Bibliometric Study of World COVID-19 Publication Output

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Abstract

The COVID-19 outbreak originating in Wuhan, Hubei province, China, coincided with chunky, the period of mass migration for the annual Spring Festival. To contain its spread, China adopted unprecedented nationwide interventions on January 23, 2020. These policies included large-scale quarantine, strict controls on travel, and extensive monitoring of suspected cases. However, it is unknown whether these policies have had an impact on the epidemic. We sought to show how these control measures impacted the containment of the epidemic. Web of Science database was searched on September 10, 2020, for COVID-19 publications published between 2019 to 2020. It was performed on the same day to avoid the possible bias from an update on the database because the metrics are changing over time. All publication types were considered; however, publications as errata were excluded. Analysis parameters include a year of publication, publication type, patterns of international collaboration, research institutions, journals, impact factor, h-index, language, and times cited. A total of 17,133 COVID-19 research publications were published across the world. The USA was the largest contributor, with 4767 (27.823%) articles published, followed by Peoples R China (2747 (16.033%) articles.

Keywords: COVID-19, COVID-19, Bibliometric study, Web of science, World publications

Introduction

A cluster of viral pneumonia cases of unknown cause, subsequently identified as a novel coronavirus, named as 2019-nCov or COVID-19, was detected on December 31, 2019, in Wuhan, China. The disease has spread rapidly from Wuhan to other regions in China. Further, the dissemination of this virus has been observed in 216 countries and over 680354 deaths as of 2 August 2020 (Aristovnik et al., 2020). Bibliometric evaluation, a commonly accepted statistical tool, helps to present the knowledge structure of a particular research field. Throughout recent years, bibliometrics has been used to provide strong insights into several biomedical fields linked to many virus outbreaks.
There have been a few recent reviews of COVID-19 or Coronavirus (Zhou et al., 2020). The previously published bibliometric studies on COVID-19 have been published by using the Web of Science (WoS) database for data collection and were limited to biomedical research areas (Wu et al., 2020). Therefore, the purpose of the current COVID-19 research during the early stage of the outbreak through bibliometric analysis (Aristovnik et al., 2020b) determine the top-cited publications, and explore the current topics to provide the scientists and researchers hot topics to provide the scientists and researchers with a resource that can help them by identifying the current research priorities. (Joshua & Sivaprakasam, 2020).

Data Source & Methods

For this study, bibliometric data were collected from the Science Citation Index Expanded, Social Sciences Citation Index, and Emerging Sources Citation Index databases within the Web of Science (WoS) core collection. These databases within WoS are maintained by Clarivate Analytics, which offers the world’s leading scientific citation search and analytical information platform. Collectively WoS collection provides enriched bibliometric data useful for citation analytics and mapping the knowledge in a given domain by examining leading authors, institutions, and collaborating nations working in a given domain of scientific research. The following query was administered to retrieve COVID-19 related bibliometric data: “Novel coronavirus” OR “Novel coronavirus 2019” OR “2019 Novel coronavirus” OR “2019 nCoV” OR “COVID-19” OR “Wuhan coronavirus” OR “Wuhan pneumonia” OR “SARS nCoV” OR “SARS-CoV-2”. Considering the timing of the outbreak in late 2019, the search strategy was limited to 2019–2020 to retrieve data that may contain publications on COVID-19 rather than earlier coronaviruses. All search fields were selected, including topics, titles, and abstracts, to retrieve the bibliometric data ensuring the sensitivity of the search strategy. This search was conducted on September 10, 2019; no restrictions on languages or publication types were applied due to the low number of publications on this recent topic. The inclusion criteria for this bibliometric study was as follows: a) journal articles published on COVID-19 topic, b) language of the publication was English, c) articles irrespective of their methodology were included, d) studies published between January 1, 2019, to September 2020, were included.

Furthermore, articles were excluded if they had conflicts with any of the above-mentioned inclusion criteria. The references of the retrieved articles were not evaluated. Therefore, articles retrieved through citation search are the only source of data in this bibliometric study. VOSviewer (van Eck & Waltman, 2010) (version 1.6.10) was used to analyze the Co-authorship, Co-occurrence, Citation, Bibliographic coupling, Co-citation, and themes.

Data Analysis and Results

On the topic of COVID-19, 17,133 publications were identified in the WOS database, which included 6882 (40.168%) original research articles, 4,378 (25.553%) early access, 4,179 (24.392%) editorials, and 1,694 other forms of publications containing letters, case reports, etc. majority of the publications (16,673, 97.315%) were written in English, followed by 188 German publications and 15,375 (89.73%) papers were open access. USA contributed 4767 (27.82%) followed by 2747 (16.03%) Chena contributed & India contributed 751 (4.38%) papers. Among 17,133 publications, 6787 papers got 69836 citations and 10346 publications uncited.

Forms used for Communicating COVID-19

Table 1 and Figure 1 illustrate the forms used for communicating COVID-19 research; these include articles published in scholarly journals, conferences and seminar proceedings, reviews, editorial materials, book chapters, meeting abstracts, etc. The study observed that a total of 17133 research publications in COVID-19. The majority of publications are published in Journal Articles, i.e., 6882 (40.168%) followed by Early Access 4378 (25.553%) publications, Editorial Material 4179 (24.392%) publications, 3825 (22.325%) published as Letters, 1546 (9.024%) publications are published as Review and also observed from the data that more than 99% of articles published in the English language.
Table 1: Covid-19 Forms of Communication

| Document types       | Records | % of 17133 |
|----------------------|---------|------------|
| Article              | 6882    | 40.168     |
| Early Access         | 4378    | 25.553     |
| Editorial Material   | 4179    | 24.392     |
| Letter               | 3825    | 22.325     |
| Review               | 1546    | 9.024      |
| News Item            | 579     | 3.379      |
| Correction           | 113     | 0.66       |
| Book Review          | 4       | 0.023      |
| Biographical Item    | 3       | 0.018      |
| Proceedings Paper    | 2       | 0.012      |
| Dance Performance Review | 1   | 0.006      |
| Data Paper           | 1       | 0.006      |
| Meeting Abstract     | 1       | 0.006      |

Table 2: Language-Wise Distribution of World COVID-19 Research Publications

| Languages  | Records | % of 17133 |
|------------|---------|------------|
| English    | 16673   | 97.315     |
| German     | 188     | 1.097      |
| Spanish    | 99      | 0.578      |
| French     | 98      | 0.572      |
| Portuguese | 32      | 0.187      |
| Hungarian  | 25      | 0.146      |

Figure 1: Covid-19 Forms of Communication

Language-Wise Distribution of World COVID-19 Research Publications

Table 2 and figure 2 indicates that Language-Wise Distribution of World COVID-19 Research Publications. Among 17133 publications, 97.315% (16673) published in English language, followed by German 188 (1.097%) papers, 99 (0.578%) papers in Spanish, French 98 (0.572%) publications, Portuguese 32 (0.187%) papers, Hungarian 25 (0.146%) papers, Italian 5 (0.029%) papers, and Chinese 13 (0.103%) papers were published.

Table 2: Language-Wise Distribution of World COVID-19

Distribution of Articles among Sub-Disciplines

The World literature about COVID-19 published during 2020 were extracted from the Web of Science citation database and classified under 20 major sub-disciplines. Table 3 and figure 3 Reveals that the top 20 major sub-disciplines of COVID-19. Medicine General Internal accounted for the largest publications i.e.2367 (13.815%) with 20507 Total Citations & 8.66 Average Citation followed by Public Environmental Occupational Health produced 1412 (8.241%) publications with 3182 Total Citations & 2.25 Average Citation, Surgery produced 984 (5.743%) publications with 2510 Total Citations & 2.25 Average Citation, Infectious Diseases produced 951 (5.551%) publications with 6864 Total Citations & 7.22 Average Citation and the top 3 h-index major sub-disciplines are Medicine General Internal with h-index 63, Infectious Diseases h-index of 41 and Immunology h-index of 3.
# S I N C E 1990

Table 3: Web of Science Categories

| Web of Science Categories                                    | Records | % of 17133 | TC      | ACPP   | h-index |
|--------------------------------------------------------------|---------|------------|---------|--------|---------|
| Medicine General Internal                                    | 2367    | 13.815     | 20507   | 8.66   | 63      |
| Public Environmental Occupational Health                     | 1412    | 8.241      | 3182    | 2.25   | 24      |
| Surgery                                                      | 984     | 5.743      | 2510    | 2.55   | 20      |
| Infectious Diseases                                          | 951     | 5.551      | 6864    | 7.22   | 41      |
| Psychiatry                                                   | 666     | 3.887      | 1645    | 2.47   | 19      |
| Cardiac Cardiovascular Systems                               | 626     | 3.654      | 2324    | 3.72   | 23      |
| Immunology                                                   | 574     | 3.35       | 3168    | 5.52   | 31      |
| Medicine Research Experimental                                | 568     | 3.315      | 1875    | 3.30   | 22      |
| Oncology                                                     | 564     | 3.292      | 1392    | 2.47   | 17      |
| Clinical Neurology                                           | 561     | 3.274      | 1256    | 2.24   | 15      |
| Pharmacology Pharmacy                                        | 520     | 3.035      | 2034    | 3.91   | 21      |
| Radiology Nuclear Medicine Medical Imaging                   | 519     | 3.029      | 2298    | 4.43   | 24      |
| Dermatology                                                  | 472     | 2.755      | 1379    | 2.92   | 17      |
| Pediatrics                                                   | 465     | 2.714      | 1171    | 2.52   | 15      |
| Virology                                                     | 464     | 2.708      | 2803    | 6.04   | 28      |
| Environmental Sciences                                       | 439     | 2.562      | 1021    | 2.33   | 14      |
| Health Care Sciences Services                                | 425     | 2.481      | 506     | 1.19   | 10      |
| Hematology                                                   | 424     | 2.475      | 1748    | 4.12   | 22      |
| Biochemistry Molecular Biology                                | 395     | 2.305      | 2260    | 5.72   | 27      |
| Neurosciences                                                | 381     | 2.224      | 977     | 2.56   | 15      |

TC = Total Citation, ACPP = Average Citation per Paper

Figure 3: Distribution of Articles among Sub-Disciplines

Top 25 Productive Journals of COVID-19

Table 4 and figure 4 reveals the top productive sources preferred by the authors in COVID-19 research publications. They cover around one-fifth (19%) of total documents and cover more than 50% of total citations. The majority of these journals are subject to health sciences, and they are classified mainly in the following sub-disciplines: infectious diseases, general medicine, and medical sciences. British Medical Journal first with 663 papers 3.87% of total publications and followed by Journal of Medical Virology contributed 325 (1.900%) publications, International Journal of Environmental Research and Public Health and Lancet ware contributed 166 (0.970%) publications each and Psychological Trauma Theory Research Practice and Policy produced 145 (0.850%). New England Journal of Medicine got the highest total citations with an h-index of 32, followed by the Journal of the American Medical Association with 4634 total citations with an h-index of 29 and Lancet 4780 total citations with an h-index of 26 respectively. Figure 5 shows the VOS viewer Citation network of most productive journals.
Table 4: Top 25 Productive Journals

| Source Titles | Records | TC    | ACPP | h-index | % of 17133 |
|---------------|---------|-------|------|---------|------------|
| BMJ British Medical Journal | 663     | 1360  | 2.05 | 17      | 3.87       |
| Journal of Medical Virology   | 325     | 1987  | 6.11 | 24      | 1.90       |
| International Journal of Environmental Research and Public Health | 166    | 430   | 2.59 | 9       | 0.97       |
| Lancet                     | 166     | 4780  | 28.8 | 26      | 0.97       |
| Psychological Trauma Theory Research Practice and Policy | 145     | 40    | 0.28 | 2       | 0.85       |
| Critical Care              | 144     | 265   | 1.84 | 9       | 0.84       |
| Dermatologic Therapy       | 142     | 276   | 1.94 | 8       | 0.83       |
| Journal of Infection       | 138     | 727   | 5.27 | 14      | 0.81       |
| New England Journal of Medicine | 114   | 5881  | 51.59 | 32 | 0.67       |
| Otolaryngology Head and Neck Surgery | 110    | 162   | 1.47 | 7       | 0.64       |
| International Journal of Infectious Diseases | 107    | 883   | 8.25 | 15      | 0.63       |
| British Journal of Surgery | 103     | 441   | 4.28 | 9       | 0.60       |
| JAMA Journal Of The American Medical Association | 102    | 4634  | 45.43 | 29 | 0.60       |
| Head and Neck Journal For The Sciences And Specialties Of The Head And Neck | 94    | 219   | 2.33 | 6       | 0.55       |
| Journal of The European Academy of Dermatology and Venereology | 90    | 476   | 5.29 | 11      | 0.53       |
| Science Of The Total Environment | 84    | 353   | 4.2  | 10      | 0.49       |
| British Journal Of Haematology | 79    | 173   | 2.19 | 7       | 0.46       |
| Journal of Biomolecular Structure Dynamics | 79    | 417   | 5.28 | 10      | 0.46       |
| Science                   | 75      | 949   | 12.65 | 16 | 0.44       |
| Nature                    | 71      | 608   | 8.56  | 11      | 0.41       |
| Nature Medicine           | 70      | 639   | 9.13  | 13      | 0.41       |
| American Journal Of Transplantation | 69  | 437   | 6.33  | 13      | 0.40       |
| Lancet Infectious Diseases | 69      | 1778  | 25.77 | 17     | 0.40       |
| Journal Of Clinical Medicine | 68    | 412   | 6.06  | 12      | 0.40       |
| Lancet Respiratory Medicine | 66     | 1428  | 21.64 | 13     | 0.39       |

Figure 4: Citation Network of Most Productive Journals

Organisational-Wise Collaboration

Table 5 reveals 20 top research organizations in the world based on their highest research articles. According to the Web of Science database, the University of London contributed the highest publications to the field, i.e., 599(3.496%) publications with 3949 citations, followed by Harvard University 547 (3.193%) publications with 3096 citations, University of California System 420 (2.451%) publications with 2248 citations, Huazhong University of Science Technology 375 publications with 7226 citations and King S College London places 20th with 166 (0.969%) publications. Among, the Huazhong University of Science Technology were placed top with 38 h-index followed by Harvard University, University of London, Wuhan University with 30, 28 & 27 h-index respectively. Figures 5 & 6 show the Co-authorship network of most productive organizations and the Citation network of most productive organizations.
Table 5: Organisational Collaboration

| Organizations-Enhanced                             | Records | TC    | ACP    | h-index | % of 17133 |
|---------------------------------------------------|---------|-------|--------|---------|------------|
| University of London                              | 599     | 3949  | 6.59   | 28      | 3.496      |
| Harvard University                                 | 547     | 3096  | 5.66   | 30      | 3.193      |
| University of California System                    | 420     | 2248  | 5.35   | 26      | 2.451      |
| Huazhong University of Science Technology          | 375     | 7226  | 19.27  | 38      | 2.189      |
| Harvard Medical School                             | 336     | 2076  | 6.18   | 23      | 1.961      |
| University College London                          | 274     | 2068  | 7.55   | 17      | 1.599      |
| Assistance Publique Hopitaux Paris APHP            | 257     | 1118  | 4.35   | 14      | 1.500      |
| Institut National De La Sante Et De La Recherche Medicale Inserm | 255   | 1244  | 4.88   | 19      | 1.488      |
| University of Toronto                              | 236     | 1343  | 5.69   | 17      | 1.377      |
| University of Milan                                | 230     | 1589  | 6.91   | 17      | 1.342      |
| University of Texas System                         | 218     | 834   | 3.83   | 14      | 1.272      |
| Johns Hopkins University                           | 211     | 1285  | 6.09   | 15      | 1.232      |
| Wuhan University                                   | 209     | 2817  | 13.48  | 27      | 1.220      |
| University of Oxford                               | 194     | 1892  | 9.75   | 18      | 1.132      |
| National University of Singapore                   | 173     | 1759  | 10.17  | 22      | 1.010      |
| Sapienza University Rome                            | 170     | 539   | 3.17   | 12      | 0.992      |
| University of Pennsylvania                         | 169     | 986   | 5.83   | 15      | 0.986      |
| University of Washington                           | 169     | 1418  | 8.29   | 15      | 0.986      |
| Imperial College London                            | 168     | 1193  | 7.1    | 17      | 0.981      |
| King S College London                              | 166     | 804   | 4.84   | 13      | 0.969      |

Most Productive Authors in COVID-19

Table 6 Shows the highly productive authors of COVID-19 related articles, total citations, and h-index during the study period. The first one is, Wang Y contributed 92 (0.537%) publications followed by Li Y 76 (0.444%), Wang J 75 (0.438%), and Li W placed last in the table with 41 (0.239%) publications. Liu Y was got 4831 total citations with 18 h-index, followed by Wang Y 1471 with 17 h-index. Liu L, Wang J, Zhang Y, Wang L were having 16, 15, 15, 14 h-index, respectively. Figure 7 & 8 show the Co-authorship network of authors & Citation network of authors.

Table 6: Most Productive Authors

| Authors    | Records | TC    | ACPP | h-index | % of 17133 |
|------------|---------|-------|------|---------|------------|
| Anonymous  | 216     | 205   | 0.95 | 7       | 1.261      |
| Wang Y     | 92      | 1471  | 15.99| 17      | 0.537      |
| Li Y       | 76      | 567   | 7.46 | 10      | 0.444      |
Wang J  |  75   | 1293  | 17.24  |  15  |  0.438  
Li L   |  74   | 2467  | 33.26  |  11  |  0.432  
Mahase E | 72   |  88   |  1.22  |  4   |  0.420  
Liu J  |  61   | 2532  | 41.51  |  13  |  0.356  
Wang L |  61   |  621  |  10.18 |  14  |  0.356  
Zhang Y|  60   |  2419 |  40.32 |  15  |  0.350  
Liu Y  |  59   |  4831 |  81.88 |  18  |  0.344  
Zhang L | 58   |  860  | 14.83  |  10  |  0.339  
Iacobucci G | 56  |  32   |  0.57  |  3   |  0.327  
Chen Y |  50   |  761  | 15.22  |  12  |  0.292  
Li J   |  48   |  341  |  7.1   |  8   |  0.280  
Liu L  |  46   |  2741 | 59.59  |  16  |  0.268  
Wiwanitkit V | 46  |  103  |  2.24  |  4   |  0.268  
Yang L |  43   |  444  | 10.33  |  6   |  0.251  
Zhang J|  43   |  172  |  4     |  6   |  0.251  
Chen J |  42   |  534  | 12.71  |  10  |  0.245  
Li W   |  41   |  378  |  9.22  |  9   |  0.239  

| Countries / Regions | Records | % of 17133 |
|---------------------|---------|------------|
| USA                 | 4767    | 27.823     |
| Peoples R China     | 2747    | 16.033     |
| Italy               | 2136    | 12.467     |
| England             | 1913    | 11.166     |
| Canada              | 861     | 5.025      |
| Germany             | 801     | 4.675      |
| India               | 751     | 4.383      |
| France              | 749     | 4.372      |
| Australia           | 729     | 4.255      |
| Spain               | 610     | 3.56       |
| Brazil              | 501     | 2.924      |
| Switzerland         | 442     | 2.58       |
| Iran                | 395     | 2.305      |
| Netherlands         | 360     | 2.101      |
| Singapore           | 338     | 1.973      |
| Turkey              | 335     | 1.955      |
| Belgium             | 281     | 1.64       |
| Japan               | 266     | 1.553      |
| South Korea         | 254     | 1.483      |
| Sweden              | 200     | 1.167      |
| South Africa        | 197     | 1.15       |
| Scotland            | 196     | 1.144      |
| Taiwan              | 187     | 1.091      |

**Figure 7: Co-authorship Network of Authors**

**Figure 8: Citation Network of Authors**

**International Linkages of COVID-19**

The geographical distribution of articles presented in Table 7, which gives the country wise-distribution of research publications contribution. Out of 17133 research articles, the USA contributed the highest number of research articles, 4767 (27.823%), followed by China with 2747 (16.033%), Italy with 2136 (12.467%), England with 1913(11.166%), Canada with 861 (5.025%), Germany with 801 (4.675%) and India with 751 (4.383%) publications. Figures 9 & 10 show the Co-authorship Countries network and the Citation network of countries.
Top 25 Funding Agencies in the field of COVID-19

Table 8 reveals the top 25 funding Institutions for COVID – 19 research in the world based on their highest publications. The top funding agency was the National Natural Science Foundation Of China, which funded 622 publications, followed by the United States Department Of Health Human Services (563 publication), National Institute Of Health NIH USA (545 publications), National Key Research And Development Program Of (82 publications). Top 25 funding Institutions funded 17 % of publications.

| Funding Agencies                                      | Records | % of 17133 |
|-------------------------------------------------------|---------|------------|
| National Natural Science Foundation of China          | 622     | 3.630      |
| United States Department of Health Human Services     | 563     | 3.286      |
| National Institutes of Health NIH USA                 | 545     | 3.181      |
| National Key Research and Development Program of China| 82      | 0.479      |
| Wellcome Trust                                       | 81      | 0.473      |
| National Institute for Health Research NIHR          | 78      | 0.455      |
| NIH National Heart Lung Blood Institute NHLBI         | 73      | 0.426      |
| Fundamental Research Funds for The Central Universities| 72     | 0.420      |
| NIH National Institute of Allergy Infectious Diseases NIAID | 66     | 0.385      |
| National Council for Scientific and Technological Development CNPQ | 62    | 0.362      |
| European Union Eu                                    | 57      | 0.333      |
| National Science Foundation NSF                       | 57      | 0.333      |
| Canadian Institutes of Health Research CIHR           | 56      | 0.327      |
| Projekt Deal                                          | 54      | 0.315      |
| National Key R D Program of China                     | 52      | 0.304      |
| Gates Foundation                                      | 47      | 0.274      |
| NIH National Cancer Institute NCI                     | 43      | 0.251      |
| NIH National Institute of General Medical Sciences NIGMS | 42   | 0.245      |
| Medical Research Council UK MRC                      | 40      | 0.233      |
| Capes                                                 | 36      | 0.210      |
| German Research Foundation DFG                        | 36      | 0.210      |
| China Postdoctoral Science Foundation                 | 34      | 0.198      |
| European Research Council ERC                         | 34      | 0.198      |
| National Health and Medical Research Council of Australia | 34  | 0.198      |
| NIH National Institute on Aging Nia                   | 34      | 0.198      |

Highly Prolific Keywords Network

The keywords in the 17133 publications measured in the present study were analyzed using VOSviewer (Figure 11). A total of 25 keywords identified as having occurred more than 90 times in the title and abstract fields across all articles. These keywords appeared in all publications; the study was classified as clusters. Covid-19 (6180 times) was used, followed by sars-Nov-2 (1926 times) and coronavirus (1570 times). Seventeen keywords were used 100 to 1000 times, and five keywords were used 90-100 times, respectively (Table 9).
Table 9

| Keyword                                      | Occurrences |
|----------------------------------------------|-------------|
| covid-19                                      | 6180        |
| sars-cov-2                                   | 1926        |
| Coronavirus                                   | 1570        |
| Pandemic                                     | 785         |
| Pneumonia                                    | 238         |
| coronavirus disease 2019                     | 188         |
| Public health                                | 183         |
| Epidemiology                                 | 173         |
| Mental health                                | 170         |
| Pandemics                                    | 153         |
| Telemedicine                                 | 150         |
| 2019-ncov                                    | 138         |
| ace2                                         | 120         |
| Infection                                    | 118         |
| Sars                                         | 108         |
| Infectious disease                           | 105         |
| Anxiety                                      | 104         |
| Children                                     | 103         |
| Severe acute respiratory syndrome coronavirus 2| 103         |
| covid-19 pandemic                             | 102         |
| Hydroxychloroquine                           | 97          |
| Novel coronavirus                             | 97          |
| Outbreak                                     | 97          |
| Treatment                                    | 94          |
| Pregnancy                                    | 93          |

Discussion and Conclusion

Results of the study reflect the current world scholarly publications on COVID-19 found 17,133 publications in the WOS database, which included 6882 (40.168%) original research articles, 4,378 (25.533%) early access, 4,179 (24.392%) editorials, and 1,694 other forms of publications containing letters, case reports, etc.... The majority of the publications (16,673, 97.315%) were written in English, followed by 188 German publications and 15,375 (89.73%) papers. The USA contributed 4767 (27.82%), the authors who have published more publications have all come from the National Natural Science Foundation Of China. The USA contributed the highest number of research publications, followed by China. Highly productive authors of COVID-19 related articles, total citations, and h-index during the study period. The first one, Wang Y, contributed publications followed by Li Y. According to the Web of Science database, the University of London contributed the highest publications to the field, i.e., 599 (3.496%) publications with 3949 citations, followed by Harvard University 547 (3.193%) publications with 3096 citations, Medicine General Internal accounted for the largest publications, i.e., 2367 (13.815%) with 20507 Total Citations & 8.66 Average Citation followed by Public Environmental Occupational Health produced 1412 (8.241%) publications with 3182 Total Citations & 2.25 Average Citation. British Medical Journal first with 663 papers 3.87% of total publications and Journal of Medical Virology contributed 325 (1.900%) publications. International Journal of Environmental Research and Public Health and Lancet ware contribute 166 (0.970%) publications.

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