

Publication Growth and Research in India on Lung Cancer Literature: A Bibliometric Study

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Abstract - This paper an attempt has been made to find the publication growth and research in India on “Lung Cancer” literature. The literature covered in the MEDLINE database for the period 2010-2015 was considered. There are 64180 records on Lung Cancer literature from the year 2010 to 2015 observed. The United States is the major producer, followed by England, Netherlands, China, and Germany etc. The scholarly communication is effected through the English language in almost all the countries irrespective of their native language of the country. Relative Growth Rate (RGR) has been decreasing. On the other hand, the Doubling Time (DT) has shown an increasing trend. A total of 680 Indian records were retrieved for the period 2010-2015. The number of Indian records increased from 2010 to 2014 but slightly declined in the year 2015. The percentage of publications in Lung Cancer which compared with world records is 1.56% in 2010 and it is 1.01% in 2015, which reveals that there is a gradual decrease of the quantum of publications on the subject compared to world publications. Indian efforts in Lung Cancer research are greater in three years out of six years of study, since the Activity Index is higher than 100, in those three years, which reflects the higher activity of Lung Cancer research than the World’s average in those years.

Keywords: Lung Cancer, Relative Growth Rate (RGR), Doubling Time (DT) and Activity Index

I. INTRODUCTION

Bibliometrics is an academic discipline and much research is being carried out for a quantitative study of the various aspects of the literature of a given subject. Bibliometric studies are used to identify the pattern of publications, authorship, citations, secondary journal coverage etc. Bibliometric analysis has received adequate attention and it has been widely applied to evaluate the research performance of the scientists and the growth of various disciplines. The popularity in the adaptation of bibliometric techniques in various disciplines stimulated stupendous growth of literature on bibliometrics and its related areas [1]. Bibliometric techniques are now being vigorously pursued and with the result, it has been found that one-fourth of all the articles published in Library and Information Science Periodicals are on bibliometrics and its related topics [2]. In this paper, an attempt has been made to find the publication growth and research in India on “Lung Cancer” literature.

A. Lung Cancer: According to Wikipedia “the Lung Cancer is also known as lung carcinoma, it is a malignant lung

tumor characterized by uncontrolled cell growth in tissues of the lung. The most common symptoms are coughing (including coughing up blood), weight loss, shortness of breath, and chest pains. Prevention is by avoiding risk factors including smoking and air pollution”. [3]

II. LITERATURE REVIEW

Bibliometrics are applicable in many aspects of information storage and retrieval. Several of papers represent one aspect of the general growth of scientific communication. [4-5] Ramakrishnan and Thavamani [6] studied in the fields of Leptospirosis. Studies conducted in large numbers by analyzing Activity Index. First suggested by Frame⁸ and also used by others. [7-13]

III. OBJECTIVES OF THE STUDY

The objectives of this paper are:

1. To examine the growth of literature in the field of Lung Cancer.
2. To analyze the languages covered on “Lung Cancer” literature.
3. To study the countries of publications covered on “Lung Cancer” literature.
4. To assess the extent of research in India on “Lung Cancer” literature.
5. The Activity Index to compare India’s performance with the world’s performance in the field of “Lung Cancer” literature.

IV. METHODOLOGY

The contributions published during 2010 - 2015 in the field of Lung Cancer literature in the MEDLINE database which covered in the Pubmed were searched and bibliographic details were collected. The records were converted into FoxPro and loaded in SPSS for the purpose of analysis.

The data on the literary production of ‘Lung Cancer’ for the period 2010-2015 has been analysed by using bibliometric techniques such as Relative Growth Rate (RGR) [14 & 15] and Doubling Time (Dt) [16] used to find the growth rates in the study and Activity Index [17] used to show how India’s research activity changed during different years compare to world.

V. LIMITATIONS

This study is restricted to a period from 2010 to 2015 using MEDLINE data which is covered in Pubmed only.

VI. ANALYSIS AND DISCUSSION

A. Quantum of Records in Indian Literature on Lung Cancer Compared With World Records

Table I provides the data with regard to the quantum of Indian records on Lung Cancer compared with world records covered on Lung Cancer. A total of 680 Indian records were retrieved for the field of Lung Cancer for the period 2010-2015. It shows from the table that the number of Indian records increased from 2010 to 2014 but slightly declined in the year 2015.

The percentage of publications in Lung Cancer which compared with world records is 1.56% in 2010 and it is 1.01% in 2015, which reveals that there is a gradual decrease of the quantum of publications on the subject compared to world publications and also in fluctuation trend throughout the study period. The average coverage of Lung Cancer Indian records out of total records is 1.06%. In the year 2014, the Indian records were high compared to other years. The increase in publication output may be due to the availability of more research, manpower, and the increase of research work in Lung Cancer in that particular year.

TABLE I INDIAN RECORDS ON LUNG CANCER COMPARED WITH WORLD RECORDS

Year	No. of Records in Lung Cancer	No. of Indian Output	Total %
2010	642	10	1.56
2011	9190	93	1.01
2012	11863	116	0.98
2013	13167	156	1.18
2014	14626	157	1.07
2015	14692	148	1.01
Total	64180	680	1.06

B. Quantum of Lung Cancer Research Output According to Country

The country-wise production of the Lung Cancer records was presented in Table II.

It is seen that the United States is the major producer, followed by England, Netherlands, China, and Germany etc. The literary production is noticed in almost all the major countries covered. Indian contributions 680 records have been ranked in the 13th position with 1.06% of total output.

TABLE II COUNTRIES VS RECORDS

S. No.	Country	Records	Percentage
1.	United States	23510	36.63
2.	England	11779	18.35
3.	Netherlands	3945	6.15
4.	China	3022	4.71
5.	Germany	2783	4.34
6.	Japan	2317	3.61
7.	Ireland	1978	3.08
8.	Greece	1704	2.66
9.	Switzerland	1349	2.10
10.	France	1021	1.59
11.	Italy	905	1.41
12.	Thailand	753	1.17
13.	India	680	1.06
14.	Korea (South)	609	0.95
15.	Australia	581	0.91
16.	New Zealand	560	0.87
17.	Spain	419	0.65
18.	Poland	341	0.53
19.	Canada	300	0.47
20.	Brazil	260	0.41
21.	Russia (Federation)	217	0.34
22.	Egypt	167	0.26
23.	Singapore	164	0.26
24.	Turkey	148	0.23
25.	Denmark	121	0.19
26.	Iran	108	0.17
27.	Czech Republic	98	0.15
28.	Romania	89	0.14
29.	Scotland	83	0.13
30.	Belgium	80	0.12
31.	Slovakia	76	0.12
32.	Hungary	61	0.10
33.	United Arab Emirates	61	0.10
34.	Austria	59	0.09
35.	Sweden	59	0.09
36.	Portugal	56	0.09
37.	Ukraine	42	0.07
38.	Pakistan	40	0.06
39.	Mexico	39	0.06
40.	Croatia	37	0.06
41.	Uganda	33	0.05

42.	Tunisia	30	0.05
43.	Bosnia and Herzegovina	27	0.04
44.	Serbia	27	0.04
45.	Israel	22	0.03
46.	Saudi Arabia	22	0.03
47.	Finland	20	0.03
48.	Argentina	19	0.03
49.	Norway	18	0.03
50.	Chile	17	0.03
51.	Slovenia	17	0.03
52.	Nigeria	13	0.02
53.	Kuwait	10	0.02
54.	Nepal	10	0.02
55.	Jamaica	8	0.01
56.	Malaysia	8	0.01
57.	Puerto Rico	8	0.01
58.	Rockville (MD)	8	0.01
59.	South Africa	8	0.01
60.	Bulgaria	7	0.01
61.	Bangladesh	5	0.01
62.	Lithuania	5	0.01
63.	Colombia	4	0.01
64.	Macedonia	4	0.01
65.	Tanzania	4	0.01
66.	Iceland	3	0.00
67.	Indonesia	3	0.00
68.	Northern Ireland	3	0.00
69.	Oman	3	0.00
70.	Bethesda (MD)	2	0.00
71.	Ethiopia	2	0.00
72.	Georgia (Republic)	2	0.00
73.	Luxembourg	2	0.00
74.	Southampton (UK)	2	0.00
75.	Venezuela	2	0.00
76.	Washington (DC)	2	0.00
77.	Boca Raton, FL	1	0.00
78.	Cardiff (UK)	1	0.00
79.	Lebanon	1	0.00
80.	Malawi	1	0.00
81.	Peru	1	0.00
82.	Qatar	1	0.00
83.	Senegal	1	0.00
84.	Sri Lanka	1	0.00
85.	Not Mentioned	3171	4.94
	Total	64180	100.00

C. Distribution of Research Production by Language

The distribution of Lung Cancer literature by language is shown in Table III. The scholarly communication is effected through the English language in almost all the countries irrespective of their native language of the country. This phenomenon is not an exception to the subject of Lung Cancer which published about 92% of the research output in English. This is followed by Chinese (2.61%), Japanese (1.75%) and French (1.05%) as second, third and fourth positions respectively. Therefore from the above analysis, it is inferred that the English language is dominating in the scholarly communication of Lung Cancer research.

TABLE III LANGUAGES VS RECORDS

Languages	Records	%
English	59047	92.00
Chinese	1675	2.61
Japanese	1125	1.75
French	677	1.05
Spanish	434	0.68
German	381	0.59
Russian	222	0.35
Portuguese	118	0.18
Poland	104	0.16
Italian	81	0.13
Hungarian	59	0.09
Czechoslovak	55	0.09
Dutch	35	0.05
Turkish	29	0.05
Danish	25	0.04
Rumanian	24	0.04
Norwegian	18	0.03
Hebrew	11	0.02
Finland	10	0.02
Korean	10	0.02
Ukraine	8	0.01
Others	32	0.05
Total	64180	100.00

D. RGR and DT for Lung Cancer Research Output in India by Year Wise

It was thought appropriate to calculate and analyse the RGR and DT for Indian output on Lung Cancer research. Accordingly, the data has been analysed and presented in table IV. It is observed from Table IV that the year wise calculation of RGR is in decreasing trend and DT for Indian output has shown increased trends throughout the study period.

TABLE IV RGR AND DT FOR LUNG CANCER RESEARCH OUTPUT IN INDIA

Year	Quantum of Output	Cumulative Total of Output	W ₁	W ₂	$1 - 2^{\overline{R}^{(aa^{-1} \text{ year}^{-1})}}$ RGR	Dt(a)
2010	10	10		2.30		
2011	93	103	2.3	4.63	2.33	0.30
2012	116	219	4.63	5.39	0.76	0.91
2013	156	375	5.39	5.93	0.54	1.29
2014	157	532	5.93	6.28	0.35	2.00
2015	148	680	6.28	6.52	0.24	2.86

VII. ACTIVITY INDEX

In Table V, Activity Index for India has been calculated to analyse India’s research performance changes over different years. The data reveals that Indian efforts in Lung Cancer research are greater in three years out of six years of study. The Activity Index is more than 100, in those three years. It clearly shows that those years higher activity of Lung Cancer research than the World’s average. In the years, where the Activity Index is less than 100, which reveals that lower activity of Lung Cancer research than the world average. The Activity Index (AI) for India was a peak in 2010 (147.01) and low Activity Index for the year 2012 (92.29) in the study period. In the case of Indian output the growth also grew almost uniform rate by year after year except the year 2015, where the records were less than the previous two years. In other words, the year 2015 has marked the highest quantum of research output at global and the year 2014 in India.

TABLE V WORLD AND INDIAN OUTPUT IN LUNG CANCER DURING 2010-2015

Year	World Output	Indian Output	Activity Index
2010	642	10	147.01
2011	9190	93	95.51
2012	11863	116	92.29
2013	13167	156	111.82
2014	14626	157	101.31
2015	14692	148	95.08
Total	64180	680 (1.06)*	100.00**

*Percentage of World output ** Average of Activity Index

VIII. CONCLUSION

The total of 64180 records on Lung Cancer from the year 2010 to 2015 was observed. It is also observed that there was 1.06% of Lung Cancer Indian literature covered in the study period i.e. from 2010 to 2015. A total of 680 Indian records were identified. The RGR and DT for Indian output have shown increasing and decreasing trends. The Activity

Index (AI) for India was a peak in 2010 and low in the year 2012 and also observed that Indian efforts in Lung Cancer research were greater in three years out of six years of study.

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