

# From Outbreak to Output: Uganda's COVID-19 Research Trajectory Through a Scientometric Lens

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## Abstract

*The COVID-19 pandemic sparked an extraordinary global expansion in scientific research, with notable and growing contributions from low- and middle-income countries, including Uganda. This study presents a comprehensive scientometric analysis of COVID-19 related research output from Uganda, aiming to examine publication trends, authorship patterns, collaboration networks, source impact, and thematic focus. Bibliographic data were retrieved from the PubMed database using an advanced search strategy: “((COVID-19) OR (SARS-CoV-2)) AND (Uganda)” for the period 2020–2025, yielding a total of 1,375 records. The dataset was analyzed using the Bibliometrix package in RStudio to generate descriptive and relational indicators. The results reveal a rapid increase in publications during the early pandemic years, peaking in 2022, followed by a gradual decline, reflecting the global transition of COVID-19 from an acute emergency to a managed public health challenge. Journal articles constituted the dominant document type, and the literature was widely dispersed across international, open-access journals. Authorship analysis indicates a highly collaborative research environment, with a high average number of co-authors per document and substantial international co-authorship, particularly with high-income countries. Keyword analysis highlights a strong emphasis on epidemiology, human populations, and demographic variables, underscoring the public health orientation of the research. Overall, this scientometric assessment demonstrates Uganda's active integration into global COVID-19 research networks and provides valuable insights into the structure and evolution of pandemic-related research. The findings may inform research policy, funding priorities, and strategies to strengthen future epidemic preparedness and scholarly output in Uganda.*

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## INTRODUCTION

The global COVID-19 pandemic, triggered by the emergence of the novel coronavirus SARS-CoV-2, represents one of the most profound global public health emergencies of the contemporary era. Following its first detection in Wuhan, China, toward the end of 2019, the virus spread swiftly across international borders, causing severe strain on healthcare infrastructures, economic systems, and everyday social functioning worldwide (Gaviria & Martin, 2023) [1]. In March 2020, the World Health Organization (WHO) officially designated COVID-19 as a global pandemic, initiating coordinated international efforts aimed at

understanding the disease, limiting its transmission, and reducing its adverse impacts (Zanke et al., 2020) [2]. The unprecedented magnitude of the crisis led to a dramatic escalation in scientific publications across multiple fields, including virology, immunology, public health, economics, and the social sciences. While this rapid expansion of research has generated valuable insights, it has also produced a vast, fragmented, and occasionally inconsistent body of literature, underscoring the necessity for systematic synthesis to clarify emerging patterns, research deficiencies, and future directions.

COVID-19 research is grounded within the broader framework of infectious disease epidemiology and public health scholarship. Coronaviruses are a group of enveloped RNA viruses that were previously associated with mild respiratory infections in humans, such as the common cold, as well as severe outbreaks – including Severe Acute Respiratory Syndrome (SARS) in 2002–2003 and Middle East Respiratory Syndrome (MERS) from 2012 onward (Pustake et al., 2022) [3]. In contrast, SARS-CoV-2 demonstrated distinctive features, notably its heightened transmissibility and diverse clinical spectrum, ranging from asymptomatic cases to acute respiratory failure and multi-organ dysfunction (Machhi et al., 2020) [4]. The virus's rapid genetic evolution, resulting in variants of concern – such as Delta and Omicron – further challenged public health responses, vaccine development, and containment strategies (Karim & Karim, 2020) [5]. Beyond its direct biomedical effects, the pandemic revealed critical weaknesses in global health systems, economic stability, and social justice, thereby intensifying the demand for interdisciplinary research approaches to address these multifaceted issues (Benjamin, 2020) [6].

Despite the extensive volume of COVID-19 related studies, considerable knowledge gaps persist regarding the virus and its long-term implications. In particular, the pathophysiological mechanisms underlying post-COVID-19 condition, commonly referred to as “long COVID,” remain inadequately understood, with inconsistent findings concerning its prevalence, determinants, and clinical management (Crook et al., 2021) [7]. Additionally, the disproportionate socioeconomic burden imposed by the pandemic – especially on low- and middle-income countries – has not been comprehensively examined in existing scholarship (Khanijahani et al., 2021) [8]. Although numerous investigations have assessed the effects of COVID-19 on individual organ systems, such as the respiratory and cardiovascular systems, integrative analyses that synthesize evidence across disciplines are limited (Angileri et al., 2020) [9]. These unresolved issues emphasize the importance of adopting a comprehensive and systematic approach to consolidating existing research and defining strategic priorities for future investigations.

## REVIEW OF LITERATURE

A very systematic review of existing literature is fundamental to understanding the current research landscape and identifying unresolved gaps in scientific knowledge. It offers a critical contextual framework that situates a study within established evidence, highlights key discoveries, and traces emerging trajectories to ensure scholarly rigor. Within scientometric research, literature reviews are especially vital, as they facilitate the recognition of highly cited works, evolving thematic areas, and intricate global collaboration networks that shape research productivity and influence. Despite the substantial expansion of scientific output following the COVID-19 outbreak, a notable deficiency persists in the comprehensive mapping of discipline-specific research trends and longitudinal patterns of scholarly communication. This scientometric study on COVID-19 was therefore conducted by Uganda-based researchers to address this limitation and to systematically organize the rapidly expanding pandemic-related literature.

Ahmad et al. (2025) [10] performed a longitudinal scientometric analysis of Annamalai University's scholarly output over a twenty-year period (2004–2023), documenting 7,667 publications and an h-index of 138. The findings demonstrate sustained growth in research productivity across multiple disciplines, particularly in medicine and science, reflecting the institution's strong global research

orientation. The study identifies robust international collaborations, most notably with Saudi Arabia and the United States. Such institutional-level evaluations serve as valuable benchmarks for assessing the contribution of major research centers to global scientific advancement, particularly during large-scale public health emergencies. The longitudinal insights further inform research governance and strategic planning relevant to future pandemic preparedness.

Saleem et al. (2025) [11] analyzed global publication trends in Fibrodysplasia Ossificans Progressiva from 1989 to 2023, identifying the United States as the leading contributor in terms of both output and citation impact. Although centered on a rare genetic condition, the study exposes significant gaps in international collaboration and illustrates the evolving intellectual structure of specialized biomedical research. Using bibliometric visualization tools such as VOSviewer and Histcite, the authors mapped institutional productivity and collaborative networks. The findings provide a foundation for expanded international engagement and underscore the need to enhance scholarly representation from underrepresented regions.

Ahmad and Nkatv (2025) [12] conducted a scientometric evaluation of the University of Ibadan's research performance between 2014 and 2023, reporting 7,159 publications with a cumulative citation count of 218,572. Publication output peaked in 2023, following elevated research activity during 2020 and 2021, aligning with the global surge in pandemic-related scholarship. Medical and health sciences emerged as dominant fields, with Nigeria, the United States, and the United Kingdom identified as key collaborative partners. Network visualizations generated using VOSviewer highlight the university's position as a major research hub in Africa. These findings emphasize the role of sustained institutional investment in addressing both regional and global health challenges.

Mohammad Anees (2023) [13] presented a bibliometric analysis of Internet of Things (IoT) applications in digital healthcare research from 2000 to 2021, revealing a pronounced increase in publications that peaked in 2021. Core research themes included telemedicine, eHealth literacy, and mobile health technologies, with the United States and the Netherlands leading in scholarly contributions. The study suggests that IoT-driven innovations are increasingly complementing or transforming conventional healthcare delivery systems. This work provides a structured overview of the accelerated integration of digital technologies in healthcare, particularly in response to global health emergencies.

Haq et al. (2022) [14] examined publication trends in the *Journal of Hospital Librarianship* between 2001 and 2020 through a bibliometric analysis of 807 Scopus-indexed records. The results reveal fluctuations in annual output and a predominance of single-authored publications, although multi-authored articles achieved higher citation impact. Major thematic areas included hospital libraries and consumer health information services. The United States accounted for 88% of the total publications, reflecting a strong national research culture in this domain.

Ahmad and Ubi (2025) [15] assessed two decades of research productivity at the University of Lagos from 2004 to 2023, noting a steady upward trajectory in scholarly output. Health Sciences and Engineering were identified as the leading research domains, with international collaboration strongly associated with increased citation impact. The highest publication volume was recorded in 2023, indicating sustained research momentum beyond the initial pandemic period. The study further highlights the positive influence of open-access publishing on research visibility. Bibliometric mapping using Web of Science data identified prolific authors and departments, reinforcing the institution's contribution to addressing global health priorities.

Stribling et al. (2020) [16] conducted a literature mapping study on Guillain-Barré Syndrome (GBS) covering publications from 2016 to 2018, analyzing 3,783 cited references to determine core journals and database coverage. Applying Bradford's Law of Scattering, the authors classified journals into productivity zones. Although focused on a neurological condition, the study underscores the value of

mapping methodologies in organizing complex research fields and guiding clinicians toward authoritative evidence sources. The findings confirm MEDLINE and Web of Science as comprehensive databases for GBS-related literature, highlighting the relevance of systematic mapping during rapidly evolving health crises.

Patel et al. (2022) [17] investigated global research trends on disruptive innovation in healthcare from 2001 to 2021, identifying a consistent growth pattern that peaked during the early years of the COVID-19 pandemic. The study positions the pandemic as a catalyst that exposed structural weaknesses in traditional healthcare systems, particularly regarding infrastructure and service availability. Prominent keywords included disruptive technology, artificial intelligence, and healthcare delivery, with Harvard Medical School emerging as the most productive institution. The authors argue that disruptive innovations are essential for achieving sustainable, cost-effective, and accessible healthcare systems.

Ahmad and Batcha (2020) [18] analyzed global coronavirus research output from 2011 to March 20, 2020, identifying 6,071 publications. The study documents the rapid emergence of SARS-CoV-2-related research and highlights the United States as the leading contributor. The literature was predominantly published in English and focused on clinical characteristics, diagnostic approaches, and therapeutic strategies. The findings reveal an increasing relative growth rate alongside a declining doubling time, indicating accelerated knowledge production. Key dissemination outlets included the Journal of Virology and PLOS One, which played pivotal roles during the early phase of the pandemic.

González-Alcaide et al. (2018) [19] employed bibliometric techniques to examine research output on Chagas cardiomyopathy, identifying 1,932 MEDLINE-indexed documents. The study observed substantial growth in scientific production, attributed to the rising incidence of the disease in non-endemic regions such as the United States and Europe. Although focused on American trypanosomiasis, the findings illustrate how globalization transforms localized diseases into global public health concerns, paralleling patterns observed in later infectious disease outbreaks. While domestic collaboration was prominent, the authors highlight the need for enhanced international cooperation and translational research. Four major research clusters were identified, centering on heart failure, diagnostic imaging, and experimental models.

## OBJECTIVES OF THE STUDY

1. To examine the overall growth and characteristics of Covid-19 research output from Uganda.
2. To analyze the year-wise distribution and publication trends of Covid-19 research.
3. To identify the most prolific authors contributing to Covid-19 research from Uganda.
4. To determine the leading journals and sources publishing Ugandan Covid-19 research.
5. To assess international collaboration patterns based on corresponding authors' countries.
6. To analyze the most frequent keywords to identify dominant research themes and methodologies.

## METHODOLOGY

This current study employs a scientometric research design grounded in bibliographic data sourced from the PubMed database (<https://pubmed.ncbi.nlm.nih.gov/>). A refined search strategy, “((COVID-19) OR (SARS-CoV-2)) AND (Uganda),” was implemented to retrieve relevant publications issued between 2020 and 2025. The search yielded a total of 1,375 records, which were subsequently exported in MEDLINE format for analysis.

The retrieved dataset was imported into the Bibliometrix package within the RStudio online environment for systematic examination. Descriptive metrics, including annual publication output, document typology, authorship structure, and source productivity, were calculated to characterize the corpus. In addition, relational analyses were conducted to explore patterns of scientific collaboration and keyword co-occurrence. Established scientometric indicators, such as single-country publications (SCP), multiple-country publications (MCP), and keyword frequency were applied to interpret collaboration dynamics and thematic emphasis within the research output.

## RESULTS AND DISCUSSION

In Table 1, The scientometric analysis demonstrates a considerable volume of COVID-19 related research linked to Uganda during the period 2020 through 2025, reflecting the country's active participation in the global scientific response to the pandemic. In total, 1,375 publications were produced across 481 unique sources, suggesting broad dissemination of Ugandan COVID-19 scholarship across a wide range of journals rather than reliance on a limited number of outlets. The observed negative annual growth rate (-46.91%) indicates a pronounced reduction in publication output over time, a pattern consistent with the global surge in research during the initial pandemic phase followed by stabilization as COVID-19 evolved from an acute emergency to an endemic condition.

The mean document age of 3.39 years confirms the relative recency of the literature, highlighting its relevance to current policy and practice. The substantial number of Keywords Plus and authors' keywords (2,101 each) points to considerable thematic breadth, suggesting that COVID-19 research from Uganda encompasses clinical, epidemiological, public health, and socioeconomic perspectives. Authorship patterns reveal a remarkably large contributor base, with 12,202 authors involved, underscoring extensive collaborative engagement. The minimal presence of single-authored publications further emphasizes the collective and interdisciplinary nature of pandemic-related research.

Collaboration metrics reinforce these observations, with an average of 14.6 authors per publication and a high proportion of international co-authored papers (69.53%), indicating Uganda's strong integration within global research networks during the pandemic period. Regarding document typology,

**Table 1.** The Overview of COVID-19 Scientometric data from uganda

Overview About Data on Covid-19 from Uganda	
Description	Results
Main information about data	
Timespan	2020:2025
Sources (Journals, books, etc)	481
Documents	1375
Annual growth rate %	-46.91
Document Average Age	3.39
<b>Document contents</b>	
Keywords Plus (ID)	2101
Author's Keywords (DE)	2101
<b>AUTHORS</b>	
Authors	12202
Authors of single-authored docs	27
<b>Authors collaboration</b>	
Single-authored docs	38
Co-Authors per Doc	14.6
International co-authorships %	69.53
<b>Document types</b>	
Case Reports;Journal Article	13
Journal Article	815
Journal Article;Review	95
Journal Article;Scoping Review	12
Journal Article;Systematic Review	8
Letter	20
Others	412

original research articles constitute the majority of publications, followed by review papers and other scholarly outputs, reflecting a strong focus on empirical investigation supported by evidence synthesis. Taken together, these findings depict Ugandan COVID-19 research as highly collaborative, globally connected, and responsive to an evolving public health emergency, with publication trends closely mirroring the shifting phases of the pandemic.

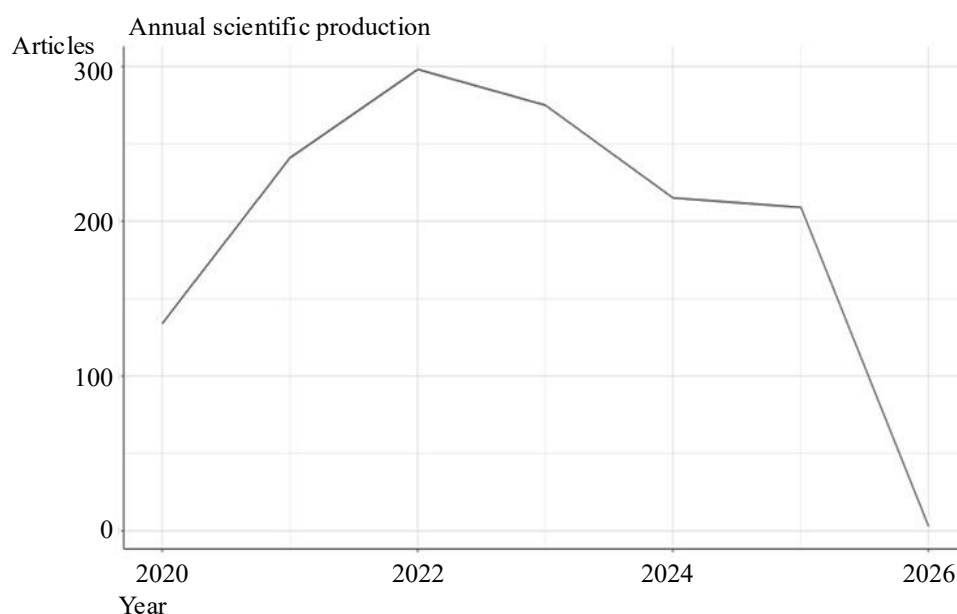
### Year-Wise Publication on COVID-19 from Uganda

Table 2 illustrates the temporal distribution of COVID-19–related publications from Uganda between 2020 and 2025, highlighting notable shifts in research productivity across different phases of the pandemic. In 2020, a total of 134 publications (9.75%) were recorded, reflecting the initial scientific response following the emergence of COVID-19, when research activity was largely exploratory and descriptive in nature. A marked increase is evident in 2021, with 241 publications (17.53%), indicating intensified scholarly engagement driven by expanded funding opportunities, strengthened collaborations, and improved access to empirical data during the height of the pandemic.

Research output peaked in 2022, with 298 publications (21.67%), signaling the consolidation and maturation of research themes as shown in Figure 1. During this period, studies increasingly focused on clinical outcomes, public health interventions, vaccination strategies, and the broader socioeconomic consequences of the pandemic. Although a modest decline is observed in 2023, with 275 publications (20.00%), productivity remained comparatively high, suggesting sustained academic interest as attention shifted toward evidence synthesis and assessment of longer-term impacts.

**Table 2.** Year-wise publication on covid-19 from uganda

S.N.	Year	Articles	Percentage
1	2020	134	9.75
2	2021	241	17.53
3	2022	298	21.67
4	2023	275	20.00
5	2024	215	15.64
6	2025	212	15.42
Total		1375	100.00



**Figure 1.** Year-Wise research output on COVID-19 from UGANDA.

A more pronounced reduction in publication output is observed in 2024 and 2025, contributing 15.64% and 15.42% of the total publications, respectively. This downward trend likely reflects the global transition of COVID-19 from an acute public health emergency to a condition managed within routine health systems. Overall, the year-wise distribution demonstrates a rapid expansion of COVID-19 research output from Uganda during the early and peak phases of the pandemic, followed by a gradual decline in subsequent years. This trajectory closely parallels global publication patterns and underscores Uganda's timely and meaningful contribution to COVID-19 research during critical stages of the pandemic response.

### **Top 10 Prolific Authors on COVID-19 from Uganda**

Table 3 presents the most prolific authors contributing to COVID-19-related research from Uganda, offering insight into individual productivity patterns and collaborative research practices. Kaleebu P stands out as the most productive author, with 47 publications representing 3.42% of the total output, highlighting a pivotal role in shaping the national COVID-19 research agenda. Bongomin F and Wanyenze RK follow closely, each with 40 publications (2.91%), indicating sustained and influential engagement across a range of thematic areas. The relatively similar publication counts among leading contributors suggest a distributed model of research leadership rather than concentration around a single dominant author.

Fractionalized publication metrics further clarify authorship dynamics by adjusting for shared contributions across multi-authored papers. Bongomin F records the highest fractionalized count (5.62), reflecting a substantial intellectual contribution despite participation in collaborative teams. Conversely, authors exhibiting high absolute publication numbers but lower fractionalized values are likely involved in larger research consortia, a common feature of COVID-19 scholarship. The repeated presence of public health-focused scholars, including Ario AR, Kabwama SN, and Ndejjo R, underscores the prominence of epidemiology, disease surveillance, and health systems research within Uganda's COVID-19 literature.

Collectively, the top ten authors account for a significant proportion of the country's research output while remaining embedded in highly collaborative networks as shown in Figure 2. This pattern reflects a balance between strong individual productivity and collective scholarly effort, reinforcing the importance of teamwork and interdisciplinary collaboration in Uganda's scientific response to a complex public health crisis.

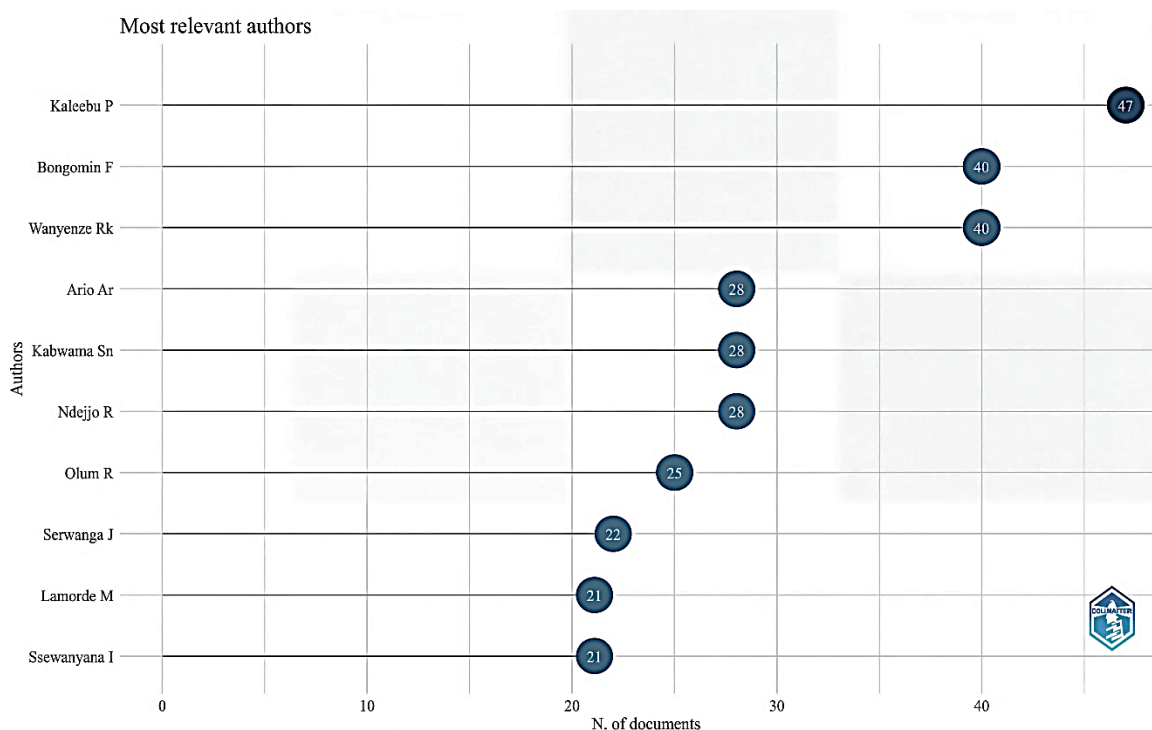
### **Top 10 Sources Publishing COVID-19 Research from Uganda**

Table 4 summarizes the principal scholarly sources publishing COVID-19 research originating from Uganda, revealing distinct patterns in journal selection and dissemination pathways. PLOS One ranks as the most productive outlet, with 59 publications (4.29%), underscoring its role as a multidisciplinary, open-access journal well suited for the timely dissemination of pandemic-related findings. The prominent representation of BMJ Global Health and PLOS Global Public Health further reflects the strong global health orientation of Ugandan COVID-19 research, particularly work addressing health systems, equity, and population-level outcomes.

Public health-oriented journals, including BMC Public Health and Frontiers in Public Health, also feature prominently, highlighting a sustained focus on epidemiological investigation, preventive strategies, and public health interventions. The inclusion of regionally focused journals such as The Pan African Medical Journal underscores the importance of Africa-based publication venues in disseminating locally contextualized evidence while retaining international reach. In addition, the presence of infectious disease-specific journals, notably BMC Infectious Diseases and The American Journal of Tropical Medicine and Hygiene, reflects Uganda's contribution to clinical, virological, and pathogen-centered dimensions of COVID-19 research.

**Table 3.** Top 10 Prolific authors on Covid-19 from Uganda

S.N.	Authors	Articles	Articles Fractionalized	Percentage
1	Kaleebu P	47	3.30	3.42
2	Bongomin F	40	5.62	2.91
3	Wanyenze RK	40	3.63	2.91
4	Ario AR	28	2.58	2.04
5	Kabwama SN	28	2.41	2.04
6	Ndejjo R	28	2.12	2.04
7	Olum R	25	3.59	1.82
8	Serwanga J	22	1.49	1.60
9	Lamorde M	21	1.72	1.53
10	Ssewanyana I	21	1.31	1.53



**Figure 2.** Most Relevant Authors on COVID-19 from Uganda.

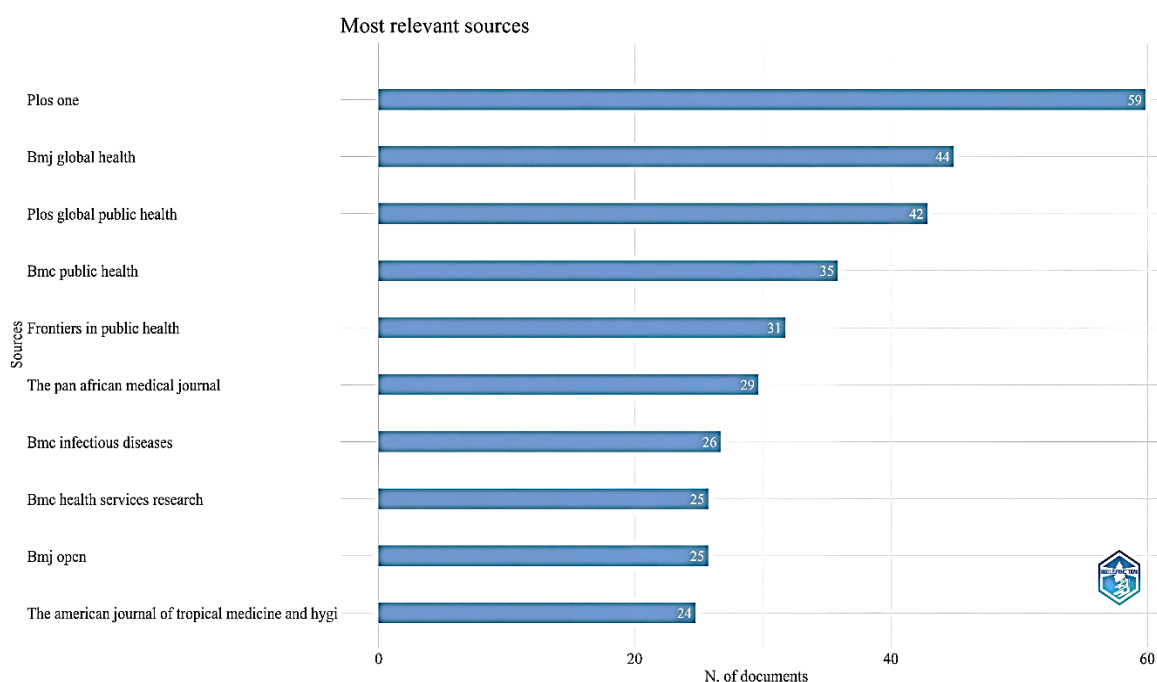
**Table 4.** Top 10 Sources that published covid-19 research from uganda

S.N.	Sources	Articles	Percentage
1	PLOS One	59	4.29
2	BMJ Global Health	44	3.20
3	PLOS Global Public Health	42	3.05
4	BMC Public Health	35	2.55
5	Frontiers In Public Health	31	2.25
6	The Pan African Medical Journal	29	2.11
7	BMC Infectious Diseases	26	1.89
8	BMC Health Services Research	25	1.82
9	BMJ Open	25	1.82
10	The American Journal of Tropical Medicine and Hygiene	24	1.75

Overall, the spread of publications across these outlets indicates a clear preference for reputable, open-access, and globally indexed journals, thereby enhancing visibility and potential citation impact. The relatively low individual source percentages further suggest that Ugandan COVID-19 research is broadly distributed rather than concentrated within a single journal, reflecting both the interdisciplinary scope of pandemic research and the strategic alignment of publication venues with public and global health priorities.

### Most Relevant Countries by Corresponding Authors in COVID-19 Research Related to Uganda

Table 5 illustrates the geographic distribution of corresponding authors contributing to COVID-19 research associated with Uganda, highlighting the extent and structure of international collaboration. Uganda ranks first with 388 articles (28.2%), indicating strong domestic leadership in COVID-19 research and reflecting the active involvement of local institutions in shaping the national research agendas shown in Figure 3. The relatively balanced proportion of single-country publications (SCP = 207) and multiple-country publications (MCP = 181), with an MCP share of 46.6%, suggests that while a substantial portion of research is locally led, nearly half is conducted through international collaboration.



**Figure 3.** Most relevant sources on COVID-19 from Uganda.

**Table 5.** Most relevant by countries by corresponding authors on Covid-19.

S.N.	Country	Articles	Articles %	SCP	MCP	MCP %
1	Uganda	388	28.2	207	181	46.6
2	USA	208	15.1	24	184	88.5
3	Canada	40	2.9	2	38	95
4	United Kingdom	37	2.7	1	36	97.3
5	Nigeria	33	2.4	1	32	97
6	South Africa	30	2.2	3	27	90
7	Kenya	27	2	3	24	88.9
8	Germany	22	1.6	3	19	86.4
9	Italy	18	1.3	3	15	83.3
10	India	16	1.2	3	13	81.3

The United States emerges as the most significant international partner, contributing 208 articles (15.1%), with a very high MCP percentage (88.5%), underscoring its dominant role in collaborative research rather than independent authorship. Similar patterns are observed for Canada, the United Kingdom, and other high-income countries, all of which exhibit MCP percentages exceeding 90%, indicating that their contributions are largely partnership-based and often involve Ugandan institutions as shown in Figure 4. Regional collaborators such as Nigeria, South Africa, and Kenya also show strong collaborative tendencies, reflecting South–South research partnerships within Africa.

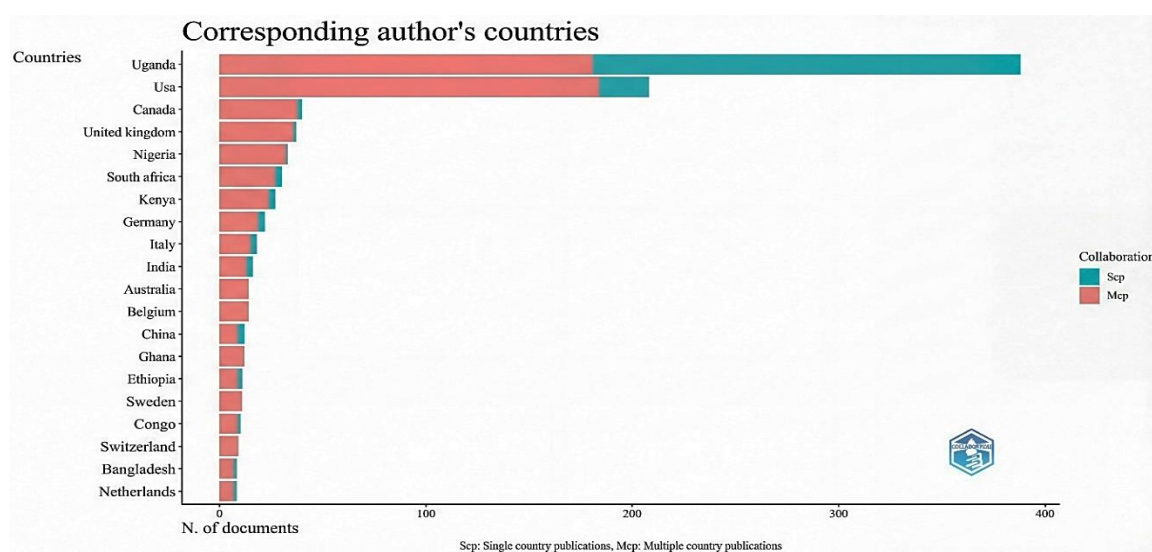
Overall, the dominance of multiple-country publications across most contributing countries highlights the highly internationalized nature of COVID-19 research related to Uganda. This collaboration-intensive pattern underscores the global interconnectedness of pandemic research and demonstrates Uganda’s integration into international scientific networks, facilitating knowledge exchange, capacity building, and broader research impact.

### Most Frequent Words in COVID-19 Research from Uganda

Table 6 presents the most frequently occurring words in COVID-19 publications related to Uganda, offering insight into the dominant research themes and methodological orientations of the literature. The term “humans” ranks first with 890 occurrences, reflecting the strong focus on human-based studies, particularly clinical, epidemiological, and public health research, rather than laboratory-only or animal-based investigations. The prominence of “SARS-CoV-2” and “COVID-19” further confirms that the literature is centered on virological and disease-specific aspects of the pandemic.

Gender- and age-related terms such as “female,” “male,” and “adult” appear frequently, indicating a substantial emphasis on demographic stratification in COVID-19 studies, which is essential for understanding differential risk, outcomes, and health-seeking behaviors. The recurrent appearance of “Uganda/epidemiology” and “COVID-19/epidemiology” underscores the epidemiological orientation of the research, highlighting surveillance, transmission dynamics, and population-level analysis as key areas of scholarly interest. The high frequency of the term “pandemics” reflects the broader contextual framing of COVID-19 within global public health emergencies.

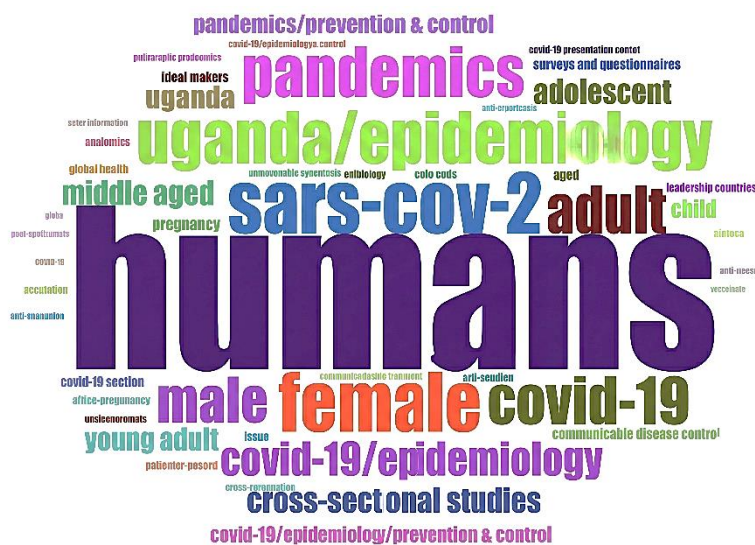
Methodologically, the presence of “cross-sectional studies” among the top-ranked terms suggests a strong reliance on observational study designs, likely driven by the urgency of data collection during the pandemic. Overall in Figure 5, the word frequency pattern indicates that COVID-19 research from Uganda is predominantly epidemiological, population-focused, and grounded in public health inquiry, with careful attention to demographic variables and disease surveillance.



**Figure 4.** Corresponding authors countries on COVID-19.

**Table 6.** Most frequent word on Covid-19.

S.N.	Words	Occurrences	Rank
1	Humans	890	1
2	Sars-cov-2	333	2
3	Female	329	3
4	Uganda/epidemiology	287	4
5	Pandemics	279	5
6	Covid-19	264	6
7	Adult	254	7
8	Male	244	8
9	Covid-19/epidemiology	184	9
10	Cross-sectional studies	139	10



**Figure 5.** Wordcount on COVID-19.

## DISCUSSION

The analysis results indicate that COVID-19 research output from Uganda broadly aligns with global publication patterns, characterized by a rapid expansion during the early stages of the pandemic followed by a gradual decline in subsequent years. The publication peak observed in 2022 corresponds to a period of increased research maturity, during which scholarly attention expanded to include clinical outcomes, vaccination strategies, and epidemiological modeling. The predominance of journal articles further suggests a strong orientation toward original empirical investigation as the primary mode of knowledge production.

The high degree of international collaboration underscores Uganda’s effective integration into global scientific networks, particularly through partnerships with institutions based in high-income countries. Such collaborative arrangements likely contributed to enhanced methodological rigor, improved access to research funding, and greater visibility of findings within the international scientific community. Analysis of keywords confirms the centrality of epidemiological and population-based research, reflecting national public health priorities during the COVID-19 response. The widespread use of cross-sectional study designs indicates a rapid-response research strategy, shaped by the urgent need for timely data to inform policy and public health decision-making.

## CONCLUSION

This specific scientometric assessment offers a comprehensive examination of COVID-19–related research associated with Uganda between 2020 and 2025. The findings reveal a dynamic, highly

collaborative, and internationally connected research ecosystem, with a pronounced emphasis on epidemiology and public health. Although publication output declined in the later stages of the study period, Uganda's overall contribution to the global COVID-19 knowledge base remains substantial and influential.

### Recommendations

The future investigations should prioritize longitudinal and interventional research designs to complement the predominance of cross-sectional studies and to better capture long-term outcomes. Enhancing local leadership within international research collaborations may strengthen national research capacity and autonomy. Policymakers are encouraged to utilize scientometric evidence to inform strategic funding decisions and research prioritization. Increased scholarly attention to post-COVID conditions and health system resilience is warranted. Sustained investment in national research infrastructure, data systems, and capacity building should remain a priority beyond pandemic contexts.

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