Iron Deficiency Anemia: A Scientometric Analysis of Indian Research Output during 2006-15

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Abstract

The study examines the Indian research output consisting of 717 publications on "iron deficiency anemia" as covered in Scopus database during 2006-15. Different parameters including publication growth, citation impact, share of international collaborative papers and identification of major international collaborative partners, global rank and share of India amongst the top 20 most productive countries, productivity and citation impact of leading Indian institutes and authors, medium of communication in most productive journals. The Indian publications output in the iron deficiency anemia research consisted of 717 articles during 2006-15 and witnessed an annual average growth rate of 18.77%. The average citation impact per article registered by the Indian publications for iron deficiency anemia research was 6.45 during 2006-15 which decreased from 10.63 during 2006-10 to 4.46 during 2011-15. The international collaborative share of India in the iron deficiency anemia research was 12.27% during 2006-15 which decreased from 12.99% during 2006-10 to 11.93% during 2011-15.

Keywords: Iron deficiency anemia, India, Publications, Bibliometrics, Scientometrics

1. Introduction

Hemoglobin is blood protein that carries oxygen to body cells and is essential for healthy functioning of cells, skin, hair and nails (NHS Choices, ; WebMD, n.d.). The decrease of hemoglobin or red blood cells in the body is called anemia (Johnson et al., 2011). The world Health Organisation has defined anaemia as blood hb values less than 13g/dl in men and 12g/dl in women. Iron is needed to make new blood cells in the bone marrow. The reduction of hemoglobin due to deficiency of iron is known as iron deficiency anemia. Iron deficiency anemia is one of the most common causes of anaemia (ASH; Medscape; MedlinePlus, n.d.). The low

bioavailability of iron can be due to insufficient dietary intake, malabsorption due to diseases such as gastritis, celiac disease, ulcerative colitis, gastric bypass surgery or due to chronic blood loss. Iron deficiency anemia is most common in women with heavy menstrual blood flow, pregnant or breast feeding women and in children with worm infestation. The general symptoms of anemia include tiredness/lethargy, headaches, pallor skin color, brittle nails, shortness of breath, pica, spoon shaped nails (Koilonychia), sore tongue, tinnitus and heart palpitations (Healthline; "Iron Deficiency Anemia"; WHO, n.d.).

According to World Health Organization, 2 billion people i.e. over 30% of the world's population are anemic. 40% of preschool children and every second pregnant women are anemic in developing countries. Iron deficiency anemia has become an epidemic. 20% of maternal deaths are due to anaemia (Ramalingam, 2014) .

2. Literature Review

There are no specific studies on Iron deficiency anemia research output. However, a scientometric study has been conducted on anemia research output in India during 1993-2013 by Ramalingam and Chamy (2014) using Scopus database. The study focused on publication growth, authorship pattern and degree of collaborations, etc. Daneshmand et al. (2015) studied haematological research productivity among five Islamic countries during 1996 to 2013 based on SCImago Journal Ranking (SJR). The study found an increase in the number of documents and citations of the five countries during the period. The countries under study published 0.248% of the total global production in the field of hematology. Gupta (2012) analysed the heredity blood disorder research output carried out during 2002-11 on different parameters including the global publications share and citation quality of top 10 leading countries, India's growth, citation impact, share of international collaborative papers, contribution of major collaborative partner countries, contribution of various subject fields and by type of heredity blood disorder, pattern of research communication in most productive journals, productivity and citation profile of top Indian institutions and authors and characteristics of highly cited papers.

3. Objectives

The main objective of this study is to analyze the iron deficiency anemia research output in India during 2006-15. The study has the following objectives: (i)To study the growth of world and Indian literature and study its distribution by type of documents and sources; (ii) To study the global contribution and global publication share of top 20 most productive countries; (iii) To study the distribution of Indian research output by broad subject areas and identification of significant keywords; (iv) To study the publication productivity and citation impact of most productive organizations and authors and; (v) To study the pattern of communication of the Indian output in the most productive journals.

4. Methodology

The study retrieved and downloaded the relevant data on iron deficiency anemia research of the world and other 20 most productive countries for a period of 10 years (2006-15). An advanced search strategy using 'iron deficiency anemia' as the keyword was used to search and download data by using the ''Title, Abstract and keywords'' field, resulting in the downloading of 8825 and 717 global and Indian records related to the iron deficiency anemia research. When the main search string was restricted to 20 most productive countries one by one in "country tag" as shown below, the publication data on these individual countries were obtained. Using analytical commands in Scopus database such as "subject area tag", "country tag", "source title tag" and "affiliation tag", the authors could retrieve information on distribution of publications by subject, collaborating countries, organization-wise and "journal-wise'', etc.

(TITLE-ABS-KEY("iron deficiency anemia") AND AFFILCOUNTRY(india)) AND PUBYEAR > 2005 AND PUBYEAR < 2016

5. Data Analysis

5.1 Publication Analysis

5.1.1. Global Publication Output and Share of 20 Most Productive Countries

The global research output on iron-deficiency anemia consisted of 8825 publications and has grown from 640 papers in 2006 to 1093 papers in 2013 and 911 papers in 2015, witnessing a annual average growth rate of 3.0% during 2006-2015. The global cumulative publications grew from 3821 to 5004 papers, registering a growth rate of 30.96% from 2006-10 to 2011-15. The global publication share of the top 20 countries on iron-deficiency anemia varied from 1.42% to 21.62% during 2006-15, with the highest publication share coming from the United States (21.62%), followed by India (8.12%), United Kingdom (7.71%), Italy (5.-05%), Turkey, Spain, Germany, Canada, Brazil, Japan (with publication shares ranging from 4.82% to 3.03%), China, France, Australia, Switzerland, Iran, Netherlands, Pakistan, Greece, South Korea, Israel (with publication shares ranging from 2.97% to 1.42%). India ranks second in iron –deficiency anemia research with its global publication share of 8.12% during 2006-15, which witnessed a remarkable increase of 3.67% as compared to United States which showed a decrease of 2.44% from 2006-10 to 2011-15. Among other countries, increase in publication share is witnessed by China (1.14%), South Korea (1.14%), Germany (0.79%), Pakistan (0.72%), Iran (0.67%), Spain (0.44%), Turkey (0.33%), United Kingdom (0.2%), Turkey (0.14%), Australia (0.11%) and Israel (0.01%) as against decrease by 2.44% in United States, Brazil (0.85%), Greece (0.55%), Japan (0.43%), Switzerland (0.26%), Canada (0.21%), France (0.13%) and Netherlands (.07%) from 2006-10 to 2011-15. The top 20 most productive countries together contributed 85.64%

share of the global output during 2006-15, which increased from 83.06% to 87.6% from 2006-10 to 2011-15 (Table 2).

Table 1
Growth of World and Indian Publications and Citations
on Iron deficiency anemia during 2006-15

Period	World	India				
	TP	TP	TC	ACPP	ICP	%ICP
2006	640	26	278	10.69	4	15.38
2007	663	47	424	9.02	5	10.64
2008	794	44	958	21.77	5	11.36
2009	817	47	386	8.21	8	17.02
2010	907	67	410	6.12	8	11.94
2011	971	83	274	3.30	7	8.43
2012	979	87	1423	16.36	9	10.34
2013	1093	100	257	2.57	17	17.00
2014	1055	117	100	0.85	10	8.55
2015	906	99	115	1.16	10	10.10
2006-2010	3821	231	2456	10.63	30	12.99
2011-2015	5004	486	2169	4.46	58	11.93
2006-2015	8825	717	4625	6.45	88	12.27

5.1.2 India's Research Output in Iron Deficiency Anemia

India's publications on iron deficiency anemia consists of 717 articles during 2006-15, which increased from 26 papers in 2006 to 99 papers in 2015, registering an annual average growth rate of 18.77%.. India's cumulative publication in Iron deficiency anemia has grown from 231 to 486 papers from 2006-10 to 2011-15, registered a growth rate of 110.38%. India ranks 2nd in global research output with a global publication share of 8.12% in iron-deficiency anemia during 2006-15, which increased from 6.04% to 9.71% from 2006-10 to 2011-15. The average citation per paper registered by India publications was 6.45 during 2006-15, which decreased from 10.63 to 4.46 from 2006-10 to 2011-15. Of the total 717 publication on iron-deficiency anemia 77.55% (556) appeared as articles, 1.95 %(14) as notes, 1.67 % as conference papers, 1.26% (9) as editorials, 0.84% (6) as book chapters, 0.425% (3) as articles in press and 0.28% (2) as short survey during 2006-15 (Table 2).

Table 2
Global Publication Output and Share of Top 20 Countries in
Iron Deficiency Anemia Research during 2006-15

Country	Number of Publications			Share of Publications		
	2006-10	2011-15	2006-15	2006-10	2011-15	2006-15
United States	879	1029	1908	23.0	20.56	21.62
India	231	486	717	6.04	9.71	8.12
United Kingdom	290	390	680	7.59	7.79	7.71
Italy	190	256	446	4.97	5.11	5.05
Turkey	177	248	425	4.63	4.96	4.82
Spain	146	213	359	3.82	4.26	4.07
Germany	121	198	319	3.17	3.96	3.61
Canada	122	149	271	3.19	2.98	3.07
Brazil	134	133	267	3.51	2.66	3.03
Japan	125	142	267	3.27	2.84	3.03
China	84	178	262	2.2	3.56	2.97
France	112	140	252	2.93	2.8	2.86
Australia	100	136	236	2.61	2.72	2.67
Switzerland	101	119	220	2.64	2.38	2.49
Iran	79	137	216	2.07	2.74	2.45
Netherlands	86	109	195	2.25	2.18	2.21
Pakistan	43	92	135	1.12	1.84	1.53
Greece	70	64	134	1.83	1.28	1.52
South Korea	30	96	126	0.78	1.92	1.43
Israel	54	71	125	1.41	1.42	1.42
Total of the world	3821	5004	8825			
Total of 20 countries	3174	4386	7560			
Share of Top 20 countries	83.06	87.65	85.67			

5.2. International Collaboration

The share of international collaborative publication output on iron-deficiency anemia (IDA) was 12.27% (88 papers), which decreased from 12.99% to 11.93% from 2006-10 to 2011-15. (Table2). USA contributed the largest share (43.18%) of international collaborative papers of India on IDA, followed by U.K. (22.73%), Switzerland (19.32%), Australia (12.50%), Canada (11.36%) and Sweden (7.95%), Germany Sri Lanka & France (6.82% each), Pakistan, Italy, Denmark, Singapore and Netherlands (5.68 each). The collaborative publication share in India's output increased by 14.26% in U.K, followed by Sri Lanka (10.34%), Australia (8.85%), Singapore, Netherlands, Denmark (8.63% each), Canada (7.12% each), Sweden (7.01%), Taiwan, New Zealand and Russian Federation (6.9% each); Germany and France (5.29% each),

Pakistan and Italy (3.57% each), Philippines (1.84%) as against decrease by 11.15% in Switzerland and 3.22% in Bangladesh from 2006-10 to 2011-15 (Table 3).

Table 3
Contribution of Top 20 Foreign Countries in India's Collaborative Output in Iron Deficiency Anemia during 2006-15

Name of Collaborative Countries	Number of Collaborative Papers			Share of Collaborative Papers		
	2006-10	2011-15	2006-15	2006-10	2011-15	2006-15
United States	14	24	38	46.67	41.38	43.18
United Kingdom	4	16	20	13.33	27.59	22.73
Switzerland	8	9	17	26.67	15.52	19.32
Australia	2	9	11	6.67	15.52	12.5
Canada	2	8	10	6.67	13.79	11.36
Sweden	1	6	7	3.33	10.34	7.95
Germany	1	5	6	3.33	8.62	6.82
Sri Lanka	0	6	6	0	10.34	6.82
France	1	5	6	3.33	8.62	6.82
Pakistan	1	4	5	3.33	6.9	5.68
Italy	1	4	5	3.33	6.9	5.68
Denmark	0	5	5	0	8.62	5.68
Singapore	0	5	5	0	8.62	5.68
Netherlands	0	5	5	0	8.62	5.68
Taiwan	0	4	4	0	6.9	4.55
New Zealand	0	4	4	0	6.9	4.55
Philippines	1	3	4	3.33	5.17	4.55
Bangladesh	2	2	4	6.67	3.45	4.55
Russian Federation	0	4	4	0	6.9	4.55
Total of India	30	58	88			

5.3 Subject-Wise Distribution of Indian Iron Deficiency Anemia Research Output

India's publication output in iron deficiency anemia (IDA) during 2006-15 has been published in context of 10 different subjects (as retrieved from database classification of the Scopus database), with the highest publication output coming from medicine (617 articles and 86.05% share), followed by biochemistry, genetics and molecular biology (122 articles and 17.02%), pharmacology, toxicology and pharmaceutics (47 articles and 6.56%), nursing (45 articles and 6.28%), agricultural & biological sciences (34 articles and 4.74%), social sciences (17 articles and 2.37%), neuroscience (10 articles and 1.39%), immunology & microbiology (9 articles and 1.26%), chemistry & dentistry (5 articles and 0.7% each). In terms of citation impact of IDA

under different subjects, it was found that nursing had scored the highest impact (9.58 citations per article), followed by social sciences (9.12 citations per article), agricultural & biological sciences (9.00 citations per article), neuroscience (7.20 citations per article), medicine (6.89 citations per article), dentistry (6.00 citations per article), biochemistry, genetics and molecular biology (4.35 citations per article), immunology and microbiology (3.89 citations per article), chemistry (3.20 citations per article), pharmacology, toxicology & pharmaceutics (2.02 citations per article). On the basis of high cited articles, social sciences contributed the highest share (5.88%), followed by agricultural & biological sciences (2.94%), medicine (1.13%) and biochemistry, genetics and molecular biology (0.82%) [Table 4]

Table 4
Subject-Wise Distribution of Iron Defiency Anemia, 2006-15

Subject	TP	%TP	TC	ACPP	H-Index	HCP	%HCP
Medicine	617	86.05	4251	6.89	23	7	1.13
Biochemistry, genetics and molecular biology	122	17.01	531	4.35	12	1	0.82
Pharmacology, toxicology & pharmaceutics	47	6.56	95	2.02	5	0	0
Nursing	45	6.28	431	9.58	13	0	0
Agricultural & biological sciences	34	4.74	306	9.00	8	1	2.94
Social Sciences	17	2.37	155	9.12	6	1	5.88
Neuroscience	10	1.39	72	7.20	3	0	0
Immunology and microbiology	9	1.26	35	3.89	4	0	0
Chemistry	5	0.7	16	3.20	2	0	0
Dentistry	5	0.7	30	6.00	3	0	0
Total of India	717		5922	6.12	7.9	10	

5.4. Significant keywords

11 Significant keywords which depict IDA and the type of research being carried out in this area along with their frequency of occurrence are shown in Table 5

Table 5
Significant Keywords in Indian Iron Deficient Anemia Research , 2006-15

Keyword	No. of Papers
Hemoglobin	266
Anemia	176
Ferritin	127
Iron therapy	78
Mean corpuscular haemoglobin	51
Beta thalassemia	45
Hepatomegaly	39
Splenomegaly	29
Thrombocytopenia	26
Microcytic anemia	24
Treatment response	23
Total of India	717

5.5. Iron Deficiency Anemia Research in India by Type of Population Group

In the IDA research in India on population by age group, the largest emphasis was on adults(302 articles, 42.12% share), followed by the child (186 articles, 25.94%share), adolescent(133 articles, 18.55%share), aged(49 articles, 68.3%share), and middle aged(47articles, 6.56%share) (Table 6)

Table 6
Distribution of IDA Publications by Population Age Group, 2006-15

Population Age Group	TP (Total Papers)	%TP
Child	186	25.94
Adolescent	133	18.55
Adult	302	42.12
Middle Aged	47	6.56

Aged	49	6.83
Total of India	717	100.00

5.6. Contribution and Citation Impact of 15 Most Productive Indian organizations

The top 15 most productive Indian organizations involved in iron deficiency anemia research have together published 240 articles (with productivity of each institution varying from 8 to 46) during 2006-2015, accounting for 33.47% of the share in the cumulative publication output of India, with an average of 16 articles per institution. The publication profile of these 15 Indian institutions along with their research output, citations received, and h-index values are presented in Table 7.

Only four institutions have registered a higher than the group average productivity (16). These are: All India Institute of Medical Sciences, New Delhi, with 46 articles, followed by Postgraduate Institute of Medical Education and Research, Chandigarh (37 articles), Maulana Azad Medical College, Delhi and Lady Hardinge Medical College, New Delhi (16 articles each). The average citation per article registered by 15 institutions is 13.63 during 2006-2015. Two institutions have registered a higher citation impact than the group average citation impact. The highest impact of 103.83 citations per article was scored by Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, followed by All India Institute of Medical Sciences, New Delhi (32.11 citations per article). The average h-index of these 15 most productive institutions was 4.13 during 2006-15. Five Indian institutions have scored a higher h-index value than the group's average of 4.13. Among these five Indian institutions, the highest h-index value (9) was achieved by All India Institute of Medical Sciences, New Delhi, followed by Postgraduate Institute of Medical Education and Research, Chandigarh (8), Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow and King Edward Memorial Hospital, Mumbai (6 each) [Table7]

Table 7
Productivity and Citation Impact of the 15 Most Productive Indian Organizations in Iron Deficiency Anemia Research, 2006-15

Affiliation	Total Documents	Total Citations	ACPP	H-Index
All India Institute of Medical Sciences, New Delhi	46	1477	32.11	9
Postgraduate Institute of Medical Education and Research, Chandigarh	37	264	7.14	8
Maulana Azad Medical College,	16	31	1.94	2

Delhi				
Lady Harding Medical College, New Delhi	16	37	2.31	4
Kasturba Medical College, Manipal	15	23	1.53	3
J L Nehru Institute of Post Graduate Medical Education & Research, Pondicherry	14	65	4.64	4
Christian Medical College, Vellore	13	92	7.08	4
Medical College and Hospital, Kolkata	13	13	1.00	2
University college of Medical Sciences, New Delhi	12	83	6.92	5
Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow	12	1246	103.83	6
King Edward Memorial Hospital, Mumbai	10	110	11.00	6
National Institute of Nutrition, Hyderabad	10	123	12.30	4
St John's Medical College, Bangalore	9	35	3.89	2
Armed Forces Medical College, Pune	9	6	0.67	1
Indira Gandhi Medical College, Shimla	8	65	8.13	2
Total of 15 organizations	240	3670	13.63	4.13
Total of India	717	4625		
Share of 15 organizations in India's total output	33.47	79.35		

5.7. Contribution and citation impact of Top 15 authors

Fifteen authors have been identified as the most productive, who have published 4 and above articles in iron deficiency anemia research in India. These 15 authors together contributed to 95 articles with an average of 6.33 articles per author and accounted for 13.25% of the share in the cumulative Indian publications output during 2006-15. The publication profile of these 15 authors along with their research output, citations received, and h-index values are presented in Table 8. Six authors have published a higher number of articles than the group average (6.33). These are J. Chandra with 11 articles, followed by A V Kurpad (10 articles), P. Thankachan (9 articles), R K Saxena (8 articles), Reena Das and SM Sharma (7 articles each). These 15 authors

have received a total of 735 citations, with an average of 15.89 citations per article. Six authors have registered a higher citation impact than the average citation impact of articles of all authors (7.04). These are P Thankachan with 17.11 citations per article, A V Kurpad (15.6), U Rusia (10.6), E.S. Edison (9.83), Rakhee Kar (8.8), Reena Das (7.71) during 2006-15. Nine Indian authors have achieved higher h-index value than the group average (3.33) during 2006-15: AV Kurpad and P. Thankachan (5 each), J Chandra, R K Saxena, Reena Das, S M Sharma, E S Edison, Rakhee Kar & K Singh (4 each).

Table8
Productivity and Citation Impact of 15 Most Productive Indian authors in
Iron deficiency Anemia Research, 2006-15

Name	Affiliation	TP	TC	ACPP	H-Index
J.Chandra	Kalawati Saran Children's Hospital, N.Delhi	11	44	4	4
AVKurpad	St John's Medical College, Bengaluru	10	156	15.6	5
P.Thankachan	St John's Research Institute, Bengaluru	9	154	17.11	5
R K Saxena	All India Institute of Medical Sciences, New Delhi	8	37	4.62	4
Reena Das	Post Graduate Institute of Medical Education and Research, Chandigarh	7	54	7.71	4
S M Sharma	Lady Hardinge Medical College, New Delhi	7	36	5.14	4
E S Edison	Christian Medical College, Vellore	6	59	9.83	4
U Kapil	All India Institute of Medical Sciences, New Delhi	5	3	0.6	1
RakheeKar	JLNehru Institute of Post Graduate Medical Education & Research, Pondicherry	5	44	8.8	4
R B Colah	Indian Council of Medical Research, New Delhi	5	22	4.4	2
U Rusia	University college of Medical Sciences, New	5	53	10.6	3

	Delhi				
K Singh	PtB.D.Sharma PGIMS, Rohtak	5	21	4.2	4
S M Alam	Institute of Liver & Biliary Sciences, New Delhi	4	17	4.25	1
D Bansal	Post Graduate Institute of Medical Education and Research, Chandigarh	4	15	3.75	3
G N V Brahmam	National Institute of Nutrition, Hyderabad	4	20	5	2
	Total of 15 authors	95	735	7.04	3.33
	Total of India	717	4625		
	Share of 15 authors in India's total output	13.25	15.89		

5.8. Medium of Communication

The 15 most productive journals publishing Indian research articles on iron deficiency anemia research together contributed 246 articles, which accounted for 34.31% of the share of the total output of India during 2006-15. The cumulative publication output share of these 15 most productive journals showed an increase in India's publications output from 10.46% during 2006-2010 to 23.85% during 2011-2015.[Table 9]

Table 9
15 Top Most Productive Journals in Indian Iron Deficiency Anemia Research, 2006-15

Name of Journal	No. of articles		
	2006-10	2011-15	2006-15
Journal of Clinical and Diagnostic Research	3	35	38
Indian Journal of Pediatrics	13	24	37
Indian Journal of Hematology and Blood transfusion	4	19	23
Indian Pediatrics	15	7	22
BMJ Case Reports	1	16	17
Indian Journal of Gastroenterology	6	9	15
Medical Journal Armed Forces India	7	7	14
Indian Journal of Pathology and Microbiology	5	8	13
International Journal of Pharma and BioSciences	1	10	11
Indian Journal of Medical Research	8	3	11
Food and Nutrition Bulletin	8	2	10
Journal Indian Academy of Clinical Medicine	2	8	10
Indian Journal of Public Health Research and	0	9	9

Development			
Indian Journal of Dermatology	2	6	8
Research Journal of Pharmaceutical Biological and Chemical Sciences	0	8	8

6. Major Findings

717 Indian publications were identified on "iron deficiency anemia" during 2006-2015 from the Scopus database using a well defined search strategy and witnessed an annual average growth rate of 18.77% and citation impact per paper of 6.45. India is ranked in the second position among the top 20 most productive countries with its global publication share of 8.12% during 2006-15. The top 20 most productive countries together contributed 85.64% publication share of the global output during 2006-15. In terms of classification of Indian publications on "iron deficiency anemia", medicine among subjects, contributed the largest publication share of 86.05%, followed by biochemistry, genetics and molecular biology (17.02%), pharmacology, toxicology and pharmaceutics (6.56%), nursing (6.28%), agricultural & biological sciences (4.74%), social sciences (2.37%) during 2006-2015. The top 15 most productive organizations and authors involved in iron deficiency anemia research together contributed 33.47% and 13.25% of the publication share and 79.35% and 15.89% citation share to the Indian publication output on Iron deficiency anemia. The 15 most productive journals publishing Indian research articles on iron deficiency anemia together account for 34.31% of the share of the total Indian output during 2006-15, which increased from 10.46% during 2006-10 to 23.85% during 2011-15.

7. Conclusion

It can be concluded that Iron deficiency anemia is a disease of international concern and has reached epidemic proportions in developing countries. A multifactorial and multisectorial approach should be adopted by countries to combat this disease. India should form national guidelines for prevention and control of iron deficiency anemia. India needs to strengthen its base, provide research facilities, infrastructural support and financial help to foster research output on iron deficiency anemia.

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	Dr B.M.Gupta is now a retired scientist. He was working as Emeritus Scientist in the National Institute of Science, Technology & Development Studies (NISTADS), CSIR, New Delhi from 2008 to 2013. B.M.Gupta retired from CSIR as Scientist G in July 2008. Dr B.M.Gupta has completed B.Lib Sci from Kurukshetra University in 1971, Associatship in Documentation from INSDOC in 1975 and PhD from Karnatak University in 1999. Mr Gupta is the recipient of the Fullbright Professional Fellowship in Library & Information Science (1999) and is elected the Fellow of the Society for Information Science (2007). He was the Principal Investigator for several projects sponsored by research agencies, such as DFG, South Asia Office, All India Council for Technical Education (AICTE), Department of Science & Technology (DST) and Office of the Principal Scientific Advisor to the Government of India. Dr Gupta has more than 200 research papers (more than 100 years after retirement) mainly in the area of scientometrics to his credit, which are published in learned national and international journals and as chapters in books and conference proceedings. He has also presented papers at several national and international conferences. His major contribution has been in editing the two important book series "Handbook of Libraries, Archives & Information Centers in India" (16 Volumes) and "South Asia Bibliography and Documentation" (8 Volumes), besides bringing out a number of technical reports and other books. He has been Guest Editor of a two special issues of the serial "*Scientometrics*", three issues of the "*DESIDOC Journal of*

| | *Library & Information Technology*" and one recent special issue of "*International Journal of Information Dissemination and Technology*" (under publication). Contact Address: 1173 Sector 15, Panchkula 134113, Haryana; Contact Numbers: 0172-2591255; 09888378275; E-Mail: bmgupta1@gmail.com |