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Global Research Performance on COVID 19 in Dimensions Database

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Abstract

Purpose: *This paper examines the global research performance on COVID 19 in Dimensions Database. Dimensions contains more than 100 million publications, ranging from articles published in scholarly journals, books and book chapters, to preprints and conference proceedings.*

Methodology: *The data were extracted from Dimensions Website (<https://app.dimensions.ai/discover/publication>). The word “Covid 19” has been used to retrieve the data as on 2nd December 2020. A total of 200852 records and 810426 citations received for the year 1871-2020. The study also analyzed top twenty researchers, source wise publications, funding wise publications, types of publications and top twenty highly cited research publications.*

Results: *The study analyzed 200852 research publications are indexed in Dimensions Database. It is found that “Elisabeth Mahase” has contributed 141 research articles and received 1,021 citations. Further it also analyzed “National Natural Science Foundation of China (NSFC)” funder has supported and published 2,792 articles and received 50,865 citations. It is further found that “Clinical Characteristics of Coronavirus Disease 2019 in China” has received 8,238 citations.*

Originality: *This research paper is original and it is based on the Global Databases report and has not been published elsewhere. This would be benefit the Covid 19 researchers, Covid 19 Scientists, and Science Faculty members to identify the Covid 19 research in single place.*

Keywords: *Covid 19, Coronavirus, Covid 19 research, Covid 19 Publications.*

1. Introduction

COVID-19 is the disease caused by a new Coronavirus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China. The most common symptoms of COVID-19 are Fever, Dry cough, Fatigue. Other symptoms that are less common and may affect some patients include: Loss of taste or smell, Nasal congestion, Conjunctivitis (also known as red eyes), Sore throat, Headache, Muscle or joint pain, Different types of skin rash, Nausea or vomiting, Diarrhea, Chills or dizziness. Symptoms of severe COVID-19 disease include: Shortness of breath, Loss of appetite, Confusion, Persistent pain or pressure in the chest, High temperature (above 38 °C). Other less common symptoms are: Irritability, Confusion, Reduced consciousness (sometimes associated with seizures), Anxiety, and Depression, Sleep disorders, more severe and rare neurological complications such as strokes, brain inflammation, and delirium and nerve damage.⁽¹⁾

2. Review of Literature

Chahrour, M, Assi, S, Bejjani, M. (2020)⁽²⁾ explored the activity and trends of COVID-19 research since its outbreak in December 2019. We explored the PubMed database and the World Health Organization (WHO) database for publications pertaining to COVID-19 since December 2019 up until March 18, 2020. Only relevant observational and interventional studies were included in our study. Data on COVID-19 incidence were extracted from the WHO situation reports. Research output was assessed with respect to gross domestic product (GDP) and population of each country. Only 564 publications met our inclusion criteria. These articles came from 39 different countries, constituting 24% of all affected countries. China produced the greatest number of publications with 377 publications (67%). With respect to continental research activity, Asian countries had the highest research activity with 434 original publications (77%). In terms of publications per million persons (PPMPs), Singapore had the highest number of publications with 1.069 PPMPs. In terms of publications per billion-dollar GDP, Mauritius ranked first with 0.075. COVID-19 is a major disease that has impacted international public health on a global level. Observational studies and therapeutic trials pertaining to COVID-19 are essential for assessing pathogenic characteristics and developing novel treatment options.

Krishnamurthy, M, Bhalachandra deshpande, S, Sajana, C. (2020)⁽³⁾ attempted to Scientometric analyze very recent literature on Coronaviruses just before and after the outbreak. Besides, the objective of this exploration was to assess the global research progress on Coronavirus in recent times. The current research is an analytical descriptive study using Scientometrics. The study sample includes research papers about the Coronavirus indexed in Web of Science (WoS) database from January 1, 2019 to May 14, 2020. The records with topic search (includes Title, Abstract, Keywords and Keywords Plus) “coronavirus” were extracted. These data were analyzed by MS Excel and the visualizations were created using Tableau. The results showed that 2551 scientific literature about the Coronavirus was indexed in WoS. A considerable number of these articles were published in journals such as the Journal of Medical Virology, Viruses, Nature, and Lancet. Authors from China, USA and Italy were the most prolific authors. About 47.51% articles received total of 11435 citations with an average of 9 citations, which indicates that nearly half articles were cited in another publication. The highest and lowest citations for these articles were 737 and 1, respectively. These results show a high rate of research on Coronavirus.

Mao, Xingjia MSc; Guo, Lu MSBb; Fu, Panfeng MDc; Xiang, Chuan MD (2020)⁽⁴⁾ investigated the global status and trends of coronavirus research. Publications related to the studies of coronavirus research from January 1, 2003 to February 6, 2020 were retrieved from the Science Citation Index-Expanded (SCI-E) of the Web of Science database. A total of 9294 publications were included. The data source was studied and indexed by bibliometric methodology. For visualized study, bibliographic coupling analysis, co-authorship analysis, co-citation analysis, co-occurrence analysis and the analysis of publication trends in coronavirus research were conducted by VOS (visualization of similarities) viewer and GraphPadPrism 6 software. The number of publications about coronavirus research increased sharply in 2004 for SARS outbreak and increased again in 2012 for MERS outbreak. The USA made the highest contributions to the global research with the most total number of publications, total citation frequency, and the highest H-index, while Netherlands had the highest average citation per item. Journal of Virology had the largest publication numbers. The University of Hong Kong is the most contributive institution with the most publications. The main research orientation and funding agency were virology and United States Department of Health Human Services.

Keywords of all related studies could be divided into 4 clusters: “Pathological research,” “Epidemiology research,” “Clinical research,” and “Mechanism research.” The outbreak of the epidemic could promote coronavirus research, meanwhile, coronavirus research contributes to overcoming the epidemic. Attention should be drawn to the latest popular research, including “Spike protein,” “Receptor binding domain,” and “Vaccine.” Therefore, more and more efforts will be put into mechanism research and vaccine research and development, which can be helpful to deal with the epidemic

Muneer, Ahmad, Sadik batcha, M. (2020)⁽⁵⁾ analyzed the trend of world literature on “Coronavirus Disease” in terms of the output of research publications as indexed in the Science Citation Index Expanded (SCI-E) of Web of Science during the period from 2011 to 2020. The study found that 6071 research records have been published on Coronavirus Disease till March 20, 2020. The various scientometric components of the research records published in the study period were studied. The study reveals the various aspects of Coronavirus Disease literature such as year wise distribution, relative growth rate, doubling time of literature, geographical wise, organization wise, language wise, form wise , most prolific authors, and source wise. The highest number of articles was published in the year 2019, while lowest numbers of research article were reported in the year 2020. Further, the relative growth rate is gradually increases and on the other hand doubling time decreases. Most of the research publications are published in English language and most of the publications published in the form of research articles. USA is the highest contributor to the field of Coronavirus Disease literature.

Rajendran. L (2020)⁽⁶⁾ examined the performance of researchers working inside the situation of Corona virus affected in animals at international level and national distribution throughout the expert interval of twenty three years from 1996-2019. A whole of 691 guides has been acquired from CAB Direct databases were taken for this study. A observe of the Coronavirus studies output of calculate Mean Absolute Deviation (M.A.D) of overall studying the research and development within the field.

Santosh, Dhage, Khaparde Vaishali, S, Muley Ratnakar, Y. (2020)⁽⁷⁾ analyzed research output for a period of 5 years between 2015 to and 2019. Web of Science database a service from Clarivate Analytics has been used to download citation and source data. Histcite application software have been used to present the datasets. Analysis part focuses on the

parameters like citation impact at local and global level, influential authors and their total output, ranking of contributing institutions and countries. In addition to this scientographical mapping of data is presented through graphs using VOSviewer software mapping technique.

Senthamilselvi, A, Surulinathi, M, Karthik, M, Jeyasuriya, T. (2020)⁽⁸⁾ attempted to highlight the publication status and growth of Hantavirus/Coronavirus research in India and make quantitative and qualitative assessment by way of analysing various features of research output based on Scopus online database during the period 1975-2020. A total of 3498 publications were published and overall H-Index is 50. The publications peaked in the year 2020 with 3218 publications and most frequently cited one is “Rodriguez-Morales, A.J., Cardona-Ospina, J.A., Gutiérrez-Ocampo, E., Ahmad, T., Sah, R.. (2020) Clinical, laboratory and imaging features of COVID-19: A systematic review and metaanalysis, *Travel Medicine and Infectious Disease* 34,101623 with 293 citations. The USA topped the list with highest share (374) of publications. United Kingdom with 212 share of publications followed by China with 154 share of publications, Thailand with 119 share of publications, Australia and Italy with 101 share of publications respectively in the context of international collaboration. All India Institute of Medical Sciences, New Delhi topped the list with 246 publications, followed by Postgraduate Institute of Medical Education & Research, Chandigarh with 178 publications, Dr. D.Y. Patil Vidyapeeth Deemed University, Pune with 108 publications. 160 Institutes are with minimum of 10 Publications 12 Institutes. The highly productive journals are: *Diabetes And Metabolic Syndrome Clinical Research and Reviews*(Elsevier) with 100 publications (CiteScore-2.6, SJR-0.672 and SNIP-0.982), *Asian Journal Of Psychiatry*(Elsevier) with 92(CiteScore-2.7, SJR-0.736 and SNIP-1.022); *Indian Journal Of Ophthalmology*(Wolters Kluwer Health)(CieScore-1.6, SJR-0.482 and SNIP-0.931) and *Journal Of Biomolecular Structure And Dynamics* with 80 publications respectively. The parameters studied include: year-wise growth of publications and citations, country-wise Collaboration of publications, domain-wise distribution of publications and highly productive institutes, highly cited publications and highly preferred journals for publications by scientists.

Shri Ram (2020)⁽⁹⁾ attempted to trace the trends of research associated with “Coronavirus” for a period of 50 years using the SCOPUS database. The study was carried out using the keyword *Coronavirus* and analyzed for annual growth, productive countries, institutes,

authors, journals, highly cited papers, and research focus using keywords. There were two peaks when a large number of publications appeared. Most of the research publications were from the USA (31.67%), and the University of Hong Kong was the most productive institute. The Journal of Virology has published the most number of articles on CoV.

Vasantha Raju, N and Patil, S.B (2020)⁽¹⁰⁾ analyzed 89 Indian publications on SARS-CoV-2 accessible through WHO COVID-19 database. The research data was restricted for the period of 2/3/2020 to 12/5/2020. The analysis was carried out in light of the objectives of the study. The study found the considerable and constant growth of Indian publications on COVID-19 from mid-April. It is interesting to note that the prolific authors belong to either AIIMS or ICMR institutes. Majority of the COVID-19 articles were found to be collaborative publications. The study noticed that no research publications on COVID-19 have appeared from North Eastern region. Regarding the research output on COVID-19, the performance of largest states like Uttar Pradesh, Madhya Pradesh and Bihar was found to be poor. Delhi state contributed highest publications on COVID-19. The All India Institute of Medical Sciences (AIIMS), New Delhi was the most productive institution in terms of publications. It is also important to note that the central government undertakings like AIIMS and ICMR, New Delhi and its affiliated institutions shared largest proportion of publications on COVID-19. The Indian Journal of Medical Research has emerged as the productive journal contributing highest number of the publications. The highest contribution in COVID-19 research takes the form of journal articles. In terms of research area, the majority of the publications were related to Epidemiology. The study reported covid, coronavirus, India, pandemic, sars etc. as the frequently occurred keywords in the COVID-19 publications. The highly cited publications were of evidenced based studies. It is observed that the studies pertaining to virology, diagnosis and treatment, clinical features etc. have received highest citations than general studies on epidemiology or pandemic.

3. Research Methodology

The data were collected from Dimensions Database (<https://app.dimensions.ai/discover/publication>)⁽¹¹⁾ for this study and the records related to COVID 19 were retrieved on 02nd December 2020. A total of 200852 records and 810426 citations received for the year 1871-2020 were extracted and grouped into various categories

such as top twenty researchers, source wise publications, funding wise publications, type of publications and top twenty highly cited research publications.

4. Objectives of the Study

These are the major objectives of the study.

1. To identify the top twenty researchers in COVID 19.
2. To find out the source wise publications.
3. To identify the top twenty funding providers in COVID 19 research.
4. To analyze the various types of publications.
5. To find out the highly cited research publications.

5. Data Analysis and Interpretation

5.1 Researchers

Table.1

Researchers

S. No	Name	Organization, Country	Publications	Citations	Rank
1	Elisabeth Mahase		141	1,021	1
2	Viroj Wiwanitkit	Dr. D.Y. Patil Vidyapeeth, Pune, India	139	470	2
3	Gareth Iacobucci	British Medical Association, United Kingdom	125	404	3
4	Giuseppe Lippi	University of Verona, Italy	109	3,995	4
5	Abi Rimmer	British Medical Association, United Kingdom	101	163	5
6	Alfonso Javier Rodriguez-Morales	Technological University of Pereira, Colombia	99	1,549	6
7	Kwok-Yung Yuen	University of Hong Kong, China	88	12,618	7
8	Kuldeep Dhama	Indian Veterinary Research Institute, India	80	1,190	8
9	Lei Liu	Shenzhen Third People's	69	5,244	9

		Hospital, China			
10	Nima Rezaei	Tehran University of Medical Sciences, Iran	68	484	10
11	Brandon Michael Henry	Cincinnati Children's Hospital Medical Center, United States	65	2,075	11
12	Alimuddin I Zumla	University College London, United Kingdom	62	797	12
13	Hong-Zhou Lu	Shanghai Public Health Clinical Center, China	61	2,017	13
14	Nanshan S Zhong	First Affiliated Hospital of Guangzhou Medical University, China	60	11,321	14
15	Kelvin Kai-Wang To	University of Hong Kong, China	59	3,192	15
16	Jasper Fuk-Woo Chan	University of Hong Kong, China	58	3,078	16
17	Benjamin John Cowling	University of Hong Kong, China	58	3,579	16
18	Dai-Hai He	Hong Kong Polytechnic University, China	56	503	18
19	Mohamad Goldust	University Hospital of Basel, Switzerland	56	262	18
20	Nicola Luigi Bragazzi	University of Genoa, Italy	55	527	20

Table 1 indicates that top twenty researchers. It is found that “Elisabeth Mahase” has contributed highest number of (141) articles and received 1,021 citations have placed first rank and its followed by “Viroj Wiwanitkit (Dr. D.Y. Patil Vidyapeeth, Pune, India)” has published 139 articles and received 470 citations have placed second rank. A good number of 58 research publications published by “Jasper Fuk-Woo Chan (University of Hong Kong, China)”, “Benjamin John Cowling (University of Hong Kong, China)” have placed sixteenth rank. It is found that “Kwok-Yung Yuen (University of Hong Kong, China)” has received highest number of (12,618) citations. It is further found that “Nicola Luigi Bragazzi (University of Genoa, Italy)” has published less number of publications (55) and received 527 citations among others and placed twentieth rank.

5.2 Sources

Table.2

Sources

S. No	Name	Publications	Citations	Rank
1	medRxiv	7,755	30,990	1
2	SSRN Electronic Journal	6,585	7,319	2
3	Research Square	5,884	1,565	3
4	arXiv	2,687	127	4
5	bioRxiv	2,393	10,432	5
6	The BMJ	1,597	12,652	6
7	JMIR Preprints	1,245	202	7
8	Preprints.org	1,039	1,522	8
9	Science	1,020	16,483	9
10	Authorea	936	47	10
11	International Journal of Environmental Research and Public Health	924	4,580	11
12	Sustainability	856	898	12
13	The Lancet	771	31,681	13
14	PsyArXiv	761	1,079	14
15	Journal of Medical Virology	754	13,954	15
16	OSF Preprints	746	345	16
17	ChemRxiv	690	578	17
18	Nature	640	11,274	18
19	PLoS ONE	631	1,956	19
20	JAMA	587	31,575	20

Table 2 shows that top twenty sources. It is found that “medRxiv” has published highest number of 7,755 research articles and received 30,990 citations and have placed first rank and it is followed by SSRN Electronic Journal has published 6,585 articles and received 7,319 citations and have placed second rank. It is found that “The Lancet” journal has published less number of 771 research publications and received highest number of 31,681 citations and placed thirteenth rank. It is further found that “JAMA” Journal has published less number of 587 articles and received 31,575 citations have placed twentieth rank.

5.3 Funders

Table.3

Funders

S. No	Organization	Country	Publications	Citations	Rank
1	National Natural Science Foundation of China (NSFC)	China	2,792	50,865	1
2	National Institute of Allergy and Infectious Diseases (NIAID)	United States	1,383	37,597	2
3	European Commission (EC)	Belgium	1,138	14,350	3
4	Ministry of Science and Technology of the People's Republic of China (MOST)	China	1,006	31,519	4
5	National Heart Lung and Blood Institute (NHLBI)	United States	880	17,034	5
6	National Institute of General Medical Sciences (NIGMS)	United States	836	15,093	6
7	National Cancer Institute (NCI)	United States	791	10,799	7
8	Wellcome Trust (WT)	United Kingdom	726	18,817	8
9	National Institute for Health Research (NIHR)	United Kingdom	639	13,263	9
10	National Center for Advancing Translational Sciences (NCATS)	United States	543	8,215	10
11	Medical Research Council (MRC)	United Kingdom	478	9,780	11
12	National Institute on Aging (NIA)	United States	455	5,498	12
13	National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)	United States	407	7,340	13
14	National Council for Scientific and Technological Development (CNPq)	Brazil	394	1,615	14
15	German Research Foundation (DFG)	Germany	387	8,634	15
16	European Research Council (ERC)	Belgium	364	6,829	16
17	Canadian Institutes of Health Research (CIHR)	Canada	344	3,208	17
18	Coordenação de Aperfeiçoamento de	Brazil	321	1,347	18

	Pessoal de Nível Superior (CAPES)				
19	National Institute of Mental Health (NIMH)	United States	310	2,675	19
20	Bill & Melinda Gates Foundation (BMGF)	United States	300	10,857	20

Table 3 indicates that top twenty funders. It is found that 4251 funders providing funding in COVID 19 research. The “National Natural Science Foundation of China (NSFC)” funder has supported and published highest number of (2,792) articles and received 50,865 citations and have placed first rank followed by “National Institute of Allergy and Infectious Diseases (NIAID)” funder has supported and published 1,383 articles and received 37,597 citations and have placed second rank. It is further found that “Bill & Melinda Gates Foundation (BMGF)” funder has published 300 articles and received 10,857 citations have placed twentieth rank.

5.4 Types of Publications

Table.4

Types of Publications

S. No	Publication Type	No. of publications	%	Rank
1	Article	1,59,182	79.25	1
2	Preprint	31,913	15.88	2
3	Chapter	5,302	2.63	3
4	Proceeding	2,404	1.19	4
5	Monograph	1,117	0.55	5
6	Edited Book	934	0.46	6
	Total	2,00,852	100	

Table 4 shows that types of publications. It is found that Articles (1,59,182 (79.25%)) and placed in first rank and it is followed by Preprint (31,913 (15.88%)) and placed in second rank. It is found that the Chapter publications are 5,302 (2.63%) have placed in third rank. It is further found that Edited Book publications are only 934 (0.46%) have placed in sixth rank.

5.5 Highly Cited Research Publications

Table.5

Highly Cited Research Publications

S. No	Name of the Title	Name of the Journal	Type	Citations	Rank
1	Clinical Characteristics of Coronavirus Disease 2019 in China	New England Journal of Medicine	Article	8,238	1
2	Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study	The Lancet	Article	6,867	2
3	Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China	JAMA	Article	4,887	3
4	SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor	Cell	Article	4,011	4
5	Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study	The Lancet Respiratory Medicine	Article	3,055	5
6	Pathological findings of COVID-19 associated with acute respiratory distress syndrome	The Lancet Respiratory Medicine	Article	2,668	6
7	COVID-19: consider cytokine storm syndromes and immunosuppression	The Lancet	Article	2,557	7
8	Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1	New England Journal of Medicine	Article	2,399	8
9	Risk Factors Associated With Acute Respiratory Distress Syndrome and Death in Patients With Coronavirus Disease 2019 Pneumonia in Wuhan, China	JAMA Internal Medicine	Article	2,325	9

10	Cryo-EM structure of the 2019-nCoV spike in the prefusion conformation	Science	Article	2,156	10
11	Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area	JAMA	Article	1,973	11
12	A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe Covid-19	New England Journal of Medicine	Article	1,945	12
13	Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial	International Journal of Antimicrobial Agents	Article	1,891	13
14	SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients	New England Journal of Medicine	Article	1,790	14
15	Correlation of Chest CT and RT-PCR Testing in Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Cases	Radiology	Article	1,718	15
16	The psychological impact of quarantine and how to reduce it: rapid review of the evidence	The Lancet	Article	1,709	16
17	An interactive web-based dashboard to track COVID-19 in real time	The Lancet Infectious Diseases	Article	1,681	17
18	Detection of SARS-CoV-2 in Different Types of Clinical Specimens	JAMA	Article	1,643	18
19	Virological assessment of hospitalized patients with COVID-2019	Nature	Article	1,630	19
20	Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China	JAMA Neurology	Article	1,594	20

Table 5 shows that highly cited research publications and it is found that “Clinical Characteristics of Coronavirus Disease 2019 in China” has received the highest number of (8,238) citations and placed first rank followed by “Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study” has got the second highest number of (6,867) citations. It is followed by “Pathological findings of COVID-19 associated with acute respiratory distress syndrome” has placed sixth rank for its citation 2,668. The article “Neurologic Manifestations of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China” has been placed twentieth rank, since it got least citation (1,594) among other articles.

6. Conclusion

Corona Virus is the pandemic viral disease originated from China in December 2019. Now the people in the world are severely suffered from this disease. The Researchers, Medical Practitioners / R & D Laboratories, Pharmaceutical Institutions intensity is to invent a vaccine to prevent from the COVID 19 disease. During short span of time it is found that a good number of scholarly content have been published on COVID 19 and made available for the researchers to get information for their research. In Dimensions database, 200852 research articles were published related to COVID 19 and given an access to the research community. The study recommends that the researchers/ authors, research and development should come forward to increase the productivity of publications on COVID 19 by means of contributing their research findings. The research and development laboratories/ institutions should encourage the researchers to publish more number of scholarly communications on COVID 19, publishers should encourage the researchers/authors by means of inviting new articles/finding in order to publish in their reputed journals. Above all the government policies should support in continue the research to find the solution for this viral disease.

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