

Open Access Movement in Medicine: A Study of Contribution of Different States of India

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Abstract

The paper is an endeavor to reveal the growth of open access (OA) literature in medicine across various states of India. The study has taken data for five year period i.e. 2005 – 2009 to understand the growth and contribution of various states of India to OA literature in medicine. The study worked at the article level to see the contribution of various states of India in OA journals. For this Elsevier's Scopus database indexed OA journals were used to identify the top contributing states of India and their corresponding research output.

Keywords: Open Access, Open Access – Medicine, Open Access – India

1. Introduction

Open access (OA) to scholarly communications ensures global visibility and accessibility, resulting in increased global recognition. Open access to information and knowledge not only enables digital inclusion of common citizens, particularly under-privileged communities, but also bridges economic divide. The online environment has brought about a revolution in scholarly publishing. Scholars now publish on the web, whether in an online journal or to their own web site (Young, 2009). Debates and discussions of open access have received increasing attention in the academic, scholarly research, and publishing communities around the globe. Though the concept of open access is still evolving, there are many aspects of the discussions. There are numerous definitions and interpretations of open access. The 2002 Budapest Open Access Initiative's definition on open access is quite comprehensive: Free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. In essence, most open access proponents agreed that scholarly literature should be freely available online. The open access movement has continued gaining momentum from library and information associations, research funding agencies, scholarly societies, and institutions of higher education (Zhang, 2007). The goal of "open access" is to grant anyone, anywhere and anytime, free access to the results of scientific research (Mele, 2009).

The movement towards open access has been building for more than a decade but today, the number of open access journals has grown very high and more than 8347 journals are listed only in Directory of Open Access Journals (DOAJ). Like other advanced countries of the world India is also contributing a sizeable amount of literature to the open access movement. In India a number of internationally-reputed institutions are producing good amount of research outcome that are expanding the frontier of knowledge and scope for

technological innovation. Poor access to international journals and the consequential low visibility of the papers are major problems facing Indian researchers. Open access is viewed as a solution to remedy this deficit. In India concept of open access is taking its roots. The present study made an attempt to ascertain the trends in open access publishing across various states of India. The study made an endeavour to assess the research contribution of each state towards open access movement in the field of medicine.

2. Objectives

The study made an attempt to fulfil following objectives:

- ◆ To assess and compare the contribution of various Indian states towards open access movement.
- ◆ To gauge the growth and trend of open access publications of India.

3. Scope

The scope of the present study is limited to research articles that include conference papers, reviews, letters, short surveys and editorials contributed by different states of India from 2005 - 2009 to OA journals in the field of medicine.

4. Methodology

The present study worked at the article level to see the contribution of Indian states in OA journals. For this Elsevier's Scopus database indexed OA journals were used to identify the top contributing states of India and their corresponding research output covering a time period of 2005 - 2009. Articles published were searched through Scopus to observe the contribution of each Indian state. Scopus maintains 47 million records, 70% with abstracts, covers over 19,500 titles from 5,000 publishers worldwide and includes over 4.9 million conference papers. It also includes 1,200 open access journals (www.scopus.com). Out of 1,200 journals 615 belong to field of medicine. In total 1, 81, 302 articles were considered for this study covering 550 (89.4%) journals of medicine published around the world. Random selection of journals was used as a method for the study. The research article output of each Indian state was ascertained.

5. Review of Literature

Many investigations have been conducted all around the world on open access concept. These studies are very helpful in understanding the modern dynamic concept of open access movement. Nicholas, Huntington and Rowlands (2005) reveal that authors based in Asia, Africa, Eastern Europe and South America are about twice as likely to publish in OA journals compared to those based in Australia, US and Western Europe. As per Turk (2008), despite a significant growth in the number of research papers available through Open Access, principally through author self-archiving in institutional archives, it is estimated that only 20 per cent of the papers published annually are Open Access. Recent studies have begun to show that Open Access increases impact. Moreover the study found most of the articles in the sciences are currently OA and fewer articles in social sciences. However, according to Frandsen (2009) authors from developing countries are not more attracted to OA journals than authors from developed countries. Authors from

developing countries do not publish more in OA journals than authors from developed countries and furthermore, authors from developing countries do not cite OA journals more than authors from developed countries. Jacso (2006) revealed that PubMed Central database of the National Institute of Health is by far the largest provider of open access full-text journal articles in medicine and the life sciences. PubMed itself has been a mightily powerful open access indexing/abstracting database with links to open access articles. Of the new publishers, BioMed Central stands out by offering open access to full-text documents in more than 160 journals. There are many open access scholarly journal article and conference paper collections being built around the world. According to Nazim and Devi (2008), among the top 25 publishing countries, India ranks 12th for the overall number of journals, but drops to 18th for journals with online content. Surprisingly, its position in the list of open access journals is fifth, well ahead of countries such as Netherlands, China, Germany, Australia, and so on which are higher in the list of online journals. Among the non-high income countries, India ranks second only to Brazil for the number of open access journals. Almost 50% of online journals from India are open access. A detailed study on the Academic staff members of two first generation universities in Nigeria is carried out by Utulu and Bolarinwa (2009) on open access initiatives adoption. According to their study only 30% of the respondents deposit their scholarly works as pre-prints, 23.3% deposit their scholarly works as post-prints, while 35% publish their papers in open access journals. Besides 40% download and use pre-prints and post-prints from subject-based repositories, while 46.7% use academic papers published in open access journals. According to Kersting and Pappenberger (2009), in 2007 the library of the University of Konstanz conducted a survey including all university researchers (professors, postdocs and PhD-students), and inquired about their actual and estimated behaviour using literature and information. The study reveals that there is a broad basic knowledge about open access in the different departments. About 60.9% of the researchers stated that they use open access journals for their research. It is not surprising that this percentage is higher in the natural sciences (up to 75.4%) than in the arts (50-56.8%) and the social sciences (50%-55.2%). Overall, more than half of the researchers reported reading open access publications. Bhat (2009) found that out of 17,516 articles, 1367 (7.8%) are published in 245 open access journals with 884 (64.66%) published in 77 Indian open access journals and 483 (35.33%) articles published in 168 foreign open access journals. Collectively the 1,367 open access articles appeared in 184 journals with the average of 7.42 articles per journal.

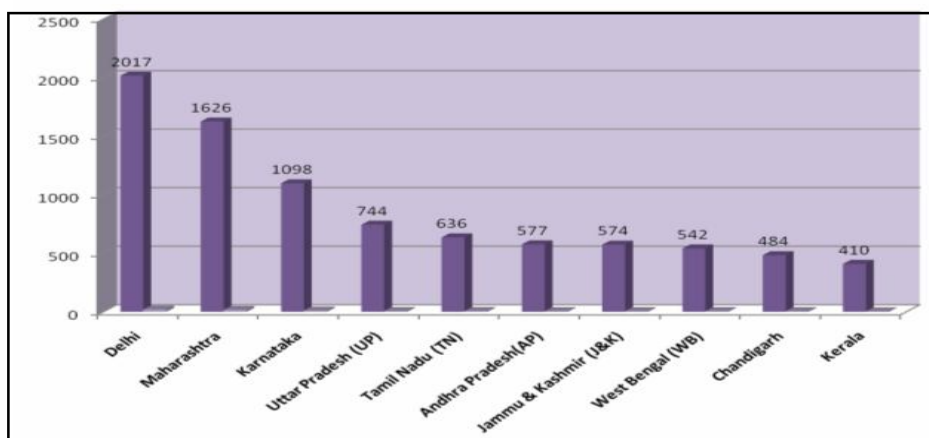
6. Analysis of Data

6.1 Top Contributing States

Analysis of data showed that a good amount of articles (10,099) have been contributed by Indian states towards the open access movement in the field of medicine across a period of 5 years from 2005 to 2009. Delhi, the capital of India is the premier state contributing the highest 2,017 (19.97%) articles in open access journals published around globe. The Indian state with 2nd highest 1,626 (16.10%) contribution in open access journals is Maharashtra followed by Karnataka at 3rd position with 1,098 (10.87%) publications and Uttar Pradesh (UP) at 4th spot with a contribution of 744 (7.37%) open access articles. Tamil Nadu (TN) with 636 (6.30%), Andhra Pradesh (AP) with 577 (5.71%) and Jammu & Kashmir (J&K) with 574 (5.68%) articles occupy the 5th, 6th and 7th spot respectively. This is shown in Table 1 and aided with Fig.1.

Table 1: Top 15 States from 2005-2009 (N=10,099)

Rank	State	Output	%age
1	Delhi	2,017	19.97
2	Maharashtra	1,626	16.10
3	Karnataka	1,098	10.87
4	Uttar Pradesh (UP)	744	7.37
5	Tamil Nadu (TN)	636	6.30
6	Andhra Pradesh (AP)	577	5.71
7	Jammu & Kashmir (J&K)	574	5.68
8	West Bengal (WB)	542	5.37
9	Chandigarh	484	4.79
10	Kerala	410	4.06
11	Punjab	302	2.99
12	Gujarat	285	2.82
13	Rajasthan	163	1.61
14	Madhya Pradesh (MP)	145	1.44
15	Haryana	134	1.33

**Figure1: Ranking of Indian States**

6.2 Yearwise Contribution

6.2.1 Leading States in 2005

Out of a total of 1,666 (16.50%) articles being contributed by Indian states in open access journals in the year 2005, Delhi came out to be the leading one with 397 (23.83%) publications. Maharashtra took the 2nd spot

with 288 (17.29%) articles followed by Jammu & Kashmir (J&K) with 129 (7.74%) and Karnataka with 126 (7.56%) article publications occupying 3rd and 4th ranks respectively. The 5th and 6th positions were taken by Andhra Pradesh (AP) with 114 (6.84%) articles and Uttar Pradesh (UP) with 98 (5.88%) articles. This is highlighted in Table 2 and supplemented with Fig.2.

Table2: Leading States in 2005 (N=1,666)

Rank	State	Output	%AGE
1	Delhi	397	23.83
2	Maharashtra	288	17.29
3	Jammu & Kashmir (J&K)	129	7.74
4	Karnataka	126	7.56
5	Andhra Pradesh (AP)	114	6.84
6	Uttar Pradesh (UP)	98	5.88
7	Chandigarh	91	5.46
8	West Bengal (WB)	86	5.16
9	Tamil Nadu (TN)	84	5.04
10	Kerala	59	3.54
10	Punjab	59	3.54
11	Gujarat	48	2.88
12	Madhya Pradesh (MP)	18	1.08
13	Rajasthan	17	1.02
14	Haryana	13	0.78
15	Himachal Pradesh (HP)	10	0.60

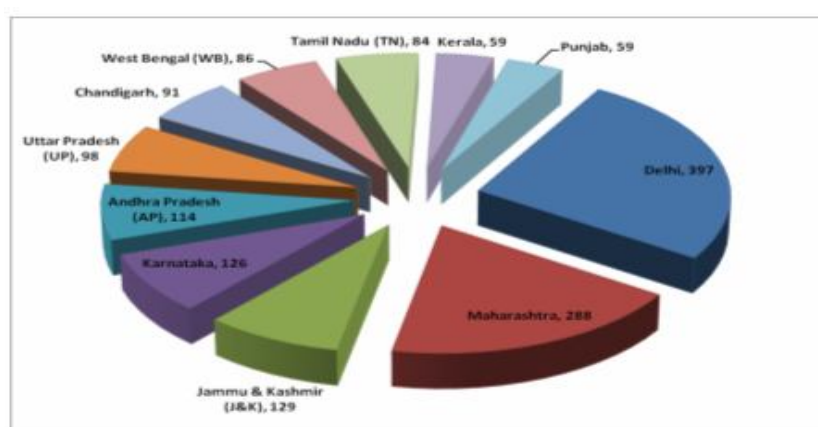


Figure 2: Highest Ranked States in 2005

6.2.2 Leading States in 2006

Delhi was the top contributing state in 2006 as well with 398 (21.24%) article publications out of a total of 1,874 (18.56%) open access publications from India. Again Maharashtra with 263 (14.03%) articles took the 2nd place followed by Karnataka dislodging J&K at 3rd position with 182 (9.71%) article publications. Tamil Nadu (TN) with 143 (7.63%) articles gained 4 places to reach 4th spot while as Jammu & Kashmir (J&K) with 140 (7.47%) articles went down to 5th spot respectively. This can be seen from Table 3 supported by Fig. 3.

Table 3: Leading States in 2006 (N=1,874)

Rank	State	Output	%AGE
1	Delhi	398	21.24
2	Maharashtra	263	14.03
3	Karnataka	182	9.71
4	Tamil Nadu (TN)	143	7.63
5	Jammu & Kashmir (J&K)	140	7.47
6	Uttar Pradesh (UP)	132	7.04
7	Andhra Pradesh (UP)	109	5.82
8	Chandigarh	99	5.28
9	West Bengal (WB)	96	5.12
10	Kerala	94	5.02
11	Punjab	54	2.88
12	Gujarat	38	2.03
13	Madhya Pradesh (MP)	28	1.49
14	Rajasthan	22	1.17
15	Haryana	21	1.12

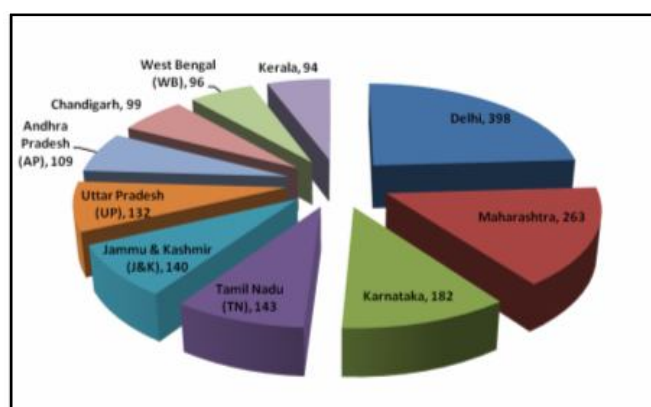


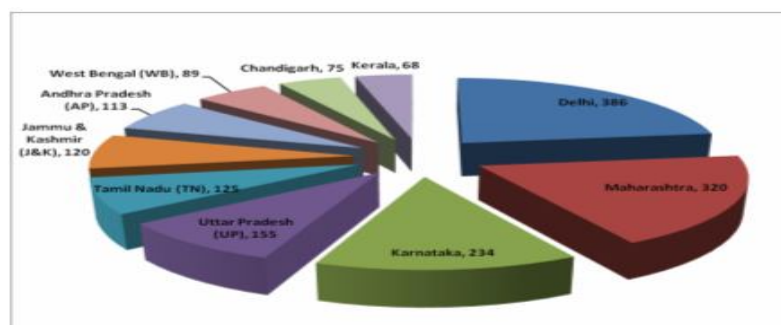
Figure 3: Highest Ranked States in 2006

6.2.3 Leading States in 2007

Indian states contributed a chunk of 1,979 (19.56%) open access publications in 2007 with the top 3 states in 2005 & 2006 retaining their positions. Delhi once again topping the list contributing 386 (19.50%) article publications followed by the state of Maharashtra at 2nd spot with 320 (16.17%) articles and Karnataka at 3rd place with 234 (11.82%) article contributions. However, Uttar Pradesh (UP) moved up to 4th position with 155 (7.83%) articles sending Tamil Nadu (TN) to 5th spot with 125 (6.32%) articles. This is clear from Table 4 supplemented with Fig.4.

Table 4: Leading States in 2007 (N=1,979)

Rank	State	Output	%AGE
1	Delhi	386	19.50
2	Maharashtra	320	16.17
3	Karnataka	234	11.82
4	Uttar Pradesh (UP)	155	7.83
5	Tamil Nadu (TN)	125	6.32
6	Jammu & Kashmir (J&K)	120	6.06
7	Andhra Pradesh (AP)	113	5.71
8	West Bengal (WB)	89	4.50
9	Chandigarh	75	3.79
10	Kerala	68	3.44
11	Gujarat	65	3.28
12	Punjab	56	2.83
13	Rajasthan	39	1.97
14	Haryana	28	1.41
15	Madhya Pradesh (MP)	17	0.86



6.2.4 Leading States In 2008

The top 5 states of 2007 maintained their positions in 2008 as well. Delhi retained the top position in 2008 with 378 (17.42%) articles out of a total of 2,170(21.49%) open access articles contributed by India in this year. The 2nd and 3rd positions were again held by Maharashtra with 335 (15.44%) articles and Karnataka with 270 (12.44%) articles respectively followed by Uttar Pradesh (UP) seizing the 4th spot with 183 (8.43%) articles. Tamil Nadu (TN) occupied 5th spot with 160 (7.37%) articles followed by West Bengal (WB) at 6th place with 129 (5.94%) articles contributed in 2008. This is shown in Table 5 and aided with Fig.5.

Table 5: Leading States in 2008 (N=2,170)

Rank	State	Output	%AGE
1	Delhi	378	17.42
2	Maharashtra	335	15.44
3	Karnataka	270	12.44
4	Uttar Pradesh (UP)	183	8.43
5	Tamil Nadu (TN)	160	7.37
6	West Bengal (WB)	129	5.94
7	Andhra Pradesh (AP)	119	5.48
8	Jammu & Kashmir (J&K)	101	4.65
9	Chandigarh	100	4.61
10	Kerala	95	4.38
11	Punjab	59	2.72
12	Gujarat	50	2.30
13	Rajasthan	43	1.98
14	Madhya Pradesh (MP)	37	1.71
15	Haryana	36	1.66

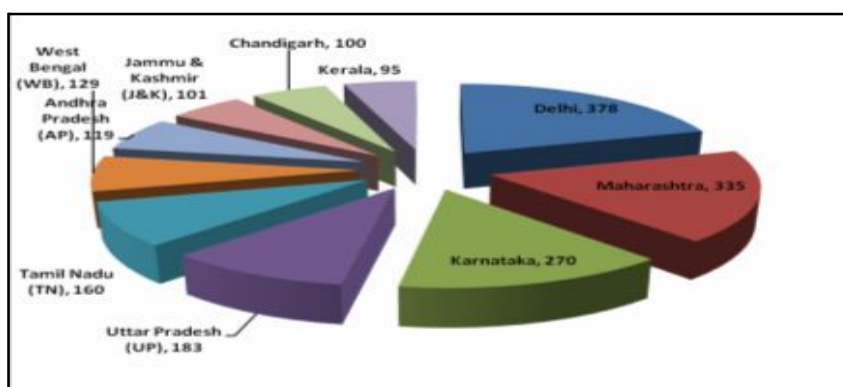


Figure 5: Highest Ranked States in 2008

6.2.5 Leading States In 2009

Delhi turned out to be the leading contributor towards open access (OA) movement in the field of medicine from 2005 to 2009 with 458 (19.00%) articles in 2009 out of a total of 2,410 (23.86%) articles contributed by Indian states this year. Maharashtra with 420 (17.43%) articles continued to occupy its 2nd position followed by Karnataka with 286 (11.87%) articles at 3rd spot. The 4th position was again seized by Uttar Pradesh (UP) with 176 (7.30%) articles while as West Bengal (WB) got the 5th rank with 142 (5.89%) article contributions. This is highlighted in Table 6 and Fig.6 provides a lucid picture.

Table 6: Leading States in 2009 (N=2,410)

Rank	State	Output	%AGE
1	Delhi	458	19.00
2	Maharashtra	420	17.43
3	Karnataka	286	11.87
4	Uttar Pradesh (UP)	176	7.30
5	West Bengal (WB)	142	5.89
6	Tamil Nadu (TN)	124	5.15
7	Andhra Pradesh (AP)	122	5.06
8	Chandigarh	119	4.94
9	Kerala	94	3.90
10	Jammu & Kashmir (J&K)	84	3.49
10	Gujarat	84	3.49
11	Punjab	74	3.07
12	Madhya Pradesh (MP)	45	1.87
13	Rajasthan	42	1.74
14	Haryana	36	1.49
15	Orissa	28	1.16

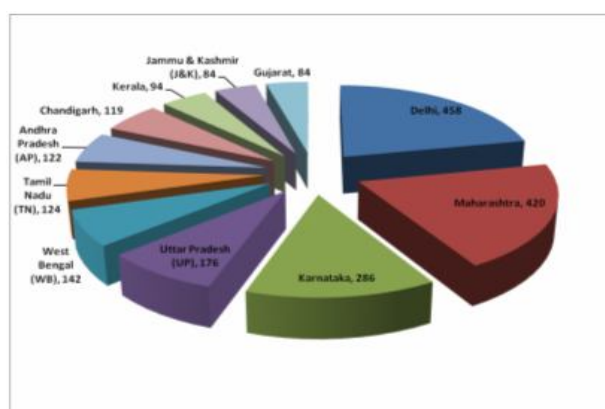


Figure 6: Highest Ranked States in 2009

6.2.6 Growth of Articles From 2005-2009

As far as the growth of open access articles is concerned, the analysis of data revealed a continuously increasing trend of contribution towards open access movement in Indian states from 2005-2009. In 2005, only 1,666 articles were contributed by Indian states which rose to 1,874 articles in 2006 and then there was further escalation in the year 2007 with 1,979 articles. 2008 and 2009 proved to be most productive years with 2,170 and 2,410 articles respectively. This trend is shown in Table 7. This also shows a massive 744 (44.66%) article increase during 5 years from 2005-2009. Table 7 and Fig.7 gives a lucid view of this trend.

Table 7: Growth of Articles over Consecutive Years

Year	2005	2006	2007	2008	2009	Total
Articles	1,666	1,874	1,979	2,170	2,410	10,099
Growth	-	208(12.48%)	105(5.60%)	191(9.65%)	240(11.06%)	
Overall Growth	-				744(44.66%)	

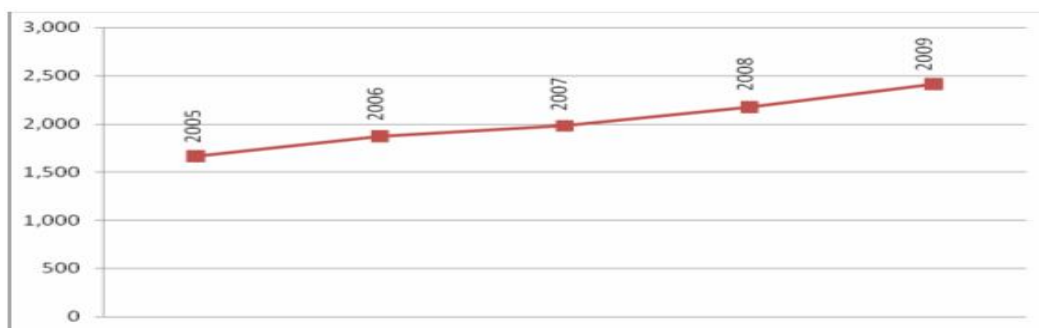


Figure7. Growth of Articles over Consecutive Years

7. Conclusion

The OA movement is gaining ground in all fields of knowledge with special reference to SMT. Huge number of OA journals in the field of medicine is testimony to the fact that the concept is taken well by the medicos. But it is very surprising the movement has not gained the ground which is expected from India. Though awareness level is somewhat good among bigger states of India but majority of states are yet to nurture the fruits of OA in an expected manner. Secondly the overall contribution of India to OA journals in medicine is very small, 10,099 articles, which again emphasis the fact that much needs to be done to initiate awareness at institutional, provincial, country and regional level among stakeholders of the benefits of OA movement and its direct positive impact on socio economic development of the country and world at large.

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