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AUTHORSHIP PATTERN AND DEGREE OF COLLABORATION IN THE LEPROSY RESEARCH: A SCIENTOMETRICS STUDY

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ABSTRACT

Abstract: In this study, we examine the authorship pattern and Degree of collaboration in Leprosy Research literature. For this purpose, the required data has been collected from the PUB Med Data Base published from 2003 to 2012. Scientometric tools such as, Authorship pattern, Degree of collaboration, collaboration co-efficient and dominance factor have been used. Applicability of Lotka's law has been tested. The study reveals that the coauthored papers are dominated and the author productivity follows the Lotka's law.

KEYWORDS: Bibliometrics, Scientometrics, Lotka's law, Authorship pattern, Degree of collaboration.

1.1 INTRODUCTION

Authorship studies provide valuable information concerning characteristics of authors, their collaboration, assessing and monitoring research activities among others. Some specific

areas in studying authorship are discovering changing patterns in the area of authorship, frequency, institution affiliation, etc. Kwadzo G and Grace A (2008). Collaboration among scientists implies that they are working together and pursuing a common scientific goal, Kundra (1996). The aim of the present study is to analyze the authorship trend and collaboration pattern, applicability of Lotka's law, authors' dominance and level of collaboration in the Leprosy literature.

1.2 OBJECTIVES

The purpose of the present study is to

- Examine the authorship pattern,
- Authors' collaboration,
- Applicability of Lotka's law,

1.3 METHODOLOGY

Data was collected from Pubmed. Data Analysis was done using various Bibliometrics Laws like Bradford's Law, Zipfs Law, Lotkas Law etc.

Bibliometric is recent development in Library and Information Science. It is an application of mathematics and statistical methods to books and other media of communication. Interpretation of data was made through tables, charts and graphs.

1.4 SCOPE & LIMITATIONS

Present study is limited to PubMed data provide link to medical literature. It is a free search engine for accessing the medline database of citation, abstracts and some full text articles on life science and bio-medical topics.

The study covers information available on leprosy in PubMed for the 10 years i.e. 2003-2012 will be used as a source for data collection which comes approximately 6981 sources.

1.5 DATA ANALYSIS

1.5.1 AUTHORSHIP PATTERN YEAR WISE

In this era, authors and scientists are turning towards the information and technology. Information and technology (IT) relates with the research. Authors and scientists are trying to write jointly than the single. Study related to number of author/s single author, multi author i.e. joint author, two, three and more than three authors is known as authorship pattern. (Barooah & Sharma, 1999)

Table No. 1.5.1: Authorship Pattern year wise

Sr.No	Year	Authorship Pattern					Total	%
		Single	Two Author	Three Author	four Autor	More Than Four Author		
1	2003	124	89	92	92	290	687	9.84
2	2004	153	85	86	83	304	711	10.18
3	2005	99	90	85	91	291	656	9.40
4	2006	100	81	89	93	282	645	9.24
5	2007	65	66	79	85	299	594	8.51
6	2008	91	79	82	97	369	718	10.29
7	2009	76	58	111	99	335	679	9.73
8	2010	75	86	81	73	380	695	9.96
9	2011	94	72	104	92	386	748	10.71
10	2012	60	114	120	112	442	848	12.15
	Total	**937**	**820**	**929**	**917**	**3378**	**6981**	**100**
	%	**13.42**	**11.75**	**13.31**	**13.14**	**48.39**	**100**	

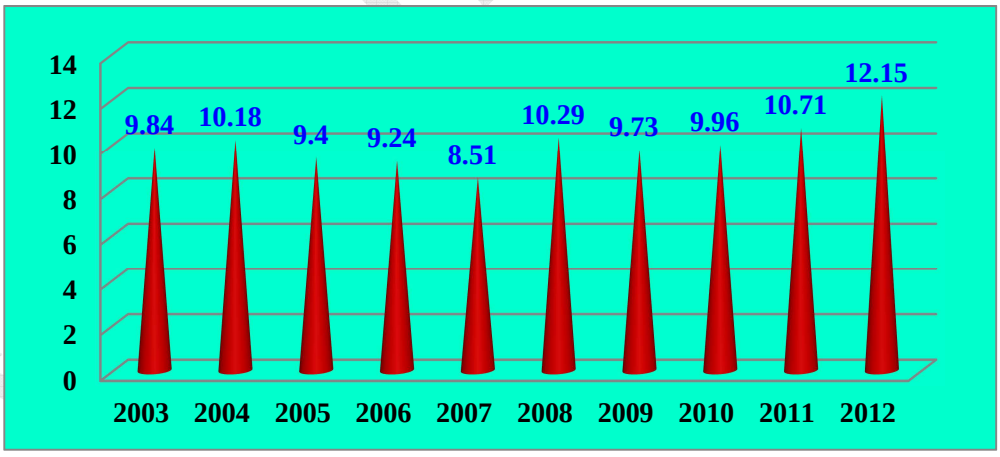

Figure No. 1.5.1: Authorship Pattern year wise

It is clear that the 153 articles written by single author and it is the highest number published in PubMed 2004. It indicates also that 60 articles written by single author

published in PubMed 2012. It is the lowest number. The number of research articles has been published in PubMed written by two authors i.e. 114 (2012) it is the highest number and 58 articles published in 2009 with lowest number. It indicate that in 2012, 120 research articles are published written by three authors as well as 71 research articles are published in 2007 and those are lowest number. Table No.5.1 shows the distribution of research in year 2012. It is the lowest number in the average of ten years 2003 to 2012. 112 articles written by four authors published in 2012 i.e. highest number. More than four authors contributed 282 research articles in the year 2006. It is the lowest contribution in the year 2003 to 2012. In the year 2012, 442 research articles contribution by more than four authors. It is the highest number is the ten years rank. 3378 research articles are contributed by more than four authors.

1.5.2 DEGREE OF COLLABORATION

Degree of collaboration (DC) among different authors presented in Table No. 5.2 in order to calculate the Degree of Collaboration (DC) the formula given by Subramanyam (1983) have been employed which is expressed mathematical as;

$$\mathrm{DC} = \frac{Nm}{Nm + Ns}$$

Whereas- DC= Degree of Collaboration

Nm= No. of multi authors papers

Ns= No. of Single authored Papers.

Here - Nm= 563

Ns= 124

$$DC = \frac{640}{124 + 563} = 0.88$$

Table No. 1.5.2 : Degree of Collaboration

Sr. No.	Years	Single Author Papers	Multi Author Papers	TA	TP	DC
1	2003	124	563	2450	640	0.88
2	2004	153	558	2885	730	0.87
3	2005	99	557	2525	626	0.87
4	2006	100	545	2628	649	0.85
5	2007	65	529	3012	609	0.83
6	2008	91	627	3463	717	0.98
7	2009	76	603	3391	710	0.94
8	2010	75	620	3232	673	0.97
9	2011	94	654	3672	747	1.02
10	2012	60	788	4153	880	1.23
	Total	**937**	**6044**	**31411**	**6981**	**9.44**

(N.B. TA-Total Authors, TP-Total Paper, DC-Degree of Collaboration)

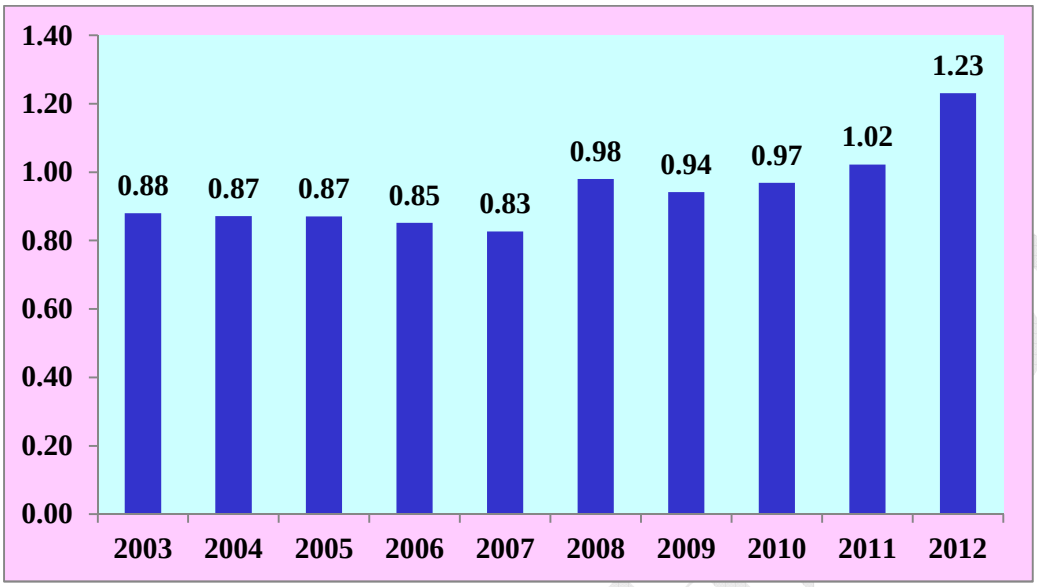

Figure No. 1.5.2: Degree of Collaboration

The above table reveals that, the year wise degree of collaboration which is falls between 0.88 and 0.87 with an average of 9.44 during the study period.

1.5.3 AUTHORS PRODUCTIVITY

Yashikane and Others (2009) in their papers published is Scientometrics Journal have given a formula to calculate Average Author Per Paper (AAPP) and Productivity Per Author (PPA). The formula is mathematically represented as follows:

$$AAPP = \frac{\text{No. of Authors}}{\text{No. of Papers}} ; \frac{2450}{640} = 3.83$$

$$PPA = \frac{\text{No. of Authors } 640}{\text{No. of Papers } 2450}; \quad = 0.26$$

Table No. 1.5.3: Authors Productivity

Sr.No.	Year	Total Paper	Total Author	AAPP	PPA
1	2003	640	2450	3.83	0.26
2	2004	730	3038	4.16	0.24
3	2005	626	2626	4.19	0.24
4	2006	649	2728	4.20	0.24
5	2007	609	3077	5.05	0.20
6	2008	717	3554	4.96	0.20
7	2009	710	3467	4.88	0.20
8	2010	673	3307	4.91	0.20
9	2011	747	3766	5.04	0.20
10	2012	880	4212	4.79	0.21
	Total	**6981**	**24305**	**3.48**	**0.29**

(N.B. AAPP-Average Author per Paper, PPA-Productivity per Author)

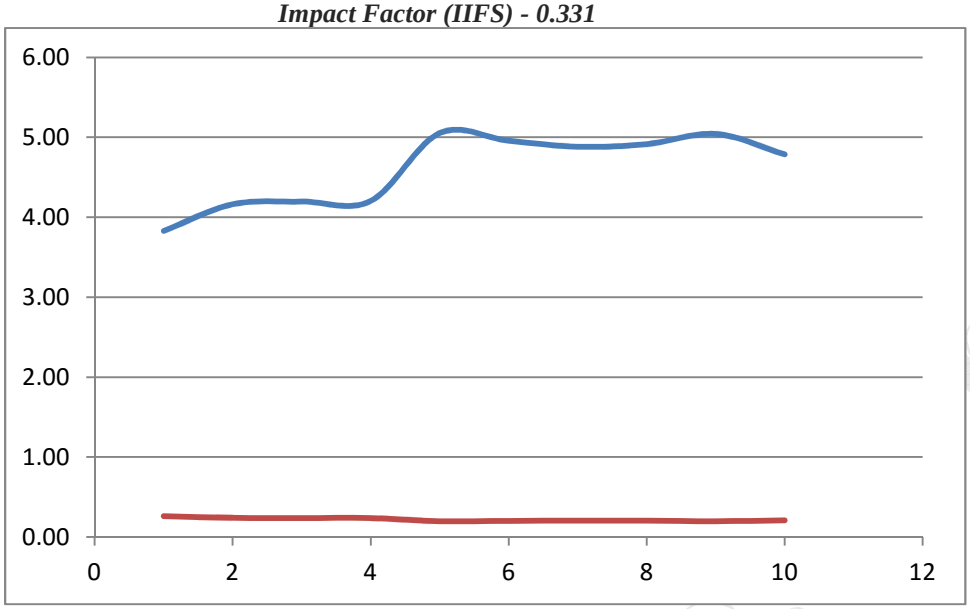

Figure No. 1.5.3: Authors Productivity

Table No. 1.5.3 illustrates the average author per paper for the period 2003-2012 is 3.48 and productivity per author mentioned as 0.48.

The above table shows that the data pertaining to author productivity and average author per year. The highest no. of productivity per author is 0.26 and lowest no of author is found 0.20. In the case of Average Author Per Paper the highest no. was found that 5.05 and lowest number was found 3.83.

1.5.4 PRODUCTIVITY TRENDS AND APPLICATION OF LOTKA'S LAW

Productivity trends for well-established and recognized subjects and discipline of universal nature like physics, chemistry and Mathematics etc. follow distribution pattern which confirms Lotka's Law, if applied to such distributions in it's original form with exponent value of two (Vaishnav & Aghav, 1994). Several studies for scientific disciplines

have been reported in the literature of Library and Information Science. It was thought that it would be appropriate and useful to investigate the applicability of Lotka's Law to the present set of data. The data from present study on author productivity is presented in table no. 1.5.4.

Table No. 1.5.4: Productivity of authors based on Lotka's law

No. of Papers	Observed No. of Authors	Expected no. of authors
1	2586	2586
2	770	646.50
3	184	287.33
4	118	161.63
5	61	103.44
6	42	71.83
7	22	52.78
8	15	40.41
9	14	31.93
10	11	25.86
11	3	21.37
12	9	17.96
13	6	15.30
14	6	13.19
15	2	11.49
17	1	8.95
18	3	7.98
19	1	7.16
20	1	6.47
21	2	5.86

22	1	5.34
23	1	4.89
24	1	4.49
25	1	4.14
27	2	3.55
28	1	3.30
29	1	3.07
33	1	2.37
41	1	1.54

It can be noted from the table no. 5.4 that the productivity distribution fit Lotka's inverse square law applied to it, in overall.

CONCLUSION

The study of authorship trends and collaboration pattern has been carried out in the leprosy literature and the following conclusions are made from the above analysis and discussions.

- Multi authored contributions are dominated in the field of Leprosy Research.
- Average number of authors per joint authored paper is 3.4.
- Average Collaboration rate (0.88) shows the better collaboration among the authors.
- Author productivity follows the Lotka's original distribution

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