



SCIENTOMETRIC ANALYSIS OF LOWER RESPIRATORY INFECTIONS RESEARCH PUBLICATIONS

KEYWORDS

Lower respiratory infections, Respiratory disease, Chest tightness, Severe flu, Wheezing

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ABSTRACT

The present study discuss on Scientometric analysis of lower respiratory infections research publications from 1991 to 2015, during the study period 1625 research papers were retrieved from Web of Science database, The study reveals that lower respiratory infections research publications are upward from 3.39 percent to 6.22 percent, thirteen document types were contributing in this research papers published, among the thirteen document types article are occupies first place with 61.05 percent, 103 countries contributing in this research, United States of America have first place with 395 research papers in this research during the study period, England has second position with 159 records, Netherlands has third place with 119 papers and so on, totally 6414 authors were contributing in this research during the study period, among the authorship pattern six and above authors collaboration are predominate place with 45.29 percent of papers. 1625 papers were contributed by 1963 institutions in this research during the study period.

INTRODUCTION

Respiratory disease has a substantial impact on the health of populations at all ages and every level of morbidity. Acute upper respiratory infections are the commonest illnesses experienced by individuals throughout life, accounting for over 27% of all GP consultations. Asthma and chronic obstructive pulmonary disease are the cause of almost 5% of all admissions and bed-days, and lower respiratory infections are responsible for almost 11% of deaths (Walters S, Ward DJ 2004). Any infection that affects the lungs and lower airways are considered a lower respiratory infection. The most common and well-known lower respiratory infections are pneumonia and bronchitis, as well as bronchiolitis in children (Kristina Duda, RN 2016). Lower respiratory infection symptoms include a severe cough that may produce mucus (phlegm), cause shortness of breath, chest tightness, and wheezing when exhaling (Charles Patrick Davis 2016).

METHODOLOGY

The data have been collected from Web of Science Database, Search string were used "lower respiratory infections" in title search box, time span field were select from 1991 to 2015. Totally 1625 records were retrieved, the data downloaded and analyzed as per objectives of the present study, the data have been analyzed with the help of MS-Excel spreadsheet. Moreover, Lotka's Law applied to author productivity, Journal Rank, Source Normalized Impact per Paper (SNIP), and SCImago Journal Rank (SJR) also has been used, sources Impact Factor (IF) and h Index value used present study.

OBJECTIVES

The following objectives of the present study are:

- To find growth of publications in lower respiratory infections research publications
- To find document types in Lower Respiratory Infections publications
- To know top ten Countries contributing in Lower Respiratory Infections research
- To find top ten authors' contributions in Lower Respiratory Infections research
- To find out top ten Institutions's contributed in Lower Respiratory Infections research

ANALYSIS AND INTERPRETATIONS

Table 1 year wise research publications in Lower Respiratory Infections

Sl. No	Publication Years	Records	Percentages
1	1991	55	3.39
2	1992	48	2.95
3	1993	46	2.83
4	1994	42	2.59
5	1995	60	3.69
6	1996	48	2.95
7	1997	51	3.14
8	1998	52	3.20
9	1999	50	3.08
10	2000	54	3.32
11	2001	74	4.55
12	2002	43	2.65
13	2003	58	3.57
14	2004	56	3.45
15	2005	58	3.57
16	2006	61	3.75
17	2007	58	3.57
18	2008	61	3.75
19	2009	89	5.48
20	2010	71	4.37
21	2011	87	5.35
22	2012	93	5.72
23	2013	126	7.75
24	2014	83	5.11
25	2015	101	6.22
	Total	1625	

Table 1 show that year wise research publications in lower respiratory infections from 1991 to 2015, this study was conducted last twenty five years, totally 1625 papers were published in Lower Respiratory Infections. During the study period in the year 2013 has occupies first place with 126 papers, 2015 has occupies second place with 101 papers, 2012 has third place with 93 papers, followed by 2009 has 89 papers, 2011 has 87 papers, 2014 has 83 papers, 2001 has 74 papers, 2010 has 71 papers, 2008 and 2006 has 61 papers respectively, 1995 has 60 papers, 2003, 2005 and 2007 has 58 papers respectively, 2004 has 56 papers, 1991 has 55 papers, 2000 has 54 papers, 1998 has 52 papers, 1997 has 51 papers, 1999 has 50 papers, 1992 and 1996 has 48 papers respectively, 1993 has 46 papers, 2002 has 43 papers, 1994 has 42 papers, this study evidence to growth of publications in lower respiratory infections research at global level during the study period.

Table 2 Document types in Lower Respiratory Infections publications

Sl. No.	Document Types	Records	percentages
1	Article	992	61.05
2	Meeting Abstract	228	14.03
3	Proceedings Paper	110	6.77
4	Review	100	6.15
5	Letter	83	5.11
6	Editorial Material	68	4.18
7	Correction	19	1.17
8	Note	10	0.62
9	News Item	5	0.31
10	Correction Addition	5	0.31
11	Reprint	2	0.12
12	Book Chapter	2	0.12
13	Discussion	1	0.06
	Total	1625	100.00

Table 2 indicates that, document types wise research publications in lower respiratory infections, thirteen document types were contributing in this research papers published, Article occupies first place with 992 papers, Meeting Abstract has second place with 228 records, Proceedings Paper has third place with 110 records, followed by Review has fourth place, Letter has fifth place, Editorial Material has sixth place, Correction has seventh place, Note has eighth place, News Item has ninth place, Correction Addition has tenth place, Reprint and Book Chapter has eleventh and twelfth place, Discussion has last position with one records in the document types.

Table 3 Top ten Country's lower respiratory infections research publications

Sl. No	Countries/Territories	Records	% of 1625
1	United States of America	395	24.31
2	England	159	9.79
3	Netherlands	119	7.32
4	Italy	112	6.89
5	France	110	6.77
6	Germany	79	4.86
7	Peoples Republic China	73	4.49
8	Spain	64	3.94
9	Canada	61	3.75
10	India	56	3.45
	93 Countries	397	24.43

Table 3 shows that Country wise publications in lower respiratory infections publications, 103 country authors were contributing 1625 research papers in this research. Among the 103 countries top ten countries are listed in this table 3, United States of America have first place with 395 research papers in this research during the study period, England has second position with 159 records, Netherlands has third place with 119 papers, followed by Italy has fourth place, France has fifth place, Germany has sixth place, Peoples Republic China has seventh place, Spain has eighth place, Canada has ninth place, India has tenth place with 56 papers in this research, moreover remaining 93 countries were published less than 56 papers in this research.

Table 4 top ten authors' publications in lower respiratory infections research

Sl. No	Authors	No. of Records	% of 1625
1	Leinonen M	22	1.35
2	Little, P	21	1.29
3	Butler, C C	21	1.29
4	Hood, K	20	1.23
5	Schaberg, T	17	1.05
6	Madh,I S A	17	1.05
7	Goossens, H	17	1.05

8	Blasi, F	17	1.05
9	Schuetz, P	16	0.99
10	Mehr, D R	15	0.92
	6404 Authors	1442	88.74

Table 4 top ten authors' contributions in lower respiratory infections research publications, totally 6414 authors were contributing in this research during the study period, among the authors Leinonen M has contributing 22 papers with first position, Little, P and Butler, C C has 21 papers Second and third place respectively, followed by Hood, K has fourth place, Schaberg, T, Madh,I S A, Goossens, H and Blasi, F fifth, Sixth, seventh and eighth place respectively, Schuetz, P has ninth place, Mehr, D R has tenth place with 15 papers contributing in this research. Moreover remaining 6404 authors were contribution less than 15 papers contributing in this research.

Table 5 Lotka's Law of Author Productivity

Sl. No	No. of Contributions	Observer No. of Authors with n (an) or F	Observed % of authors 100/an/ a1	Expected no. of authors (an=a/n 2) P	Expected % of authors predicted by Lotka's/ 100n	(F-P)2/P
1	1	5045	100.000	5045	100.00	0.00
2	2	889	17.621	1261.25	25.00	109.87
3	3	238	4.718	560.56	11.11	185.61
4	4	108	2.141	315.31	6.25	136.30
5	5	54	1.070	201.80	4.00	108.25
6	6	20	0.396	140.14	2.78	102.99
7	7	11	0.218	102.96	2.04	82.13
8	8	4	0.079	78.83	1.56	71.03
9	9	9	0.178	62.28	1.23	45.58
10	10	9	0.178	50.45	1.00	34.06
11	11	11	0.218	41.69	0.83	22.60
12	12	2	0.040	35.03	0.69	31.15
13	13	2	0.040	29.85	0.59	25.99
14	14	2	0.040	25.74	0.51	21.90
15	15	1	0.020	22.42	0.44	20.47
16	16	1	0.020	19.71	0.39	17.76
17	17	4	0.079	17.46	0.35	10.37
18	20	1	0.020	12.61	0.25	10.69
19	21	2	0.040	11.44	0.23	7.79
20	22	1	0.020	10.42	0.21	8.52
	Total	6414			x2	52.65

LOTKA'S LAW OF AUTHOR PRODUCTIVITY

The Lotka's Law of author productivity is tested with the applications of scientific productivity Chi-square model, and it is applied in relation to number of authors contributing to the number of publications. Potter (1981) identified the Lotka's fraction $1/n_a = 4.65$ on the basis of Euler – maclaurin formula of summation. This model is applied in the present study.

The sum was used as a deviser for $1/n = 4.65$ to determine the proportion of the total number of authors expected to produce 'n' papers (in case of present study $n = 1,2,3,4...65$). The following formula was used to find the proportions:

$$s = \sum_{n=1}^{65} 1/n \cdot 4.65$$

It explains that the number of authors making "n" contributions is about $1/n^2$ of those making a single contribution and the proportion of contribution that makes a single contribution is about 60 percent.

In other words, for every 100 authors making one contribution

each, there would be 25 others contributing 25 articles each (100/22 =25) and about 11 contributing three articles each (100/33 = 11.1) about 6 contributing four articles each (100/44 = 6.25), and so on.

The Lotka's Law was also tested with the application of scientific productivity Chi-Square model in relation to a number of authors who contributed "n" number of publications. It can be expressed by the equation,

$n = 1, 2, 3, \dots; an = a \cdot 1/n^2$ In other words, for every 100 authors, making one contribution each, there would be 25 authors contributing two articles each (100/22 = 25) about 11 contributing articles each (100/33 = 11.1), and so on. Here "an" is the number of authors contributing "n" papers each and "a" is the number of authors contributing one paper each.

The Chi-square can be computed as $(f - p) \cdot 2/p$, where f = observed number of authors with "n" publications; p = Expected number of authors (Lotka, A.J. 1926).

Based the above discussion it is appropriate to examine and analyse the implications of Lotka's Law in relation to author productivity on Lower Respiratory Infections research productivity, Table 5 shows the Lotka's Law of author productivity.

In this study, the productivity of Lower Respiratory Infections research scientists is examined. At the first observation, the analysed data invalidate Lotka's findings that the proportion of all contributions that make a single contribution is less than 60 percent.

Further, Lotka's Chi-square model confirms the source trend. It explains the fact that the calculated χ^2 value is 52.65, which is less than the tabulated value at 5 percent level of significance. Thus the present analysis clearly validates the Lotka's findings.

In the present analysis, productivity is attributed to several factors. If a complete publication detail of an author is taken, the Lotka's Law testing may present a different picture.

Table 6 authorship pattern in Lower Respiratory Infections

Sl. No.	Authorship	No. of records	Percentages
1	Single	229	14.09
2	Double	154	9.48
3	Three	156	9.60
4	Four	199	12.25
5	Six	151	9.29
6	Six and Above	736	45.29
7	Total	1625	100.00

Table 6 shows that authorship pattern in lower respiratory infections research publications during the study period, among 1625 papers six and above authors collaboration have occupies predominate place with 736 papers, followed by Single author contribution are 229 papers, four author collaborations are 199 papers, three author collaborations are 156 papers, Double author collaborations are 154 and six author collaborations are 151 papers.

Table 7 top ten sources' contributed in Lower Respiratory Infections research

Sl. No	Source Titles	Records	% of 1625
1	Pediatric Infectious Disease Journal	60	3.69
2	Journal of Antimicrobial Chemotherapy	42	2.59
3	European Respiratory Journal	34	2.09
4	Clinical Infectious Diseases	34	2.09
5	Pediatric Pulmonology	32	1.97
6	Journal of Chemotherapy	32	1.97

7	Medecine et Maladies Infectieuses	28	1.72
8	International Journal of Antimicrobial Agents	24	1.48
9	Pediatric Research	23	1.42
10	Plos One	22	1.35
	432 Sources	1294	79.63

Table 7 indicates that top ten sources contributed in Lower Respiratory Infections research, totally 442 sources were contributed 1625 papers in this research during the study period, among the sources only top ten sources are listed this table 6, 'Pediatric Infectious Disease Journal' has occupies first place with 60 papers, 'Journal of Antimicrobial Chemotherapy' has second place with 42 papers, 'European Respiratory Journal' and 'Journal of Chemotherapy' has third and fourth place with respectively, 'Pediatric Pulmonology' and 'Journal of Chemotherapy' has fifth and sixth place with fifth and sixth place with 32 papers, 'Medecine et Maladies Infectieuses' has seventh place with 28 papers, 'International Journal of Antimicrobial Agents' has eight place with 24 papers, 'Pediatric Research' has 23 papers with ninth place, 'Plos One' has tenth place with 22 papers, and remaining 432 sources were contributing less than 22 papers contributing in this research.

Table 8 top ten Lower Respiratory Infections paper published source's Impact Factor and h-Index

Sl. No.	Title	SNIP	SJR	h index	Cites last (3years)	Impact Factor
1	Pediatric Infectious Disease	0.987	1.416	121	2693	2.587
2	Journal of Antimicrobial Chemotherapy	1.425	2.157	149	6827	4.919
3	European Respiratory Journal	2.216	3.204	188	6944	8.332
4	Clinical Infectious Diseases	6.757	4.742	261	12592	8.736
5	Pediatric Pulmonology	0.993	0.91	86	1181	2.85
6	Journal of Chemotherapy	0.073	0.49	40	239	1.333
7	Medecine et Maladies Infectieuses	0.820	0.605	23	384	1.422
8	International Journal of Antimicrobial Agents	1.424	1.63	93	2421	4.097
9	Pediatric Research	0.943	1.29	117	1661	2.761
10	PLoS ONE	1.044	1.395	181	282338	3.057

Sources: SCImago Journal Rank,

Table 8 indicates that; top ten Lower Respiratory Infections paper published source's Impact Factor and h-Index values, among the ten sources 'Clinical Infectious Diseases' Impact Factor is 8.736, h index value is 261, followed by 'European Respiratory Journal' Impact Factor value is 8.332, and its h index value is 188 compare among the ten sources, 'Journal of Antimicrobial Chemotherapy', h index value is 149 its impact Values is 4.919, 'International Journal of Antimicrobial Agents' Impact Factor value is 4.097, h index value are 93, 'PLoS ONE' Impact Factor value is 3.057, h index value are 181, 'Pediatric Pulmonology' Impact Factor value is 2.85, h index value are 86, 'Pediatric Research' Impact Factor value is 3.057, h index value are 117, 'Pediatric Infectious Disease Journal' Impact Factor value is 2.587, h index value are 121, 'Medecine et Maladies

Infectious' Impact Factor value is 1.422, h index value are 23, 'Journal of Chemotherapy' Impact Factor value is 1.333, h index value are 40. Moreover, among the ten sources 'Clinical Infectious Diseases' has highest Source Normalized Impact per Paper (SNIP), value are 6.757, SCImago Journal Rank (SJR) value is 4.742, and last 3 years total cites are 12592, remaining nine sources total cites are less than are ten thousand.

Top 9 top ten institutions's contributed in Lower Respiratory Infections research

Sl. No	Institutions/ Organizations	Records	% of 1625
1	University of Utrecht	47	2.89
2	Assistance Publique Hopitaux Paris Aphp	44	2.71
3	University of London	38	2.34
4	Utrecht University Medical Center	36	2.22
5	University Of Toronto	30	1.85
6	Centers for Disease Control Prevention - USA	28	1.72
7	University of Southampton	27	1.66
8	University of Barcelona	27	1.66
9	Johns Hopkins University	27	1.66
10	Finland National Institute For Health Welfare	27	1.66
	1953 Institutions / Organizations	1294	79.63

Top 9 top ten institutions's contributed in lower respiratory infections research publications, 1625 papers were contributed by 1963 institutions, among the institutions, 'University of Utrecht' has occupies first position with 47 papers, 'Assistance Publique Hopitaux Paris Aphp' has second place with 44 papers, 'University of London' has third place, 'Utrecht University Medical Center' has fourth place, 'University Of Toronto' has fifth place, 'Centers for Disease Control Prevention – USA' has sixth place, 'University of Southampton', 'University of Barcelona', 'Johns Hopkins University', and 'Finland National Institute For Health Welfare' has seventh, eighth, ninth and tenth position with 27 papers contributed in this research respectively.

CONCLUSION

Conclude from this study, totally 1625 papers were published in lower respiratory infections research during the study period, lower respiratory infections research publications are increased from 3.39 percentage to 6.22 percentage, thirteen document types were contributing in this research papers published, Article has first Meeting Abstract has second place, Proceedings Paper has thirds place and so on, totally 103 country authors were contributing in this research. Among the 103 countries United States of America is first place, England has second position, Netherlands has third place and so on, single author papers are less compare with multiple authored papers in this research. The analysed data invalidate according Lotka's findings that the proportion of all contributions that make a single contribution is less than 60 percent. Totally 442 sources were contributed in this research during the study period, among the sources 'Pediatric Infectious Disease Journal' has occupies first place 'Journal of Antimicrobial Chemotherapy' has second place, 'European Respiratory Journal' has third place and so on.

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