Tuberculosis Research in India: Scientometric Analysis

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Abstract

The Bibliographic study analyzes the research activities of India in Tuberculosis during the thirty years period of 1987-2016.This study based on the research performance year wise, country wise, Language wise distribution, bibliographic form and author pattern. The publication of data on tuberculosis has been retrieved by using SCOPUS database. A Total of 22871 publications can be seen in Scopus a multidiscipline data base on Tuberculosis

Keywords

Tuberculosis, Indian Tuberculosis Research, Bibliographic study,TB, Indian Research.

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1. INTRODUCTION

India has a long distinguished tradition of research in the field of Tuberculosis (TB). Pioneering studies from India demonstrated the efficacy and safety of domiciliary treatment, the necessity of direct observation of treatment, the feasibility of case detection through sputum smear microscopy in primary health care Institutions and effectiveness of Intermitted short course chemotherapy. Today India has the third largest country in the global environment on Tuberculosis research. The focus of TB research in India has shifted to the operational research areas such as evaluating models to involve the private health Sector; assessing the role of incentives in treatment compliance, risk factors for delay in diagnosis, evaluating diagnosis treatment and prevention of TB among HIV infected persons: monitoring MDR-TB (Multidrug resistant TB) estimating cost –effectiveness of the DOTS (Directly Observed Treatment Short course).Hence in this study an attempt has been made to analysis the Indian research output on Tuberculosis during the period of 1987-2016.

2. BIBLIOMETRICS

Bibliometrics is the study of published Literature and its usage. It has been increasingly used in analyses of scientific production and become a statistical support device that allows mapping and generating different information and knowledge handing and management indicators, particularly in scientific and productivity-related information systems necessary to the planning, evaluation an d management of a given scientific community or country. It is also a quantitative instrument that allows minimization of the subjectivity inherit to information indexation and retrieval, which produces knowledge in a given field. Based on the considerations above, the present study evaluated all the articles published in the Tuberculosis and assessed the growth of research output in India.

3. REVIEW OF LITERATURE

Review of related literature is a primary component which enables to understand the earlier research interests, research patterns and the magnitude of the research in a field of knowledge Conventional bibliographic methods is generally, evaluate the research trend by investigating the publication output of different countries(Rahman,Haque, &Fukui,2005(6) , Nagaraja and others,2914(7),

Journals(Javed (2008) [1],subjects (Rajendran, Ramesh Babu, & Gopalakrishnan,2005[8]and research fields (Krishnamoorthy, ramkrishna & Devi,2009) [9].

4. OBJECTIVIES

The major objectives of the study are

- To identify the growth of country wise production of Tuberculosis.
- To examine the growth of literature in India on Tuberculosis.
- To analyse the bibliographic form/document type of the publication in Tuberculosis.
- To find out the language wise distribution of research output.
- To find out the authorship pattern of research output in this study.

5. HYPOTHESES

The following hypotheses are formulated for this study.

- Research productivity in Tuberculosis is comparatively high in the developed countries.
- There exists substantial published worldwide on Tuberculosis. Periodical are the major sources of publications for Tuberculosis.
- Maximum number of articles published in English language.
- There exists a significant level of difference between Tuberculosis research performance of Indian scientists and scientists of other countries.

5. METHODOLOGY

The term "Tuberculosis" has been used as a search term for retrieving literature from a multidiscipline international indexing and abstracting database 'SCOPUS'. The search string used for searching the database isQUERY FOR GLOBALOutput (AA(Tuberculosis) ANDPUBYEAR>1987 AND PUBYEAR<2017)QUERY FOR INDIAN OUTPUT: (AA (Tuberculosis) AND PUBYEAR<2017 < 2017 AND (LIMIT-TO(AFFILCOUNTRY,"India")))

A total of 308800 records were identified in the field of Tuberculosis worldwide during the period o1987-2016. The Indian output on Tuberculosis seems to be 22871.The classified by using Excel and thesame has been loaded into SPSS (statistical package for social sciences) for the purpose of analysis. It covers year wise distribution, countrywise distribution, Bibliographic document type Language wise distribution and Authorship pattern.

5. ANALYSIS

Tuberculosis research communication. Tuberculosis research output doubles once in five years.

Table 1: Countrywise Distribution of Publications

S.No	Country	No of publications	Percentage	Cumulative Percentage
1	United States	82041	26.57	26.57
2	United Kingdom	29275	9.48	36.05
3	**India**	**22871**	**7.41**	**43.46**
4	China	15359	4.97	48.43
5	France	15252	4.94	53.37
6	Germany	15071	4.88	58.25
7	Japan	13602	4.40	62.65
8	Canada	10601	3.43	66.09
9	Spain	9883	3.20	69.29
10	Italy	9859	3.19	72.48
11	Others	84986	27.53	100.00
	Total	308800	100.00	

It can be inferred from the table 1 that United States has a maximum of 82,041 (26.57%) publications. It is followed by United Kingdom (29275, 9.48%) and India (22871, 7.41%). India has third position on Tuberculosis research output. 33 Percent of publications were produced by two countries. Eight countries together have 66 Percent of publications. Ten countries together has nearly 72 Percent of publications. Out of this, Indian Tuberculosis Research Productivity alone has been analyzed.

Table 2: Tuberculosis Research Vs Years

S.No	Year	Publications	%	Cum	Cum %	RoG	CAGR
1	1987	105	0.46	105	0.46	1.00	0.11
2	1988	114	0.50	219	0.96	1.09	0.11
3	1989	129	0.56	348	1.52	1.13	0.11
4	1990	141	0.62	489	2.14	1.09	0.11
5	1991	183	0.80	672	2.94	1.30	0.11
6	1992	153	0.67	825	3.61	0.84	0.12
7	1993	154	0.67	979	4.28	1.01	0.12
8	1994	183	0.80	1162	5.08	1.19	0.12
9	1995	153	0.67	1315	5.75	0.84	0.14
10	1996	160	0.70	1475	6.45	1.05	0.14
11	1997	217	0.95	1692	7.40	1.36	0.13

12	1998	242	1.06	1934	8.46	1.12	0.13
13	1999	262	1.15	2196	9.60	1.08	0.13
14	2000	318	1.39	2514	10.99	1.21	0.13
15	2001	345	1.51	2859	12.50	1.08	0.13
16	2002	374	1.64	3233	14.14	1.08	0.14
17	2003	476	2.08	3709	16.22	1.27	0.13
18	2004	572	2.50	4281	18.72	1.20	0.12
19	2005	651	2.85	4932	21.57	1.14	0.12
20	2006	752	3.29	5684	24.85	1.16	0.12
21	2007	873	3.82	6557	28.67	1.16	0.11
22	2008	948	4.14	7505	32.82	1.09	0.12
23	2009	1030	4.50	8535	37.32	1.09	0.12
24	2010	1196	5.23	9731	42.55	1.16	0.11
25	2011	1531	6.69	11262	49.24	1.28	0.09
26	2012	1929	8.43	13191	57.68	1.26	0.06
27	2013	2229	9.75	15420	67.42	1.16	0.03
28	2014	2356	10.30	17776	77.72	1.06	0.02
29	2015	2568	11.23	20344	88.95	1.09	-0.01
30	2016	2527	11.05	22871	100.00	0.98	0.00
	Total	22871	100.00				

Table 2.1: Tuberculosis Research Productivity Vs RGR and Doubling Time

S.No	Year	No. of publicaations	%	Cum. Publications	Cum %	w1	w2	RGR	Dt()
1	1987	105	0.46	105	0.46		4.654	4.65	0.15
2	1988	114	0.5	219	0.96	4.654	5.389	0.74	0.94
3	1989	129	0.56	348	1.52	5.389	5.852	0.46	1.5
4	1990	141	0.62	489	2.14	5.852	6.192	0.34	2.04
5	1991	183	0.8	672	2.94	6.192	6.51	0.32	2.18
6	1992	153	0.67	825	3.61	6.51	6.715	0.21	3.38
7	1993	154	0.67	979	4.28	6.715	6.887	0.17	4.05
8	1994	183	0.8	1162	5.08	6.887	7.058	0.17	4.04
9	1995	153	0.67	1315	5.75	7.058	7.182	0.12	5.6
10	1996	160	0.7	1475	6.45	7.182	7.296	0.11	6.04
11	1997	217	0.95	1692	7.4	7.296	7.434	0.14	5.05
12	1998	242	1.06	1934	8.46	7.434	7.567	0.13	5.18
13	1999	262	1.15	2196	9.6	7.567	7.694	0.13	5.45
14	2000	318	1.39	2514	11	7.694	7.83	0.14	5.12
15	2001	345	1.51	2859	12.5	7.83	7.958	0.13	5.39
16	2002	374	1.64	3233	14.1	7.958	8.081	0.12	5.64
17	2003	476	2.08	3709	16.2	8.081	8.219	0.14	5.05
18	2004	572	2.5	4281	18.7	8.219	8.362	0.14	4.83
19	2005	651	2.85	4932	21.6	8.362	8.504	0.14	4.9
20	2006	752	3.29	5684	24.9	8.504	8.645	0.14	4.88
21	2007	873	3.82	6557	28.7	8.645	8.788	0.14	4.85
22	2008	948	4.14	7505	32.8	8.788	8.923	0.14	5.13
23	2009	1030	4.5	8535	37.3	8.923	9.052	0.13	5.39
24	2010	1196	5.23	9731	42.6	9.052	9.183	0.13	5.28

25	2011	1531	6.69	11262	49.2	9.183	9.329	0.15	4.74
26	2012	1929	8.43	13191	57.7	9.329	9.487	0.16	4.38
27	2013	2229	9.75	15420	67.4	9.487	9.643	0.16	4.44
28	2014	2356	10.3	17776	77.7	9.643	9.786	0.14	4.87
29	2015	2568	11.2	20344	89	9.786	9.921	0.13	5.14
30	2016	2527	11.1	22871	100	9.921	10.04	0.12	5.92
	Total	22871	100						

It is seen from the Table 2 and 2.1, that the total number of publications is less than 1000 per year for the 22 years of study i.e. 1987-2008 and from 1991 to 1992. From the year 2009 onwards there is a steady growth on publications. Overall publication output was found to be steadily increasing in nature. The cumulative output of Tuberculosis is increasing every year. The cumulative percentage also shows that an increase of percentage

Table 3: Research Productivity Vs Document Type

S.No	**Document type**	**Number of Publications**	**%**
1	Article	18210	79.62
2	Review	2022	8.84
3	Letter	1251	5.47
4	Conference Paper	400	1.75
5	Note	274	1.20
6	Editorial	261	1.14
7	Book Chapter	252	1.10
8	Short Survey	154	0.67
9	Book	26	0.11
10	Erratum	21	0.09
	Total	22871	100.00

It is observed from the Table 3 that the scientific research output largely published in periodicals and sometimes as conference papers. Of course,some of those papers presented in conferences were further updated and published in journals of the respective branch of knowledge. In this study, it is observed from that more than three fourth of the contributions (79.62%) were journal articles, (8.84%) were reviews and (5.47%) were Letters. By and large it is found that the scholarly communication of Tuberculosis research output is mostly through journals, reviews and letters.

Table 4: Research Productivity Vs Languages

S.No	Language	No. of publications	%
1	English	22816	99.76
2	Turkish	17	0.07
3	French	10	0.04
4	Spanish	7	0.03
5	German	5	0.02
6	Italian	5	0.02
7	Portuguese	3	0.01
8	Chinese	2	0.01
9	Polish	2	0.01
10	Arabic	1	0.00
11	Croatian	1	0.00
12	Dutch	1	0.00
13	Estonian	1	0.00
	Total	22871	100.00

It is interesting to note that the scientific research communications contributed by Indian researchers in the field of tuberculosis in 12 other languages other than English. However 22816 (99.76%) publications out of 22871 were contributed in English language. It is followed by Turkish (17, 0.07%) and French (10, 0.04%). It is significant to note that some contributions are published in more than one language simultaneously. In other words the publications were in Turkish, French, Spanish, German, Italian and Russian are published in English language too. (Table 4)

Table 5: Authorship Pattern

S. No.	Author	Frequency	Percent	Cumulative Percent
1	Single Author	1558	6.8	6.8
2	Two Authors	3752	16.4	23.2
3	Three Authors	4260	18.6	41.8
4	Four Authors	4358	19.1	60.9
5	Five Authors	3075	13.4	74.3
6	Six and above	5868	25.7	100.0
	Total	22871	100.0	

The solo research can be seen only 6.8%. The collaborated research works out to 93.2%. Further it can be seen from the table 1.5 that more than Six and above authors have contributed more publications (25.7%) followed by four authors (19.1%) and three authors (18.6%).Further the authorship pattern has been calculated based on year wise as well as block years which can be seen from Tables 5 .

6. CONCLUSION

There are 3,08,800 publications on tuberculosis available in Scopus database. India has 22,871 publications and placed in third position on Tuberculosis research output, 33% of publications were produced by two countries. Eight countries together have 66% of publications. Ten countries together have nearly 72% of publications, 84 countries were collaborated in tuberculosis research with Indian authors. It is Interesting to note that the scientific research communications contributed by Indian researchers in the field of tuberculosis in 12 other languages other than English. Journal artic les, reviews and letters were the most preferred bibliographic form in Tuberculosis research communication. Tuberculosis research output doubles once in five years.

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