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Pandemics and Their Business Impacts: A Global Perspective

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Abstract

In the long and medium term, the evolution of pandemics and the resulting harm to the global economy have been alarming. Pandemics have a variety of detrimental effects on the economy. They impact families, companies, and the government by reducing labor supply, worker productivity, and population income, increasing company expenditures and public healthcare infrastructure costs. This research aims to examine and organize the present body of knowledge in the field of pandemics and their economic effect. With the help of a systematic literature review and bibliometric analysis, the study presents the status and development in this area of research. All business sectors, including supply chain, logistics, travel & tourism, entertainment, recreation and fitness, hospitality, have been negatively impacted worldwide. The paper contributes to the existing state of literature by examining the impact of significant pandemics on various business activities around the globe. However, there is a surge in telecommunication, including data providers and e-commerce businesses.

Keywords

Pandemics, Business, COVID-19, Supply Chain, Logistics, Travel, and Tourism

Imprint

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INTRODUCTION

The World Health Organization (WHO) defines the pandemic as "*A pandemic is the worldwide spread of a new disease.*" (World Health Organization, 2010) There have been various pandemics that have affected the world. With the advent of every pandemic, there is a change in the world [1].

In the long and short term, the evolution of these pandemics and the resulting harm to the world economy have been highly upsetting. Various studies in the past have found that population health, as measured by life expectancy, infant mortality, and maternal mortality, is strongly linked to the economy's economic health (Pritchet and Summers, 1996; Bloom and Sachs, 1998). These pandemics negatively impact the economy in various ways; they impact households, businesses, and government by detrimentally affecting labor supply, worker productivity, and population incomes, increasing business expenses, and mounting costs on public healthcare infrastructure. The pandemic changes the way we lead our day-to-day life; it changes the government policies for health care and changes the business world. All business sectors, including supply chain, logistics, travel & tourism, entertainment, recreation and fitness, hospitality, have been negatively impacted worldwide. However, there is a surge in telecommunication, including data providers and e-commerce businesses. Thus, pandemics have provided challenges and opportunities to the entire industry and economic activities around the globe [2].

In this study, we explore the numerous changes that have happened due to the global reaction to past pandemics [3]. To the best of the author's knowledge, no research on the subject has been done, and this research will attempt to address that gap. The following is the order in which the paper should be read. The first part briefly introduces the issue, section 2 discusses the aims and methods, section 3 includes a thorough review of the literature and content analysis, section 4 discusses the pandemics and their consequences, and section 5 concludes with a conclusion [4].

OBJECTIVES AND METHODOLOGY

This study aims to systematically explore the research and examine the literature available in the area of pandemics affecting business operations. We have covered pandemics, such as Spanish 19, SARS, H1N1 influenza, Nipah, and COVID-19 for study [5].

The following research questions guided this Systematic Literature Review:

1. How have pandemics been related to business operations?
2. What was the methodology followed to address the crisis?
3. What were the outcomes of the study?

Similar steps were involved in conducting a systematic literature review as in the studies done by Okoli & Schabram, 2010; Parris & Peachey, 2013; Tan et al., 2019. Figure 1 shows the Literature Review - Research stages

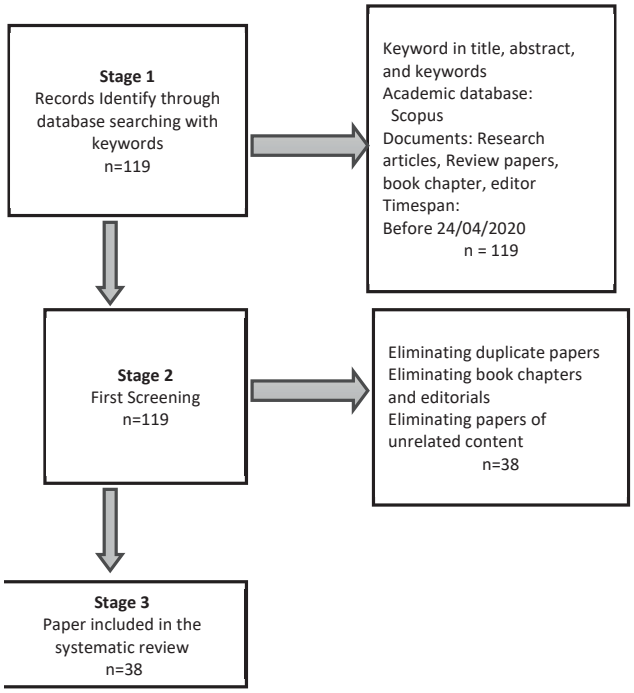


FIGURE 1.Systematic literature review - research stages (compiled by authors)

Stage 1: Exploring the Academic Archive

To achieve the objectives of the study foremost, all documents available on the Pandemics and their business impact were extracted through the Scopus database accessible from the authors' university library system. The search was restricted to English Language only. The investigation was initiated by the keyword "Pandemics" and "Business" and "Impact". Finally, the documents obtained were recorded. Figure 2 presents all the document types extracted and pertinent to the area of our study [6].

The graph depicts the state of research in the area of pandemics and its impact on business. The number of publications so far has been limited. Amongst that, the highest type is an article (31) followed by a conference paper (9) highlighting the global impact of pandemics [7].

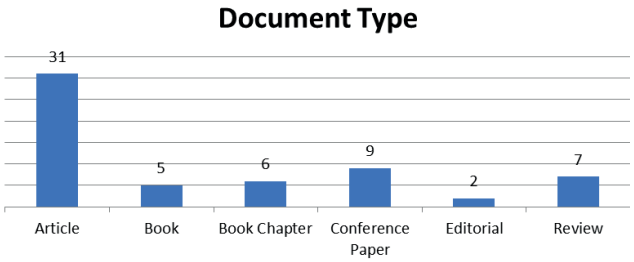


FIGURE 2.Document type (compiled by authors)

Stage 2: Getting an Overview

The articles are classified into the related topic and not related to topic categories. The eligibility for an article for selection in the study was; (a) the article must be published in the English language; (b) the article must not include conference paper, book chapter, and editorial's; (c) the article should discuss pandemics and business impact as the central theme (d) examines the business preparedness and response to the global pandemics. If any of the above components were not satisfied, the articles were excluded. Finally, 38 publications (n = 36) from peer-reviewed journals that met the inclusion criteria from 1996-20 were chosen. The gathered list of source titles or journals within the analysis and results section [8]

Stage 3: Evaluating the Content

The content of crucial papers and the bibliometric analysis of linked research were examined in the final stage [9]. The key papers' substance was scrutinized. Conducted by methodically reading chosen articles and review papers, and evaluating the paper's aims, methods, and findings (Table 1) To better understand the present status of literature, we additionally provide the year of publication (Figure 3), year-by-year citations (Figure 4), and country of publishing (Table 2 and Figure 5) [10].

REVIEW OF LITERATURE

Previous studies on pandemics suggest their negative impact on significant businesses like transportation, travel, logistics, banking and finance, small-scale companies around the globe (Spriggs, M. 2013; Torá-Rocamora et al., 2012). However, some studies suggest that specific industries like teleconferencing and video conferencing observe positive growth (Overby, J. et al., 2004). Table 1 presents some of the significant contributions from scholars worldwide to the existing literature [11].

TABLE 1

A comprehensive review of the literature (Compiled by authors)

Source	Objectives	Method	Conclusions
Itzwerth, R., Moa, A., & MacIntyre, C. R. (2018).	To study the public sector preparedness of Australia for the pandemic in the year 2009	Review of documents	The 2009 pandemic plans showed that their infrastructure is inadequate to deal with health emergencies.
Elmahdawy, M. et al., (2017)	The article reviews experience with Ebola virus disease in an economic scenario.	Review of papers	The articles provide that significant investment in health infrastructure and cooperation between international organizations is required to develop vaccines, treatments, and tools to detect such diseases.
Chung, L. H. (2015)	The influence on airport companies during a pandemic epidemic is investigated in this article.	On secondary data, a simple linear regression test was performed using time series analysis.	Detection through adequate technology is essential, which should be placed at airports.
Tosh P. et al., (2014)	To suggest the plan of action for the health care business at the time of large-scale pandemic or disaster.	Systematic literature review. Survey and Panel based expert opinion using modified Delphi method.	Vibrant supply chain network and infrastructure including is helpful to deal with pandemic related situation
Heiko et al. (2013)	To understand the future role and the discontinuities in the global logistics industry during pandemics and resource crises.	Experts opinion using Delhi online- portal	When discontinuities, including terrorist attacks and pandemics, the industry should be ready with extreme and wild card scenarios. This will leverage the full potential of logistics at all times.
Rebmann et al. (2013	To study the impact of the 2009 H1N1 pandemic on US businesses	A questionnaire, logistic regression analysis	Businesses reported staffing shortages as people were ill. More prominent companies implemented more interventions, such as providing education and vaccine, in response to the pandemic than smaller businesses.
FitzGerald et al. (2012	To study the impact of Pandemic (H1N1) 2009 on the directors and staff of Emergency Departments of Australia.	Theme analysis, electronic surveys, quantitative analysis	The study found that the department staff reported issues of lack of awareness of pandemic plans, the aggression of patient and patient's family, excessive workload at the time of handling patients during the pandemic.
Torá-Rocamora, et al., (2012)	The paper measures the impact of the 2009 H1N1 pandemic and compare the effect between 2007-2010	Time series analysis	Businesses were significantly affected. Along with economic activities, health, education, and the social sector were the most dislocated.
Foulke, E.G. (2007)	To prepare a plan for business and industry to minimize the influenza pandemic impact.	Qualitative Study	The pandemic influenza maintenance operations include working with suppliers to ensure the continuation of services, developing a sick level policy that does not penalize sick people, and identifying possible exposure and health risks to the employees.
Overby et al. (2004)	To investigate the impact of Severe Acute Respiratory Syndrome (SARS) on international trade.	Qualitative study	Banking and finance, global logistics, aviation and travel, electronics sectors had been negatively affected due to the virus. However, there occurred positive growth in teleconferencing and video-conferencing business.

Further, the year-wise count of peer-reviewed articles published between 1996-2020 has been presented below.

Figure 3 depicts the publication's year-wise distribution indicating the limited number of published articles in the chosen field of study [12]. Moreover, the citation number of articles published is also not impressed with a maximum of 4 citations per article as depicted in Figure 4.

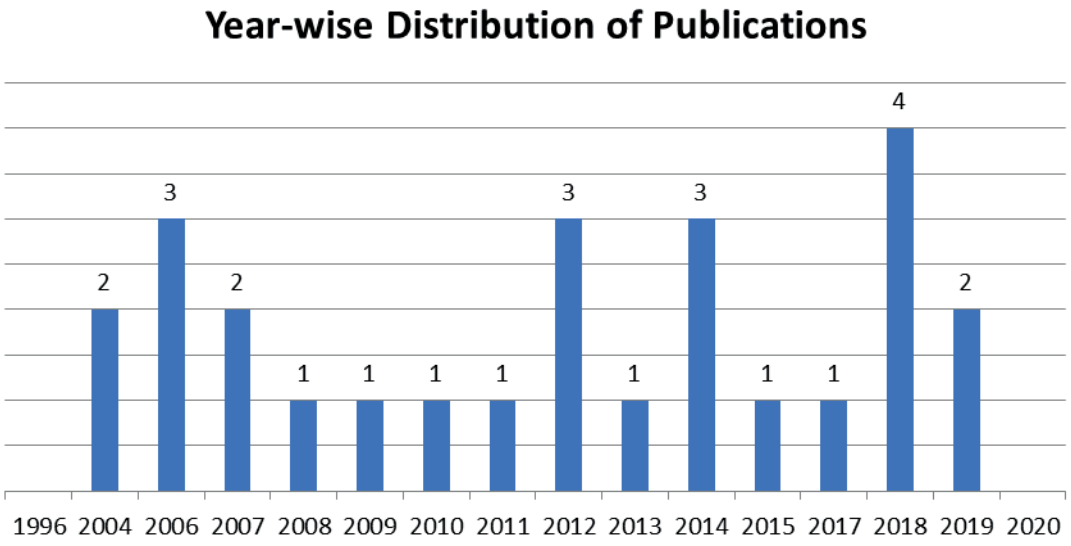


FIGURE 3.Year-wise distribution of publications (compiled by authors)

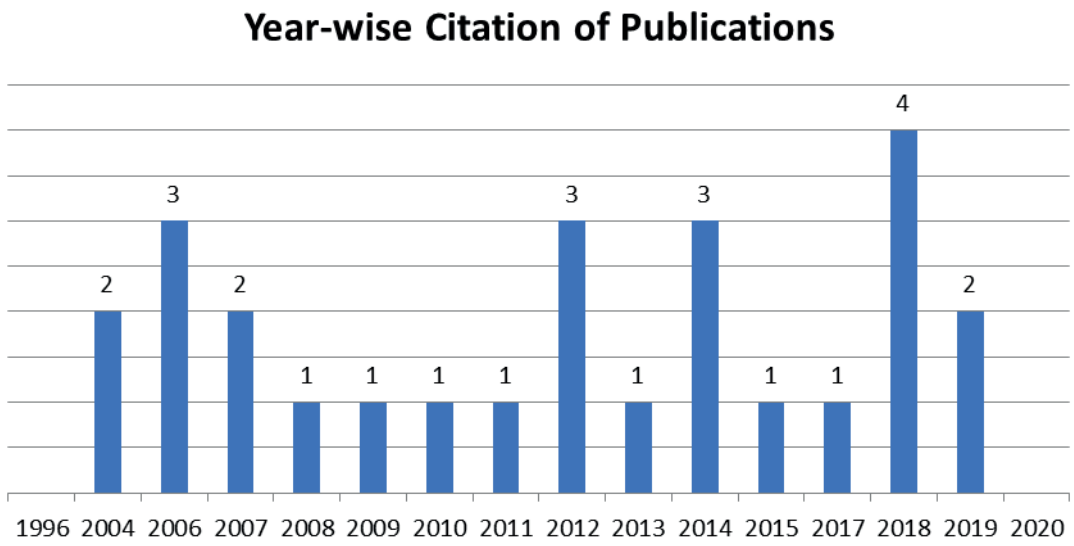


FIGURE 4.Year-wise citation of publications (Compiled by authors)

TABLE 2

Details of country-wise publications (compiled by authors)

Row Labels	Count per Country
United States	15
Australia	7
South Africa	3
Turkey	2
Canada	2
Italy	1
Spain	1
Germany	1
United Kingdom	1
India	1
Egypt	1
Philippines	1
Mexico	1
Japan	1
Grand Total	38

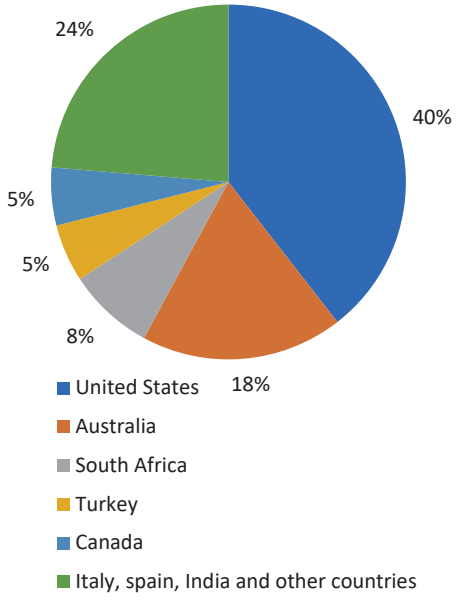


FIGURE 5.Country-wise distribution of publications (compiled by authors)

TABLE 3

List of journals (compiled by authors)

Source Title	Count of Publications
AFE Facilities Engineering Journal	1
African Journal of AIDS Research	1
African Journal of Hospitality, Tourism, and Leisure	1
American Journal of Infection Control	2
Asia Pacific Journal of Marketing and Logistics	1
Biological Trace Element Research	1
BMC Public Health	1
Chest	1
Computational and Mathematical Organization Theory	1
Current Osteoporosis Reports	1
Development Southern Africa	1
EMA - Emergency Medicine Australasia	1
Food Science and Technology (London)	1
Foresight	1
International journal of environmental research and public health	1
International Journal of Health Care Quality Assurance	1
International Journal of Simulation Modeling	1
International Research in the Business Disciplines	1
Journal of Air Transport Management	1
Journal of business continuity & emergency planning	2
Journal of Global Antimicrobial Resistance	1
Journal of Infectious Diseases	1
Journal of International Development	1
Journal of law and medicine	1
Journal of Medical Systems	1
Journal of Occupational Medicine and Toxicology	1
Journal of Public Health Policy	1
Long Range Planning	1
Medical Journal of Australia	1
Microbial Ecology	1
Occupational and Environmental Medicine	1
Proceedings of the National Academy of Sciences of the United States of America	1
Resources, Conservation and Recycling	1
Safety and Health	1
TB & HIV	1
Value in Health Regional Issues	1
Grand Total	38

The graphs from Figure 5 depict that the country-wise published studies in the area of pandemics and their business impact [13]. It can be observed that around half of the studies are published in the United States (40%), followed by Australia (24%) and South Africa (18%). This indicates the need for research on this area of study from various parts of the world [14]. Further, to understand the scope of publication, the list of journals having a magazine in the chosen area of study is presented in Table 3. It can be observed that Pandemics and its business impact is inter-disciplinary research covering journals from the field of medicine, engineering, business, and environmental studies [15].

RESULT AND DISCUSSION

This section will discuss the various pandemics that the world has witnessed and how it has changed the world. First, we would be categorizing the pandemic into two broad categories, namely, communicable and non-communicable diseases. This classification makes it easy to understand and comprehend the intensity and scope of the world's response [16].

Cardiovascular disease, chronic respiratory illnesses, malignancies, diabetes, mental illness, and other non-communicable diseases (NCDs). In 2012, they were the leading cause of death. They accounted for 60 percent of total deaths (Allen, 2016) [17]. The critical part here is that there is no human-to-human transmission; hence the containment measures do not include the isolation having restrictions on movement. The intervention is done at a community level promoting lifestyle changes and others. Health education and media campaigns have been the primary form of intervention. The economic burden is tough to measure. They are typically measured in cost-benefit analysis (Nissinen, Berrios, & Puska, 2001) [18].

The other kind of pandemic is the pandemic arising out of infectious diseases. They mainly include the influenzas flu and many others. Traveling is a significant factor in spreading infectious diseases (Wilder-Smith & Freedman, 2003) [19]. This spreading of the disease from human to human makes it essential to contain the disease, so the loss of life could be minimized. However, we have to implement stringent measures in doing so, which causes a significant economic loss. We will be discussing the impact of the Spanish Flu of 1918, Nipah virus (1999), SARS (2001), H1N1 (2009), and lastly, COVID-19 (2019). We will also be focusing on their economic impact [20].

Spanish Flu - 1918

We begin our discussion with the first pandemic of the 20th century, the Spanish Flu of 1918. It has been one of the deadliest pandemics that the world has ever witnessed. The Spanish flu killed around 50 million people worldwide (Jordan, Tumpey, & Jester, n.d.). The Spanish flu, being one of the deadliest flu's in the history of humanity, had a mortality rate of 2.5 percent (Billings, 2005). We begin with a pandemic because the lessons learned from this pandemic are still relevant, and still, we continue to use the same tools that we had developed to fight this pandemic. World War -1 made it easy for the virus to travel around the world with the armed forces. Also, the Spanish flu, being one of the deadliest pandemics, will provide an upper bound to the economic damage that can occur because of the pandemic (Barro, Ursúa, & Weng, 2020). The flu happened in three significant waves, first in the spring of 1918, then the deadliest wave from September to February 1919, and then the last wave in 1919 itself. The graph of death rate by the Spanish flu was like the 'W' shaped. The death rate was exceptionally high among young people between 15-45 (Reid, 2001). The high mortality rate among the young resulted in many orphans, and productive capacity suffered a shock. There was no vaccine to protect against the virus or their antibiotics for such infections during the pandemic. The control measures were confined to quarantine, isolation, good personal hygiene, limiting the public gatherings, and disinfectants (United States federal agency, n.d.). These control measures are very much the same today; even now, during the current pandemic, we have been limited to using these century-old techniques for controlling the pandemic (World Health Organization, n.d.).

Nipah virus - 1999

Nipah virus outbreak in 1999 in Malaysia. The virus first began to appear in pig farmers. The virus can travel from animals to humans and can also transmit directly between humans or through food. The fatality of the virus can range between 40 to 75 percent. The initial outbreak of the virus in 1998-1999 resulted in 105 deaths (Looi & Chua, 2007). The disease was successfully contained and was not allowed to spread worldwide, resulting in fewer cases and fewer deaths. However, there has been no vaccine or treatment for the virus (Nipah virus, 2018). Post the first outbreak in 1998-1999; there have been subsequent outbreaks of the virus in India and Bangladesh; however, it was contained (Chadha et al., 2006; Homaira et al., 2010).

The business impact of this virus was huge in Malaysia. The pig industry had suffered a lot of losses due to the virus infection. Millions of the pigs were culled due to the virus outbreak (Looi & Chua, 2007). The poultry and pig industries were approximately 94 percent of the total livestock industry in Malaysia in 1995. Poultry was one of the exports of Malaysia (Jelan & Dahan, 1998). The government could contain the virus by taking swift measures in announcing the outbreak, free sharing of information, and proactive decision to compensate the pig farmers (Looi & Chua, 2007).

SARS - 2002

Severe acute respiratory syndrome (SARS) caused by the coronavirus (CoV) was first reported in November 2002 in Guangdong Province, China (Organization, 2003; Siu & Wong, 2004). The disease could transmit from human to human, which allowed it to reach 29 countries (Organization, 2003; Siu & Wong, 2004). The estimated fatality of the disease is around 10 percent in the total number of deaths was 774, far lower than the Spanish Flu (Goldsmith et al., 2004). The outbreak of the virus lasted till July 2003. SARS was a severe disease as there was no vaccine or treatment for the disease. The result was to control the disease through old methods of isolation and quarantine (Organization, 2003). The condition could spread through direct contact with the infections droplets (Diamond, 2003).

The business impact of the virus was felt in many terms. There was a decline in the travel and tourism industry and hospitality sector. The willingness of people to go out and eat, cinema's and retail were impacted negatively (Keogh-Brown & Smith, 2008). The SARS reduced the confidence and resulted in the demand shock, which hurt East Asia, including China. The shipments were delayed. The loss of faith was also reflected via the falling stock prices. The country that was most affected by the outbreak was Hong Kong. The real GDP for the country fell by 0.3 percent from the December quarter. The growth rate of China also declined from 9.9 to 8.6 percent (Treasury, 2002). The global economic impact of the outbreak was estimated at around US$30–100 billion by various authors (Smith, 2006).

H1N1 - 2009

In 2009, a novel in fauna virus spread in the world from the USA. The virus could transmit from human to human (Relman et al., 2010). Till April 2010, as per the CDC estimate, there were 60.8 million cases, more than 274 thousand hospitalizations, and 12469 deaths in the US had occurred within the first year of the pandemic (Centers for Disease Control and Prevention, 2019). Globally the total number of deaths due to the disease was estimated to be approximately between 105,700–395,600 (Dawood et al., 2012). The economic and social losses included the loss of wages and school days as schools had to be closed for safety (Chen et al., 2011). The financial cost of the pandemic was less than 1 percent of the world GDP (Smith et al., 2011)

COVID-19 - 2019

The most recent outbreak of pandemics started in December 2019 due to a novel coronavirus. The genome of the COVID-19 has 86 percent similarity to the SARS virus of 2002. Both viruses have probably originated from bats (Lai et al., 2020; Rothan & Byrareddy, 2020; Wilder-Smith & Freedman, 2003). Similar to the SARS virus, it is also capable of transmitting from human to human. The virus can similarly share itself as SARS 2002 virus did through tiny droplets of infections (Singhal, 2020). The disease spread quickly across the world and was called a pandemic by WHO on March 11, 2020 (Cucinotta & Vanelli, 2020). Accordingly, to contain the disease, the epicenter of the disease, the Chinese authority put the city under lockdown. The lockdown lasted for 11 weeks (Coronavirus Resource Center, n.d.). During April, most of the world witnessed some form of shutdown (Sheth, 2020). This was in line with the century-old methods of isolation and quarantine to check the spread of the infection.

The impact of these global shutdowns will be enormous; however, we will try to briefly highlight the sector's issues once the lockdown restrictions are gradually relaxed. The agriculture sector is being affected in terms of the fall in the prices of agriculture output globally. The demand for food products has plummeted due to the shutdown of hotels and restaurants. Petroleum has also been impacted. The shutdown of economic activities across the world led to a sharp decline in crude oil prices. The sharp deterioration even resulted in the adverse price of West Texas Intermediate (WTI) (Selmi, Bouoiyour, & Hammoudeh, 2020). The GDP is expected to contract for the US by 20.3 percent, and for the developing economy like India, it fell by over 23 percent. The impact of this contraction will in felt in every sector, and unemployment will surge (Walmsley, Rose, & Wei, 2020).

The tertiary sectors include education, hospitality, tourism and aviation, real estate, sports industry and Information technology, media, research & development. The education industry will be severely affected by it as one of the first measures that we had learned from the Spanish flu was the closure of places of public gatherings. As a result, schools, colleges across the globe were shut as the first response to the pandemic. The closure of schools will also impact the programs in developing countries where the schools provide the meal, such as the Mid-day meal program in India (Nicola et al., 2020; Upadhyay, Patra, & Khan, 2020). The government of India demonetized currency in 2016 and was also promoting the usage of digital currency (Pal, A., Tiwari, C. K., & Khandelwal, T, 2019). The pandemic is expected to increase the movement towards the cashless as cash may provide the surface for the virus to transmit (Allam, Z., 2020).

With the pandemic and stay-in-home orders in most parts of the world, people around the globe cannot move, which has caused a significant fall in demand for the hospitality, tourism, and aviation sector. The pandemic has hard hit the sports industry. Most of the year's sporting events have been canceled or postponed, including Tokyo Olympics (Chappelet, 2020). The world may witness a recession because of the current pandemic (Fernandes, 2020). The real estate sector will also face a significant slump in demand. The overall contraction of the world GDP will lead to lesser jobs and reduce the need for housing.

CONCLUSION

The paper contributes to the existing state of literature by examining the impact of significant pandemics on various business activities around the globe. With the help of a systematic literature review and bibliometric analysis, the study presents the current status and development in this area of research. Scholars from United States, Australia, and South Africa have contributed the maximum to this field of study. Concerning impact, business activities, education, health, and social sector were severely affected due to shut down and closure of all economic and non-economic activities. Banking and finance, global logistics, avi-

ation and travel, electronics sectors have been negatively affected due to the virus. However, there occurred growth in automation services, e-commerce, telecommunication, including teleconferencing and video-conferencing business. To minimize losses, the spread of diseases in industry, educating employees, other parties about the potential risk of space is essential in maintaining business continuity during a pandemic. The government support through the significant fiscal stimulus to needy businesses and simultaneous keeping the supply chains intact should be the prime focus at the time of pandemics to minimize the impact.

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