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Original article

Publications on COVID-19 from Vietnam during 2020 and 2021: A bibliometric analysis

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Raw data are available in the supplementary files.

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Abstract

Background: Following the outbreak of the COVID-19 pandemic, published research from Vietnam related to the pandemic was analysed using bibliometrics.

Objectives: To examine the status of research on COVID-19 by authors from Vietnam.

Methods: The following bibliometric aspects were considered in the analysis: international collaboration, institutions from Vietnam and their partner institutions worldwide, subjects and topics, types of documents, and individual authors. The basis of the study was data obtained from the Scopus database between 2020 and 2021. The data were analysed using Microsoft Excel, R, and VOSviewer, and the emerging trends illustrated through descriptive analysis and science mapping.

Results: Between 2020 and 2021, researchers from Vietnam co-authored 1034 documents related to COVID-19, amounting to 0.35% of the total of 296,148 such documents published worldwide as ascertained from the Scopus database. Vietnam's top country collaborators in that research were USA, Australia, the United Kingdom, India, and Taiwan ROC. The top Vietnam institutions were Duy Tan University, Ton Duc Thang University, and the University of Economics Ho Chi Minh City. The research from Vietnam covered many subjects, from medicine and natural sciences to social sciences and economics. Eight clusters of topics related to COVID-19 were identified. In terms of citations, the most highly cited documents were the outcome of collaboration with international authors. Lastly, the study ranked top authors based on either the number of publications or the number of citations.

Conclusion: This study provides a preliminary picture of studies related to COVID-19 co-authored by researchers in Vietnam. The picture may help the Vietnam government in devising appropriate strategies for post-COVID-19 restoration of the country's socio-economic status.

Keywords:

Collaboration clusters, most cited authors, most productive authors

Introduction

Since the first case of the corona virus was detected in China in late 2019, the COVID-19 pandemic has spread across the globe, causing an unprecedented crisis for all sectors and countries.[1] In response, researchers in all countries focused were focused on issues related to the pandemic. By the end of 2021 (that is, as on 31 Dec. 2021), the Scopus database showed a total of 296,148 documents on COVID-19 across the world, encompassing a range of research disciplines. This large number resulted in the demand for systematic reviews, from different angles, of papers related to COVID-19. For instance, Utkarsh and Sigala[2] explored the preliminary trend in tourism-related COVID-19 documents by analysing 177 articles published up to January 2021 as indexed by the Web of Science and outlined avenues for further research in tourism and hospitality sectors.

Similarly, Kim et al.[3] examined the impact of the COVID-19 pandemic on water use through 21 articles written in English and published between July 2020 and July 2021. Other high-profile studies focused on COVID-19 and creative industry,[4] COVID-19 and eating disorders,[5] and COVID-19 and the supply chain.[6] Nevertheless, the common feature of these reviews was their focus on the sector or the subject (domain or discipline) rather than the location – as ascertained through affiliation – of their authors. Such a review from a geographical perspective is also important because it can provide comprehensive background knowledge on all aspects of COVID-19 for a given region or country. This is the gap the present study sought to bridge by conducting a bibliometric analysis, based on the Scopus database, of articles related to COVID-19 in which at least one author or co-author was from Vietnam.

Methods

Data collection

We used the Scopus database to extract data for the bibliometric analysis. Scopus is officially used by different Vietnamese government agencies such as the National Foundation for Science and Technology Development and the National Committee for Professorship Titles.

Specifically, we formulated the following search query (view full query in the Supplement of the article):

AFFIL ("viet nam" OR vietnam) AND TITLE-ABS-KEY (pandemic OR corona OR COVID-19 OR covid19 OR coronavirus OR "SARS-CoV-2")

From the results of the search query, we selected only those documents that satisfied all the following criteria, namely those that were published

- in English,
- in 2020 or 2021, and
- in any of the following categories: article, review, conference paper, data paper, book chapter, or book.

Statistical analysis

The data were analysed using Microsoft Excel, R, and VOSviewer; for charts and graphs, we used descriptive analysis and science mapping, which presents in graphic form the composition of bibliographic objects and their relationships[7] for exploring patterns if any.[8]

Results

The query yielded a total of 1130 documents (Figure 1), of which 1034 documents satisfied the criteria mentioned earlier: 310 (30%) documents were published in 2020 and 724 (70%) published in 2021. Those were

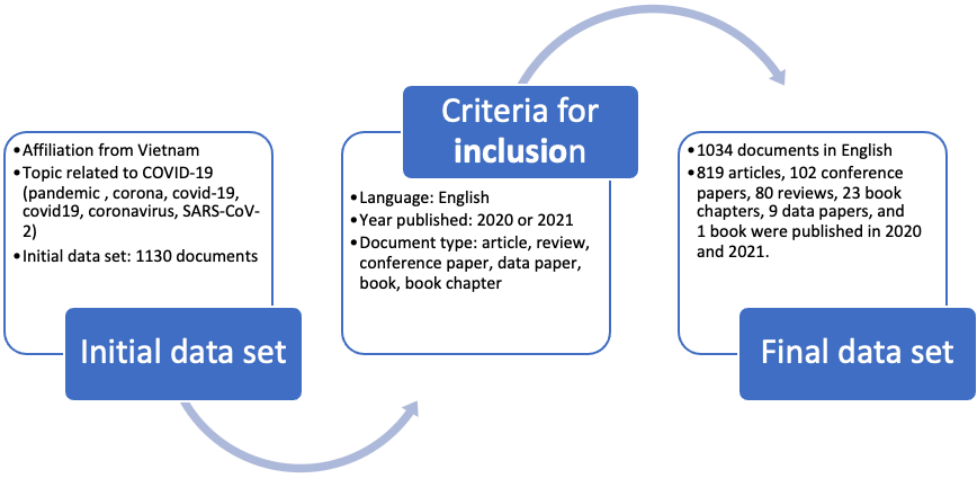

Figure 1. Selection of documents related to COVID-19 from Vietnam.

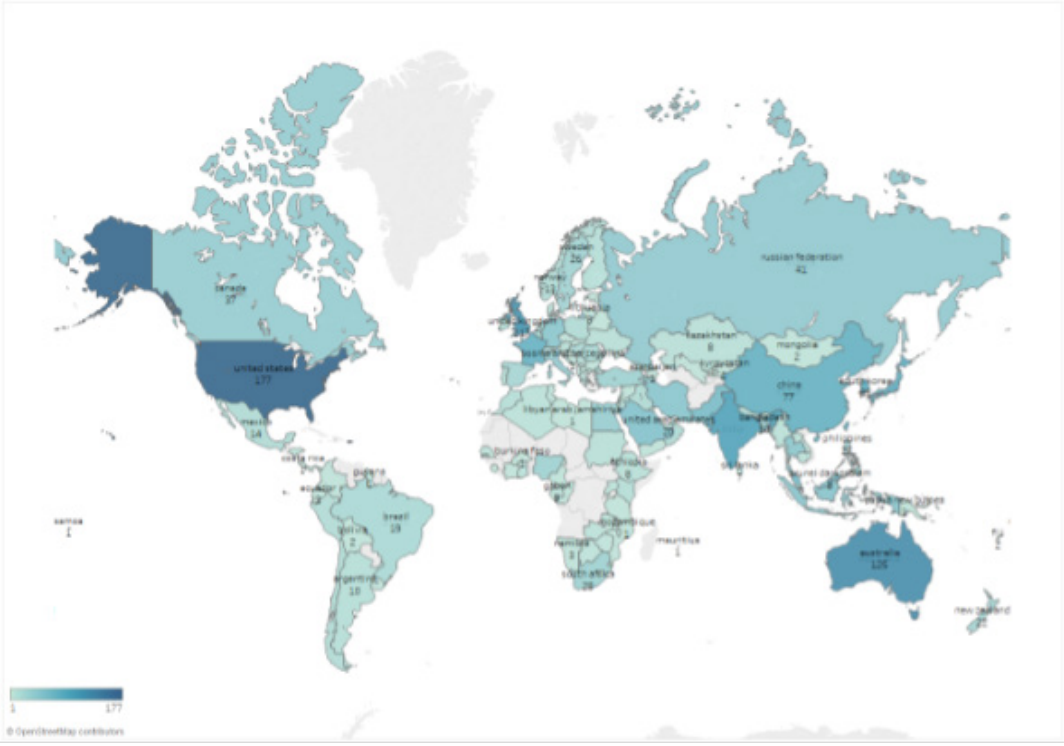

Figure 2. Countries collaborating with Vietnam in research on COVID-19 (as ascertained through affiliations of authors of papers published in 2020 or 2021 using Scopus database).

categorized as follows: articles, 819 (79.3%); conference papers, 102 (9.9%); reviews, 80 (7.7%); book chapters, 23 (2.2%); data papers, 9 (0.8%); and books, 1 (0.1%).

Top collaborating countries

Figure 2 shows the countries in which collaborators of researchers from Vietnam were located for research on COVID-19.

Authors from 130 countries published had co-authored at least one document with their peers in Vietnam. The United States, with 177 co-authored documents (or approximately 17% of the total 1034 documents) topped the list, followed, in that order, by Australia (125, or 12%), the United Kingdom (117, or 11%), India (96, or 9%), and Taiwan ROC (90 or 9%).

Top institutions

Table 1 shows the top ten institutions from Vietnam ranked by the number of publications related to COVID-19 (the left-hand column) and the top ten international institutions ranked by the number of authors from them who had co-authored papers with at least one author from Vietnam (the right-hand column). Among the top 10 institutions from Vietnam, three were medicine- or health-based universities, namely Hanoi Medical University (at no. 3), Hanoi University of Public Health (at no. 6), and the University of Medicine and Pharmacy, Ho Chi Minh City (at no. 9). The seven others were multidisciplinary universities. However, among the top 10 international institutions, it was not the United States that was at the top, although more authors – 177 out of 1034 documents (Figure 2) – from that country than any other country had published papers with at least one co-author from Vietnam. The top international institution was the National University of Singapore, followed by the University of Oxford (Table 1).

Table 1. Institutions ranked by the number of published documents related to COVID-19 or by the number of published documents with at least one co-author from Vietnam

Top 10 institutions from Vietnam, by the number of documents on COVID-19			Top 10 international institutions, by the number of documents with at least one co-author from Vietnam		
Rank	**Institution**	**Documents (%)**	**Rank**	**Institution and country**	**Documents (%)**
1	Duy Tan University	125 (12.08)	1	National University of Singapore, Singapore	50 (4.83)
2	Ton Duc Thang University	93 (8.99)	2	University of Oxford, UK	42 (4.06)
3	Hanoi Medical University	72 (6.96)	3	Johns Hopkins University, USA	35 (3.38)
4	University of Economics Ho Chi Minh City	68 (6.57)	4	RMIT University, Australia	21 (2.03)
5	Nguyen Tat Thanh University	56 (5.41)	5	Taipei Medical University, Taiwan ROC	18 (1.74)
6	Hanoi University of Public Health	43 (4.15)	6	Nagasaki University, Japan	17 (1.64)
7	FPT University	43 (4.15)	7	Aix Marseille University, France	15 (1.45)
8	Ho Chi Minh City Vietnam National University	36 (3.48)	8	King Saud University, Saudi Arabia	14 (1.35)
9	University of Medicine and Pharmacy at Ho Chi Minh City	31 (2.99)	9	Monash University, Australia	13 (1.25)
10	Can Tho University	29 (2.80)	10	Sultan Qaboos University, Oman	13 (1.25)

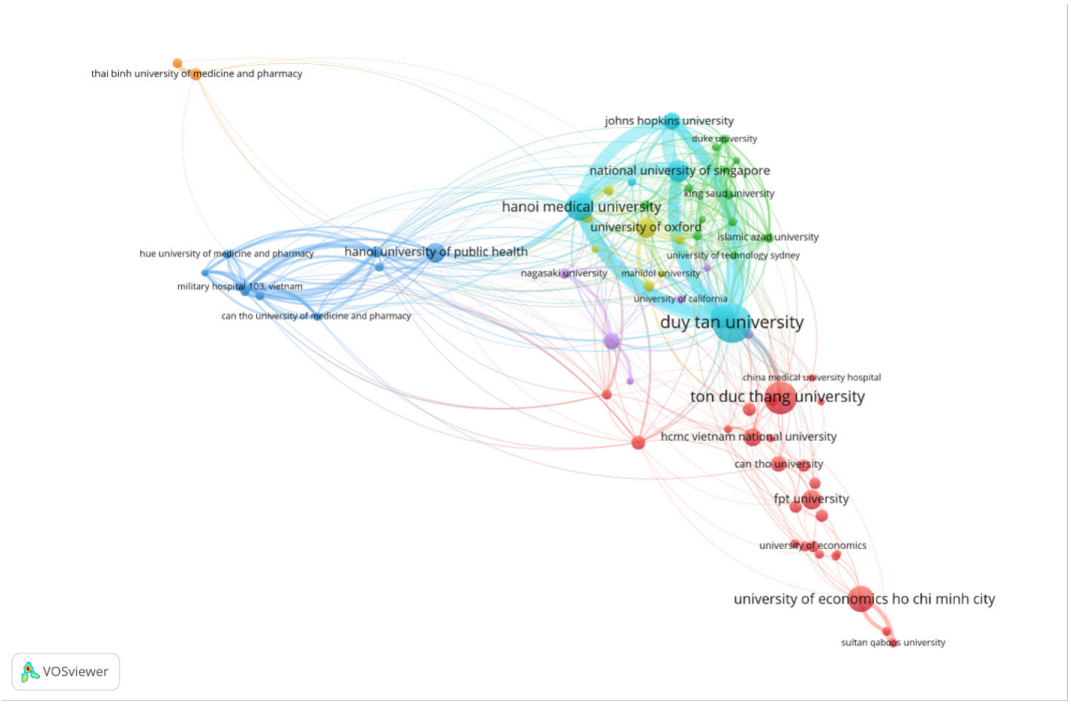

Figure 3. Network of 68 international institutions collaborating with institutions in Vietnam in research on COVID-19 (limited to those with a minimum 10 documents each co-authored with at least one researcher from Vietnam)

The network of institutions in Vietnam and their international collaborators in research on COVID-19 comprised a total of 68 institutions that had published at least 10 documents related to COVID-19. These 68 institutions formed seven clusters (Figure 3).

1 Red cluster, led by Ton Duc Thang University (93 documents, 2103 citations, 51 total link strength – represents the number of times cooperates others)

2 Green cluster, led by Hanoi National University of Education (11 documents, 101 citations, 18 total link strength)

3 Blue cluster, led by Hanoi University of Public Health (43 documents, 555 citations, 76 total link strength)

4 Yellow cluster, led by the University of Oxford (42 documents, 89 citations, 86 total link strength)

5 Purple cluster, led by the University of Medicine and Pharmacy at Ho Chi Minh City (31 documents, 97 citations, 59 total link strength)

6 Turquoise cluster, led by Duy Tan University (125 documents, 2724 citations, 243 total link strength)

7 Orange cluster, led by Thai Binh University of Medicine and Pharmacy (11 documents, 4079 citations, 22 total link strength)

Top subjects and topics

Table 2 ranks the disciplines or domains by the number of documents on COVID-19 co-authored by researchers from Vietnam. Medicine ranked first, with 327 documents (31.6%), followed by social sciences (185 documents, 17. 9%).

Table 2. Disciplines or domains ranked by the number of documents on COVID-19 published by researchers from Vietnam in 2020 or 2021 (as ascertained from Scopus database).

Discipline or domain	Documents (%)
Medicine	327(31.6)
Social sciences	185 (17.9)
Computer science	183 (17.70)
Economics, econometrics, and finance	128 (12.38)
Engineering	120 (11.61)
Environmental science	102 (9.86)
Business, management, and accounting	99 (9.57)
Mathematics	93 (8.99)
Immunology and microbiology	78 (7.54)
Biochemistry, genetics, and molecular biology	74 (7.16)
Physics and astronomy	64 (6.19)
Materials science	54 (5.22)
Chemistry	53 (5.13)
Energy	45 (4.35)
Decision sciences	42 (4.06)
Multidisciplinary	41 (3.97)
Chemical engineering	35 (3.38)
Agricultural and biological sciences	32 (3.09)
Pharmacology, toxicology, and pharmaceutics	24 (2.32)
Psychology	18 (1.74)
Neuroscience	17 (1.64)
Veterinary	17 (1.64)
Nursing	13 (1.26)
Earth and planetary sciences	12 (1.16)
Arts and humanities	11 (1.06)
Health professions	8 (0.77)
Dentistry	1 (0.10)

Based on related groups of a total of 50 keywords, the documents formed eight clusters (Figure 4). The keywords were limited to those that fetched at least five documents from the database. The clusters are listed below by the colour used for them in Figure 4 along with the keywords comprising each cluster.

1 Red: COVID-19, air pollution, air quality, artificial intelligence, big data, deep learning, Hanoi

2 Green: mental health, depression, anxiety, health literacy, stress, psychological distress, physical activity

3 Blue: Vietnam, vaccine, COVID-19 vaccine, attitude, public health, healthcare worker, intention, practice

4 Yellow: numerical simulation, simulation, pandemic, quarantine, social distancing

5 Purple: bitcoin, oil, gold, stock market, safe haven

6 Turquoise: e-learning, higher education, online learning, perception

7 Orange: impact, tourism

8 Brown: coronavirus

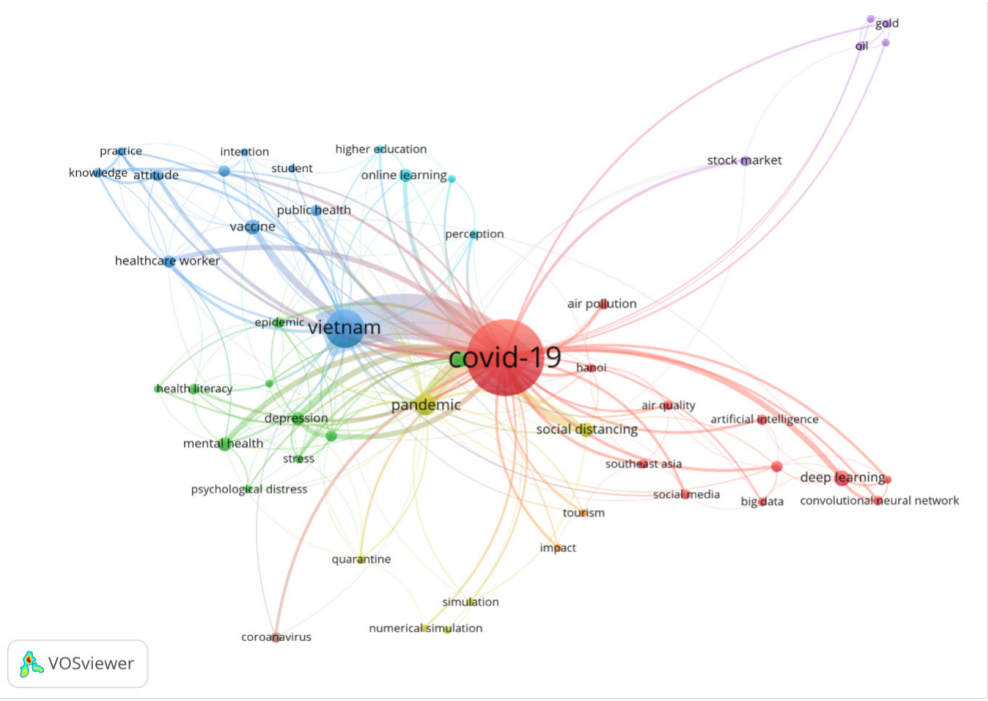

Figure 4. Network of topics related to COVID-19 (50 keywords, each fetching at least five documents from the database).

Top documents and authors

Table 2 (see Supplementary File) shows the top 10 documents on COVID-19 co-authored by researchers from Vietnam's ranked by the number of times the documents were cited. The most cited document was by Gautret et al.[9] with 3047 citations, followed by that by Wang et al.[10] (1123 citations). Of the top 10, five belonged to only one category, namely medicine; three, to immunology, microbiology, neuroscience; and two, to economics, econometrics, and finance.

All these ten documents were the result of international collaboration. The list was dominated by authors from other countries: other than in the paper by Nguyen et al.[14] no researcher from Vietnam was either the first author or the corresponding author.

Table 3 (see Supplementary File) shows the top 10 authors, ranked either by the number of papers published by them or by the number of times the authors were cited. The results were highly convergent: eight scholars featured in both lists. Hoang Van Thuan and Nguyen Thi Phuong Thao were the only two names that were confined to the top 10 in terms of citations, and Nguyen Thi Hiep and Nguyen Thu Ha were the only two names that were confined to the top 10 in terms of the number of documents published. Specifically, Hoang Van Thuan received 4012 citations, all of them due to only two papers, both with the same first author, namely Gautret.[9,13]

Discussion

Over the previous two years (2020 and 2021), along with researchers worldwide, those from Vietnam too have participated actively in research on COVID-19 to shed light on the unprecedented pandemic from different angles. Specifically, during 2020 and 2021, researchers from Vietnam co-authored 1034 documents related to COVID-19, accounting for 0.35% of the total of 296,148 such documents published worldwide (as ascertained from the Scopus database).

The top four collaborating countries were the United States, Australia, the united Kingdom, and Taiwan ROC—a result consistent with the observation that the same four countries were also identified as the most traditional collaborators of Vietnam in some earlier studies including those by Ho (2015) and by Nguyen, Ho, and Le (2017).[15,16] On the other hand, India, a non-traditional collaborator, was among the top five, probably because COVID-19 being a new and urgent problem, it pushed and encouraged Vietnamese researchers to seek new partners and to form new research groups to tackle the pandemic without losing time.

Second, our study shows the wide impact of COVID-19: among the top ten institutions from Vietnam, three were medical- or health-based whereas seven were multidisciplinary— research on COVID-19 therefore encompasses not only health but also several other disciplines including the social sciences, computer science, and economics (Table 2 and Figure 4). In practical terms, this result implies that to address the problems stemming from the pandemic, a multidisciplinary approach with participation of researchers from different disciplines is paramount.

Third, the three lists, namely the top 10 most cited documents, the top 10 most productive authors in terms of the number of documents they co-authored, and the top 10 most impactful researchers in terms of the number of times their documents were cited (Table 2 and Supplementary Table 2 in the Appendix) may serve as a reference for future scholars who wish to investigate issues related to COVID-19 from Vietnam's perspective. The present study also showed that although most of the researchers from Vietnam did not play a leading role in their studies on COVID-19, there will always be room for future researchers from Vietnam in studying COVID-19.

As with similar bibliometric studies, the present study also has several limitations.[17] First, it is merely a descriptive study: future studies on related topics may adopt a more sophisticated approach such as the 'mindsponge' mechanism – see, for example, Vuong et al. (2021)[18] – to obtain more sophisticated insights. Second, the present study was not extended to the contents of the documents on COVID-19. For instance, this study identified Gautret et al.[9] as the most cited document on COVID-19 among those with at least one co-author from Vietnam; however, the sample and the method used in that study have been criticized by several

peers, for example by Toumi and Aballea.[19] Future studies may overcome the drawback of bibliometrics, as adopted in the present study, by using content analysis of studies related to COVID-19. Third, the present study overlooked some bibliometric indicators such as open access versus non-open access documents, funding sources, and the number of citations after excluding self-citations—incorporating these indicators will provide a more insightful picture of the topic of the present study.

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