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ANALYZING REGIONAL AND CONTINENTAL IMPACTS AND RESPONSES PERTAINING TO COVID-19 PANDAMIC: A SYSTEMATIC REVIEW



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Abstract

The aim of this study was to identify how likely diverse are the impacts of corona 19 on humans, regionally and continentally and the future agenda. We used PRISMA FRAMEWORK and the search mainly focused on the mapping of existing literature up to date on SCOPUS during the last 10 years with special attention on most cited literature. We found that most published articles and reviews emphasize medical clinical aspects with less attention to environmental and interdisciplinary research aspects which constituted only 2% of the published work.

Keywords: Pandemic, Covid-19, Regional and Continental Impacts

INTRODUCTION

A pandemic is defined as the "worldwide spread" of a new disease. Reported pandemic diseases go back to 1918 in which 40 million people were killed due to Spanish influenza (1). Of the pandemics that has been most cited in the literature is obesity (2) who analyzed data from 68.5 million persons to assess the trends in the prevalence of overweight and obesity among children and adults between 1980 and 2015. The study revealed that obesity has doubled in more than 70 countries and has continuously increased in most other countries. Another example of global pandemics is heart failure which is estimated 26 million people worldwide and resulting in more than 1 million hospitalizations annually, in both the United States and Europe (3). A widespread of *Escherichia coli* sequence type 131 (ST131) was identified in 2008 (4). Infections were reported in Europe (particularly the UK), North America, Canada, Japan and Korea. Middle East respiratory syndrome (MERS) is a highly lethal respiratory disease caused by a novel single-stranded, positive-sense RNA beta-coronavirus (MERS-CoV) (5).

The most recent pandemic appeared as a cluster of pneumonia cases in December 2019 in Wuhan, China, caused by a novel beta-coronavirus, the 2019 novel coronavirus (2019-nCoV). The most cited article on covid 19 was published by Huang C. et al. in 2020

in which they reported the epidemiological, clinical, laboratory, and radiological characteristics and treatment and clinical outcomes of these patients admitted to Wuhan hospital (6). The novel virus was found to belong to subgenus sarbecovirus. Orthocoronavirinae subfamily is known to be the seventh member of the family of coronaviruses that infect humans (7). A study on confirmed cases revealed that 49 (49%) had a history of exposure to the Huanan seafood market (8). The average age of the patients was 55.5 years. Patients had clinical manifestations of mostly fever, cough, shortness of breath and muscle ache. Some of the patients revealed confusion, headache, sore throat, rhinorrhoea, chest pain, diarrhea, nausea and vomiting. A comprehensive study was conducted on 1099 patients with laboratory-confirmed Covid-19 from 552 hospitals in 30 provinces showed that the median age of the patients was 47 years; 41.9% of the patients were female (9). Another study was conducted on 191 patients (135 from Jinyintan Hospital and 56 from Wuhan Pulmonary Hospital), of whom 137 were discharged and 54 died in hospital. The study revealed that 91 (48%) patients had a comorbidity, with hypertension being the most common (58 (30%) patients), followed by diabetes (36 (19%) patients) and coronary heart disease (15 (8%) patients) (10). Most of the articles on covid-19 were published in the US (23.8%), China (21.2%), Italy (11.8%), United Kingdom (8.6%), India (4.6%) and others. Most of the published work under covid 19 focused on clinical investigations and treatments which experienced a great deal of discrepancies as the virus is new to human life. Limited or no articles gave attention to ecological aspects of covid 19 in terms of natural habitats.

Globally speaking, it has been emphasized that compared with SARS and MERS, COVID-19 has spread more rapidly, due to increased globalization and adaptation of the virus in every environment (11). Due to lockdown in most countries some studies revealed decrease in pollutants concentrations around cities (12). Recent data released by NASA (National Aeronautics and Space Administration) and ESA (European Space Agency) indicates that pollution in some of the epicenters of COVID-19 such as Wuhan, Italy, Spain and USA has reduced up to 30% (13) in addition to an improvement and drop in water pollution in some parts of the world. Currently, almost 200 countries and regions have been affected by the epidemic, with the number of infections and deaths still increasing. As an extreme event, the outbreak of COVID-19 has greatly damaged the global economic growth and caused a certain impact on the environment (14). Recent studies revealed positive and negative indirect effects of COVID-19 on the environment, particularly in the most affected countries such as China, USA, Italy, and Spain (15). Due to the forced restrictions, pollution level in cities across the country drastically slowed down just within few days which magnetize discussions regarding lockdown to be the effectual alternative measures to be implemented for controlling air pollution (16).

This systematic review aims to investigate the regional and global impacts and responses pertaining to covid-19 and prospected future agenda, in an attempt to explore regional and global trends of the pandemic.

METHODOLOGY

In this research, we developed a systematic search strategy to identify relevant literature provided by SCOPUS database and the search terms used were confined to the period 2010-2020 with focus on journals articles and review papers published in English only.

The selection process was based on PRISMA FRAMEWORK (17) and the search mainly focused on the mapping of existing literature on PANDEMICS using SCOPUS which revealed 39525 articles and review papers all languages of which 36633 are in English. The search on COVID 19 revealed 10701 articles and review papers which confining the search to PANDEMICS AND ENVIRONMENT gave 1438 records.

The data extraction phase focused on articles and review papers in English focusing on medicine, immunology and microbiology as subject areas, covering the period 2010-2020 from all countries. Duplicated and irrelevant articles were excluded and a total of 18 articles and review papers were extracted and included in the systematic review.

RESULTS AND INTERPRETATION

Figure (1) shows that the focus on pandemics studies since 1894 up to date in 2020 where corona-19 dominated researchers' attention by 16.3% of the total literature published so far in SCOPUS, most of which is dominated by the United States and the United Kingdom, and some other (Figure 2). The BMJ (Clinical research ed.) published by the British Medical Association reflected most of the literature so far published in covid-19.

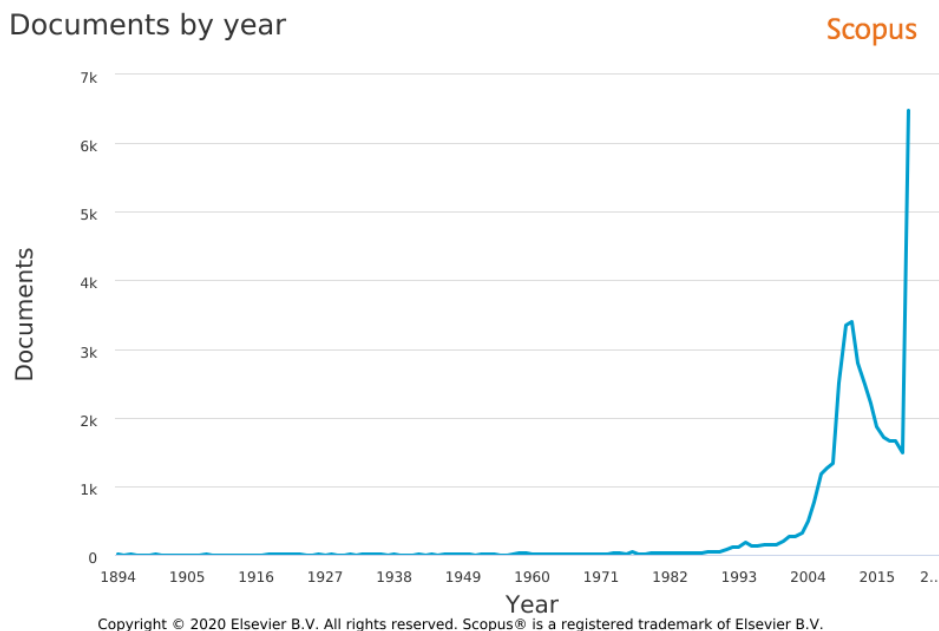


Fig.1. Published articles and reviews on “pandemics” by year in SCOPUS (1894-2020)

As covid-19 is a novel virus all of the published articles date to the first five months of this year except 7 publications date to 2019, when reference was first published on the novel coronavirus emphasizing that the primary healthcare facilities and general practitioners face a number of problems related to the current epidemiological situation (18). More

attention to covid-19 by country is shown by the US, China, Italy and the UK as shown in Figure (3). China, being the source of covid-19 is taking the lead after the US, however, if other languages is included in the search, we might witness a different view.

It is evident that attention to pandemics and the environment has been on the rise as reflected in Figure (4), with an increase in 2013 in which more focus was given to obesity pandemic and the role of variable indoor environment to counteracting the current obesity epidemic. At present, we are experiencing the highest peak with covid-19 which dominates scientific publications trends all over. Regional interests reflect that the topmost countries which gave attention to pandemics and the environment included the United States, United Kingdom, France, Canada and China, as shown in Figure (5).

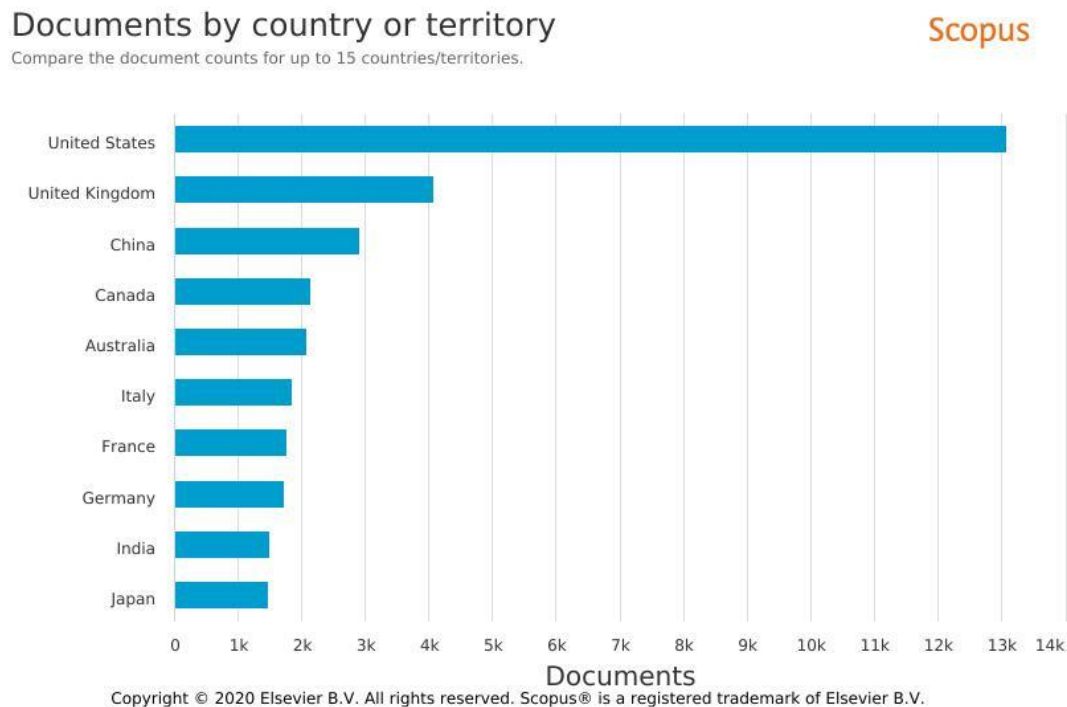


Fig. 2. Published articles and reviews on “pandemics” by region/country in SCOPUS (1894-2020)

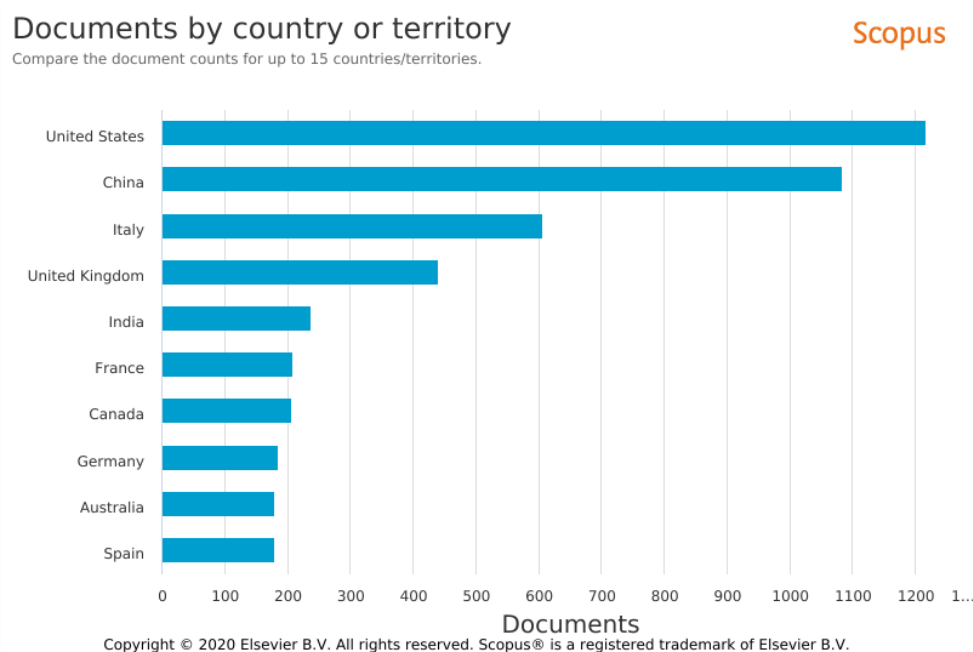


Fig.3. Published articles and reviews on “COVID-19” by region/country in SCOPUS

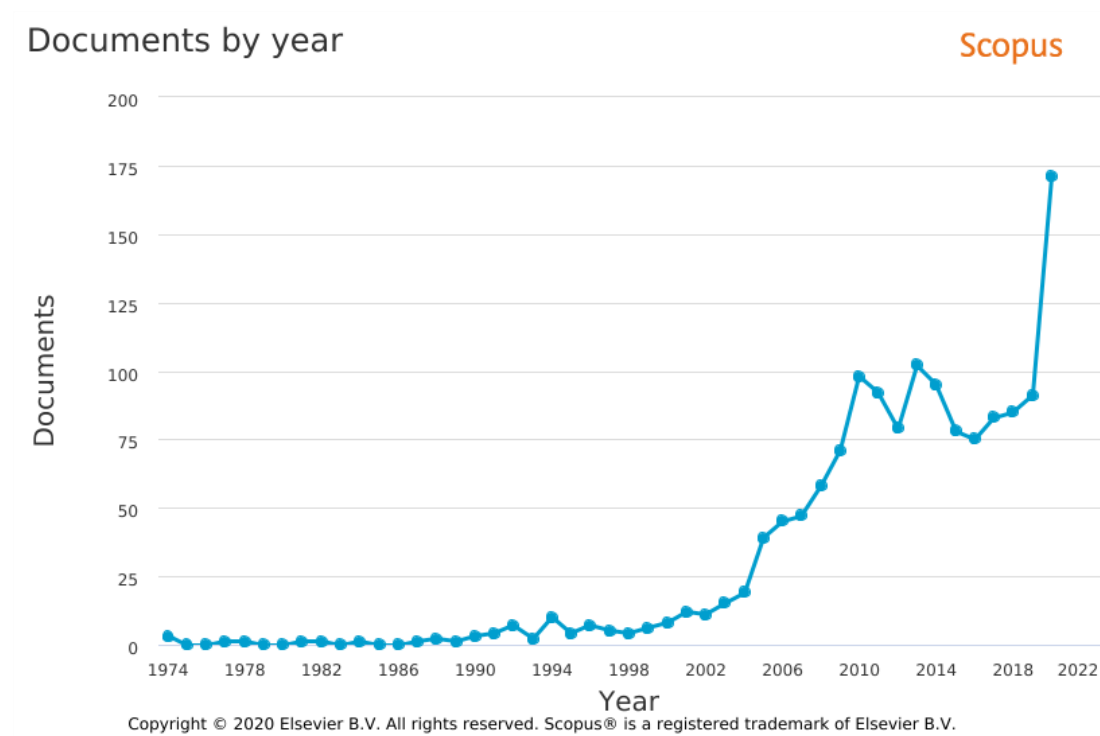


Fig. 4. Published articles and reviews on “Pandemics and the environment” by year in SCOPUS (1974-2020)

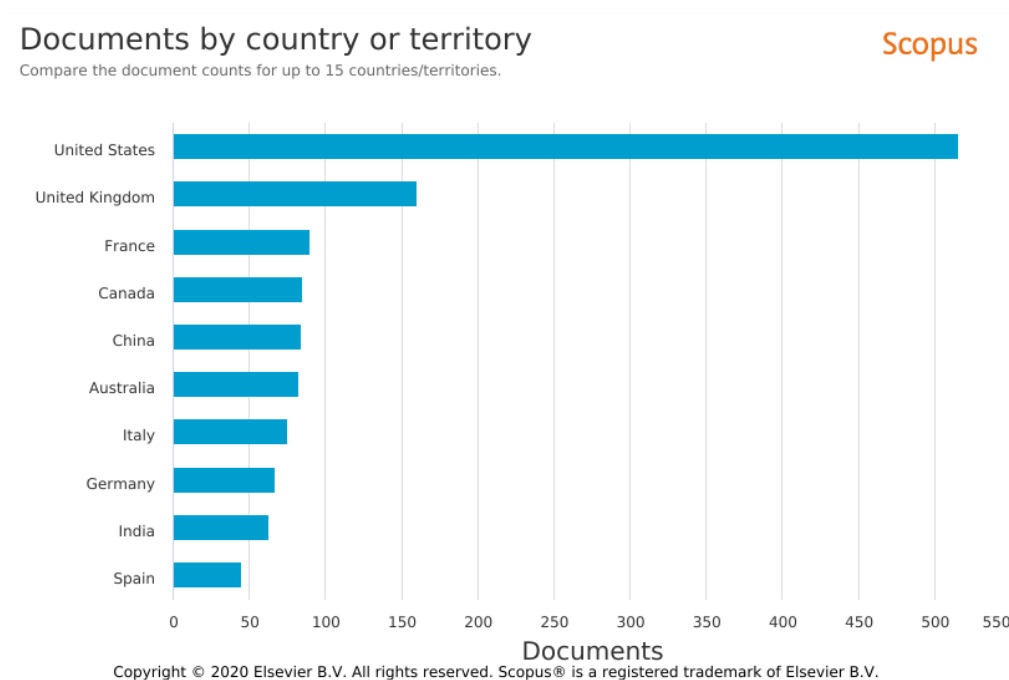


Fig. 5. Published articles and reviews on “Pandemics and the environment” by region/country in SCOPUS (1974-2020)

Globally speaking, as of May 29th, 2020, there have been 5701337 confirmed cases of COVID-19, including 357688 deaths reported to WHO according to region (Figure 6). The data shows that COVID-19 pandemic drastically affected human lives in the Americas and Europe more than any other region, with Africa being the least affected so far. However, the origin of the pandemic, China, showed 84547 confirmed cases of COVID-19

with 4645 deaths during the same period. The peak period in China was February 13th which resulted in 15152 confirmed cases with a high daily increase of 13130 cases.

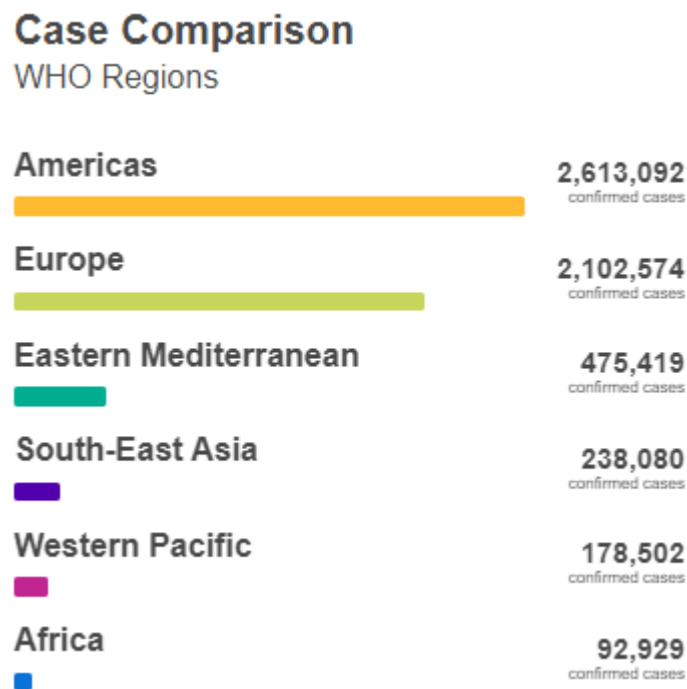


Fig. 6. COVID Case Comparison, WHO Regions

Most focus of the literature during recent years has been on COVID-19 human loss and impacts on the economy. Less attention has been given to the ecological and environmental dimensions of the pandemic reference to other biotic and abiotic elements of the environment. It was evident that most of the studies on COVID-19 were medically oriented by 60.8% as shown in Figure (7). Environmental and interdisciplinary research aspects constituted only 2% of the published work.

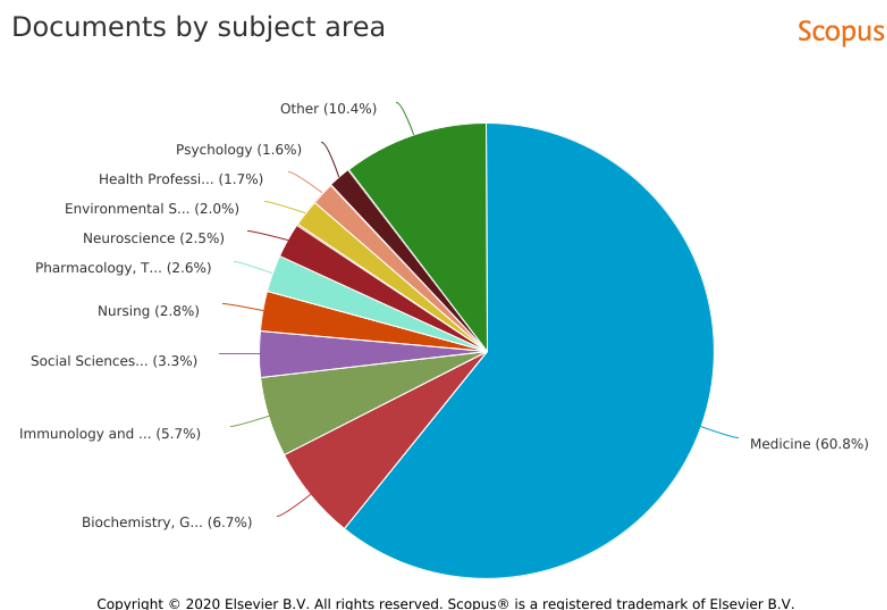


Fig. 7. Published articles and reviews on "COVID-19" by Subject Area in SCOPUS

It has been evident that despite the human and economic costs, that the lockdown due to COVID-19 reduced transport activities and energy consumption and lower oil demand which reflected on environmental quality expresses in toxic gasses concentrations (e.g. NO₂ 20-30%) in various locations around the globe (Table I).

Table I. NO₂ emissions data acquisition across different regions

Location	Agency	Time	% Reduction	Source
Wuhan	NASA & ESA	Jan-Feb 2019-2020	30%	NASA & ESA 2020
China	ESA	Jan-Feb 2020	20-30	ESA 2020
Europe	ESA	March 2019-March 2020	20-30	ESA 2020
Italy	ESA	March 2019-March 2020	20-30	ESA 2020
France	ESA	March 2019-March 2020	20-30	ESA 2020
Spain	ESA	March 2019-March 2020	20-30	ESA 2020
USA	NASA	March 2015-2019 March 2020	30%	NASA 2020

Although the positive impacts of COVID-19 may be temporary but many lessons should be learned on how to reduce pollution on long term basis.

CONCLUSION AND FUTURE AGENDA

Based on the findings of the limited research conducted on the impact of lockdown resulting from COVID 19, it is evident that pandemics act as natural mechanisms mitigatethe abiotic and biotic components of the biosphere that is inhabited by humans. We conclude that more multi-disciplinary scientific research is needed for a better understanding of global aspects including pandemics.

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