

The Leading Edge: Developing a Multichannel Approach Measuring Reach in Medical Publication

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Abstract

Objective: To develop a multichannel process to quantify and predict the reach of a scientific publication. This approach provides a holistic measure of an article's reach by drawing upon page views, download statistics, and social media mentions in real time, rather than relying on the lagging indicators of impact factor and citation frequency.

Research Design and Methods: An analysis of publisher studies, third-party analyses, scientific databases, and article download reports. The present analysis also includes a comparison of article downloads and social media reports from publishers (n=12).

Results: The current analysis revealed the gaps in practices for measuring the reach of scientific publications in real time. Available data suggest readers spend, on average, <30 minutes on publisher websites viewing articles, choosing instead to download articles for later use and this figure has declined each year of the last decade. As such, download reports are increasingly useful tools for quantifying a publication's reach. The articles most downloaded are frequently supported by a series of social media tactics to increase awareness of new publications.

Conclusions: The use of impact factors and citation frequency are routine, even as new metrics that provide a comprehensive measure of the reach of a publication have emerged in recent years. These lagging indicators may distort the importance of a medical publication. Simultaneous utilization of leading and lagging indicators appears to be the most accurate measure of a publication's impact.

Background

A wide variety of metrics are available to be utilized by the medical publications community to quantify the relative impact of peer-reviewed publications. However, increasing evidence suggests that the traditional metrics which are currently used for quantifying a publication's impact and relative citation frequency may be ill suited to a dynamic healthcare environment dominated by social media¹

Journal impact factors are a popular and traditional measure for assessing citations of medical publications and are frequently used as a metric for a journal's prestige, legitimacy, content, and overall reach.¹ While the formula used to determine a journal impact factor has been well published and critiqued, the metric is increasingly viewed as a flawed arbiter of journal quality and scientific value (**Table 1**)

The impact factor, as an individual measure, is focused purely on the details of the citation and does not take into account the article download history. Furthermore, citation frequency (which builds the impact factor) and citation downloads have different profiles when viewed over time: most downloads reach their peak in the immediate few months following publication, while citations build over a longer period of 2-3 years²

In addition, the manner in which readers interact with publications continues to evolve. Professionals are reading more articles per year than previously, but spending less time on each article (<30 minutes per article, down from ~45 minutes in 1990s).² A recent unpublished survey by the authors also identified that healthcare professionals spend less than 45 minutes per month scanning medical literature. Rather, most readers were directed to particular articles based on the results of internet-based searches

With recent advances in technology, various new media, social media, and crowdsourcing measures are now also becoming increasingly popular in biomedical publishing as a measure of impact and reach, as authors and publishers seek to increase the reach of their publications in real time³

Despite the recent increase in the adoption of social media in biomedical publishing, the net volume of articles across social media channels remains generally low, with only 21% of all new publications being announced through Twitter with social media networks, such as Facebook and LinkedIn, having limited to no uptake amongst the clinical or patient community – highlighting the challenge of utilizing social media as a tool to measure clinical impact of any publication.⁴ This may be partially due to the fact that social media utility and citation measurement are not linked or even sufficiently correlated to provide meaningful metrics of use and reach⁴

The relatively low utility of social media and the limitations in the impact factor system highlight the need for alternative methods to evaluate the real time impact and reach of a medical publication in real time

In light of limitations in both traditional and social media publication metrics, article downloads have emerged as a potential adjunctive measure of an article's reach in real time. Article downloads do not – however – correlate to full reading, however the increase of downloading aligns with the industry-wide trend of readers downloading articles for later analysis in lieu of online reading^{2,5}

A multi-channel approach that combines multiple metrics may represent the most appropriate and complete picture of a publication's impact over time (**Figure 1**)

Social media uptake is highest and most effective before and directly after an article's publication⁶

Article downloads are positively correlated with social media usage and increase after articles become available on a publisher's website

Journal citations are a lagging indicator that quantifies reach in the years after initial publication⁷

A 2012 study on interactive journals identified that only 9% of those surveyed with an impact factor >4.0 maintained a blog or social media dissemination platform, demonstrating the lack of social media being used in medical publications and variability between therapeutic areas⁸ (**Table 2**)

Table 1. Potential Flaws with Journal Impact Factors

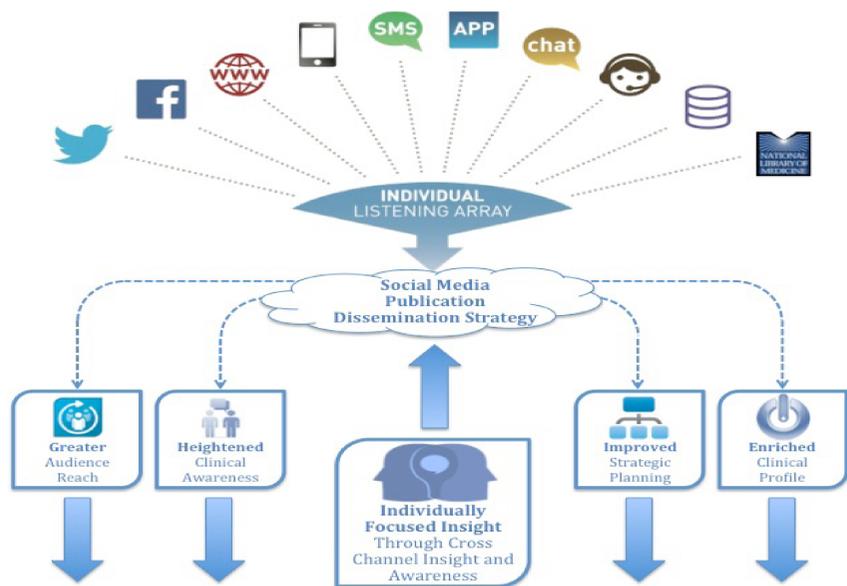
Uncertainty over citable versus non-citable publications	Impacted by non-scientific factors, including country of publication, discipline, and publication language
Lagging indicator failing to capture citations in rapidly advancing sciences	Measure only use by published authors, thereby disregarding utility to clinicians, students, and the general public
Potential for artificial inflation	Focused solely on journal without regard for individual article

Purpose

The Medicine Group sought to combine practices employed by medical communication agencies, public relations firms, medical journals and societies, and pharmaceutical and biotechnology companies in order to develop a novel, multilayered approach to measuring the clinical impact of medical publications through a multi-channelled, social media-driven strategy

The Medicine Group sought to determine the most accurate metrics for measuring the uptake and impact of new publications

Figure 2. A Multi-Channel, Qualitative Approach To Measuring Publication Impact Throughout The Overall Lifecycle Of The Article



Strategic Approach

The Medicine Group has created a multilayered strategic approach for the development of an analytical plan, based on social media measures, to assist in evaluating the clinical impact of specific publication plan activities (**Figure 1**)

The analytical plan utilized a social media blitz surrounding specific publications across a variety of channels, starting with Twitter and followed by posts on Facebook, LinkedIn, and smaller social media sites tailored specifically to patients or physicians

The social media posts link to the publication hosted on the journal's Web site and to supplementary Web pages that complement the activity, including video interviews, blogs, and other salient publications

Author interviews on YouTube, Vimeo, or posted on the journal's Web site allow researchers to discuss the rationale, methods, and findings of their research quickly and in context

All social media outlets are interlinked, a feature available on most services that allows a Facebook post to appear simultaneously on Twitter and LinkedIn. This interlinking enables maximal exposure of single publication activities

Blog posts offer another venue for publication engagement and allow results to be summarized quickly and in accessible language

Data suggest an increase in the number of Twitter mentions even before an article is released; this should be exploited to raise awareness of upcoming publications and requires detailed information on when the article will first appear online⁶

Table 2. The Use of Blogs, Commenting, and Sharing Features Among General Internal Medicine and Internal Medicine Subspecialty Journals

Specialty	Number of Journals with Impact Factor ≥ 4.0	Blogs (%)	Commenting Feature (%)	Sharing Feature (%)
Internal Medicine	30	43.3	30.0	96.7
Hematology/Oncology	47	2.0	4.2	91.4
Cardiology	28	3.5	21.4	96.4
Gastroenterology	14	14.2	0.0	85.7
Nephrology	7	14.0	0.0	100.0
Rheumatology/ Immunology/Allergy	26	3.8	7.6	96.0
Endocrinology	20	0.0	0.0	100.0
Pulmonary/Critical Care	9	0.0	11.0	100.0

Adapted from Nair V, Khan S, Jhaveri KD. Interactive journals and the future of medical publications. *Am J Med.* 2012;125(10):1038-1042.

Outcomes

Traditional measures of publication dissemination, including numbers of citations or impact factors of journals in which articles are published, do not report on the social media impact of articles

Novel measurements such as altmetrics and social media tracking software are increasingly useful in quantifying the impact of social media activity on publication visibility

However, these metrics may be flawed; the relationship between traditional and new measures has been difficult to elucidate, and there is no clear relationship between traditional metrics (citation counts) and social media measures

The Medicine Group uses twin-linked metrics to determine the success of a social media strategy surrounding a specific article

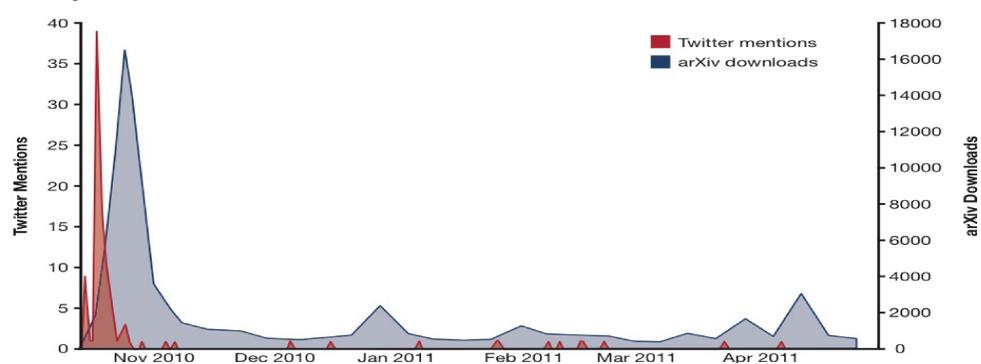
The first measure is the number of HTML page views, a measure of how many people follow the original link to the journal's Web site as directed from Twitter, Facebook, or LinkedIn

The second is a measure of article downloads, which is a count of how many people downloaded the article from the journal's Web site

Metrics on social media sites or social media trackers are useful, including numbers of re-tweets, likes, or shares on media sites and hashtag measures provided by social media trackers

Re-tweets and comments are considered the most robust forms of content engagement on social media sites and reflect the likelihood of reading a post rather than just glancing at it

Figure 2. Response Dynamics Graph Showing Twitter Mention Spikes and Article Downloads Shortly After Submission and Publication



Key Points

Putting new health information before industry stakeholders is not sufficient; they need to communicate and engage with the content via specific actions on social media sites such as "liking" and "sharing" on Facebook, re-tweeting the activity on Twitter, or posting on personal blog sites. Social media activity, download statistics, and citation rates are independently unable to elucidate the full reach of a modern medical publication

Twitter is an especially useful tool immediately after a publication is released. A response dynamics study (**Figure 2**) demonstrates that the number of Twitter mentions surges immediately after submission and publication, then drops precipitously after 4-6 weeks – highlighting the potential (but also limited) role of social media in determining the overall clinical impact of any given publication

Data suggest a "strong tie between social media interest, article downloads, and even early citations," though the results are preliminary and drawn from an array of scientific disciplines beyond clinical medicine

This information dovetails with a 2011 study that elucidates the correlation between the number of tweets an article receives in its first days of circulation with the number of times that article is cited

Conclusions

A multi-channelled approach that combines a variety of metrics provides the greatest insight into the degree to which a publication is received, read, understood in its appropriate context, and cited in peer-reviewed publications

Social media listening platforms, publisher download reports, and databases of citation metrics are available options that can be used to inform stakeholders to increase the reach of individual publication

Different metrics are appropriate based on timing, with social media uptake considered critical before a publication is released, followed by real-time download information, and yearly citation reports

Effective social media strategies represent an effective and quantifiable means of disseminating medical information to a wider audience

Research suggests a multilayered approach is the most effective method of increasing the profile of a new publication

Successful social media strategies in medical publications employ a constellation of platforms including Twitter, LinkedIn, Facebook, and blogging sites in order to reach the largest possible audience and improve the overall clinical impact

Controls to quantify the effectiveness and clinical impact of social media on medical publications are still evolving and represent an area for further research and investigation

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