A Scientometric Analysis of Food Poisoning Research Since 2009-2018: Based on the Web of Science Database

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Abstract - This study evaluates the "Food Poisoning" research output from the year 2009 to 2018 (10 years). The data were downloaded from the Web of Science (WoS) database which was maintained by Thomson Reuters. The total number of records was 1726. Food poisoning is defined as an infection caused by the consumption of food or water contaminated with bacteria and/or their toxins, or with parasites, viruses, or chemicals. The study mainly focused on the year wise, author wise, language and country wise publications of the food poisoning research. The collected data were analyzed with the help of 'Bibexcel tool'.

Keywords: Scientometric, Web of Science, Bibexcel, Food Poisoning, Authors Productivity

I. INTRODUCTION

Scientometrics is nothing but the study of quantitative aspects of science. The scientometric study is a statistical method of as well as to evaluate and the growth of a subject. contemporary scientometrics is frequently based on the work of Derek. J de Solla Price and Eugene Garfield. The former one is known as "Father of Scientometrics". He formulated his theory on the exponential growth of science in 1963 whereas Garfield founded the Institute for Scientific Information (ISI)which provides the data and tool for scientometric analysis. Food poisoning occurs when you eat food contaminated with bacteria or other toxins. Symptoms include diarrhea, vomiting, and stomach cramps, and generally, start 4 to 36 hours after eating contaminated food. Food poisoning is especially common during summer when food may not be kept cold enough to prevent bacteria from growing. The most common pathogens are nor virus, Escherichia coli, Salmonella, Clostridium perfringens, Campylobacter, and Staphylococcus aureus.

II. REVIEW OF LITERATURE

Gomathi P & Rubinandhini A (2016) [1] this study reveals the breast cancer research output from the year 2006-2015. The data were downloaded from the web of science database which was maintained by Thomson Reuters. A total number of records were 4206. The result of such studies may be very useful for research administrators, policymakers, and funding agencies. Breast cancer is a progressive disease, signs, and symptoms slowly worsen over time. There is no change to do well. The collected data were analyzed with the help of 'Bibexcel tool'.

Malic, B.A., Aftab, A, & PM, N.A. (2019) [2] has been presented a bibliometric examination of the crowdsourcing publications. The publication crowdsourcing in the Science Citation Index Expanded of the Web of Science. The overall quantity of data was 1796 in the period of 2008-2017. The parameters analyzed included document type, language type, most prolific journal, independent publications, collaborative publications, etc. English remains the dominant language and accounted for nearly 100 percent of the total output. The USA, China, and the UK produce 80% of total production.

III. RESEARCH METHODOLOGY AND LIMITATION OF THE STUDY

The data for this study were retrieved from the web of science database, which is a scientific and indexing service maintained by Thomson Reuters. The "Food Poisoning" research output from the year 2009 to 2018. The total number of data was 1726. For this study bibliographic element such as Authorship Pattern, type of document, Language wise, Keywords wise, and Country wise etc., was analyzed using Bibexcel.

IV. OBJECTIVES OF THE STUDY

1. To find out the year wise distribution of the article
2. To identify the Relative Growth Rate and Doubling Time.
3. To calculate the Language wise distribution
4. To determine the document type distribution of research.
5. Authorship pattern of publication and Degree of Collaborations.
6. To find out the Prolific Author wise publications
7. To find out the keyword wise and country wise distribution of articles.

V. DATA ANALYSIS AND INTERPRETATION

Table I shows that year wise distribution of publications of Food poisoning research output during the year 2009 to 2018 (10 years) a total of publications 1726 were published. The highest number of publications 217 (12.57%) were published in the year 2018 followed by 2017 i.e. 209 (12.10%). The study reveals that the majority of the articles were published in the year 2018 i.e. 217 (12.57%).

TABLE I YEAR-WISE DISTRIBUTION OF ARTICLES

S. No	Year	Records	%	TC
1	2009	110	6.37	2191
2	2010	128	7.41	3185
3	2011	139	8.03	2395
4	2012	179	10.37	3337
5	2013	155	8.98	1843
6	2014	182	10.54	1869
7	2015	208	12.05	1652
8	2016	199	11.52	1012
9	2017	209	12.10	599
10	2018	217	12.57	176
Total		1726	100	18259

TABLE II RELATIVE GROWTH RATE AND DOUBLING TIME OF TUBERCULOSIS PUBLICATIONS

Year	No. of Publications	Cumulative no. of publications	W_1	W_2	R (a) (W1- W2)	Mean R (a)	Doubling Time	M Dt(a)
2009	110	110	-	4.70	-		-	
2010	128	238	4.70	5.47	0.77		0.9	
2011	139	377	5.47	5.93	0.46		1.50	
2012	179	556	5.93	6.32	0.39	0.372	1.77	1.41
2013	155	711	6.32	6.56	0.24		2.88	
2014	182	893	6.56	6.79	0.23		3.01	
2015	208	1101	6.79	7.00	0.21		3.3	
2016	199	1300	7.00	7.17	0.17		4.07	
2017	209	1509	7.17	7.31	0.14	0.178	4.95	4.056
2018	217	1726	7.31	7.45	0.14		4.95	
Total	1726					0.55		5.466

Table II shows that the Relative Growth Rate of total contribution published had gradually greater than before. The Growth Rate in 0.372 in the first five years (2009-2013), followed by the second five years (2014-2018) Growth Rate was 0.178 in decreased. The mean doubling time during the first five years 2009-2013 was 1.41 and it was enlarged during the second five years 2014-2018 was 4.056.

The overall study period has witnessed a mean Relative Growth Rate in 0.55. In general, the relative growth rate of publications of all sources in Food poisoning output has shown an increasing trend. The overall study period has witnessed a mean doubling time value was 5.466.

Table III shows that Exponential Growth Rate of publications. The highest growth rate of 1.28 was found in 2012 with 179 publications. Followed by the 1.17 was found during the year of 2014 with 182 publications. The lowest growth rate of 0.86 was found in 2013 with 155 publications.

It is also found that the Exponential Growth Rate was found to be 9.72 and the average growth rate has positive value showing the increasing trend in the Food Poisoning research.

TABLE III EXPONENTIAL GROWTH RATE

S. No	Year	No. of Publications	Exponential Growth rate
1	2009	110	-
2	2010	128	1.16
3	2011	139	1.08
4	2012	179	1.28
5	2013	155	0.86
6	2014	182	1.17
7	2015	208	1.14
8	2016	199	0.95
9	2017	209	1.05
10	2018	217	1.03
Total		1726	9.72

TABLE IV LANGUAGE WISE DISTRIBUTIONS

S. No	Name of the Language	Records	%
1	English	1607	93.10
2	Japanese	42	2.43
3	Spanish	23	1.33
4	Portuguese	12	0.69
5	Polish	12	0.69
6	Chinese	7	0.40
7	French	7	0.40
8	German	4	0.23
9	Turkish	3	0.17
10	Korean	3	0.17
11	Russian	2	0.11
12	Greek	1	0.05
13	Croatian	1	0.05
14	Malay	1	0.05
15	Slovene	1	0.05
	Total	1726	100

The division of Food Poisoning literature by language is shown in table IV the scholarly communication is effected through English language in almost all the countries, irrespective of the native language of the subject of Food Poisoning which published about 1607 (9310%) of the research output in English followed by Japanese publications 42 (2.43%). The study concludes that the majority of the articles are published in the English Language i.e., 1607 (93.10%).

TABLE V TYPE OF DOCUMENT WISE DISTRIBUTION OF PUBLICATIONS

S. No	Type of Documents	Records	%	TC
1	Article	1500	86.90	14318
2	Review	145	8.40	3652
3	Meeting Abstract	27	1.56	212
4	Article; Proceedings Paper	19	1.10	29
5	Editorial Material	13	0.75	21
6	Letter	11	0.64	19
7	News Item	3	0.17	5
8	Article; Book Chapter	2	0.11	3
9	Correction	2	0.11	0
10	Review; Book Chapter	1	0.05	0
11	Article; Data Paper	1	0.05	0
12	Book Review	1	0.05	0
13	Article; Early Access	1	0.05	0
	Total	1726	100	18259

Table V reveals that the type of document wise distribution of publications. It is an accepted fact that most of the scholarly communication of scientific research is published

in articles 1500 (86.90%). Followed by Review 145 (8.40%). Finally, most of the scholarly communication of scientific research is published in the type of document was Articles 1500 (86.90%).

TABLE VI AUTHORSHIP PATTERN WISE PUBLICATIONS

S. No	Authors	Records	%
1	1 Author	102	5.90
2	2 Authors	165	9.55
3	3 Authors	253	14.65
4	4 Authors	277	16.04
5	5 Authors	234	13.55
6	6 Authors	208	12.05
7	7 Authors	168	9.73
8	8 Authors	98	5.67
9	9 Authors	76	4.40
10	10 Authors	57	3.30
11	> 10 Authors	88	5.09
	Total	1726	100

The table VI shows that the Authorship pattern of publications. The most of publications were by the four authors 277 (16.04%) followed by the three authors contributed 253 (14.65%), five authors contributed 234 (13.55%). The minimum number of contributed was ten authors were 57 (3.30%).

The scope of the degree of collaboration in Food Poison research has been deliberate with the help of the formula devised by K. Subramanian. This rule has been adopted to observe the scope of research collaboration in the study.

The formula where; $DC = \dfrac{Nm}{Nm + Ns}$

DC = Degree of Collaboration   Nm = Number of Multiple Authors   NS = Number of Single Author

$$= \frac{1624}{1624 + 102} \qquad = \frac{1624}{1726} \qquad = 0.94$$

TABLE VII DEGREE OF COLLABORATION

S. No	Authorship pattern	Publications	Percentage
1	Single Author	102	5.90
2	Multiple Authors	1624	94.09
	Total	1726	100

Table VII shows that the Degree of Collaboration research output. The firsr phase Single author and next phase Multi-authors. It is clear from the table Single author records are 102 (5.90%) and multiple authors were 1624 (94.09%).

Finally the majority of the articles published in multiple authors. The Degree of Collaboration significance was 0.94

TABLE VIII PROLIFIC AUTHOR'S WISE DISTRIBUTION OF ARTICLES (TOP TEN)

S. No	Name of the Authors	Records	%
1	McClane BA	25	1.44
2	Sarker MR	23	1.33
3	Johler S	20	1.15
4	Paredes-Sabja D	17	0.98
5	Kamata Y	15	0.86
6	Sugita-Konishi Y	13	0.75
7	Li JH	13	0.75
8	Hennekinne JA	13	0.75
9	Oh DH	12	0.69
10	Hu DL	12	0.69

All-Author List (5754)

Table VIII shows in these analysis 5754 prolific authors (top 10) and 1726 records. It reveals that McClane BA is the most productive author contributing 25 (1.44%) articles followed by Sarker MR with 23 (1.33%). This study reveals that McClane BA is the most productive author contributing 25 (1.44%) articles.

TABLE IX KEYWORD WISE DISTRIBUTION OF PUBLICATIONS (TOP TEN)

S. No	Name of the Keywords	Records	%
1	Identification	219	3.14
2	Strains	184	2.64
3	Food	117	1.68
4	Escherichia-Coli	99	1.42
5	Prevalence	98	1.40
6	Genes	91	1.30
7	United-States	80	1.15
8	Outbreak	78	1.12
9	Bacteria	73	1.04
10	Resistance	70	1.00

Table IX shows that Keyword wise distributions of publications. The word 'IDENTIFICATION' is highest with 219 (12.68%). This is followed by the word 'STRAINS' which occurred in 184 (10.66%) publications The majority of the word 'IDENTIFICATION' 219 (12.68%) time used in this study.
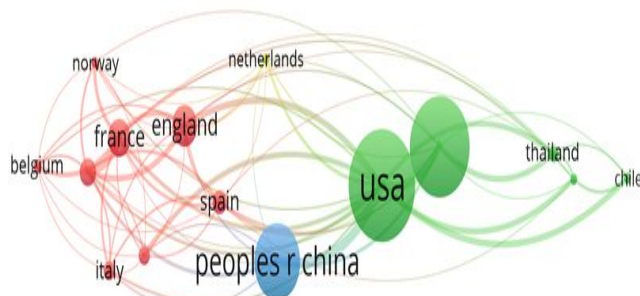

Fig. 1 Country wise publications (top 15)

TABLE X COUNTRY WISE DISTRIBUTIONS OF PUBLICATIONS (TOP 15)

S. No	Name of the Country	Records	%
1	USA	280	12.92
2	Japan	250	11.54
3	Peoples R China	186	8.58
4	UK	120	5.54
5	South Korea	113	5.21
6	France	87	4.01
7	India	76	3.50
8	Germany	62	2.86
9	Brazil	60	2.77
10	Iran	55	2.53
11	Spain	54	2.49
12	Italy	43	1.98
13	Australia	42	1.93
14	Turkey	41	1.89
15	Taiwan	37	1.70

(Total Country list (99))

The total number of publications in Food Poisoning were 99 international collaboration of contribution of top 15 countries are listed in table 10 the largest contribution to worldwide collaborative papers of the USA in Food Poisoning research comes from 280 (12.92%) it is conquered the first position. Followed by the country Japan was 250 (11.54%). The study reveals that the USA was published the majority of the articles are 280 (12.92%).

VI. FINDINGS AND CONCLUSION

1. The year wise distribution of publication of Food poisoning research output during the year 2009 to 2018 (10 years) a total of publications 1726 was published. The study reveals that the majority of the articles published in the year 2018 i.e. 217 (12.57%).
2. The overall study period has witnessed a mean Relative Growth Rate in 0.55. The overall study period has witnessed a mean doubling time value was 5.466.
3. Exponential Growth Rate was found to be 9.72 and the average growth rate has positive value showing the increasing trend in the Food Poisoning research.
4. The majority of the articles are published in the English Language i.e., 1607 (93.10%).
5. Most of the scholarly communication of publications were published in the Articles 1500 (86.90%).
6. The most of publications contributed by the four authors 277 (16.04%) compared to others.
7. This study reveals that McClane BAd is the most productive author contributing 25 (1.44%) articles.
8. The frequency of occurrence of words among the publications as keywords revealed that the word 'IDENTIFICATION' is highest with 219 (12.68%).
9. The top 15 countries are listed the largest contribution to international collaborative papers of the USA 280 (12.92%) it is dominated the first position.

REFERENCES

[1] Anyi, Kevin Wan Utap., Ngah, Zainab Awang & Anuar, N.B. (2009). Bibliometric Studies on Single Journals: A Review. *Malaysian Journal of Library & Information Science, 14*(1), 17-55.

[2] Dutt, B., Garg, K.C., & Bali, A. (2003). Scientometrics of the international journal Scientometrics. *Scientometrics, 56*(1), 81-93.

[3] Garg, K. C., Kumar, Suresh & Lal, Kashmiri. (2006). Scientometric Profile of Indian Agricultural Research as Seen through Science Citation Index Expanded. *Scientometrics, 68*(1), 151-166.

[4] Gomathi, P., & Rubinandhini A. (2016). Bibliometrics study on breast cancer research during the year 2006-2015. *International Journal of Research in Library Science*, *2*(2), 232-241.

[5] Retrieved from: http://umm.edu/health/medical/altmed/condition/food poisoning

[6] Retrieved from: https://www.google.com/search?q=Yoshikane+et+al +formula&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjV6IbD5 ZzhAhXRdH0KHd_lA-sQ_AUIDigB&biw=1517&bih=730&dpr= 0.9#imgdii=IXFLWA0lducQ6M:&imgrc=VMrwiiQ20bFQxM:

[7] Malic, B.A., Aftab, A, & PM, N.A. (2019). Mapping of Crowdsourcing Research: A Bibliometric Analysis. *DESIDOC Journal of Library and Information Technology, 39*(1), 23-30.

[8] Senthilkumar, R *et al.,* (2015). Scientometric Analysis of Astrophysics Research Output in India during 1989-2914. *Library Research World*, *1*(2), 97-109.

[9] SenthilKumaran, P., & Abdul Jaseem. (2016). Scientometric Analysis of Black Pepper Research in India. *International Journal of Research in Library Science*, *2*(2), 116-122.

[10] Singh, Gian., Mittal, Rekha & Ahmad, Moin. (2007). A Bibliometric Study of Literature on Digital Libraries. *Electronic Library*, *25*(3), 342-348.

[11] Thirumagal, A. (2013). Osteoarthritis research growth during 2001-2012: A bibliometrics study. *IASLIC Bulletin*, *58*(2), 81-92.