

Congenital Rubella Syndrome: A Scientometric Study

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Abstract-*The main goal of the present study is to analyses and evaluate Congenital Rubella Syndrome research publications using Dimension AI Database during the years 2013 to 2022 through scientometric measurements. For that, a total of 479 articles were downloaded from Dimension AI with bibliographic details. It is observed that the majority of publications published in the form of Journal Articles 461 (96.24%), the highest number of contributions is 61 (12.73%) was published in 2020. Maximum AGR (28.21) recorded in the Year 2016, in the year 2021 (1.22) maximum ARoG recorded and minimum in the year 2016 (0.78). The highest number of articles have been published by the collaboration of six and more than six authors 220 (45.93%). It shows multi – author prominence rather than a single author. CC 0.78 was recorded in the Year 2021, MCC result similar to CC. The highest Collaborative Index was recorded in the Year 2017. The mean of relative growth for the first five years 2013 to 2017 is (0.35) and the mean relative growth rate for the last five years 2018 to 2022 is reduced to (0.16). It has been found that the Centers for Disease Control and Prevention' contribute the highest number of publications, contributing to 15 (3.13%). Ingelo, Joseph P stood in the first position with the highest number of 17 (3.55%) articles as top author. The United States has the top rank with 136 (28.4%) publications.*

Keywords:*Scientometrics, Rubella, Congenital Rubella Syndrome, Dimension AI, Annual Growth Rate (AGR), Research, Bibliometrics*

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1. Introduction

Rubella is a viral disease that is highly contagious and primarily affects children. It is transmitted through the respiratory route, and symptoms typically appear 2-3 weeks after exposure. In children, the disease is usually mild, causing low fever, nausea, and a temporary rash. However, adults may experience arthritis and joint pain. If a woman contracts rubella during early pregnancy, it can result in fetal death or a condition known as congenital rubella syndrome (CRS), which involves multiple defects in the brain, heart, eyes, and ears. Rubella does not have a specific treatment, but it can be prevented through immunization. The rubella virus is transmitted through airborne droplets when infected individuals sneeze or cough. Only Human suffering from this virus. Rubella, also referred to as German measles, typically causes a mild illness in most individuals. The name "rubella" is derived from Latin, meaning "little red." Initially, rubella was considered to be a variation of measles or scarlet fever. However, it was recognized as a distinct disease in 1814 through the German medical literature, leading to its common name "German measles." Besides hearing loss, eye and heart defects and other developmental disabilities, children with Congenital rubella syndrome (CRS) may experience lifelong disabilities such as autism, diabetes mellitus and thyroid dysfunction. These conditions often require expensive therapy, surgeries, and ongoing care. A togavirus is responsible for causing congenital rubella syndrome (CRS), a severe complication resulting from a rubella infection. It typically manifests as a

mild viral infection with temporary rash, conjunctivitis, runny nose, swollen lymph nodes, low-grade fever, and nausea. About 50% of cases may be asymptomatic. Rubella infection during early pregnancy can lead to miscarriage or fetal death, while babies born with CRS exhibit a range of birth defects.

Scientometric is an emerging field that analyzes the development of science, technology, and innovation using quantitative methods. It studies scientific publications to understand discipline-specific structures and growth. The term originated in Russia and gained importance through the journal "Scientometrics." Derek J. de Solla Price and Eugene Garfield laid the foundations of modern scientometrics. Through bibliometric, scientometric, and informetric techniques, scientometrics examines both quantitative and qualitative aspects of publications, answering questions about researchers and their locations. It measures the number of articles published in a given period and their citation impact. Scientometrics is closely linked to the history of science, philosophy of science, and sociology of scientific knowledge. Researchers in this field explore the dissemination and growth of literature, author productivity, document obsolescence, and distribution of scientific literature by country and language. These studies monitor research patterns and overall growth in specific areas of study.

1.1 Dimension Database- (Dimensions AI: Comprehensive Dataset for Research & Innovation)

Dimensions is a linked research knowledge system that re-imagines discovery and access to research. Developed by Digital Science in collaboration with over 100 leading research organizations around the world, Dimensions brings together grants, publications, citations, alternative metrics, clinical trials, patents and policy documents to deliver a platform that enables users to find and access the most relevant information faster, analyze the academic and broader outcomes of research, and gather insights to inform future strategy. (app.dimension.AI/about)

2. Literature Review

Ajiferuke, Isola et.al. (1988), critically examined the limitations of using the collaboration index (CI) and the degree of collaboration (DC) as indicators of collaboration strength in a discipline. It also explored an alternative metric, the collaboration coefficient (CC), which combines the strengths of both CI and DC. The CC ranged from 0 to 1, approaching zero when single-authored papers dominated, and effectively distinguished varying levels of multiple authors. By considering the shortcomings of CI and DC, the CC provided a more comprehensive measure of collaboration within the field. **Tupe S.K & Khaparde V.S , 2016** analyzed 217 articles with 4813 references in Information Technology and Libraries on DOAJ from 2005 to 2014 (10 volumes & 40 issues). Most articles (57.14%) had single authors. The USA had the highest output with 178 publications (82.03%). The mean relative growth rate for 2010-2014 was 0.13, indicating a reduction. Doubling time (Dt (p)) increased from 1.00 in 2006 to 7.70 in 2014. The mean doubling time for 2005-2009 was 1.69, increasing to 5.69 for 2010-2014. The majority of references (3154) were print, while 1659 were web references. **Yadav, Sunil Kumar et. al. (2019)**, Observed the collaboration research of 578 articles during the study period (2008-2017) of the SRELS Journal of Information Managements. The majority of articles involved collaboration, with a maximum of 292 (50.52%) being two-author collaborations. Out of the total articles, 382 (66.09%) were contributed by two or more authors. Metrics such as collaboration index, degree of collaboration, collaboration coefficient, modified collaboration coefficient, activity index, relative growth rate, and doubling time were calculated. The study revealed an average collaboration index of 1.86, average degree of collaboration of 0.66, average collaboration coefficient of 0.36, average relative growth rate of 0.32, and average doubling time of 3.40. The findings suggest a prevalence of joint authorship and a high collaboration coefficient, indicating the predominance of team research in the journal. **Thamaraiselvi, M et. al. (2021)**, analyzed the collaborative measures and authorship patterns of the current science journal from 2014 to 2018. Data from the Web of Science database yielded 4298 articles for analysis. The study revealed that 33.50% of papers had a single author. The average collaborative index was 3.39, with a collaboration degree of 0.90. The overall collaborative coefficient was 0.78, remaining constant. Relative growth rate decreased and doubling time increased. Strong positive correlations existed between publications and authors, as well as between single and multiple authors in the journal.

3. Objectives of Study

The present study main aim is to find the output of Congenital Rubella Syndrome research publications which is available in Dimension AI Database during the period 2013 to 2022. Following are the specific objectives of this study:

1. To study the Annual Growth Rate (AGR) of Articles with Year- Wise Distribution of Articles.
2. To analyze the Authorship Pattern and assess the Collaborative Co-efficient (CC), Modified Collaborative Co-efficient (MCC) and Collaborative Index (CI) of Articles.
3. To determine the Year- Wise Degree of Collaboration of Articles.
4. To examine the Relative Growth Rate (RT) and Doubling Time (DT) of Articles
5. To check the Most Productive Author, Institution and Country of the Articles
6. To find out the Most Productive Journal of Articles.
7. To examine the Document Type- Wise Distribution of Articles

4. Methodology:

The present study data retrieved from the Dimension AI database on the topic Congenital Rubella Syndrome for Scientometric Study, which is span over the 10 year period from 2013 to 2022. For this study the open access data were used. A total of 479 research articles was downloaded and collected with bibliographic information with various parameters like year, Author, Name of publications, document type, authors Affiliations (institutions), countries etc. As well export csv file of data for graph visualization. Further, collected data was filtered and analyzed using Microsoft-excel along with Vosviewer statistical and mapping visualization bibliometric network software tool.

5. Analysis of Data

A study analyzed the output of congenital rubella syndrome, including 479 articles, 3044 authors, 73 countries, and 531 organizations from the years 2013 to 2022. The main findings of the study are summarized in the accompanying tables, figures, and graphs.

5.1. Annual Growth Rate (AGR) and Year- Wise Distribution of Articles

Table No.1 and Figure No.1 shows the year- wise distribution of articles and their annual growth rate of publications on “Congenital Rubella Syndrome” collected from Dimension AI during the year 2013 to 2022. The highest number of contributions 61 (12.73%) was published in 2020 while the lowest number 38 (7.93%) of research contributions in the year of 2013. The second highest number of research contributions 54 (11.27%) was published in 2019. It reflects the growth of publication increasing from 2013 to 2022. On the other side it has been seen that the maximum AGR (28.21) recorded in the Year 2016 and the Minimum AGR (-18.03) recorded in the Year 2021. Table also depict the ARoG (Annual Ratio of Growth) of publications. In the Year 2021 (1.22) maximum ARoG recorded and minimum in the Year 2016 (0.78).

The formula proposed by Kumar and Kaliyaperumal (2015) is utilized to calculate the Annual Growth Rate (AGR).

$$AGR = \frac{\text{End Value} - \text{First Value}}{\text{First Value}} \times 100$$

Annual Ratio of Growth (ARoG) calculated with the formula,

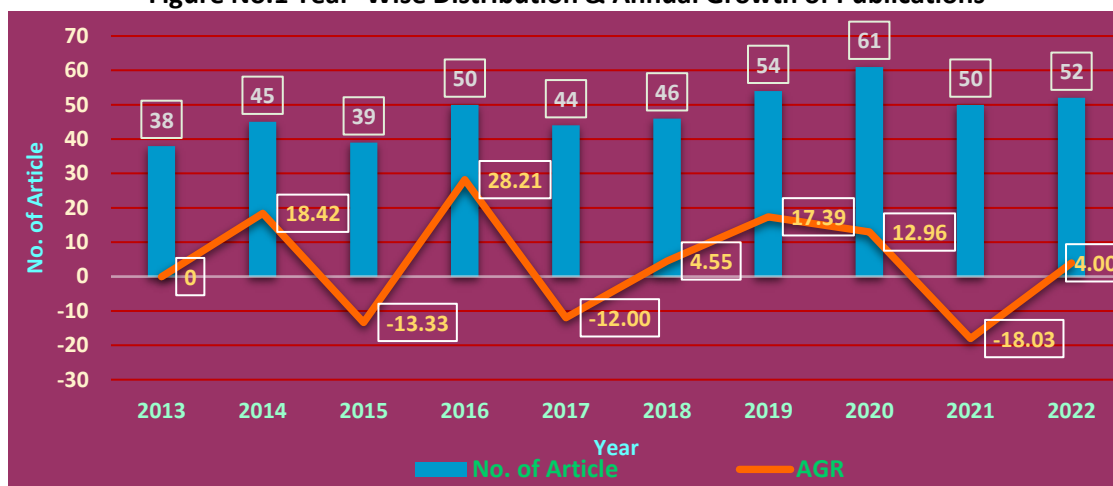
$$ARoG = \frac{\text{Last Year Output}}{\text{Current Year Output}}$$

Table No.1 Year- Wise Distribution & Annual Growth of Publications

Year	No. of Article	Percentage	AGR	ARoG
2013	38	7.93	0	0
2014	45	9.39	18.42	0.84
2015	39	8.14	-13.33	1.15
2016	50	10.44	28.21	0.78

2017	44	9.19	-12.00	1.14
2018	46	9.60	4.55	0.96
2019	54	11.27	17.39	0.85
2020	61	12.73	12.96	0.89
2021	50	10.44	-18.03	1.22
2022	52	10.86	4.00	0.96
Total	479	100.00		

Figure No.1 Year- Wise Distribution & Annual Growth of Publications



5.2. Authorship Pattern of Articles Year –Wise

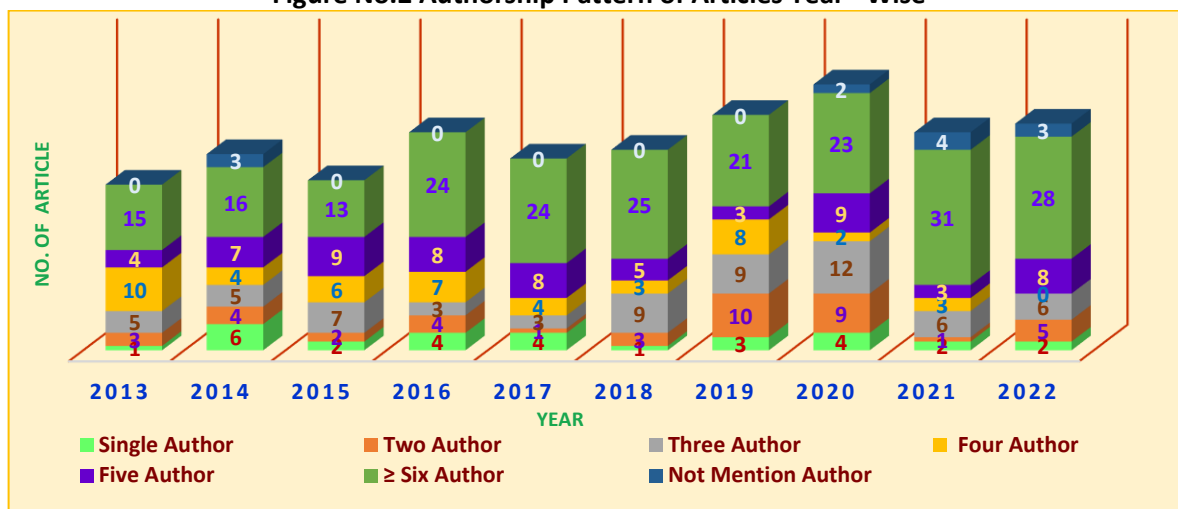
Table No.2 and Figure No. 2 shows the Authorship Pattern of the articles and the output of CI, CC and MCC published during the year 2013 to 2022. The highest numbers of articles had been published by the collaboration of Six and more than Six Authors 220 (45.93%). This is followed by 65 (13.57%) contribution of Three Authors. The least numbers of author publication by Single Authors 29 (6.05%) respectively. It has been found that the maximum Collaborative Co-efficient (CC) 0.78 was recorded in the Year 2021, followed by 0.75 was recorded in the Year 2022, Modified Collaborative Co- efficient (MCC) result similar to CC. The highest Collaborative Index (CI) 4.89 was recorded in the Year 2017 followed by 4.80 in 2018 and 4.70 in the year 2021.

Table No.2 Authorship Pattern of Articles Year –Wise

Year	Single Author	Two Author	Three Author	Four Author	Five Author	≥ Six Author	Not Mention Author	Total	CI	CC	MCC
2013	1	3	5	10	4	15	0	38	4.53	0.74	0.74
2014	6	4	5	4	7	16	3	45	3.91	0.67	0.67
2015	2	2	7	6	9	13	0	39	4.46	0.72	0.72
2016	4	4	3	7	8	24	0	50	4.66	0.71	0.71
2017	4	1	3	4	8	24	0	44	4.89	0.73	0.73
2018	1	3	9	3	5	25	0	46	4.80	0.75	0.75
2019	3	10	9	8	3	21	0	54	4.13	0.68	0.68
2020	4	9	12	2	9	23	2	61	4.08	0.69	0.70
2021	2	1	6	3	3	31	4	50	4.70	0.78	0.78
2022	2	5	6	0	8	28	3	52	4.58	0.75	0.76
Total	29	42	65	47	64	220	12	479	4.46	0.72	0.72

Collaborative Co-efficient (CC), Modified Collaborative Co-efficient (MCC) and Collaborative Index (CI)

Figure No.2 Authorship Pattern of Articles Year –Wise



5.3 Year- Wise Degree of Collaboration of Articles

Different methods have been used in research studies to determine the degree of research collaboration. The formula suggested by Subramanyam (1983) has been used in this research.

The formula is where

The degree of collaboration $C = \frac{Nm}{(Nm+Ns)}$

C = Degree of collaboration

Nm = Number of multiple authors

Ns= Number of single authors

Here, Nm = 438

Ns = 29

$C = \frac{438}{(438+29)} = 0.94$

Thus, result show the average degree of author collaboration of Thus, result show the average degree of author collaboration of Congenital Rubella Syndrome is 0.94 which is clearly indicates its dominance upon multi - authored articles.

Table No. 3 Year- Wise Degree of Collaboration of Articles

Year	No. of Articles	No. of Authors	Single Authored Article(NS)	% of Papers	Multi Authored Article (NM)	% of Papers	Degree of Collaboration (DC)
2013	38	200	1	0.21	37	7.72	0.97
2014	45	266	6	1.25	36	7.52	0.86
2015	39	222	2	0.42	37	7.72	0.95
2016	50	326	4	0.84	46	9.60	0.92
2017	44	297	4	0.84	40	8.35	0.91
2018	46	368	1	0.21	45	9.39	0.98
2019	54	323	3	0.63	51	10.65	0.94
2020	61	348	4	0.84	55	11.48	0.93
2021	50	342	2	0.42	44	9.19	0.96
2022	52	352	2	0.42	47	9.81	0.96
Total	479	3044	29	6.05	438	91.44	0.94 (Mean)

The Table No. 3 represents the year-wise number of multi-authored articles and their degree of collaboration. From the total 479 publications 12 articles author name was not given. In the study, the degree of collaboration of all years is almost same of the mean value as 0.94. As per to the table, multi-author publications dominated single-author articles during the span of the ten-year period. The single authored articles are very few in all years. The multi authored articles 55 (11.48%) are highest in the year 2020.

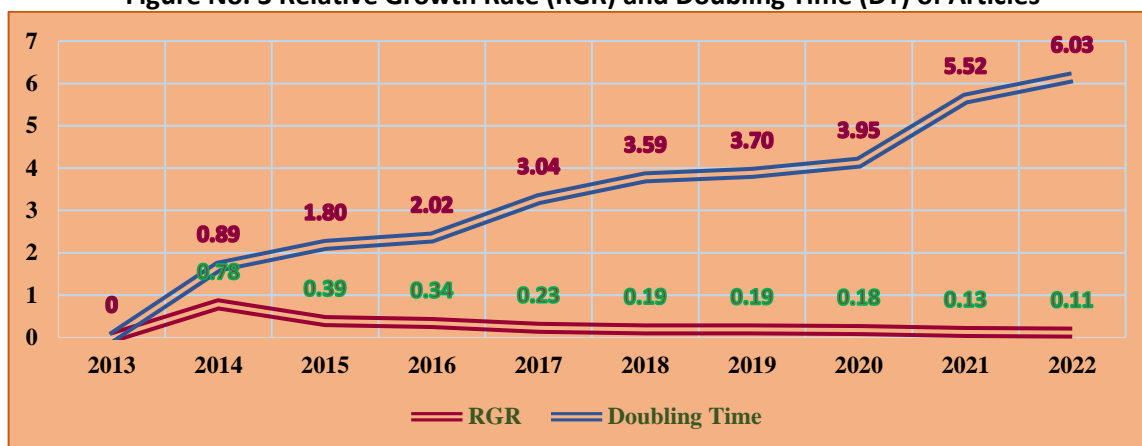
5.4 Relative Growth Rate (RGR) and Doubling Time (DT) of Articles

From the Table No. 4 & Figure No. 3 it noticed that the mean relative growth for the first five years 2013 to 2017 is (0.35) and the mean relative growth rate for the last five years 2018 to 2022 reduced to (0.16). While the Doubling time for different years gradually increased from (0.89) in 2014 to (6.03) in 2022. The mean doubling time for the first five years from 2013 to 2017 is (1.55) which is increased to (4.56) during the last five years 2018 to 2022. Thus, as the rate of growth of publication was decreased, the corresponding doubling time was increased.

Table No. 4 Relative Growth Rate (RGR) and Doubling Time (DT) of Articles

S.No.	Year	Article	Cumulative	Log W1	Log W2	RGR	Mean RGR	Doubling Time	Mean DT
1	2013	38	38		3.64	0	0.35	0	1.55
2	2014	45	83	3.64	4.42	0.78		0.89	
3	2015	39	122	4.42	4.80	0.39		1.80	
4	2016	50	172	4.80	5.15	0.34		2.02	
5	2017	44	216	5.15	5.38	0.23		3.04	
6	2018	46	262	5.38	5.57	0.19	0.16	3.59	4.56
7	2019	54	316	5.57	5.76	0.19		3.70	
8	2020	61	377	5.76	5.93	0.18		3.95	
9	2021	50	427	5.93	6.06	0.13		5.52	
10	2022	52	479	6.06	6.17	0.11		6.03	
Total		479							

Figure No. 3 Relative Growth Rate (RGR) and Doubling Time (DT) of Articles



5.5 Top Most Prolific Institute of Articles

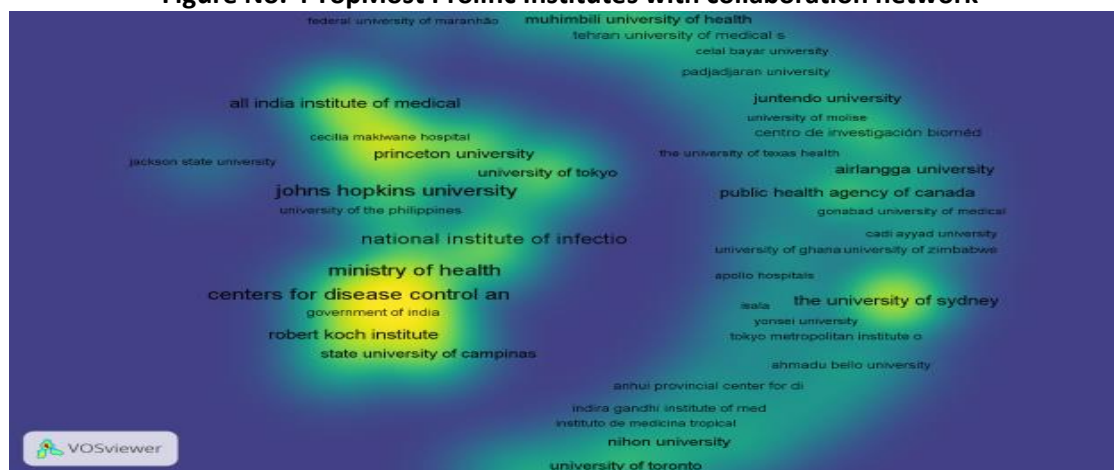
Table No.5 and Figure No.4 depicts the top 20 most productive institution which published more than 4 articles from the total number of 531 institution were analyzed from the 479 articles of Congenital Rubella Syndrome during year 2013 to 2022. It is noted that ‘Centers for Disease Control and Prevention’ contribute the highest number of publications 15 (3.13%) link strength with other institutes 41 followed by contribution of ‘Johns Hopkins University’ with 14 (2.92%) link strength 54, ‘London School of Hygiene & Tropical Medicine’ and ‘Ministry of Health’ 12 (2.51%).

Table No. 5 Top Most Prolific Institute of Articles

S.No.	Organization	Documents	total link strength
1	Centers for Disease Control and Prevention	15	41
2	Johns Hopkins University	14	54
3	London School of Hygiene & Tropical Medicine	12	43
4	Ministry of Health	12	31

5	National Institute of Infectious Diseases	11	20
6	Public Health England	11	36
7	World Health Organization	11	23
8	All India Institute of Medical Sciences	8	30
9	National Center for Immunization and Respiratory Diseases	8	25
10	Nagasaki University	7	24
11	Robert Koch Institute	7	20
12	The University of Sydney	7	33
13	Airlangga University	6	0
14	Hokkaido University	6	16
15	Oswaldo Cruz Foundation	6	24
16	Post Graduate Institute of Medical Education and Research	6	27
17	Princeton University	6	25
18	Public Health Agency of Canada	6	10
19	UNSW Sydney	6	30
20	Japan Science and Technology Agency	5	9
	Juntendo University	5	0
	Mayo Clinic	5	4
	Muhimbili University of Health and Allied Sciences	5	5
	National Centre for Immunisation Research & Surveillance	5	26
	National Health Laboratory Service	5	44
	National Institute Of Hygiene And Epidemiology	5	12
	National Institute of Virology	5	29
	University of the Witwatersrand	5	40
	World Health Organization Regional Office for South-East Asia	5	6

Figure No. 4 TopMost Prolific Institutes with collaboration network



6.6 Top Most Productive Authors of Articles

The top 20 most prolific authors are listed and depicted in Table No. 6 and Figure No. 5 Congenital Rubella Syndrome articles during the year 2013 to 2022. The authors who have published less than 5 articles were not considered into account to avoid long list. A total number of 2477 authors were analyzed from the 479 research articles. Icenogle, Joseph P stood in the first position with the highest number of 17 (3.55%) articles. This is followed by Reef, Susan E stood second position with 10(2.09%) articles and Abernathy, Emily S contributes 9 (1.88%) articles.

Table No.6 Top Most Productive Author of Articles

S.No.	Authors	Articles	Percentage
1	Icenogle, Joseph P.	17	3.55
2	Reef, Susan E	10	2.09
3	Abernathy, Emily S.	9	1.88
4	Goodson, James L.	8	1.67
5	Mori, Yoshio	8	1.67
6	Mshana, Stephen E.	8	1.67
7	Takeda, Makoto	8	1.67
8	Metcalf, C. Jessica E	7	1.46
9	Mirambo, Mariam M.	7	1.46
10	Moriuchi, Hiroyuki	7	1.46
11	Vynnycky, Emilia	7	1.46
12	Yoshida, Lay-Myint	7	1.46
13	Dabbagh, Alya	6	1.25
14	George, Suji	6	1.25
15	Khanal, Sudhir	6	1.25
16	Viswanathan, Rajlakshmi	6	1.25
17	Aboud, Said	5	1.04
18	Alexander, James P.	5	1.04
19	Bahl, Sunil	5	1.04
20	Grant, Gavin B.	5	1.04
	Gupta, Nivedita	5	1.04
	Hübschen, Judith M.	5	1.04
	Khandaker, Gulam	5	1.04
	Majigo, Mtebe	5	1.04
	Mankertz, Annette	5	1.04
	Moss, William J.	5	1.04
	Nishiura, Hiroshi	5	1.04
	Paradowska-Stankiewicz, Iwona	5	1.04
	Perelygina, Ludmilla	5	1.04
	Poland, Gregory A.	5	1.04
	Rota, Paul A.	5	1.04
Wannemuehler, Kathleen	5	1.04	

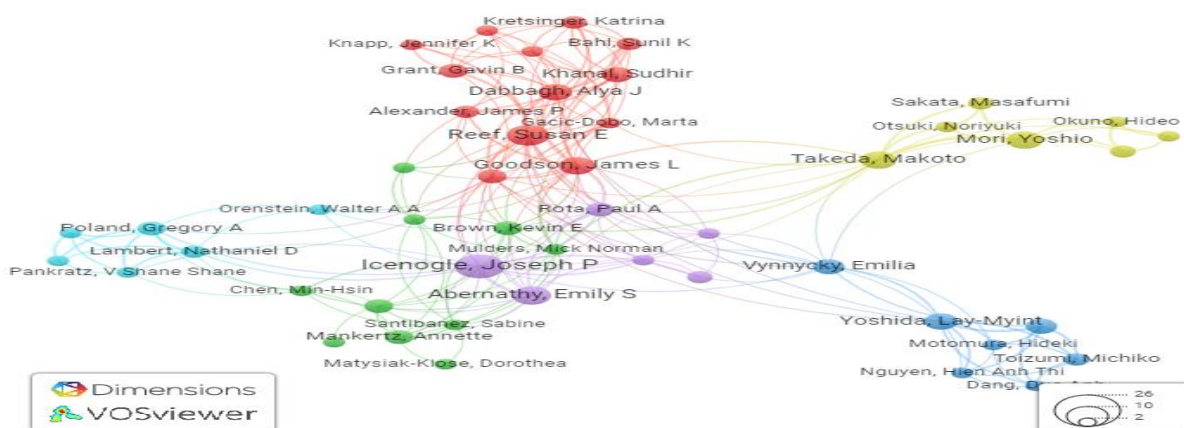


Figure No. 5 Top Most Productive Author of Articles& their collaboration network

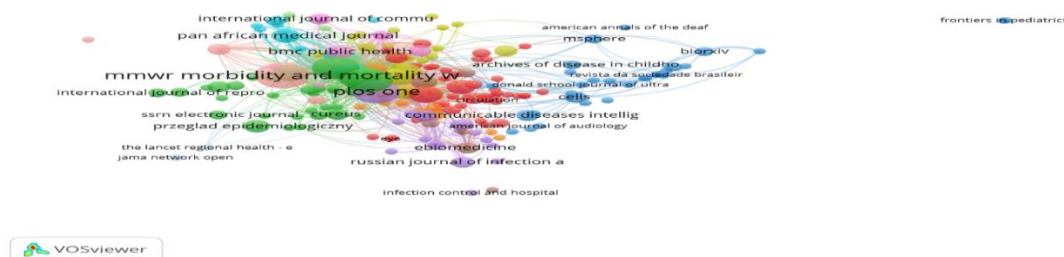
7.7 Journal - Wise Distribution of Articles

Table No.7 and Figure No. 6 shows the most productive top 20 journals of congenital rubella syndrome published during the year 2013 to 2023 which published more than three articles.It can be seen that the Journal MMWR Morbidity and Mortality Weekly Report published the highest number of articles 17 (3.55%). Vaccine is the second most productive journal with 14 (2.92%), followed by the third position shared by journals ‘Human Vaccines & Immunotherapeutics’ and PLOS ONE with the same contribution of articles 13 (2.71).

Table No. 7Top Most 20 Productive Journal of Articles

S.No.	Source Name	Article	Percentage
1	MMWR Morbidity and Mortality Weekly Report	17	3.55
2	Vaccine	14	2.92
3	Human Vaccines & Immunotherapeutics	13	2.71
4	PLOS ONE	13	2.71
5	BMC Infectious Diseases	11	2.30
6	International Journal of Environmental Research and Public Health	7	1.46
7	International Journal of Infectious Diseases	7	1.46
8	Research Square	6	1.25
9	Vaccines	6	1.25
10	BMC Public Health	5	1.04
11	BMJ Case Reports	5	1.04
12	Eurosurveillance	5	1.04
13	Open Forum Infectious Diseases	5	1.04
14	Pan African Medical Journal	5	1.04
15	Emerging Infectious Diseases	4	0.84
16	Epidemiology and Infection	4	0.84
17	Japanese Journal of Infectious Diseases	4	0.84
18	Journal of Medical Virology	4	0.84
19	Juntendo Medical Journal	4	0.84
20	Przegląd Epidemiologiczny	4	0.84
21	Western Pacific Surveillance and Response	4	0.84

Figure No. 6Top Most 20 Productive Journal of Articles



8.8. Top- Most Productive Country

From out of 479 articles of congenital rubella syndrome in analyzed 73 countries found. Table No. 8 and Figure No. 7 reveal the top most 20 productive countries of articles which have contributed four and above four articles. It shows that United States has contributed 136 (28.4%) publications and ranked top among the countries followed by Japan with 100 (20.9%) and India 81 (16.9%) publications which occupies second and third positions respectively.

Table No. 8.8. Top 20 Most Productive Country

S.No.	Country Name	Articles	Percentage
1	United States	136	28.4
2	Japan	100	20.9
3	India	81	16.9
4	Brazil	53	11.1
5	Australia	48	10.0
6	United Kingdom	43	9.0
7	South Africa	40	8.4
8	Germany	37	7.7
9	Canada	32	6.7
10	Italy	22	4.6
11	China	21	4.4
12	Spain	18	3.8
13	Indonesia	15	3.1
14	Vietnam	14	2.9
15	Nigeria	13	2.7
16	Tanzania	13	2.7
17	Zambia	13	2.7
18	Iran	12	2.5
19	Switzerland	12	2.5
20	Ethiopia	10	2.1

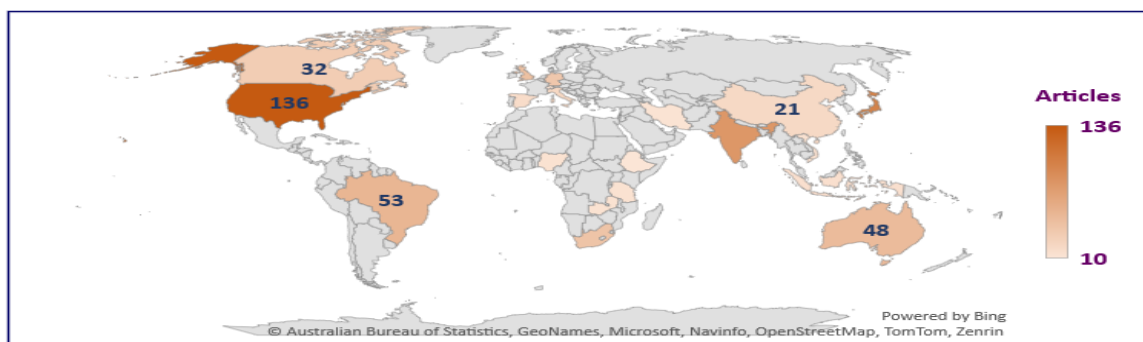


Figure No. 7 Top 20 Most Productive Country

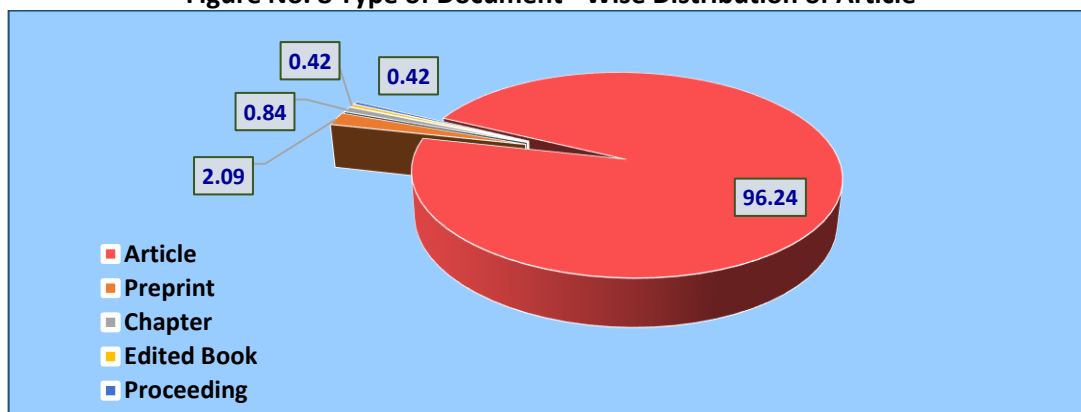
9.9 Type of Document - Wise Distribution of Articles

Table No. 9 and Figure No. 8 shows that majority of publications published in the form of Journal Articles 461 (96.24%) and other 3.71% in the forms of Preprint 10 (2.09%), Chapter 4 (0.84%) and Edited book & Proceeding 2 (0.42%) each.

Table No. 9.9 Type of Document - Wise Distribution of Articles

Sr. No.	Document Type	Articles	Percentage
1	Article	461	96.24
2	Preprint	10	2.09
3	Chapter	4	0.84
4	Edited Book	2	0.42
s5	Proceeding	2	0.42
Total		479	100.00

Figure No. 8 Type of Document - Wise Distribution of Article



Key Findings

- Majority of publications published in the form of Journal Articles 461 (96.24%)
- The highest number of contributions 61 (12.73%) was published in 2020. maximum AGR (28.21) recorded in the Year 2016 and the Minimum AGR (-18.03) recorded in the Year 2021. In the Year 2021 (1.22) maximum ARoG recorded and minimum in the Year 2016 (0.78).
- The highest numbers of articles had been published by the collaboration of Six and more than Six Authors 220 (45.93%). It has been found that the maximum Collaborative Co-efficient (CC) 0.78 was recorded in the Year 2021, followed by 0.75 was recorded in the Year 2022, Modified Collaborative Co-efficient (MCC) result similar to CC. The highest Collaborative Index (CI) 4.89 was recorded in the Year 2017. The degree of collaboration of all years is almost same of the mean value as 0.94. As per to the table, multi-author publications dominated single-author articles during the span of the ten-year period.
- The mean of relative growth for the first five years 2013 to 2017 is (0.35) and the mean relative growth rate for the last five years 2018 to 2022 reduced to (0.16). While the Doubling time for different years gradually increased from (0.89) in 2014 to (6.03) in 2022.

The mean doubling time for the first five years is (1.55) which is increased to (4.56) during the last five.

- It is noted that 'Centers for Disease Control and Prevention' contribute the highest number of publications 15 (3.13%). Icenogle, Joseph P stood in the first position with the highest number of 17 (3.55%) articles as top author position. United States has contributed 136 (28.4%) publications and ranked top among the countries followed by Japan with 100 (20.9%) and India 81 (16.9%) publications which occupies second and third positions respectively.

Conclusion:

Nowadays, scientometric measurement and technique are helpful for any subject-related literature research and analysis. Congenital Rubella Syndrome affects the lives of newborns and children if not taken the prevention. This study and result are helpful to researchers, scientists, policymakers, health professionals, and others for their research and study, making cures and vaccinations, and taking proper decisions.

References:

1. Ajiferuke, Isola et.al. (1988), Collaborative coefficient; A single measure of the degree of collaboration in research. *Scientometrics*, Vol. 14(5-6), 421-45. <https://www.researchgate.net/publication/242915907> (Accessed on 12 June 2023)
2. Thavamani, K. & Velmurugan, C. (2013). Authorship pattern and collaborative research work in 'Annals of Library and Information Studies'. Proceedings of the National Conference on Next Generation Library Services, SALIS 2013 NGLIS August 16-17, Chennai

3. Khaparde, V.S.(2011) E-journals in Library and Information Science: A Bibliometric Study. International Journal of Humanities and Social Sciences. Centerfor Promoting Ideas, USA. Special Issue August. 1 (11).
- a. Khaparde, V.S. (2011) Pattern of Information use by Researchers in Library and Information Science. International Journal of Humanities and Social Sciences. Center for Promoting Ideas, USA. September. 1 (12).
- b. Khaparde, V.S. (2013) Bibliometric Analysis of Research Publication of Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Journal of Computer Science & Information Technology. 1 (1) 65-73.
4. Rajendra, P et.al. (2011), Scientometric Analysis of Contribution to Journal of Scientific & Industrial Research, *International Journal of Scientific and Industrial Research*, Vol.1 (2), 2011, 89-79. [http://www.ijodls.in/uploads/3/6/0/3/3603729/ramalingam \[8\] _79-89.pdf](http://www.ijodls.in/uploads/3/6/0/3/3603729/ramalingam%20%5B8%5D_79-89.pdf) (Accessed on 4 July 2023)
5. Selvavinayagam, A.V et.al. (2018), Scientometrics, Techniques, Sources and their Key Points to Analysis of LIS Research: An Overview, *International Journal of Science & Technology (IJST)*, Vol. 8 (1), 2018, 10-19. http://ijst.co.in/papers/vol8issue1/ijst_180303.pdf (Accessed on 4 July 2023)
6. Tupe, S.K & Khaparde V.S (2016), Scientometric Study on Journal of Information Technology & Libraries on DOAJ, "Knowledge Librarian" An International Peer Reviewed Bilingual E- Journal of Library and Information Science, Vol.3 (3), 2016, 10-26.
7. Vann Rann, A.F.J (1997), Scientometrics- State- of- The- Art, *Scientometrics*, Vol.38 (1), 1997, 205-2018. <http://www.cwts.nl/tvr/documents/avr-stateart-sciento.pdf> (Accessed on 4 July 2023)
8. Yadav, Sunil Kumar et. al. (2019), "Authorship and Collaboration Pattern in SRELS Journal of Information Management during 2008- 2017: An Evaluation", *Library Philosophy and Practice (e- Journal)*. 2119. <https://core.ac.uk/download/pdf/188141446.pdf> (Accessed on 12 June 2023)
9. <https://www.who.int/news-room/fact-sheets/detail/rubella> (Accessed on 18 March 2023)
10. <https://www.nicd.ac.za/diseases-a-z-index/congenital-rubella-syndrome/> (Accessed on 18 March 2023)
11. <https://www.cdc.gov/vaccines/pubs/pinkbook/rubella.html> (Accessed on 18 March 2023)
12. <https://www.paho.org/en/topics/rubella> (Accessed on 18 March 2023)
13. <https://www.vosviewer.com/>(Accessed on 18 March 2023)
14. <https://www.proquest.com/docview/2506600250/> (Accessed on 20 March 2023)
15. [https://en.wikipedia.org/wiki/Dimensions_\(database\)](https://en.wikipedia.org/wiki/Dimensions_(database)) (Accessed on 22 June 2023)
16. <https://rena.mpdl.mpg.de/rena/Record/ERS000002007> (Accessed on 15 June 2023)
17. <https://app.dimensions.ai/about>(Accessed on 01 March 2023)
18. <https://www.paddle.com/resources/growth-rate> (Accessed on 01 June 2023)