A Scientometric Analysis of Malaria Research during 2010-2014: A Study

R. Vijayakumar
Librarian
AVS College of Arts and Science
Salem-106
Email: vijaylib13@gmail.com

R. Hariharan
Librarian
AVS College of Technology
Salem-106
Email: hari51290@gmail.com

Abstract

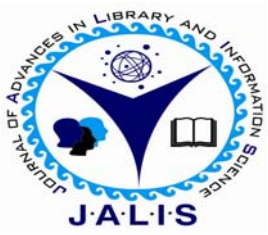
This study examined Malaria research performance during 2010 to 2014 by conducting scientometric analysis of collected data have been downloaded form Web of Science database. The information used for this research included number of papers, author productive, pattern of co-authorship, source journals and also collaboration with different countries. The information was coded and tabulated with the help of various scientometric techniques. The results showed that there was a significant growth in quantity of papers from 2010 to 2014. In general, recent papers had averaged more authors, more domestic collaboration, more international collaboration, and more citations received than earlier papers.

Keywords

Scientometric Anaysis, Malaria Research, Author Productivity, Pattern of Co-Authorship
.

Electronic access

The journal is available at www.jalis.in



Journal of Advances in Library and Information Science
ISSN: 2277-2219 Vol. 5. No.3. 2016. pp.243-247

INTRODUCTION

Scientific productivity in the form of intellectual contributions and communicated in written form is commonly considered to be of fundamental importance to scientific career advancement. In the last two decades there has been an unprecedented growth of scientometric studies in different fields, mainly because of the government and private organizations that invest large amount of money for research activities need accountability.

REVIEW OF LITERATURE

Ranganathan, A. and Balasubramani, R. (2014) have investigated Green Energy Research in India as revealed by the scholarly publication indexed in web of science (WoS) for a period of fifteen years from 1999 to 2013. It was seen that the analyses included research growth, author productivity, authorship pattern, Geographical distribution of the literature, citation analysis rank, global publications' share, citation impact, share of international collaborative papers and major collaborative partner countries and patterns of research communication in most productive journals. It also analyses the characteristics of most productive institutions, authors and high-cited papers. Goyal et al. (2013) has been evaluated his research papers in authorship patterns and collaborative research trends in the field of chemical sciences the authorship trends and collaborative research are studied in the field of Chemical Sciences based on the data collected from Indian Journal of Chemistry Section-B (IJCB) published during the 2002-2011. Outcome of the study shows that multi authored articles 97.24% prevail the single authored articles 2.75%. The degree of collaboration in the field of chemical sciences is 0.97. Average number of authors per paper varies from 3.21-3.78. This study is in support for the fact that chemical sciences research is collaborative in all aspects.

Baskaran, C. (2013) reported a study analysised the author productivity, discipline-wise and institution-wise collaboration and ranking of authors in research contribution of Alagappa University during 1999-2011. Relative Growth Rate (RGR) was found to be fluctuating trend during the study period. The Doubling time (Dt) was found to be increased and decreased trend in this study. Degree of collaboration and its mean value is found to be 0.963. The top three institutions with Alagappa University are Central

Electro Chemical Research Institute, National Cheng King University and Anna University.

OBJECTIVES OF THE STUDY

The major objectives are framed with the exclusive notion of the present study as mentioned below:

1. To find out the year wise distribution of publications.
2. To ascertain the authorship pattern.
3. To identify the geographical wise distribution of publications.
4. To examine the author wise distribution of publications.
5. To study journal wise distribution of publications
6. To identify word wise distribution of publications

METHODOLOGY

The present study data were collected from Web of Science database for the period 2010-2014. It can be seen that nearly 1421 bibliographic records of contribution in the field of Malaria research over the period of 5 years. The researcher applied the search strings malaria research of that has used for the data extraction from the database of Web of Science to download the records based on the above strings. A total of 1421 records were downloaded and analysised by using the Histcite software applications as per the objectives of the study.

Table 1: Year Wise Distribution

S. No	Year	Recs	% age	Cum.	TLCS	TGCS
1	2010	267	18.79	267	175	3280
2	2011	247	17.38	514	114	2760
3	2012	280	19.71	794	138	2137
4	2013	298	20.97	1092	56	1265
5	2014	329	23.15	1421	16	508
Total		**1421**	**100**		**499**	**9950**

Table 1 shows year wise article output from 2010 to 2014. 1421 articles were published within five years. Highest percentage of articles were published in the year 2014 and 2010 constituting 23.15% and 18.79% respectively. The years 2014 highest contributed 23.15% respectively. It could be deduced from the above discussion that, among the study period the publication trend is increasing and decreasing. Highest percent of articles published in 2014 and the lowest percent of articles published in the year 2011.

Table 2: Shows Year wise Authorship Pattern

Authorship Pattern	2010	2011	2012	2013	2014	Total
Single	24	15	15	8	17	79
Two	29	27	26	28	25	135
Three	34	28	28	37	41	168
Four	33	32	41	39	23	168
Five	26	21	25	34	37	143
Six	27	32	26	24	44	153
Seven	19	20	20	36	32	127
Eight	21	14	21	26	18	100
Nine	11	9	17	19	20	76
Ten & above	43	49	61	47	72	272
Total	**267**	**247**	**280**	**298**	**329**	**1421**
CI	5.92	6.04	6.29	6.02	6.09	**6.07**
CC	0.71	0.73	0.75	0.76	0.76	**0.74**
MCC	0.72	0.74	0.76	0.77	0.77	**0.75**

Table 2 show of year wise authorship pattern of papers published between 2010 and 2014. In this table, all the publications were divided into ten categories. It is observed that out of 1421 contributions, a total of 272 publications have been contributed by ten and above authors and followed by three and four authors 168. Collaboration Index that is a measure of mean number of authors per paper varies between 5.92 for the block year 2010 and 6.09 for the block year 2014 with a mean value of 5.07. To differentiate between the levels of multiple authors, two parameters CC and MCC were calculated and presented in Table 2 CC is between 0.71 for the block year 2010 and 0.76 for the block year 2014. MCC varies between 0.72 for the block year 2010 and 0.77 for the block year 2014.

Table 3: Author Productivity

Year	Total No. of Article	Total No. of Author	AAPP	PPA
2010	267	1551	5.81	0.17
2011	247	1627	6.59	0.15
2012	280	1851	6.61	0.15
2013	298	1896	6.36	0.15
2014	329	2208	6.71	0.15
Total	**1421**	**9133**	6.43	0.16

The data pertaining to author productivity has presented in the Table 3 the table shows that the total

average number of authors per paper is 6.43 for the relatively equal average number of authors per article when compared the total average number of authors per article.

The average productivity per author is 0.16 during the year 2010 – 2014. The years 2011 & 2012 has the relatively equal productivity per author when compared to the average productivity. Productivity has been calculated with the following formula.

Average Authors Per Paper = No. of Authors / No. of Papers

Productivity Per Author = No. of Papers / No. of Authors

Pattern of Co-Authorship

In order to assess the Pattern of Co-Authorship (CAI), the following formula suggested by Garg and Padhi has been employed.

$$CAI = \frac{N_{ij}/N_{io}}{N_{oj}/N_{oo}}$$

CAI = 100 implies that a country's co-authorship effort for a particular type of authorship corresponds to the world average, CAI > 100 reflects higher than average co-authorship effort, and CAI < 100 lower than average co-authorship effort by that country for a given type of authorship pattern.

For calculating the co-authorship index for authors, countries have been replaced by block. For this study, the authors have been classified into four blocks, vz Single, Two, Three and more than three authors and the results of Co-authorship index as per the formula have been presented.

Table 4: Pattern of Co-Authorship

Year	Single Author		Two Authors		Three Authors		>Three Authors		Total
	No	CAI	No	CAI	No	CAI	No	CAI	
2010	24	162	29	114	34	108	179	92	**266**
2011	15	109	27	115	28	95	177	98	**247**
2012	15	96	26	97	28	84	211	103	**280**
2013	8	48	28	98	37	105	225	103	**298**
2014	17	92	25	79	41	105	246	102	**329**
Total	**79**		**135**		**168**		**1039**		**1421**

It is observed from the Table 4, the CAI for single authors is declined from 162 in the year 2010 to 92 in the year 2014. On the other hand, the CAI for double authors is enhanced from 114 in the year 2010 to 79 in the year 2014, which indicates the pattern of co-authorship is increasing among the contributions of the journal. On the other hand, there is a fluctuation trend of CAI for multi authored contributions. The similar type of result has been drawn by Jeyshankar R, et al in the Current Science.

Table 5: Author Wise Distribution Articles and Citations

S. No	Author	Recs	Rank	TLCS	TGCS
1	Sokhna C	14	1	22	321
2	White NJ	12	2	8	134
3	Raoult D	11	3	22	299
4	Rogier C	11	3	10	187
5	Trape JF	11	3	21	305
6	Van Geertruyden JP	11	3	13	112
7	von Sonnenburg F	11	3	13	112
8	Mtove G	10	4	10	155
9	Reyburn H	10	4	15	170
10	Sirima SB	10	4	4	81
11	Sowunmi A	10	4	10	34
12	Chandramohan D	9	5	4	152
13	Genton B	9	5	5	209
14	Hamainza B	9	5	4	149
15	Magnussen P	9	5	1	81
16	Parola P	9	5	9	106
17	Peterson S	9	5	10	69
18	Snow RW	9	5	0	109
19	Tiono AB	9	5	4	67
20	D'Acremont V	8	5	0	190
Total		**201**		**172**	**2966**

Table 5 shows the individual author wise distribution of the articles, The data covered over the study period in Web of Science is taken for analyses were identified among the top 20 authors. Published by the top 20, Sokhna C occupied the first position with 14 articles, White NJ are in the second position with 12 articles (Ranked by Articles only). Nearly ten authors they have published more than 10 articles among the top 20 authors.

Table 6: Journals Wise Distribution Articles

S. No	Journal	Recs	TLCS	TGCS
1	Malaria Journal	221	0	1819
2	Plos One	113	0	788
3	American Journal of Tropical Medicine and Hygiene	53	76	404
4	Plos Neglected Tropical Diseases	35	0	391
5	Journal of Ethnopharmacology	32	8	247
6	Tropical Medicine & International Health	28	37	183
7	Journal of Travel Medicine	26	35	156
8	Parasitology Research	26	18	153
9	BMC Infectious Diseases	18	0	57
10	Travel Medicine and Infectious Disease	18	7	52
11	BMC Public Health	17	0	81
12	ACTA Tropica	16	7	67
13	Clinical Infectious Diseases	16	20	246
14	Parasites & Vectors	15	0	84
15	Journal of Infection in Developing Countries	13	4	46
16	Transactions of the Royal Society of Tropical Medicine and Hygiene	13	14	57
17	International Health	12	5	15
18	International Journal of Infectious Diseases	11	5	41
19	Journal of Vector Borne Diseases	11	5	20
20	Emerging Infectious Diseases	10	13	154

Table 6 presents a list of top 20 sources titles with their publication where the Malaria research during 2010-2014. The following results were founded by the researcher; Malaria Journal has produced number of records 221 with 0 TLCS and 1819 TGCS with first position in producing articles. The journal of Plos One has produced 113 of records with 0 TLCS and 788 TGCS with the second rank position in producing articles of malaria research output. Remaining journals were produced 418 articles in the area of Malaria research.

Table 7: Word Wise Distribution

S. No	Word	Recs	TLCS	TGCS
1	Malaria	648	241	4320
2	Fever	216	87	1103
3	Plasmodium	161	49	1015
4	Children	159	73	1089
5	Treatment	154	43	1105
6	Falciparum	141	43	832
7	Health	112	61	825
8	Case	91	26	507
9	Infection	91	23	572
10	Dengue	83	41	491
11	Mosquito	77	24	744
12	Management	72	33	443
13	Febrile	69	39	401
14	Control	68	16	693
15	Based	66	36	688
16	Clinical	66	25	441
17	Community	66	36	532
18	Diagnostic	63	47	692
19	Rapid	63	39	710
20	Diseases	62	26	604

The table 7 represents the keyword wise distribution of research output of Malaria. The keyword of Malaria was found the prime keyword and it has shown highest occurrence word. It had occurred 648

times in the research output, 241 TLCS and 4320 TGCS. The second most occurred word is Fever which is accounted to 216 times in the research publications, 87 TLCS and 1103 TGCS and followed by Plamodium, Childer, and Treatment. While analyzing the authors have represented the word wise distribution of research output of Malaria.

Table 8: Geographical Wise Distribution

S. No	Country	Recs	Percent	TLCS	TGCS
1	USA	399	28.1	191	3850
2	UK	241	17	110	2495
3	India	137	9.6	58	766
4	France	118	8.3	57	1030
5	Tanzania	88	6.2	50	1049
6	Switzerland	87	6.1	41	945
7	Nigeria	85	6	32	312
8	Kenya	80	5.6	25	760
9	Australia	71	5	40	809
10	Thailand	62	4.4	23	525
11	Uganda	60	4.2	20	413
12	Brazil	59	4.2	29	380
13	Germany	57	4	26	560
14	Belgium	54	3.8	15	542
15	Netherlands	51	3.6	14	340
16	Sweden	48	3.4	23	404
17	Canada	42	3	17	419
18	Italy	39	2.7	11	397
19	Ghana	37	2.6	18	337
20	Senegal	34	2.4	27	502
Total		**1849**	**130.2**	**827**	**16835**

The table 8 presents the value for the malaria majority of India 399(28.01%) with 191TLCS and 3850 TGCS with first position in producing articles, second position UK 241 (17.00%) with 110 TLCS and 2495 TGCS, third position India 137(09.60%) with 58 TLCS and 788 TGCS, fourth position France 118(08.30%) with 57 TLCS and 1030 TGCS and fifth position Tanzania 88(06.20%) with 50 TLCS and 1049 TGCS of malaria research for the duration 2010-2014. Nearly ten countries they have published more the 60 articles among the 20 countries.

CONCLUSION

This study analyzed Malaria research performance during 2010 to 2014 by conducting scientometric analysis. 1421 bibliograpic records of contribution in the field of malaria research. Analysis of authorship pattern, Co-authorship pattern also indicates that author is willing to work with co-author. Collaboration index is 6.07 for the study period which reveals that there exists a high level. He trends towards malaria research are gaining currency day-by-day. Every work of researchers depends purely on the library because it contains more source information. The researchers have become an important entity where in more and more researchers help to make it innovative.

REFERENCES

[1]. Baskaran, C. (2013). Research Growth Trend and Author Collaboration of Alagappa University in India during 1999-2011. *International Journal of Library and Information Studies*, 3(1), 57-64.

[2]. Fuyuki, Y et al. (2009) An analysis of the connection between researchers productivity and their co-authors' past attributions, including the importance in collaboration networks. *Scientometric*, 79 (2), 435-449.

[3]. Garg, K C and Padhi, P. (1999). Scientometrics of Laser Research Literature as viewed through the Journal of Current Laser Abstracts. *Scientometrics*, 45(2), 251- 268.

[4]. Goyal, V., Gupta, G.K. and Kumar, A. (2013). Authorship patterns and collaborative research trends in the field of chemical sciences. *International Journal of Information Dissemination and Technology*, 3(3), 184- 186.

[5]. Ranganathan, A. and Balasubramani, R. (2014). Scientometric Profile of Research Activities on Green Energy: An Indian Perspective. *International Journal of Research in Applied, Natural and Social Sciences*, Vol. 2 No. 1, pp. 23-30.

[6]. Jeyshankar, R, Ramesh Babu, B and Gopalakrishnan, S. (2009). Research Output in "Current Science": A Bibliometric Study. *Indian Journal of Library and Information Science*, 3 (3), 173-182.

[7]. Meena. M and Nagarajan. M (2013). Indian Research Output on Malaria: A Bibliometric Study using Scopus Data Base. *Journal of Advances in Library and Information Science*, 2(4), 192-196.