# Impact of Covid-19 on Right to Health: A Bibliometric Analysis

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**Abstract: Background:** The coronavirus disease of 2019 (COVID-19), a global pandemic, has significantly impacted the right to health. Global health has been disrupted and Governments struggled to provide timely necessary medical attention to the citizens which have violated their right to health in diverse ways.

**Purpose:** To know the recent trends on right to health study during Covid-19. To know who are the prominent authors and universities working in this area of study.To find out what are the grey areas of socio-legal study in this area.

**Method:** Publications related to impact on right to health during the COVID-19 pandemic across the world from year 2020-2023 were extracted from the Scopus database. 437 documents have been extracted by limiting the subject area to social sciences, humanities and psychology. Bibliometric indicator analysis was performed using RStudio 4.3.1.

**Results:** The most relevant authors are Forman L, Mcmellon C and Van Hout MC. The most cited countries are USA, Canada and China.The commonly used keywords in the research works are humans, pandemic and human rights.The emerging or declining themes are epidemic,viral disease and coronavirus.The basic themes are human rights, health impact and health policy.

**Keywords:** COVID-19. Bibliometric.Right to health. R Studio. Scopus

## Introduction

History has witnessed at least one pandemic in every century. In contemporary world, due to globalization pathogens can move easily among individuals (Sarukhan, 2016). After the Spanish flu in the last century humanity has been grasped by the Covid-19 pandemic in 2019.The epicentre of the outbreak of corona virus pandemic is believed to be from a laboratory in Wuhan city of China.Early research on Covid-19 emphasizes its zoonotic origin, designating bats as the disease's carriers.Two other corona virus epidemics, Severe Acute Respiratory Syndrome (SARS) in 2002 and Middle East Respiratory Syndrome (MERS-CoV) in 2012, struck humanity before the COVID-19 outbreak. COVID-19, Ebola Virus Disease, and H1N1 (swine flu) have infected more people globally than SARS and MERS, which had fatality rates of 11% and 35%, respectively, during outbreaks that occurred over the past 20 years (Sarukhan, 2016).

On March 11, 2020, World Health Organisation had declared Covid-19 as a pandemic. Initially, due to the absence of any specific treatment or vaccine,social distancing was the only mode of curbing the spread of the virus.

Covid-19 infection symptoms typically includes high fever, loss of taste and smell, cough, cold and in some severe cases respiratory complications that can lead to death of a person.Covid-19 pandemic made humanity witness global health disruptions wherein right to health had been violated across the world due to shortage of essential services, deficiency in healthcare infrastructure and lack of preparedness of executive wing of the government.Unavailability of crucial treatment during the pandemic raised various human rights concern under the broader head of right to health.Lack of Personal Protection Equipment (PPE) kits, shortage of Intensive Care Units, oxygen crisis, lack of space for burial, all these had violated basic human rights of the people. States have a primary obligation to protect the health and well-being of its people but many states have drastically failed to fulfill this obligation during the pandemic. This have occurred due to irrational decision making and financial constraints. Hence the study on right to health literature during the last three years in the context of Covid-19 has become necessary.

COVID-19 has amplified global awareness on public health law. The previous two centuries,have witnessed global legal developments influencing both national and international public health law. COVID-19 pandemic has drawn attention to the utility of international health law in handling global health emergencies.The International Health Regulations (IHR)(2005) provide a legal framework that lays down nations rights and duties during cross border public health emergencies. The IHR came

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into force to address public health event caused by epidemiological outbreak.The increase in the rate of emergence of communicable diseases have also increased international legal scholarship on issues pertaining to public health. The role of law in curbing spread of communicable diseases is indisputable. With the inflow of writings on human rights and coronavirus pandemic a considerable amount of debates have also arisen. Further researchers have not only focused on recent pandemics but also on past pandemics to gain important lessons from the same. Human rights law now has an impact on international health law due to the recognition of the overlap between health and human rights. This has occasionally resulted from legal disputes involving the alleged violation of rights to life, dignity, and the highest attainable standard of health, which are recognised by the constitution or other laws in some jurisdictions, and which required the application of international human rights law by courts. The coronavirus induced pandemic has enhanced the significance of health law in general and has gained attention to its global scope (Bennett et al.,2022).

The scientific development in the study of the coronavirus disease in diverse fields affirms the significance of finding out the research dynamics. The primary concern of the researchers is to disentangle the prominent countries which are excelling on research in this area, collaboration networks and publication outcomes. This research paper aims at examining present publications on COVID-19 connected with right to health which is an essential parameter of a pandemic. This research makes use of up-to-date bibliometric analysis of publication records. The final objective is to raise awareness on right to health, increase knowledge pool and provide probable suggestive measures.This research work makes recommendations to enhance pandemic preparedness for future pandemics rooted in resilience action.

## Integration of AI and Computer Science in Analyzing COVID-19's Impact on the Right to Health

The COVID-19 pandemic has increased novel threats to global health care systems and has shown that the application of artificial intelligence (AI) and computer science is essential for dealing with pandemics. AI and computer science have played multiple crucial roles in as many aspects of the pandemic, such as the modeling of the outbreaks, the distribution of the health resources, and the facilitation of various decision-making processes. The integration of these two is also important when arguing the right to health in the period of the pandemic.

### AI in Predictive Modeling and Outbreak Management

Artificial intelligence and especially the machine learning techniques have been widely applied in modelling the further spread of COVID-19. Due to the fact that it can constantly scan and calculate large amounts of data such as infection rates, mobility and social interaction patterns AI is capable of predicting areas that might experience an increase in infections (Vaishya *et al.*, 2020). This predictive capability enables different governments and health organizations to allocate resources depending on the risk levels and assists in carrying out specific actions in order to safeguard the right to health due to the avoidance of health care system overload.

### Data Mining and Natural Language Processing (NLP)

The COVID-19 has created numerous papers which are unstructured data providing a vast volume of information. Data mining as well as NLP has been used to explore this data. NLP algorithms are capable of analyzing and interpreting human language, pausing the legal information from the research papers, articles and tweets. This aids in ascertaining new trends of violating health rights during the COVID-19 epidemic prevalent in the population (Kundra *et al.*, 2021). For instance, conducting an analysis of the sentiment of the posts shared on social networking sites indicates the areas that require special attention from the policymakers in terms of health, and subsequently, policymakers act in consonance with the people's plight (Cheng *et al.*, 2020).

### Telemedicine and AI-Powered Healthcare

Telemedicine is one more field that has been developed due to the pandemic and IT solutions such as AI have a great impact on it. The symptom checkers and virtual assistants which are implements of AI have been incorporated into telehealthing platforms (Ohannessian *et al.*, 2020). It refers to tools used in arriving at first assessments on how patients should be disposed or probably admitted and attend to or discharged in the first place so as not to overcrowd institutions and facilities and ensure the provision of quality service to everyone. This directly contributes to the implementation of the right to health since healthcare becomes accessible particularly in areas which are hard to reach.

### AI in Vaccine Distribution and Management

In this context, the right to health incorporates a core tenet of vaccines, the equity delivery. AI has been useful in managing through minimizing the impact of Covid-19 through proper vaccine distribution. Logistic planners can use the approaches to come up with efficient distribution plans with references to population, infection, and other constraints (Goh *et al.*, 2021). This guarantees that vaccines get to the nutritionally vulnerable populations in good time thus fulfilling their rights to health.

### Research Questions

1. Who are the prominent authors in this field of study?

2. Which countries authors collaborate the most for doing research in this area?

3. Which are the relevant institutions working on this area of research?

4. What are the most preferred sources in which authors would like to publish their works?

5. Which keywords and co-occurrence networks are most commonly used in COVID19 research?

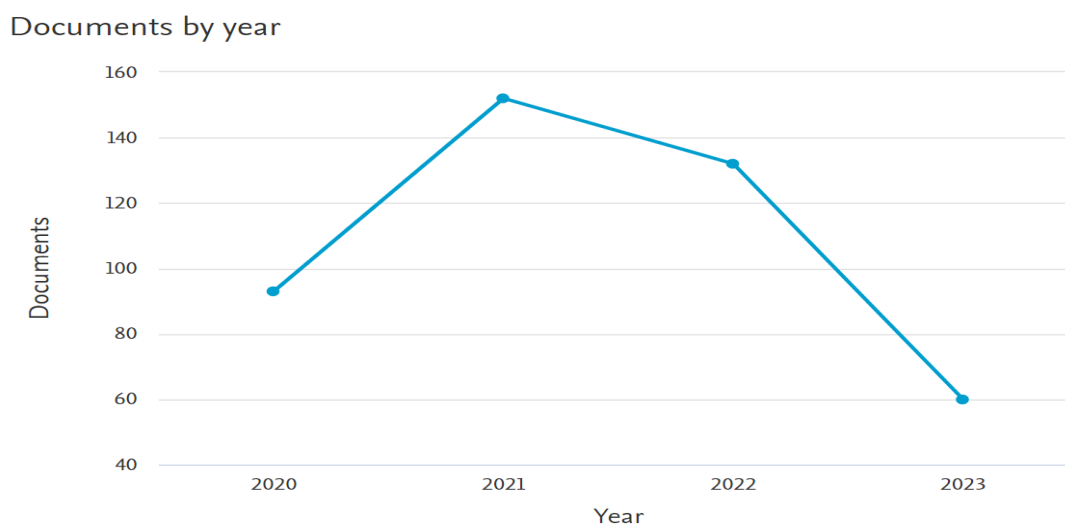6. What are the emerging themes of research?

**Methods and data source**

By using various forms of research methodology, researchers are able to ascertain and examine scientific research trends in a particular field of research and the significance of publication on that research topic(Ellegaard & Wallin, 2015).By analysing the relationships between various research components, the bibliometric methodology summarises the field's bibliometric and cognitive structure and encompasses the usage of quantitative methods on bibliometric data (Moustakas, 2022). Bibliometric analysis is a mode of research which provides vital information to researchers about the recent trends of research and prominent authors and their works. This helps researchers to collaborate with foreign authors and institutions and thereby enhance their quality of research.

The researchers have done extensive literature review from various databases such as Scopus,Elsevier,Google scholar,Pubmed,Science direct and Researchgate to understand how to do bibliometric analysis.After reviewing the literatures it is found that mostly bibliometric analysis have been done on topics such as effect of Covid-19 on mental health,effect of coronavirus pandemic on economics and international trade, Covid-19 and hospitality sector and Covid-19 and management etc. However, very little work has been done on Bibliometric analysis of Covid-19 and right to health.Documents relating to impact of Covid-19 on right to health have been retrived from Scopus database.The keywords which have been used for searching the documents are 'COVID-19'and 'health'. The documents are retrieved using the Scopus database's "article title, abstract, and keywords" option.437 documents have been exported to CSV format. The database search was conducted on August 2, 2023. The CSV file was opened in excel sheet for data analysis. The documents type include original articles, review articles and books. The language has been limited to English only. This study analyzes the most eminent authors and institutions across the world,top journals where papers have been frequently published and keywords tree map analysis etc.
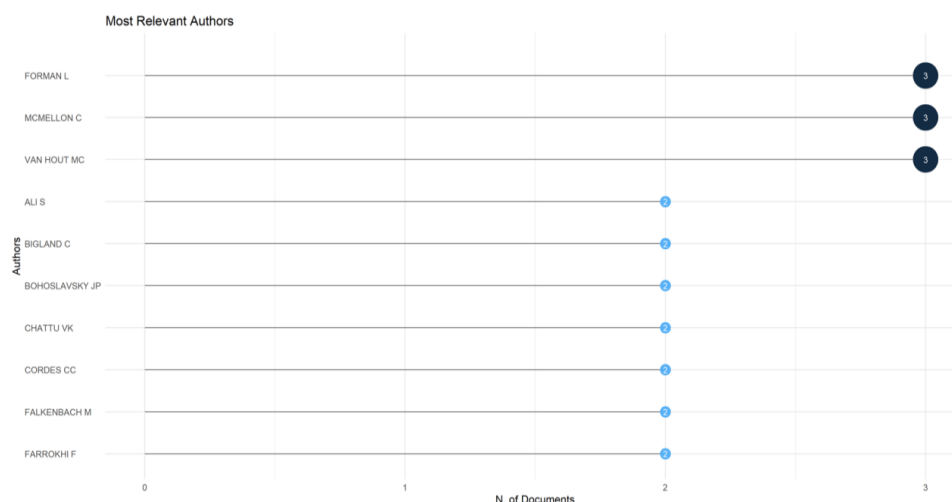
**Bibliometric Analysis Results**

**Documents published per year**



**Fig.1** Documents by year

As the data suggests, 94 documents have been published in the year 2020, 153 documents have been published in 2021, 132 documents have been published in 2022 and 60 documents have been published in 2023 till now.Majority documents have been published in the years 2021 and 2022.
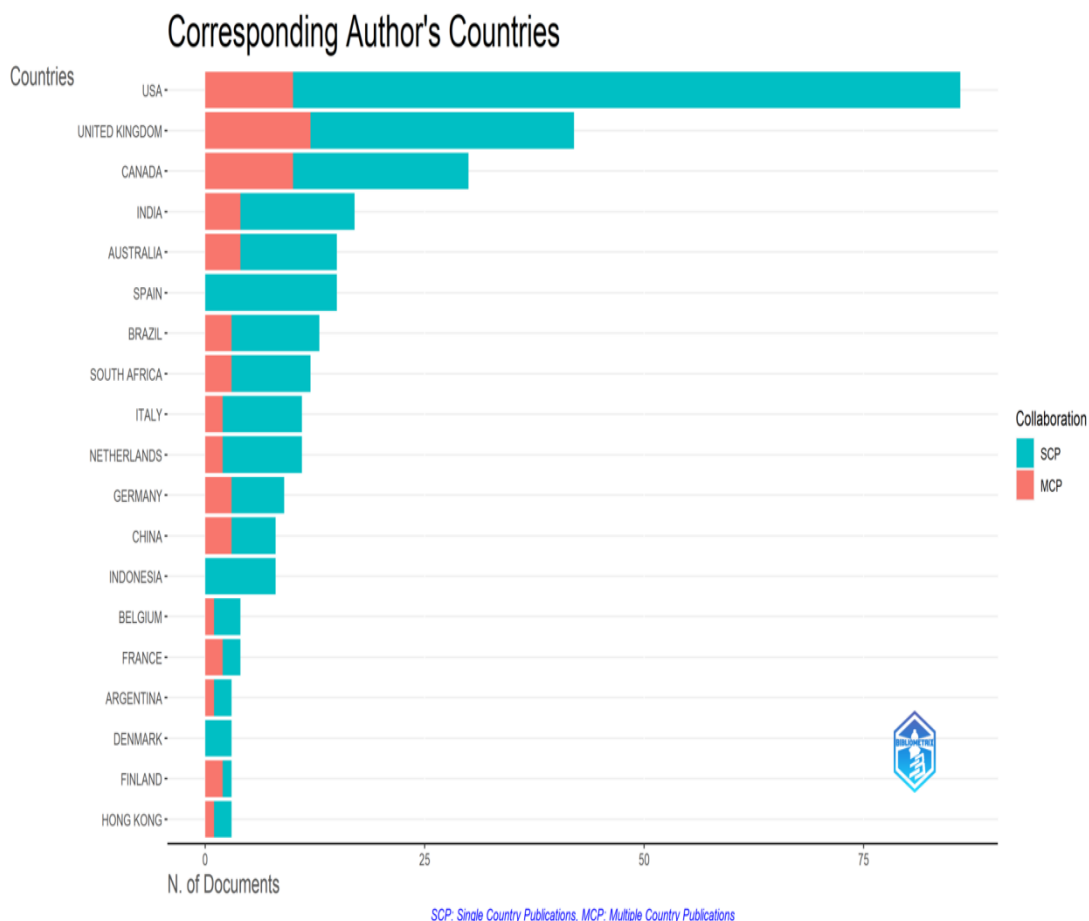
**Relevant authors**



**Fig. 2** Most relevant authors

This figure shows the top ten authors working on the impact of Covid-19 on right to health. The most prominent authors are Forman L with 3 publications followed by Mcmellon C and Van Hout MC with 3 publications.

**Collaboration Pattern**



**Fig.3** Corresponding Author's Countries

As evident from this figure, single country publications are mainly from USA, United Kingdom,Canada, India, Australia, Spain and Indonesia.Authors have mostly collaborated for doing research with authors of USA, United Kingdom, Canada, India and Australia. It is interesting to note that along with USA and UK, Indian authors also has notably contributed to multiple country publications in the field of right to health and Covid-19.

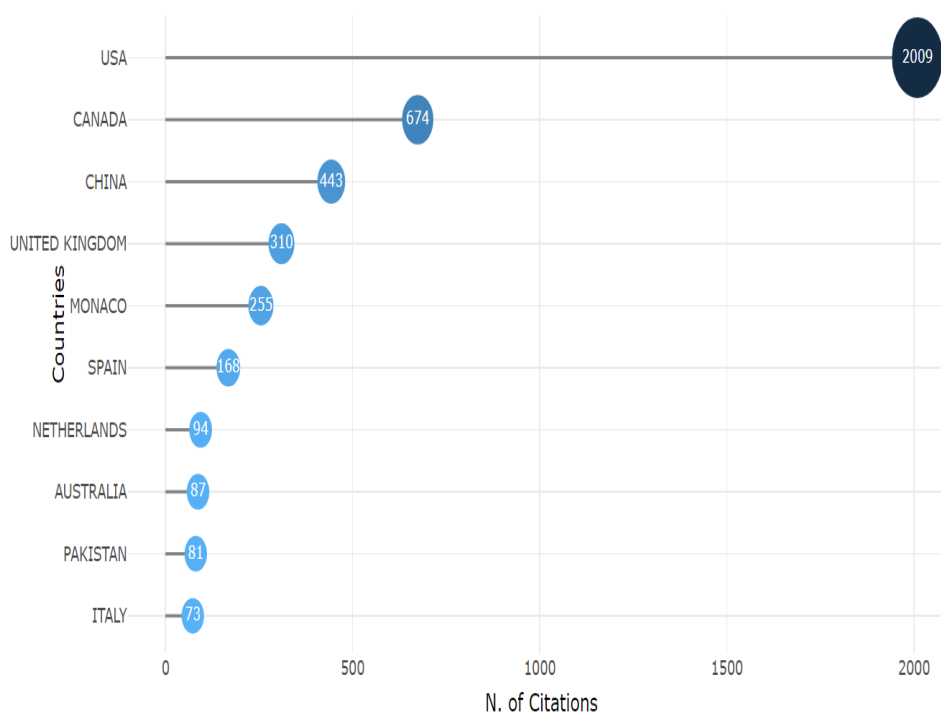**Visual representation of authors collaboration network**



**Fig.4** Authors colloboration network

The most prominent authors collaboration network as per the above diagram can be classified into 4 different groups of collaboration. The first group of authors are Silva AR, Villardi P, Van de ploeg src and Silva CA. The second association is between Sekalala S and Forman L followed by third association of Mcmellon C and Maclachlan A. Another prominent collaboration is between Van Hout MC and Bigland C. This colloboration network overlay will make it easier for researchers to locate authors and contact them for collaborative research.

**Most cited nations**



**Fig.5** Most cited countries

The most cited countries in research works are USA with 2009 citations, Canada (674) citations,China (443) citations, United Kingdom (310) citations and Monaco (255) citations.
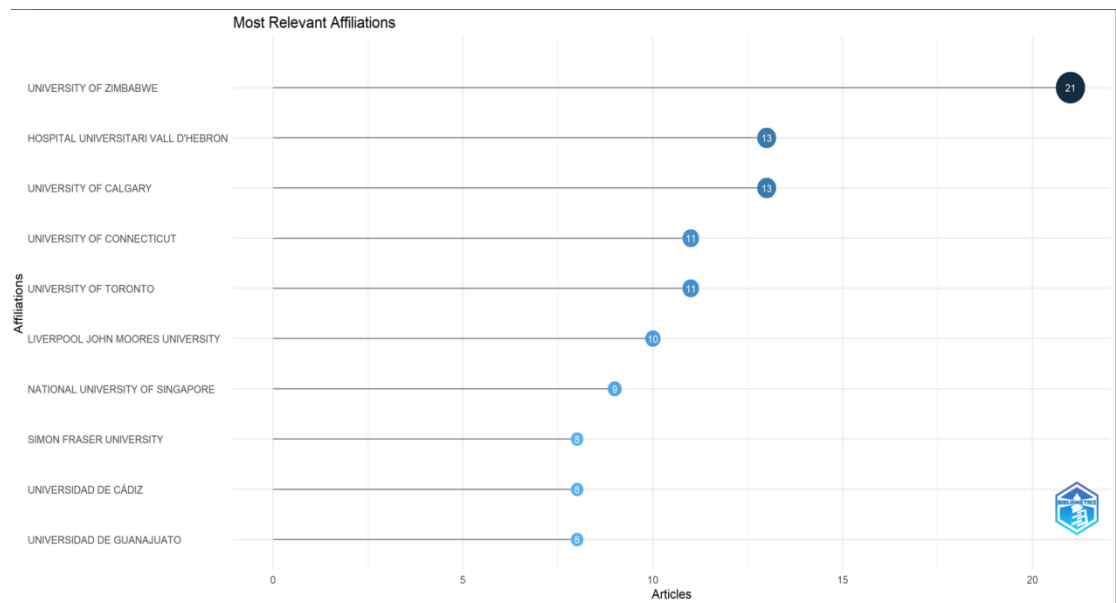
**Most relevant affiliations**



**Fig.6** Most relevant affiliations

To know the eminent institutions doing research in this area an analysis of the top most universities and their overtime scientific production is relevant. As per the above figure University of Zimbabwe has 21 publications which is the highest number of research output amongst all the institutions.Hospital Universitari Vall Dhebron and University of Calgary have 13 scientific production respectively, followed by University of Connecticut and University of Toronto which have 11 publications respectively.
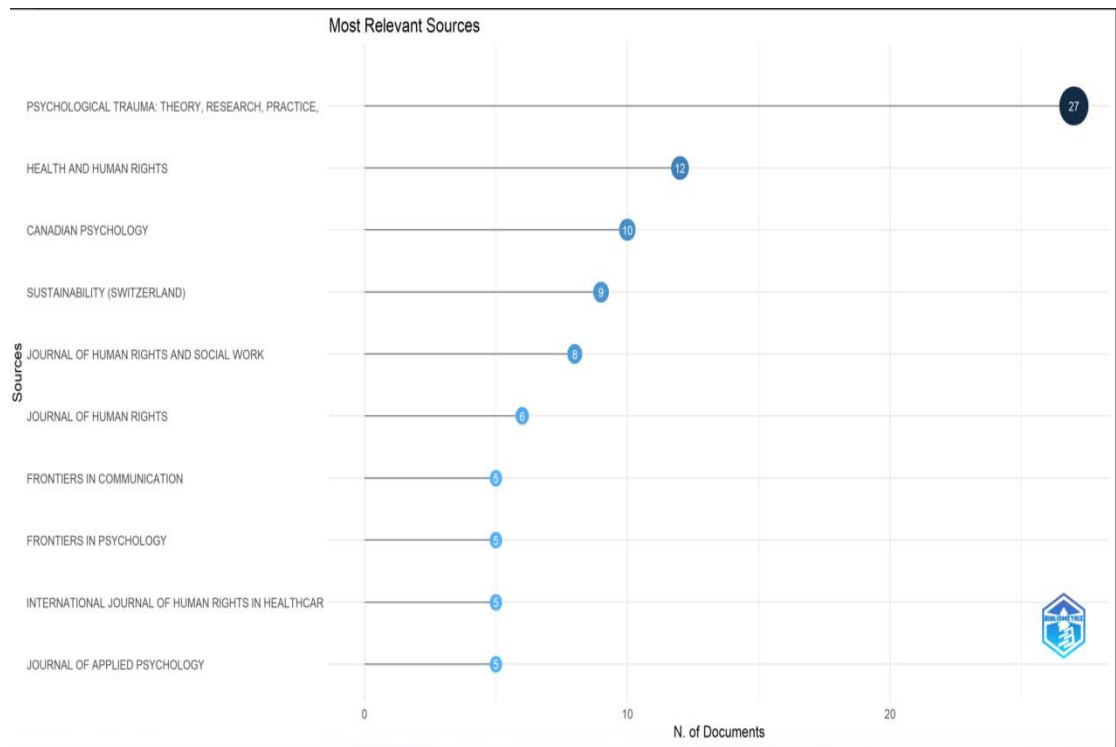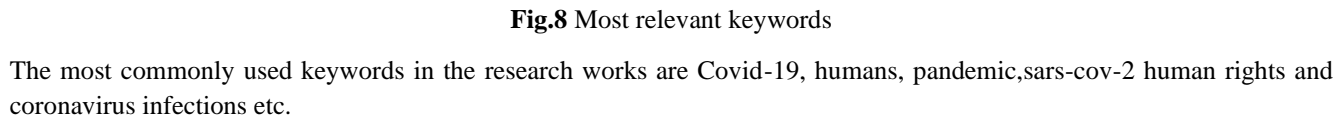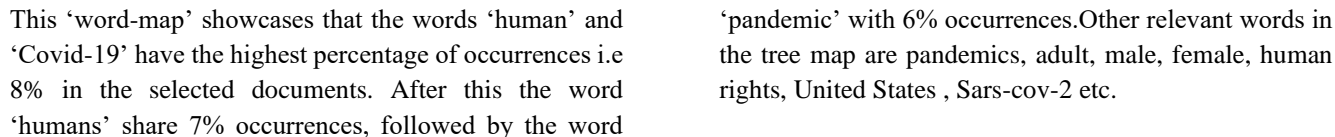
**Most relevant sources**



**Fig.7** Most relevant sources

The analysis of the most significant sources is significant as this would help researchers to have knowledge of the journals which have published most of the papers on the topic in hand. As the data shows, the most relevant journals are 'Psychological Trauma:Theory, Research, Practice' with 27 publications, followed by 'Health and Human Rights' with 12 publications then Canadian Psychology with 10 publications. 'Sustainability' have 9 research outputs and 'Journal of Human Rights and Social Work' have 8 publications.

**Relevant keywords**



**Fig.8** Most relevant keywords

The most commonly used keywords in the research works are Covid-19, humans, pandemic,sars-cov-2 human rights and coronavirus infections etc.



**Fig.9** Tree map

This 'word-map' showcases that the words 'human' and 'Covid-19' have the highest percentage of occurrences i.e 8% in the selected documents. After this the word 'humans' share 7% occurrences, followed by the word 'pandemic' with 6% occurrences.Other relevant words in the tree map are pandemics, adult, male, female, human rights, United States , Sars-cov-2 etc.
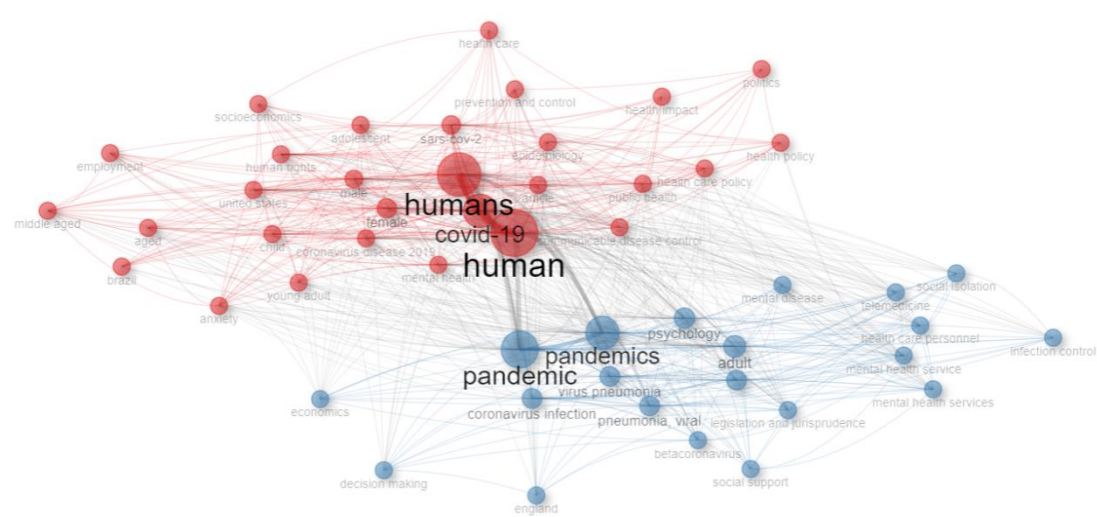
**Co-occurrence network**



**Fig.10** Co-occurrence network of keywords

Co-occurrence network is also known as semantic network is a graphic representation of the relationship between the represented material. This shows the collective interconnection of terms.In the above diagram the nodes size represents the frequencies of terms in the research works and the colours depict the clusters(Yang & Qi, 2022).There are two clusters in this co-occurrence network:

1) Red cluster: The main keywords in this cluster are 'humans', 'Covid-19', 'healthcare policy', 'health impact', 'politics', 'prevention and control', 'public health', 'mental health', 'socio-economics' and so on.This cluster hints that one of the prominent research area is improvement of public healthcare system through policies.

2) Blue cluster: The core keywords in this co-occurrence network are 'pandemic', 'psychology', 'infection control', 'social support', 'social isolation', 'healthcare personnel', 'telemedicine', 'decision making' and so on.These keywords show close association with Covid-19 and right to health.Proper decision making and social support are important dynamics to manage public health crisis.
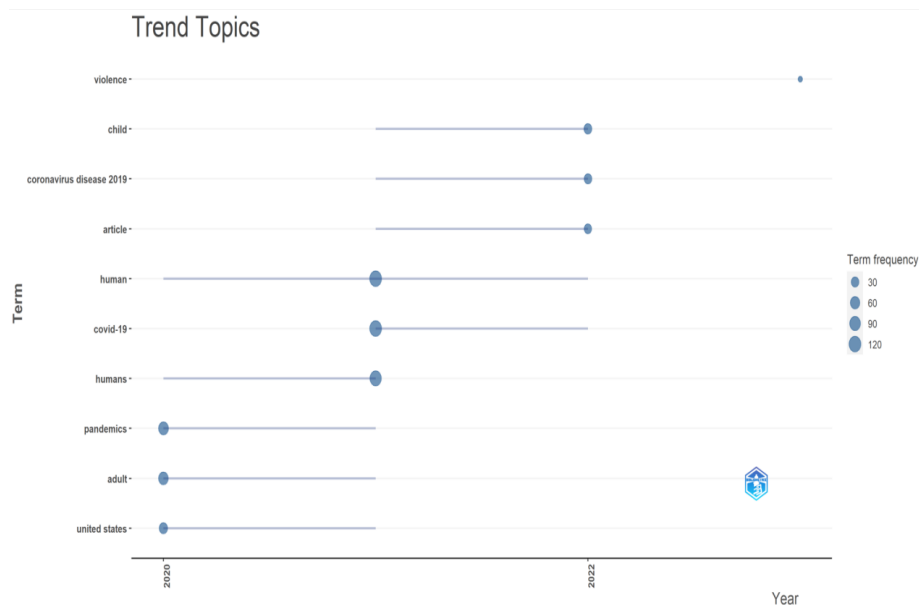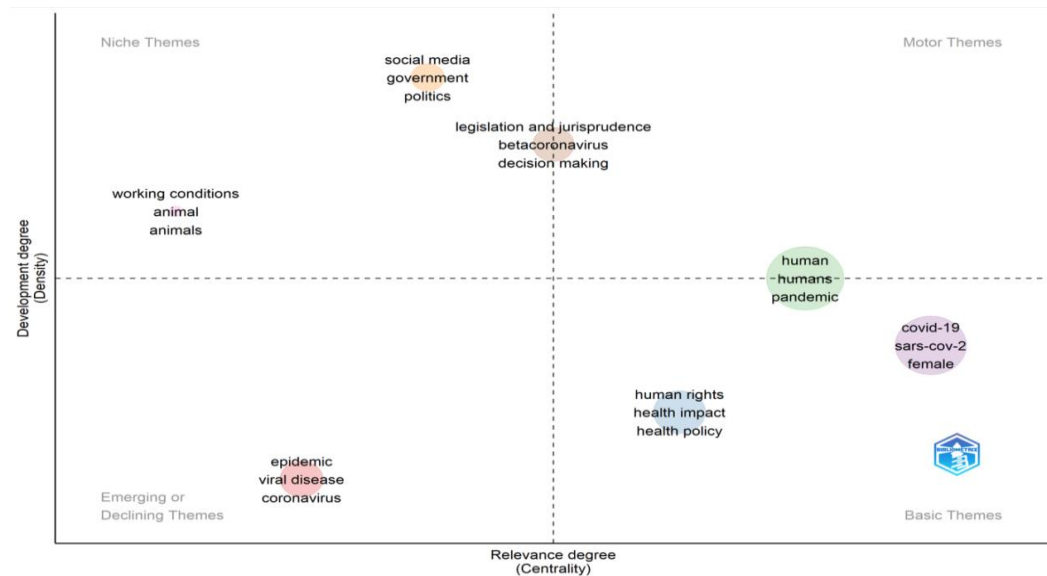
**Trending topics**



**Fig.11** Trend Topics

The top 10 trending research topics from 2020-2022 are violence, child, coronavirus disease 2019, article, human, Covid-19, humans, pandemics, adult and United States.

**Fig.12** Thematic map

Thematic map is an analytic tool for systematic presentation in a qualitative research.The theme can be categorized into two measures namely centrality and density.Centrality is a metric used to determine how much a network interacts with other networks. On the other hand, density measures the internal fortitude of the network.In a two-dimensional strategic diagram, a set of research themes in a research field can be seen given both measures. (Cobo et al.,2018).There are four groups of themes in a thematic map:

(a) Themes that are prominent and well-developed in the upper-right section are important for the structure of the research field. They are known as the motor-themes of the speciality due to their prominent centrality and high density.The motor themes are human,legislation and jurisprudence, betacoronavirus and decision making.As evident from the above figure the topics legislation and jurisprudence,betacoronavirus and decision making are related to both motor theme and niche theme.

(b) Strong internal relationships but weak external links make the themes in the upper-left region, which have only sporadic field significance. These subjects are totally distinct and highly specialised. These themes are called niche themes.The niche themes in the above figure are social media,government, politics, working condition and animals.

(c) The themes in the lower-left section are minor and underdeveloped. With little density and low importance, the themes in this section primarily indicate either arising or dissipating themes.The emerging or declining themes here are epidemic, viral disease and coronavirus.

(d) The concepts in the lower-right section are essential for the field of study even though they are not fully developed. This area contains universal and crucial themes. The basic themes are humans, pandemic, human rights, health impact, health policy, covid-19,and female.The crucial topics for research in this area are human rights, health policy and pandemic etc.

**Discussion and findings**

There are two types of analysis under bibliometric analysis i.e performance analysis and science mapping. Performance analysis is used to find out the most productive authors, most relevant affiliations and most cited countries.It also points out the subject area wise document, the top sources and mostly cited documents. Scientific mapping deals with the connection between the selected documents and scientifically depicts authors collaboration network and relationship between the research topics.In this research paper performance analysis and scientific mapping has been carried out by using Rstudio built-in bibliometric functions (Donthu et al., 2021).Figure 3 has shown the most relevant corresponding author countries wherein it is clear that authors from developed as well as developing countries have collaborated with international authors to enrich the literature on past, present and future pandemics and their probable impact on human rights.From fig.7 researchers can easily identify sources which publish original works on Covid-19 and related issues,According to the bibliometric analyis as shown in Fig.8 the most common keywords are Covid-19, pandemic,humans and human rights. This means that till now the area of concern of researchers are Covid-19 pandemic and human rights. International legal framework on pandemic has got little attention in the literature.Further the researchers of this study have also given brief knowledge on the current important topics of research through bibliometric analysis.

The identified documents have shown considerable resemblance in their approach. Mostly USA, China, India, South African countries and Indonesian authors have published research papers on topics focusing on public health, public policy, human rights, gender based violence etc.From studying the literature the following inferences have been drawn:

Governments'reliance on extraordinary powers as a response to COVID-19 was highly debatable as the imposition of preventive measures although temporarily went unchecked as a result of which third world states witnessed rampant human rights violations .Granting of emergency powers to executive government by the legislature during public health crisis can mitigate the adverse effects on human rights. However the exercise of such emergency powers by executive must be open for rigorous scrutiny so that the executive body does not exceed it's limits (Bennett et al.,2022).

Public health policies have been implemented as a quick response to Covid-19 by the governments worldwide.As a part of the health policies various restrictions have been imposed on the public which has curtailed some of the human rights of the population. In addition to this the pandemic has also accelerated various prior inequalities within the population such as access to health care,educational disparity, poverty, refugee crisis and racial injustice. For disadvantaged populations, general public health policies can be particularly difficult. People confined to refugee camps or those living in substandard, densely populated urban housing, for instance, cannot quarantine or avoid gatherings.Without adequate prison policy and resources at place, prisoners are unable to adhere to sanitation and masking standards, and the type of facilities for correction is not good for social isolation.COVID-19 induced restrictions made it difficult for daily wage earners to get work, as a result of which they were unable to procure food, live saving drugs, and other essentials of life. Public health initiatives are intended to safeguard society's most vulnerable citizens when viewed from the perspective of human rights, but in actuality, the outcome might be the opposite. Furthermore, policies may be created to appear as though they are intended to control pandemics but actually have political objectives, such as suppressing protests against the government by capping assemblies. Prioritising and assessing COVID-19 public health interventions in conjunction with the needs of those most in need may lead to a pandemic response that is not only fairer but also more feasible and enduring for those who are most susceptible of disease transmission, illness, and mortality.The preventive measures of quarantine and isolation are old and efficient public health protection measures during a pandemic.In modern times although quarantine,isolation and social distancing are considered as necessary but these

strategies are not enough for pandemic prevention, as additional measure such as contact tracing is required. Despite implementing new measures with the help of artificial intelligence there has been erosion of basic human rights particularly for marginalized populations such as immigrants, prisoners, refugees, women and children.COVID-19 has pointed out the significance of vaccination and its consequent effect on social welfare. Inequalities have impacted the vulnerable population as a result of which millions of children have not received timely vaccination.In order to realize universal rights health education can be a crucial resource for citizens (García-Toledano et al., 2022).

Governments should think about how their actions might affect people's rights, especially those that pertain to the rights to a livable environment, to be protected from harm, and to access treatment, testing, and mental health services.In light of the virus' duration of incubation, these precautions shouldn't be in place for any longer than the necessary minimum amount of time.Children and other vulnerable populations suffered during the COVID-19 pandemic as a result of isolation and quarantine policies that increased the possibility of abuse and neglect.Violence is often accompanied by social exclusion and poor mental health, and these policies might have a long-term detrimental effect on mental health.Some policy makers as a measure to provide quarantine and isolation to the vulnerable population and thereby adhere to the protective orders have made special arrangements.For instance,hotel quarantine and isolation are available in New York City and Baltimore for COVID-19 positive patients as well as suspected patients who are unable to isolate themselves because of overcrowding or unstable housing. Free meals are provided as part of these programmes. (Zweig et al., 2021).Another issue that has emerged during the pandemic as the existing literature reveal is the dominance of pandemic patriarchy in almost all the corners of the world. Coronavirus pandemic has increased domestic violence, gender based violence and violence against women. The deterioration of labour conditions, inadequate healthcare access,poor reproductive rights have herald an era of feminine oppression. The phase of pandemic patriarchy has set new standards to be achieved for the realization of rights of women both at the national and international frontiers (Brysk, 2022).

Many studies have explained the causes as to why states aim to increase their power during a pandemic.In some cases, power dynamics govern governments in their pursuit of pandemic mitigation. Other common reasons include ensuring governments adhere to standard operating procedures mandated by international organisations, to reduce public panic, and to prevent the healthcare system from collapsing. Whatever may be the

motivation behind government actions the researchers working in this area have drawn attention of the world governments that civil and political rights can be restricted for a temporary period under exceptional circumstances.In this article, the researchers after having done bibliometric analysis of data has come to the conclusion that the scope of the literature on Covid-19 and impact on right to health is limited as the total number of documents available in scopus regarding this topic is very less.Most of the articles are descriptive in nature and familiar in their approach.Majority of the literature lacks discussion on the long lasting impact of coronavirus pandemic.So, we argue that there is an ample scope for future research on impact of Covid-19 on right to health in a comprehensive manner and long-term considerations (Chiozza & King,2022).

## Conclusion

This bibliometric analysis of data reveals the importance of immediate action to an outbreak both from researchers and clinical perspective.High priority publication of findings would give other nations information about a potential pandemic and give them time to react and prepare for it. The WHO's standard operating procedures for infectious disease cases also call for prompt communication of such cases. Polio and tuberculosis have been successfully eradicated in most regions of the world using the same approach of reporting notable diseases.

This bibliometric analysis of data from Scopus database gives a bird-eye view of Covid-19 and right to health related publications across the world. Many articles have focused on right to health of women and gender discrimination issues with relation to access to healthcare during Covid-19.For the underprivileged and those who reside in developing nations, health justice can be a resilience tool in times of crisis.Proper health policy and systematic vigilance are crucial for public health governance.In the long run, more structural approaches can take the place of social policies and crisis management. Researchers can use the findings of this analysis to do further research on this area.

**Declarations**

**Conflict of interests:** There is no competing interests between the authors.

**Ethical approval:**Not required

**Patient and public involvement:** Not required

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