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A scientometric study of tularemia disease; Web of science

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Abstract
The study is based on the Scientometrics analysis of 532 research article published during the period of 2017-2021. This Study will review on Reletive growth rate, Collabrative Index In Stem Cell and regenerative medicine, Co - Authorship Pattern of contribution, no of Author wise distribution, Author Producvity, degree of collaboration, country-wise distribution, document type distribution, the findings must reveal various aspects of the characteristics and patterns of contributions of the study.

Keywords: scientometrics, tularemia, web of science

Introduction
Scientometrics is the science of measuring and analyzing science. In practice, Scientometrics is often done using Bibliometrics which is a measurement of the impact of (scientific) publications. Scientometrics is the science of method scientific output similar to Bibliometrics used by librarians and information scientist. (Agrawal, Aruna, 1982); related fields are the history of science and technology philosophy of science and sociology of scientific knowledge. (Eugene Garfield, 1995); application of mathematical and statistical methods of scientific literature (Derek de solla, 2000); to identify national an international network and to map the development of new fields of science and technology as well as to know the inner logic of science development (yadavJaisi Ram, 1984); this enables to evaluate the size of scientific production on the assumption that the essence of scientific activity is the assumption the production of knowledge (Eugene Garfield, 2002); open access has emerged in the last few years as serious alternative to additional commercial publishing models taking the benefits offered by technology one step further (Wasudevan K T 1995); one significant finding in the field is principle of cost escalation to the effect that achieving further findings at a given level of importance grow exponentially more costly in the expenditure of efforts and resources (Manavalan R 1982) [8]; other characteristics of open access journals are that author relation copyrights and they must self-achieved content in an independent repository (David Wilson, 2001); modern Scientometrics is mostly based on latter founded the institute for scientific information which is heavily used for Scientometrics analysis (Derek, J. 1995); currently prepares and international methodological manual that will contain guidelines for creating applying and interpreting the indices based on Bibliometric data (Eva Rodenas, 2001).

Definition Analysis
Scientometrics
According to bankapur, M.B. and Kumabar, (1993) "Scientometrics is a more general that Bibliometrics. It is interesting to know, that both disciplines have a large overlap. It is surprised to learn certain comments stating that both disciplines have a large overlap. It is surprised to learn certain comments stating that Scientometrics, using Bibliometrics techniques id a part of Bibliometrics".

Scientometrics Analysis
According to (2006), wouters, a cart intension has always existed between academic Scientometrics and political /practical, Scientometrics, the letter of which has been described as a hybrid of social science and bur rerate expertise (2006).

Web of Science
Web of Science Core Collection content is uniquely selective and our indexing is uniquely consistent. Our independent and thorough editorial process ensures journal quality, while more than 50 years of consistent, accurate and complete indexing has created an unparalleled data structure.
Every article and all cited references from every journal have been indexed, creating the most comprehensive and complete citation network to power both confident discovery and trusted assessment. Only the Web of Science Core Collection indexes every piece of content cover-to-cover, creating a complete and certain view of over 115 years of the highest-quality research swine flu- Swine influenza is a respiratory disease of pigs caused by type A influenza viruses that regularly cause outbreaks of influenza in pigs.
Tularemia is a rare infectious disease. Also known as rabbit fever or deer fly fever, it typically attacks the skin, eyes, lymph nodes and lungs. Tularemia is caused by the bacterium Francisella tularensis. The disease mainly affects rabbits, hares, and rodents, such as muskrats and squirrels

Review of Literature
(Alhamdi, Khaparde & Kanekar, 2014) [1] they attempted on bibliometric analysis of ten volumes (57-66) in the field of journal of Documentation. It is based on the references

appended to International Journal of "Journal of Documentation" during 2001-2010. The present study is based on 15150 references appended to 364 articles contributed by the authors in Journal of Documentation. It was found that Journals Citations are more in number than other citations. In Authorship pattern it was found that Solo Researchers are Predominant than Collaborative Researchers. The extent of collaboration was not much popular among the Journal of Documentation. The mean relative growth for articles and citation in the first five years 2001 to 2005 is reduced according to the last five years 2006 to 2010.The value of group co-efficient (gp) was only 0.46. It was seen that researchers cited latest documents. Universities are the major contributors. The study shows the UK, USA, Finland, and Denmark, have the majority of most cited records in Journal of Documentation. Out of 364 articles there are 175 articles have pages length from 11 to 20.

Khaparde & Pawar (2013) studied the authorship pattern and author's collaborative research in Information Technology with a sample of 17917 articles collect from LISA during 2000-2009.The average number of authors per article is 1.80. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is 0.71 but the year wise degree of collaboration is almost same in all the years of mean value 0.49. According to 10 years of period, the multi- authorship articles are higher and predominant on single authorship. The study found that the researches in Information Technology are keep toward team research or group research rather than solo research.

Fawaz Alhamdi and Khaparde V S (2015) Analyzed Authorship pattern in cloud computing research in LISTA. They collect 108 articles during the year 2009 to 2013.In this study the number of contributions found to be the highest is 24 in the year of 2012. The rate of growth of publication highly decreased from the rate of 0.693 in 2010 to 0.193. in 2013 whereas the orresponding the Doubling time for different years gradually increased from 1 in 2010 to 3.95 in 2013.

Objectives of the Study

The primary objective of this study is to understand the growth of Scientrometrics Study are cyber lows and their research output in global during the period 2017 -2021 More specific objectives are as follows:

1. Relative Growth Rate (RGR) & Doubling Time of No. of Articles
2. Collabrative Index in Stem Cell and regenerative medicine
3. Co - Authorship Pattern of contribution
4. To study of No of author
5. year wise degree of collaborion
6. To study of Author Producvity
7. To Study country wise contribution
8. To study of document type distribution

Scope and Limitation of the Study

The present study is based on the Scientometric Profiles of Tularemia in web of science. The present study is based on over all 532 contributions during 2017-2021

Data collection

Data can be numerically expressed that is quantified quantifiable or objective (Fasibs off and Dely, 1990) the data was collected from Eric, with the help of spas and excel. Total 532 contributions during 2017-2021

Data Analysis and Interpretation:

Scientometric analysis is a branch of Bibliometrics. It is an important research tools for understanding of the subject it aims at measuring the utility of documents and relationship between documents and fields.

The present study is based on the Scientometric profile of Tularemia in web of science.The present study is based on over all 532 contributions during 2017-2021

Table no 1 Relative Growth Rate (RGR)

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 (1919),

Blackman (1919) defined, which in turn had its origin from the study of the rate of interest in

the financial investment. The mean Relative Growth rate (R) over the specific period of interval can be calculated from the following equation.

$$R_{1\text{-}2} = \text{Loge } 2\,W - \text{loge } IW$$

Whereas,

1-2 R = mean relative growth rate over the specific period of interval.

Loge IW = log of initial number of Articles.

Loge 2 W = log of final number of articles after a specific period of interval.

2 T - 1 T = the unit difference between the initial time and final time.

The year can be taken here as the unit of time. The RGR for articles is hereby circulated.

Therefore,

1-2 (aa-1 year-1) can represent the mean relative growth rate per unit of year over a specific

period of interval.

Doubling Time (DT)

There exists a direct equivalence between the relative growth rate and the doubling time. If the numbers of articles/pages of subject double during a given period then the difference the logarithms of numbers at the beginning and end of this period must be logarithms of number 2. If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval and for both articles and pages can be calculated by the formula,

$$\text{Doubling time (DT)} = \frac{0.693}{R\,(p)}$$

Therefore,

$$\text{Doubling time for articles } D(T) = \frac{0.693}{1\text{-}2\ R\ (aa\text{-}1\ year\text{-}1)}$$

Table 1: Relative Growth Rate

Year	Frequency	Commulitive	W1	W2	Rgr	Mean	Dt	Mean Dt
2017	106	106	0	4.66	0		0	
2018	124	230	4.66	5.43	0.77		0.15	
2019	90	320	5.43	5.76	0.33	0.322	0.066	0.45
2020	112	432	5.76	6.06	0.3		0.06	
2021	100	532	6.06	6.27	0.21		0.04	

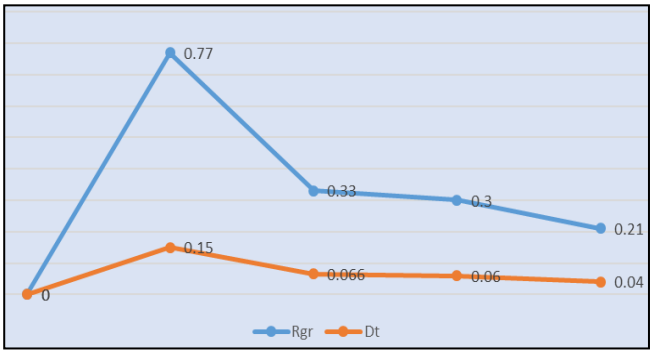

Fig 1: reletive growth rate

From the Table No.4 and it noticed that the mean relative growth for the five years 2017 to 2021 is (0.322), While the Doubling time for different years [Dt(p)] gradually increased from (0) in 2017 to (0.04) in 2021. The mean doubling time for the ten years (i.e. 2017 to 2021) is only (0.45). Thus as the rate of growth of publication was decreased, the corresponding Doubling Time was increased

Table 2: Collabrative Index in Stem Cell and Regenerative Medicine

Year	single author	two author	three author	four author	five author	more than author	Total	CI
2017	2	10	13	6	13	62	106	4.94
2018	5	7	21	12	13	66	124	4.8
2019	2	5	9	8	12	54	90	5.07
2020	4	10	6	15	15	62	112	4.93
2021	5	9	12	10	9	55	100	4.98
	18	41	61	51	62	299	532	

Collaborative Index

$CI = \sum Aj=1jfi$

N

Collaborative Index provides the year wise mean number of authors per multi authored Paper CI ranges from 4.94 (2017) to 4.93 (2020) with an average of per multi authored

Table 3: Co - Authorship Pattern of contribution

Year	Author Nature	Frequency	Total	Per	Cummulative
2017	single author	2		1	1
	co- author	104	106	98	99
2018	single author	5		4	4
	co- author	119	124	95	99
2019	single author	2		2	2
	co- author	88	90	97	99
2020	single author	4		3	3
	co- author	108	112	96	99
2021	single author	5		4	4
	co- author	95	100	95	99

It is observed from the Table No.3 that the value of Co-Authorship Pattern for Single authored papers during 2017-2021 was highest with 5 publications (4%) in 2018 and the same year Co - Authorship Pattern for multi authored papers highest with 119 publications (95%), which indicated that the collaborative research is increasing over the study of "Scientometrics"

Table 4: No of Author

No of Author	Frequency	Persentage
single	18	3.38
two	41	7.71
three	61	11.47
four	51	9.59
five	62	11.65
six	65	12.22
sevan	63	11.84
eight	42	7.89
nine	31	5.83
more than number	98	18.42
	532	100.00

Table no 4 single number of author frequency are 18 and two number are author frequenc is 41and more number are frequency are 98 table no 4

Table 5: Author Productivity

Year	Total No of Article	Total No of Author	AAPP	PPA
2017	106	729	6.87	0.14
2018	124	736	5.93	0.16
2019	90	676	7.51	0.13
2020	112	752	6.71	0.14
2021	100	722	7.22	0.13

Table 6: Degree of Collaboration

Year	Total No of Article	No of Single Authored Article	% Of Article	Multi Authored Article	% Of Article	Degree of Collabration
2017	106	2	11.11	104	20.23	0.98
2018	124	5	27.78	119	23.15	0.95
2019	90	2	11.11	88	17.12	0.97
2020	112	4	22.22	108	21.01	0.96
2021	100	5	27.78	95	18.48	0.95
	532	18	100.00	514	100.00	100

In order to determine the strength of Collaboration (DC), the following formula suggested by Subramanyam K [19] has been employed. Where, DC = Degree of Collaboration NM = Number of Multiple Authored Papers NS = Number of Single Authored Papers the Degree of Collaboration of authors by year wise is presented in the Table No. 6. The degree of collaboration ranges from 0.98 to 0.95 The average degree of collaboration is 0.98 during the period 2017- 2021 and it brings out clearly that there exists a higher level of collaboration in

Table 7: Document Type Contribution

Article	416	78.20
Review	56	10.53
Meeting Abstract	20	3.76
Editorial Material	18	3.38
Letter	14	2.63
Review; Early Access	3	0.56
Article; Early Access	2	0.38
Article; Proceedings Paper	1	0.19
Correction	1	0.19
Review; Book Chapter	1	0.19
	532	100.00

Table No. 7 & Figure no.3 gives the publications were divided in to 9 document types, the form wise distribution of publications out of the total 532 publications, 416 (78.20%) publications were in Article form. Followed by other document type such as Research review 56 (10.53%) editorial material 18 (3.38 %), letter 14 with (3.38%)

Table 8: Country Wise Contribution

USA	**229**	**43.05**
France	45	8.46
Germany	36	6.77
Sweden	22	4.14
Swizerland	19	3.57
Turkey	18	3.38
Czech Republic	16	3.01
Poland	14	2.63
Spain	13	2.44
Japan	13	2.44
Iran	12	2.26
Australia	11	2.07
England	10	1.88
China	10	1.88
Russia	8	1.50
Italy	7	1.32
Israel	6	1.13
South Korea	4	0.75
Pakistan	4	0.75
India	4	0.75
Portugal	3	0.56
Netherlands	3	0.56
Canada	3	0.56
Hungary	2	0.38
Finland	2	0.38
Belgium	2	0.38
Single Time Publication	16	3.01
532		100.00

It can be observed from Table No. 09 the country wise distribution of contributors, the table 9 reveals that out of the total 532 contributors has contributed during 2017-2021, majority of article 416 (78.20 %) have been contributed USA country form. 45 contributors have been contributed form France, 36 contributors have been contributed form Germany Like that followed by 16 countries contributed with One Publication.

Findings

1. the country wise distribution of contributors, the table 9 reveals that out of the total 532 contributors has contributed during 2017-2021 majority of article 416 (78.20 %) have been contributed form Usa country.
2. The average degree of collaboration is 0.98 during the period 2017 – 2021 and it brings out clearly that there exists a higher level of collaboration in the journal.
3. CI ranges from 4.94 (2017) to 4.93 (2020) with an average of per multi authored
4. the value of Co- Authorship Pattern for Single authored papers during 2017-2021 was highest with 5 publications (4%) in 2018 and the same year Co - Authorship Pattern for multi authored papers highest with 119 publications (95%)

Conclusions

In spite of the clinical significance of *F. tularensis*, little is known about the genetic makeup of the bacterium or its mechanisms of pathogenicity. While it is known that the bacterium can invade a range of cell types, and it is clear that the bacterium is primarily an intracellular pathogen, the mechanisms allowing invasion and growth within host cells are not known. This lack of information is hindering research aimed at developing improved vaccines against tularemia.

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