

EMBO virtual policy overview session on research integrity: emerging concepts in research policy

Tallinn University of Technology, 13 April 2021

SUMMARY

Introduction

The two-hour virtual session was organised by Sandra Bendiscioli, EMBO senior policy officer, in collaboration with EMBO Member Peep Palumaa, from the Tallinn University of Technology. The 16 participants included Estonian EMBC Delegates Toivo Rääm and Maia Kivisaar, members of the Estonian Research Council, members of national evaluation and ethical committees, and PIs in the life sciences from the Tallin University of Technology.

The session focused on concerns about developments in the research system that are unintentionally negatively affecting research practices and the quality of research. The focus was in particular on research assessment and peer review processes for the distribution of research funding, and the roles of institutes and funders in mitigating the problems.

The aim was to create awareness about international discussions on these issues, falling within EMBO's broader goal to contribute to creating a research environment in Europe where researchers can work at best. Similar virtual sessions with representatives of other EMBC Member States are planned in the next months.

Trends in research policy in Estonia, Prof. Tiit Land, Rector of the Tallinn University of Technology

Prof. Tiit Land gave an overview of the demographic, economic and research landscape in Estonia. Among a population of 1.5 million people, Estonia has a community of 5000 researchers, 3200 of which work in the in the six public universities. After independence in 1991, demographic changes have caused a decrease in the current number of PhD students, and current policies are addressing this. There are 20 R&D institutions that were evaluated by foreign experts and are eligible for R&D public funding. Estonian researchers are quite successful in obtaining EU research funding, with a success rate of about 14% in Horizon 2020. The 5-year R&D&I policy from 2014 to 2020 had as main objective to boost the following areas: ICT, health technologies and services, and a more effective use of resources.

The natural sciences face the challenge of a decreased budget since 2014. A further challenge for all disciplines is that the national budget includes funding from EU structural funds, which will decrease in the next funding period. This will neutralize the increase to 1% of the GDP dedicated to R&D funding in 2021. All eyes are on the new government elected in January 2021. The new research strategy 2021-2035 has the goal to increase R&D funding



by the private sector to 2% of the GDP. However, the new R&D&I& policy has not been adopted yet.

Research integrity, Sandra Bendiscioli, EMBO Senior Policy Officer

Integrity in research is equivalent to high-quality research, carried out following the highest scientific standards and responsibly in all its phases. There is increasing evidence from national and international surveys and reports that a number of factors in the research system are having unintended negative effects on research integrity and are pushing researchers to forego good practice. Research misconduct and questionable research practices include fabrication of data, unjustified omission of outliers, a too small sample size, inadequate data management procedures, P-hacking, inappropriate statistical methods, unjustified claiming of authorship, unjustified modification for images, and many more. These have detrimental consequences for the quality of science, the wellbeing of society and society's trust in scientific research.

Systemic factors that are perceived as negative incentives to responsible research practices include high levels of competition, limited funding resources, short-term funding, the focus on journal-based metrics (such as JIF and H-index) in research assessment, and career workload. Conversely, policies such as data sharing policies and requirements, open access publishing, professional training and development opportunities, and institutional policies on good research practice have a positive impact on research practice.

The quality of European research is also endangered by the inconsistent approaches to the governance of research integrity and its breaches in European countries. As a consequence of the disparate national systems, and the lack of any system altogether in some countries, often allegations of research misconduct are not pursued, their handling is inconsistent, the level of sanctions varies across Europe, and clarifying cross-border cases of misconduct is extremely challenging. An EMBO report explored options to solve these problems, including the establishment of an advisory, investigative or oversight pan-European body (www.embo.org/documents/science_policy/governance_of_ri.pdf).

When developing policies and structures for research, decision makers should keep all the aspects above in consideration to ensure that newly developed policies create the best incentives for responsible and high-quality research to thrive in Europe.

Responsible Research Assessment, Helen Sitar, EMBO Policy Officer

The purpose of evaluating researchers and their output is to reward good work and promote those who contribute most to the advancement of science. 'Responsible' research assessment involves several key elements: 1., the appropriate use of metrics 2., that assessors' judgements are free from bias, and 3., evaluations based on the scientific rigor of the work or the skills and suitability of the researcher. Irresponsible assessment relies on proxies for quality, such as institutional affiliations or journal names.



In the current research system, publications have become the currency for rewards, instead of being regarded as contributions to knowledge. In parallel, the rewards system is focussed on publication-based metrics, such as Journal Impact factor or the H-index at the expense of what really matters—the quality, originality, rigor or influence of the published research. Other types of outputs, such as contributions to the research community, to public policies, or open science could be considered. A number of qualitative and quantitative indicators are available to assess these, though their use is not yet mainstreamed, and not comprehensive. Unfortunately, the time, capacity and tools needed to perform thorough evaluations are unavailable to many. This results in many evaluators (unintentionally) relying on proxy measures for quality, or even on unconscious biases. This creates a climate of hyper-competition and drives issues, e.g., in research reproducibility and integrity.

The San Francisco Declaration on Research Assessment (DORA) is an initiative that has arisen to address these issues (<https://sfdora.org>). It aims to eliminate the use of journal-based metrics and promotes the value of all scholarly outputs (e.g. datasets, software, peer reviews, well-trained researchers, societal outcomes, in addition to publications). It facilitates dialogue and builds communities of practice so actors may learn from one another as they trial new approaches to assessing research(ers). The Declaration has been signed by over 1700 organisations and 19000 individuals to date (April 2021).

Peer review for funding allocation; acknowledged limits and proposals, Sandra Bendiscioli, EMBO Senior Policy Officer

Peer review is the most widespread mechanism for research assessment worldwide. It has many advantages: it gives the research community a leading role in the distribution of research funding, it ensures that the distribution happens according to scientific criteria and not political aims, it is understood, accepted and has legitimacy from the scientific community and politicians.

In spite of its success, some limitations of peer review have been recognized. Some of them are exacerbated by recent developments in the research system: high levels of competition, low success rates, small research budgets, and increased public and politicians' scrutiny. Reviewers are asked to evaluate an increasing number of applications, and have less time to devote to each evaluation task. There is increasing evidence that conscious and unconscious biases warp selection processes, and concerns on conservatism and risk aversion in decision making have been expressed. Other concerns are a lack of transparency and the inability to make fine distinctions between qualitatively similar proposals.

To overcome some of these limitations, funding agencies have proposed or tried out changes to the peer review process: from eliminating it altogether to modifying panel composition, blinding applications, applying a partial lottery, introducing narrative CVs, broadening criteria, providing training and producing clear guidelines for reviewers, and



evaluating regularly their selection processes. International funders have joined forces in a number of initiatives, such as the Research on Research Institute, to analyse the effects of any changes, exchange best practice and be able to reach evidence-based decisions (<https://researchonresearch.org>).

Institutes and funders' roles, Michele Garfinkel, EMBO Head of Policy

The responsibilities to create an environment conducive to high quality research are shared among a broad range of stakeholders: individual researchers, evaluators, journals/editor/publishers, policy makers, publics, funders and institutes. In particular funders and institutes are boundary organisations that have different goals and represent different interests at the same time. They play a central role in shaping the research environment and researchers' perception of it (workplace climate).

Funders' power comes from the possibility to attach conditions to funding. To foster good research practice funders can mandate training, and some are even specifying what that training should entail (e.g., NIH and NSF in the US); and suggest or mandate the adoption of principles for responsible research assessment, e.g., the DORA principles. Funders can also make funding available to ensure that their investments can harvest best results by funding, e.g., open science tools and the examination of post-review papers. Or they can request that institutes have policies and structures in place to support researchers in dealing with research integrity issues.

Institutes have a fundamental role in shaping the research environment. They can provide basic oversight to research establishing committees and boards and appointing responsible officials; they can provide training and encourage or mandate it for their researchers; they should take allegations of research misconduct seriously and carry out investigations to ensure that the scientific results coming out of their labs are solid and can be trusted by other researchers and by the public; and they should implement the principles of responsible research assessment in their evaluations. The Estonian Code of Conduct for Research Integrity includes a description of the responsibilities of all stakeholders and is a good guide for the implementation of some of the measures described above.

