

# COVID-19 and literature evidence: should we publish anything and everything?

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**Summary.** COVID-19 first presented in Wuhan, Hubei Province, China in December 2019. Since then, it has rapidly spread across the world, and is now formally considered a pandemic. As of 4<sup>th</sup> of May more than 3.2 million people have been infected and over 250,000 people have died. Since the very start, scientists and researchers have tried to utilize this case to publish academic experiences and suggestions toward fighting this virus, which is lethal in some cases. To date, more than 9,000 academic papers have been published since December 2019. The quality of publications varies from a plain letter to the editor to randomized studies. This review aims to analyse the current published literature related to COVID-19 and assess the quality of such articles. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** COVID-19, review, bibliometric analysis

## Introduction

December 2019 saw the emergence of COVID-19, a potentially lethal respiratory infection caused by the SARS-CoV-2 coronavirus. First identified in Wuhan, Hubei Province, China, the disease had since become a global health crisis, with the World Health Organization labelling it as a pandemic. Such a novel disease has prompted a dramatic surge of research and publications regarding its behaviour, presentation, diagnosis, treatment, prognosis and prevention. Though this largely reflects a global effort for researchers from all fields combat COVID-19 with joint forces, such a surge in scientific publications has also sparked discussions regarding the quality and impact of publications. Given the sudden and rapid spread of COVID-19, scrambling resources to properly conduct trials of high levels of evidence for publication by the time of writing this manuscript was extremely difficult.

It is therefore unclear what types of publications this large, recent addition to the literature belongs to, and such trends of publishing in such special times have not been properly assessed. Understanding this is important for readers when interpreting relevant publications, as well as for authors when considering materials for publication. As such, we aim to formally evaluate the existing publications pertinent to COVID-19.

## Method

A comprehensive literature search was done on PubMed, SCOPUS and Embase to identify all articles that discussed the novel corona virus, COVID. Key words used were 'COVID' 'SARS-CoV-2' 'SARS-CoV' '2019-nCoV' 'COVID-19' 'Novel Corona virus'. The search terms were used as key words and in combination as MeSH terms to maximize the output from

the literature findings. The number of citations was obtained from the web of science (Wos). Time limit was placed from December 2019 until the day of the search 12.4.2020. No limits were placed on publication language or origin of the article.

All the relevant articles were identified and screened by three authors; the results are summarised narratively in each relevant section within the text of this review. The articles were grouped based on the region of the publishing author, type of the manuscript, speciality of the manuscript and the publishing journal. Duplicated were removed to avoid extra counting.

## Results

The initial result from all three databases were 4,370 published articles, after screening by three authors and removal of duplicates, a total of 3,827 papers were identified.

### *Level of evidence*

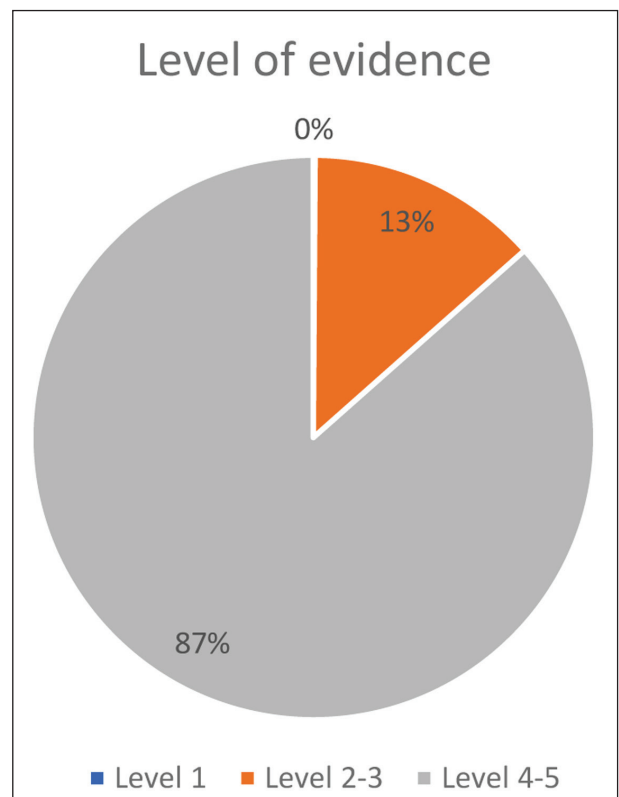
Majority of articles included was level 4 and 5. A detailed table revealing the level of evidence of all studies included are shown in table 1 and figure 1. The level of evidence mainly is level 4 and 5 with 4 randomised control trials as level 1.

### *Publication by Journals*

Journals with more than 20 articles published are shown in Table 2. The BMJ has the most number of articles published (172), followed by Journal of medical Virology (120) and JAMA (91). Majority of the articles published by the BMJ is commentary; this is due to multiple concerns raised by doctors and health care professions involved. For examples, constant

**Table 1.** Breakdown of papers based on level of evidence

Level of evidence	Number of papers
Level 1	4
Level 2-3	511
Level 4-5	3312



**Figure 1.** Showing a breakdown of papers based on level of evidence

change of PPE guidelines, Postgraduate training recruitment, early graduation for final year medical students and doctors wellbeing. On the other hand, the journal of medical virology and JAMA published on epidemiology, investigation, diagnostic technique, virology characteristics and treatment. The Lancet and New England Journal of medicine also published 76 and 29 papers respectively; although these numbers have increased significantly due to the daily increase in publishing the backlog of the articles.

### *Publication by Region and Country*

Most of the primary authors were based in China, with 1232 papers out of 3827 available. This is seconded by USA (781) and UK (364). Italy and France also contributed 276 and 78 papers, respectively. The number of papers based on regions is shown on the table 3 and figure 2.

As the disease was first reported in China, the research was first started in China. The Chinese have

**Table 2.** Show the number of papers published in journals (Only Journals with more than 25 articles published are included)

Journals	Number of papers
BMJ	172
Journal of Medical Virology	120
JAMA	91
The Lancet	76
Clinical infectious diseases	72
Zhonghua liuxingbingxue zazhi	43
Travel Medicine and Infectious Disease	41
The Lancet Infectious Diseases	40
Chinese journal of tuberculosis and respiratory diseases	35
International Journal of Infectious Diseases	35
Science	35
Infection Control and Hospital Epidemiology	34
Annals of internal medicine	32
Emergency medicine practice	30
The New England journal of medicine	29
Eurosurveillance	28
Journal of travel medicine	25
Radiology	25

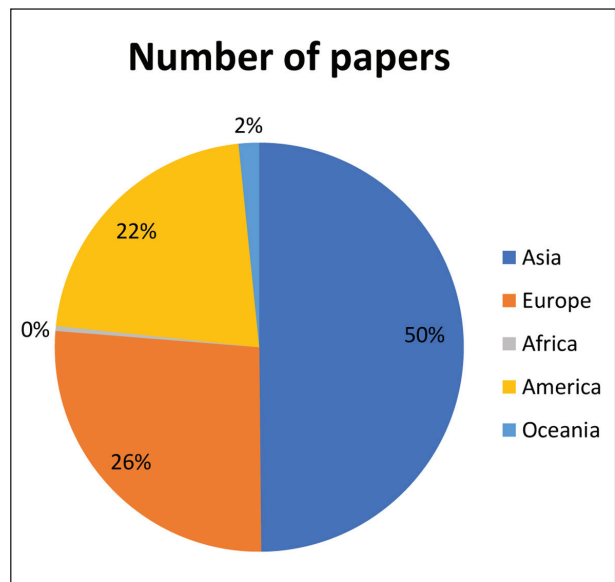
**Table 3.** Showed the number of publications in each region and specific countries

Region	Number of papers (Total: 3827)
Asia	1908
Europe	1011
Africa	15
America	831
Oceania	62
Specific Country	
China	1232
Germany	69
France	78
Italy	276
UK	364
USA	781

been reporting clinical features, laboratory finding and radiological changes on various journals in the world in order. A larger cohort also reduces sample size bias and provides better results via statistical analysis. Similar pattern is seen in the US and Italy, with many populations affected by the COVID-19, research and its finding have been reported in multiple journals. Researchers and clinicians have been constantly monitoring the disease pattern and articles have been published to contribute to the existing knowledge based

*By Speciality*

The number of paper published listed in their primary speciality are shown in table 4. Speciality with the most number published was public health followed by infectious disease and Pharmacology. It is worth noting that there were only 225 papers published on respiratory.



**Figure 2.** Showed the number of publications in each region as pie chart

**Table 4.** Showed the number of papers published and their primary speciality

Speciality	Number of papers (Total: 3827)
Public Health	1346
Infectious Disease	563
Pharmacology	262
Respiratory	225
Radiology	176
Paediatrics	115
Psychology	101
Obs & Gynae	95
Gastroenterology	94
Cardiology	83
Microbiology	82
Immunology	71
Anaesthesia	53
Critical Care	51
Pathology	43
Dermatology	38
Neurology	36
Haematology	31
Surgery	31
Cancer	30
Ophthalmology	30
Endocrine	25
Renal	25
Emergency Medicine	23
Oncology	22
Transplantation	21
Geriatric	18
Physics	16
Laboratory Medicine	15
ENT	14
Medical Education	10
Rheumatology	10
Urology	10
Nephrology	8
Otolaryngology	7
Dentistry	6
Hepatology	6
Pain	5

Speciality	Number of papers (Total: 3827)
Rehabilitation	5
Veterinary	5
Orthopaedic	3
Psychology	3
Research	2
Vascular	2
Biochemical	1
Biology	1
Dental	1
Internal Medicine	1
Nutrition	1
Optometry	1
Pain Medicine	1
Palliative Care	1
Plastic Surgery	1
Rhinology	1

Due to the unknown nature of the disease, multiple papers focused on area of public health, infectious disease and pharmacology, covering the epidemiology, prevention and cure of COVID-19. We now have a better understanding of the virus, its incubation period, prevention. A Cure of COVID-19 is currently developing although several medications have been reported to be effective against COVID-19 with limited evidence.

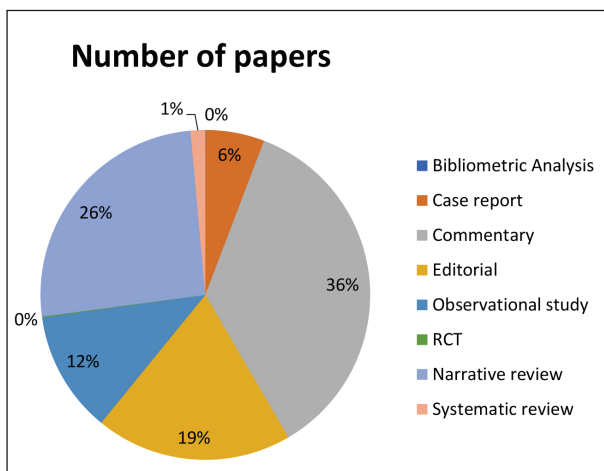
#### *Type of papers*

Table 5 and Figure 3 showed the breakdown of types of paper published on COVID-19. The most common type was commentary (1370) followed by review articles and editorial and observational study. There were 4 randomised control trials and 55 systematic review performed and reported up to 12/4/2020.

Number of commentary published consists of one-third of the total of numbers of paper published. Many experts were sharing their opinion and views for COVID-19. Small case series or reports are also commonly seen, especially on new ideas that have not been previously published. As a newly discovered disease,

**Table 5.** Showed the breakdown of types of paper published on COVID-19

Types of paper	Number of papers (Total: 3827)
Commentary	1370
Narrative Review	982
Editorial	738
Observational study	456
Case report	221
Systematic review	55
RCT	4
Bibliometric Analysis	1



**Figure 3.** Showed the breakdown of types of paper published on COVID-19 in Pie chart

new ideas are generated daily and journals are publishing constantly. On the other hand, case reports, systematic review and randomised control trails remain limited. It is likely the number of RCT will be reported once results are available.

**Discussion**

The coronavirus disease (COVID-19) was first reported in December 2019 in Wuhan, China. The COVID-19 has spread from China across the world and has declared as a pandemic by the World Health Organisation due to its significant morbidity and mortality. The COVID-19 has become a priority by researcher and multiple articles have been published

since. We aimed to perform a review for all evidence available so far.

Qualities of evidence are used to determine the strength of recommendation. The level of evidence is assessed based on a various factor. This includes methodological, validity, and applicability. We found majority of the paper published are level four to five. This is mainly due to the high number of studies with small sample size, published as editorial or letter to editor. Studies with small sample size are prone to bias and not statistically significant. It is interesting to note than one of the original articles in New England Journal of Medicine has more authors (56) than patients (53) included in the study.(1) The quality of systematic review has also been reviewed by Yu et al using the AMSTAR-2 tool. Out of 49 systematic reviews included, 31 were deemed critically low quality. It is worth noting that funding support significantly decreased the quality of systematic review indicating the potential of bias in favouring the funding sources. (2)

In terms of literature review, the most cited article was a letter to editor by Zou et al, from china with 33 times cited. (3) This is followed by an observational study by Chen et al and a case report from Xu et al, both from China and with 30 times cited. Zou and his colleagues described their findings on viral load detected in nasal and throat swabs from 17 patients infected with SARS-CoV-2. It showed that in both systematic and asymptomatic patients, the viral loads were highest within 5 days after contracting the virus. Moreover, the viral loads were higher in Nasal swabs than throat. This pattern is seen similar with the influenza virus. (3)

Chen et al focused on the clinical characteristics of COVID-19 and its relation to pregnancy. They have performed a literature review and conducted a retrospective study in their obstetrics department. Samples were taken from amniotic fluid, core bloods and neonatal throat swab. Limited with a small sample size (n=9), they have not found any evidence of vertical transmission in pregnant women with COVID-19 pneumonia in their trimester. Lastly, Xu et al presented their findings on acute respiratory distress syndrome (ARDS) secondary to COVID-19. It summarises the clinical features and pathological finding in patients developing ARDS post COVID-19. (4)

A total of 54 different specialities have published their finding on COVID-19. Most research focused on Public health and infectious disease. Articles published mainly focused on describing the clinical and pathological features on COVID-19. This includes, clinical symptoms, mode of transmission, investigations and diagnosis. This is followed by pharmacology, respiratory and radiology.

To date, there is no specific treatment for COVID-19. Chloroquine and Hydroxychloroquine have been reported to be effective against COVID-19. Vincent et al. suggested that Chloroquine and Hydroxychloroquine potentially affect the glycosylation of the angiotensin-converting enzyme-2. This enzyme is the receptor that the virus uses to enter to the cell. (5) However, concerns on poor methods and reporting have been raised. (6)

Radiology articles mainly report or describing the radiological findings for COVID-19. Salehi and his colleague conducted a systematic review summarising the radiological finding for COVID-19. They have reported several CT findings specific to COVID-19 from available literatures and also focused on initial and follow up CT radiological findings. (7)

There are several limitations of our study. COVID-19 is a rapidly evolving topic with lots of areas of research still undergoing. Multiple researches are currently ongoing and the numbers of articles available are constantly changing. We, therefore, would like to sum up and perform a search to update the current knowledge that is available in the research field. Moreover, although no limitation was placed on the language of studies to be included, there are a lot of Chinese articles published in Chinese journals which are only indexed by local Chinese abstracting services, and not in any of the international databases we searched. This is normally not a serious limitation but given this pandemic started in China and they published the greatest number of papers, this is very relevant in this case. Last, most studies presented with a small sample size and conducted as a retrospective study. The quality of evidence is limited by this method and this factor needs to be considered when interpreting the findings.

## Conclusion

The recent surge in scientific publications related to COVID-19 have seen disproportionate distribution of different publication types, which may point to part of the scientific output to be of low quality and uninformative. Readers should exercise caution when interpreting new scientific reports about COVID-19, and authors should consider the validity, meaning and impact of their work carefully before deciding on publication.

**Conflict of interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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