

UK Progress towards the use of metrics responsibly

Three years on from The Metric Tide report

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Of interest to	Bibliometric specialists, research managers, senior leaders, researchers, research funders, data and metric providers, publishers, policy makers.
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Executive summary

Over the last five years the use, and abuse, of metrics in research assessment has been in sharp focus, with three major frameworks – the San Francisco Declaration on Research Assessment (DORA)¹, the Leiden Manifesto² and The Metric Tide³ – all calling for a step change in the culture of metrics use.

The UK Forum for Responsible Research Metrics (FFRRM) was established in September 2016, and provides advocacy for the UK higher education sector on the use of research metrics responsibly. This report outlines the work of the FFRRM to date, Professor James Wilsdon reflects on progress made in the UK since the independent review of metrics titled The Metric Tide which he chaired in 2015, and the newly appointed Chair of the FFRRM, Professor Max Lu (Vice-Chancellor at the University of Surrey) provides a forward look, outlining the FFRRM's priorities and next steps.

The FFRRM's work to date has focused on advising the Research Excellence Framework (REF) 2021 panels on the use of metrics in the research assessment exercise in the UK; developing a set of principles on the governance, purchasing and operation of research infrastructure; and facilitating discussion regarding the culture and the use of research metrics in UK institutions.

The key aim of this report is to reflect the recent discussion, and results from a survey conducted by the FFRRM, about the existing culture of the use of research metrics. The FFRRM hosted a successful event in February 2018 titled 'The turning tide: a new culture of research metrics'. Over 140 attendees joined, from a variety of stakeholder groups. From the event, it is clear that the UK HE sector wishes to change the existing culture, but that implementing change is multifaceted, and challenging. The three panel sessions brought together stakeholders to discuss the existing frameworks implementation and impact on the culture of research metrics, the researcher's perspective, and the wider implications of the use of metrics.

The discussion at the event shows that although the UK is engaged, more work needs to be done to share practice and instigate change – it was agreed that this is not a straightforward task. Professor James Wilsdon, who chaired The Metric Tide review, reflects that we are making steps in the right direction, but more effort is needed to embed principles in

¹ <https://sfdora.org/>

² <http://www.leidenmanifesto.org/>

³ <https://re.ukri.org/news-events-publications/publications/metric-tide/>

institutions, to develop better indicators and to foster more sensitive management frameworks.

Professor Max Lu, the newly appointed chair of the FFRRM sets priorities for the group and outlines next steps. He highlights that the FFRRM have a leadership and advocacy role to guide the sector on the use of metrics responsibly. There is a need for better understanding of what works and why. The FFRRM will define communities of practice, and engage with international networks to steer the policy development for the sector.

The FFRRM are delighted to launch this report at the Euroscience Open Forum 2018 (ESOF) event today, with two members talking about how we can use metrics to support open research. This marks the beginning of the FFRRM's international discussions.

Introduction

The UK Forum for Responsible Research Metrics

In July 2015 (almost three years ago to the day), the independent review of the role of metrics in research assessment and management published its final report, *The Metric Tide*. The report highlighted that the metrics agenda was growing in importance in the UK and globally, with increased pressure on higher education institutions (HEIs), researchers, funders and policymakers to develop effective and appropriate strategies for using metrics in the management and assessment of research. Alongside this, the report found widespread evidence that the description, production and consumption of metrics remains contested and open to misunderstandings, with a wide mixture of positive and negative effects noted, and legitimate concerns raised over gaming of metrics and a lack of transparent, open and interoperable data infrastructure to support existing and new metrics systems.

In support of this, *The Metric Tide* recommended that the UK research community establish a UK Forum for Responsible Research Metrics, bringing together research funders, HEIs and their representative bodies, publishers, data providers and experts to take forward the recommendations in the report. The independent sector group was established in September 2016. Informed by *The Metric Tide*, they agreed to the following broad objectives (whilst remaining sensitive to the changing research environment):

- a. to support the effective leadership, governance, and management of research cultures within HEIs;
- b. to support the responsible use of metrics among the stakeholders in the UK research system beyond the HEI (funders, publishers, data providers)
- c. to improve the data infrastructure that supports research information management.

In June 2018, Professor Max Lu, Vice-Chancellor at The University of Surrey, was appointed as the new chair of the FFRRM. The FFRRM are now reflecting on the progress made by the UK sector, their work to date, and are setting out their priorities.

This report outlines the FFRRM's work to date, including:

- the event they hosted in February 2018, and the results of a UK-wide survey on the culture of research metrics '**The turning tide: a new culture of research metrics**'
- the evidence base and process to producing advice for the Research Excellence Framework (REF2021) panels '**Research Excellence Framework (REF) 2021 FFRRM's advice**'
- developing a set of principles on the governance, purchasing and operation of research infrastructure '**Research infrastructure: developing a set of principles**'.

The continuing focus on research metrics

Research metrics, as well as teaching and knowledge exchange metrics, continue to grow in importance in the UK and globally, and the messages outlined in 2015 still resonate. There is a particular emphasis on the openness of research, and bodies such as the European Commission have published advice on the importance of researcher incentives, including the use of metrics, to the success of an open research system.

Professional bodies and interest groups within the UK are having the conversations exploring the policy and practice that underpins this complex area. The professional Association for Research Managers and Administrators in the UK (ARMA) has a special interest group on research metrics, and metrics was a focus at the recent biennial congress of the International Network of Research Management Societies. We also see the research community producing fora for these discussions. A community led initiative ‘The Bibliomagician’⁴ was created in 2016 by the Lis-Bibliometrics Forum which supports busy practitioners to keeping abreast of the latest news, topics, tips and techniques to help them analyse and use bibliometrics responsibly and effectively.

We also see developments in existing global initiatives. DORA, for example, has recently re-launched, with a new website and a community manager. They published a roadmap in June 2018⁵, which outlines that they will ‘promote tools and processes that embody best practices in research assessment’.

UK higher education institutions are interested in using research metrics responsibly. The FFRRM’s recent survey demonstrated that UK higher education institutions agree with the principles of DORA, Leiden and The Metric Tide. Some institutions have developed their own policies which go beyond what is outlined in individual frameworks (for example, Loughborough University). On a recent count (results accurate on 3 July 2018) 26 UK HEIs had signed DORA, an increase of 9 since the FFRRM’s event in February 2018. However, the survey demonstrated that little is being done in practice to move from the principles to implementation.

This report outlines progress thus far, and what the FFRRM intends to do going forward to support the UK sector (and beyond) to be able to use research metrics responsibly.

⁴ <https://thebibliomagician.wordpress.com/>

⁵ <https://sfdora.org/2018/06/28/introducing-a-roadmap-for-dora/>

'The turning tide: a new culture of research metrics'

On the 8 February 2018, the Forum for Responsible Research Metrics hosted a free, all-day event in London. The event aimed to discuss the use of research metrics with a range of stakeholders, and to identify and share good practice. Prior to the event (in winter 2017), the FFRRM surveyed UK research organisations to explore if they agreed with the principles outlined in DORA, Leiden and The Metric Tide (existing frameworks) and to understand if any action had been taken locally to address the principles of the frameworks. This report synthesises the discussion, and is not intended to reflect the viewpoint of individual participants.

Over 140 attended the event, which 'sold out' in record time reflecting the high level of interest in this area. Attendees included policy makers, Vice-Chancellors, academics, research managers, bibliometric specialists, Pro Vice-Chancellors of Research, data providers, journalists, and those with an interest in the use of metrics in research. A full agenda can be found at Annex 1. The discussion at the event was structured around five themes:

- a. Challenges and solutions: making a culture which uses metrics responsibly (panel 1)
- b. The researcher's perspective (panel 2)
- c. The wider implications on the use of research metrics (panel 3)
- d. UK Research and Innovation (opening address and Research Councils UK sign DORA)
- e. The higher education institutions perspective (survey results and closing remarks)

The discussions at the event demonstrated that although UK institutions are keen to change the existing research metric culture (removing reliance on journal metrics and using metrics in a responsible way), very few of them know how to practically implement change. Institutions expressed the need for more advocacy, and good practice shared across the sector. Themes raised throughout the discussion included: understanding and measuring what we value, the importance of transparency, developing metrics competencies through training, incentivising 'good' behaviour, challenging the prestige culture in publication practice, and ensuring sensitivity across the stages of the research career and across disciplines.

Challenges and solutions: making a culture which uses metrics responsibly (panel 1)

We specifically need leadership and advocacy from senior leaders to implement change. Stakeholders must to be clear about the role metrics have to play. This will

facilitate training, develop competencies of understanding, and incentivise the use of metrics responsibly. Effort should be made to bring stakeholders together and provide practical advice on the implementation of the existing frameworks.

Frameworks are the beginning, and not the end. Frameworks on the responsible use of research metrics are the beginning of the process. Signing up to statements such as DORA, the Leiden Manifesto, The Metric Tide, and/or developing institutional policies on the use of research metrics does not alone ensure that metrics are used responsibly. The challenge is the next step: implementing these principles.

Senior buy-in. Success will rely upon frameworks/policies having owners. Senior management buy-in is important to changing culture within an institution, but HEIs cannot act alone and all stakeholders must engage, including: researchers, research organisations, data providers, funders, and industry.

Guidance on the use of metrics. Where metrics are used as part of assessment processes, clear guidance needs to be available which outlines: how metrics will be considered by peer reviewers and/or promotion panels; which metrics will be used for what purpose; how applicants and/or researchers should present metrics (or not) when applying for new positions or funding; and how reviewers should use/interpret any metrics presented.

Publishing prestige. Academics are operating in a publishing prestige economy where publishing practice and journal choice is important. Institutions and funders need to incentivise and support academics to change the way they think about publication. This includes thinking creatively about the types of information used in academic recruitment.

Metrics have a role to play to support narrative. Information is increasing, and more understanding of what information is available across our diverse sector is needed. The data boom presents opportunities, as long as the use of data remains sensitive to disciplinary differences, interdisciplinarity, and unintended consequences. Metrics should not be ignored. Ignoring metrics has the potential to be as irresponsible as relying solely on them. They have a role to support narrative and peer review to inform decision making - but we need to get the balance right.

Metrics competencies. The competencies of those implementing and interpreting metrics needs to be tested and improved. HEIs should address the unconscious bias of assessors (regarding their interpretation of research metrics, and peer review), and provide suitable training to raise awareness. It is important to remember that not all researchers, and assessors will become bibliometric experts, however it was suggested that there would be benefit to the development of a minimum competency level for users.

Incentivise ‘good’ behaviour. Researchers should be recognised for engaging in peer-review to incentivise individuals to take the time required to consider the qualitative and quantitative elements of the assessment holistically.

Bring together stakeholders. A wide-range of stakeholders need to work together, ideally having working to a clear set of principles through an existing framework (DORA/Leiden/Metric Tide). This includes funders, league table producers and suppliers of metrics. More should be done to bring the users and creators of metrics together. The sector could develop communities of practice in addition to codes of practice.

The researcher’s perspective (panel 2)

Stakeholders should be sensitive to the potential impact metrics have on individuals. We should articulate what the research community, funders, and individuals’ value in research (and researchers) to develop an approach which is transparent and facilitates diversity. This should be sensitive to all levels of the research career.

Metrics do not reflect individuals. Metrics are influential and have the potential to impact individuals, their careers, and their mental health and wellbeing. If used as a shortcut to the assessment of research and researchers, they have the potential to be detrimental to individuals, holistic assessment remains important. Where possible metrics should be about departments, schools and institutions and remove the link to the individual.

Metrics should measure what we value. The sector needs to understand what it values in research and researchers so metrics can be focussed on measuring what matters rather than focussing on what can be measured. Research is endeavour, and we need to support ‘exploratory effort’ in the way that we measure research. Researchers need to be able to express what they value about their own work in their assessment (particularly in recruitment and promotion procedures). A ‘portfolio-based’ approach in recruitment or a ‘biosketch’ written by the individual provides the opportunity for individuals to focus on their key contributions. This approach was proposed to be more sensitive to individuals having strengths in some areas, and weaknesses in others.

Transparency and education builds trust. There needs to be a balance between qualitative and quantitative assessment. Transparency in the development and application of measures is important to build trust within the research community. Institutions should be clear with researchers on how they will use data, particularly in the context of promotion and progression. It was suggested that diversifying panels could also help to build trust – as the interpretation of metrics will come from wider perspectives. Education and training were also

identified as key to making sure that researchers believe that their senior colleagues are capable of fairly interpreting metrics.

Disciplinary differences and the less-than-conventional career path. Researcher's approaches are framed by the 'norms' of research and scholarly communication and how this relates to career development. The few success measures used by the sector that are informed by metrics are limited. This alongside the small number of data suppliers does not facilitate or encourage diversity. Underpinning data is often biased towards STEM disciplines, with the arts, humanities, and social sciences less visible and distinct. More consideration should be given to metrics which reflect success in a broad range of disciplines and career paths.

Impact on early career researchers. The metrics-based culture permeates, and this is particularly challenging for early career researchers (ECRs) as they are expected to have shared authorship, publish with a 'big name', work in a 'hot area', write review papers, and generally play the game well. It was proposed that ECRs should have different metrics to more senior colleagues when being considered for promotion. We need to nurture ECRs, recognise the quality and value of these academics, and facilitate a healthy work environment for them to establish their research career.

Senior academics to lead the change. Senior academics have to lead the change to a healthy research culture where metrics play a role - as expectations (somewhat imposed by research metrics) - are filtering into the populations of ECRs and postgraduate researchers. Senior colleagues should listen to ECR experiences and recall their own experiences to inform new approaches.

Encouraging a positive research environment. Can we develop metrics which produce and incentivise a healthy research culture? More work should be done to consider if there are ways to incentivise diversity, openness, interdisciplinary and collaboration.

The wider implications of the responsible use of metrics (panel 3)

We should focus on tailor-made, content-oriented approaches to assessment which both balances the use of indicators (rather than metrics) and brings them closer to narrative assessment. Culture change will take time, but all stakeholders should work together to facilitate this.

Indicators to support narrative. There is an urgent need to connect evaluation processes to primary processes - with a modest and balanced role for data which can indicate excellence (indicator was the preferred term to metrics). Work should be done to map connections

between quantitative indicators and qualitative statements. When indicators are brought closer to the narrative, assessors have the tools to deliver responsible peer review.

Indicators are used to demonstrate the value of research. It should be recognised that policy and funding decisions are informed, and will continue to be informed, by the use of indicators. Government bodies have a role to play in the responsible use of these quantitative data.

Indicators should be tailor-made. The use of indicators must recognise the breadth of research. The Wellcome Trust have mixed methods in assessing research – and other achievements (non-data) should be part of this assessment. We should be focus on tailor-made, content-oriented approaches to the assessment of individuals.

Publishers should have clear positions. PLOS have a clear position regarding the journal impact factor. PLOS recognises that it takes years for a journal impact factor to develop and therefore do not use it for visibility, and they do not promote its use. There is a need to focus on the individual article, and not the journal in which it is published.

We need cultural change. Stakeholders are not always going to get this right, but we should take a long-term view and a collaborative approach which facilitates a cultural change.

UK Research and Innovation: a funder's perspective

UK Research and Innovation⁶ urged the sector to tackle the use of research metrics in their institutions – encouraging and advocating the use of metrics in a responsible way. The UK have a role to play, working with partners internationally, to address the culture of the use of research metrics. The UK need not have its own bespoke approach, but should be using existing frameworks in a UK context.

It was highlighted that the Research Excellence Framework (REF) sub panels will not make use of journal impact factors, rankings, or the perceived standing of the publisher in assessing the quality of research outputs; the existing culture isn't established by the REF.

Research Councils UK (now part of UK Research and Innovation) signed DORA in February 2018. A statement was published committing research councils to using robust and transparent quantitative evidence to support research assessment, as well as not using

⁶ As of the 1 April 2018, the seven UK disciplinary research councils joined two other councils, Research England, and Innovate UK, to form UK Research and Innovation.

inappropriate metrics, such as H-index and journal impact factors in review processes. Going forward work will be done within UK Research and Innovation to pursue a policy position acceptable to all nine councils.

Higher education institution's perspective

Dr Paul Ayris presented the results of the FFRRM's survey on the implementation of principles (such as those outlined in DORA). From the results it was clear that although institutions are engaged in this discussion, there are practical difficulties faced by most when implementing change, with only four institutions found to be comprehensively taking action. When asked whether the UK should develop an agreement similar to DORA the response was generally positive. However, some free text comments reflected that the challenge is global, and having an international position is preferable. A full report of the results is available at Annex 2.

Professor Adam Tickell, Vice-Chancellor at Sussex University noted that the use of metrics in research must be on the agenda for UK Research and Innovation as there is an intrinsic link between publication motivation/practice and open research.

Research Excellence Framework (REF) 2021: FFRRM's advice

Background

The Research Excellence Framework (REF) is the UK's system for assessing the quality of research nationally in UK higher education institutions. It will be undertaken by the four UK higher education funding bodies in collaboration with the sector in 2021, and is currently in development. The following general principles apply to the exercise in 2021:

1. the assessment outcomes will be the products of expert review, informed by indicators where appropriate;
2. the assessment will be undertaken by an expert sub-panel for each unit of assessment (UOA), working under the guidance of the four broader Main Panels;
3. for each submission, three distinct elements will be assessed – output quality, impact and environment.

A key aim of the UK Forum for Responsible Research Metrics has been to provide advice to the UK HE Funding Bodies and the REF panels on the Research Excellence Framework (REF2021). The FFRRM appointed a working group, chaired by Professor Roger Kain in the summer of 2017 to:

- a. provide evidence-based advice on the responsible use of quantitative data in assessment of the environment in REF2021 at unit of assessment and institution level;
- b. provide advice on the initial findings from a project seeking to develop standardised guidelines for the use of quantitative evidence for impact case studies at unit of assessment level.

The working group were asked by the FFRRM to make recommendations which are in line with the core concepts that underpin the responsible use of research metrics (as outlined in The Metric Tide report) including robustness, humility, transparency, diversity and reflexivity.

The FFRRM's advice is currently being considered by the REF2021 panels, and therefore the recommendations are not presented in this report. A paper outlining the recommendations made by the FFRRM will be published in the summer of 2018 on the UUK webpages. This report briefly outlines the FFRRM's approach taken to produce their advice.

Quantitative data in assessment of the environment

It was announced in the REF2021 Initial Decisions document⁷ (September 2017) that the UOA-level environment element of the REF will be assessed on the basis of a more structured template, including the use of more quantitative data to evidence narrative content.

This decision was largely in response to the feedback from REF2014 panels, which raised concern about the extent to which the assessment of the template involved assessing quality of writing. There was support from most groups of REF2014 panellists for increasing the use of data and decreasing that of narrative in environment. This was not without some concern about the nuanced judgements that the narrative elements better enabled panellists to make, and whether increased metrics would favour one particular sort of environment rather than the optimum for each individual institution. They proposed an appropriate balance between narrative and data.

Since REF2014, The Metric Tide recommended that there is scope for enhancing the use of quantitative data in environment on the basis that data is provided with context to enable their interpretation. The independent review of the REF (Stern Review)⁸ suggested that environment statements might be best suited to using quantitative data. The Consultation on REF2021 (conducted in December 2016)⁹ asked the sector 'Do you agree with the proposal to improve the structure of the environment template and introduce more quantitative data into this aspect of the assessment' (question 34a). The majority of those who expressed an opinion were in favour of the proposal to improve the structure of the environment template and introduce more quantitative data saying that it will improve comparability and promote a more objective assessment of environment. However, there were caveats outlined and some concerns raised including: burden, disciplinary and institutional differences, and the importance of context and benchmarking to interpret data.

The working group of the FFRRM, chaired by Professor Roger Kain, were appointed in the summer of 2017 to consider the existing evidence and develop advice for the REF2021 panels. The group was representative across the UOAs, and included metrics experts. They met three times between September 2017 and February 2018. The FFRRM were consulted and updated throughout. UK sector groups were also consulted, including the REF Equality and Diversity

⁷ <http://www.ref.ac.uk/publications/2017/initialdecisionsontheresearchexcellenceframework2021.html>

⁸ <https://www.gov.uk/government/publications/research-excellence-framework-review>

⁹ <http://www.hefce.ac.uk/pubs/year/2016/201636/>

Advisory Panel, REF Interdisciplinary Research Advisory Panel, the Chair of the Universities UK Open Access coordination group, and the Universities UK open access monographs group.

The FFRRM agreed that the term ‘indicator’ should be used to describe the quantitative evidence presented in the REF2021 environment narrative statement. This was recommended as the most appropriate way to describe measures which have the potential to be used to demonstrate excellence (or indicate excellence). The FFRRM considered the existing evidence base, and developed a set of principles to govern their work. Following this, they developed lists of potential indicators against each section of the environment template, testing them against the principles they had developed. As outlined, the REF panels are considering the advice from the FFRRM. A report of the advice, including the FFRRM’s principles and recommended indicators, will be published in the summer of 2018.

Standardised guidelines for the use of quantitative evidence for impact case studies

The REF team appointed a contractor to develop standardised guidelines for the use of quantitative evidence in impact case studies. This work aimed to provide a more standardised case study ‘vocabulary’ for quantitative impact indicators that will potentially facilitate a more effective and efficient (text-mining-based) analysis of these data across the submitted impact case studies. The working group of the FFRRM were presented with initial findings, and provided feedback on the indicators and proposed standards.

Research infrastructure: developing a set of principles

As outlined, the work of the FFRRM is framed around the recommendations from The Metric Tide report. Recommendation 9 outlines the need for greater transparency and openness in research data infrastructure. Therefore, one of the aims of the FFRRM is to advise the sector on creating an environment in which systems, data collection, and analysis tools use robust and credible data. These robust data can then be used in a responsible way.

At the FFRRM's recent event, the sector highlighted the need for trustworthy metrics in the research environment, and that the systems producing metrics play a role in instilling that trust.

Extract from The Metric Tide: There are powerful currents whipping up the metric tide [including]...increases in the availability of real-time 'big data' on research uptake, and the capacity of tools for analysing them...Indicators can only meet their potential if they are underpinned by an open and interoperable data infrastructure. How underlying data are collected and processed – and the extent to which they remain open to interrogation – is crucial. Without the right identifiers, standards and semantics, we risk developing metrics that are not contextually robust or properly understood.¹⁰

The FFRRM appointed a contractor to develop a set of principles for technologies that can support open, trustworthy research information management. The aim of this work is to articulate operational principles for the design, implementation, and governance of research information systems. The FFRRM expect the principles, once developed and agreed, to be widely adopted by funders, data providers, administrators and researchers.

The FFRRM members have been working in consultation with the contractor. The FFRRM have been presented with a draft, and they will deliver workshops in the winter of 2018-19 to consult with stakeholders across the sector to further test the principles against reality. We expect the workshops to also develop a set of scenarios (or use-cases) in which the principles could be used to inform practice.

¹⁰ <https://re.ukri.org/news-events-publications/publications/metric-tide/>

Drowning or surfing? Reflections on The Metric Tide three years on

A piece by Professor James Wilsdon Professor of Research Policy at the University of Sheffield. James was the Chair of the independent review of the role of metrics in research assessment and management which reported in 2015 (The Metric Tide).

In his 2003 bestseller *Moneyball*, Michael Lewis describes how the fortunes of the Oakland Athletics baseball team were transformed by the rigorous use of predictive data and modelling to identify and invest in undervalued talent.¹¹ These approaches soon spread through baseball and into other sports, and are now widely used in the financial sector, recruitment industry and elsewhere, to inform hiring and promotion decisions.

A recent study by researchers at the MIT Sloan School of Management argues that universities are ripe for their own *Moneyball* moment. As the authors note:

Ironically, one of the places where predictive analytics hasn't yet made substantial inroads is in the place of its birth: the halls of academia. Tenure decisions for the scholars of computer science, economics, and statistics – the very pioneers of quantitative metrics and predictive analytics – are often insulated from these tools.¹²

By analysing a set of metrics for publications, citations and co-authorship at an early stage in a researcher's career, and including these in hiring and promotion decisions, the MIT team suggests that it is possible to predict future performance with greater accuracy and reliability than through subjective judgements alone.

Given the role that citations, H-indices, journal impact factors, grant income and other conventional metrics already play in research management and decision-making (both explicitly and implicitly), some might welcome predictive analytics as the logical next step. Already there are private providers, such as Academic Analytics, offering a version of these services to universities.¹³

¹¹ Lewis, M. (2003), *Moneyball: The Art of Winning an Unfair Game*. WW Norton: New York

¹² Brynjolfsson, E. and Silberholz, J. (2016), 'Moneyball' for Professors? *Frontiers blog*. MIT Sloan Management Review, 14 December 2016

¹³ <https://www.academicanalytics.com>

Others would be horrified – and see predictive analytics as the point at which the rising metric tide broke through whatever defences exist around our traditional notion of an academic career.

Wherever we stand on this spectrum, it seems likely that applications of metrics and ‘big data’ within universities are still at a relatively early stage, given the longer-term possibilities. Over the next decade, it is easy to envisage increasingly granular data on research qualities and impacts being combined with more sophisticated metrics for teaching and learning to give managers, planners and policymaker’s access to an unprecedented wealth of real-time data and metrics.

This gives rise to concerns over diversity: in particular, that metrics may drive universities to adopt similar strategic priorities in pursuit of league table success, and encourage individual researchers to focus on lower-risk, incremental work. And to concerns over harmful incentives, which in turn exacerbate problems of research quality, integrity and reproducibility.¹⁴ These themes were high on the agenda at the FFRRM’s February 2018 event.

The rising tide

It was in response to such concerns that The Metric Tide review was set up by the former HEFCE (now Research England) in April 2014, with the backing of the then Minister of Universities and Science, David Willetts. To be honest, as a rank-and-file professor, I was rather surprised to be asked to chair the review: in the UK, these tasks are typically handed to paid-up members of the ‘great and good’. Fortunately, I was brilliantly supported by a thoughtful and highly engaged steering group, a wonderful secretariat, and had the opportunity to engage with other international efforts.

From the start, we could see the opportunity the review presented: not only to consider narrower questions about the use of metrics in the UK’s REF (which was the primary concern of the Minister), but also to open up a wider discussion across the research community about the possibilities and pitfalls of the use of metrics.

In our July 2015 report, we made a series of recommendations to university leaders, funders, publishers and researchers designed to ensure that indicators and underlying data infrastructure could better support the diverse qualities and impacts of higher education and

¹⁴ Benedictus, R. and Miedema, F. (2016), Fewer numbers, better science. *Nature*, Vol. 538: 453-454, 27 October 2016

research. Over and above these detailed points, we also advanced the concept of responsible metrics, which we argued should be built on five principles:

- Robustness: basing metrics on the best possible data in terms of accuracy and scope;
- Humility: recognising that quantitative evaluation should support – but not supplant – qualitative, expert assessment;
- Transparency: keeping data collection and analytical processes open and transparent, so that those being evaluated can test and verify the results;
- Diversity: accounting for variation by field, and using a range of indicators to reflect and support a plurality of research and researcher career paths across the system;
- Reflexivity: recognising and anticipating the systemic and potential effects of indicators, and updating them in response.

The initial splash

When *The Metric Tide* was published, it provoked a lively debate in the UK and further afield. Despite the spread of opinion encountered over the course of the review, we were encouraged by the degree of consensus in support of our recommendations. On the day of its launch, pretty much everyone – from metrics advocates like Elsevier, to fierce critics like UCL’s David Colquhoun – offered their endorsement of the report.

However, in UK research policy, the issues were far from settled. Following the May 2015 general election, the government announced ambitious plans to reform the higher education and research system. These were set out in a November 2015 green paper, followed by a white paper and a Bill, which was finally approved by Parliament in April 2017.¹⁵

The green paper reopened questions over metrics and the REF, and a comprehensive review of the REF, chaired by Lord Stern, was initiated in December 2015 and issued its findings in July 2016. Despite further pressure from some quarters to move to a fully metrics-based REF, the Stern Review concluded – in line with *The Metric Tide* – that peer review should remain the primary method of research assessment, supported by responsible uses of data where appropriate. This approach – maintaining the primacy of peer review, while using carefully selected metrics in the environment section of the REF, and improving data infrastructure – has now been embedded in the framework for REF2021.

¹⁵ BIS (2015), *Higher education: teaching excellence, social mobility and student choice*. London: BIS, November 2015; BIS (2016), *Success as a Knowledge Economy: Teaching Excellence, Social Mobility and Student Choice*. London: BIS, May 2016

Wider ripples

So in a narrow sense, the review succeeded, insofar as the REF has retained peer review as its primary methodology of assessment. But if we won that battle, what about the bigger - some would say perpetual – war, in which, as Peter Lawrence once argued, "Poorly designed evaluation criteria are dominating minds, distorting behaviour and determining careers"¹⁶.

Five years on from DORA, and three years on from the Leiden Manifesto and the Metric Tide, are we surfing or drowning?

Here I am cautiously optimistic but don't in any sense underestimate the scale of the challenge. First, it has been encouraging to see the UK Forum for Responsible Research Metrics (one of our recommendations) start its work, and draw attention in particular to the need for more meaningful institutional responses to this agenda (through its recent survey of HEIs). And with the recent creation of UK Research and Innovation, I hope that responsible metrics can form part of a wider and more energetic drive to improve the culture, quality and integrity of UK research.

Second, I applaud the swelling rank of universities which have developed their own policies on the use of metrics, often drawing on a blend of points from DORA, Leiden Manifesto and the Metric Tide. Prominent examples include:

- University of Bristol's policy on responsible metrics¹⁷
- University of Kent's statement on fair assessment of research¹⁸
- University of Birmingham's guidelines and working group on responsible metrics¹⁹
- University of Bath's 'Principles of research assessment and management'²⁰
- University of York's 'Policy for research evaluation using quantitative data'²¹
- University of Loughborough's policy on 'Using Metrics Responsibly'²²

¹⁶ Lawrence, P.A. (2007), The mismeasurement of science. *Current Biology*, 17 (15): R583-R585.

¹⁷ <http://www.bristol.ac.uk/research/environment/responsible-metrics/>

¹⁸ [http://blogs.kent.ac.uk/osc/2018/02/22/statement-on-fair-assessment-of-research/;](http://blogs.kent.ac.uk/osc/2018/02/22/statement-on-fair-assessment-of-research/)
<http://blogs.kent.ac.uk/osc/2018/02/12/has-the-tide-turned-a-new-culture-for-responsible-metrics-is-on-the-horizon/>

¹⁹ <https://intranet.birmingham.ac.uk/as/libraryservices/library/research/research-metrics.aspx>

²⁰ <http://www.bath.ac.uk/corporate-information/principles-of-research-assessment-and-management/>

²¹ <https://www.york.ac.uk/staff/research/governance/research-policies/policy-for-research-evaluation-using-quantitative/>

²² <http://www.lboro.ac.uk/research/scholcomms/assessment/respmetrics/>

- University of Glasgow's 'Statement on the Use of Quantitative Indicators in the Assessment of Research Quality'²³

Third, at a European level, it has also been great to see the Metric Tide's proposals being picked up and pursued, in part through an EC Expert Group on Altmetrics (which I chaired from 2016-2017) and now through the work of a further group on indicators, which Paul Wouters of Leiden University is chairing. Our report – entitled *Next Generation Metrics* - was published in March 2017, and was well received by European Commission policymakers in DG Research and Innovation, who are now looking to carry forward its recommendations within the new Horizon Europe framework programme.²⁴

These are all steps in the right direction. But more effort is needed to embed these principles in institutions, to develop better indicators, and to foster more sensitive management frameworks. Alliances should also be forged beyond the higher education sector, linking to wider streams of scholarship and advocacy around algorithmic accountability and the future of the workplace. And UK efforts need to be aligned and joined to parallel efforts across Europe, in the United States and further afield.

As a community, we now have the evidence we need to influence how the metric tide washes through higher education and research. And we have a growing body of best practice to draw from. Funders, publishers, research managers, information professionals – and of course, researchers themselves – have a crucial role to play in determining whether we sink or swim.

²³ https://www.gla.ac.uk/media/media_555903_en.pdf

²⁴ [http://ec.europa.eu/research/openscience/index.cfm?pg=altmetrics_eg;](http://ec.europa.eu/research/openscience/index.cfm?pg=altmetrics_eg)

The future of the UK Forum for Responsible Research Metrics



Professor Max Lu

Vice-Chancellor, University of Surrey

Chair of the Forum for Responsible Research Metrics; and UK Research and Innovation Board member.

I am delighted to be appointed as the chair of the FFRRM. I take on this role from Professor David Price (Vice-Provost, Research, UCL), who is an advocate and leader for the use of metrics in a responsible way, and I thank him on behalf of the members of the Forum, and the UK HE sector, for the work he has done thus far.

In my current position as Vice-Chancellor of the University of Surrey, and in previous appointments in Australia, I have seen research metrics utilised in different ways. The Australian system is much more reliant on the use of metrics for the assessment of research excellence than here in the UK. I feel well placed to work with the Forum to consider the opportunities and challenges of the use of metrics – or indicators - in research assessment. I am also a member of the UK Research and Innovation board and a member of the Prime Minister’s Council for Science and Technology. In both roles, I see opportunities to advocate for the responsible use of research indicators, in developing effective measures of our research and innovation outcomes.

On reading James Wilsdon’s reflection on how far we have come since The Metric Tide report, and considering the report from the recent event hosted by the Forum, it is clear that the UK higher education sector strongly desire to use metrics responsibly. All stakeholders with an interest in research metrics now need to work together to effect change. I think that The Metric Tide report has successfully drawn attention to the various challenges and opportunities with using metrics including; bibliometrics (for research and researcher assessment), the need to improve infrastructure interoperability, and the importance of the narrative in the assessment of research. The framework set by The Metric Tide positions responsible metrics in the governance, management and assessment of research. This position

is incredibly helpful, and can be considered alongside the other frameworks (DORA, Leiden, or institutional policies).

I see my appointment as Chair of the FFRRM as the perfect opportunity to provide thought-leadership and help the sector to set future priorities and action plans in this important area. As outlined in this report, we have further work to do to tie together the REF2021 recommendations, and consult with the sector on a set of principles which will help to inform practice when procuring, governing or operating research infrastructure.

So, what next?

I see the FFRRM having a thought-leadership role. We want to develop a vision for the use of indicators in research in the UK and engage stakeholders to develop a clear, and realistic policy framework for responsible use of metrics. This will entail developing further understanding of the existing landscape, as well as producing evidence on what works.

There was a call from the sector at the FFRRM's recent event to encourage more discussion at all levels and types of staff within institutions, and to share good practice amongst all stakeholders in the sector. On discussion with members of the Forum, this is about sharing emerging practice, and making sure we have the right communities of practice to openly discuss, and revise approaches, as appropriate. The FFRRM will have a role in identifying these communities, and to work with other stakeholders, such as the Bibliomagician Forum and Universities UK, to facilitate discussion.

It is also clear that we need to reflect on how to engage the UK funding bodies and the UK sector in thinking about future research assessment exercises. The work, led by Professor Roger Kain, will be recommending that more work should be done in the context of UK Research and Innovation to structure and coordinate data collection with due notice given to HEIs about the intended use of data in future research assessment exercises, to improve data quality and availability. The FFRRM have a role to consider what the future of research assessment in the UK will look like, and what role indicators have to play.

The Forum will provide more advocacy to encourage the UK higher education sector to drive change. However, the responsible use of research indicators is not an issue that is specific to the UK. This is a global challenge as well as a global opportunity, and I see the FFRRM engaging with networks and developing strong international links. We are delighted to launch this report at the Euroscience Open Forum, at which two FFRRM members Professor James Wilsdon and Dr Steven Hill (Director of Research, Research England) are delivering a session titled 'experiments in responsible metrics: how can we use indicators and data to support

open science'. As outlined at the February event, there is an intrinsic link between publication motivation/practice, incentives and open research, and this is a global issue.

The FFRRM shall re-visit their aims and objectives, which were set out in 2016, to make sure they align with current thinking on our priorities. This will be done over the autumn months.

We know that the use of research metrics will require the existing research culture to adapt and change. As a sector led group, we are ready to work collaboratively with all involved to provide leadership, guidance, and advocacy for the responsible use of research metrics.

Annex 1

The turning tide: a new culture of responsible research metrics programme

Double click on the image below to open the event programme, speakers, panel members, and attendee list.



The turning tide

A new culture of responsible metrics for research

Thursday 8 February 2018
1000 - 1600
Marble Arch
London

Wi-Fi

Network: **etcvenues**
Password: **wifi7018**

[#responsiblemetrics](#)

This free event, hosted by the Forum for Responsible Research Metrics, will bring together stakeholders within the higher education sector to explore the emerging culture of the use of metrics responsibly.

Annex 2

Analysis from the survey on current practice in UK research organisations

The Forum conducted a survey at the end of 2017 on current practice on the use of research metrics in research and researcher assessment in UK research organisations. Universities UK hosted the survey, which was promoted in UK wide networks. All responses were anonymous. Paul Ayris, Pro-Vice-Provost (University College London Library Services), an observer to the Forum, analysed the results to the survey.

There were 96 responses to the survey; the majority (but not all) completed the survey in its entirety. 68 organisations named themselves when asked. Where respondents recorded their organisation type, the overwhelming majority (72 responses) were HEIs.

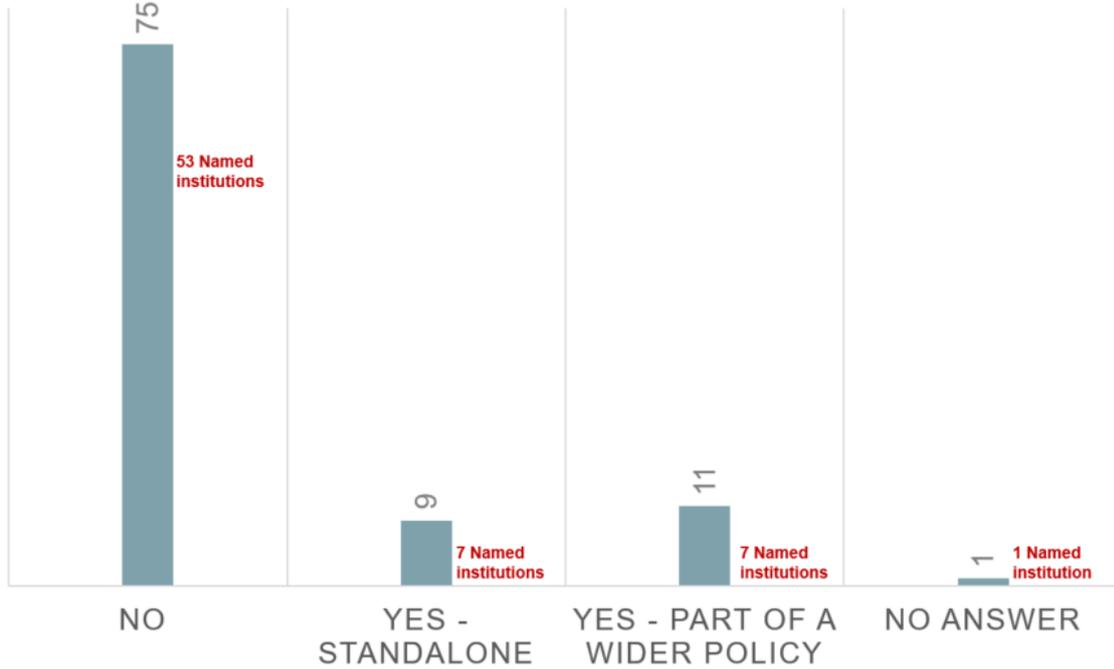
The results of the survey demonstrate that there is a need and an appetite for focus and leadership in the field of research metrics. There is agreement with the principles of DORA, the Leiden Manifesto and The Metric Tide. However, there is a wide variation amongst UK HEIs as to their level of current engagement in activity to implement change.

Analysis of the results

Selections of free-text comments have been collected below under relevant questions. These are mainly from organisations who identified themselves by name in the survey; where they did not and the comment has been selected below, it is reproduced with the tag '[anonymous comment]'. The responses were accurate as of December 2017.

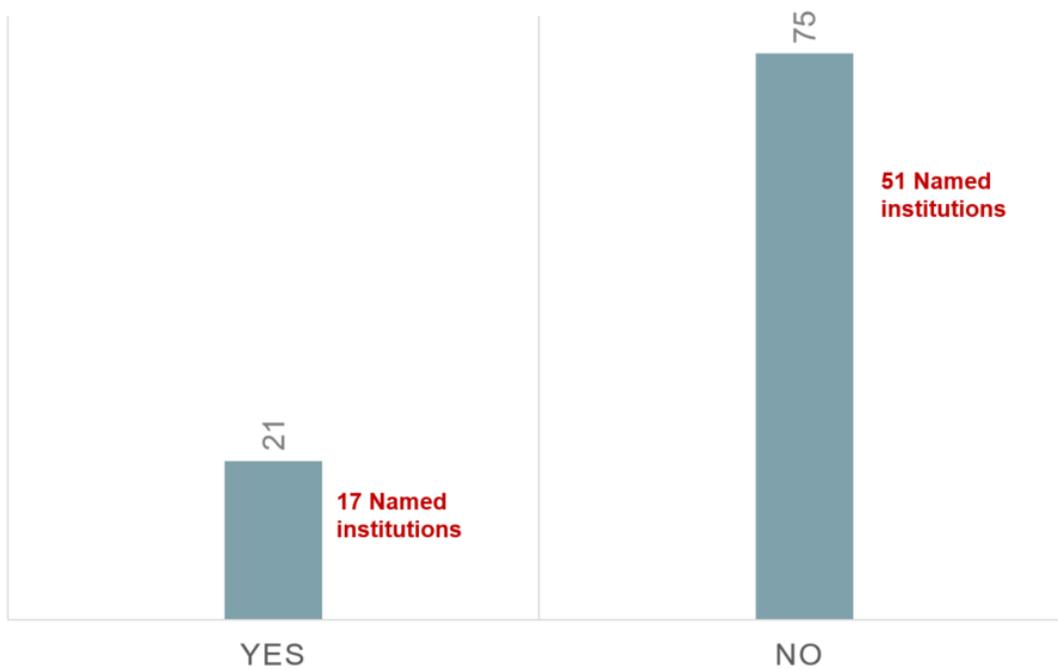
75 responses indicated that their institution did not have a research metrics policy (Q1). When only those organisations who named themselves are considered, the number of negative responses was 53.

Q1 DOES YOUR RESEARCH ORGANISATION HAVE A RESEARCH METRICS POLICY?

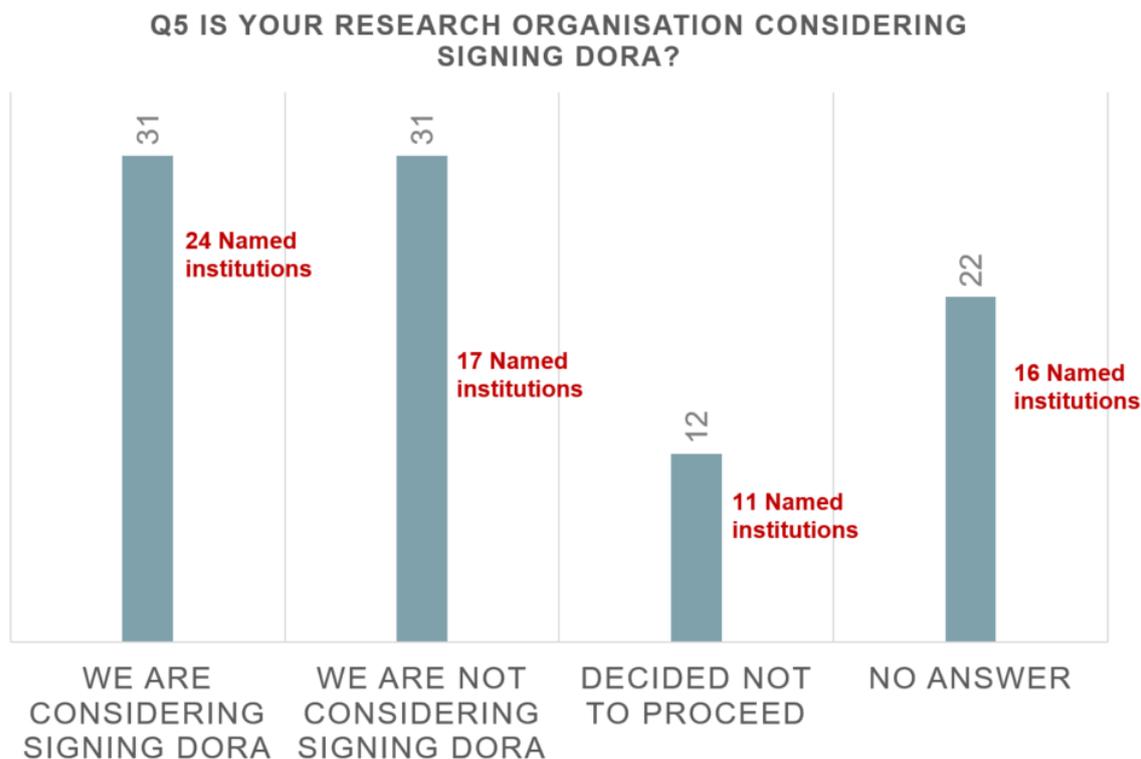


21 responses also indicated that their institution had signed DORA, but 75 had not (Q2). When only those organisations who named themselves are considered, the number of negative responses was 51.

Q2 HAS YOUR RESEARCH ORGANISATION SIGNED DORA?



31 organisations said they were not considering signing DORA, 31 said they were considering it, and a further 12 said they had considered it but decided against it (Q5). When only those organisations who named themselves are considered, the answers were as follows: 17 organisations said they were not considering signing DORA, 24 said that they were considering it and a further 11 said they had considered it but decided against it.



Question 6 asked for respondents to identify their reasons for signing/not signing DORA. A wide range of responses were provided with no single reason dominating the responses. The responses included the following:

- the Dean of my school is metric and spreadsheet crazy
- Not regarded as a key concern at this time
- the level to which we use metrics within the organisation has been such that we did not feel the culture we have necessitated signing DORA
- At initial discussions, we did not wish to sign up without being able to fully implement the necessary changes as they deserved more than just lip service. In discussion with current DORA signatories, the overwhelming response from institutions was that they viewed both DORA and the Leiden Manifesto as a statement of intent, aiming for a culture where they were complying, whilst knowing that it would be a journey before they fully (if ever) met those principles. With this in mind, we are now revisiting DORA as a statement of principle to aspire to.
- DORA is strongly supported by senior staff leading research.

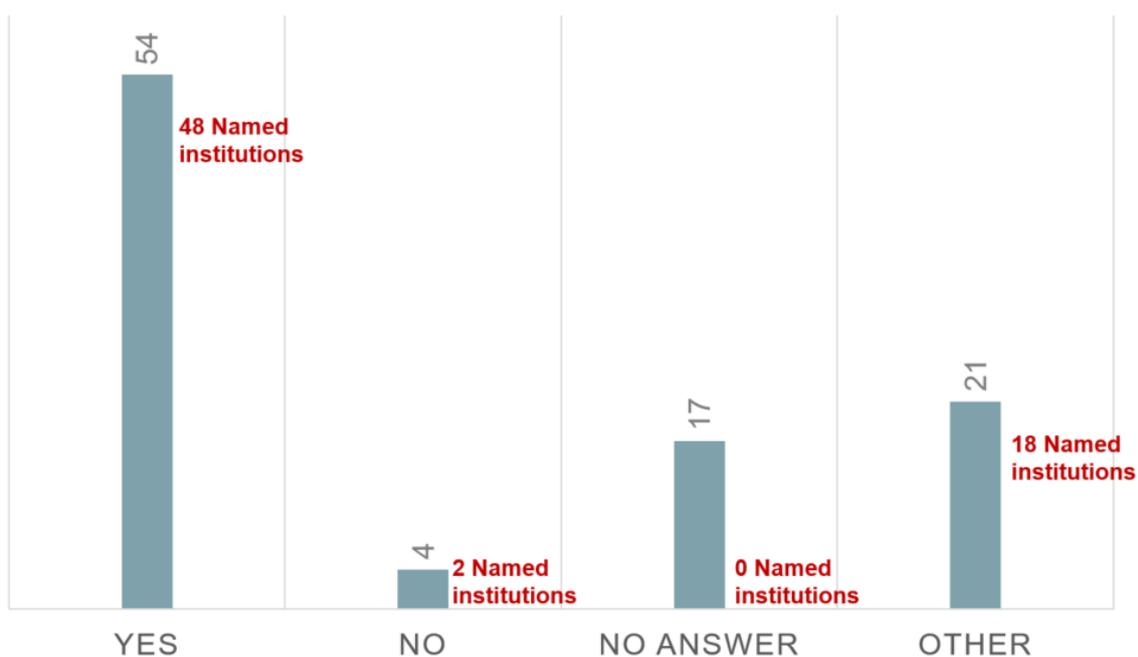
- Signed as part of LERU in 2015

In answer to Question 7, which asked institutions if they agreed with the principles behind the Leiden Manifesto 54 institutions responded positively. When only those organisations who named themselves are considered, 48 respondents agreed with the principles in the Leiden Manifesto.

Respondents were able to provide free text comments to elaborate on their responses to this question, typical comments were:

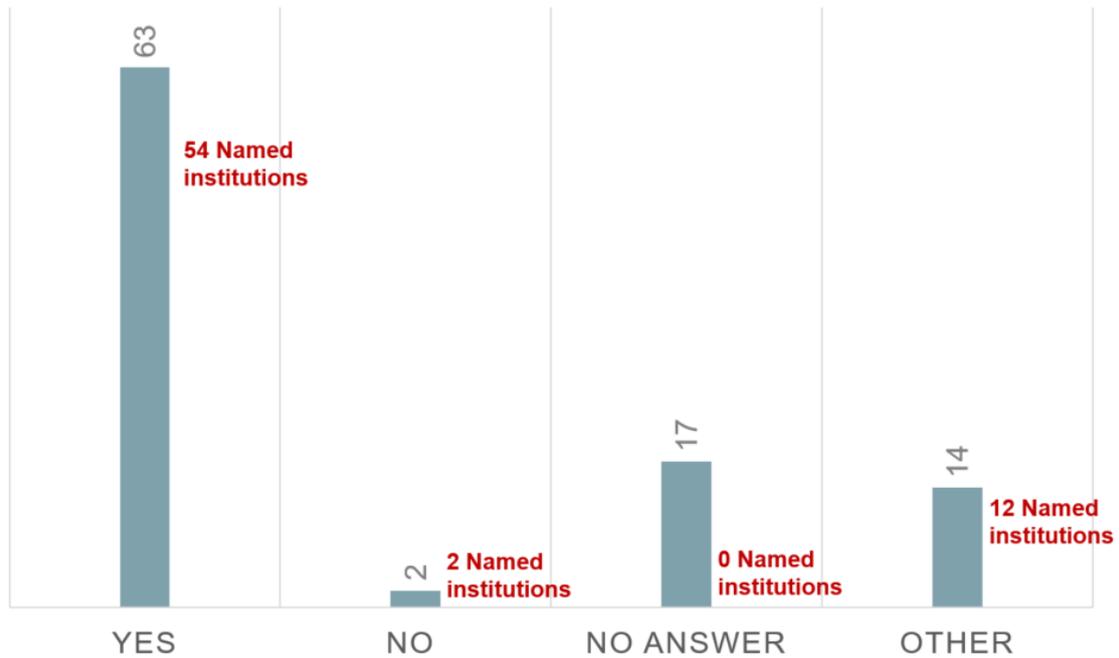
- We have not formally considered these principles at institutional level, however the principles appear largely in line with our current approach to research evaluation and we do seek to adopt specific institutional principles for bibliometric analyses.
- Not aware of Leiden manifesto.

Q7 DOES YOUR RESEARCH ORGANISATION AGREE WITH THE PRINCIPLES OF THE LEIDEN MANIFESTO?



Question 8 looked for levels of acceptance of The Metric Tide report, and 63 respondents agreed. When only those organisations who named themselves are considered, the number agreeing was 54.

Q8 DOES YOUR RESEARCH ORGANISATION AGREE WITH THE FRAMEWORK OUTLINED IN THE METRIC TIDE?



Question 9 asked what action had been taken locally to promote the principles of the Leiden Manifesto, DORA and/or The Metric Tide. The analysis of the responses resulted in three broad categories:

Action	Number of responses
Implemented Nothing	11
Implemented Something	52
No answer; or Answer does not answer question	33

Where respondents had implemented some or all of the principles, the status of implementation fell into two categories.

Action forms a start to future activity	Action can be regarded as comprehensive
48	4

Typical responses to question 9 were:

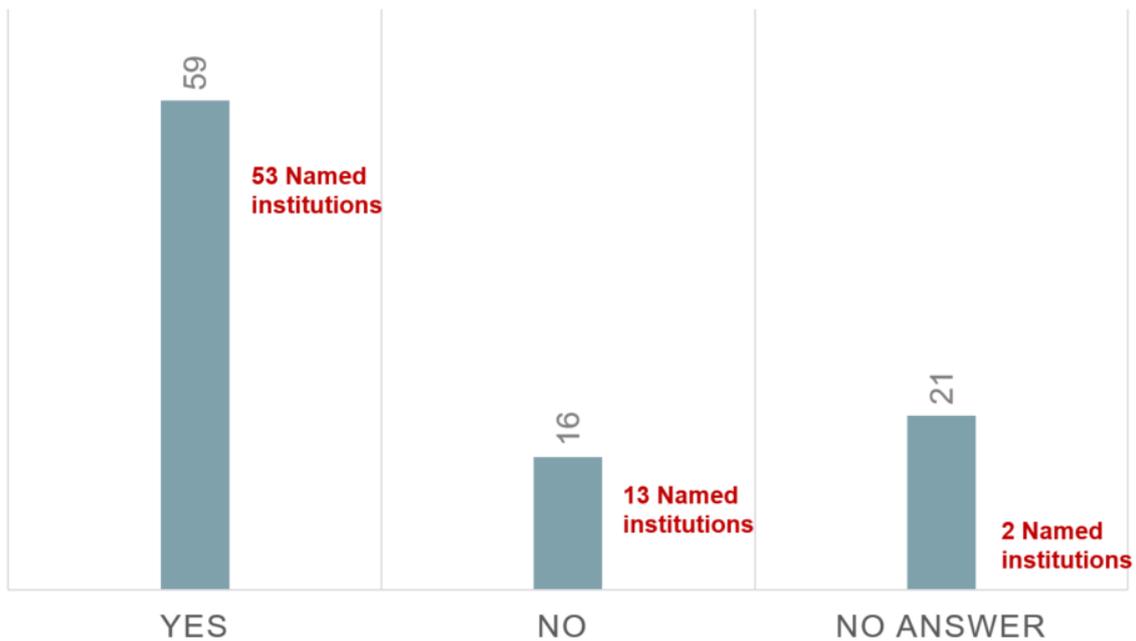
- None
- Absolutely none
- 1/ we have published a statement (following wide consultation) on the use of quantitative indicators in research assessment. Many of the institutional initiatives to

promote the principles of Leiden etc are described in that document; for example, we only use metrics that are normalised by subject, and ask candidates at recruitment to describe their best four papers and their contributions to it (thus favouring quality over quantity, and not relying on simple proxy indicators). 2/ Our Code of Good Practice in Research was updated in Nov 2017 to include a much expanded section on good publication practice.

- Internal policy on assessment of individual research performance was sent to all teaching and research staff when approved by Senate. Availability of institutional policy on intranet, including reference to principles and being signatories to DORA. Referenced when giving advice about use of SciVal and in SciVal training. Our use of indicators in relation to research assessment, performance and planning is based on the use of quantitative indicators and systems being used to supplement and not displace more meaningful and engaging forms of qualitative review, such as peer review, recognising the diversity of disciplines and research agendas that we encompass. We continue to work toward improving our data infrastructures and on a shared understanding of the usefulness and limits of the underlying data. Our internal processes and mechanisms for research assessment incorporate peer review as an inherent principle and as a signatory to the DORA we do not permit the use of journal-based indicators (such as journal impact factors) when making judgements about research quality. Where individuals apply for progression or promotion, research data will only form part of the broader evidence base for decision making on these issues. We also seek to use data to assist in monitoring equality and diversity to ensure that the ongoing research and impact assessment does not negatively affect any groups of staff.

Question 10 asked: Do you see value in the UK developing an agreement with similar ambitions to DORA, utilising The Metric Tide report, which aligns with the UK research context? Although there was no absolute agreement, many institutions saw the value of this approach – with 59 respondents responding positively.

Q10 DO YOU SEE VALUE IN THE UK DEVELOPING AN AGREEMENT SIMILAR TO DORA AND THE METRIC TIDE?



When only those organisations who named themselves are considered, the number of positive responses was 53.

Common statements were:

- I think this would be helpful, particularly if it is owned by UKRI
- cf. Concordat on Open Data as an exemplar of broad policy makers collaboration
- One of the great strengths of the DORA declaration is that it is international and reflects opinion on the global stage. A UK equivalent would have value but would not replace the DORA declaration and it would need to be made clear why institutions should sign both (especially to those institutions who have already signed the DORA declaration). Any such declaration should have detailed guidance for HR implementation of its evaluative suggestions.

Question 11 asked for final comments. Typical responses were:

- We are exploring how altmetrics can better inform our arts and humanities areas, but there is much scepticism among academic staff, along the lines published in the metric tide report
- There is a real willingness to embrace this agenda.