



Scientometric Profile of Ebola Research Output

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ABSTRACT

This paper discuss on scientometric profile of Ebola research output during 1996 - 2015, this study reveals that, During the study period in year 2015 have occupied first position with 45.67 percentage papers in Ebola research and 1997 has occupies least position with 0.79 percentage in this research. Moreover, the Doubling Time mean value is 4.57. Document type's wise research in Ebola papers during the study period, articles has occupies first position with 44.71 per cent, 2190 papers published in twelve languages 97.01 per cent of records were published in English language, totally 7589 authors were contributed 2190 Ebola Research paper during the study period.

KEYWORDS

Ebola, Infectious Diseases, Virus Disease, hemorrhagic fever, Epidemiology

Introduction

Ebola Virus first recognized in 1976, when two unrelated epidemics occurred in northern Zaire and 850 km away in southern Sudan; 88% of the patients in 318 recognized cases died in the former, and 53% of 284 in the latter.¹⁻² Disease recurred in the same area of the Sudan in 1979,³ and the Zaire subtype virus was isolated from a patient in a solitary case in northwestern Zaire in 1977.⁴ Ebola hemorrhagic fever was not recognized again for almost 2 decades. Then, in 1995 – 1996, an additional Ebola subtype (Coted'Ivoire) was isolated from a human patient,⁵ three separate Zaire subtype epidemics were recognized in Gabon.⁶

The 1976 Zaire epidemic in particular was driven by the sue of improperly sterilized needles and syringes, resulting in much of the geographic spread of infection. Interhuman spread of Ebola virus in the African epidemics was very extensive among medical staff, often resulting in closure of hospitals and clinics. Transmission to household contacts ranged between 3% and 17%, involved up to five generations of infection, and was associated with closed contact with sick patients and their body fluids, the epidemics subsided with the use of properly sterilized equipment, closure of hospitals, education of the populace, and institution of maskgown glove precautions.^{1,2,7,8} In addition, various have been visualized in alveoli of humans and aerosol infected monkeys.⁹

Objectives

- The following objectives of the present study are:
- To find Ebola research publications during the study period
- To find top twenty authors contributions in Ebola Research
- To identify the top twenty sources published in Ebola research
- To examine top twenty Ebola published source's Impact Factor and H Index value

Materials and Methods

The data have been collected from the Web of Science database; the study period is during (1996-2015). The search string was used 'Ebola' in the Title search box, field were used, the time span field were select from 1996 to 2015. A total of 2190 records were retrieved, the data downloaded and analyzed as per objectives of the present study. Moreover, Journal Rank, Source Normalized Impact per Paper (SNIP), and SCImago Journal Rank (SJR) also has been used for Impact factor and H Index value.

Relative Growth Rate (RGT)

The Relative Growth Rate is the number of publications/pages per unit of time. Hence, one year is taken as the unit of time. The mean relative growth rate R (1-2) over a specified period of interval can be calculated from the following equation suggested by Mahapatra (1985).

$$R(1-2) = \frac{W2 - W1}{T2 - T1}$$

Where,

R = Mean relative growth rate over the specify period of interval

W1 = log W1 (Natural log of initial number of publications/ pages)

W2 = log W2 (Natural log of initial number of publications/ pages)

T2-T1 = Unit difference between the initial time and final time.

Therefore,

R (a) = relative growth rate per unit per of publication per unit of time (year)

R (p) = relative growth rate per unit per of pages per unit of time (year)

Analysis and Interpretation

Table 1 year wise research output in Ebola

Sl. No	Publication Years	No. of records	Percentage
1	1996	33	1.13
2	1997	23	0.79
3	1998	34	1.17
4	1999	74	2.54
5	2000	46	1.58
6	2001	49	1.68
7	2002	49	1.68
8	2003	68	2.34
9	2004	50	1.72
10	2005	50	1.72
11	2006	60	2.06

12	2007	75	2.58
13	2008	43	1.48
14	2009	51	1.75
15	2010	53	1.82
16	2011	73	2.51
17	2012	63	2.17
18	2013	58	1.99
19	2014	629	21.62
20	2015	1329	45.67
	Total	2910	100.00

Table 1 indicate that year wise research output in Ebola at global level, during the study period 1996 – 2015, in 2015 have published 45.67 percentage, in 2014 have 21.62 percentages, followed by 2007 has 2.58 per cent, 1999 has 2.54 per cent, 2011 has 2.51 per cent, in 2003 has 2.34 per cent, 2012 has 2.17 per cent, the remaining years have published less than 2 per cent of papers in this research and in the year 1997 has occupies least position with 0.79 percentage,

Table 2 Relative Growth Rate and Doubling Time of Ebola research literature

Sl. No.	Year	No. of Records	Cumulative	W1	W2	W2-W1 R (a)	Mean (a) 1-2	Doubling Time	Mean dt (a) 1-2
1	1996	33	33		3.49		0.29		3.24
2	1997	23	56	3.49	4.02	0.53		1.31	
3	1998	34	90	4.02	4.49	0.47		1.47	
4	1999	74	164	4.49	5.09	0.6		1.16	
5	2000	46	210	5.09	5.34	0.25		2.77	
6	2001	49	259	5.34	5.55	0.21		3.30	
7	2002	49	308	5.55	5.73	0.18		3.85	
8	2003	68	376	5.73	5.92	0.19		3.65	
9	2004	50	426	5.92	6.05	0.13		5.33	
10	2005	50	476	6.05	6.16	0.11		6.30	
11	2006	60	536	6.16	5.87	0.29	0.18	2.39	5.9
12	2007	75	611	5.87	6.41	0.54		1.28	
13	2008	43	654	6.41	6.48	0.07		9.90	
14	2009	51	705	6.48	6.55	0.07		9.90	
15	2010	53	758	6.55	6.63	0.08		8.66	
16	2011	73	831	6.63	6.72	0.09		7.70	
17	2012	63	894	6.72	6.79	0.07		9.90	
18	2013	58	952	6.79	6.85	0.06		11.55	
19	2014	629	1581	6.85	7.36	0.51		1.36	
20	2015	1329	2910	7.36	7.97	0.61		1.14	
	Total	2910					0.23		4.57

Table 2 shows that, Relative Growth Rate and Doubling Time, during the study period publications Doubling Time mean value is 4.57. In 1996, the Ebola research publication was 33; gradually the research publications were rise to 1329 in the year 2015. The relative growth rate mean is 0.23.

Table 3 Document types wise research in Ebola papers

Sl. No	Document Types	No. of records	Percentages
1	Article	1301	44.71
2	Editorial Material	559	19.21
3	News Item	424	14.57
4	Letter	282	9.69
5	Meeting Abstract	134	4.60
6	Review	128	4.40
7	Proceedings Paper	37	1.27
8	Correction	36	1.24
9	Biographical Item	4	0.14

10	Reprint	2	0.07
11	Book Review	2	0.07
12	Book Chapter	1	0.03
	Total	2910	100.00

Table 3 shows that, document types wise research in Ebola papers during the study period, articles has occupies first position with 44.71 per cent, followed by Editorial Material has occupies second place with 19.21 per cent, News Item has 14.57 per cent, Letter has 9.69 per cent, Meeting Abstract has 4.60 per cent, Review has 4.40 per cent, Proceedings Paper has 1.27 per cent, Correction is also one type of document of types so it has 1.24 percentages, and remaining Biographical Item, Reprint, Book Review, Book Chapter each has occupies less than one percentage.

Table 4 Languages publications in Ebola research output

Sl. No	Languages	No. of records	Percentages
1	English	2823	97.01
2	French	33	1.13

3	Spanish	24	0.83
4	German	11	0.38
5	Russian	10	0.34
6	Dutch	3	0.10
7	Portuguese	1	0.03
8	Italian	1	0.03
9	Hungarian	1	0.03
10	Greek	1	0.03
11	Danish	1	0.03
12	Chinese	1	0.03
	Total	2910	100.00

Table 4 indicates that languages publications in Ebola research publications, among the 2910 records, 97.01 per cent of records have published in English language, followed by 1.13 per cent document have published in French, 0.83 per cent of papers published in Spanish, 0.38 per cent of papers have published in German, 0.34 per cent of papers have published in Russian, 0.10 per cent papers were published in Dutch language, the remaining six documents were published Portuguese, Italian, Hungarian, Greek, Danish, and Chinese each language has 0.03 per cent.

Table 5 Top twenty authors published in Ebola Research

Sl. No	Authors	No. of records	% of 2910
1	Feldmann, H	133	4.57
2	Geisbert, T W	62	2.13
3	Rollin, PE	56	1.92
4	Kawaoka, Y	55	1.89
5	Jahrling, P B	46	1.58
6	Bavari, S	43	1.48
7	Kobinger, G P	42	1.44
8	Hensley, L E	40	1.37
9	Gulland, A	40	1.37
10	Peters, C J	38	1.31
11	Nichol, S T	37	1.27
12	Basler, C F	36	1.24
13	Sanchez, A	35	1.20
14	Bray, M	35	1.20
15	Ksiazek, T G	34	1.17
16	Becker, S	34	1.17
17	Volchkov, VE	32	1.10
18	Takada, A	30	1.03
19	Leroy, E M	30	1.03
20	Klenk, H D	30	1.03

Table 5 shows that, top twenty authors' published in Ebola Research, totally 7589 authors were contributed in this research, among the authors Feldmann, H has occupies first position with 133 papers published in this research, followed by Geisbert, T W has 62 papers, Rollin, PE has this place with 56 papers, followed by Kawaoka, Y has 55 papers, Jahrling, P B has 46 papers, Bavari, S has 43 papers, Kobinger, G P has 42 papers, Hensley, L E and Gulland, A each author have published 40 papers, Peters, C J has 38 papers, Nichol, S T

has 37 papers Basler, C F has 36 papers, Sanchez, A and Bray, M each have published 35 papers in this research, Ksiazek, T G and Becker, S each has 34 papers, Volchkov, V E has 32 papers, Takada, A, Leroy, E M and Klenk, H D each author have published 30 research papers in Ebola Research remaining 7760 authors were contributing less than 30 papers in this research.

Table 6 top twenty sources published in Ebola research

Sl. No	Source Titles	No. of records	% of 2910
1	Lancet	151	5.189
2	Journal of Infectious Diseases	143	4.914
3	Journal of Virology	133	4.57
4	British Medical Journal	126	4.33
5	Science	84	2.887
6	Lancet Infectious Diseases	71	2.44
7	Morbidity and Mortality Weekly Report	65	2.234
8	Nature	58	1.993
9	New England Journal of Medicine	56	1.924
10	Journal of the American Medical Association	54	1.856
11	Emerging Infectious Diseases	48	1.649
12	Virology	46	1.581
13	Plos One	40	1.375
14	Clinical Infectious Diseases	37	1.271
15	Eurosurveillance	36	1.237
16	Tropical Medicine International Health	35	1.203
17	Antiviral Research	30	1.031
18	Plos Pathogens	27	0.928
19	Proceedings of The National Academy of Sciences of The United States of America	26	0.893
20	New Scientist	26	0.893

Table 6 shows that top twenty sources published in Ebola research, totally 632 sources were published during the study period, among the sources 'Lancet' has occupies first position with 151 papers, followed by 'Journal of Infectious Diseases' has second place with 143 papers, 'Journal of Virology' has third place with 133 papers, followed by 'British Medical Journal' has 126 papers, 'Science' has 84 papers, 'Lancet Infectious Diseases' has 71 papers, 'Morbidity and Mortality Weekly Report' has 65 papers 'Nature' has 58 papers 'New England Journal of Medicine' has 56 papers, 'Journal of the American Medical Association' has 54 papers, 'Emerging Infectious Diseases' has 48 papers, 'Virology' has 46 papers 'Plos One' has 40 papers, 'Clinical Infectious Diseases' has 37 papers, 'Eurosurveillance' has 36 papers 'Tropical Medicine International Health' has 35 papers, 'Antiviral Research' has 30 papers, 'Plos Pathogens' has 27 papers, 'Proceedings of The National Academy of Sciences of The United States of America' and 'New Scientist' each sources have published 26 papers in Ebola research during the study period.

Table 7 top twenty Ebola published source's Impact factor and H Index

Sl. No	Title	Total No. of Output	Total Cites	Impact Factor	SJR	SNIP	h- index
1	Lancet	151	38920	39.207	11.15	13.452	560
2	Journal of Infectious Diseases	143	9182	5.778	3.19	0.984	198
3	Journal of Virology	133	18710	4.648	2.692	1.052	235
4	British Medical Journal	126	15900	16.378	2.206	1.597	316
5	Science	84	86116	31.477	10.107	7.84	851
6	Lancet Infectious Diseases, The	71	5241	19.446	10.251	2.182	146
7	Morbidity and mortality weekly report	65	237	0	5.012	3.66	143
8	Nature	58	106774	42.351	17.313	7.93	890
9	New England Journal of Medicine	56	64994	54.42	12.155	14.91	757
10	JAMA - Journal of the American Medical Association	54	23594	30.387	5.197	8.86	522
11	Emerging Infectious Diseases	48	7509	7.327	2.943	2.27	165
12	Virology	46	3477	3.278	1.456	0.87	141
13	PLoS One	40	238332	3.534	1.3	1.03	153
14	Archives of Clinical Infectious Diseases	37	17	8.886	0.118	0.15	5
15	Eurosurveillance	36	2807	4.659	1.985	1.35	59
16	Tropical Medicine and International Health	35	1323	2.302	1.132	0.99	81
17	Antiviral Research	30	2215	3.434	1.399	1.1	84
18	PLoS Pathogens	27	14875	8.057	4.368	1.78	111
19	Proceedings of the National Academy of Sciences of the United States of America	26	113082	9.809	5.781	2.542	566
20	New Scientist	26	32	0.379	0.104	0	15

Sources: SCImago Journal Rank

In the table 7 shows that, the top twenty journals along with their Impact Factor and h - Index are given. The h - Index value is minimum 5 to a maximum of 890. The Impact Factor of first 20 journals represented in the table 6, New England Journal of Medicine got the first position in the rank by Impact Factor of 54.42 and followed by others. Moreover, 'New England Journal of Medicine' has highest value of Source Normalized Impact per Paper (SNIP) is 14.91; 'Nature' has highest SCImago Journal Rank (SJR) value is 17.313.

Conclusion

Concluded from the study, the year wise publications in Ebola research in 1995 have 33 and gradually the research publications were rise to 1329 in 2015, the article type document has 1301, majority of research papers was published in English language, among the authors Feldmann, H he have published 133 research papers in this research during the study period. Totally 632 sources were published related to Ebola research papers during the study period, among the sources 'Lancet' only published more than 150 papers in this research. The Impact Factor of top twenty journals in this research, New England Journal of Medicine got 54.42 Impact Factor Value.

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