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Coronavirus: a scientometric study of worldwide research publications

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1. Introduction

Since the outbreak of the coronavirus (CoV) in Wuhan Province in China, doctors, health organizations, and administrations across the globe have been stretched in response to the increasing incidence and distribution of the outbreak. CoVs are a large family of viruses that cause respiratory illness. CoV is related to the severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus (MERS-CoV). Historically, SARS-CoV entered the spotlight when it caused an epidemic in Hong Kong. Thereafter, China, Vietnam, Canada, Saudi Arabia, and other parts of the globe witnessed outbreaks of the virus. The main cause of SARS was identified as CoV [1–4]. The other form of CoV identified in 2013 as MERS-CoV is genetically related to humans [5,6]. However, CoV has been the subject of virology research since 1931 and was identified as a pathogen affecting both humans and animals [7]. The major symptoms of CoV and its variants are characterized by respiratory illness (pneumonia, bronchitis, etc.) and intestinal infections (gastroenteritis, diarrhea, etc.) in both humans and animals [7,8]. The origin of the current strain of CoV has been linked to bats in China [9] and camels (Camelus dromedarius) in the Middle East region [10].

In contemporary ages, bibliometric study has become popular, which applies literature metrology characteristics to measure the aid of an area of research, predicts exhaustive developments of research or hotspots in a certain field, and makes an important contribution to the prevention and treatment of diseases.

Descriptive analyses were conducted to evaluate the characteristics and types of documents, and the top 25 authors and journals involved in coronavirus disease 2019 (COVID-19)-related research and publications were identified. Also, coauthorship among all the authors in the bibliography was measured, and an evaluation of how many
of them were connected within documents authored or coauthored by individuals was performed. Additionally, the affiliating institutions and countries of the respective authors were mapped using a network analysis approach. This set of analyses allowed comparing the nature and magnitude of collaboration at the individual, institutional, and global degrees and analyzing how such collaboration impacted the information base on COVID-19. Additionally, keywords and texts in titles and abstracts within scientific documents had been identified and evaluated for the use of textual content-mining methods, and network analyses were conducted to assess the connectedness among those documents and related keywords. Furthermore, the co-occurrence of multiple authors, keywords, institutions, and countries, different thresholds were used to create visualizations of frequency distributions for each variable, whereas all entries within each variable were assessed for the same threshold to ensure equitable comparisons within respective fields of analyses. In addition, a multidimensional scaling approach was used to conduct a factorial analysis and construct a conceptual structure map depicting hierarchic relationships among knowledge areas within the research landscape of COVID-19.

Evaluation of research developments is executed through bibliometric techniques. Bibliometric methods aid in the measurement of the publication form on a given topic, journals, authors, institutions, and countries using statistical methods [11–13]. Research on SARS had been reported [14] and there has been international linkages of CoV research output [15–17], however there are no specific bibliometric analyses on CoV. Bibliometric studies related to SARS were stated through 2003, with no descriptive bibliometric research to be associated with CoV thereafter. The aim of this study is to present a bibliometric perspective of CoV research for the period 1989–2020 (32 years).

2. Methodology

The study was analyzed the research output of CoV for the period 1989–2020 on several parameters. The Web of Science (WoS) citation database has been used to retrieve the publications data for 32 years. These WoS database is maintained by Clarivate Analytics, which is the world’s leading scientific citation search and analytical information platform. The study period 1989–2020 is selected, as the database is available. Search string used for the data retrieval is SU = (Corona virus) AND Timespan = 1989–2020. Database = SCSCI, A&HCI, this search criterion yielded 12,726 records. In addition MS Excel was used for the purpose of data analysis, and collaboration networks have been generated by using VOSviewer software [5,9,18,19].

These are the major bibliometric parameters established in other research publications [16,20]. The number of citations accumulated by the publication through February 22, 2020, was used to determine the impact factor (IF). The number citations received in the year of publication is denoted as TP, the number of citations in the year 2020 is denoted as C2020, and total citations (TC) are denoted as TC 2020. The qualitative parameter of an article’s Hirsch index (h-index) [21] was obtained from the database for
the most productive authors and institutes. Citation analysis is 2 S. RAM, a tool for journal evaluation, and the evaluation is carried out based on its IF [10,18,22–31]. The IF is a yearly mean number of citations received by articles published in a journal during the past 2 years [32]. IFs of the journals were obtained from the 2018 Journal Citation Report (JCR) and denoted as IF2018; the research direction in a field can be assessed using bibliometric analysis. Authors provide keywords that are useful in determining the hot research areas [33–35]. Research trends using author keywords were analyzed using VOSviewer [10,18,24–27]. The collaboration network is defined from the authors’ affiliations [10,18,24–30,36].

3. Analysis and results

3.1 Contribution of coronavirus publications by year

Data on the bibliographic records were collected from the online version of WoS related to CoV research publications from worldwide for the period of 1989–2020. A total of 12,726 publications were collected; Table 22.1 reveals the features of CoV research worldwide, with 12,726 papers and 361,839 citations. As per the WoS data the cumulative publications growth of CoV research had increased from 385 to 749. Highest number (782) of papers was published in the year 2004 and the least (76) number of publications was in the year 1989. In 1989, 76 articles were produced and received 2732 citations with 35.95 average citations per paper, and the highest h-index recorded in the year 2004 was only 90 (Figs. 22.1 and 22.2).

3.2 Forms of publication of coronavirus research

Table 22.2 illustrates the forms of publication of CoV research; these include articles, reviews, proceedings paper, editorial materials, meeting abstracts, letters, notes, news item, book chapters, etc. The study observed that there were a total of 12,726 publications in CoV research output from around the world. The majority of publications are published in journal articles, i.e., 10,358 (82.128%), followed by reviews, 1122 (8.896%), proceedings papers, 439 (3.481%); editorial materials, 357 (2.831%); meeting abstracts, 281 (2.228%); letters, 234 (1.855%); notes, 115 (0.912%); news items, 83 (0.658%); book chapters, 63 (0.5%); corrections, 54 (0.428%); and early access, 41 (0.325%); and less than five articles are published in reprint, three papers as correction addition. It was also observed from the data that more than 99% of articles were published in the English language.

3.3 Language-wise distribution of coronavirus research

Table 22.3 indicates that 97.407% (12,726 publications) of the worldwide publications in CoV were in the English language, followed by French, 87 (0.69%) papers; German, 81 (0.642%); Spanish, 36 (0.285%); Chinese, 31 (0.246%); Hungarian, 23 (0.182%); Polish,
16 (0.127%); Portuguese, 13 (0.103%); Russian, 10 (0.079%); Dutch and Turkish, 9 (0.071%); Italian, 4 (0.032%); Czech and Korean, 2 (0.016%); and less than 1% of papers were published in Greek, Japanese, and other languages.

### 3.4 Distribution of articles among subdisciplines

The CoV articles published during 1989–2020 were classified under 25 major subdisciplines (as defined by WoS citation database). Table 22.4 reveals the top 25 research areas of the world in the field of CoV. Virology accounted for the largest publications, i.e., 3993 (31.483%), followed by veterinary sciences, 1908 (15.044%) publications; infectious
diseases, 1490 (11.784%) publications; immunology, 1477 (11.646%); microbiology, 1405 (11.078%); biochemistry and molecular biology, 1113 (8.776%); and biotechnology and applied microbiology, 718 (5.661%); multidisciplinary sciences, 581 (4.581%); medicine research experiment, 569 (4.486%) etc.
### Table 22.2  Forms of publication of coronavirus research.

| Document types                  | Publications | % of 12,726 |
|---------------------------------|--------------|-------------|
| Articles                        | 10,358       | 82.128      |
| Reviews                         | 1122         | 8.896       |
| Proceedings papers              | 439          | 3.481       |
| Editorial materials             | 357          | 2.831       |
| Meeting abstracts               | 281          | 2.228       |
| Letters                         | 234          | 1.855       |
| Notes                           | 115          | 0.912       |
| News items                      | 83           | 0.658       |
| Book chapters                   | 63           | 0.500       |
| Corrections                     | 54           | 0.428       |
| Early access                    | 41           | 0.325       |
| Reprints                        | 5            | 0.040       |
| Correction additions            | 3            | 0.024       |
| Data papers                     | 1            | 0.008       |
| Retracted publications          | 1            | 0.008       |

### Table 22.3  Language-wise distribution of worldwide coronavirus research.

| Languages    | Publications | % of 12,726 |
|--------------|--------------|-------------|
| English      | 12,285       | 97.407      |
| French       | 87           | 0.69        |
| German       | 81           | 0.642       |
| Spanish      | 36           | 0.285       |
| Chinese      | 31           | 0.246       |
| Hungarian    | 23           | 0.182       |
| Polish       | 16           | 0.127       |
| Portuguese   | 13           | 0.103       |
| Russian      | 10           | 0.079       |
| Dutch        | 9            | 0.071       |
| Turkish      | 9            | 0.071       |
| Italian      | 4            | 0.032       |
| Czech        | 2            | 0.016       |
| Korean       | 2            | 0.016       |
| Danish       | 1            | 0.008       |
| Greek        | 1            | 0.008       |
| Japanese     | 1            | 0.008       |
| Slovenian    | 1            | 0.008       |
| Welsh        | 1            | 0.008       |
Table 22.5 reveals the top productive sources preferred by the authors of the world in the field of CoV research. The *Journal of Virology* ranks first in terms of publications, i.e., 1130 publications with 8.96% of total publications, followed by *Virology*, 479 publications with 3.798%; *Advances in Experimental Medicine and Biology*, 246 publications with 1.951%; *Emerging Infectious Diseases*, 245 publications with 10,096 citations; *PLos One*, 239 publications with 4339 citations; *Archives of Virology*, 232 publications with 4428 citations; *Viruses Basel*, 170 publications with 1940 citations; *Journal of Virolological Methods*, 168 publications with 3100 citations; *Journal of Clinical Microbiology*, 137 publications with 7022 citations; *Antiviral Research*, 133 publications with 2605 citations; *Journal of Medical Virology*, 131 publications with 4326 citations; and *Proceedings of the National Academy of Sciences of the United States of America*, 122 publications with 12,867 citations.

### Table 22.4 Distribution of articles among subdisciplines.

| Web of Science categories | Publications | % of 12,683 |
|---------------------------|--------------|-------------|
| Virology                  | 3993         | 31.483      |
| Veterinary Sciences       | 1908         | 15.044      |
| Infectious Diseases       | 1490         | 11.748      |
| Immunology                | 1477         | 11.646      |
| Microbiology              | 1405         | 11.078      |
| Biochemistry and Molecular biology | 1113     | 8.776       |
| Biotechnology and Applied microbiology | 718      | 5.661       |
| Multidisciplinary Sciences| 581          | 4.581       |
| Medicine Research experiment | 569    | 4.486       |
| Medicine general internal | 436          | 3.438       |
| Cell biology              | 412          | 3.248       |
| Pharmacology pharmacy     | 409          | 3.225       |
| Public environmental and occupational Health | 373     | 2.941       |
| Biochemical Research Methods | 353   | 2.783       |
| Biophysics                | 311          | 2.452       |
| Genetics and heredity     | 220          | 1.735       |
| Respiratory system        | 213          | 1.679       |
| Chemistry, Medicinal      | 202          | 1.593       |
| Pediatrics                | 176          | 1.388       |
| Pathology                 | 172          | 1.356       |
| Biology                   | 151          | 1.191       |
| Chemistry, Multidisciplinary | 138     | 1.088       |
| Parasitology              | 133          | 1.049       |
| Neurosciences             | 131          | 1.033       |
| Agriculture and dairy Animal Science | 109 | 0.859 |

3.5 The 25 major productive journals of coronavirus

*Table 22.5* reveals the top productive sources preferred by the authors of the world in the field of CoV research. The *Journal of Virology* ranks first in terms of publications, i.e., 1130 publications with 8.96% of total publications, followed by *Virology*, 479 publications with 3.798%; *Advances in Experimental Medicine and Biology*, 246 publications with 1.951%; *Emerging Infectious Diseases*, 245 publications with 10,096 citations; *PLos One*, 239 publications with 4339 citations; *Archives of Virology*, 232 publications with 4428 citations; *Viruses Basel*, 170 publications with 1940 citations; *Journal of Virolological Methods*, 168 publications with 3100 citations; *Journal of Clinical Microbiology*, 137 publications with 7022 citations; *Antiviral Research*, 133 publications with 2605 citations; *Journal of Medical Virology*, 131 publications with 4326 citations; and *Proceedings of the National Academy of Sciences of the United States of America*, 122 publications with 12,867 citations.
3.6 Organization-wise collaboration

Table 22.6 and Fig. 22.3 reveal the ranking of 25 top research organizations in the world based on their highest research articles. According to the WoS database the University of Hong Kong contributed the highest number of publications to the field, i.e., 517 publications with 28,869 citations, followed by the Chinese Academy of Sciences, 391 publications with 10,999 citations; the National Institutes of Health (NIH), USA, 312 publications with 16,051 citations; and in the 25th place is the University of London, 146 publications with 6606 citations.

Table 22.5 The 25 major productive journals of coronavirus research.

| Source titles                                         | TP   | TC     | ACP   | h-index | % of 12,726 |
|-------------------------------------------------------|------|--------|-------|---------|-------------|
| Journal of Virology                                   | 1130 | 55,178 | 48.83 | 104     | 8.96        |
| Virology                                              | 479  | 18,088 | 37.76 | 66      | 3.80        |
| Journal of General Virology                           | 276  | 9820   | 35.58 | 54      | 2.19        |
| Advances in Experimental Medicine and Biology         | 246  | 1539   | 6.23  | 15      | 1.95        |
| Emerging Infectious Diseases                          | 245  | 10,096 | 40.87 | 52      | 1.94        |
| Plos One                                              | 239  | 4339   | 17.98 | 34      | 1.90        |
| Archives of Virology                                  | 232  | 4428   | 19    | 37      | 1.84        |
| Virus Research                                        | 231  | 5415   | 23.44 | 37      | 1.83        |
| Veterinary Microbiology                               | 190  | 3908   | 20.46 | 34      | 1.51        |
| Viruses Basel                                         | 170  | 1940   | 11.41 | 24      | 1.35        |
| Journal of Virological Methods                        | 168  | 3100   | 18.34 | 29      | 1.33        |
| Journal of Clinical Microbiology                      | 137  | 7022   | 51.26 | 49      | 1.09        |
| Antiviral Research                                    | 133  | 2605   | 19.59 | 28      | 1.06        |
| Journal of Medical Virology                           | 131  | 4326   | 32.77 | 37      | 1.04        |
| Proceedings of the National Academy of Sciences of the USA | 122  | 12,867 | 105.47| 67      | 0.97        |
| Journal of Infectious Diseases                        | 119  | 4227   | 35.52 | 38      | 0.94        |
| Journal of Clinical Virology                          | 117  | 3066   | 26.21 | 33      | 0.93        |
| Avian Diseases                                        | 115  | 2787   | 24.23 | 29      | 0.91        |
| Vaccine                                               | 109  | 2560   | 23.49 | 29      | 0.86        |
| Virology Journal                                      | 107  | 1966   | 18.37 | 25      | 0.85        |
| Virus Genes                                           | 100  | 1984   | 19.84 | 24      | 0.79        |
| Biochemical and Biophysical Research Communications    | 97   | 3426   | 35.69 | 35      | 0.77        |
| Journal of Biological Chemistry                       | 91   | 4850   | 53.3  | 43      | 0.72        |
| Nidoviruses: Toward Control of SARS and Other Nidovirus Diseases | 89   | 369    | 4.15  | 10      | 0.71        |
| Plos Pathogens                                        | 87   | 4234   | 48.67 | 39      | 0.69        |

TP, Total Publications; TC, Total Citations; ACP, Average Citations per Paper; h-index, Hirsch index.
3.7 Most productive authors in coronavirus research

Table 22.7 and Fig. 22.4 show the highly productive authors of CoV research output during the study period, their highest number of papers, irrespective of what is reflected in the WoS citation database. Yuen K.Y. contributed 212 (1.681%) publications, followed by Perlman S., 179 (1.419%); Baric R.S., 159 (1.261%); Drosten C., 147 (1.166%); Weiss S.R., 129 (1.023%); Woo P.C.Y., 128 (1.023%); etc.

3.8 International linkages of coronavirus research

The international distribution of articles is presented in Table 22.8, which gives the country-wise distribution of contributions. Out of the total 12,726 research articles, the
United States contributed the highest number of research articles with 4524 publications with 35.871% share, followed by China, 2667 publications (21.147%); Germany, 882 publications (6.993%); England, 782 publications (6.2%); Netherlands, 728 publications (5.772%); Canada, 707 publications (5.606%); Japan, 586 publications (4.646%); and many countries contributed below 0.5% share, with India contributing 125 publications (0.991) during 1989–2020 (Fig. 22.5).

Table 22.9 reveals the rank list of top 25 highly funding institutions in the world based on their highest publications, citations, average citations per publication, and h-index. According to the WoS database, the United States Department of Health and Human Services contributed the highest publications to the field of CoV research, i.e., 2192 publications, followed by the NIH, USA, 2146 publications (17.016%); NIH National Institute of Allergy Infectious Diseases (NIAID), 1082; National Natural Science Foundation of China, 606 (4.805%); NIH National Institute of Neurological Disorders Stroke (NINDS), 276 (20.188%); Ministry of Education Culture Sports Science and Technology Japan MEXT, 161 (1.277%); European Union, 156 (1.237%); NIH National Institute of General Medical Sciences (NIGMS), 128 (1.015%); and NIH National Cancer Institute (NCI), 116 (0.92%).

**FIGURE 22.3** Organizational collaboration network.
### Table 22.7  Most prolific authors in coronavirus research.

| Authors       | Number of Publications | % of 12,726 |
|---------------|------------------------|-------------|
| Yuen K.Y.     | 212                    | 1.681       |
| Perlman S.    | 179                    | 1.419       |
| Baric R.S.    | 159                    | 1.261       |
| Enjuanes L.   | 159                    | 1.261       |
| Drosten C.    | 147                    | 1.166       |
| Weiss S.R.    | 129                    | 1.023       |
| Woo P.C.Y.    | 128                    | 1.015       |
| Rottier P.I.M.| 125                    | 0.991       |
| Chan Kh.      | 119                    | 0.944       |
| Lau S.K.P.    | 119                    | 0.944       |
| Memish Z.A.   | 110                    | 0.872       |
| Saif L.J.     | 110                    | 0.872       |
| Snijder E.J.  | 110                    | 0.872       |
| Holmes K.V.   | 99                     | 0.785       |
| Jiang S.B.    | 97                     | 0.769       |
| Peiris J.S.M. | 97                     | 0.769       |
| Liu D.X.      | 92                     | 0.729       |
| Stohlman S.A. | 88                     | 0.698       |
| Denison M.R.  | 85                     | 0.674       |
| Haagmans B.L. | 83                     | 0.658       |
| Zhang Y.      | 83                     | 0.658       |
| Lai M.M.C.    | 82                     | 0.65        |
| Thiel V.      | 82                     | 0.65        |
| Taguchi F.    | 81                     | 0.642       |
| Talbot P.J.   | 78                     | 0.618       |

*Figure 22.4* Authors coauthorship network.

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| Authors       | Number of Publications | % of 12,726 |
|---------------|------------------------|-------------|
| Yuen K.Y.     | 212                    | 1.681       |
| Perlman S.    | 179                    | 1.419       |
| Baric R.S.    | 159                    | 1.261       |
| Enjuanes L.   | 159                    | 1.261       |
| Drosten C.    | 147                    | 1.166       |
| Weiss S.R.    | 129                    | 1.023       |
| Woo P.C.Y.    | 128                    | 1.015       |
| Rottier P.I.M.| 125                    | 0.991       |
| Chan Kh.      | 119                    | 0.944       |
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| Lai M.M.C.    | 82                     | 0.65        |
| Thiel V.      | 82                     | 0.65        |
| Taguchi F.    | 81                     | 0.642       |
| Talbot P.J.   | 78                     | 0.618       |

*Figure 22.4* Authors coauthorship network.
4. Results and Findings

A total of 12,726 papers on CoV research published between 1989 and 2020 were retrieved from WoS database. The number of publications has gradually increased, and in 2004, a total of 782 papers were published, which was followed by a significant increase to 734 in 2019. It is indicated that this field has been attracting more attention since the current CoV outbreak. The increasing trend in the number of papers per year is illustrated in Table 22.1. The forms of publishing CoV research include articles published in the scholarly journals, conferences and seminar proceedings, reviews, editorial materials, book chapters, meeting abstracts, etc. The study observed a total of 12,726 publications in CoV research. The worldwide publications on CoV (COVID-19) have been primarily in the English language, followed by French with 87 (0.69%) papers, and there are 25 top

| Countries/regions  | Number of publications | % of 12,726 |
|-------------------|------------------------|-------------|
| The United States | 4524                   | 35.871      |
| People’s Republic of China | 2667 | 21.147 |
| Germany           | 882                    | 6.993       |
| England           | 782                    | 6.2         |
| Netherlands       | 728                    | 5.772       |
| Canada            | 707                    | 5.606       |
| Japan             | 586                    | 4.646       |
| France            | 567                    | 4.496       |
| South Korea       | 426                    | 3.378       |
| Saudi Arabia      | 409                    | 3.243       |
| Taiwan            | 403                    | 3.195       |
| Italy             | 361                    | 2.862       |
| Singapore         | 338                    | 2.68        |
| Australia         | 330                    | 2.617       |
| Spain             | 328                    | 2.601       |
| Switzerland       | 298                    | 2.363       |
| Brazil            | 217                    | 1.721       |
| Sweden            | 171                    | 1.356       |
| Belgium           | 160                    | 1.269       |
| Egypt             | 136                    | 1.078       |
| Scotland          | 126                    | 0.999       |
| India             | 125                    | 0.991       |
| Thailand          | 102                    | 0.809       |
| Poland            | 91                     | 0.722       |
| Turkey            | 90                     | 0.714       |
research organizations in the world based on their highest research articles. According to the WoS database the University of Hong Kong contributed the highest number of publications to the field, i.e., 517 publications with 28,869 citations, followed by the Chinese Academy of Sciences with 391 publications with 10,999 citations and NIH, USA, with 312 publications.

Scientific studies perform a vital role in the prevention and control of an epidemic [1,14], which merits to be absolutely mobilized, deployed, and reinforced comprehensively to update our expertise knowledge and the connection among disease, humanity, and history [10,11,17,18,22–31,37]. In addition, scientific and technologic methodology and tactics need to be the pinnacle precedence in our steady fight against viruses and in getting us completely organized for prevention and control of an epidemic [2,38]. Many scientific research had been performed for CoV prevention and management, which lay the solid foundation for virus identification, vaccine improvement, formulation of prevention and control measures, and R&D of specific drugs [1,14,39]. In this regard, this chapter summarizes the scientific research publications after the epidemic outbreak and aims to provide reference and thinking for the path of medical studies on CoV in the future.

**FIGURE 22.5** International collaboration network of coronavirus research.
Table 22.9  Top 25 funding agencies in the field of coronavirus research.

| Funding agencies                                           | Publications | % of 12,726 |
|------------------------------------------------------------|-------------|-------------|
| United States Department of Health and Human Services     | 2192        | 17.38       |
| INIH USA                                                   | 2146        | 17.016      |
| NIH National Institute of Allergy Infectious Diseases (NIAID) | 1082        | 8.579       |
| National Natural Science Foundation of China               | 606         | 4.805       |
| NIH National Institute of Neurological Disorders Stroke (NINDS) | 276         | 2.188       |
| Ministry of Education Culture Sports Science and Technology | 161         | 1.277       |
| Japan MEXT                                                 | 156         | 1.237       |
| European Union                                             | 156         | 1.237       |
| NIH National Institute of General Medical Sciences (NIGMS) | 128         | 1.015       |
| NIH National Cancer Institute (NCI)                       | 116         | 0.92        |
| United States Public Health Service                       | 114         | 0.904       |
| National Basic Research Program of China                   | 112         | 0.888       |
| National Key Research and Development Program of China     | 99          | 0.785       |
| Medical Research Council, UK (MRC)                        | 94          | 0.745       |
| Wellcome Trust                                             | 94          | 0.745       |
| NIH National Center for Research Resources (NCRR)         | 86          | 0.682       |
| Japan Society for the Promotion of Science                | 83          | 0.658       |
| European Commission Joint Research Centre                 | 81          | 0.642       |
| Biotechnology and Biological Sciences Research Council (BBSRC) | 80          | 0.634       |
| Netherlands Organization for Scientific Research NWO       | 75          | 0.595       |
| National Science Council of Taiwan                         | 72          | 0.571       |
| National Council for Scientific and Technological Development CNPQ | 66          | 0.523       |
| Canadian Institutes of Health Research (CIHR)              | 64          | 0.507       |
| Ministry of Science and Technology China                   | 64          | 0.507       |
| University of Hong Kong                                    | 64          | 0.507       |

NIH, National Institutes of Health.

5. Conclusion

Virology, epidemiology, medical features, laboratory examination, radiography, prognosis, and treatment are the research hotspots of CoV outbreak; these studies’ findings play a vital role in the prevention and control of the epidemic spreading all around the world. With research on CoV nevertheless booming, new vaccine and effective medicinal drugs for CoV infection may be anticipated in the near future.

The results showed there is a direct relationship between the CoV outbreaks and the number of scientific publications in this area in the world. The quality of the researchers’ productions in this area can be deliberated by scientific methods, and researchers’ self-citation has affected their h-index. For healthcare researchers, policymakers, and planners, it is necessary to be aware of the results of scientific studies of strategic and vital research areas, such as CoV, to identify more appropriate therapeutic goals, make better decisions, and provide more effective solutions in the shortest time.
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