SCIENTOMETRIC ANALYSIS OF "ANNALS OF ONCOLOGY" DURING 2010 – 2014

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ABSTRACT

This paper presents bibliometric analyses of 10681 articles published in ANNALS OF ONCOLOGY (AOO) during 2010-2014. The data was downloaded from web of science database. The analysis covers various parameters like year wise publication, growth pattern, word frequency, ranking of authors, ranking of institution, document types etc., and Histographicanalysis of the datasets has been performed using Histcite software.

Keywords: Oncology, Bibliometric analysis, Content analysis, Citation.

1. INTRODUCTION

Academic journals are utilized by the researchers and experts to share their thoughts, considerations, developments, advancements, and disclosures. So individual journals are the main target of the many bibliometric and scientometric studies. The terms bibliometrics and scientrometrics wereintroduced by Pritchard, Nalimov and Mulchenko in 1969. Bibliometric study is a simple statistic method of bibliography counting to evaluate and quantify the growth of a subject (Tsay *et al.,* 1997).

2. ORIGIN OF THE JOURNAL

Annals of Oncology, the journal of the European Society of Medical Oncology and the Japanese Society of Medical Oncology, provides rapid and efficient peer-review publications on innovative cancer treatments or translational work related to oncology and precision medicine.

Main focuses of interest include: systemic anticancer therapy (with specific interest on molecular targeted agents and new immune therapies), randomized trials (including negatives ones), top-level guidelines, and new fields currently emerging as key components of personalized medicine, such as molecular pathology, bioinformatics, modern statistics, and biotechnologies. Radiotherapy, surgery and pediatrics manuscripts can be considered if they display a clear interaction with one of the fields above or are paradigm-shifting.

With a large international editorial board of experts who are leaders in their fields, Annals of Oncology aims at delivering the best communication on the fast moving, and continually evolving, global oncology landscape.

Annals of Oncology is covered by the following major indexing services CAB Abstracts, Current Contents® /Clinical Medicine, Elsevier BIOBASE - Current Awareness in Biological Sciences (CABS), EMBASE, Journal Citation Reports /Science Edition, PROQUEST, Prous Science Integrity®, PubMed, Science Citation Index Expanded (SciSearch®) and Science Citation Index (http://www.oxfordjournals.org/our_journals/anno nc/about.html (09-01-2016)).

3. REVIEW OF LITERATURE

There are several bibliometric studies available in the literature which includes bibliometric studies on single journals, citation studies and subject studies. A study by Nageswara Rao *et al.* (2013) on Bibliometric Analysis of theJournal of Propulsion and Power (1985-2013) showed thatthe highest number (194) articles were published in year 1992 and lowest (81) in 1987. Out of total articles, 1330 were produced by two authors and 1098 by three authors. It is found that 1205 different institutions were involved in publication of articles. 'Purdue University' contributed highest number of 163 articles. Out of ranked list of 21 affiliations which produced more than 50 articles, 18 institutions were from USA, 2 from Japan, and 1 from Germany, etc.

Manoj Kumar and Moorthy (2011) studied Bibliometric Analysis of DESIDOC Journal of Library and Information Technology during 2001-2010. Showed that maximum papers (17.3 per cent each) were published in 2008 and 2009, and minimum papers (3.6 per cent) were published in 2001. And Authors from government research institutions

contributed 110 (40.6 per cent) papers followed closely by 105 papers (38.74 per cent) from universities. Authors from colleges and private research institutions comprised 11.07 per cent and 6.27 per cent, respectively.

Anil Kumar and Prakasan (2008) studies on Pramana - Journal of Physics: A scientometric analysis. Focuses on publishing trend; impact factor; authorship pattern; types of articles; institutional collaboration of authors; affiliated institutions of authors; countries of contributing authors; keyword analysis; and referencing pattern. The number of articles being published in Pramana and its ISI impact factor are increasing. There is an upward trend in number of collaborated papers. Authors from University of Delhi, Delhi; Bhabha Atomic Research Centre, Mumbai; Physical Research Laboratory, Ahmedabad; Institute of Physics, Bhubaneswar; Indian Institute of Science, Bangalore; Tata Institute of Fundamental Research, Mumbaietc. Contributed most number of articles. One fourth of the total articles published in Pramana are from outside India, the host country of the journal and the number of articles submitting from other countries is also increasing. Cosmology; super symmetry; chaos; quantum chromo dynamics; phase transition; and quark-gluon plasma are the leading micro-fields of physics to which maximum number of articles published in Pramana. The average number of references per article is found as 21.85 and it is 104.4 when the average is taken only for review articles.

4. OBJECTIVES

The objectives of this study are as follows:

- ✓ To find out the year wise publication of research output.
- ✓ To analysis the growth rate of the publication using CARG, RGR and Doubling Time.
- ✓ To find out the ranking of authors and Institutions.
- ✓ To examine the contribution of different countries.
- ✓ To analysis the document type of the journal.
- ✓ To identity keyword frequency of the journal.

5. ANALYSIS

The bibliographic records for the analysis are limited to 10681 articles published in ANNALS OF ONCOLOGY (AOO)in the period of 2010-2014.

The required bibliographic data have been captured from Web of Science database and analyzed by using Histcite software application. For each articles we identified like year wise publication, growth pattern, word frequency, ranking of authors, ranking of institution, the country of publication and document types.

5. YEAR WISE PUBLICATIONS

Table 1. Year wise distribution of articles

S No	Year	No. of Articles	%	Cumulative	Cumulative %
1.	2010	2931	27.4	2931	27.4
2.	2011	1673	15.7	4604	43.1
3.	2012	3586	33.6	8190	76.7
4.	2013	1048	9.8	9238	86.5
5.	2014	1443	13.5	10681	100
	Total	10681	100	35644	

Table 1 shows the number of papers published in AOO during 2010-2014. Table also shows thatmaximum papers (86.5%) were published in 2014, and minimum papers (27.4%) were published in 2010.

6. COMPOUND ANNUAL GROWTH RATE – CARG

The Compound Annual Growth Rate (CAGR) (http://www.investopedia.com/terms/c/cagr.asp (11-01-2016)) is the mean annual growth rate of an investment over a specified period of time longer than one year.

This can be written as follows:

$$CAGR = \left(\frac{Ending\ Value}{Beginning\ Value} \right)^{\left(\frac{1}{\#\ of\ years} \right)} - 1$$

Year	2010	2011	2012	2013	2014	5 Year CARG
Records	2931	1673	3586	1048	1443	-0.13213914

CARG = (1443/2931) ^ (1/5))-1 = -13.21%

Therefore the compound annual growth rate for the period of 5 years is -13.21%

7. RELATIVE GROWTH RATE (RGR) AND DOUBLING TIME

The Relative Growth Rate (RGR) is the increase in number of articles/pages per unit of time. This definition is derived from the definition of relative growth rates in the study of growth analysis of individual plants and effectively applied in the

field of Botany (Hunt, 1978), which in turn, had its origin from the study of the rate of interest in the financial investment (Blackman, 1919).The mean Relative Growth Rate(R) over the specific period of interval can be calculated from the following equation:

$$RGR = (\ln W_2 - \ln W_1)/(t_2 - t_1)$$

Where:

$\ln$ = natural logarithm

t_1 = time one (in days)

t_2 = time two (in days)

W_1 = Dry weight of plant at time one (in grams)

W_2 = Dry weight of plant at time two (in grams)

Table 2. Relative growth rate and doubling time of the journal.

S. No.	Year	No. of Records	%	Cumulative	W1	W2	RGR	Doubling Time
1.	2010	2931	27.4	2931	....	7.98	....	...
2.	2011	1673	15.7	4604	7.98	8.43	0.45	1.54
3.	2012	3586	33.6	8190	8.43	9.01	0.58	1.19
4.	2013	1048	9.8	9238	9.01	9.13	0.12	5.775
5.	2014	1443	13.5	10681	9.13	9.27	0.14	4.95
	Total	10681	100	35644				

Table 2 discussed the relative growth rate of the articles during the year between 2010 and 2014. The overall study period has witnessed RGR is decreasing every year, whereas doubling time is increasing every year. The RGR is highest in the year 2012 with 0.58 and lowest in the year 2014 with 0.14. The doubling time is highest in the year 2013 with 5.77 and lowest in the year 2012 with 1.19.

8. RANKING OF AUTHORS

Table 3. Ranking of authors by number of papers published in AOO during 2010-2014(Top 15)

S.No.	Author	Records	TLCS	TGCS
1.	Van Cutsem E	80	16	708
2.	Nakagawa K	74	3	50
3.	Yamamoto N	74	3	70
4.	Tabernero J	64	19	658
5.	La Vecchia C	55	56	1451
6.	Falcone A	54	6	238
7.	Hatake K	53	2	21
8.	Blay JY	48	42	821
9.	Tamura K	48	0	49
10.	Massard C	46	13	329
11.	Soria JC	46	23	374
12.	Takahashi S	46	5	138
13.	Fujiwara Y	45	0	61
14.	Yamada Y	45	0	53
15.	Fizazi K	44	27	554

Table 3 discussed the authors who have published a large number of papers and the table shows only the top 15.

It is clearly seen from the table that Van Cutsem E has published the maximum number of articles with 80 records, having the global citation score of 708 and local citation score of 16, followed by Nakagawa K and Yamamoto N with 74 records, having global citation scores of 50 and 70, local citation scores of 3 respectively. It is also noted that La Vecchia C with 55 records has a global citation score of 1451.

9. RANKING OF INSTITUTIONS

Table 4. Ranked list of organizations which contributed more than 100 articles.

S. No.	Institution	Recs	TLCS	TGCS
1.	InstitutGustave Roussy	333	124	2644
2.	University of Texas:	240	53	1752
3.	National Cancer Centre	213	20	802
4.	Unknown	208	4	35
5.	Memorial Sloan Kettering Cancer Center	174	55	1725
6.	Dana-Farber Cancer Institute	141	22	948
7.	Kinki University	134	11	306

8.	European Institute of Oncology	123	94	2365
9.	Royal Marsden Hospital	122	43	962
10.	University of Milan	120	81	2215
11.	Centre Leon Berard	117	50	894
12.	University Hospitals	117	53	929
13.	NCI	115	18	550
14.	Harvard University	109	79	2424
15.	Medical University of Vienna	103	37	1564

Table 4 shows highly prolific organizations contributing more than 100 articles.From Table 4, it is evident that Institute Gustave Roussy (World's leading cancer-research institutes) contributed highest articles 333 with global citation score of 2644 and local citation score of 124, followed byThe University of Texas: MD Anderson Cancer Center (The original three comprehensive cancer centersin the United States) with 240 articles, having a global citation score of 1752 and local citation score 53 and 213 articles by National Cancer Centre and so on.

10. DOCUMENT TYPES

Table 5. Number of references in different types of articles published in AOO during 2010-2014.

S. No.	Document Type	Recs	%	TLCS	TGCS
1.	Meeting Abstract	8022	75.11	60	1339
2.	Article	1983	18.57	1047	35229
3.	Letter	267	2.5	41	845
4.	Review	209	1.957	121	4691
5.	Editorial Material	145	1.358	33	334
6.	Correction	37	0.346	1	2
7.	Article; Proceedings Paper	18	0.169	7	207
	Total	10681	100	1310	42647

The data presented in Table 5 which gives the types of articles wise distribution of publication and their citation information. It is clearly noticed from the table that the major source of records published in the form of meeting abstracts (75.11%), followed by articles and letter with 1983 (18.57%) and 267 (2.5%) having global citation scores of 35229 and 845, local citation scores of 1047 and 41 respectively.

11. WORD FREQUENCY

Table 6 is the abbreviatedlist of keywords with their number of occurrence in the records analyzed. It is clearly seen from the table that the word "Cancer" has been used in 5590 records by the researchers with global citation score of 25902 and local citation score of 812, followed by the word "Patients" in 3583 records with a global citation score of 13165 and local citation score of 402.

Table 6. Frequently connected with the articles during 2010-2014. followed 15 keywords published in AOO

S. No.	Word	Records	TLCS	TGCS
1.	Cancer	5590	812	25902
2.	Patients	3583	402	13165
3.	Cell	1675	245	7842
4.	Breast	1486	306	8815
5.	Phase	1400	214	7911
6.	Treatment	1369	242	8697
7.	Advanced	1347	140	5475
8.	Chemotherapy	1340	214	5232
9.	Metastatic	1152	146	5879
10.	Colorectal	1062	73	2623
11.	Clinical	921	199	7085
12.	Lung	898	125	4215
13.	Analysis	819	135	3823
14.	Non	799	106	3780
15.	Carcinoma	789	74	3129

12. CONTRIBUTION OF COUNTRIES

Table 7. Countries in the affiliations of the authors of the articles published in AOO during 2010-2014.

S.No.	Country	Records	TLCS	TGCS
1.	USA	2039	440	14404
2.	Japan	1753	55	1857
3.	Italy	1507	448	12547
4.	France	1205	337	9917
5.	UK	1112	282	8743
6.	Germany	974	319	9173
7.	Spain	843	210	6039
8.	Netherlands	576	166	5648
9.	Belgium	553	160	5412
10.	Switzerland	517	257	6461

11.	Canada	442	138	3855
12.	Peoples R China	430	51	2143
13.	South Korea	413	47	1306
14.	Australia	291	126	3737
15.	Austria	232	68	2183

Table 7 explain the countries in the affiliations of the authors of the articles published in AOO during 2010-2014. It is clearly observed that all countries multiple participation and the table shows only the top 15.

Hence, It is observed that 'USA' contributed 2039 articlesto the total contributions, followed by 1753 articles by Japan, 1507 articles by Italy and so on.

13. HISTOGRAPH

With using the HistCite Graph Maker,attempt to create "historiographs" of the articles in the collection (10681). A historiograph is a chronological citation network display citation links between articles.
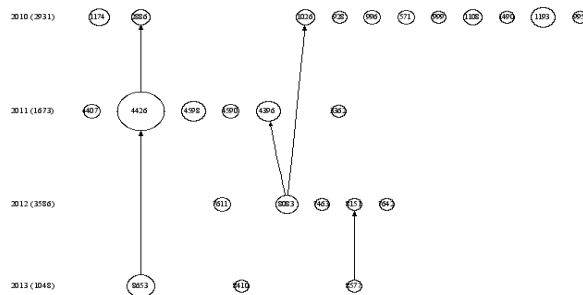
S. No	Paper No		LCS	GCS
1.	571	Arbyn M, 2010, ANN ONCOL, V21, P448	0	122
2.	928	Okines A, 2010, ANN ONCOL, V21, Pv50	2	108
3.	995	Casali PG, 2010, ANN ONCOL, V21, Pv98	6	102
4.	996	Crino L, 2010, ANN ONCOL, V21, Pv103	2	121
5.	999	D'Addario G, 2010, ANN ONCOL, V21, Pv116	0	112
6.	1026	Roila F, 2010, ANN ONCOL, V21, Pv232	8	165
7.	1108	La Vecchia C, 2010, ANN ONCOL, V21, P1323	0	153
8.	1174	O'Day SJ, 2010, ANN ONCOL, V21, P1712	0	177
9.	1193	Reck M, 2010, ANN ONCOL, V21, P1804	13	257
10.	1490	Savagner P, 2010, ANN ONCOL, V21, P89	0	102
11.	2886	Eidtmann H, 2010, ANN ONCOL, V21, P2188	8	147
12.	3362	Posner MR, 2011, ANN ONCOL, V22, P1071	6	117
13.	4396	Bokemeyer C, 2011, ANN ONCOL, V22, P1535	6	240
14.	4407	Witzig TE, 2011, ANN ONCOL, V22, P1622	5	118
15.	4426	Goldhirsch A, 2011, ANN ONCOL, V22, P1736	35	902
16.	4590	Sequist LV, 2011, ANN ONCOL, V22, P2616	2	142
17.	4598	Arbyn M, 2011, ANN ONCOL, V22, P2675	2	266
18.	7463	Cardoso F, 2012, ANN ONCOL, V23, P11	1	96
19.	7611	Peters S, 2012, ANN ONCOL, V23, P56	3	139
20.	7642	Escudier B, 2012, ANN ONCOL, V23, P65	2	110
21.	8083	Schmoll HJ, 2012, ANN ONCOL, V23, P2479	9	223
22.	8151	Mezynski J, 2012, ANN ONCOL, V23, P2943	3	99
23.	8410	Malvezzi M, 2013, ANN ONCOL, V24, P792	7	116
24.	8577	Loriot Y, 2013, ANN ONCOL, V24, P1807	1	104
25.	8653	Goldhirsch A, 2013, ANN ONCOL, V24, P2206	7	341

The above figure illustrates 25 most highly cited papers in the articles published in AOO during 2010-2014 based on their GCS. In this Histography, it is clearly noticed that paper number 4426, Goldhirsch A (2011) has scored the highest global citation scores of 902, followed by paper number 8653, Goldhirsch A (2013) with the global citation scores of 341.

14. CONCLUSION

The investigations exhibited in this study have allowed many conclusions of broad observation on

quantitative research and specifically to ANNUAL OF ONCOLOGY.

- ✓ The study reveals that 10681articles were published in the ANNALS OF ONCOLOGYduring 2010-2014.The highest numbers of articles (86.5 %) were published in 2014, and minimum articles (27.4%) were published in 2010.

- ✓ It has been found that growth trend of (RGR) is highest in the year 2012 with 0.58 and lowest in the year 2014 with 0.14. The doubling time is highest in the year 2013 with 5.77 and lowest in the year 2012 with 1.19.Although this study has identified a decreasing trend of Compound Annual Growth Rate (CAGR), the editorial board should pay much attention to increase it further.

- ✓ The findings of the Authors "Van Cutsem E has published the maximum number of articles with 80 records, having the global citation score of 708 and local citation score of 16, followed by Nakagawa K and Yamamoto N with 74 records, having global citation scores of 50 and 70, local citation scores of 3 respectively.

- ✓ The study shows that the major source of records published in the form of meeting abstracts (75.11%), followed by articles and letter with 1983 (18.57%) and 267 (2.5%) having global citation scores of 35229 and 845, local citation scores of 1047 and 41 respectively.

- ✓ In the frequency of keyword used, the word "Cancer" has been used in 5590 records by the researchers with global citation score of 25902 and local citation score of 812.

The study reveals that 'USA' contributed 2039 articlesto the total contributions, followed by 1753 articles by Japan, 1507 articles by Italy.

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