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Harnessing the True Power of Altmetrics to Track Engagement

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ABSTRACT

Altmetrics has recently been at the forefront of tracking medical literature propagation on social media in the modern era. With the rapidly evolving landscape of social media for academia, there's room to revise the approach. The authors discuss current limitations and suggest changes to make online attention trackers more robust and wholesome. Medical literature propagated on currently popular social media platforms like Instagram or TikTok are not accounted for by altmetrics. For altmetrics to become a more robust tool it is vital that it keeps up with the times and accounts for representation of data from these platforms as well. Greater inclusivity, dynamic weightage of different social media platforms based on location dependant availability and usage, and period re-evaluation based on prevailing trends may help metrics reflect the true attention garnered by published research. Besides, development of hybrid scores with separate components to reflect online attention and traditional citations may provide readers a more fair and balanced perception of the actual importance of an article. With the changes proposed, altmetrics has the potential to become a much more inclusive and reflective tool in times to come.

Keywords: Altmetrics; Social Media; Research; Databases; Technology

Young doctors and researchers are avid users of social media and have a florid online presence, and the ongoing pandemic has increasingly brought them to realize the potential of these platforms in disseminating medical literature and promoting health and safety behaviours.[1] Measures of online attention such as altmetrics are the new norm in visibility, although changing times may require such measures to adapt and evolve, in keeping with fast paced developments in science, technology, and its acceptance by the world.

Traditionally, citations are considered to be the prime metric of visibility and utility in science.[2] However, recently, with the unescapable reality of social media, the world has adapted to the rapidity and reach of online platforms for dissemination.[3] Thus, it is widely acknowledged that online attention garnered by a published article on the different social media platforms combined may be a better indicator of visibility. In such times, it is vital that online metrics of attention keep up with the pace of the current times, which may call for them to continuously adapt and blend with the trends of social media use. Greater inclusivity,

dynamic weightage of different social media platforms, and period re-evaluation based on prevailing trends may help metrics such as altmetric attention score (AAS) reflect the true attention garnered by published research.[4-6] In this brief, the authors discuss evolving trends of social media use and propose measures to be adapted for online bibliometrics in keeping with current times.

Altmetrics is a tool that has been gaining popularity in the last decade since its introduction in 2012.[7] It is a complementary metric used to measure reader behaviour as well as interactions with content and social media.[8] Altmetrics gives an output score based on 3 factors, volume, sources, and authors, which is collectively known as the AAS. Among the three factors, volume—determines the number of mentions an article receives from each author and source, sources—affects the score depending on the type of source (where some sources like newspaper publication translates to a higher score than others such as blogs), and authors—bases the score on the credibility and conflict of interest of the author where a higher score may be received if a personal account cites the article in comparison to journals citing their own articles.

Attention and citability are two different metrics but both equally important. While attention depends on the amount of social media activity an article receives, citability, refers to the number of times the article is shared by someone else. It has been reported extensively that newly published articles have lower citation rates but higher altmetric scores and older articles will likely have higher citation rates but lower altmetric scores.[9] This is because newer articles start receiving attention as soon as they are posted in the global sphere that is social media. The views and amount of interaction on social media is much greater than the amount of views on journal websites simply due to the open accessibility and convenience of social media platforms. This leads to altmetric scores that are higher as there is more reach but citations will build up over time once researchers evaluate the research article and incorporate it into their researches if they find it relevant to their work. Furthermore, journals that are more adept at promoting their research papers on social media will consequently have higher altmetric scores than those who are not. It may be of interest to the medical community if altmetrics data was split into two metrics, one AAS metric that is purely for attention and another for citability. Hence, journals may be able to use the latter as it may be a more rigid criterion for measuring the importance of an article than attention alone which is determined and influenced greatly by social media trends and social media personalities of influence. Furthermore, higher initial altmetric scores have shown to correlate with higher citation count, and thus it is paramount that all articles are treated fairly and the credibility of the research itself does not go down simply due to low AASs.[10,11] Hence, dichotomized 'altmetric -attention' and 'altmetric-citation' metics should both be reported as separate entities while working hand in hand as two unique altmetric scores so that the readers can judge and gauge the importance of the article based on both attention and citation metrics separately rather than attention alone. Altmetrics when combined with traditional metrics can enhance and supplement the readers perception of the actual importance of an article and can help identify the salient articles from other less relevant research. This combined use can also help to promote educational and research articles.[12,13]

Altmetrics track sites such as Mendeley, CiteULike, Zotero, and Wikipedia.[14] Social media sites like Pinterest, Twitter, Facebook, Reddit, and Linkedin are also measured by altmetrics.[14] At the moment, altmetrics does not support or obtain data from popular social media platforms such as TikTok and Instagram. A comparison between TikTok
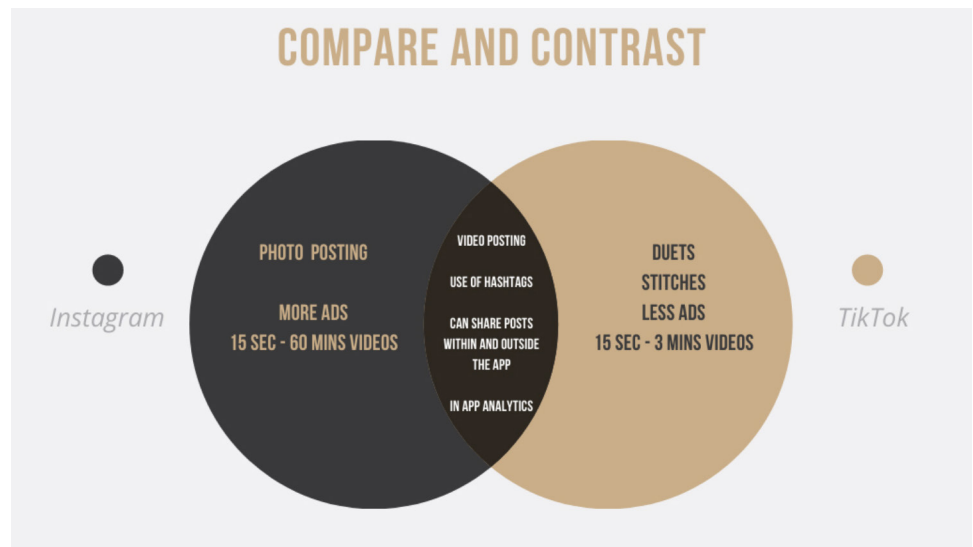
Fig. 1. Comparison and contrast between Instagram and TikTok.

and Instagram is shown in **Fig. 1**. TikTok is a platform used by many to make creative, educational, or comedic short videos with over 1 billion downloads since its global release in September 2017. Sixty-four percent of the users are under 24 years of age.[15] This is relevant to medical students as they can see videos from doctors and healthcare professionals.[15]

Even healthcare professionals utilize TikTok to disseminate information to the general public often creating content that can resonate with the younger generations.[16] Accounts like @ dermdoctor make videos explaining different skin conditions, recommending skincare products with scientific evidence. Another doctor on TikTok, @brianboxerwachlermd, reacts to videos and educated viewers by critiquing hoax medical videos, exposing myths from facts. These educational videos are beneficial to all users and have gained popularity in the last 4 years. Medically relevant hashtags such as Coronavirus (111.9B views), dermatologist (3.2B views), medical (6.7B views) and rheumatology (395.6K views) have gained a lot of views. Thus, tracking TikTok interactions with medically relevant literature for AAS would be the next relevant step.

TikTok achieves user interaction and participation by employing tools such as duet, stitch, share and an option to like videos. A duet is when a creator replies to a TikTok and both their and the original video shows up side by side. A stitch is when creators can use a clip from a video in conjunction to their own. In both cases the creator of the original video is credited. TikTok can be a powerful platform for researchers to promote and spread awareness of their research and findings while altmetrics can track the duet, stitch, likes, and shares that a video discussing medical literature receives.

Instagram is another popular social media platform that would benefit from tracking by altmetrics. Since its release in October 2010, Instagram has over 1 billion downloads. Studies have shown that 90% of the users are under the age of 35.[17] Educational posts are being made daily, many of which are related to medical topics which have been popular among medical students.[18]

A great number of posts have been made under medical related hashtags such as, Coronavirus (35.8M posts), dermatologist (1M posts), medical (7.5 M posts), and rheumatology (55.9K posts).

Accounts like @the_rheumatologypost post content related to rheumatology, such as ways to complement arthritis treatments. By using social media platforms such as Instagram, rheumatologists can reach a vast audience immediately such as their patients, students, or even researchers.[19] Medical journals like @NEJM (The New England Journal of Medicine) have come on board the app and successfully gathered over 461K followers. Posts relating to clinical cases with pictures to guess the diagnosis are popular. This educates the users, while providing them a quick overview of medical research which can be accessed as full-text links in bios as and when required. Instagram has also been used by national public health agencies such as @cdcgov, the official account of the Centers for Disease Control and Prevention is the public health agency of the United States to dispel misinformation, and post credible health and safety updates for the lay public. Such initiatives have become the need of the hour while dealing with a massive *infodemic* and widespread misinformation in these sensitive times.[20] Some fields of medicine such as dermatology, pathology, physical medicine and rehabilitation (PMR), radiology, and rheumatology are heavily reliant on imaging, making Instagram an amazing platform for the creation of such posts.[18] The rheumatology community also uses live streams on social media platforms such as Facebook or Twitter to broadcast their events which allows the audience watching to have a live discussion during the event.[21] A recent study showed that Instagram offers great opportunity for journals to establish their presence with the use of quality content, videos, and interactive posts. The current landscape of Instagram in academia is rapidly evolving for research and education in rheumatology.[22]

A newer feature on Instagram, Reels, launched in August 2020 has also been used to make medical related short videos for educational purposes. These are especially beneficial for medical fields like dermatology, pathology and PMR that rely heavily on visual content to teach and educate the public.[23] Altmetrics could track the amount of times a post relating to medical literature has been liked, shared, saved, and the amount of reach the post has received. Other considerations in relation to the use of altmetrics are highlighted in **Fig. 2**.

Other suggestions for enhancing the performance of altmetrics include selective score weightage depending on the distribution of social media use per country. There are countries where Facebook or Twitter is limited or less popular, their medical discourse happens in other social media sites. In some countries, Twitter is a popular platform for medical discussions.[24] In these countries, altmetrics can be far more reflective of attention if the weightage of articles posted on Twitter was higher than those posted on Facebook for example which is less popular for medical literature publishing than Twitter. If there are more Facebook users in Eastern Europe, then Facebook could be given higher weightage in that part of the world. Hence, taking into account geographical variables could make altmetrics a much more robust tool.[5]

University students and the younger generation are avid users of social media with approximately 80% having at least one social media account.[25,26] As such, much of the information they have been getting regarding coronavirus disease 2019 (COVID-19) during the pandemic has been through social media. Studies on the health beliefs model in university students in China showed that even as COVID-19 infections were on a decline, university students reported a high perceived risk of COVID infection. They also reported high self-efficacy in withholding COVID-19 guidelines and measures, showing that social media had been having a prominent impact in keeping people adherent to social distancing and preventative guidelines even when COVID restrictions had been lifted.
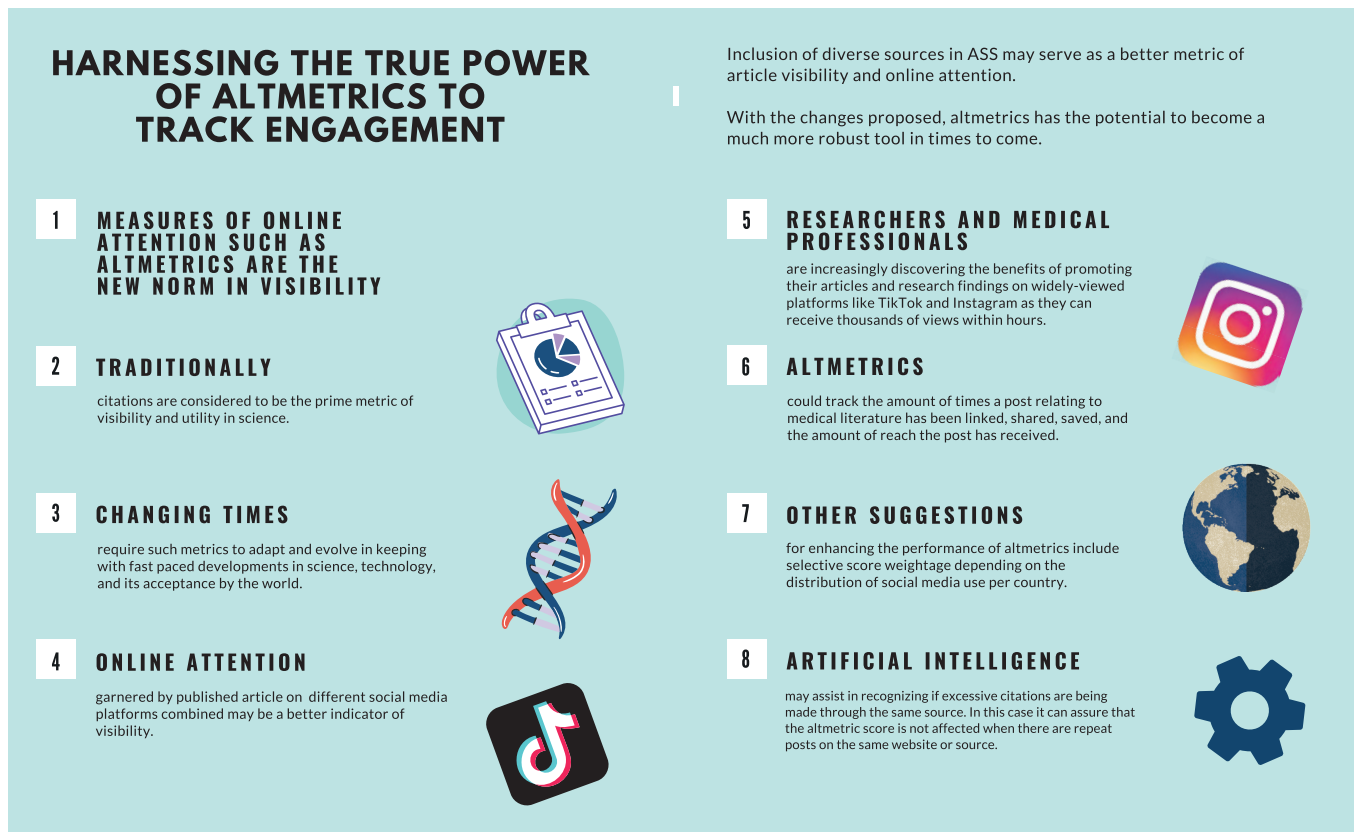
HARNESSING THE TRUE POWER OF ALTMETRICS TO TRACK ENGAGEMENT

Inclusion of diverse sources in ASS may serve as a better metric of article visibility and online attention.

With the changes proposed, altmetrics has the potential to become a much more robust tool in times to come.

1 **MEASURES OF ONLINE ATTENTION SUCH AS ALTMETRICS ARE THE NEW NORM IN VISIBILITY**

2 **TRADITIONALLY**
citations are considered to be the prime metric of visibility and utility in science.

3 **CHANGING TIMES**
require such metrics to adapt and evolve in keeping with fast paced developments in science, technology, and its acceptance by the world.

4 **ONLINE ATTENTION**
garnered by published article on different social media platforms combined may be a better indicator of visibility.

5 **RESEARCHERS AND MEDICAL PROFESSIONALS**
are increasingly discovering the benefits of promoting their articles and research findings on widely-viewed platforms like TikTok and Instagram as they can receive thousands of views within hours.

6 **ALTMETRICS**
could track the amount of times a post relating to medical literature has been linked, shared, saved, and the amount of reach the post has received.

7 **OTHER SUGGESTIONS**
for enhancing the performance of altmetrics include selective score weightage depending on the distribution of social media use per country.

8 **ARTIFICIAL INTELLIGENCE**
may assist in recognizing if excessive citations are being made through the same source. In this case it can assure that the altmetric score is not affected when there are repeat posts on the same website or source.

Fig. 2. Infographic summary on harnessing altmetrics.

It is also well known that news travels fast on social media. Social media trends may become popular even before local and national news outlets present on such stories. People had already begun talking about an unknown respiratory disease on social media even before the world came to know of COVID-19. Researchers can share their newly published work, societies release their guidelines and recommendations on Twitter before it reaches email subscriptions or even hardcopy printouts by post. Hence, keeping an eye on what is trending can give us a good idea of what is happening around the globe. Altmetrics may benefit from tracking trends and suggesting what relevant literature people should read on so they remain informed. Allocating special subgroup scores, on information which is new, credible, and deserves higher priority for readers may go a long way in tackling misinformation, and easing out a global discussing on health.[5] Real time discussion data and feedback can be evaluated as well. It should be noted that, public engagement or trends can be controversial in terms of determining scientific value or deciding changes in practice or policy.[26]

Deep learning technology or artificial intelligence can help in this detail by improving the way we look at altmetrics. The usual altmetric scores show the amount of attention and influence, but context can be helpful for the discerning researcher. The Brooklyn project called Scite (https://scite.ai) uses AI to display the context of the citation and if there is contrasting or supporting evidence. It's metrics badge can likewise show editorial notices.[27,28] This feature could be more crucial now in light of certain literature that trend or go viral, and then are eventually retracted. Another interesting resource is Connected Papers which visually presents as nodes, relevant papers according to similarity in subject matter

or references. This means that papers which may not directly cite each other can be easily found.[28,29] It is not unreported that repeat posting and artificial means have been employed just to increase altmetric scores by people and this is something that altmetics must be aware about.[30] Artificial intelligence may assist in recognizing if excessive citations are being made thought the same source. In this case it can assure that the altmetric score is not affected when there are repeat posts on the same website or source.

In summary, social media sites are continuously evolving with new platforms emerging every few years. Researchers and medical professionals are increasingly discovering the benefits of promoting their articles and research findings on widely-viewed platforms like TikTok and Instagram as they can receive thousands of views within hours. While promoting is indeed important, communicating it in an easily understandable manner to the general public is also another challenge. Altmetrics has been a powerful tool to gauge user interaction and reach of published medical literature and mentions of the literature on social media, however, it needs to be flexible enough to evolve with the times. Furthermore, creating two separate metric scores for attention and citability can help appease the needs for researchers and publishers. Altmetrics scores must also account for geographic differences in social media platform popularity by means of selective weightage-by-country so the score given is a better indicator of social media attention. These amendments, if employed, could potentially enhance the breadth and scope of altmetrics in the current generation of social media and provide a better indicator of how well an article is being received by people worldwide.

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