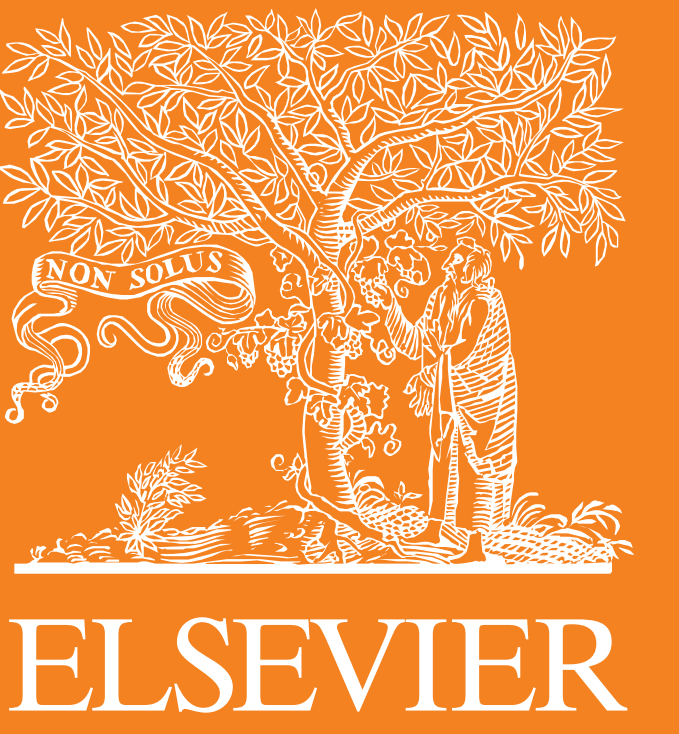


# Research Assessment Metrics: Past, Present and Future

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## Introduction

While scientific journals were part of the academic community more than 350 years ago, the concept of research metrics is relatively recent. Beginning with Garfield's development of the Impact Factor in the mid-1960s, research assessment metrics have exploded over the decades, beyond journal citation-based metrics to include entities such as authors and articles.

These metrics have similarly been shaped by new technologies and platforms. In 2010, the term "altmetrics" was coined to acknowledge the increasing importance of other measures of impact, for example, how many times an article has been shared, or mentioned on social media.

In this timeline we chronicle key events in the evolution of research assessment metrics. Finally, we look to the future – with institutions and researchers increasingly asked to demonstrate the societal impact of their research, what new tools and metrics might we see in the coming years?

## Looking to the Future

As research assessment moves beyond traditional citation metrics, researchers and institutions are examining new types, and measurements, of impact. Notably, calls for ways to quantify research's impact on society, including clinical and policy impact, are growing increasingly louder. However, debate remains about the best tools and metrics to reliably measure research's contribution to society.

**Clinical Impact**  
Clinical and translational science is cited 3 to 5 times less than basic science, because clinical research relies on basic science but not vice-versa.<sup>2</sup> At the same time, different areas of medical research have different citation practices: low-impact research areas tend to focus on clinical intervention research, while high-impact research areas are often more oriented on basic and diagnostic research.<sup>3</sup>

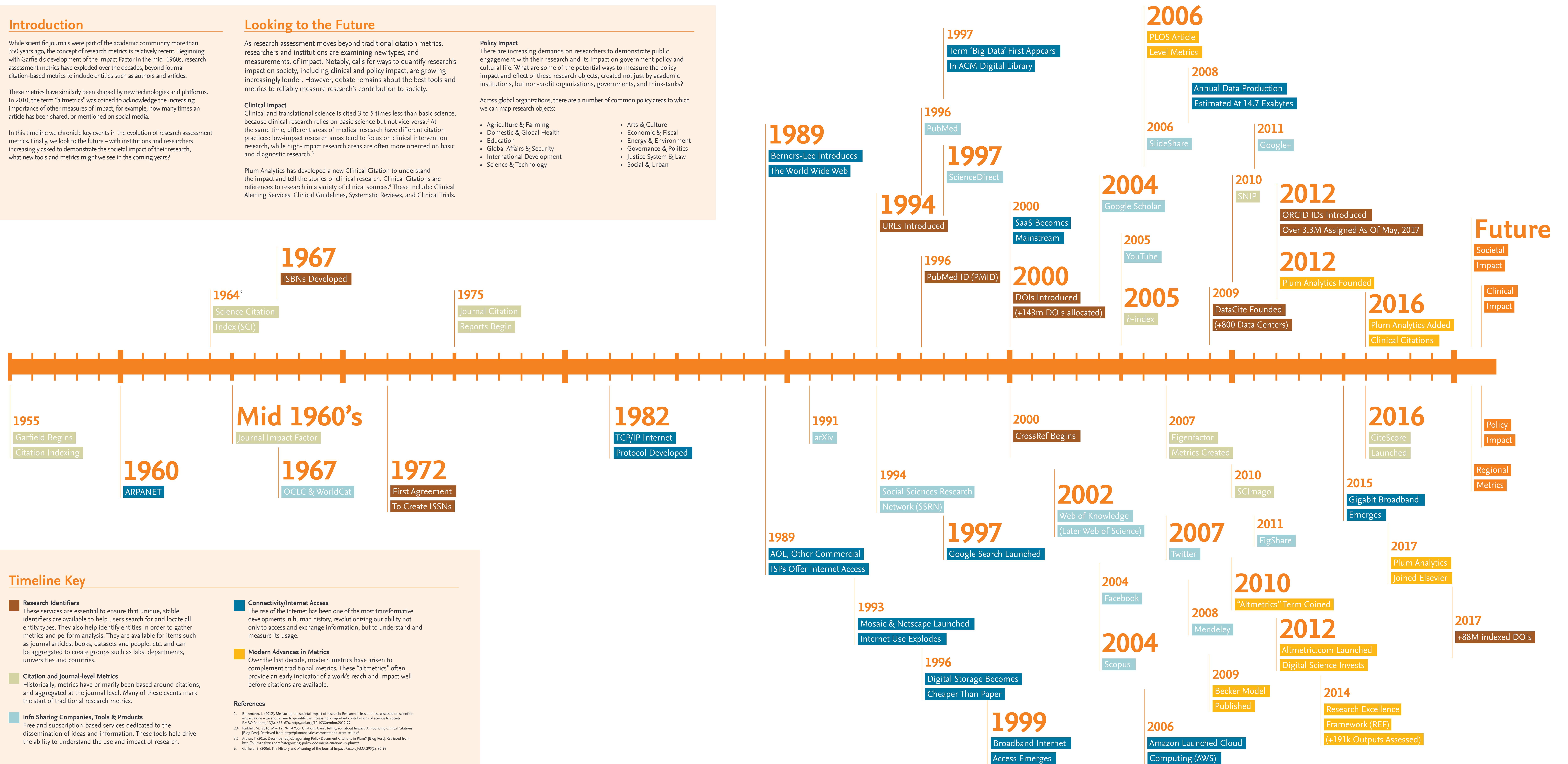
Plum Analytics has developed a new Clinical Citation to understand the impact and tell the stories of clinical research. Clinical Citations are references to research in a variety of clinical sources.<sup>4</sup> These include: Clinical Alerting Services, Clinical Guidelines, Systematic Reviews, and Clinical Trials.

### Policy Impact

There are increasing demands on researchers to demonstrate public engagement with their research and its impact on government policy and cultural life. What are some of the potential ways to measure the policy impact and effect of these research objects, created not just by academic institutions, but non-profit organizations, governments, and think-tanks?

Across global organizations, there are a number of common policy areas to which we can map research objects:

- Agriculture & Farming
- Domestic & Global Health
- Education
- Global Affairs & Security
- International Development
- Science & Technology
- Arts & Culture
- Economic & Fiscal
- Energy & Environment
- Governance & Politics
- Justice System & Law
- Social & Urban



## Timeline Key

- Research Identifiers**  
These services are essential to ensure that unique, stable identifiers are available to help users search for and locate all entity types. They also help identify entities in order to gather metrics and perform analysis. They are available for items such as journal articles, books, datasets and people, etc. and can be aggregated to create groups such as labs, departments, universities and countries.
- Citation and Journal-level Metrics**  
Historically, metrics have primarily been based around citations, and aggregated at the journal level. Many of these events mark the start of traditional research metrics.
- Info Sharing Companies, Tools & Products**  
Free and subscription-based services dedicated to the dissemination of ideas and information. These tools help drive the ability to understand the use and impact of research.

- Connectivity/Internet Access**  
The rise of the Internet has been one of the most transformative developments in human history, revolutionizing our ability not only to access and exchange information, but to understand and measure its usage.
- Modern Advances in Metrics**  
Over the last decade, modern metrics have arisen to complement traditional metrics. These "altmetrics" often provide an early indicator of a work's reach and impact well before citations are available.

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