

# World Journal of *Clinical Oncology*

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## Current global research landscape on COVID-19 and cancer: Bibliometric and visualization analysis

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### Abstract

#### BACKGROUND

Cancer is a severe public health issue that seriously jeopardizes global health. In individuals with coronavirus disease 2019 (COVID-19), cancer is considered an independent risk factor for severe illness and increased mortality.

#### AIM

To identify research hotspots and prospects, we used bibliometrics to examine the global production of COVID-19 literature published in the field of oncology.

## METHODS

Data on publication output were identified based on the Scopus database between January 1, 2020, and June 21, 2022. This study used VOSviewer to analyze collaboration networks among countries and assess the terms most often used in the titles and abstracts of retrieved publications to determine research hotspots linked to cancer and COVID-19. The *Impact Index Per Article* for the top 10 high-cited papers collected from Reference Citation Analysis (RCA) are presented.

## RESULTS

A total of 7015 publications were retrieved from the database. The United States published the greatest number of articles (2025; 28.87%), followed by Italy (964; 13.74%), the United Kingdom (839; 11.96%), and China (538; 7.67%). The *University of Texas MD Anderson Cancer Center* ( $n = 205$ , 2.92%) ranked first, followed by the *Memorial Sloan-Kettering Cancer Center* ( $n = 176$ , 2.51%). The *European Journal of Cancer* ( $n = 106$ , 1.51%) ranked first, followed by the *Frontiers in Oncology* ( $n = 104$ , 1.48%), *Cancers* ( $n = 102$ , 1.45%), and *Pediatric Blood and Cancer* ( $n = 95$ ; 1.35%). The hot topics were stratified into “cancer care management during the COVID-19 pandemic”; and “COVID-19 vaccines in cancer patients”.

## CONCLUSION

This is the first bibliometric analysis to determine the present state and upcoming hot themes related to cancer and COVID-19 and vice versa using VOSviewer during the early stages of the pandemic. The emergence of hot themes related to cancer and COVID-19 may aid researchers in identifying new research areas in this field.

**Key Words:** Bibliometric; Scopus; COVID-19; Cancer; Coronavirus disease; VOSviewer; Reference Citation Analysis

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**Core Tip:** Many systematic reviews and meta-analyses found that the number of papers investigating the impact of coronavirus disease 2019 (COVID-19) on cancer in various countries increased during the pandemic. The existing literature on COVID-19, focusing on cancer research, has not been provided by any bibliometric analysis. The hot topics were stratified into “cancer care management during the COVID-19 pandemic”; and “COVID-19 vaccines in cancer patients”. Cancer and COVID-19 have emerged as hot topics, which may help researchers uncover new research opportunities in this area.

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## INTRODUCTION

The first confirmed case of coronavirus disease 2019 (COVID-19) was recorded in Wuhan, China, on December 31, 2019[1]. Since that time, COVID-19 has been spreading rapidly throughout the world. Although some individuals diagnosed with COVID-19 have no symptoms, patients who become symptomatic exhibit a wide range of severity, ranging from mild respiratory symptoms to critical lung disease, sepsis, multiple organ failure, or even death[2,3]. As of June 22, 2022, a total of 538321874 cases of COVID-19 have been confirmed worldwide, including 6320599 deaths[4]. According to the Sustainable Development Goals (SDGs) Report 2020, COVID-19 halts the progress of SDG 3, which seeks to guarantee well-being and a healthy life for everyone. During the crisis, health services for cancer screening have been disrupted or ignored in many places[5].

Cancer patients represent a district group in the population with a weakened immune system due to anticancer treatments and disease activity[6,7]. In pandemics like COVID-19, cancer patients may be deprived of receiving appropriate health care as many health institutes announced shortages of their resources, along with the inadequate information available in the literature to manage them properly [8]. Therefore, health care practitioners have to decide whether to initiate or defer anticancer treatments, considering the risks and benefits of such action. Notably, patients with active cancer are highly susceptible to COVID-19. They are suspected of having serious consequences, such as admission to the

intensive care unit, a requirement for mechanical ventilation, or death[9]. These unfavorable outcomes could sometimes be related to types of cancer, particularly hematologic malignancies and lung cancer [9].

Some studies reported a death rate of 28% among COVID-19 patients with cancer, which was far higher than the rate in the general population[10,11]. It was also found that certain demographics and disease-related factors, including male gender, smoking, old age, having  $\geq$  two medical conditions, cancer status, and performance situation, were strongly associated with the mortality rate among COVID-19 cancer patients[12,13]. However, receiving antitumor therapy within four weeks of diagnosis with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection was not associated with the death rate[10].

According to several systematic reviews and meta-analyses, the number of publications analyzing the impact of COVID-19 on cancer in various nations increased during the pandemic[14-18]. Although various bibliometric studies have been undertaken to evaluate COVID-19 research worldwide[19-23], limited studies have been identified that have presented the current literature on COVID-19, focusing on cancer research. The bibliometric methodology was utilized to measure and categorize research output, allowing for mapping the subject area based on the most involved authors, institutions, nations, citations, journals, and hot topics[24-28]. Therefore, this study sought to comprehensively analyze the current status of publications on COVID-19 in the oncology field through visual and bibliometric analysis. This study intends to be a valuable resource and guide for oncologists, clinicians, virologists, and epidemiologists conducting research on the emerging human coronavirus in the field of cancer in order to generate novel ideas for effective control measures and to outline COVID-19 vaccine guidance for cancer patients as soon as possible.

## MATERIALS AND METHODS

### Data source

The present study, which includes the analysis, was performed in June 2022. The authors utilized the Scopus database to find relevant publications as: (1) It is available to the author through the "Research4 Life" library; (2) it is the largest database available, and it has a greater number of indexed journals than other databases (*e.g.*, PubMed or Web of Science) and is completely inclusive of all journals in Medline [29-31]; and (3) it indexes journals in the disciplines of health, social sciences, life sciences, and physical sciences[32,33]. In addition, Scopus has previously been used to analyze and visualize research publications on various health-related topics[34-38].

### Search strategies

In order to obtain all publications pertaining to COVID-19 and cancer published between January 1, 2020, and June 21, 2022, we employed the 'Advanced search' feature of the Scopus online database. The retrieval and export of data took place within one day to avoid the risk of bias induced by ongoing database changes (June 21, 2022). The following strategy was used to retrieve data for this study (Figure 1):

**Step 1:** The phrases associated with COVID-19 were entered into the Scopus engine to accomplish the study's objectives. They were drawn from previous bibliometric researches on COVID-19[20,21,39-41]. All selected "terms" were included in the "Article Title/Abstract/Keywords" section.

**Step 2:** The documents identified in step 1 were then limited to those having the phrases "cancer and related terms" in their titles. Cancer-related terms were taken from PubMed's Medical Subject Headings (MeSH), and from a previous systematic and meta-analysis on COVID-19 in the oncology field[14-17,42] and placed into the Scopus engine. Some documents (*i.e.*, erratum, and retracted) were excluded (Figure 1).

### Bibliometric analysis

The following bibliometric indicators were compiled using an Excel spreadsheet: total number of publications, type of publication, prolific countries, prolific institutions, prolific journals, and top-cited publications. Reference Citation Analysis (RCA) data were used to calculate the *Impact Index Per Article* for the top ten most cited papers. Baishideng Publishing Group Inc. owns the RCA, an open transdisciplinary citation analysis database (Pleasanton, CA 94566, United States)[43].

### Visualization analysis

The network visualization maps were created using the VOSviewer (version 1.6.16) software program [44,45]. VOSviewer was used in our study as it is well-known as a software tool for visualizing quantitative data. VOSviewer is widely used for mapping, networking, and visualization to emphasize international collaboration and create a co-occurrence matrix to identify research hotspots based on published evidence. A node represents a certain element, such as a country or term. Stronger



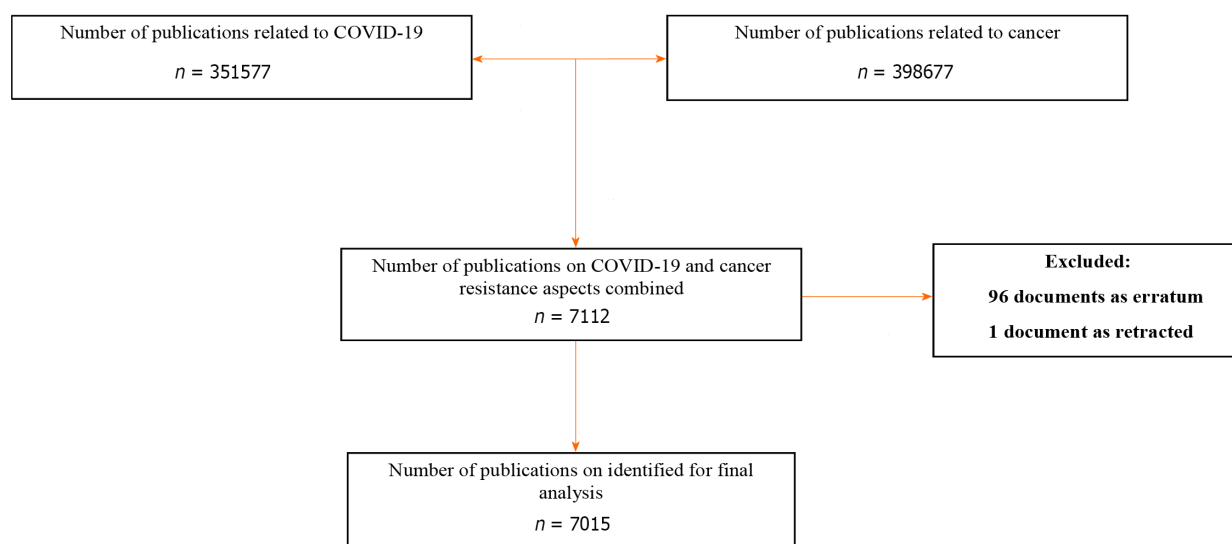


Figure 1 Flowchart for including and excluding literature studies.

cooperation is shown by wider links between nodes, whereas a bigger node size suggests a large number of publications[44,45]. The study themes in the collected literature were determined by mapping the most common terms in titles/abstracts. Using VOSviewer, it is possible to create an overlay visualization in which the most recently used author terms are shown in yellow. Terms overlay visualization was based on the occurrences and average publication per year scores.

## RESULTS

### Volume and types of publications

At the time of data collection (June 21, 2022), Scopus has published 351577 documents on COVID-19 throughout all research fields. During the study period (January 1, 2020, to June 21, 2022), Scopus identified 7015 papers on cancer and COVID-19 which were categorized into ten types. Among them, "Article" accounted for 57.59% of the total publications (4040 articles) and was the most frequent type, followed by letters to the editor ( $n = 1061$ ; 15.12%), and reviews ( $n = 936$ ; 13.34%). The remaining publication types were 978 documents (13.94%).

### Contributions of countries to global publications

We ranked ten high-output countries according to the number of publications (Table 1). The United States published the greatest number of articles (2025; 28.87%), followed by Italy (964; 13.74%), the United Kingdom (839; 11.96%), and China (538; 7.67%). Figure 2 depicts a network map of the major participating countries' international research collaborations on cancer and COVID-19-related literature.

### Active institutions/organizations

Table 2 shows the top ten active institutions. The University of Texas MD Anderson Cancer Center ( $n = 205$ , 2.92%) ranked first, followed by the Memorial Sloan-Kettering Cancer Center ( $n = 176$ , 2.51%) and the Harvard Medical School ( $n = 155$ ; 2.21%). The majority of active institutions were from the United States ( $n = 4$ ), followed by Italy ( $n = 3$ ), Canada ( $n = 1$ ), France ( $n = 1$ ), and India ( $n = 1$ ).

### Active journals

For cancer and COVID-19-related literature, Table 3 shows the top ten active journals. The *European Journal of Cancer* ( $n = 106$ , 1.51%) ranked first, followed by the *Frontiers in Oncology* ( $n = 104$ , 1.48%), *Cancers* ( $n = 102$ , 1.45%), and *Pediatric Blood and Cancer* ( $n = 95$ ; 1.35%).

### Top cited publications

Table 4 lists the top ten most cited works in the field of COVID-19 and cancer, ranked by total citations. The citations in the top ten ranged from 2498 to 340[9-12,46-51]. Among the top 10 papers by total citation frequency, Liang *et al*[46], published in *The Lancet Oncology* in 2020, had the greatest overall citation frequency (number of citations = 2498). The impact index per article of the ten most cited articles ranged from 118.5 to 1017.0 (Table 4).



**Table 1 Publication contributions of the top 10 productive countries**

Ranking	Country	Number of documents	%
1 <sup>st</sup>	United States	2025	28.87
2 <sup>nd</sup>	Italy	964	13.74
3 <sup>rd</sup>	United Kingdom	839	11.96
4 <sup>th</sup>	China	538	7.67
5 <sup>th</sup>	India	489	6.97
6 <sup>th</sup>	France	403	5.74
7 <sup>th</sup>	Canada	363	5.17
8 <sup>th</sup>	Germany	349	4.98
9 <sup>th</sup>	Spain	327	4.66
10 <sup>th</sup>	Australia	237	3.38

**Table 2 Top ten active institutions/organizations on research related to coronavirus disease 2019 and cancer**

Ranking	Institution	Country	n	%
1 <sup>st</sup>	University of Texas MD Anderson Cancer Center	USA	205	2.92
2 <sup>nd</sup>	Memorial Sloan-Kettering Cancer Center	USA	176	2.51
3 <sup>rd</sup>	Harvard Medical School	USA	155	2.21
4 <sup>th</sup>	Dana-Farber Cancer Institute	USA	152	2.17
5 <sup>th</sup>	University of Toronto	Canada	132	1.88
5 <sup>th</sup>	Università degli Studi di Milano	Italy	127	1.81
7 <sup>th</sup>	Istituto Europeo di Oncologia	Italy	121	1.72
8 <sup>th</sup>	INSERM	France	120	1.71
9 <sup>th</sup>	Fondazione IRCCS Istituto Nazionale dei Tumori, Milan	Italy	119	1.70
10 <sup>th</sup>	Tata Memorial Hospital	India	116	1.65

### Research themes in cancer and COVID-19-related literature

Mapping the most frequent appearing terms in the title/abstract fields of publications in cancer and COVID-19 with a minimum occurrence of 100 resulted in 253 terms being distributed into two clusters corresponding to the two primary study topics (Figure 3). The clusters are “cancer care management during the COVID-19 pandemic” (cluster 1, red), and “COVID-19 vaccines in cancer patients” (cluster 2, green); (Figure 3). The guideline, emergency, procedure, safety, process, recommendation, guidance, approach, and care are the most often used terms in cluster 2. The most often used terms in cluster 2 are vaccine, vaccination, immunotherapy, and development.

The evolution of color from dark blue to yellow represents the variation of the hot topic over time. As shown in Figure 4, researchers focused on topics related to COVID-19 vaccines in cancer patients during the last year and have become the hot research topics, attracting increasing attention.

## DISCUSSION

This is the first bibliometric study in the field of cancer to assess and visualize COVID-19 research. We reviewed a total of 7015 publications from the Scopus database, and we present a detailed analysis of worldwide contributions and hotspots in COVID-19 and cancer research during the early stages of the pandemic. According to our study, the growing number of publications in cancer and COVID-19-related literature indicates that this topic is receiving considerable attention. During the COVID-19 pandemic, the popularity of sustainable development research has increased. The number of publications indicates that as the pandemic expanded internationally, more countries were impacted, which has led to an increase in researchers paying attention to the pandemic's influence on sustainable development[52].

**Table 3 Top ten active journals on research related to coronavirus disease 2019 and cancer**

Ranking	Journal	n	%	IF
1 <sup>st</sup>	<i>European Journal of Cancer</i>	106	1.51	9.162
2 <sup>nd</sup>	<i>Frontiers in Oncology</i>	104	1.48	6.244
3 <sup>rd</sup>	<i>Cancers</i>	102	1.45	6.639
4 <sup>th</sup>	<i>Pediatric Blood and Cancer</i>	95	1.35	3.167
5 <sup>th</sup>	<i>Lancet Oncology</i>	90	1.28	41.316
6 <sup>th</sup>	<i>Supportive Care in Cancer</i>	86	1.23	3.603
7 <sup>th</sup>	<i>Cancer</i>	81	1.15	6.860
8 <sup>th</sup>	<i>JAMA Oncology</i>	75	1.07	31.777
9 <sup>th</sup>	<i>JCO Oncology Practice</i>	73	1.04	NA
10 <sup>th</sup>	<i>Advances in Radiation Oncology</i>	60	0.86	NA

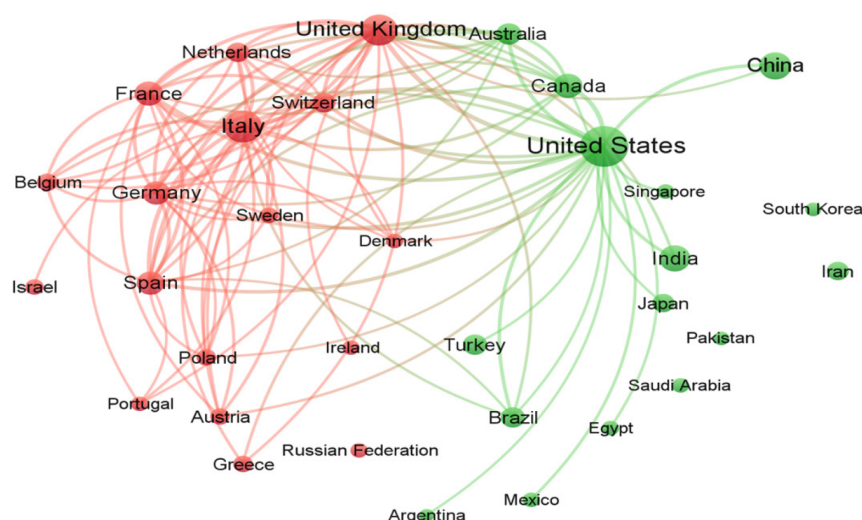
IF: Impact factor; NA: Not available.

**Table 4 List of the top 10 cited articles for coronavirus disease 2019 studies related to cancer between January 1, 2020, and June 21, 2022**

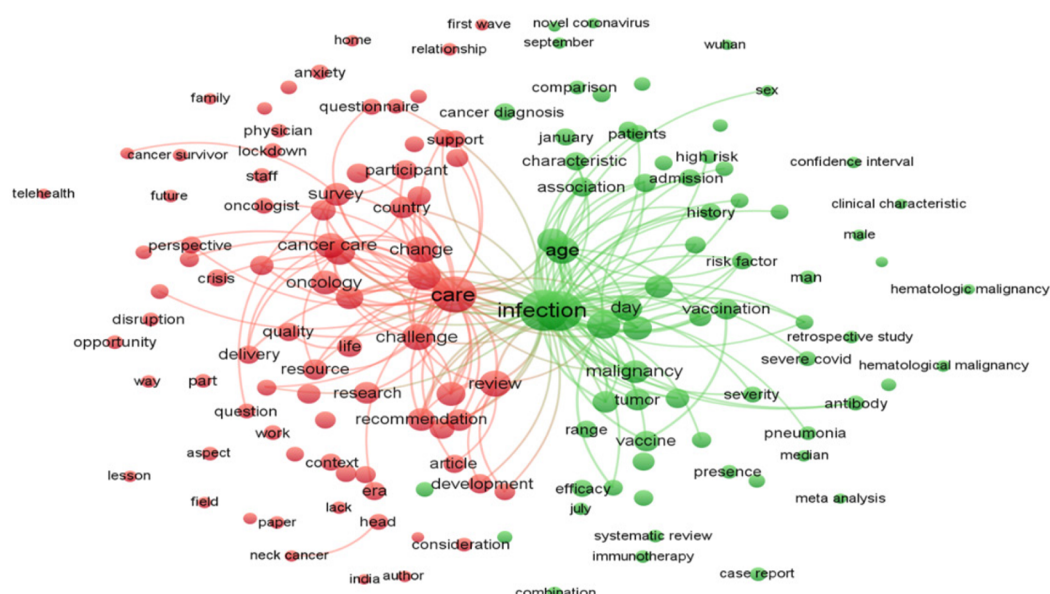
Ranking	Ref.	Title	Year	Source title	Cited by	Impact Index Per Article <sup>1</sup>
1 <sup>st</sup>	Liang <i>et al</i> [46]	"Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China"	2020	The Lancet Oncology	2498	1017.0
2 <sup>nd</sup>	Zhang <i>et al</i> [47]	"Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China"	2020	Annals of Oncology	859	296.0
3 <sup>rd</sup>	Tian <i>et al</i> [49]	"Pulmonary Pathology of Early-Phase 2019 Novel Coronavirus (COVID-19) Pneumonia in Two Patients With Lung Cancer"	2020	Journal of Thoracic Oncology	835	315.5
4 <sup>th</sup>	Kuderer <i>et al</i> [12]	"Clinical impact of COVID-19 on patients with cancer (CCC19): a cohort study"	2020	The Lancet	825	292.5
5 <sup>th</sup>	Dai <i>et al</i> [9]	"Patients with cancer appear more vulnerable to SARS-CoV-2: A multicenter study during the COVID-19 outbreak"	2020	Cancer Discovery	774	118.5
6 <sup>th</sup>	Yu <i>et al</i> [50]	SARS-CoV-2 "Transmission in Patients with Cancer at a Tertiary Care Hospital in Wuhan, China"	2020	JAMA Oncology	659	236.0
7 <sup>th</sup>	Maringe <i>et al</i> [48]	"The impact of the COVID-19 pandemic on cancer deaths due to delays in diagnosis in England, UK: a national, population-based, modelling study"	2020	The Lancet Oncology	579	189.0
8 <sup>th</sup>	Lee <i>et al</i> [10]	"COVID-19 mortality in patients with cancer on chemotherapy or other anticancer treatments: A prospective cohort study"	2020	The Lancet	574	210.5
9 <sup>th</sup>	Mehta <i>et al</i> [11]	"Case fatality rate of cancer patients with COVID-19 in a New York Hospital system"	2020	Cancer Discovery	426	158.5
10 <sup>th</sup>	Feldmann <i>et al</i> [51]	"Trials of anti-tumour necrosis factor therapy for COVID-19 are urgently needed"	2020	The Lancet	340	140.0

<sup>1</sup>The Impact Index Per Article is presented based on Reference Citation Analysis.

One of the key hot issues in the current study was "Cancer care management during the COVID-19 pandemic". According to several studies, the probability of developing COVID-19 in cancer patients is considered twofold higher than in the normal population. Therefore, oncologists should employ appropriate therapeutic methods in the event of a pandemic, weighing the risks of mortality from COVID-19 against the risks and benefits of continuing anticancer therapy[53-55]. Additionally, managing patients efficiently during pandemics or big crises should be a key component of the cancer care continuum. Common immunosuppressive treatments are likely to make cancer patients more vulnerable to COVID-19-related severe outcomes. Although recent studies of immunocompromised people suggest that outcomes may be less severe, several malignancy studies show a link between



**Figure 2 International collaboration in cancer and coronavirus disease 2019-related literature is visualized as a network map among the most active countries.** This graphical collaboration map was created after a minimum of 50 publications were placed in each country. Of 143 countries working in this field, 33 met this threshold. The node size denotes the number of publications for that country.

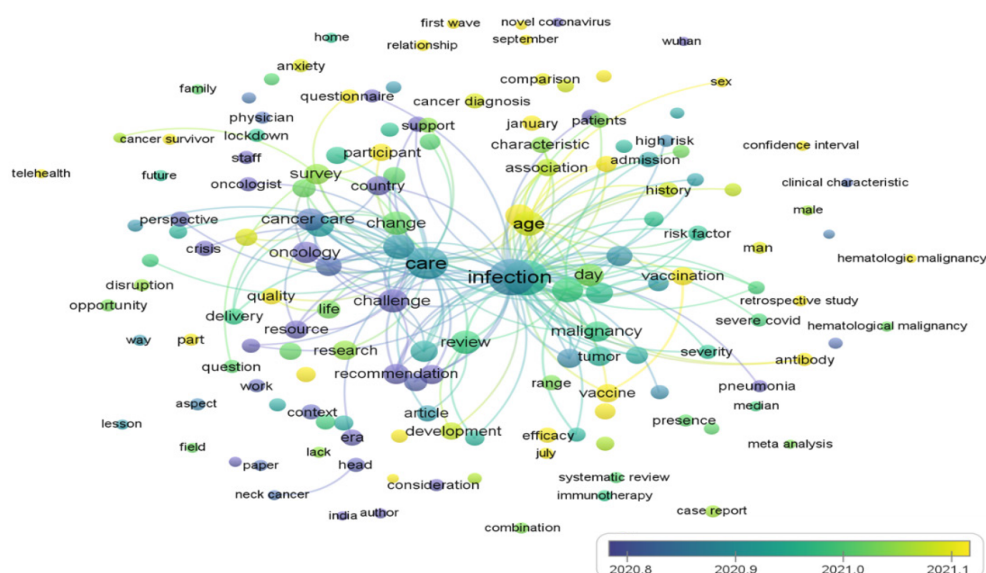


**Figure 3 Map of terms in the title/abstract fields of papers relating to cancer and coronavirus disease 2019 as a network visualization.** This graphical map of terms was created by placing the minimum number of term occurrences at least 100 times. Out of 75191 terms in this field, 253 terms met this criterion, grouped into three clusters and colored differently. The node size denotes the number of articles that contain that term.

increased fatality rates[12,56]. These risks are likely to differ depending on the type of cancer treatment and type of cancer[46,50,57]. According to the findings from a large systematic review and meta-analysis[58], it was shown that cancer is a comorbidity in between 1% and 2% of COVID-19 patients who are hospitalized in China, and in 5% to 7% of patients in Western nations. Based on these findings, it appears that the subjects clinically appear the same as normal individuals, and early research has shown that patients with cancer and COVID-19 have a greater in-hospital mortality risk.

Thus, this also minimizes harm in the event of a future pandemic, but it also empowers the gains generated by the current pandemic to improve overall health care delivery for all cancer patients and, by leveraging the efforts of many organizations across the cancer care stakeholders, helps all patients receive the highest-quality care while simultaneously fostering cooperation on a global scale[59,60].

Another hot subject is the COVID-19 vaccine in cancer patients. Since the early stages of the pandemic, patients with cancer have been designated as a high-risk group for COVID-19[61,62]. Therefore, the safety and effectiveness of COVID-19 vaccination in immunosuppressed persons must be better understood urgently, as excluding them and other susceptible groups from continuing trials of COVID-19 vaccines would result in inaccurate prognostic health models, which will impact subsequent



pandemic waves[63,64]. Given the significant risk of morbidity and death from COVID-19 in cancer patients, current information on the safety and efficacy of the approved COVID-19 vaccinations in these patients is limited. However, the benefits likely outweigh the risks of vaccine-related adverse effects[65].

Published documents that are often cited have a large academic influence. [Table 4](#) lists the ten cancer and COVID-19-related documents with the highest citation frequency. The most frequently cited paper on the subject is “Cancer patients with SARS-CoV-2 infection: a nationwide analysis in China,” published in *The Lancet Oncology* and cited 2498 times. This prospective observational study found that cancer patients were more likely to develop SARS-Cov-2 infection, require mechanical ventilation, and have an increased mortality risk[46]. It also showed that the clinical conditions of cancer patients got worse more rapidly than that of the other populations[46]. The paper by Zhang *et al*[47], which was published in *Annals of Oncology*, was the second most cited article. This study aimed to describe the clinical characteristics of COVID-19 patients who had cancer. The results revealed that more than 80% of patients had a dry cough, low lymphocyte count, high body temperature, low protein levels, and high value of inflammatory markers (C-reactive protein). In addition, patients who received anticancer therapy during the last two weeks were more likely to have serious consequences.

The third highest cited paper, published in *Journal of Thoracic Oncology*[49], analyzed two lung cancer tissue specimens of patients with COVID-19 and showed multinucleated giant cells, exudate-containing proteins, and central reactive hyperplasia of pneumocytes, along with infiltrated patches of inflammatory cells. The paper by Kuderer *et al*[12], which was published in the *Lancet*, was the fourth most cited article. This cohort analysis of 928 cancer patients diagnosed with COVID-19 noted that male gender, smoking, old age, having  $\geq$  two medical conditions, use of chloroquine and azithromycin, cancer status, and performance situation were the determinants of death during one month. However, the types of malignancy or antitumor treatments used did not predict the death rate.

The paper by Dai *et al*[9], which was published in *Cancer Discovery*, was the fifth most cited article. The study was carried out to compare COVID-19 cancer patients *vs* non-cancer patients and their susceptibility to COVID-19. The risk of serious outcomes, including admission to the intensive care unit, developing serious symptoms, invasive ventilation, or death, was higher in cancer patients than in non-cancer cases. Hematologic malignancies, lung cancer, and metastatic tumors were the most frequent types of cancer to have such events.

The paper by Yu *et al*[50], which was published in *JAMA Oncology*, was the sixth most cited article. According to this study, which was conducted in one center in China, the risk of contracting COVID-19 among oncology patients was found to be 0.79%. In addition, the subgroup analysis revealed a greater rate of SARS-CoV-2 infection in non-small cell lung cancer patients over 60 years old compared to those under 60 years.

The seventh most cited article was by Maringe *et al*[48] and published in the *Lancet Oncology*. According to this study, the COVID-19 pandemic in the UK is predicted to significantly increase the number of preventable cancer deaths in England. The COVID-19 pandemic is predicted to impact cancer patients significantly, and urgent policy initiatives are needed to address the backlog in regular diagnostic services. The paper by Lee *et al*[10], which was published in the *Lancet*, was the eighth-most cited article. The outcomes of this study revealed a high mortality rate among COVID-19 patients with



active malignancy (28%). The mortality rate was significantly associated with old age, male gender, and other diseases. However, receiving anticancer treatment within four weeks of being diagnosed with SARS-CoV-2 infection was not related to the mortality rate.

The paper by Mehta *et al*[11], which was published in *Cancer Discovery*, was the ninth most cited article. This study reported a mortality rate of 28% (61/218) among COVID-19 cancer patients, which were distributed as 20 deaths of blood cancer (37%) and 41 of solid cancer (25%). The predictors of mortality were advanced age, presence of other medical conditions, a high level of inflammatory markers, and admission to the intensive care unit.

The tenth most cited article was by Feldmann *et al*[51] and published in the *Lancet*. This study revealed that tumor necrosis factor (TNF) is considered one of the main targeted therapies for certain inflammatory diseases, such as rheumatoid arthritis. Importantly, COVID-19 involves an inflammatory process with a role for TNF, indicating a possible benefit of using anti-TNF agents in COVID-19 patients. Moreover, no adverse outcome was found in COVID-19 patients who used anti-TNF therapy. Thus, there is an urgent need for clinical trials of anti-TNF treatment targeting COVID-19 patients.

### Strengths and limitations

Publications in cancer and COVID-19-related literature were assessed and analyzed comprehensively and objectively using the largest abstract and citation database containing peer-reviewed research. Although this is the first bibliometric investigation of COVID-19 in the field of oncology, there are certain limitations: (1) The search was conducted on June 21, 2022, and included all documents from January 1, 2020, up to June 21, 2022, but the Scopus database would have been open for new documents from 2022, so this part was omitted; (2) Only publications containing the terms related to cancer in the title were retrieved; and (3) As the search was limited to Scopus indexed journals, a few publications not included in the Scopus database were missed. Other bibliometric studies have also noted some limitations[35,66,67].

## CONCLUSION

In conclusion, this is the first bibliometric analysis to determine the present state and upcoming hot themes related to cancer and COVID-19 and vice versa using VOSviewer during the early stages of the pandemic. The top five most productive countries reporting high research on cancer and COVID-19-related literature are the United States, Italy, the United Kingdom, China, and India. In terms of publications in this discipline, the *University of Texas MD Anderson Cancer Center* and the *Memorial Sloan-Kettering Cancer Center* are the most prolific institutions. The results of the present bibliometric analysis revealed that most hot research topics have evaluated “cancer care management during the COVID-19 pandemic”, and “COVID-19 vaccines in cancer patients”. The emergence of hot themes related to cancer and COVID-19 may aid researchers in identifying new research areas in this field.

## ARTICLE HIGHLIGHTS

### Research background

In comparison to the general population, cancer patients with coronavirus disease 2019 (COVID-19) have a mortality rate that is two times higher.

### Research motivation

Despite the fact that numerous bibliometric studies have been carried out to assess COVID-19 research across the globe, there are few studies that have focused on COVID-19 literature and cancer research.

### Research objectives

Through visual and bibliometric analysis, this study aimed to thoroughly examine the current state of publications on COVID-19 in the field of cancer.

### Research methods

The Scopus database was searched to identify publishing output data. To identify research hotspots related to cancer and COVID-19, this study used VOSviewer to analyze international collaboration networks and evaluate the terms most frequently used in the titles and abstracts of the articles retrieved. The *Impact Index Per Article* is shown for the top 10 highly cited publications gathered *via* Reference Citation Analysis (RCA).

### Research results

The results of the present bibliometric analysis revealed that most hot research topics have evaluated

“cancer care management during the COVID-19 pandemic”, and “COVID-19 vaccines in cancer patients”.

### Research conclusions

Based on a current review of hot topics and research patterns, the findings of this study may help researchers uncover new research areas in the field of cancer and COVID-19.

### Research perspectives

For oncologists, clinicians and virologists, this study aims to be a valuable resource and guide for research on emerging COVID-19 in the field of cancer to generate novel ideas for effective control measures and to outline COVID-19 vaccine guidance for cancer patients in the most timely manner.

## FOOTNOTES

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