

Research Productivity of Life Sciences from 2014-2016: A Scientometric Study through Web of Science Database

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Abstract - This paper attempts to analyse quantitatively the growth and development of 'Life Sciences' research publication output as reflected in the Web of Science (WOS) database from 2014 to 2016. A total of 9941 papers published by the researchers in the Research areas Life Sciences. The Year wise analysis shows that Life Sciences reflected with 3313 papers per year. In the year 2016 topped with 3824 publications and the lowest were in the year 2014 with 2711 publications. The trend shows that Life Sciences Research productivity has gradually increased. Science Technology and other topics topped with 672 documents (6.72%) published, most of them are Journal article as document type with 7395 (74.39%) and the most preferred source is Co Charane Database of Systematic Reviews 215 (2.16%) to publish. The country-wise distribution shows that the USA ranked topped with 3151 (31.70%) publications. India published 242 (2.43%) publications with 13th position. Among the authors, a total of 31 records published without the author name mentioned with Anonymous. Guruwamy K S ranked first and published 25 articles, Davidson B R with 19 and Liu Y with 17. So many organizations/Institutions have published the articles in Life Sciences. Harvard University has published 131 (1.32%), followed by UCL 101 (1.02%), University Toronto 97 (0.98%) and so on.

Keywords: Scientometrics Analysis, Life Sciences, Subject Wise Distribution, Geographical Distribution, Web of Science, Research Trends

I. INTRODUCTION

The dissemination and consumption of research findings by researchers, scholars, and practitioners are seen as a necessary act of expanding and information knowledge in many fields of study. Research publications help to sustain the development of new knowledge and ultimately contribute to the growth of life sciences Studies. Practitioners are using published work on theories and best practices in solving problems and inventing new things.

Scientometrics is the quantitative study of the disciplines of science based on published literature and communication [1]. This could include identifying the emerging areas of scientific research, examining the development of research over time, or geographic and organizational distributions of research. In this study, we did the Scientometrics analysis of Life Science Research, a significantly growing area in the knowledge-driven world.

II. SCOPE AND METHODOLOGY

The present study attempts to find out the publication pattern of global researchers in the field of Life Sciences. The study is based on the publications in the field of Life Sciences and aims to analyse quantitatively the growth and development of Life Science publication output as reflected in Web of Science (WOS) database during years, 2014-2016.

III. OBJECTIVES OF THE STUDY

The main objective of the study is to present the growth of literature and make a quantitative assessment of the status of Life sciences research by analysing the various features. The specific objectives are:

1. To Analyse the Year wise growth of Life Sciences Literature
2. To prepare the rank list of Authors
3. To know Subject wise distribution of scholarly literature
4. To measure the Document wise publications
5. To measure the Research area/Subject wise publication
6. To measure the Country-wise distribution
7. To measure the Source wise publications
8. To measure the Institution wise distribution

IV. RESULTS AND DISCUSSION

A. Year-Wise Distribution of Publications

During the study period 2014 to 2016, the Year wise analysis reflected with average 3313 papers per year. In 2016 topped with 3824 publications and in the year 2015 with 3406 and the lowest in the year 2014 with 2711 publications. The trend shows that Life Sciences Research productivity has gradually increased. (Table I show 3 years contributions).

TABLE I YEAR-WISE DISTRIBUTION OF PUBLICATIONS

S. No.	Publication Years	Record Count	% of 9941
1	2016	3824	38.47%
2	2015	3406	34.26%
3	2014	2711	27.27%

B. Author Wise Contributions

Author wise contributions show that, the total 31 articles published without the author name mentioned with Anonymous. Gurusamy K S ranked first and published 25 articles, Davidson B R with 19 and Liu Y with 17. (Table II show the top 25 authors contributions).

TABLE II AUTHOR WISE CONTRIBUTIONS

S. No.	Author	Record Count	% of 9941
1	Anonymous	31	0.3%
2	Gurusamy KSS	25	0.3%
3	Davidson BR	19	0.2%
4	Liu Y	17	0.2%
5	Wang J	16	0.2%
6	Wang Y	16	0.2%
7	Wang L	15	0.2%
8	Chen J	13	0.1%
9	Wang X	13	0.1%
10	Ho YS	12	0.1%
11	Li J	12	0.1%
12	Zhang J	12	0.1%
13	Chen H	11	0.1%
14	Kim JH	11	0.1%
15	Kumar S	11	0.1%
16	Lee S	11	0.1%
17	Liu J	11	0.1%
18	Thurrow K	11	0.1%
19	Gluud C	10	0.1%
20	Li Y	10	0.1%
21	Rees K	10	0.1%
22	Zhang H	10	0.1%
23	Zhang Q	9	0.1%
24	Vaughan J	8	0.1%
25	Zhang X	8	0.1%

TABLE III DOCUMENT WISE PUBLICATION

S. No.	Field: Document Types	Record Count	% of 9941
1	Article	7395	74.39%
2	Review	1904	19.15%
3	Editorial Material	383	3.85%
4	Book Review	159	1.60%
5	Proceedings Paper	140	1.41%
6	Book Chapter	78	0.79%
7	Meeting Abstract	35	0.35%
8	Biographical Item	17	0.17%
9	News Item	16	0.16%
10	Letter	15	0.15%
11	Correction	11	0.11%
12	Reprint	4	0.04%
13	Software Review	2	0.02%

C. Document Wise Distribution

Among the 9941 publications (during 2014-2016), journal articles are 7395 (74.39%), Reviews 1904 (19.15%), Editorial Material 383 (3.85%), Book Reviews 159 (1.60%), Proceedings Paper 140 (1.41%), and so on. (Table III shows the document wise contributions clearly).

D. Research Area/Subject Wise Contribution

The WOS identified 100 research areas in field of Life Sciences. We are listed the top 25 research areas viz., Science Technology and Other Topics 672 (6.76%), Education and Educational Research 638 (6.42%), General Internal Medicine 623 (6.27%), Chemistry 602 (6.06%) and so on. (Table IV show the top 25 research areas contributions).

TABLE IV RESEARCH AREA/ SUBJECT WISE CONTRIBUTION

S. No.	Field: Research Areas	Record Count	% of 9941
1	Science Technology Other Topics	672	6.76%
2	Education of Educational Research	638	6.42%
3	General Internal Medicine	623	6.27%
4	Chemistry	602	6.06%
5	Psychology	506	5.09%
6	Environmental Sciences Ecology	438	4.41%
7	Biochemistry Molecular Biology	412	4.14%
8	Engineering	378	3.80%
9	Public Environmental Occupational Health	364	3.66%
10	Computer Science	349	3.51%
11	History Philosophy Of Science	328	3.30%
12	Social Sciences Other Topics	327	3.29%
13	Business Economics	308	3.10%
14	Physics	267	2.69%
15	Nursing	258	2.60%
16	Health Care Sciences Services	256	2.58%
17	Pharmacology Pharmacy	255	2.57%
18	Neurosciences Neurology	245	2.47%
19	Information Science Library Science	210	2.11%
20	Philosophy	203	2.04%
21	Materials Science	201	2.02%
22	Biotechnology Applied Microbiology	198	1.99%
23	Sociology	194	1.95%
24	Life Sciences Biomedicine Other Topics	189	1.90%
25	Oncology	180	1.81%

E. Country Wise Distribution

The country-wise distribution showing that the USA ranked topped with 3151 (31.70%) publications, England 1218 (12.25%), Germany 770 (7.75%), China 735 (7.39%), Canada 596 (6.0%), Australia 547 (5.50%) and Netherlands 412 (4.01%). India published 242 (2.43%) publications with 13th position. The following Table V shows the top 25 countries contributions in this field.

TABLE V COUNTRY-WISE DISTRIBUTION

S. No.	Field: Countries/Territories	Record Count	% of 9941
1	USA	3151	31.70%
2	England	1218	12.25%
3	Germany	770	7.75%
4	Peoples R China	735	7.39%
5	Canada	596	6.00%
6	Australia	547	5.50%
7	Netherlands	412	4.14%
8	Spain	410	4.12%
9	France	395	3.97%
10	Italy	395	3.97%
11	Brazil	290	2.92%
12	Switzerland	271	2.73%
13	India	242	2.43%
14	Japan	237	2.38%
15	Sweden	233	2.34%
16	Iran	205	2.06%
17	Scotland	197	1.98%
18	Belgium	193	1.94%
19	Russia	186	1.87%
20	Denmark	172	1.73%
21	Poland	152	1.53%
22	Turkey	150	1.51%
23	South Africa	145	1.46%
24	South Korea	137	1.38%
25	Finland	132	1.33%

F. Source Wise Distribution

Source wise analysis shows that the highest number of publications i.e. 215 (2.16%) of Cocharane Database of Systematic Reviews, followed by Nutrition Reviews 55 (0.55%), Scientometrics 50 (0.50%) and so on.

The following Table VI shows the top 25 ranking Source Titles during the 3 years study period.

TABLE VI SOURCE WISE DISTRIBUTION

S. No.	Field: Source Titles	Record Count	% of 9941
1	Cochrane Database Of Systematic Reviews	215	2.16%
2	Plos One	147	1.48%
3	Nutrition Reviews	55	0.55%
4	Scientometrics	50	0.50%
5	Bmj Open	49	0.49%
6	Scientific Reports	43	0.43%
7	Asian Nursing Research	34	0.34%
8	Frontiers In Psychology	32	0.32%
9	Proceedings Of The National Academy Of Sciences Of The United States Of America	32	0.32%
10	Cbe Life Sciences Education	31	0.31%
11	Science Education	31	0.31%
12	Health Technology Assessment	30	0.30%
13	Journal Of Chemical Education	29	0.29%
14	Chimia	26	0.26%
15	Iranian Red Crescent Medical Journal	26	0.26%
16	Acta Astronautica	24	0.24%
17	Rsc Advances	24	0.24%
18	Bmc Public Health	23	0.23%
19	Journal Of Cleaner Production	23	0.23%
20	Omics A Journal Of Integrative Biology	23	0.23%
21	American Biology Teacher	22	0.22%
22	International Journal Of Science Education	22	0.22%
23	Journal Of Biomedical Semantics	22	0.22%
24	Journal Of Forensic Sciences	22	0.22%
25	Tomsk State University Journal	21	0.21%

G. Organizations Wise Distribution

Many organisations and Institutions have published the articles in Life Sciences. Harvard University has published 131 (1.32%), followed by UCL 101 (1.02%), University Toronto 97 (0.98%) and so on.

The following Table VII shows that the top 25 most productive institutions in Life Sciences.

TABLE VII ORGANIZATIONS WISE DISTRIBUTION

S. No.	Field: Organizations	Record Count	% of 9941
1	Harvard Univ	131	1.32%
2	Ucl	101	1.02%
3	Univ Toronto	97	0.98%
4	Chinese Acad Sci	96	0.97%
5	Univ Oxford	96	0.97%
6	Kings Coll London	93	0.94%
7	Stanford Univ	90	0.91%
8	Univ Washington	89	0.90%
9	Univ Michigan	84	0.85%
10	Univ Cambridge	80	0.81%
11	Univ Illinois	80	0.81%
12	Univ Sydney	69	0.69%
13	Univ Wisconsin	66	0.66%
14	Univ British Columbia	64	0.64%
15	Univ Edinburgh	63	0.63%
16	Univ Calif Los Angeles	62	0.62%
17	Univ Maryland	61	0.61%
18	Arizona State Univ	60	0.60%
19	Univ Calif Berkeley	60	0.60%
20	Univ N Carolina	59	0.59%
21	Univ Queensland	59	0.59%
22	Univ Colorado	57	0.57%
23	Univ Ghent	56	0.56%
24	Johns Hopkins Univ	55	0.55%
25	Univ Amsterdam	55	0.55%

VI. CONCLUSION

This paper has highlighted on the quantitative contributions made by the Life Sciences, as reflected in the Web of Science (WOS) database. During the last three years period, the USA is leading in Life Sciences research publications and the USA ranked topped with 3151 (31.70%) publications, followed by England 1218 (12.25), India published 242 (2.43% publications with 13th position). In the Year wise analysis showed that Life Sciences papers gradually increased. Generally, the results of this study revealed that the contribution of Life sciences research literature is on a gradual rise. Even contribution of Institutions and organisations are also considered in the productivity of their research.

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