

Survival of COVID-19 patients research trends 2020-2022: a bibliographic study

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Abstract

Purpose: With a bibliography analysis, this study attempted to reveal research trends in COVID-19 patients survival from 2020-2022. Furthermore, it attempted to determine keyword co-occurrences and the bibliographic coupling of countries and sources. Understanding the trends within research on COVID-19 patients' survival is essential, and analysis might provide some information.

Methods: Patients who had COVID-19 survived, based on the Scopus database. All articles could be stored in the research information system (.ris) and comma-separated values (CSV) versions. Using Microsoft Excel and the VOSviewer, analysis data mapping was accomplished.

Results: The analysis's results show that during the period of three years, there have been various changes in the development of papers regarding the Survival of COVID-19 patients. It was determined that research on this subject increased from 2020 to 2021 but declined from 2021 to 2022 in the time from 2020 to 2022. The studies were composed by Tang N. (top publication), Li Y. (top author by document), and Chen X. Participants were published mainly in the USA (top country), PLOS One (top source). The keyword "human" comes the most (1730), while "covid-19" is the author's keyword (1281). There are many 304 total occurrences for the survival keyword. The strongest connections for collaborations occur between China and the United States, and for source, between Frontiers in Immunology and the Journal of Clinical Medicine.

Conclusion: The COVID-19 patient's research survival in the years 2020–2022, however, was largely dependent on US-China collaboration. The Publication of Clinical Medicine and Frontiers in Immunology had the strongest association, per the co-author source, even though PLOS One was the most widely used journal for COVID-19 survival studies. Research on COVID-19 patients' survival shows a decline in 2022.

Keywords: bibliography analysis; VOS viewer; survival; COVID-19 patients; COVID-19 research

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INTRODUCTION

The COVID-19 pandemic has turned into a global issue (1). One of the most extensively transmitted RNA viruses, severe acute respiratory syndrome coronavirus 2 (SARS-COV-2), is the cause of COVID-19 (2). The World Health Organization (WHO) recorded 526 billion confirmed cases and 6,3 billion fatal cases by May 31, 2022 (3). The survival function in mathematics is the likelihood that a person or a particular object will survive after a unit of time has passed. Until an important event happens, survival time is calculated based on a specific beginning point (4). The study time variable for survival analysis was the interval from symptom onset to death or survey completion (5).

The prognosis and prognosis of severe COVID-19 patients depend on early diagnosis and therapy. It is crucial to discover potential risk factors for disease development in this population because most people who develop severe COVID-19 begin with modest symptoms and subsequently advance to severe disease (6). Diabetes, WBC, neutrophil, lymphocytes, and BUN were some early predictors with intermediate accuracy for COVID-19 patients' survival (1). Another study showed that individuals with Covid-19 who do not have congenital illnesses typically have greater survival rates. However, if the patient stays sick for longer than two weeks, whether they have a congenital condition or not, their resilience will eventually wane (4). The survival rates of Covid-19 patients without congenital diseases are often higher. Nevertheless, whether or not the patient has a congenital issue, their resilience will eventually decrease if they are sick for more than two weeks (5).

A complete picture of the current state of the literature on COVID-19 deaths is crucial for some reasons, including 1) organizing and coordinating the literature; 2) exploring the research topics covered; 3) comprehending the evolution of literature; and 4) identifying the top researchers, institutions, and nations in this field (8). Bibliometrics is "the use of mathematical and statistical techniques to books and other kinds of communication," according to its definition. This makes it possible to evaluate a sizable body of academic literature, provides useful methods for analyzing trends in research activity over time, and will help identify impending publications, fresh applications, research priorities, and references in a subject (9). The current study's objective was to use bibliometric data to present a comprehensive literature assessment on COVID-19 patients' survival from 2020 to 2022. It also looked for the coupling of countries and sources in bibliographies and keyword co-occurrences.

The methodology involves looking through databases of descriptive literature.

METHODS

Data were retrieved from the Scopus database on November 3, 2022. Scopus was chosen because it covers a wider range of topics, indexes documents faster, and includes more recent publications on literature searches (10). The most widely used bibliography software programs allow for data import from Scopus. Scopus has the added benefit of including data for all cited authors, which improves the accuracy of author-based citation and co-citation analyses (11).

The information was then exported in research information system (.ris) and comma-separated values (CSV) formats. To see and assess trends, article data from the source database is mapped using a bibliometric map. Utilizing Microsoft Excel and the VOSviewer, this mapping was completed.



Figure 1. Methodology for the phrase-specific annotated bibliography

RESULTS

Based on the literature search and analysis findings, 1869 articles from the Scopus database were connected to the Survival of COVID-19 patients. The progression of studies on COVID-19 patients' survival from 2012 to 2022 has fluctuated. These numbers show a 346-article growth between 2020 and 2021, from 582 articles to 928 items. Decrease the number of articles by 569 in 2022, from 928 to 359.

Table 1 shows references and their citation frequency for the top 10 publications. The most referenced articles are typically considered baseline references pertinent to the study. Tang N. publishing time in 2020. As a result, these are the most influential papers on the Survival of COVID-19 patients studies, contributing to a larger number of citations (12).

Table 1. Top 10 Publications

Citation Corresponding author country	Title	Source Title	Total citations
Tang N. (2020), China	Anticoagulant treatment is associated with decreased mortality in severe coronavirus disease 2019 patients with coagulopathy	Journal of Thrombosis and Haemostasis	2032
Diao B. (2020), China	Reduction and Functional Exhaustion of T Cells in Patients With Coronavirus Disease 2019 (COVID-19)	Frontiers in Immunology	1215
Klok F. A. (2020), Netherlands	Confirmation of the high cumulative incidence of thrombotic complications in critically ill ICU patients with COVID-19: An updated analysis	Thrombosis Research	1124
Lippi g. (2020), Italy	Thrombocytopenia is associated with severe coronavirus disease 2019 (COVID-19) infections: A meta-analysis	Clinica Chimica Acta	913
Dai M. (2020), China	Patients with cancer appear more vulnerable to SARS-CoV-2: A multicenter study during the COVID-19 outbreak	Cancer Discovery	882
Luo P. (2020), China	Tocilizumab treatment in COVID-19: A single center experience	Journal of Medical Virology	859
Li L. Q. (2020), China	COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis	Journal of Medical Virology	782
Ragab D. (2020), Egypt	The COVID-19 Cytokine Storm; What We Know So Far	Frontiers in Immunology	705
Abani O. (2021), UK	Tocilizumab in patients admitted to hospital with COVID-19 (RECOVERY): a randomised, controlled, open-label, platform trial	The LANCET	704
Wang L. (2020), China	Coronavirus disease 2019 in elderly patients: Characteristics and prognostic factors based on 4-week follow-up	Journal of Infection	702

Table 2. Top 10 Authors

Ranking	Author by Document	Documents	Citations	Ranking	Author by Citation	Documents	Citations
1	Li Y.	42	626	1	Chen X.	12	3351
2	Li J.	35	1258	2	Liu Y.	32	2406
3	Zhang Y.	33	1879	3	Li D.	6	2100
4	Liu Y.	32	2406	4	Zhang Y.	33	1879
5	Wang Y.	31	1268	5	Chen L.	13	1676
6	Liu Z.	23	403	6	Chen Y.	11	1436
7	Wang Z.	22	582	7	Wang C.	10	1381
8	Zhang L.	22	272	8	Li M.	17	1361
9	Li X.	21	334	9	Wang L.	17	1291
10	Wang J.	20	536	10	Wang Y.	31	1268

Table 2 shows the top 10 authors. Of 13184 writers who contributed to this study, 180 keywords for the author met the requirement of having at least one of their documents. Li Y., Li J., and Zhang Y. were the top three authors (n = 42, 35, and 33). Chen X. (citations = 3351), Liu Y. (citations=2406), and Li d. received the most citations (2100).

Figure 2 shows the mapping of the co-occurrence of co-authors' keywords. 193 keywords met the requirement of at least five occurrences, resulting in seven clusters, 2135 connections, and a total link strength of 2300,50. The most frequent repetitions were: covid-19 (1281), sars-cov-2 (460), mortality (295), coronavirus (115), prognosis (83), survival (70), coronavirus illness (66), acute respiratory distress syndrome (61), inflammation (60), and risk factors (53).

Figure 3 shows the co-occurrence of all keywords. 1733 out of 9863 had at least five occurrences, resulting in eight clusters, 350444 connections, and 1695728 overall link strength. The most common repetitions were: human (n=1730), covid-19 (n=1690), coronavirus disease 2019 (n=1466), male (n=1333), humans

(n=1319), female (n=1318), article (n=1307), adult (n=1176), sars-cov-2 (n=1048), and aged (n=1011).

There are 304 occurrences of the keyword "survival" and 12381 overall strong links. Involved the network of connections between terms related to survival and other terms, particularly human, covid-19, male, middle-aged, aged, diseases severity, adult, epidemiology, interleukin 6, c reactive protein, d dimer, prognosis, risk factors, retrospective studies, risk factor, hospital mortality, age, comorbidity, hospital admission, intensive care unit, artificial ventilation, pandemic, mortality rate, severe acute mortality syndrome, hospital patient, observational study, hospital mortality, sars-cov-2, cohort analysis, diabetes mellitus, pandemics, very elderly, blood, and article.

Figure 4 shows the bibliographic coupling of published sources. Three clusters were created when examining the bibliographic coupling of sources, 72 out of 814 sources met the requirement for having at least five documents per source. main sources were *Plos One* (n = 67), *Journal of Clinical Medicine* (n = 50), and *Frontiers in Immunology* (n = 42). There was the

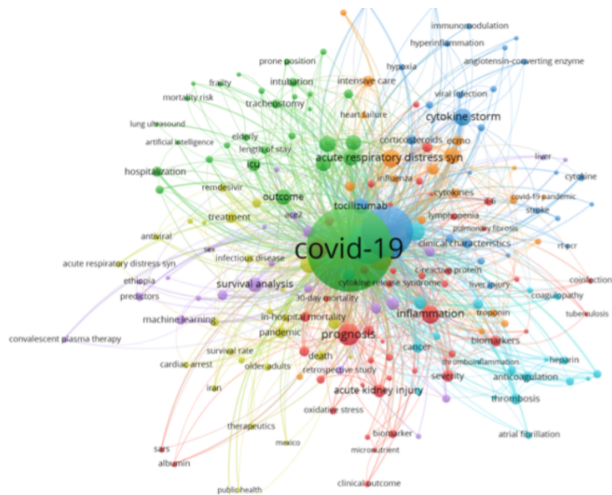


Figure 2. Co-occurrence of author keywords

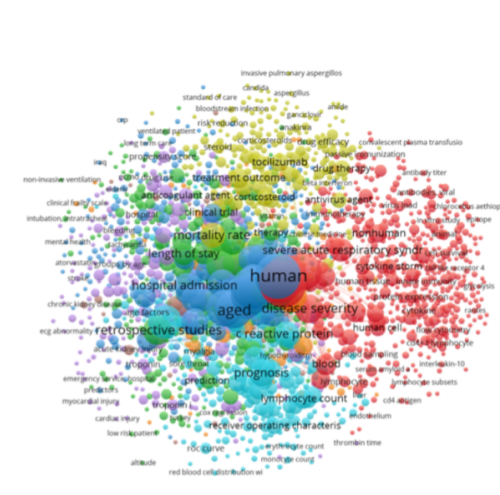


Figure 3. Co-occurrence of all keywords

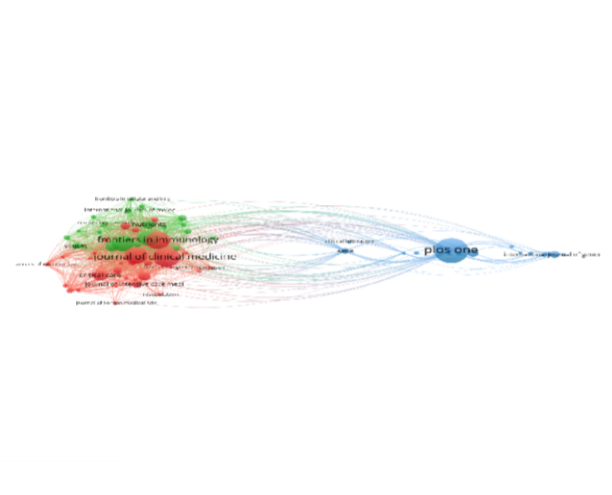


Figure. 4. Bibliographic coupling by sources

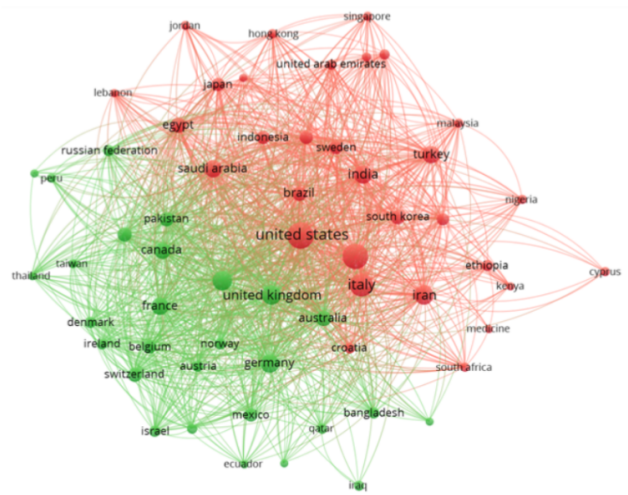


Figure 5. Bibliographic coupling by country

strongest connection between the *Journal of Clinical Medicine* and *Frontiers in Immunology* (374). Then comes *Plos One* and *Journal of Clinical Medicine* (90), and then *Plos One* and *Frontiers in Immunology* (46).

Figure 5 shows bibliographic coupling by country. Two clusters were created when 59 out of 151 countries examined in the analysis of the countries' bibliographic coupling met the requirement for having at least five documents. The top countries included the United States (n = 392), China (n = 339), and Italy (n = 239). The strongest collaborative link was found between the United States and China (41589), the second China and Italy (26126), and the United States and Italy (22756).

DISCUSSIONS

In this bibliometric analysis, 1869 articles in the Scopus-indexed journal Survival of COVID-19 patients written between 2020 and 3 November 2022 were examined. New findings from the analysis were revealed. The data showed that most papers were published in 2021 and the fewest in 2022. The study was written by 13184 different authors. the highest document author, as opposed to the highest document citation author. This shows no correlation between the number of documents per author and the number of citations. Most frequently cited papers are typically considered baseline references pertinent to the study by Tang N from China, which was scheduled for publication in 2020 (12).

PLOS ONE is its primary source of production. These findings are in line with several bibliometric research conducted in related domains. *PLOS ONE* has been placed #1 among the core journals for publishing the most papers on other studies (9), (13). However, other investigations revealed that *the BMJ* (7) and *JAMA Neurology* (14) were the primary sources.

According to country distribution, the USA has contributed the most to the research on COVID-19 patients' survival. Previous research also demonstrates that the USA holds the top position in the world of research. The USA ranked first in other fields in the study that was examined (13), (15), (16), (17). In contrast to Li Y., Caracciolo G. (18) and Wang Y. (7) In contrast to Li Y., Caracciolo G.

The five most frequent repeating keywords were identified by the co-occurrence network analysis of all keywords.: "human", "covid-19", "coronavirus disease 2019", "male", and "humans". Contrary to this, the co-occurrence network analysis by author keywords: "covid-19", "sars-cov-2", "mortality", "coronavirus", and "prognosis". This is comparable to other investigations (19).

Based on all keywords, "survival" term involved the relationship network: "human", "covid-19", "male", "middle aged", "aged", "diseases severity", "adult", "epidemiology", "interleukin 6", "c reactive protein", "d dimer", "prognosis", "risk factors", "retrospective studies", "risk factor", "hospital mortality", "age", "comorbidity", "hospital admission", "intensive care unit", "artificial ventilation", "pandemic", mortality rate", "severe acute mortality syndrome", "hospital patient", "observational study", "hospital mortality", "sars cov-2", "cohort analysis", "diabetes mellitus", "pandemics", "very elderly", "blood", and "article. By survival term, there are 304 total occurrences.

The United States and China had the strongest international collaborations, and the *Journal of Clinical Medicine* and *Frontiers in Immunology* had the strongest connections with relation to sources.

CONCLUSION

Collaboration between the US and China was fundamental to the COVID-19 patients' research survival in 2020–2022. Although *PLOS One* was the most popular journal for studies on COVID-19 patients' survival, the *Journal of Clinical Medicine and Frontiers in Immunology* had the strongest relationship, according to the co-author source. Research on COVID-19 patients' survival shows a decline in 2022.

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