chains. Meat Sci. 2021 [Epub ahead of print]: 108459, doi: 10.1016/j.meatsci.2021.108459, indexed in Pubmed: 33602591.
- Maliszewska M, Mattoo A, van der Mensbrugghe D. The Potential Impact of COVID-19 on GDP and Trade: A Preliminary Assessment. 2020, doi: 10.1596/1813-9450-9211.
- FAO Food and Agriculture Organization. Q&A: COVID-19 pandemic - impact on food and agriculture. 2020. http://www.fao.org/2019-ncov/q-and-a/en/ (2020 Dec 19).
- Chen S, Brahma S, Mackay J, et al. The role of smart packaging system in food supply chain. J Food Sci. 2020; 85(3): 517–525, doi: 10.1111/1750-3841.15046, indexed in Pubmed: 32056210.
- Siche R. What is the impact of COVID-19 disease on agriculture? Scientia Agropecuaria. 2020; 11(1): 3–6, doi: 10.17268/sci.agropecu.2020.01.00.
- Gottheil FM. Principles of Microeconomics. 7th Edition. Cengage Learning: EEUU.; 2013: 592.
- FAO Food and Agriculture Organization. FAO Director-General urges G20 to ensure that food value chains are not disrupted during CO-VID-19 pandemic. http://www.fao.org/news/story/en/item/1268254/icode/ (2020 Dec 19).
- Rosales G, Mercado W. Effect of changes in food price on the quinoa consumption and rural food security in Peru. Scientia Agropecuaria. 2020; 11(1): 83–93, doi: 10.17268/sci.agropecu.2020.01.10.
- Galanakis CM. The Food Systems in the era of the coronavirus (COVID-19) Pandemic crisis. Foods. 2020; 9(4), doi: 10.3390/foods9040523, indexed in Pubmed: 32331259.
- Euractiv. No evidence of COVID-19 transmission through food, says EFSA. 2020. https://www.euractiv.com/section/coronavirus/news/noevidence-of-covid-19-transmission-through-food-says-efsa/ (2021 Jan 2).
- Reiley L. Meat processing plants are closing due to COVID-19 outbreaks. Beef shortfalls may follow. 2020. https://www.washingtonpost. com/business/2020/04/16/meat-processing-plants-are-closing-duecovid-19-outbreaks-beef-shortfalls-may-follow/ (2021 Jan 2).
- FDA. Food safety and the coronavirus disease 2019 (COVID-19) | FDA. 2020. https://www.fda.gov/food/food-safety-during-emergencies/food--safety-and-coronavirus-disease-2019-covid-19 (2020 Dec 19).
- 33. UNWTO World Tourism Barometer. , doi: 10.18111/wtobarometereng.
- Bartik A, Bertrand M, Cullen Z, et al. How Are Small Businesses Adjusting to COVID-19? Early Evidence from a Survey. 2020, doi: 10.3386/w26989.
- Gursoy D, Chi C. Effects of COVID-19 pandemic on hospitality industry: review of the current situations and a research agenda. Journal of Hospitality Marketing & Management. 2020; 29(5): 527–529, doi: 10.1080/19368623.2020.1788231.
- EFSA. Coronavirus: No evidence that food is a source or transmission route. 2020. https://www.efsa.europa.eu/en/news/coronavirus-noevidence-food-source-or-transmission-route (2020 Dec 19).

- Darnell MER, Subbarao K, Feinstone SM, et al. Inactivation of the coronavirus that induces severe acute respiratory syndrome, SARS-CoV. J Virol Methods. 2004; 121(1): 85–91, doi: 10.1016/j. jviromet.2004.06.006, indexed in Pubmed: 15350737.
- Lu G, Wang Q, Gao GF. Bat-to-human: spike features determining 'host jump' of coronaviruses SARS-CoV, MERS-CoV, and beyond. Trends Microbiol. 2015; 23(8): 468–478, doi: 10.1016/j.tim.2015.06.003, indexed in Pubmed: 26206723.
- WHO. Virus origin/Reducing animal-human transmission of emerging pathogens. 2020. https://www.who.int/health-topics/coronavirus/who-recommendations-to-reduce-risk-of-transmission-ofemerging-pathogens-from-animals-to-humans-in-live-animal-markets (2020 Dec 20).
- Cheng VCC, Lau SKP, Woo PCY, et al. Severe acute respiratory syndrome coronavirus as an agent of emerging and reemerging infection. Clin Microbiol Rev. 2007; 20(4): 660–694, doi: 10.1128/CMR.00023-07, indexed in Pubmed: 17934078.
- Han J, Zhang X, He S, et al. Can the coronavirus disease be transmitted from food? A review of evidence, risks, policies and knowledge gaps. Environ Chem Lett. 2020 [Epub ahead of print]: 1–12, doi: 10.1007/s10311-020-01101-x, indexed in Pubmed: 33024427.
- BfR. Can the new type of coronavirus be transmitted via food and objects? - BfR. 2020. https://www.bfr.bund.de/en/can\_the\_new\_type\_ of\_coronavirus\_be\_transmitted\_via\_food\_and\_objects\_-244090.html (2020 Dec 20).
- 43. Gursoy D, Chi CG, Chi OH. COVID-19 Study 2 Report: Restaurant and Hotel Industry: Restaurant and hotel customers' sentiment analysis. Would they come back? If they would, WHEN? (Report No. 2), Carson College of Business, Washington State University. : 2020b.
- Laverty AA, Millett C, Majeed A, et al. COVID-19 presents opportunities and threats to transport and health. J R Soc Med. 2020; 113(7): 251– 254, doi: 10.1177/0141076820938997, indexed in Pubmed: 32663425.
- Pepe E, Bajardi P, Gauvin L, et al. COVID-19 outbreak response, a dataset to assess mobility changes in Italy following national lockdown. Sci Data. 2020; 7(1): 230, doi: 10.1038/s41597-020-00575-2, indexed in Pubmed: 32641758.
- Hall CM. Crisis events in tourism: subjects of crisis in tourism. Current Issues in Tourism. 2010; 13(5): 401–417, doi: 10.1080/13683500.2010.491900.
- Rogerson CM, Rogerson JM. COVID-19 and Tourism Spaces of Vulnerability in South Africa. African Journal of Hospitality, Tourism and Leisure. 2020; 9(4): 382–401, doi: doi: 10.46222.
- Ma H, Chiu Yh, Tian X, et al. Safety or Travel: Which Is More Important? The Impact of Disaster Events on Tourism. Sustainability. 2020; 12(7): 3038, doi: 10.3390/su12073038.
- Gössling S, Scott D, Hall C. Pandemics, tourism and global change: a rapid assessment of COVID-19. Journal of Sustainable Tourism. 2020; 29(1): 1–20, doi: 10.1080/09669582.2020.1758708.
- World Travel and Tourism council (WTTC).2020. https://wttc.org/Research/Economic-Impact (2021 Jan 2).
- UN Conference on Trade and Development (UNCTAD). 2020. https:// unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2416 (2020 Dec 20).
- United Nations Department of Economic and Social affairs (UN DESA). 2020. http://www.un.org/development/desa/dspd/2020/05/covid--19-sport/ (2020 Dec 20).
- Burrow, G. The Economic impacts of COVID-19 on US sports. 2020. https://www.economicmodeling.com/2020/05/28/the-economicimpact-of-covid-19-on-us-sports-up-to-92-6k-lost-every-minute/ (2021 Jan 2).
- Parnell D, Widdop P, Bond A, et al. COVID-19, networks and sport. Managing Sport and Leisure. 2020: 1–7, doi: 10.1080/23750472.2020. 1750100.
- Olufadewa II, Adesina MA, Ayorinde T. From Africa to the World: Reimagining Africa's research capacity and culture in the global knowledge economy. J Glob Health. 2020; 10(1): 010321, doi: 10.7189/jogh.10.010321, indexed in Pubmed: 32257145.
- Olufadewa II, Adesina MA, Ayorinde TA. Global Health in Iow and middle income countries: A framework for action. Lancet Global Health; 2021.
- Olufadewa II, Adesina MA, Ayorinde T, et al. Reimagining One Health in Africa: a strategy to ending re-emerging infections and anti-microbial resistance. Int J Health Plann Manage. 2021; 36(1): 223–225, doi: 10.1002/hpm.3069, indexed in Pubmed: 32946137.
- Oladoye MJ. Monkeypox: A Neglected Viral Zoonotic Disease. European Journal of Medical and Educational Technologies; 2021.