

ORIGINAL RESEARCH ARTICLE

Research progress on Leprosy Disease at Global Level: A Scientometric Study

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**ABSTRACT**

Leprosy is one of the oldest and notorious, but least understood diseases of man which continues to be a challenge to health worldwide, with about 2,50,000 new cases being currently detected every year. Leprosy was not a specified disease in the Millennium Development Goals, but improvements in other areas these cover, such as education and levels of poverty will help leprosy patients and services. This paper address to find the growth of Leprosy research using Pub Med database during the period from 1960 - 2012.

**Key words:** Leprosy, Leprosy research and Scientometric study.

**1. INTRODUCTION**

Among communicable diseases, leprosy remains a leading cause of peripheral neuropathy and disability in the world, despite extensive efforts to reduce the disease burden. Mathers *et al.* [1] and Britton and Lockwood [2] express disease prevalence, defined as the number of patients diagnosed with leprosy and registered for treatment over the course of a year, Durrheim and Speare [3] and Smith and Richardus [4] is very sensitive to factors such as treatment duration and case-finding method. As a result, alternative indicators such as the fraction of people with leprosy who have grade 2 disability (G2D) have been suggested to monitor the results of leprosy control activities.

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*. It usually affects the skin and peripheral nerves, but has a wide range of clinical manifestations. Among communicable diseases, leprosy is a leading cause of permanent physical disability. Timely diagnosis and treatment of cases, before nerve damage has occurred, is the most effective way of preventing disabilities due to leprosy; effective management of leprosy complications – including reactions and neuritis – can prevent or minimize the

development of further disabilities. The disease and its associated deformities are responsible for social stigma and discrimination against patients and their families in many societies.

The mode of transmission of the leprosy bacillus remains uncertain, but most investigators believe that *M. leprae* is spread from person to person primarily as a nasal droplet infection. The incubation period is unusually long for a bacterial disease: generally five to seven years. The peak age of onset is young adulthood, usually 20-30 years of age; the disease is rarely seen in children less than five years old. While humans are considered to be the major host and reservoir of *M. leprae*, other animal sources, including the armadillo, have been incriminated as reservoirs of infection. The epidemiological significance of these findings is unknown, but is likely to be very limited, except perhaps in North America. Unlike tuberculosis, there is no evidence to suggest that an association exists between HIV infection and leprosy.

*M. leprae* multiplies very slowly and the incubation period of the disease is about five years. Symptoms can take as long as 20 years to appear. Leprosy is not highly infectious. It is

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transmitted via droplets, from the nose and mouth, during close and frequent contacts with untreated cases. Untreated, leprosy can cause progressive and permanent damage to the skin, nerves, limbs and eyes. Early diagnosis and treatment with multidrug therapy (MDT) remain the key elements in eliminating the disease as a public health concern. BCG vaccination is known to have some protective effect against the disease. Though, there has been an enormous reduction in the number of patients registered for treatment, new cases of leprosy will continue to appear for many years or even decades. Therefore, health services must sustain the key provision of `quality services at all levels in the foreseeable future. The principles of integration, quality, equity and sustainability have been accorded primacy in the formulation of this Enhanced Global Strategy.

## 2. OBJECTIVES

To assess the research output year by year and over all during the study period of 1960 - 2012 at global level on the Leprosy research articles published by the Pub med and to assess the Relative growth time and period of the doubling time of the publication in the leprosy research field.

## 3. REVIEW OF LITERATURE

Review of related literature further avoids the duplication work that has already been done in that area. It also helps the researcher to study the different aspects of the problems. It enables the researcher to identify the unexplored areas, in order to create new grounds for research. While the science of Scientometric has historically been an academic study in information science, there are increasingly more practical uses for it in librarianship. There are a number of aspects of Scientrometric that would appeal to librarians. Scientometric is in sum, a research method that identifies patterns in scholarly publication utilizing quantitative analysis and statistics. Ryan *et al.* [5], have reported their quantitative assessment of a number of papers contained in MEDLINE related to selected types of assistive technology, and identified journals publishing significant number of papers related to AT, and evaluated them with quantitative productivity and quality measures. Rangnekar [6], has studied publications on multiple sclerosis during the period from 1988 - 1999 with data from in the Research Outputs Database. Ming-Hsen *et al.* [7], have scrutinized the science citation index (SCI), its coverage of journals that are the criterion for performance assessment of researchers' world-

wide. Roy and Goswami [8] conduct a Scientometric analysis of the body of literature contained in international peer - reviewed journals. Maurer and Salman Khan [9] provide a scientometric and content analysis of the studies in the field of e-learning that were published in five Social Science Citation Index (SSCI) journals.

## 4. MATERIAL AND METHODS

### 4.1 Data Collection

The publications of Leprosy research at global level from 1960-2012 were retrieved from Pub Med Database. Further, the bibliographical details of the publications of Leprosy research consist of contribution to journal articles, books, conference proceedings, reviews and letter/ correspondence etc.

The contribution of Leprosy research is covered by Pub Med of MEDLARS database. Papers published from global level were downloaded from the above databases. For analysis, it have been considered all papers published during 1960-2012 relating to Leprosy research.

## 5. ANALYSIS

### 5.1 Leprosy research output at Global level (World)

Papers published from 1960 – 2012 addressed in global level were downloaded from the above data base for analysis. For analysis, two year block is taken in to consideration for the convenience. The (Table 1) shows the distribution of Leprosy research output at Global level (World).

It is evident from a scrutiny of the above table that the Leprosy research output at the International level is high with 5.81% (1150) publications in the year 2004 - 2005, whereas in the year 1968 - 1969 the output is low with 1.62% (321). Further, it can be found that the research output gradually raise and fall year after year.

**Table 1:- Distribution of Leprosy research output at Global level (World)**

S. No	Year	Number of publication	Percentage	Cumulative Publication	Percentage
1	1960-1961	332	1.68	332	1.68
2	1962-1963	408	2.06	740	3.74
3	1964-1965	483	2.44	1223	6.18
4	1966-1967	460	2.32	1683	8.50
5	1968-1969	321	1.62	2004	10.13
6	1970-1971	476	2.41	2480	12.53
7	1972-1973	561	2.83	3041	15.36
8	1974-1975	476	2.41	3517	17.77
9	1976-1977	849	4.29	4366	22.06
10	1978-1979	746	3.77	5112	25.83
11	1980-1981	727	3.67	5839	29.50
12	1982-1983	743	3.75	6582	33.26
13	1984-1985	934	4.72	7516	37.97

14	1986-1987	743	3.75	8259	41.73
15	1988-1989	763	3.86	9022	45.58
16	1990-1991	800	4.04	9822	49.63
17	1992-1993	753	3.80	10575	53.43
18	1994-1995	860	4.35	11435	57.78
19	1996-1997	639	3.23	12074	61.00
20	1998-1999	928	4.69	13002	65.69
21	2000-2001	922	4.66	13924	70.35
22	2002-2003	1052	5.32	14976	75.67
23	2004-2005	1150	5.81	16126	81.48
24	2006-2007	978	4.94	17104	86.42
25	2008-2009	1146	5.79	18250	92.21
26	2010-2011	1001	5.06	19251	97.27
Total	2012	541	2.73	19792	100.00
		19792	100.00		

The two years block 1960 - 1961 and 1968 - 1969, the output is nearly 1 to 2 percent. The years 1962, 1963 to 1966 - 1967 and 1970 - 1971 to 1974 - 1975 the output is 2 to 3 percent. Next, the years 1978 - 1979 to 1982 - 1983 1986 - 1987, 1988 - 1989 and 1996 - 1997 where the output is 3 to 4 per cent. It is concluded that the highest output is in the years 2004 - 2005, 2008 - 2009 and 2010 - 2011.

## 5.2. Relative Growth Rate and Doubling Time

The following table shows the Relative Growth Rate and Doubling Time of Leprosy research output at the International (World) level.

(Table 2) presents data on the relative growth rate and doubling time of Leprosy research output at the International (World) level.

Leprosy research output at the International level was 332 articles in the year 1960 -1961 and it rose to 19792 in 53 years of the study period. The relative growth rate falls. It could be observed that its relative growth rate falls from 0.802 in 1960 - 1961 to 0.028 in 2012. The study period records the mean relative growth rate of 0.157. The doubling time for publications on Leprosy research at the International level increased from 0.865 in 1960 - 1961 to 25.005 in 2012. The doubling time for publications at the aggregate level has been computed as 7.567 years.

**Table 2: Relative Growth Rate (R) and Doubling Time of Leprosy research output at the International (World) level**

S. No	Year	Number of publication	Cumulative Publication	W1	W2	RG	DT
1	1960-1961	332	332				
2	1962-1963	408	740	5.805	6.61	0.802	0.865
3	1964-1965	483	1223	6.607	7.11	0.502	1.379
4	1966-1967	460	1683	7.109	7.43	0.319	2.171
5	1968-1969	321	2004	7.428	7.60	0.175	3.970
6	1970-1971	476	2480	7.603	7.82	0.213	3.252
7	1972-1973	561	3041	7.816	8.02	0.204	3.398
8	1974-1975	476	3517	8.020	8.17	0.145	4.765
9	1976-1977	849	4366	8.165	8.38	0.216	3.205
10	1978-1979	746	5112	8.382	8.54	0.158	4.393
11	1980-1981	727	5839	8.539	8.67	0.133	5.212
12	1982-1983	743	6582	8.672	8.79	0.120	5.786
13	1984-1985	934	7516	8.792	8.92	0.133	5.222
14	1986-1987	743	8259	8.925	9.02	0.094	7.351
15	1988-1989	763	9022	9.019	9.11	0.088	7.843
16	1990-1991	800	9822	9.107	9.19	0.085	8.157
17	1992-1993	753	10575	9.192	9.27	0.074	9.382
18	1994-1995	860	11435	9.266	9.34	0.078	8.863
19	1996-1997	639	12074	9.344	9.40	0.054	12.745
20	1998-1999	928	13002	9.399	9.47	0.074	9.359
21	2000-2001	922	13924	9.473	9.54	0.069	10.115
22	2002-2003	1052	14976	9.541	9.61	0.073	9.515
23	2004-2005	1150	16126	9.614	9.69	0.074	9.367
24	2006-2007	978	17104	9.688	9.75	0.059	11.770
25	2008-2009	1146	18250	9.747	9.81	0.065	10.686
26	2100-2011	1001	19251	9.812	9.87	0.053	12.978
Total	2012	541	19792	9.865	9.89	0.028	25.005
		19792				0.157	7.567

**Table 3: Distribution of subject area of Leprosy research publication**

S. No	Year	Number of publication	Percentage	Cumulative Publication	Percentage
1	Leprosy in General	11559	58.40	11559	58.40
2	Leprosy Review	3197	16.15	14756	74.56
3	Leprosy Epidemiology	528	2.67	15284	77.22
4	Lepromatous Leprosy	495	2.50	15779	79.72
5	Leprosy reaction	785	3.97	16564	83.69
6	Leprosy Neuropathy	469	2.37	17033	86.06
7	Leprosy treatment	2141	10.82	19174	96.88
8	Others	618	3.12	19792	100.00
		19792	100.00		

There is a steady increase in the number of Leprosy research output at the International (World) level. However, relative growth rate shows a *down* trend; it means the rate of increase is low in terms of volume: this is highlighted by the doubling time of Leprosy research output at the International level which is higher than the relative growth rate.

### 5.3. Subject area of Leprosy research publication

The following table shows the distribution of the total publication on the Leprosy research with related subject.

The above table shows the Leprosy publication distributed in eight major areas. Among them leprosy in general occupy the top most place having over fifty eight per cent of the total publications. Followed by Leprosy Review 16.15 percent, Leprosy treatment 10.82 percent, Leprosy reaction 3.97 percent, Leprosy Epidemiology 2.67 per cent, Lepromatous Leprosy 2.50 percent, and Leprosy Neuropathy 2.37 percent.

### 6. CONCLUSION

Access to information, diagnosis and treatment with multidrug therapy remain key elements in the strategy to eliminate the disease as a public health problem, defined as reaching a prevalence of less than 1 leprosy case per 10,000 population. Only a couple of endemic countries have still to achieve this goal at the national level; most are now applying the same elimination strategy at regional, district and sub-district levels.

Leprosy control, based on timely detection of new cases and their treatment with effective chemotherapy in the form of multidrug therapy, will not change over the coming years. The emphasis will remain on sustaining the provisions for quality patient care that are equitably distributed, affordable and easily accessible. Currently, there are no new technological breakthroughs or developments that warrant any drastic changes to the strategy for leprosy control that is in place.

There is an urgent need to bring about decisive and innovative changes to the organization of leprosy control and the working arrangements among all partners, as well as to influence the attitude of health-care providers, persons affected

by leprosy and their families, and the general public.

### REFERENCE

1. Mathers CD, *et al.* (2007) Measuring the burden of neglected tropical diseases: the global burden of disease framework. PLoS Negl Trop Dis. 2007; 1:e114. doi: 10.1371.
2. Britton WJ and Lockwood DN. (2004). Leprosy. Lancet, 2004; 3, 63 p.1209 – 1219.
3. Durrheim DN and Speare R. (2003) Global leprosy elimination: time to change more than the elimination target date. J Epidemiol Community health. 2003; 57: 316 – 317.
4. Smith C and Richardus JH. (2008) Leprosy strategy is about control, not eradication. Lancet. 2008; 371: 969 – 970.
5. Ryan, C., *et al* (2004). Estimating Research Productivity and Quality in Assistive Technology: a Bibliometric Analysis Spanning Four Decades. IEEE Transactions on Neural Systems and Rehabilitation Engineering, Vol. 12, No. 4 pp. 422-429.
6. Rangnekar, D., (2005). Analysing the Bibliometric Presence of the Multiple Sclerosis Society. Aslib Proceedings-New Information Perspectives, Vol. 57, No. 3, 2005.
7. Ming-Hsen *et al.* (2006). The Impact of Impact Factor on Small Specialties: a Case Study of Family Medicine in Taiwan. Scientometrics, Vol. 66, No. 3, pp. 513 – 520.
8. Roy, Arup and Goswami, Chandana (2013) "A scientometric analysis of literature on performance assessment of microfinance institutions (1995-2010)", International Journal of Commerce and Management, Vol. 23 Iss: 2, pp.148 – 174.
9. Maurer, Hermann and Khan, Muhammad Salman (2010) "Research trends in the field of e-learning from 2003 to 2008: A scientometric and content analysis for selected journals and conferences using visualization", Interactive Technology and Smart Education, Vol. 7 Iss: 1, pp.5 – 18.