

Bibliometric Analysis of Publications on Neglected Tropical Diseases in Nigeria using Data from Dimensions Database

Abstract

Background: Neglected Tropical Diseases (NTDs) is a global public health problem and pose a significant burden on public health in Nigeria, necessitating research efforts to combat these diseases. This study aims to provide a comprehensive bibliometric analysis of publications on NTDs in Nigeria.

Methods: Data were collected from Dimensions database on January 14, 2025, using the search term: ("Neglected Tropical Diseases" OR "Neglected Tropical Disease" OR NTDs) AND (Nigeria OR Nigerian OR Nigerians)). The search yielded 299 Publications (comprising data from January 1st, 2008 till the search date) and after manual cleaning and removal of duplicates, 242 publications remained. Microsoft Excel and VOSviewer software were used in data analysis for descriptive analysis and bibliometric mapping respectively.

Results: The majority of publications (91.3%) were articles. The most productive source was PLOS Neglected Tropical Diseases (SNIP: 1.670, SJR: 1.260). The most productive year, author, institution, and country were identified. Bibliographic mapping on co-authorship and co-citation analysis were revealed detailing the clusters, links, and a total link strength.

Conclusions: This study provides insights into the research landscape of Neglected Tropical Diseases in Nigeria, highlighting areas of collaboration, and impact. The findings can inform further research, research policy and capacity-building initiatives.

Limitations: The study is limited to publications indexed in the Dimensions database.

Keywords: Neglected Tropical Diseases, Nigeria, Bibliometric Analysis, VOSviewer, Dimensions Database.

Introduction

Neglected Tropical Diseases are communicable diseases caused by a wide range of pathogens, including viruses, bacteria, parasites, fungus, and toxins. They are primarily prevalent in tropical regions and have an impact on impoverished nations. Neglected Tropical Diseases encompass a wide range of infectious diseases including leprosy, lymphatic filariasis, onchocerciasis, schistosomiasis, and soil-transmitted helminthiasis. These diseases often thrive in areas with inadequate healthcare facilities, poor sanitation, and limited access to safe drinking water. Despite their significant burden, Neglected Tropical Diseases are understudied and underreported, often relegated to the periphery of global health concerns.

Neglected Tropical Diseases affect more than one billion people globally, with India, Nigeria, and Indonesia having the biggest number of people requiring treatment (Statista, 2023). In Africa, the reported cases of Neglected Tropical Diseases are alarming, with 578 million people in need of interventions by 2020. Nigeria topped the list, with 136.4 million people requiring Neglected Tropical Disease interventions (World Health Organization, 2020).

Nigeria, in particular, bears a heavy Neglected Tropical Disease burden. Using leprosy as a case study, there were 2425 new cases recorded in 2023, with a prevalence rate of 11.291 per 1000,000 population (World Health Organization, 2023). Other neglected tropical diseases, such as lymphatic filariasis, onchocerciasis, and schistosomiasis, also pose significant public health concern in Nigeria.

Neglected Tropical Diseases are infectious, necessitating proactive approaches for monitoring, preventing, and controlling diseases. However, historically, responses to Neglected Tropical Diseases have been reactive, often triggered by disease outbreaks or epidemics. This approach is costly, inefficient, and unsustainable. Rather, a proactive, data-driven strategy is needed to mitigate the impact of Neglected Tropical Diseases.

This bibliometric analysis aims to contribute to the worldwide effort to combat Neglected Tropical Diseases by reviewing the available literature on Neglected Tropical Diseases in Nigeria. This study seeks to shed light on the present state of Neglected Tropical Diseases research in Nigeria by examining publication trends, research gaps, and areas of attention, with the ultimate goal of informing evidence-based policies and initiatives to reduce the Neglected Tropical Diseases burden in Nigeria.

Materials and Methodology

This study used bibliometric analysis to investigate the Nigerian research trends for Neglected Tropical Diseases (NTDs). The steps followed included data collection, data cleansing, and data analysis with analytical tools.

Data Source

Data for this study were obtained from the Dimensions database, which is a comprehensive and multidisciplinary research database that includes articles, grants, patents, and clinical trials. The Dimension database was chosen for this investigation because it provides wide coverage of research publications.

Search Strategy

On January 14, 2025, a systematic search was performed in the Dimensions database using a combination of keywords and Boolean operators. The search query was meant to capture papers relating to Neglected Tropical Diseases in Nigeria and included the following terms:

("Neglected Tropical Diseases" OR "Neglected Tropical Disease" OR NTDs) AND (Nigeria, Nigerian, or Nigerians)

This search query was used to find publications that included the search terms in their titles and abstracts.

Data Collection

The search query produced 299 papers from the Dimensions database. The publications spanned from January 1, 2008, up to January 14, 2025.

Data Cleaning

A manual cleaning process was used to ensure the data's accuracy and reliability. Duplicate articles were removed and publications that failed to meet the inclusion criteria (that is, those that did not focus on NTDs in Nigeria) were dropped.

Data Analysis

The cleaned data were analyzed using Microsoft Excel and VOSviewer software.

Descriptive Analysis

The descriptive analysis was carried out using Microsoft Excel, which included determining the frequency and percentage of publications by type, year, author, institution, and country. The descriptive study offered an overview of Nigeria's Neglected Tropical Diseases research landscape.

Bibliometric Mapping

The bibliometric mapping on co-authorship analysis was carried out using the VOSviewer software (version 1.6.18) which stands for Visualization of Similarities (van Eck & Waltman, 2010).

Collaborations, linkages, and patterns between authors, institutions, and countries were uncovered using bibliometric mapping.

Results

Descriptive Analysis

Analysis of The Search Output:

299 publications were retrieved and only 242 publications were included after removing duplicate publications and publications that were either not related to Nigeria (only mentioned Nigeria passively) or not related to Neglected Tropical Diseases (only mentioned Neglected Tropical Diseases passively). Of these, 91.32% (n = 221) were articles, 5.79% (n = 14) were preprints, while 1.65% (n=4) were chapters and Proceedings account for the remaining fraction of the publications(%=1.24,n=3).

Table 1 Description of research output within study period based on Publication type

Publication Type	Frequency n (%)
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Articles	221
Preprints	14
Chapters	4
Proceedings	3

The first publication (n=1) on Neglected Tropical Diseases was in 2008, followed by a slow pace of publication until 2019 when it increased by 15-fold. Since then, the pace of research has been consistent, with over 25 publications per year (Fig. 1).

Table 2: Publications on Neglected Tropical Diseases related literature in Nigeria from 2008 to 2025(As at January 14th)

YEARS	NUMBER OF PUBLICATIONS	YEARS	NUMBER OF PUBLICATIONS
2008	1	2017	15
2009	2	2018	8
2010	2	2019	16
2011	4	2020	29
2012	4	2021	32
2013	1	2022	30
2014	5	2023	42
2015	10	2024	36
2016	2	2025 (As at Jan. 14th)	3

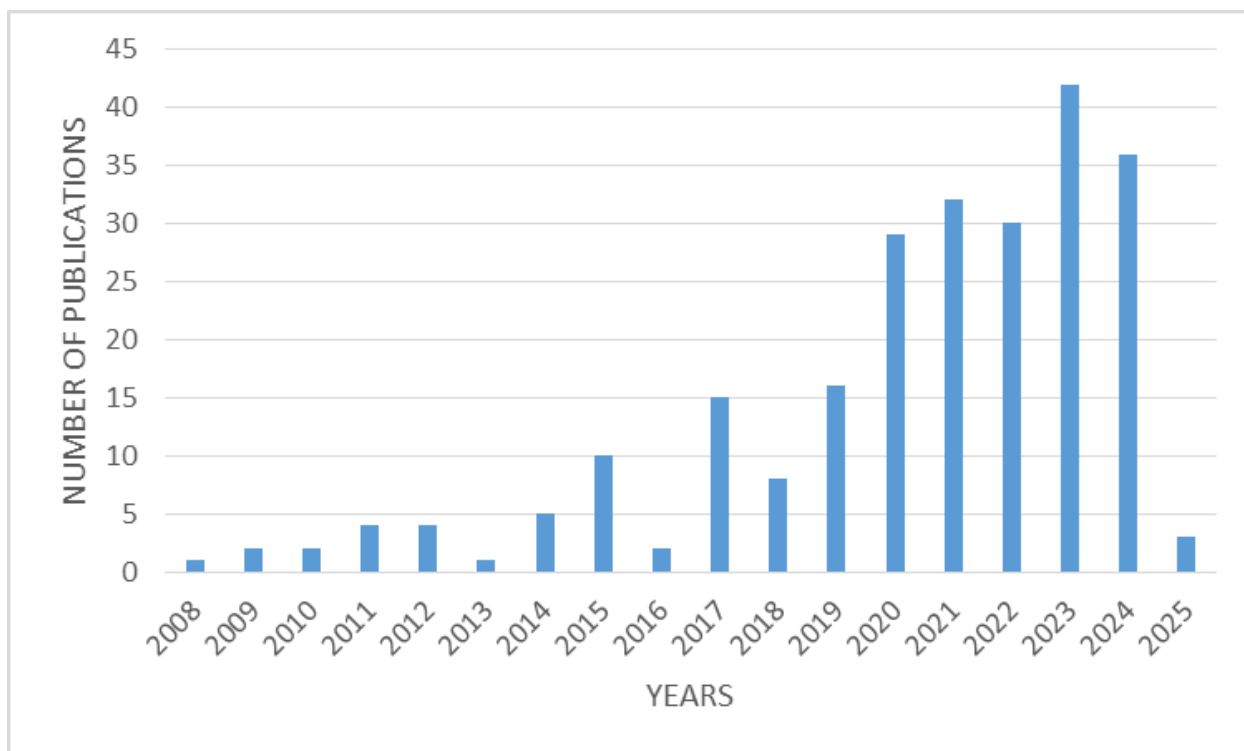


Fig. 1: Trend line of publications on Neglected Tropical Diseases related literature in Nigeria from 2008 to 2025 (As at January 14th)

Analysis of Proportion of Publications by First Author:

The results showed a wide range of publications per author, from a single publication to more than 10 publications. Dean Laura and Racheal Thomson were the authors with the most publications (10 each). A higher proportion of the authors had only one publication relevant to the search.

Table 3: Proportion of Publications published by Top Researchers (those with citation above 20 and minimum of 5 documents)

Authors	Number of Publications (%)	Number of Citations	Affiliations	Country
Dean Laura	10 (4.13)	98	Liverpool School of Tropical Medicine	United Kingdom
Racheal Thomson	10 (4.13)	98	Liverpool School of Tropical Medicine	United Kingdom
Isiyaka Sunday	9 (3.72)	128	Sightsavers	United

				Kingdom
Ozano Kim	7 (2.89)	81	Liverpool School of Tropical Medicine	United Kingdom
Diehi Jan Carel	6 (2.48)	60	Delft University of Technology	Netherlands
Adekeya B. Oluwatosin	5 (2.07)	50	Ahamadubello University Teaching Hospital Zaria	Nigeria
Oladimeji Oladepo	5 (2.07)	50	University of Ibadan	Nigeria
Onasanya Adeola	5 (2.07)	36	Delft University of Technology	Netherlands
Ekeke Ngozi	5 (2.07)	26	RedAid Nigeria (RAN)	Nigeria

Analysis of most productive institutions

Table 4 shows the institutions with the most publications in Neglected Tropical Diseases research in Nigeria. The Federal Ministry of Health in Nigeria was the most productive institution (n = 21), followed by the University of Ibadan (n = 16), Liverpool School of Tropical Medicine (n = 13), Federal University of Agriculture (n = 10), and others. Only the top ten institutions published more than 40% (45.04%) of the total literature. Liverpool School of Tropical Medicine, Sightsavers, Swiss Tropical and Public Health, and Delft University of Technology are among the international organizations that have made the top ten most productive institutions. Ahamadu Bello University and the Nigeria Institute of Medical Research also reached the top ten list.

Out of the top 19 institutions, 11 are federal public universities in Nigeria, 2 are federal health research institutions in Nigeria, 1 is a federal tertiary health institution, 1 is a state university in Nigeria (Delta State University), and Carter Center is an internationally owned NGO (Table 4). It is worth noting that three of the 19 most productive institutions are NGOs.

Table 4: Most productive institutions (Those with At least 5 publications)

Institution	Number of Publications	Number of Citations	Type of Organization
Federal Ministry of Health	21	321	Federal Research Institute
University of Ibadan	16	277	Federal University
Liverpool School of Tropical Medicine	13	152	International Institution
Federal University of Agriculture	10	189	Federal University
Ahamadu Bello University	9	46	Federal University
Nigeria Institute of Medical Research	8	49	Federal Research Institute
Sightsavers	8	78	International NGO
University of Jos	8	49	Federal University
Swiss Tropical and Public Health Institution	8	127	International NGO
Delft University of Technology	8	65	International Institution
University of Nigeria	7	125	Federal University
Carter Center	7	116	International NGO
University of Calabar	7	15	Federal University
Delta State University	7	22	State University
University of Lagos	6	34	Federal University
Nnamdi Azikiwe University	6	62	Federal University
Aminu Kano Teaching Hospital	6	37	Federal Institution
Federal University Oye Ekiti	5	25	Federal University

Bayero University	5	189	Federal University
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Analysis of most productive countries in Neglected Tropical Diseases research in Nigeria

Nigeria, being the focus country, ranked first on the list of most productive countries, accounting for 61.57% (n=149) of all publications. The United States contributed 13.63% (n = 33) of the total published literature in terms of external participation from other countries. In that order, the United Kingdom, Netherlands, Switzerland, South Africa, China, and Germany came next (Table 5).

Table 5: Most productive countries with minimum number of documents = 5 and minimum number of citation =50

Countries	Number of Publications (%)	Number of Citations
Nigeria	149 (61.57)	1529
United States	33 (13.63)	700
United Kingdom	31 (12.81)	443
Netherlands	11 (4.55)	130
Switzerland	10 (4.13)	197
South Africa	8 (3.31)	145
China	8 (3.31)	145
Germany	5 (2.07)	51

Analysis of sources with highest publication

In Nigeria, the most Neglected Tropical Diseases-related research is published in PLOS Neglected Tropical Diseases, International Health, Nigerian Journal of Parasitology, International Journal of Tropical Disease and Health, MedRxiv, Research Square, Pan African Medical Journal, and Dutse Journal of Pure and Applied Science. Five of the sources featured SNIP and SJR. One of them (PLOS Neglected Tropical Diseases) had SNIP and SJR more than 1, while four of them (International Journal of Tropical Disease and Health, MedRxiv, Research Square, and Dutse

Journal of Pure and Applied Science) did not have SNIP or SJR. Two of the journals are affiliated to Nigeria.

Except for PLOS Neglected Tropical Diseases and the International Journal of Tropical Disease and Health, which were both specialized to Neglected Tropical Diseases and tropical diseases respectively, all of the journals were multidisciplinary.

Table 6: Analysis of Publication Sources with the highest number of publications in HIV/AIDS research in Nigeria (minimum number of publications =5)

Source	Number of Publications	SNIP	SJR	Number of Citations	Country of Origin
PLOS Neglected Tropical Diseases	25	1.670	1.260	611	United States
International Health	18	1.000	0.733	72	United Kingdom
Nigerian Journal of Parasitology	6	0.113	0.119	6	Nigeria
International journal of Tropical Disease and Health	6	-	-	15	Multiple countries
MedRxiv	6	-	-	1	United States
Research Square	5	-	-	1	United States
Pan African Medical Journal	5	0.517	0.323	48	Cameroon
Dutse Journal of Pure and Applied Science	5	-	-	1	Nigeria

Analysis of most cited Publications

The most cited publication (article) was "Snakebite is Under Appreciated: Appraisal of Burden from West Africa" published in PLOS Neglected Tropical Diseases with 113 citations, while the second most cited publication was "Nigeria: "Ground Zero" for the High Prevalence Neglected Tropical Diseases" published in PLOS Neglected Tropical Diseases, also with 97 citations, and the third was on "Prevalence and Risk Factors of Schistosomiasis among Hausa Communities in Kano State Nigeria Table 5 provides information on the remaining publications. It is noteworthy

that all of the most cited publications are articles and PLOS Neglected Tropical Diseases published five of the most cited publications.

Table 7 Most cited Publications in Neglected Tropical Diseases research in Nigeria (Minimum number of citations at 50)

Publications	Authors	Citations	Source	Publication Type
Snakebite is Under Appreciated: Appraisal of Burden from West Africa	Habib 2015	113	PLOS Neglected Tropical Diseases	Article
Nigeria: "Ground Zero" for the High Prevalence Neglected Tropical Diseases	Hotez 2012	96	PLOS Neglected Tropical Diseases	Article
Prevalence and Risk Factors of Schistosomiasis among Hausa Communities in Kano State Nigeria	Dawaki 2016	57	Rev. Inst. Med. Trop. Sa. Paulo	Article
The Menace of Schistosomiasis in Nigeria: Knowledge, Attitude and Practice Regarding Schistosomiasis among Rural Communities in Kano State	Dawaki 2015	64	PLOS ONE	Article
The Microbiome in Urogenital Schistosomiasis and Induced bladder Pathologies	Adebayo 2017	60	PLOS Neglected Tropical Diseases	Article
Urinary Schistosomiasis among Preschool Children in a rural community near Abeokuta	Ekpo 2010	89	Parasites & Vectors	Article
Antimicrobial Importance of Medicinal Plants in Nigeria	Ugboko2020	75	The Scientific World Journal	Article
Cost Effectiveness of Triple Drug Administration (TDA) with Praziquantel, Ivermectin and Albendazole for Prevention of Neglected Tropical Diseases in	Evans 2011	50	PLOS Neglected Tropical Diseases	Article

Nigeria				
Measuring Changes in Transmission of Neglected Tropical Diseases, Malaria, and enteric Pathogens from quantitative antibody level	Arnold 2017	72	PLOS Neglected Tropical Diseases	Article

Bibliometric Analysis

Analysis of most productive authors by principal author analysis

Dean Laura, Thomas Racheal, Isiyaku Sunday, Ozano Kim, and Diehl Jan Carel are the top five most productive first authors as shown in Table 8. Four of the nine authors are affiliated to the United Kingdom, three are affiliated to Nigeria, and the remaining two to the Netherlands.

Table 8: most productive first authors in Neglected Tropical Diseases research in Nigeria (Authors with minimum of 5 publications)

Authors	Number of Documents	Number of citations	Total Link Strength	Affiliation	Country
Dean Laura	10	98	134	Liverpool School of Tropical Medicine	United Kingdom
Thomas Racheal	10	98	134	Liverpool School of Tropical Medicine	United Kingdom
Isiyaku Sunday	9	128	116	Sightsavers	United Kingdom
Ozano Kim	7	81	95	Liverpool School of Tropical Medicine	United Kingdom
Diehl Jan Carel	6	60	30	Delft University of Technology	Netherlands
Adekeye Oluwatosin	5	50	70	Ahmadu Bello Teaching Hospital	Nigeria

Ekeke Ngozi	5	26	52	Red Aid Nigeria (RAN)	Nigeria
Onasanya Adeola	5	36	26	Delft University of Technology	Netherlands
Oladepo Oladimeji	5	50	24	University of Ibadan	Nigeria

Overall co-authorship analysis of authors

Figure 2 depicts the network of co-authors, which consists of authors who have published at least two (2) Neglected Tropical Diseases-related studies in Nigeria, with at least five citations. Out of 1168 authors found in the search, only 147 met the criteria, and the network had 72 items (nodes), 5 clusters, 440 co-authorship ties, and 858 total link strength.

The item (node) symbol indicates an author, the item (node) size represents the author's publications, and the links between authors represent their relationships (Okoroiwu et al; 2022).

Dean Laura (93 clusters; red node), Thomson Racheal (93 clusters; red node), Isiyaku Sunday (74 clusters; red node), Ozano Kim (62 clusters; red node), and Adekeye Oluwatosin (60 clusters; chartreuse node) were the most collaborating authors in Nigeria's Neglected Tropical Diseases research network. The first four are affiliated to the United Kingdom, while the last is affiliated to Nigeria.

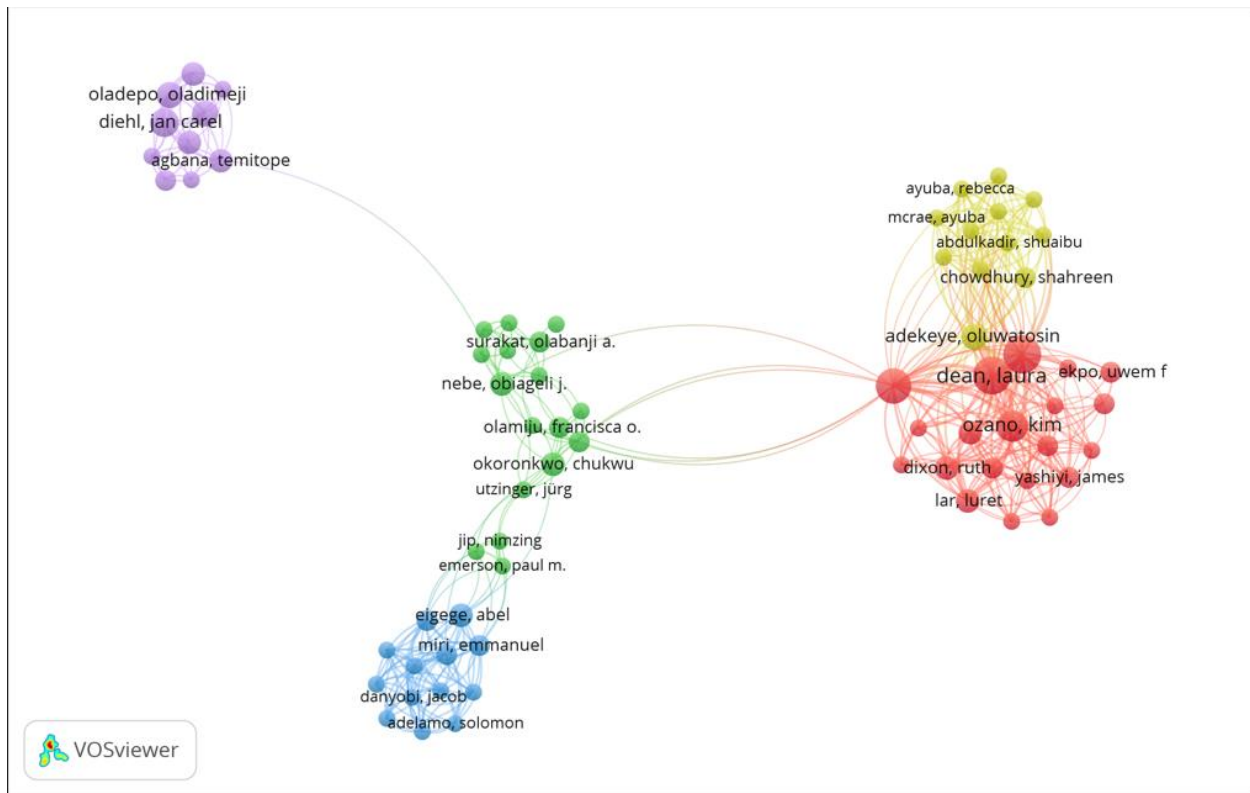


Fig. 2: Coauthorship network among authors publishing HIV/AIDS related articles in Nigeria

Analysis of co-authorship of participating institutions

Figure 3 depicts the network of institutions/organizations that have published at least two (2) Neglected Tropical Diseases-related studies in Nigeria, with at least five citations. Only 86 of the 360 organizations identified in the search met the criteria. The network consisted of 80 items (nodes), 11 clusters, 215 co-authorship links, and 352 total link strength.

Based on total link strength, the Federal Ministry of Health (50 clusters; wine node), Swiss Tropical and Public Health Institute (37 clusters; light blue node), Nigeria Institute of Medical Research (26 clusters; light blue node), Liverpool School of Tropical Medicine (22 clusters; wine node), and Federal University of Agriculture (21 clusters; node not visible) were the most collaborating institutions in Neglected Tropical Diseases research in Nigeria.

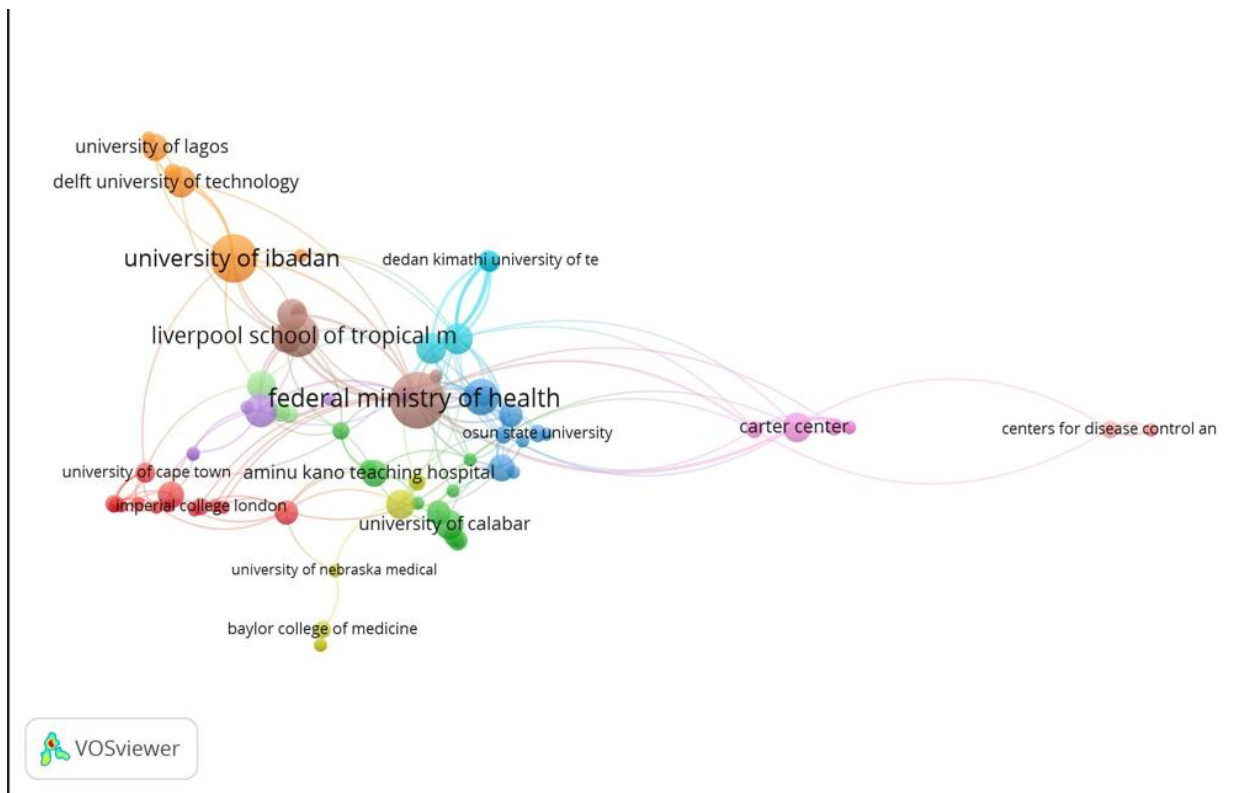


Fig. 3: Collaborative network among institutions publishing Neglected Tropical Diseases related research in Nigeria

Analysis of co-authorship of participating Countries

Fig. 4 depicts the network of countries that have published at least two (2) studies on neglected tropical diseases in Nigeria, each with at least five (5) citations. Out of 37 countries searched, only 17 met the criteria, and the network had 17 items (nodes), 7 clusters, 45 co-authorship links, and 156 total link strength.

Nigeria (93 clusters; blue node), the United Kingdom (41 clusters; light blue node), the United States (35 clusters; green node), Switzerland (28 clusters; red node), and China (21 clusters; red node) were the countries with the most collaboration in the Neglected Tropical Diseases research network in Nigeria.

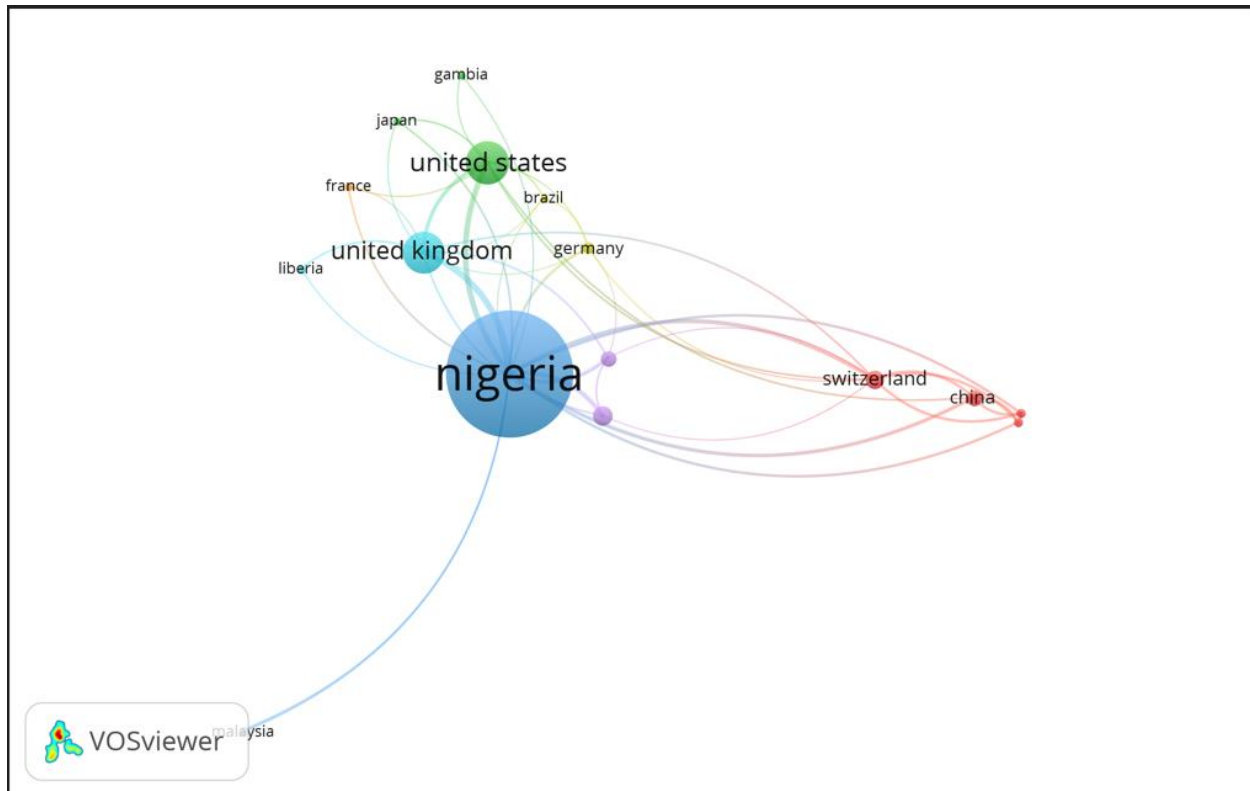


Fig. 4: Collaborative network among countries publishing Neglected Tropical Diseases related research in Nigeria

Discussion

This study explores quantitative evaluation of Neglected Tropical Diseases related research in Nigeria from 2008 to 14th January, 2025 in Dimensions database. The authors' most common publication type is articles, meaning that the subject matter was primarily experimental or clinical. This is in line with similar bibliometric studies on HIV/AIDS related research in Nigeria (Okoroiwu et al; 2022).

The trend of research publications on Neglected Tropical Diseases in Nigeria has shown a growing and encouraging trend. However, Neglected Tropical Diseases-related literature in Nigeria grew slowly until 2019, when it started witnessing drastic increase. The rise in output could be attributed to the first response to the 2019-2020 Lassa fever outbreak, which was one of the greatest outbreaks in recent history, with Nigeria being particularly affected. Lassa fever is a major public health concern and the outbreak may have emphasized the need for additional research into Neglected Tropical Diseases.

PLOS Neglected Tropical Diseases, International Health, Nigerian Journal of Parasitology,

International Journal of Tropical Disease and Health, MedRxiv, Research Square, Pan African Medical Journal, and Dutse Journal of Pure and Applied Science were the primary journals sources for Neglected Tropical Diseases-related publications in Nigeria. These journals may provide opportunities for further research in Neglected Tropical Diseases research in Nigeria. Furthermore, patronage of PLOS Neglected Tropical Diseases, which has the greatest SNIP:SJR ratio (1.670:1.260), may be linked to the journal's editorial policy. In contrast to other journals in the same category, PLOS Neglected Tropical Diseases prioritizes scientific rigor over novelty (PLOS Neglected Tropical Diseases, 2025).

Source-normalized Impact per Paper (SNIP) is a field normalised assessment of journal impact. SNIP scores are the ratio of a source's average citation count and 'citation potential'. Citation potential is measured as the number of citations that a journal would be expected to receive for its subject field. Scimago Journal Rank (SJR) is a measure of the prestige of scholarly journals. SJR scores are computed using network analysis of citations received by journals (Kazakhstan Nazarbayev University Library, n.d.).

The article "Snakebite is Under Appreciated: Appraisal of Burden from West Africa" published in PLOS Neglected Tropical Diseases had the most citations. The study found that snakebite envenoming (SBE) has a large public health burden in West Africa, with an estimated total of 319,874 Disability Adjusted Life Years (DALYs) lost across 16 nations, resulting in a total burden of roughly 319,874 DALYs. According to the article, the annual cases of snakebite fatalities and amputations differ greatly between countries, with Nigeria reporting the highest estimates of 1927 deaths and 2368 amputations (Habib, A. G. et.al; 2015).

The Federal Ministry of Health and the University of Ibadan are Nigeria's indigenous organizations with the highest publications in Neglected Tropical Diseases research, followed by the Liverpool School of Tropical Medicine, an international school. The Federal Ministry of Health (FMOH) Nigeria is the government agency in charge of developing and executing policies, programs, and services to promote, protect, and improve the health and well-being of Nigerians. The University of Ibadan is Nigeria's first university, founded in 1948 as University College Ibadan (part of the University of London) and then converted to an indigenous University in 1962. (University of Ibadan, n.d.). The University of Ibadan is ranked first in Nigeria, 1083rd in the world, and 1031 in research according to World University Ranking, 2024 (Centre for University Ranking, 2024).

Institutions in Nigeria led the publishing because the search was limited to Nigeria, although the United States and United Kingdom dominated internationally in Neglected Tropical Diseases research in Nigeria, accounting for 13.63% and 12.81%, respectively. The UK Foreign,

Commonwealth, and Development Office (FCDO) funded the Accelerate the Sustainable Control and Elimination of Neglected Tropical Diseases (Ascend) program, which supported neglected tropical disease (NTD) programs in 23 African countries and two in South Asia. This could explain why the UK contributed more to NTD research in Nigeria (Anderson,2023).The United States' dominance in many disciplines of research is well documented in studies such as Okoroiwu HU, Lopez-Munoz F, and Povedano-Montero FJ. (2018). Furthermore, the United States is said to have committed 3.46% of its GDP to research and development (R&D) in 2021 (World Bank, R&D, 2024).

Dean Laura, Thomas Racheal, Isiyaku Sunday, Ozano Kim, and Diehl Jan Carel were the top five most productive authors overall, and Dean Laura, Thomas Racheal, Isiyaku Sunday, Ozano Kim, and Adekeye Oluwatosin were the top five most collaborative authors in Nigerian Neglected Tropical Diseases research. The authors listed above in the two categories are crucial to Neglected Tropical Diseases research in Nigeria, and they are anticipated to have a significant impact on the field in the future.

The Federal Ministry of Health (Nigeria), the Swiss Tropical and Public Health Institute (international organization), the Nigeria Institute of Medical Research (Nigeria), the Liverpool School of Tropical Medicine (international institution), and the Federal University of Agriculture (Nigeria) were the major collaborators. Two international institutions in this list may be linked to the global importance of the topic under consideration, their availability to funding, and the GDP worth of their respective countries' research and development efforts.

Nonetheless, this study may have some drawbacks that are common to bibliometric studies. First, the specifications defined by the dimensions database determine the final product of the investigated materials. Moreso, local journals that were not indexed in the Dimensions database during the study period would have been excluded. Neglected Tropical Diseases research articles in Nigeria may have also been overlooked if the authors did not use our special search descriptors. Finally, certain articles indexed only somewhere else may have been overlooked. However, the output accurately represents research trends in the studied domain.

Conclusion

Despite its limitations, this study provides insights into the research landscape of Neglected Tropical Diseases in Nigeria, highlighting areas of collaboration, and impact. The findings can inform further research, research policy and capacity-building initiatives.

Ethics approval and consent to participate:

This study is based on analysis from secondary data, thus, did not require ethical clearance.

Disclaimer (Artificial Intelligence):

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

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