

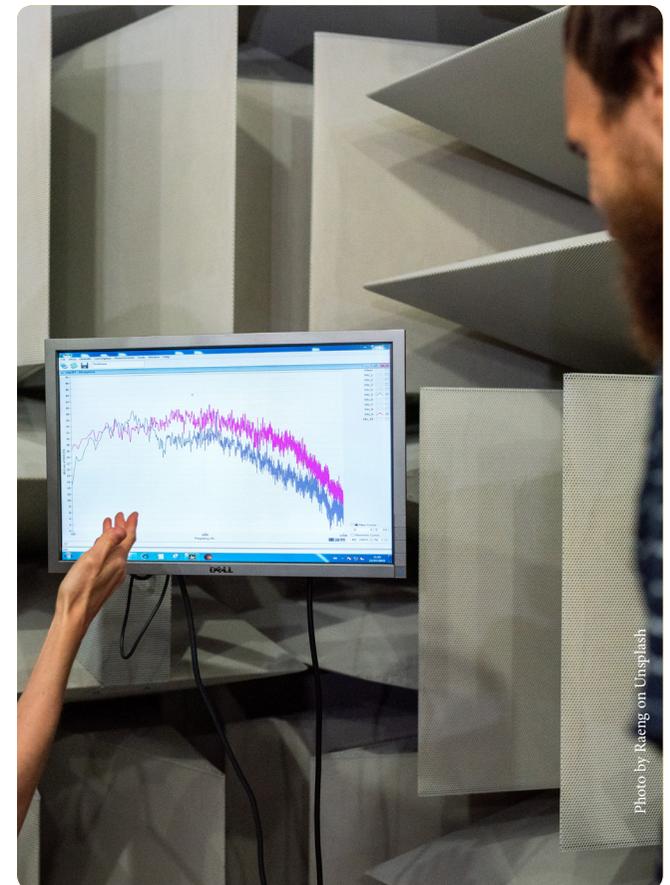


## WHY DO MEASURES FLUCTUATE?

METRICS REPORT - GUIDELINES FOR TALKING TO MANAGEMENT

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# WHO IS THIS REPORT FOR?



This report is for those based in libraries who are trying to address challenges of metrics in relation to research with senior management. It assumes a familiarity with metrics and their fluctuations, and its aim is to facilitate discussions with management. If you are unfamiliar with the fluctuations of metrics or the problems reliance on them can cause, we recommend starting with these resources:

- [Scholarly Metrics Recommendations For Research Libraries: Deciphering the Trees in the Forest.](#)
- [The Leiden Manifesto Under Review: What Libraries Can Learn From It. Digital Library Perspectives.](#)
- [Bibliomagician blog. Comment & practical guidance from the LIS-Bibliometrics community.](#)

## The background

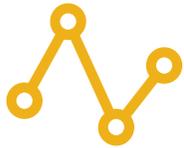
Research-related metrics fluctuate. Bigger is not always better and numbers don't reveal the whole picture. A policy change which values research culture over metrics can, for example, lead to a (temporary) decrease in research indicators. This concept is clear to those working with research outputs. For those working at a higher strategic level, however, the patterns and trends driving research metrics may not be fully understood.

This report, from LIBER's Innovative Metrics Working Group, highlights common pitfalls when discussing metrics as well as new approaches — DORA, the Leiden Manifesto, the Metric Tide — being adopted by certain institutions. With this foundation in place, guidelines for engaging with and increasing understanding among management when discussing responsible research indicators are presented, along with additional resources.

Building on the experiences of the working group and institutions in addressing the question of responsible metrics with management, the recommendations in this report are intended to help librarians explain to management why measures fluctuate — a topic which workshop attendees at LIBER conferences highlighted as important to address.



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## THE BASICS OF METRICS

Numbers are essential to everyday life. They provide insightful feedback (e.g., a budget shows profit/loss; ticket sales indicate how many seats are available) and essential points of comparison — as opposed to substantive feedback which (although it can inform, educate, and help improve) is not useful when it comes to rankings. Imagine a student and an end-of-term paper. The examiner's comments will enhance the future work of the student, help shape their thinking and show areas for improvement. It is, however, the mark that will tell the student whether they have successfully passed the assignment.

Numbers tell their best story though, when they are placed in context. Only then can we truly know if a 20 is truly better than a ten, or if a graph line trending upwards is really something to celebrate. When it comes to research metrics, three points are crucial when evaluating the importance of the number.

**1. Metrics Fluctuate Often & For Many Reasons** - The yearly Journal Impact Factor ([JIF](#)) ranking is one high-profile example of how metrics regularly fluctuate. In this case, the relatively small number of papers contributing to the Impact Factor introduces a large random component in the variation. As there are many more journals with a low Impact Factor than journals with a high one, rankings for the low impact ones are less stable than for the high impact ones. For high-impact journals, noise and fluctuations have only a small influence on the impact, and do not lead to any change in ranking. However, journals are often compared for a fixed year, without taking into account the higher variation for small journals. Some Libguides explain this (e.g. [University of Oulu](#)) but there is, as yet, no sector-wide understanding. The Field-Weighted Citation Impact (FWCI) is another example, used by many universities as an institutional KPI. In their Research Metrics Guidebook (p.47), Elsevier recommend, “this metric should be used with care” because the FWCI can fluctuate **when used for smaller datasets** or when it includes a large proportion of recently published outputs.

**2. Targets Can Have Unintended Consequences** - When targets are set, people aim to meet or exceed them. This is, at one level, fundamentally obvious. Less obvious are the unintended (and potentially negative) consequences of certain targets. Take, for example, a target such as “Increased reach of research” which specifies an increase in citations as the associated metric. This could lead those being measured to focus solely on increasing citations — rather than considering where best to publish their findings. They may, for example, choose to publish in a format where the ability to capture citations is more advanced (e.g., articles), than the most appropriate format or publishing in a more highly-cited language (predominantly English), whether or not those who could use the research can read that language. Much work has been done over recent years that has seen the rise of multi-authored papers ([Kuld, O'Hagan 2018](#)), self-citations (for example in [Italy](#)), citation inflation (total number of citations is growing annually by **5.6%**) and the encouraging of citations from reviewers of their work.

**3. Citation Frequency Doesn't Correlate to Quality** - A poor piece of research which makes alternate claims to accepted norms will often be frequently cited. Many researchers will, for example, be familiar with phrases such as “the counter to this was provided in {citation} but has been shown to be inapplicable in this situation through e.g. {3 citations}”.<sup>1</sup>



## INITIATIVES FOR CHANGE



When seeking to reform metrics, institutions do not have to re-invent the wheel. Many initiatives have already outlined principles and frameworks which can be followed.

### Leiden Manifesto

The Leiden [Manifesto for Research Metrics](#) was first published as a [comment in the scientific journal Nature](#) in 2015. Five experts led by Diana Hicks, a professor in the School of Public Policy at the Georgia Institute of Technology, and Paul Wouters, the director of the [Centre for Science and Technology Studies](#) (CWTS) at Leiden University gathered the collective thought and proposed 10 principles for the measurement of research performance:

- 1) Quantitative evaluation should support qualitative, expert assessment.
- 2) Measure performance against the research missions of the institution, group or researcher.
- 3) Protect excellence in locally relevant research.
- 4) Keep data collection and analytical processes open, transparent and simple.
- 5) Allow those evaluated to verify data and analysis.
- 6) Account for variation by field in publication and citation practices.
- 7) Base assessment of individual researchers on a qualitative judgement of their portfolio.
- 8) Avoid misplaced concreteness and false precision.
- 9) Recognise the systemic effects of assessment and indicators.
- 10) Scrutinise indicators regularly and update them.

These principles, expanded on the manifesto's website, are clear, understandable and endorsed by many researchers. Each of the ten is a principle that management can understand and endorse. The manifesto gives explanations for each. Additionally, and especially from number six and onwards, the principles introduce the idea that these measures will fluctuate.

### Declaration on Research Assessment (DORA)

[DORA](#) was developed in 2012 during the Annual Meeting of the American Society for Cell Biology in San Francisco and has since become a worldwide initiative covering all disciplines. The declaration includes key principles for funders, publishers, professional societies, institutions and researchers. DORA also holds the possibility to "Sign" it – turning it into a possible public declaration that confirms a stakeholder is committed to the principles contained within it.

DORA is more limited than the other approaches in that it is focussed on metrics concerned with place of publication not being a proxy for a research output (e.g., an article in a journal). On the other hand, it is a global initiative with a public list of those working towards achieving these principles and thus has substantial momentum.

### Metric Tide

"[The Metric Tide](#): Report of the Independent Review of the Role of Metrics in Research Assessment and Management" was published in July 2015. It shares the findings and recommendations of the Independent Review of the Role of Metrics in Research Assessment and Management - a multidisciplinary group of experts in scientometrics, research funding, research policy, publishing, university management and administration – who address the history, applicability and future role for research metrics.

For institutions that do not see an appropriate solution in the above initiatives, a bespoke statement can be an option. At Loughborough University, for example, the [responsible metrics policy](#) has taken the principles of the Leiden Manifesto and expanded on them in a local context.



## GUIDELINES



The following guidelines can help shape conversations with management. Although not exhaustive in nature, they should provide a solid starting point.

### Engage Proactively

Prevention is always better than the cure. The foundation of a good relationship with senior leaders lies in setting expectations, selecting appropriate metrics and establishing yourself as an expert.

- **Knowing in advance:** It will be easier to approach fluctuation if those looking at the metrics are aware that they will fluctuate, since seeing downturns and upswings is then expected. By contrast, if metrics suddenly decrease without warning or prior discussion, subsequent conversations are likely to be more difficult and perceived as defensive.
- **Measure what matters<sup>2</sup>:** This reflects the previously discussed problems with targets. It is tempting to replace targets with things that can be easily measured. Focussing on what is important to an individual, group or institution may mean that more work is required to evidence that these things are being achieved, but the key aim will be more aligned with the priorities of that person or group.

• **Good practice is sustainable:** Avoid practices which lead to short-term increases in metrics to the detriment of research in the long term. Encouraging group citation is one example. High research integrity, open sharing of research, publishing in the most appropriate place, the correct format and language, and consistent and accurate use of persistent identifiers will, in the long term, lay the most sustainable groundwork for the research's use.

• **Get yourself a seat at the table:** Institutions conducting research are often large and complex, with many departments and experts. Don't assume that senior management know that a particular service or expert exists. Offer your expertise and proactively indicate what support and understanding you have of research quality indicators, disseminations and academic impact management, so that leaders come to you for information and advice when questions arise.

### Areas of application

In explaining to management why metrics fluctuate, it is important to understand Institutional management and the roles of people being addressed. Approaching a faculty dean responsible for academic target setting at schools will be a very different conversation to approaching Human Resources for changes in a hiring procedure. Consider the potentially applicable areas below:

	TARGET SETTING	EVALUATION	PROMOTION	HIRING	TRAINING
Individuals	•	•	•	•	•
School/Department	•	•	•	•	
Faculty	•	•			
Institution	•	•	•	•	
Promotion panels			•		•
Hiring panels			•	•	•
Research Evaluation committees		•			•
Research directors	•	•	•		•

To determine whether these guidelines would be applicable to a given discussion, it is key to understand the needs of the management group or individual with whom you will meet.



## Education

Discussing with management is key to understanding why metrics fluctuate — knowing that they do is the first part, but education on research metrics helps add depth and context to a discussion. Much work has already been done on this and the **SCOPE** process has been developed to inform and target these discussions. When managers know in advance that metrics will fluctuate over a normal research cycle, it is less concerning when it happens — especially if there is also an understanding of why it is happening, whether that is due to the format, language, location or discipline of a research output.

The more researchers, managers and professional services that are aware of the challenges of research metrics, the more conversations they will be included in and the more frequently the discussion will come up. The key to this is training — taking the skills that exist in the library environment and sharing them more widely in the areas where metrics are used for research evaluation, including research and innovation services, academic committees and human resources departments. The training can be part of existing training — for example, a session as part of standard recruitment training, or of equality and diversity training — but could also be included in library-based training on topics such as academic profiles, choosing where to publish or in literature searching.

### Be positive – what management can do

To say “these measures will fluctuate” is a simple message, but it offers no room for management action in influencing the situation. Fortunately, there are many positive actions which management can take to increase the reach of research, including:

- **Data quality:**

*Disambiguation* - ensuring that all research outputs from an institution are included in reports accurately, through addressing variants of institutional name. When entering affiliation in research outputs, researcher may use a research centre, departmental or unofficial variant of an institutional name — this is particularly the

case in co-authored publications where a non-corresponding author may have no input into the affiliation entered. Disambiguating these records in research data bases improves the accuracy of reporting.

*ORCID* - *ORCID* achieves much the same as disambiguation, but for authors. It provides a persistent digital identifier that distinguishes individual researchers. It ensures that researchers get recognition for all their contributions reducing the risk of errors and improving reporting accuracy.

*Being aware that different databases capture different information, for example Scopus, Web of Science and Google Scholar are all capturing different data, so consistent use and comparison is vital.*

- **Single/archive copies**, not multiple platforms (single source of truth).
- **Make the output Open Access** (pre-print, green, gold, ...) as soon as possible.
- **Encourage inclusion of Open Data** reporting and references in the article.
- **Have a contact within the library** for specific advice or queries on the use of metrics.

Compare apples with apples, but if you want fruit salad, don't only water the apple trees. In other words, ensure that when comparing metrics that like-to-like comparisons are used, but to encourage a range of research practices, use a range of measures.



## SOME FINAL INSIGHTS: WHAT CONVINCED AN EXPERT?

Library Director at the University Library of Southern Denmark, Dr Bertil F. Dorch serves on LIBER's Executive Board and as head of the Steering Committee for Digital Skills and Services. With a background in computational astrophysics, he currently teaches responsible conduct of research — one of his main research interests. Here are a few of his wise words on the subject:

- **The focus of training is very much on research integrity**, and responsible metrics is a practice that demonstrates integrity in research. It is for the library to be a trustworthy partner in research and libraries cannot not be responsible without warning people of the issues and consequences of using particular measures.
- **HR, regulation and communications departments** may know that something is “on the edge” but their expertise is focussed on how/whether you can do it rather than the integrity and consequences of doing so.
- **Management can often say “Do this” so we do.** The Library has a choice — they can use this as justification “We know it isn't best but VC says to do it, so we do it” or the ethical choice would be for the library to inform of the biases and consequences, including negative consequences of a policy.
- **Universities are politically governed systems** - If we could say irresponsible use of metrics was illegal, it would be straightforward, but you can't put your foot down completely over ethics decisions without being left out of future relevant discussions. Libraries can be informative and guiding, and have an obligation to inform, positioning them to align integrity and ideology in strategic decisions.



## Resources

[Leiden Manifesto](#) points 6-10 give relevant examples of fluctuation which are accessible.

[Metrics toolkit](#) gives the limitations of [different types](#) of metrics.

Good examples such as “[Metrics: journal's impact factor skewed by a single paper](#)” and Stephen Curry's “[I am not my H-index](#)”

[Scholarly Metrics Recommendations For Research Libraries: Deciphering the Trees in the Forest](#)

Coombs, S. K., & Peters, I. (2017). [The Leiden Manifesto Under Review: What Libraries Can Learn From It. Digital Library Perspectives.](#)

[Introducing SCOPE – a process for evaluating responsibly](#)

[Bibliomagician blog.](#) Comment & practical guidance from the LIS-Bibliometrics community.

Hardy Schwamm, Sarah Slowe: Responsible Metrics - Why Management Matters. [Presentation given at Liber 2019 workshop](#)

Sarah Slowe: Responsible Metrics - Why Management Matters. [Presentation given at ILIDE 2019](#)

Charlotte Wien: New public management and the house of human knowledge. [Presentation given at ILIDE 2019](#)

[Liber Webinar:](#) Sarah Slowe and Isabelle Peters Innovating the ways metrics are applied, responsible metrics and measuring openness.

University of Oulu Libguide: Why Journal Impact Factor fluctuates - Evaluation based on scientific publishing: [Journal Impact Factor](#)

[Five arguments to persuade HE Leaders to evaluate research responsibly](#)



This report has been authored by Sarah Slowe and Hardy Schwamm of LIBER's Innovative Metrics Working Group. The authors would like to acknowledge the support of Charlotte Wien, Working Group Chair, and her contribution in reviewing the document.

Slowe, S., Schwamm, H. 2020, *June*. LIBER.

[Why do measures fluctuate? Guidelines for talking to management.](#)