

Collaborative endeavor of Poliomyelitis Research: An Image of PubMed, 2000-2015

Keshava*, Thimmaiah B.N.**

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Abstract

The research work made attempts to Scientometric analysis of 5045 papers reflected in PubMed, during 2000-2015 on poliomyelitis research literature. The collected data were record in Excel spreadsheets and analyzed to determine the Degree of Collaboration between authors, collaboration and authorship pattern. The result shows that 66.71 percent of the papers were multi authored of 5045 research papers, the highest number of papers (1629) (32.29 percent) was published by single authors followed by 12.69 percent of papers (640) with two authors, 10.80 percent of papers (545) by three authors and 5.89 percent of papers published by more than ten authors and only 1.88 percent of the papers published by ten authors.

Keywords: Author Pattern; Collaboration; Pub Med; Poliomyelitis.

Introduction

In the first half of the 20th century, poliomyelitis was widely feared. It often struck without warning, was highly contagious, and affected large, young populations, causing prolonged or permanent flaccid paralysis or death. There are arresting and disturbing accounts of the explosive nature of polio epidemics and the response of communities to these outbreaks [1]. The effective control of poliomyelitis throughout most of the world has been a remarkable story of scientific and social progress. However, "wild" poliomyelitis is still endemic in parts of sub-Saharan Africa and the Indian subcontinent, and it continues to occur sporadically elsewhere. In addition, there is a small incidence of vaccine induced polio in infants and adults. Global eradication remains a goal of the World Health Organization and of public health policies throughout the world, with the eventual discontinuation of routine immunization [2]. Acute

poliomyelitis now rarely encountered in the United Kingdom, but "imported" poliomyelitis still occurs and it is necessary to distinguish acute poliomyelitis from other causes of acute flaccid paralysis. Despite the obvious success of preventive policies, many patients who had poliomyelitis experience late functional deterioration after periods of prolonged stability the so called postpolio syndrome. The patterns of disability and their management present unique challenges to the multidisciplinary rehabilitation team [3].

In the recent times collaboration is an integral part of research. It is a mutual involvement of participants in a coordinated effort to overcome certain problems together. The collaborative interactions are characterized by shared goals, symmetry of structure and a high degree of negotiation, interactivity and interdependence. The sharing of goals may be interdisciplinary, inter departmental or inter institutional. The interdisciplinary collaboration has increased the productivity of research and encouraged the development of innovative new strategies in investigations [4]. Scientometric analysis the quantitative aspects of the generation, propagation and utilization of scientific information to contribute to a better understanding of the mechanism of scientific research activities The aim of the scientometrics is to reveal the characteristics of scientific phenomena and process in scientific

Author's Affiliation: *Associate Professor, **Research Scholar, Dept. of Studies and Research in Library and Information Science, Tumkur University, Tumakuru, Karnataka, India-572103.

Reprint's Request: Keshava , Associate Professor, Dept. of Studies and Research in Library and Information Science, Tumkur University, Tumakuru, Karnataka, India-572103.
E-mail: keshtut2gmail.com

research for more efficient management. Scientometrics is the science of Measuring and analyzing science using qualitative, quantitative and computational approaches. Scientometrics is a reliable method for the evaluation of scientific development. One of its main indices is the number of published articles or science production in a specific field of science, in this case, Poliomyelitis [5].

Objectives

The objectives of the study were to find:

- To know the Authorship Pattern;
- Degree of author Collaboration;

- Co-authorship patterns and author productivity

Methodology

The data was collected pertaining to the poliomyelitis research literature as reflected in PubMed database during period 2000-2015. The data were recorded in Excel spread sheet and analyzed as per the objectives of the study to determine the Degree of Collaboration between authors, collaboration and authorship pattern.

Table 1: The table and Figure shows that 5045

Table 1: Article contribution by year

Year	Total	Percentage
2000	338	6.70
2001	347	6.88
2002	299	5.93
2003	305	6.05
2004	345	6.84
2005	322	6.38
2006	323	6.40
2007	290	5.75
2008	268	5.31
2009	278	5.51
2010	308	6.11
2011	293	5.81
2012	312	6.18
2013	366	7.25
2014	469	9.30
2015	182	3.61
Total	5045	100.00

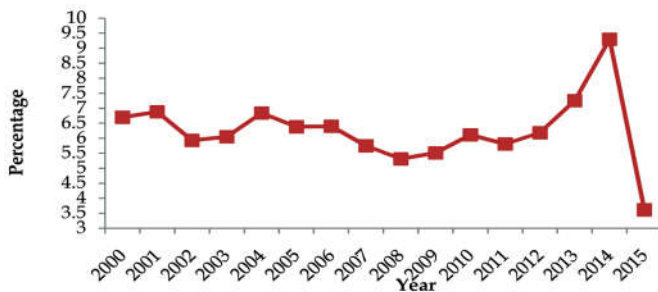


Fig. 1: Article Contributions by Year

Table 2: Authorship patternsa

Author	Total	Percent
Single	1629	32.29
Two	640	12.69
Three	545	10.80
Four	480	9.51
Five	379	7.51
Six	373	7.39
Seven	258	5.11
Eight	207	4.10
Nine	142	2.81
Ten	95	1.88
More than Ten	297	5.89
TOTAL	5045	100.00

research literature has contributed during 2000-2015. Poliomyelitis research literature growth is normally increasing. The highest number of research articles were published in the 2014 with 469(9.30%).

Table 2 & 3: The tables and figure shows that, 66.71% of the papers were multi authored of the 5045 research papers, the highest number of papers 1629 (32.29%) was published by single authors followed by 12.69 of papers with two authors, 10.80% of papers by three authors and 5.89% of papers published by more than ten authors and only 1.88% of the papers published by ten authors. The highest number of publication by single author from the year 2000-2006 and gradually increasing from 2007-2014.

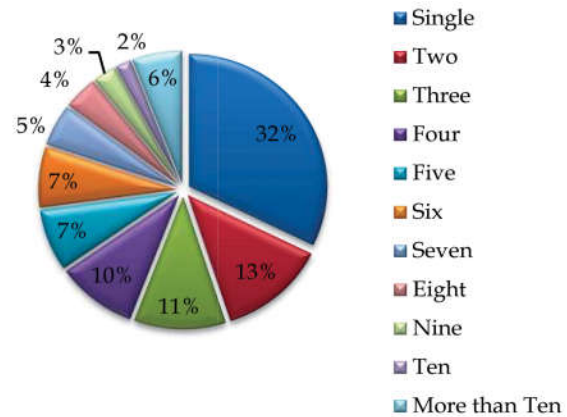


Fig. 2: Authorship pattern

Table 3: Year wise distribution of authorship pattern

Year	Single	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten	>Ten	Total
2000	137	46	31	33	27	24	16	10	5	4	5	338
2001	138	47	33	34	16	32	20	8	7	5	7	347
2002	104	39	36	29	33	25	9	8	6	5	5	299
2003	109	28	33	32	24	20	23	15	6	5	10	305
2004	151	40	36	31	22	19	11	9	6	2	18	345
2005	119	34	35	37	19	25	13	16	10	5	9	322
2006	118	50	37	28	22	21	14	7	7	10	9	323
2007	90	37	33	28	23	24	15	10	9	7	14	290
2008	74	32	33	31	24	18	17	14	2	8	15	268
2009	94	36	33	23	24	15	18	11	9	1	14	278
2010	75	43	48	33	15	24	16	20	10	4	20	308
2011	80	42	29	23	19	28	19	13	11	3	26	293
2012	79	45	28	31	18	29	16	15	15	8	28	312
2013	106	47	32	33	34	31	24	10	11	9	29	366
2014	99	49	52	42	40	29	21	37	23	13	64	469
2015	56	25	16	12	19	9	6	4	5	6	24	182
Total	1629	640	545	480	379	373	258	207	142	95	297	5045

Table 4: Degree of Author Collaboration

Year	Single	Multiple Author	DC
2000	137	201	0.59
2001	138	209	0.60
2002	104	195	0.65
2003	109	196	0.64
2004	151	194	0.56
2005	119	203	0.63
2006	118	205	0.63
2007	90	200	0.69
2008	74	194	0.72
2009	94	184	0.66
2010	75	233	0.76
2011	80	213	0.73
2012	79	233	0.75
2013	106	260	0.71
2014	99	370	0.79
2015	56	126	0.69
Total	1629	3416	0.67

Degree of Collaboration

The formula suggested by Subramanyam (1993)[6] has used to find out the DC between the authors;

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

Where, DC= degree of collaboration; Nm=number

of multi-authored papers; Ns = number of single-authored papers.

Table 4 shows that the DC of authors ranges from 0.59 to 1. The average DC is 0.67 during the period of study, and it clearly shows that there was a high level of collaboration between authors during this period.

The Table 5 shows the author productivity during

the study period is given that the average number of author per paper (AAPP) is 3.86. The average productivity per author (APPA) is 0.26 productivity per author. The formula used to determine author productivity is as follows:

AAPP=number of authors/number of papers;
APPA=number of papers/number of authors.

Table 5: Author Productivity

Year	Total no of Papers	No of Authors	AAPP	APPA
2000	338	1065	3.15	0.32
2001	347	1133	3.27	0.31
2002	299	1007	3.37	0.30
2003	305	1127	3.70	0.27
2004	345	1108	3.21	0.31
2005	322	1143	3.55	0.28
2006	323	1093	3.38	0.30
2007	290	1124	3.88	0.26
2008	268	1083	4.04	0.25
2009	278	1026	3.69	0.27
2010	308	1278	4.15	0.24
2011	293	1258	4.29	0.23
2012	312	1396	4.47	0.22
2013	366	1540	4.21	0.24
2014	469	2379	5.07	0.20
2015	182	794	4.36	0.23
Total	5045	19554	3.86	0.26

Conclusion

The study explores that the majority of papers by multi authors and Indian authors. There was poor international collaboration by Indian authors. The average page is 6.27 and it is the ideal for research papers. The Degree of collaboration (using Subramanyam's formula) indicates that there exists a high degree of collaboration. The average Co-Authorship Index for all the authors reflects the world average in the journal and improving trend of coauthored papers. The study revealed that the journal seems to be popular among the international research community with around 25% of papers.

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