Article-Level Metrics (ALMs) of "Nature" Journal

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ABSTRACT

The main aim of scientific research is to systematically generate valid data which is measurable, reproducible, and testable, contributing to the existing knowledge about the subject. This paper explains the Altmetrics of Nature Journal that is a summation of the impact of all articles in a journal based on citations. Article-level metrics measured the impact of individual articles, including usage (e.g., pageviews, downloads), citations, and social metrics like Twitter, Facebook and blogs, of non-duplicate online mentions. Paper discuss article-level metrics from http://www.nature.com web site and analyses the data accordingly.

Keyword: Altmetrics, Article-Level Metrics (ALMs), Nature Journal, Scientometrics, Bibliometrics

INTRODUCTION

The ultimate aim of scientific research is to systematically generate valid data which is measurable, reproducible, and testable, contributing to the existing knowledge about the subject. The purpose of research will fail if the knowledge gathered is not communicated to the scientific world. Science journals have been essential in publishing scientific content for centuries. Statistics, bibliometrics and Altmetrics are increasingly on a scientific library's agenda. Citations have been traditionally considered as the recognition of research work. Accordingly, journal impact factor is based on the citation data and publication in journals with high impact factors has been a measure of scientific reputation. Altmetrics are a fast emerging concept. Kali (2015). It is a novel article level matrix encompassing online activities and interactions between authors and readers which are more likely to reflect the actual impact of a publication than traditional metrics. Unlike traditional metrics, these are not restricted only to journal articles. Altmetrics of scientific literature are hosted in a central website (http://altmetrics.org/manifesto/). The estimation of altmetrics is based on number and nature (more weightage for blogs and

journals than tweets) of nonduplicate online mentions and their authors. Several eminent academic publishers are currently providing altmetrics information for articles published in their journals.

WHAT IS ALTMETRICS?

The term "Altmetrics" is short for "Alternative Metrics" or "Article Levels Metrics" (ALMs). These are a range of nontraditional metrics that can be used to assess the impact that scholars have on research in their areas of study. They can include the number of article downloads, citation of research in online news/social media sources, bookmarks and nontraditional forms of scholarship.

According to Adie, Euan (2013) the founder of Altmetric.com; "Altmetrics indicate the quantity and quality of on line attention in multiple channels, including social media, blog posts, and news coverage".

Alternative metrics (called Altmetrics to distinguish them from bibliometrics) are considered an interesting option for assessing the societal impact of research, as they offer new ways to measure (public) engagement with research output (Piwowar, 2013).

"Altmetrics is a term to describe web-based metrics for the impact of scholarly material, with an emphasis on social media outlets as sources of data" (Shema, Bar- Ilan, & Thelwall, 2014). "All of these above definitions covers the impact beyond academia which is tracked by Altmetrics unlike bibliometrics."

"Metrics" refers to ways to quantitatively and objectively measure the scholarly significance of publications. This measurement may be done at the level of the individual, the group, the department, the university or the journal.

WHAT ALTMETRICS MEASURE?

Altmetrics live the amount of times a pursuit output gets cited, tweeted concerning, liked, shared, bookmarked, viewed, downloaded, mentioned, favourited, reviewed, or mentioned on varied reasonably net platforms. It harvests those net influence knowledge from a large form of net sources and platforms as well as open access journal platforms, erudite citation databases, web-based analysis sharing services, and social media. The numbers ar harvested nearly in real time, providing analysisers with quick proof that their research has created a sway or generated a oral communication within the public forum.

METRICS AND DATA SOURCES IN ALTMETRICS

Altmetrics capture and assess the broad ranges of online influence a paper or work can have from various web sources which includes citations; views, mentions, shares, bookmarks and many more.

Usage Data: Page views: hypertext mark-up language & PDF; and document downloads: PDF, etc. to assess scholarly impact. Information will be counted from varied databases and repositories like wood nymph, Figshare, GitHub, SlideShare etc.

Citations: with the exception of citations caterpillar-tracked from internet of Science and Scopus; Altmetrics takes into count the non-scholarly citations from sources like Google Scholar, CrossRef, PubMed, ScienceSeeker, Wikipedia, Scholarpedia etc.

Captures: Altmetrics capture Social bookmarking information of a pursuit paper in platforms like Delicious, CiteULike, Connotea; saves in EndNote, Zotero & Mendeley; favorites in SlideShare and YouTube; followed in GitHub; and variety of Mendeley readers of that specific paper that helps to work out the impact on scholarly community.

Mentions: This metrics counts the quantity of comments & mentions in Facebook, Twitter, LinkedIn, SlideShare; mentioned in journal, e-news & medias, on-line forums; and coupled & mentioned in Wikipedia etc. e. Social Media: on-line discussions of a pursuit article in social media like Facebook, Twitter, Google+, LinkedIn, and Reditt.com etc.

Web of Science: WoS is that the ISI-Thomson Reuters's flagship product to facilitate a pursuit platform. It's the only destination to the world's largest assortment of analysis information, books, journals, proceedings, publications and patents covering: 100+ years of abstracts; over ninety million records covering five,300 science publications in fifty five disciplines; eight million+ cited references; 8.2 million records across one hundred sixty, conference proceedings across all regions.

CrossRef: CrossRef could be a not-for-profit membership organization for scholarly business operating to create content simple to search out, link, cite and assess. CrossRef interlinks ample things from a range of content varieties, as well as journals, books, conference proceedings, operating papers, technical reports, and information sets. CrossRef provides the technical and business infrastructure to supply for this reference linking mistreatment Digital Object Identifiers (DOIs). CrossRef provides deposit and question service for its DOIs.

Scopus: Scopus is that the largest abstract and citation info of peer-reviewed literature: scientific journals, books and conference proceedings. Delivering a comprehensive summary of the world's analysis output within the fields of science, technology, medicine, social sciences, and humanities and humanities, Scopus options sensible tools to trace, analyze and visualize analysis. It covers fifty five million records, 21,915 titles and five,000 publishers.

Mendeley: Mendeley is one most generally used Altmetrics services - the quantity of articles with Mendeley bookmarks is analogous to the quantity of articles that have citations. Mendeley provides info concerning the quantity of readers and teams. In distinction to CiteuLike no usernames for readers are provided, however Mendeley provides basic info relating to demographics love country and educational position. Mendeley could be a social bookmarking tool utilized by students and also the metrics most likely mirror a vital scholarly activity - adding a downloaded article to a reference manager.

CiteuLike: CiteuLike is another social bookmarking tool, not as wide used as Mendeley and while not reference manager practicality. One advantage over Mendeley is that usernames and

dates for all sharing events are publically on the market, creating it easier to explore the bookmarking activity over time

Twitter: aggregation tweets linking to scholarly papers is difficult, as a result of they're solely keep for brief periods of your time (typically around seven days). There is a tons of Twitter activity around papers, and solely a tiny low fraction is from the authors and/or journal.

Facebook: Facebook is sort of as standard as Twitter with regards to scholarly content, and provides a wider form of interactions (likes, shares and comments). Facebook activity could be a smart indicator for public interest in an exceedingly scholarly article and correlates additional with hypertext mark-up language views than PDF downloads.

Wikipedia: Wikipedia is that the preferred Free reference work in English on the market on internet. Its websites are written collaboratively by anonymous web volunteers. Scholarly content is often coupled from Wikipedia. As per a study, within the English Wikipedia the foremost oftentimes cited publisher is Elsevier with near to thirty five links. Additionally to Wikipedia pages, links to scholarly articles also are found on user and file pages.

NATURE: INTERNATIONAL WEEKLY SCIENCE JOURNAL

Nature is the world's most highly cited interdisciplinary science weekly international journal, the finest peer-reviewed research in all fields of science and technology on the basis of its originality, importance, interdisciplinary interest, timeliness, accessibility, elegance and surprising conclusions. According to the 2013 Journal Citation Reports Science Edition (Thomson Reuters, 2014). Its Impact Factor is 42.351. The impact factor of a journal is calculated by dividing the number of citations in a calendar year to the source items published in that journal during the previous two years. It is an independent measure calculated by Thomson Reuters, Philadelphia, USA. It has got many awards and rewards.

Nature Publishing Group (NPG). Nature, the Nature research journals, Nature Communications, and Nature Scientific Reports are among the more visible publications to adopt

ALMs. Like Scopus, NPG utilizes Altmetric tools to display quantitative and qualitative data regarding an article's social and scholarly reach.

RELATED STUDIES:

Wang and others (2015) In this study authors compared the difference in the impact between open access (OA) and non-open access (non-OA) articles. 1761 *Nature Communications* articles published from 1 Jan. 2012 to 31 Aug. 2013 are selected as our research objects, including 587 OA articles and 1174 non-OA articles. Citation data and daily updated article-level metrics data are harvested directly from the platform of nature.com. Data is analyzed from the static versus temporal-dynamic perspectives.

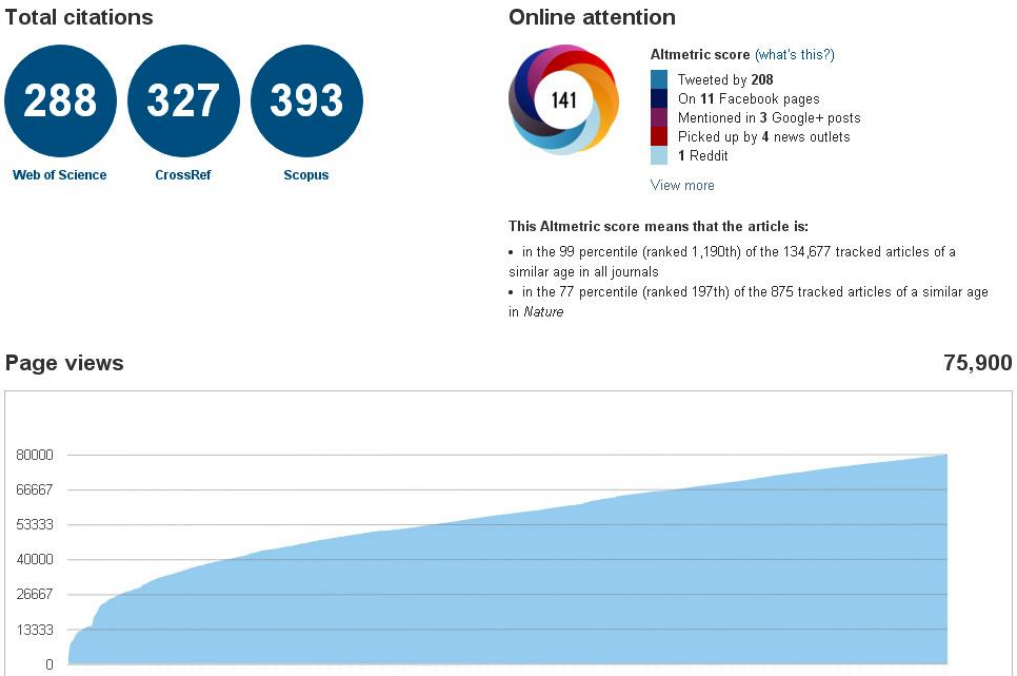
Martín-Martín and Others (2016) In this work they presented a method for capturing the structure of an entire scientific community (the Bibliometrics, Scientometrics, Informetrics, Webometrics, and Altmetrics community) and the main agents that are part of it (scientists, documents, and sources) through the lens of *Google Scholar Citations* (*GSC*). Additionally, they compare these author-portraits to the ones offered by other profile or social platforms currently used by academics (*ResearcherID*, *ResearchGate*, *Mendeley*, and *Twitter*), in order to test their degree of use, completeness, reliability, and the validity of the information they provide. Regarding the number of authors found in each platform, *GSC* takes the first place (814 authors), followed at a distance by *ResearchGate* (543), which is currently growing at a vertiginous speed. The number of *Mendeley* profiles is high, although 17.1% of them are basically empty. *ResearcherID* is also affected by this issue (34.45% of the profiles are empty), as is *Twitter* (47% of the *Twitter* accounts have published less than 100 tweets). Only 11% of our sample (93 authors) have created a profile in all the platforms analyzed in this study.

Gillani and Hassan (2016) describes the impact of "altmetrics" field by deploying altmetrics indicators using the data from Google Scholar, Twitter, Mendeley, Facebook, Googleplus, CiteULike, Blogs and Wiki during 2010- 2014. To capture the social impact of scientific publications, they propose an index called alt-index, analogues to h-index. While we observe

medium Pearson's correlation (ρ= .247) among the alt-index and h-index, a relatively high correlation is observed between social citations and scholarly citations (ρ= .646). Interestingly, they found high turnover of social citations in the field compared with the traditional scholarly citations, i.e. social citations are 42.2% more than traditional citations. The social mediums such as Twitter and Mendeley appear to be the most effective channels of social impact followed by Facebook and Google-plus. Overall, altmetrics appears to be working well in the field of "altmetrics".

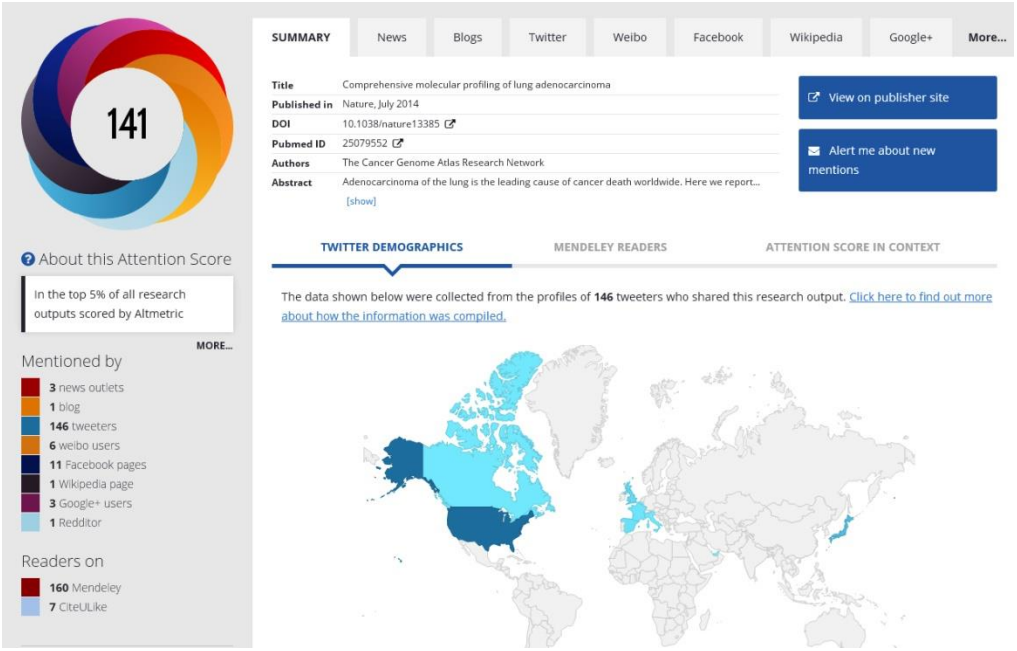
ARTICLE-LEVEL METRICS:

Below images shows the resulting score is displayed as a 'donut'. The different coloured bands in the ring-shaped donut icon represent the various sources the article has mentions from – blue for twitter, yellow for blogs, red for mainstream media sources, and so on. For a more detailed breakdown of results, showing all mentions and analytics from across Twitter, the blogosphere, mainstream media outlets, Facebook, and Google, the attention that each article is receiving from non-traditional sources.



Source: http://www.nature.com/nature/index.html

Fig.1



Source: http://www.nature.com/nature/index.html

Fig.2

OBJECTIVE OF THE STUDY:

- To study the number of articles in year 2014
- To study the number of citation in Web of Sciences, Cross Reference and Scopus.
- To study the readers on Mendely and CiteuLike
- To study the online Social Media Attention on published articles.

METHODOLOGY:

Article-level metrics (ALMs) refer to a whole range of measures that can provide insights into the "impact" or "reach" of an individual article. Whereas the well-known Impact Factor measures citations at the journal level, ALMs aim to measure the research impact of an article in a transparent and comprehensive manner. They not only look at citations and usage but also include article coverage and discussions in the social web. In order to explore Nature.com I have retrieved publications between January 2014 and December 2014 a total number of 174 articles on 31st Mach, 2016. This means that roughly 15 articles has been published per month and taken to consideration of all publication having Digital Object Identifier (DOI) number. Collected all the following relevant information about each tool like availability of metrics about each article; citation metrics; metrics about (online) readers and views; Altmetric score; Twitter demographies, Facebook pages, News, blogs and Google+ posts; However, the scope of this

analysis is limited as only articles explicitly mentioning the term "altmetric(s)" were considered and altmetrics could only be retrieved for articles having a DOI. Data is analyzed using excel spread sheets and presented.

DATA ANALYSIS:

Month-wise distribution of articles

The Nature Journal regularly publishes in international journal of repute. The journal published 1748 research papers in year 2014. The journal on an average has published 14.5 research papers in the year 2014. The below table shows that the maximum number of articles were published in the month of May, 2014 and minimum number of articles were published in the month of December, 2014. The number of research publications of The Nature Journal for the twelve months period given month-wise in Table-1.

Table-1 Month-wise distribution of articles

S.No.	Year	Month	Volume	No. of Articles	Percentage (%)
1	2014	January	505	17	9.77
2	2014	February	506	13	7.47
3	2014	March	507	14	8.05
4	2014	April	508	16	9.20
5	2014	May	509	18	10.34
6	2014	June	510	15	8.62
7	2014	July	511	15	8.62
8	2014	August	512	13	7.47
9	2014	September	513	15	8.62
10	2014	October	514	15	8.62
11	2014	November	515	12	6.90
12	2014	December	516	11	6.32
		Total		**174**	100

Number of Citations on Web of Sciences, Cross Ref. and Scopus.

Single number count for article citations from each service's database (may vary by service). The citations counts are reliant on the availability of the individual APIs from Web of Science,

CrossRef, and Scopus. These counts are updated daily once they become available. Once a citation count is available, the list of articles citing this one is accessible by clicking on the circle for that citation source.

Web of Sciences: Maximum number of citations counted in the month of January 18.88% followed by March 13.43% and Minimum number of citations counted in the month of December 1.96% are recorded, remaining counted citations showed in below table-2.

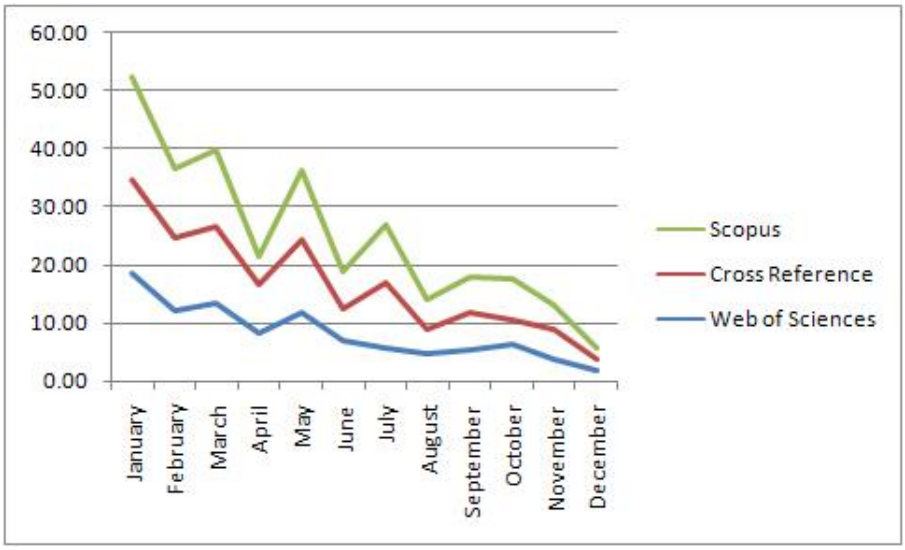
CrossRef: Maximum number of citation counted in the month of May 12.56% followed by February 12.48% and July 11.17% There is a minimum citation count in the month of December 1.78% are recorded, remaining counted citations showed in below table-2.

Scopus: Maximum number of citation counted in the month of January 17.65% followed by March 13.21% and February 11.68% There is a minimum citation count in the month of December 1.83% are recorded, remaining counted citations showed in below table-2.

Table-2 Month-wise Number of Citations

S.No.	Month	Web of Sciences	Percentage (%)	Cross-Ref	Percentage (%)	Scopus	Percentage (%)
1	January	1487	18.66	1331	16	1522	17.65
2	February	980	12.29	1038	12.48	1007	11.68
3	March	1070	13.42	1098	13.2	1139	13.21
4	April	662	8.31	703	8.45	410	4.75
5	May	947	11.88	1045	12.56	1022	11.85
6	June	563	7.06	440	5.29	562	6.52
7	July	452	5.67	929	11.17	876	10.16
8	August	380	4.77	350	4.21	428	4.96
9	September	440	5.52	514	6.18	532	6.17
10	October	514	6.45	329	3.95	606	7.03
11	November	320	4.01	394	4.74	362	4.2
12	December	156	1.96	148	1.78	158	1.83
Total		**7971**	**100**	**8319**	**100**	**8624**	**100**

Fig.1 Month-wise Number of Citations



Readers on Mendeley and CiteLike

In order to examine how Mendeley and CiteLike counts differ with differently tagged papers, four regression models with four counts as dependent variable and the tags as independent variable were calculated. As Table 3 shows, each model includes the individual recommendation scores of the readers by profession like Student (PG & UG), Researcher and others, Readers by discipline like Agricultural and Biological Sciences, Medicine and Dentistry, Chemistry, Biochemistry, Genetics and Molecular Biology, Engineering and Others. Since the recommendations reflect the quality of the papers, the results of the tags are adjusted for the quality of the papers. In other words: the different results for the tags can hardly be traced back to the differing quality of the papers counts to be controlled for in the analysis.

Mendeley: Maximum number of readers counted in the month of January 19.79% followed by March 10.83% and May 10.59%, There is a minimum number of readers in the month of December 3.61% are recorded, remaining reader counts showed in the table-3.

CiteLike: Maximum number of readers counted in the month of March 14.79% followed by January 12.88% and May 12.15%. and minimum number of readers in the month of December 2.93% are recorded, remaining reader counts showed in the table-3.

Table-3 Month-wise Readers

S.No.	Month	Readers on			
		Mendeley	%	CiteLike	%
1	January	8055	19.79	88	12.88
2	February	3361	8.26	50	7.32
3	March	4408	10.83	101	14.79
4	April	3582	8.8	64	9.37
5	May	4313	10.59	83	12.15
6	June	2719	6.68	42	6.15
7	July	3400	8.35	52	7.61
8	August	1642	4.03	36	5.27
9	September	2444	6	52	7.61
10	October	3236	7.95	43	6.3
11	November	2082	5.11	52	7.61
12	December	1469	3.61	20	2.93
Total		**40711**	**100**	**683**	**100**

Social Media Attention

Altmetric calculates a score supported the web attention a writing receives. every colored thread within the circle represents a distinct kind of on-line attention and therefore the range within the centre is that the Altmetric score. The score is calculated supported 2 main sources of on-line attention: social media and thought print media. Facebook and Twitter information will indicate papers that square measure of interest outside the sphere of science. the quantity of times a writing has been cited by individual thought news sources, blog post, or member of Google+ together with a link to the initial article or post. News articles, diary posts and Google+ RHP, Reddit, Wiki and Videoup posts don't perpetually link to articles during a manner which will be picked up by aggregators employed by Altmetric, that the listed links aren't essentially a mirrored image of the whole scope of media, diary or Google+ interest. Further, the list of diarys and news supply lined is manually curated by Altmetric and so is subject to their discretion for inclusion as a scientific blog or media source. The news, blog, and Google+ posts square measure provided by Altmetric and square measure updated hourly.

Table-4 shows the online attention on Facebook pages, Twitter tweets, news, google+ additions and Research Highlight Platform (RHP), Reddit, blogs, wiki and Video up. Highest News outlets

counted in the month of January (365), 4917 Tweets in the month of October, Facebook pages in the month of October (448), Google plus pages in the months of January and May (96), RHP in the month of January (13), Reddit links in the month os January (7) and Blog links in the month of January (136), Wiki pages also in the month of January (16) and Video add-ons in the month of May (6) are counted.

Table-4 Month-wise researcher online attention

S.No.	Month	Online Attention								
		News	Tweets	FB Pages	Google+	RHP	Reddit	Blogs	Wiki	Video_up
1	January	365	4133	221	96	13	7	136	16	4
2	February	140	883	22	10	9	1	39	4	1
3	March	113	920	46	9	11	2	32	6	1
4	April	182	1032	27	15	12	5	58	7	3
5	May	172	1242	30	96	10	2	67	7	6
6	June	102	889	65	54	8	6	44	11	3
7	July	115	884	57	36	8	5	59	4	1
8	August	76	925	18	7	9	2	27	3	2
9	September	122	1272	76	18	5	1	46	9	2
10	October	374	4917	448	83	7	2	132	8	3
11	November	176	1541	67	24	7	1	85	7	4
12	December	85	365	32	10	1	0	25	1	0
Total		**2022**	**19003**	**1109**	**458**	**100**	**34**	**750**	**83**	**30**

Concluding Remarks:

In this paper I measured the impact of "altmetrics" by deploying altmetrics indicators. In addition, It is measurement of Nature Journal altmetrics which captures the social impact of scientific publication. However, the scope of this analysis is restricted as solely articles expressly mentioning the term "altmetric (s)". Altmetrics may solely be retrieved for articles having a DOI number. Firstly, Scopus (8624) highest citations are recoded when compared to other social media of Cross-Ref (8319) citations are recoded and Web of Sciences (7971) Citations are recoded. When it comes to Readers on Mendeley (40711) appears to be the most effective channels of social impact on Nature journal, and CiteLike (683) the very less readers are corded.

Social Media Attention on Twitter recorded the highest when compare to other media like News, Facebook, Google+, RHP, Reddit, Blogs, Wiki and Video-ups. Note that the data gathered in this research is publically available - we encourage other community members to build more sophisticated models using this dataset. To summarise, a analysis of dynamics, properties, and potential use of latest net primarily based metrics that relates these new measures to the already established indicators of publication impact could contribute to the event of additional helpful tools for the scientific and critical community

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