

Measuring social media attention of scientific research on Novel Coronavirus Disease 2019 (COVID-19): An investigation on article-level metrics data of Dimensions

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Abstract

The purpose of this research was to evaluate the rate of attention to the scientific productions on *COVID-19* in social media over a period of four months. The present research was an applied descriptive-analytical study that used Scientometrics analysis. The population study included research papers about the *COVID-19* indexed in Dimensions platform from December 2019 to March 2020. Information of 20% of the articles with the highest citation count and 20% of the articles with the highest number of Altmetric Attention Score (AAS), including title, journal, citation and Altmetrics indicators for each article were extracted. These data were analyzed by SPSS 16.0. The results showed that 1910 scientific productions about the *COVID-19* were indexed in the Dimensions platform. A considerable number of these articles were accessible via preprint services and were published in journals such as The Lancet, JAMA, BMJ and NEJM. Authors from China and Japan were the most active authors. All of the 382 articles had AAS, that is, all of these articles received attention at least in one of the social media. The highest and lowest AAS for these articles were 14030 and 6, respectively. These results show a high rate of attention by researches and users of social media to the articles presented on *COVID-19*. The result of this research also showed a significant positive relationship between the citations and Altmetric indicators. As the results of this research showed, the “information supply” in the field of *COVID-19* was remarkably high. Also, the “information demand” by the social media audiences was high.

Introduction

Counting the citations of the articles to evaluation of scientific research impact started in the 1960s and ever since this approach has been used extensively. It seems that citation alone may not cover a wide spectrum of research impacts. For instance, publications that are not cited may have a significant impact (Bornmann, 2014); since numerous non-writers such as practitioners, general people and instructors read research papers and use them in such activities as teaching or business (Kurtz and Bollen 2010; Thelwall and Kousha 2014; Schloegl and Stock 2004).

Also, considering that it takes so many years to receive the citation, the use of this method is very slow for some evaluation; therefore, scientometrics experts try to introduce different indicators that are more realistic to evaluate the research impact. Web resources such as social media are recently used as a complementary tool for evaluation of research activities. They can provide a broader image of scientific impact due to increasing popularity among people (Priem et al. 2012). The interactions of users within the social media have the potential to provide valuable data for evaluation (Neylon and Wu 2009). This attribute results in the creation of new indicators to assess the impact of the articles; thus, it has led to the emergence Altmetrics. The Altmetrics is one of the means to evaluate and trace science influence on the social web. The purpose of its formation is to present the invisible influence of scientific publications by the use of Altmetrics indicators such as visits, downloads, bookmarks, favorites, mention, and article capture based on the social web data. Altmetrics may be useful for tracking real-time usage of the latest publications, recording usage statistics of online resources, finding how research has been used by researchers and the public and predicting future citations.

One of the environments used for Altmetrics studies and article impact assessment is the Dimensions platform (<https://app.dimensions.ai/>). This tool provides access to data related to the presence and attention received by the scientific products in different social media such as Twitter, Facebook, YouTube, Policy document, Blog, News, and so on. Also, the main indicator of Dimension is Altmetric Attention Score (AAS). The AAS is calculated by summing each indicator multiplied by its weight with necessary adjustments, and the AAS are updated in real-time (Huang et al. 2018).

In September 2019, new Coronavirus started to spread Pneumonia across Wuhan, China to the rest of the world. Presently, it is a paramount health threat for the general public. On 12 January 2020, the World Health Organization temporarily named this virus as new Coronavirus 2019 (2019-nCoV). On 11 February 2020, this organization called this disease officially Coronavirus Disease 2019 (COVID-19) (WHO 2020a). The 2019- coronavirus pandemic spread throughout the world and till 22 March 2020, a sum of 185 countries was affected by the virus (WHO 2020b). The worldwide challenge of this disease resulted in a considerable amount of scientific production to identify different aspects of the disease such as clinical symptoms, diagnosis, epidemiology, transmission, prevention, control and its treatment.

The purpose of this research was to evaluate the rate of attention to the scientific productions on COVID-19 in social media. Considering the importance of the subject, the present study investigated the number of indexed articles related to COVID-19 in Dimension platform over a period of four months, the number of citations received by these articles, and the amount of attention paid to them by social media audiences to determine the real-time impact of the scientific productions on COVID-19; Thus, the purpose of this research was twofold: first to describe the distribution of the scientific productions that are known as the concept of "information supply" during the last few months; second to determine how many of these articles took more attention by the users in a short period under the concept of "information demand".

Research Methodology

The present research was an applied descriptive-analytical study that used scientometrics analysis. The population study included research papers about the COVID-19 indexed in Dimensions platform from December 2019 to March 2020. Dimensions contains more than 100 million publications, ranging from articles published in scholarly journals, books and book chapters, to preprints and conference proceedings. Dimensions provides Citation indicators and Altmetric attention scores (AAS) to evaluate the impact of the publications. Following keywords were used in search section of Dimensions platform, within the Article Title and Abstract fields:

“Wuhan corona virus” OR “COVID 19” OR “2019-nCov” OR “COVID-19” OR “coronavirus disease 2019” OR “2019 Novel Coronavirus” OR “2019 nCoV” OR “corona virus disease-19”

The result of this search retrieved 1910 articles. To examine their Citation and Altmetrics indicators, the Information of 20 percent of the articles with the highest citation count and with the highest number of AAS, including article title, year and journal name were saved in Excel file. Subsequently, the citation

counts, Altmetrics indicators (Twitter, Facebook, Reddit, YouTube, Blogs, News, Wikipedia, and YouTube) and also AAS for each article were extracted. These data were analyzed by SPSS: PC 16.0. Descriptive and analytic analysis were performed and presented in tables and figures

Results

The result of the analysis showed that 1910 research papers about COVID–19 indexed in Dimension Platform. A considerable number of these articles were accessible via preprint services such as MedRxiv (373), BioRxiv (117), ArXiv (74), Research Square (59), SSRN (57) and ChemRxiv (48). Preprint servers are online archives, or repositories, containing works or data associated with various scholarly papers that are not yet peer-reviewed or accepted by academic journals. The journals including Lancet, BMJ, Journal of Medical Virology, NEJM and JAMA were in subsequent rankings. Table 1 shows the most active authors in this field.

Table 1 The most active authors in COVID-19 domain

Author	Number of Article	Affiliation
Hiroshi Nishiura	16	Hokkaido University, Japan
Dai-Hai He	14	Hong Kong Polytechnic University, China
Natalie Marie Linton	13	Hokkaido University, Japan
Andrei R R Akhmetzhanov	13	Hokkaido University, Japan
Yijun Lou	12	Hong Kong Polytechnic University, China

Twenty percent of the articles with the highest citations (382) and Twenty percent of the articles with the highest AAS (382) were examined. 382 articles with the highest citations were published in 110 preprint services. Also, 382 articles with the highest AAS were published in 377 preprint services or journals. The titles of journals with more than 7 articles are presented in table 2.

Table 2 Journals with more than 7 articles

articles with the highest citations			articles with the highest AAS		
preprint server OR journal	Index in:	Number of Article	preprint server OR journal	Index in:	Number of Article
MedRxiv	preprint server	39	MedRxiv	preprint server	60
BioRxiv	preprint server	35	The Lancet	ISI, Scopus, PubMed	40
The Lancet	ISI, Scopus, PubMed	22	BioRxiv	preprint server	35
Journal of Medical Virology	ISI, Scopus, PubMed	22	JAMA	ISI, Scopus, PubMed	22
Nature Reviews Drug Discovery	ISI, Scopus, PubMed	17	New England Journal of Medicine	ISI, Scopus, PubMed	19
Radiology	ISI, Scopus, PubMed	16	Radiology	ISI, Scopus, PubMed	16
JAMA	ISI, Scopus, PubMed	14	Journal of Medical Virology	ISI, Scopus, PubMed	11
Journal of Clinical Medicine	ISI, Scopus	11	The Lancet Infectious Diseases	ISI, Scopus, PubMed	11
Eurosurveillance	ISI, Scopus, PubMed	11	Eurosurveillance	ISI, Scopus, PubMed	9
Emerging Infectious Diseases	ISI, Scopus, PubMed	7	The BMJ	ISI, Scopus, PubMed	8
The Lancet Infectious Diseases	ISI, Scopus, PubMed	7	Emerging Infectious Diseases	ISI, Scopus, PubMed	7
□□□□□□□□		7			

A visual inspection of table 2 reveals the commonalities of the journals in two categories and all of these journals are indexed in WOS, Scopus and PubMed. A total of 382 articles with the highest citations received 5521 citations. Nine articles alone made up 40 percent of the citations (Table 3). The highest citations are 472 and the least citation is one.

Table 3 Articles with 40 percent of the total citations

Title	Time cited	AAS	Journal
Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China	472	10904	The Lancet
A Novel Coronavirus from Patients with Pneumonia in China, 2019	343	4112	NEJM
Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia	304	5617	NEJM
Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study	239	3623	The Lancet
A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster	220	4296	The Lancet
Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China	188	5480	JAMA
A pneumonia outbreak associated with a new coronavirus of probable bat origin	185	2800	Nature
Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding	165	1742	The Lancet
Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany	118	8326	NEJM

Table 4 shows that these articles have high AAS. A total of 382 articles had received 383682 times attention on various social media. The titles of articles that have a high percentage of attention on social media are presented in table 4.

Table 4 Articles with more than 20 percent of the total attention in social media

Title	Time cited	AAS	Journal
Uncanny similarity of unique inserts in the 2019-nCoV spike protein to HIV-1 gp120 and 2 Gag		14030	BioRxiv
Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China	472	10904	The Lancet
Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China	36	10116	JAMA
High Temperature and High Humidity Reduce the Transmission of COVID-19	0	9328	SSRN Electronic Journal
Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany	118	8326	NEJM
Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study	1	7547	The Lancet
First Case of 2019 Novel Coronavirus in the United States	116	7360	NEJM
Clinical Characteristics of Coronavirus Disease 2019 in China	50	6950	NEJM

Table 5 presents the information of citation and Altmetrics indicators of articles with the highest citations.

Table 5 Citation and Altmetric indicators of articles with the highest citations

Citation and Altmetric indicators	indicators	Non-zero occurrence; n (%)	Average number of non-zero occurrence	Min	Max
Citation	Citations: 5521	382 (100%)	14.4	1	472
Altmetric indicators	News: 7456	265 (69.3%)	28.13	0	363
	Blog: 928	171 (44.7%)	5.4	0	139
	Twitter: 335616	382 (100%)	875.5	1	22588
	Face book: 1054	177 (46.3%)	5.9	0	50
	Wikipedia:29	65 (17%)	1.9	0	6
	Redit:396	107 (20%)	3.7	0	17
	YouTube: 87	48 (12.5%)	1.8	0	7

Overall, these articles were cited 5521 times; the mean value of citation to every one of these articles was 14.4 times. Tables 5 shows that the "Twitter" indicator with 335616 times had the highest frequency followed by the "News" and "Facebook" indicators, respectively. All of the 382 articles had AAS, that is, every one of these articles received attention at least in one of the social media. The highest and lowest AAS for these articles were 14030 and 1, respectively.

Table 6 presents the information of Citation and Altmetrics indicators of articles with the highest AAS.

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Citation and Altmetric indicators	indicators	Non-zero occurrence; n (%)	Average number of non-zero occurrence	Min	Max
Citation	Citations: 4753	235 (61.5%)	20.2	0	472
Altmetric indicators	News: 9968	326 (85.3%)	30.57	0	487
	Blog: 1165	245 (64.1%)	4.7	0	139
	Twitter: 556219	382 (100%)	1456	3	60660
	Face book: 1291	242 (63.3%)	5.3	0	50
	Wikipedia:154	83 (21.7%)	1.8	0	6
	Redit:645	152 (39.7%)	4.2	0	33
	YouTube: 99	57 (14.9%)	1.7	0	7

The total AAS for these articles was 556219 with the mean value of 1004.4 per article. Table 6 shows that the "Twitter" indicator had the highest number with 556219 times followed by the "News" and "Facebook" indicators, respectively. All of the 382 articles had AAS, that is, every one of these articles received attention at least in one of the social media. The highest and lowest AAS for these articles were 14030 and 6, respectively. Overall, 61.5% of these articles were cited at least "one" time.

Table 7 presents the result of the correlation coefficient between the Citations and Altmetrics indicators. The grey part of the table is the correlation coefficient between the indicators of articles with the highest numbers of citations; the block section is the correlation coefficient between the indicators of articles with the highest numbers of AAS.

Table 7. Spearman correlation between the indicators

Indicators	Citation	AAS	News	Blog	Twitter	Facebook	Wikipedia	Reddit	YouTube	Total Altmetrics indicators
Citation	1	0.447 0.000	0.502 0.000	0.391 0.000	0.196 0.000	0.552 0.000	0.620 0.000	0.270 0.000	0.424 0.000	0.203 0.000
AAS	0.481 0.000	1	0.778 0.000	0.455 0.000	0.670 0.000	0.652 0.000	0.437 0.000	0.588 0.000	0.487 0.000	0.687 0.000
News	0.453 0.000	0.881 0.000	1	0.510 0.000	0.474 0.000	0.641 0.000	0.446 0.000	0.470 0.000	0.336 0.000	0.486 0.000
Blog	0.423 0.000	0.777 0.000	0.775 0.000	1	0.258 0.000	0.413 0.000	0.346 0.000	0.285 0.000	0.217 0.000	0.266 0.000
Twitter	0.471 0.000	0.958 0.000	0.759 0.000	0.702 0.000	1	0.407 0.000	0.235 0.000	0.486 0.000	0.270 0.000	1 0.000
Facebook	0.426 0.000	0.669 0.000	0.597 0.000	0.540 0.000	0.661 0.000	1	0.479 0.000	0.412 0.000	0.444 0.000	0.415 0.000
Wikipedia	0.349 0.000	0.389 0.000	0.347 0.000	0.407 0.000	0.371 0.000	0.341 0.000	1	0.322 0.000	0.301 0.000	0.241 0.000
Reddit	0.298 0.000	0.570 0.000	0.522 0.000	0.496 0.000	0.569 0.000	0.543 0.000	0.318 0.000	1	0.138 0.007	0.491 0.000
YouTube	0.363 0.000	0.442 0.000	0.408 0.000	0.369 0.000	0.448 0.000	0.379 0.000	0.374 0.000	0.345 0.000	1	0.247 0.000
Total Altmetrics indicators	0.480 0.000	0.977 0.000	0.789 0.000	0.730 0.000	0.992 0.000	0.666 0.000	0.384 0.000	0.571 0.000	0.449 0.000	1

The result of the Spearman correlation indicated that there was a positive significant relationship between all the indicators ($p < 0.05$).

Discussion

This research was designed to describe and analyze the citations and altmetric indicators of scientific production about COVID-19. Dimensions platform is a modern and innovative linked research data infrastructure and a tool for reimagining discovery and access to research. Dimensions include high-level altmetric data for every article in the index and display this on the article details page (Bode 2018). The result of the analysis showed that 1910 scientific production about the COVID-19 were indexed in the Dimensions platform. A considerable number of these articles were accessible via preprint services and journals indexed in international databases. Authors may submit revised versions of their papers to the preprint server at any time. Preprint servers are a great way for researchers to share and receive feedback on scholarly works in progress. Therefore, a preprint is a full draft research paper that is shared publicly before it becomes peer-reviewed. Most preprints are given a DOI; so that they may be cited in other research papers (Mudrak 2020). A study in the Journal of the American Medical Association received notable increases in citations and altmetric scores when authors posted their work first as a preprint (Serghiou and Ioannidis 2018). The result also showed that authors from China and Japan were the most active authors in this domain. These articles were accessible via preprint services such as MedRxiv and BioRxiv and were published in journals such as The Lancet, JAMA, BMJ, NEJM, Radiology and Journal of Medical Virology.

The AAS for an article provided by Altmetric aggregates activities surrounding research outputs in social media. The AAS is derived from the weighted scores of individual indicators such as News, Blogs, Wikipedia pages, Policy Documents, Twitter, Facebook, YouTube and Reddit by algorithms. The AAS is calculated by summing up each indicator multiplied by its weight with necessary adjustments; they are updated in real-time (Huang et al. 2018).

All of the 382 articles had AAS, that is, every one of these articles received attention at least in one of the social media. The highest and lowest AAS for these articles were 14030 and 6, respectively. Also, News, Facebook, Blog, Reddit, Wikipedia, and YouTube indicators were in the next rank. These results show the high rate of attention of researchers and users of social media to the articles presented in this domain. Social Media platforms have the potential to show and measure the rate of attention paid to any article. While it takes years for traditional citations to accrue, the number of downloads, views, and mentions in social media is reported in a matter of days, even hours (Wang et al. 2013). The rate of Like or Share in a social media such as Twitter or Facebook is an indication of its progress, effectiveness and the interest of users to an article. These results are similar to Moradi and Alipour (2018), who found Twitter was more attractive to researchers than any other social media. Nemati Anaraki et al. (2017) also explored the impact of Iranian pediatrics articles using Altmetrics method and showed that 256 articles out of 1332 articles in the field of pediatrics had Altmetrics score and were mentioned in 10 social media, i.e. Mendeley, CiteULike, Weblogs, Mainstreams, Twitter, Reddit, Facebook, Pinterest, Google plus and Faculty1000. Rom and Shaliny (2018) assessed the research impact of Himachal Pradesh University Shimla using alternative methods and showed that there were a considerable number of papers being discussed on social media platforms on the parameter of Usage, Capture, Mention, Social Media, and Citation. The most prominent usage pattern has been noticed as Abstract Views on the EBSCO platform, whereas Mendeley has the most favored mode of capture. Batooli et al. (2016a) research was a

comparative study of the impact of ResearchGate indicators on increasing citation counts of top Clinical Medicine articles of Iranian and Turkish Researchers and found that all the articles were shared in ResearchGate. These results showed a high impact of social networks such as Twitter or Facebook in increasing the visibility of scientific works. Batooli et al. (2016b) also assessed the scientific output of Kashan University of Medical Sciences based on scientometrics measures of Scopus, ResearchGate, and Mendeley and showed that the articles were downloaded 183 times in Mendeley and 521 times in ResearchGate. In another study conducted by Batooli (2017), "Top Papers" of Iranian researchers were assessed based on citation indicators of WOS and Altmetrics Indicators of ResearchGate and found that the rate coverage of articles in ResearchGate was 99.6%.

The result of this research showed a significant positive relationship between the Citation and Altmetric indicators. There also exist significant correlations among the online attention from different social media platforms. Social media brings scholarly articles to the public. Not only researchers, but also many general people are directed to scholarly articles by social media attention. Articles with more social media attention would have more article visitors (Wang 2017). These results are similar to those reported by Batooli et al. (2016b) found that the correlations between the number of ResearchGate views and Scopus citations were positive and statistically significant. The same was true for the correlations between Mendeley reads and Scopus citations. Mohammadi and Thelwall (2013) showed that there was a positive relationship between the numbers of Mendeley bookmarks and citations. Wilson and Thelwall (2015) also showed that there was a positive relationship between numbers of Mendeley bookmarks and Scopus citations in medical science. Batooli (2017) showed that the correlations between the numbers of WOS citations and the number of views, downloads, and citations in ResearchGate were positive and statistically significant.

Conclusion

The Corona Virus Disease-2019 (COVID-19) epidemic by 2019-nCoV is spreading worldwide. To acquire knowledge and information on COVID-19, numerous researchers started to research in this field over a period of four months. The results of this research showed that the "information supply" in the field of COVID-19 in different aspects of this disease was remarkably high. Also, the "information demand" by the social media audiences were high in such a way that many of these articles attracted social media audiences over the past few months. While some of these articles were accessible via preprint services. This result illustrates the importance of preprinting services in increasing the visibility of scientific products. Therefore, the results of this study showed that posting a preprint led to a significant increase in Altmetric attention scores and citations. The result of the research also showed that there was a significant positive relationship between the Citation and Altmetrics indicators; Therefore, the activities of researchers on social media have the potential to increase the visibility of scientific works. It is recommended that researchers use this social media as a means of "self-archiving". The present research is one of the first scientometrics study about articles on COVID-19 by using Dimensions tool. We suggest that the scientific productions presented about COVID-19 in other platforms and databases be examined and their result be compared with the result of the present research.

Declarations

Conflicts of interest

The authors declare no conflict of interest

References

- Batooli, Z. (2017). The Relationship between Web of Science and ResearchGate Indicators of Iranian Researchers' Top Papers. *Iranian Journal of Information Processing and Management*, 33(1), 161-184.
- Batooli, Z., Janavi, E., & Ravandi, S. N. (2016a). The impact of ResearchGate indicators on increasing citation counts of top Clinical Medicine articles in Web of Science: A Comparative study of Iranian and Turkish Researchers. *Quarterly Journal of Knowledge and Information Management*, 3(2), 83-93.
- Batooli, Z, Nadi Ravandi, S & Sabahi Bidgoli, M. (2016b). Evaluation of Scientific Outputs of Kashan University of Medical Sciences in Scopus Citation Database based on Scopus, ResearchGate, and Mendeley Scientometric Measures. *Electronic Physician*, 8 (2): 2048-2056.
- Bode, C., Herzog, C., Hook, D., and McGrath. R. (2018). Guide to the Dimensions Data Approach: A collaborative approach to creating a modern infrastructure for data describing research: where we are and where we want to take it. Dimensions Report Cambridge, MA: Digital Science. <https://www.digital-science.com/resources/portfolio-reports/a-guide-to-the-dimensions-data-approach>. Accessed 5 March 2020.
- Bornmann, L. (2014). Is there currently a scientific revolution in scientometrics? *JASIST*, 65(3): 647-648.
- Huang, W., Wang, P., & Wu, O. (2018). A correlation comparison between Altmetric Attention Scores and citations for six PLOS journals. *PLoS One*, 13(4): 1-15.
- Kurtz, M.J., & Bollen, J. (2010). Usage bibliometrics. *Annual Review of Information Science and Technology*, 44(1):1-64.
- Mohammadi, E., and Thelwall, M. (2013). Assessing the Mendeley readership of social sciences and humanities research. Proceedings of issi 2011: the 13th conference of the international society for scientometrics and informetrics, vols 1 and 2.
- Moradi, S., & Alipour, O. (2018). The Characteristic of 100 top altmetrics articles. *Journal of Scientometrics*. doi: 10.22070/rsci.2019.3897.1248
- Mudrak, B. (2020). What are preprints and how do they benefit authors? *American Journal Experts*. <https://www.aje.com/arc/benefits-of-preprints-for-researchers>. Accessed 19 June 2019.

- Nemati Anaraki, L., Aghajani Koupaei, H., & Alibeyg, M. (2018). The Impact of Iranian Pediatrics Articles based on Altmetric Method: 2010-2016. *Journal of Health Administration, 20*(70), 94-106.
- Neylon, C., & Wu, S. (2009). Article-Level Metrics and the Evolution of Scientific Impact. *PLoS biology, 7*(11): 1-6.
- Priem, J., Piwowar, H.A., & Hemminger, B.M. (2012). Altmetrics in the wild: Using social media to explore scholarly impact. *arXiv preprint arXiv:1203.4745*.
- Ram, S. & Shalini (2018). Alternative Metrics for Assessing Research Impact PlumX Tool to Showcase Academic Profile of Himachal Pradesh University. Paper presented at the 2018 5th International Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLLIS).
- Schloegl, C., & Stock, W.G. (2004). Impact and relevance of LIS journals: A scientometric analysis of international and German-language LIS journals—Citation analysis versus reader survey. *Journal of the American Society for Information Science and Technology, 55*(13), 1155-1168.
- Serghiou, S., Ioannidis, J.P.A. (2018). Altmetric Scores, Citations, and Publication of Studies Posted as Preprints. *JAMA, 2018;319*(4):402–404.
- Thelwall, M., & Kousha, K. (2014). Academia. edu: Social network or Academic Network? *Journal of the Association for information Science and technology, 65*(4), 721-731.
- Wang, X., Cui, Y., Li, Q., & Guo, X. (2017). Social media attention increases article visits: an investigation on article-level referral data of PeerJ. *Frontiers in Research Metrics and Analytics, 2*, 11. <https://www.frontiersin.org/articles/10.3389/frma.2017.00011/full>. Accessed 20 Feb 2020.
- Wang, X., Wang, Z., and Xu, S. (2013). Tracing scientist's research trends realtimely. *Scientometrics, 95* (2), 717–29. Wilson, P., & Thelwall, M. (2016). Mendeley readership altmetrics for medical articles: An analysis of 45 fields. *JASIST, 68* (7): 1962-1972.
- World Health Organization (2020a). Naming the coronavirus disease (COVID-19) and the virus that causes it. [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it). Accessed 19 Feb 2020.
- World Health Organization (2020b). Coronavirus disease (COVID-19) Pandemic. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. Accessed 5 March 2020.

Figures

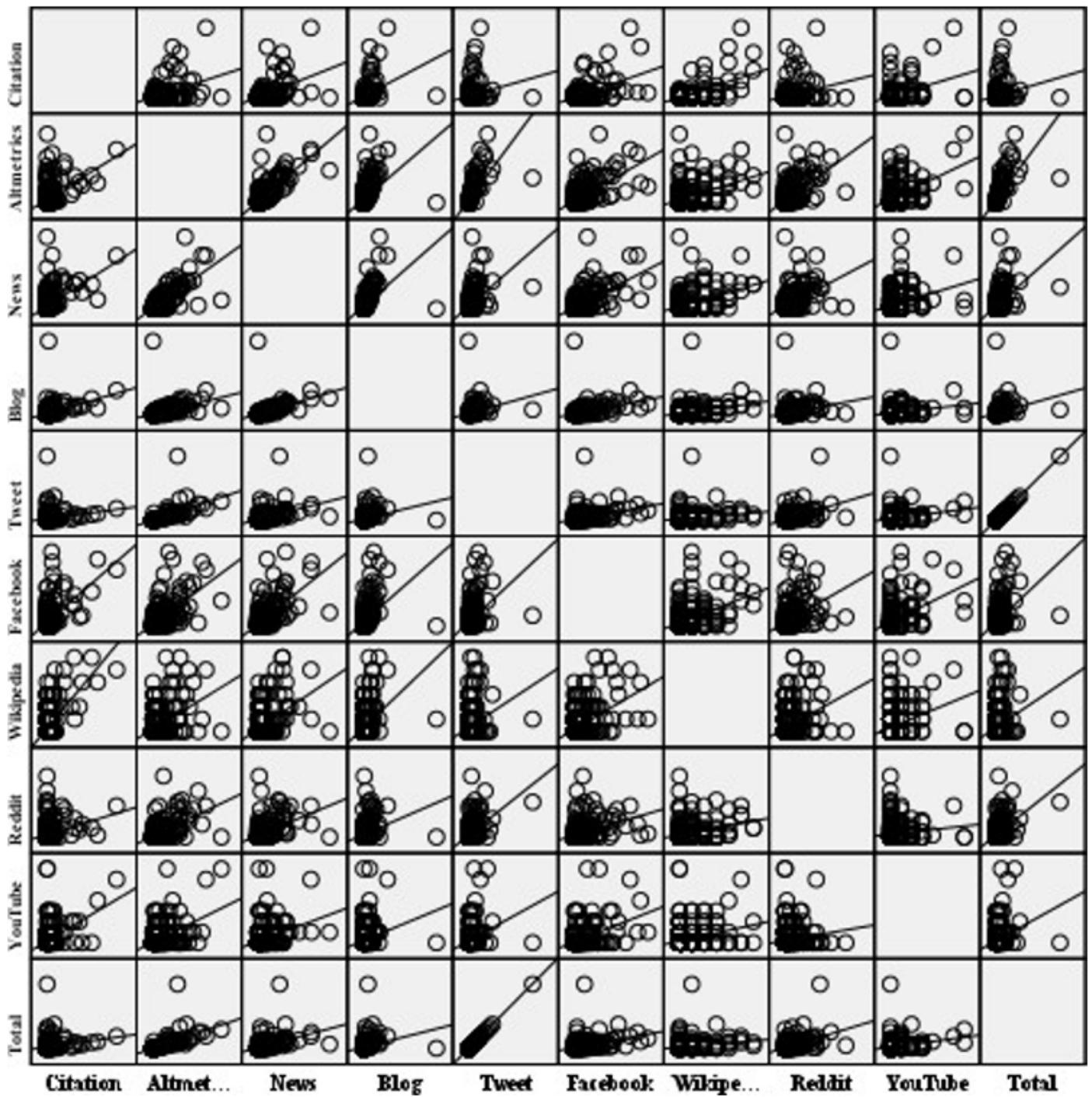


Figure 1

Correlation between the Citation and Altmetrics indicators (articles with the highest AAS)

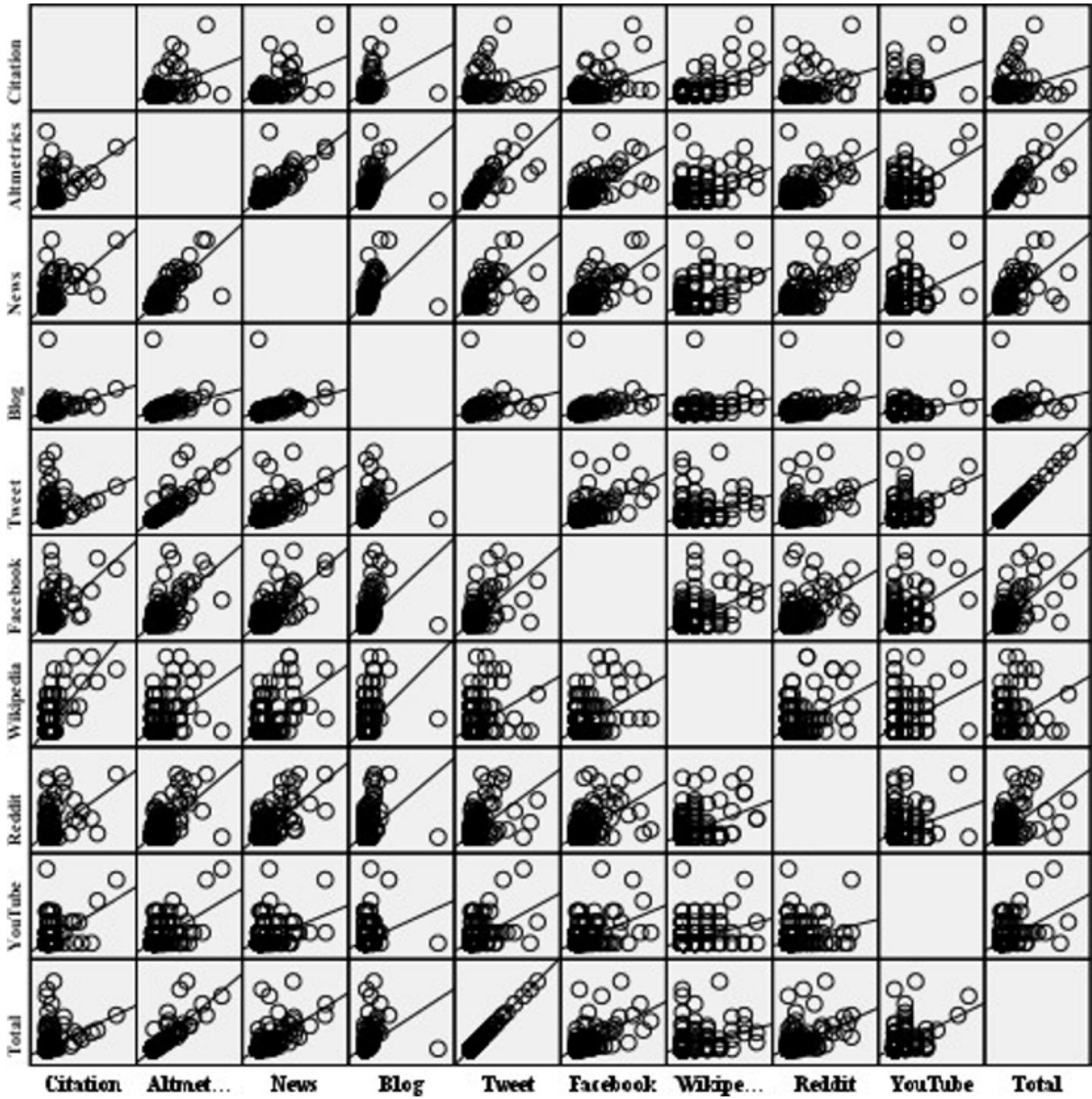


Figure 2

Spearman correlations between the Citation and Altmetrics indicators (articles with the highest Citations)