

Responsible research and innovation as social learning: Insights from BBSRC and the ERA CoBioTech programme

Robert Smith, Jane Calvert, Thoko Kamwendo and Deborah Scott, March 2020

How should funders shape the shared trajectories of science, technology and society? In recent years, two related ideas of 'responsible innovation' and 'responsible research and innovation' (RRI) have gained currency. But what these terms mean in practice is often unclear and opaque for research funders.

In late 2017 we were commissioned by BBSRC to review practices of responsible research and innovation (RRI) within funding organisations internationally and recommend how they could operationalise RRI within a multinational funding programme for biotechnology, ERA CoBioTech. We completed this work over the course of six months and delivered our recommendations in the form of an *Agenda for Responsible Research and Innovation (RRI) in ERA CoBioTech* in May 2018. The final version of ERA CoBioTech's Agenda for RRI is available online [here](#).

This first post outlines some of the findings from our initial research, explains the rationale behind the *Agenda for Responsible Research and Innovation* and introduces its approach. We end with lessons learnt during the process. In future posts we'll write about our experiences trying to put the Agenda into action.

Our process

Comprehensively reviewing funders' approaches to RRI is difficult because the term is slippery. It co-exists with a range of other governance approaches in research and innovation policy. The most prominent of these is the Ethical, Legal and Social Implications/Issues/Aspects (ELSI/A) approach but there are also connections to public engagement, work on participatory priority setting, and societal grand challenges. Care is also needed when extracting information from different national and organisational contexts. While several programmes refer to RRI-like approaches in their policy documents, in practice there are specific social, organisational, political and cultural dynamics at play that shape the form RRI takes. Some relevant differences include the coordinating organisation's public/private status, disciplinary remit, and established approaches to agenda setting. The point here is that a range of phenomena are likely to look similar but there is not one stable entity called RRI that can easily be extracted and transported into a new context; an approach with purchase in one location may not resonate elsewhere.

Nevertheless, it is possible to learn by looking across different programmes and identifying common themes. We interviewed approximately 40 social scientists, public administrators and natural scientists involved in RRI programmes in 12 countries and reviewed public documents from 8 programmes. We supplemented this work with extended ethnographies in the field of synthetic biology. Further details of our methodology are presented in the Appendix of ERA CoBioTech's Agenda.

Patterns and lessons

The prevailing approach taken by programme managers to RRI is to mandate a form of 'socio-technical integration' at the research project level. This usually means funding social sciences and humanities as part of natural

science/engineering research projects. Thus, while there are clear overlaps with the research councils' experiments with public engagement in the UK¹, it is the ELSI/A programmes of the Human Genome Project and EC Framework Programmes that have acted as the most powerful precursor for the organisation of research. In the UK a prominent example is the BBSRC/EPSRC/MRC Synthetic Biology Research Centres (SBRC's), which were all required to integrate consideration of the social, ethical, environmental and/or political dimensions of synthetic biology to gain funding. Other examples include the iGEM competition², the European Commission's Framework Programme³, NSF's SynBerc Programme⁴ and the Norwegian Research Council's Digital Life Programmes⁵.

Several reflective accounts have now been published by social scientists working in this mode of research. They report that they are often disciplinarily isolated, ambiguously valued, and that they are expected to deal with a narrow range of issues. So while a generation of scholars seems to be developing skills for cross-disciplinary work, it is important (for all) to ensure they are adequately supported and are not considered solely as 'add-ons'.⁶ The research councils have a clear role to play in this regard.

While this institutionalised model of social science integration can facilitate valuable interdisciplinary collaborations, a fuller range of more ambitious activities could be adopted, which would also acknowledge the relative power of research funders in shaping the direction of research. Some productive examples of this type of work include new advances in societal portfolio analysis⁷, responsible metrics⁸, analysis of intellectual property regimes, as well as revitalised traditions of citizen-led priority setting in the Netherlands⁹ and public engagement within the UK. The iGEM competition has made a concerted effort to signal value through clear judging criteria and capacity building through its 'Human Practices Hub'.¹⁰ Examples relating to the practices of research councils come from explicit attempts to conceive of responsible innovation as a form of institutional reflexivity (tried with BBSRC¹¹) or organisational learning (adopted by the Norwegian Research Council¹²).

¹ See, e.g. Wilsdon, J., Wynne, B., & Stilgoe, J. (2005). *The Public Value of Science: Or how to ensure that science really matters*. Demos: London.

² <https://igem.org>

³ <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>

⁴ <https://ebrc.org/synberc/>

⁵ <https://digitallifenorway.org/gb/>

⁶ Felt, U. (2017). 'Response-able practices' or 'new bureaucracies of virtue': The challenges of making RRI work in academic environments. In L. Asveld, R. van Dam-Mieras, T. Swierstra, S. Lavrijssen, K. Linse, & J. van den Hoven (pp. 48-68). Cham: Springer International Publishing.

⁷ <https://observatoriosociallacaixa.org/en/-/responde-la-investigacion-a-las-necesidades-de-salud>

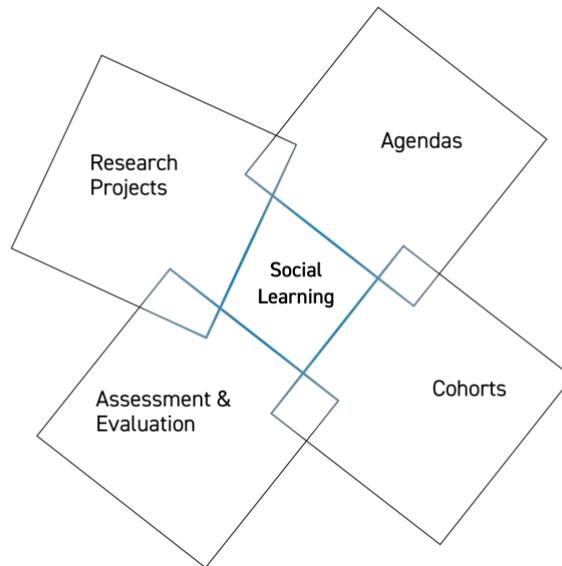
⁸ <http://www.hefce.ac.uk/pubs/rereports/Year/2015/metricride/Title,104463,en.html>

⁹ <https://www.livingknowledge.org/science-shops/about-science-shops/>, <https://www.nwo-mvi.nl/approach>

¹⁰ https://2019.igem.org/Human_Practices

¹¹ Smith, R.D.J., Hartley, S., Middleton, P., Jewitt, T. (Forthcoming) *Knowing when to talk? Building institutional reflexivity in research policy*. Available on request.

¹² https://www.rri-practice.eu/wp-content/uploads/2018/09/RRI-Practice_National_Case_Study_Report_NORWAY.pdf



ERA CoBioTech's Agenda for Responsible Innovation

Drawing on the research above, we developed a series of four lessons and twelve recommendations for funders and researchers. The lessons and recommendations are presented in full in the [Agenda](#) but here we focus on what they mean for ERA CoBioTech in practice.

One key contribution of the science and technology studies literature is to show how little institutional space there has been for serious debate about the different priorities and trade-offs involved in investments in science, technology and innovation. Science and innovation tend to operate through cycles of promise and uncertainty, neglecting opportunities to identify concrete and desirable goals for technology and society. One reason for this is that strong but mundane institutional dynamics (such as time pressures and contract agreements) close down such opportunities. The sociologists of science Joly, Rip & Callon suggest this places innovation in a regime of 'techno-scientific promises' rather than a regime of 'collective experimentation'.¹³ Shifting to collective experimentation would require an active process of space-creation within existing institutions, which research funders can help co-ordinate.¹⁴ Our overarching approach to responsible innovation is not to treat it as top-down framework to be 'tick-boxed' but as an opportunity to build capacity for analysis, debate, reflection, and social learning across an innovation system. We aim to do this in two ways.

The first is simple: to *strengthen* existing approaches to RRI at the project level. To achieve this, ERA CoBioTech is signalling its commitment to RRI in its funding activities. Researchers are encouraged by the programme to treat it as an engaged form of scholarship rather than an add-on – to see it as form of knowledge production. Clear guidance is

¹³ Joly, P.-B., Rip, A., & Callon, M. (2010). Re-inventing innovation. In M. Arentsen, W. van Rossum, & A. Steenge (Eds.), *Governance of Innovation: Firms, Clusters and Institutions in a Changing Setting* (pp. 19-32). Edward Elgar Pub.

¹⁴ Foley, R., & Wiek, A. (2017). Bridgework ahead! Innovation ecosystems vis-à-vis responsible innovation. *Journal of Nanoparticle Research*, 19(2), 83

given in funding call documents and online forums on this research and how it should be assessed, and relevant assessment expertise has been added to ERA CoBioTech funding panels.

The second approach we are taking is to **broaden** the focus of RRI beyond the project by developing collaborative experiments between administrators and ourselves. The goal of these experiments is to generate new methodologies that can provide space for shared reflection and learning. We are targeting three activities within the funding programme:

- **Agenda Setting.** We co-designed an agenda setting workshop in early 2018 with Anja Berndt of BBSRC. We have also been asked to assist in the convening of a 'European Biotechnology Hub Meeting in mid-2020'. We would like to begin experimenting with portfolio analysis methodologies but there are features particular to the ERA-NET scheme that make this challenging.
- **Cohorts.** Our background research and agenda setting workshop both highlighted the need for funders to actively create spaces to allow researchers to share lessons beyond individual projects. In early 2020, we will be convening a workshop with the first two project cohorts to meet this need.
- **Assessment and Evaluation.** We are drawing on recent social scientific work on the performativity of indicators, which emphasises their capacity not just to measure but also to signal value to researchers. We convened a workshop with ERA CoBioTech partners to begin a discussion of value within the programme and are now developing an evaluation process that adopts a narrative approach to evaluation and will produce evidence of public/stakeholder engagement. To ensure the programme draws on a diverse knowledge base, we are targeting both senior and junior members of each project. This data will be used by the programme to modulate decisions in the future.

What are we learning?

We were commissioned by BBSRC and ERA CoBioTech's other funding partners to explore and articulate how RRI could be incorporated into the programme's strategic decision making. In practice this means moving beyond the well-established ELSI-model of funding. Such a shift means acknowledging that there are numerous operational activities within a funding organisation that ultimately shape the form and direction of a research trajectory. In making this move, we have found it helpful to focus not on the potential for public contestation and controversy, but to place concepts such as institutional reflexivity, social learning and public value, which are all established in science and public policy, at the heart of our approach.¹⁵

The policy experiments we have briefly summarised provide an indication of what is possible within a funding programme. However, context is extremely important, meaning that the precise approach taken by ERA CoBioTech is not one that can be straightforwardly transferred to other settings. It has been tailored to the context of a multilateral funding programme, which already has a prerogative to hold network-wide workshops and develop monitoring processes. Conversely, other settings may offer more space to experiment with agenda setting, funding programmes and advisory structures because they have not been pre-determined by grant agreements that govern ERA-NET

¹⁵ Wilsdon, J., Wynne, B., & Stilgoe, J. (2005). *The Public Value of Science: Or how to ensure that science really matters.*

schemes. As such, we suggest our lessons be best taken as points of departure for other funding organisations. In the UK, for instance, there is considerable experience with public engagement to inform agenda setting.¹⁶ Recent experiments with BBSRC staff have focused on operationalising concepts of institutional reflexivity in decision making about public and stakeholder engagement¹⁷.

Some early findings from engaging with the ERA CoBioTech programme suggest that demonstrating a commitment to RRI within the funding programme also functions as a form of capacity building elsewhere in an innovation system. For instance, by training evaluation panels we are simultaneously training future PIs and generating knowledge of how to incorporate RRI sensibilities into evaluation. The review panels are also raising issues not initially considered by the ERA CoBioTech programme partners but which may be considered in the future.

Our experience in ERA CoBioTech is that placing social learning at the heart of the approach – and finding creative ways to open-up research policy – can be productive for all involved because it simultaneously generates social scientific knowledge of policy environments, produces practitioner knowledge of social scientific methodologies, and ensures the approaches are tightly tailored to their context. All are necessary for the successful implementation of RRI.

¹⁶ Jones, R. 2008. “When It Pays to Ask the Public.” *Nature Nanotechnology* 3: 578–579.

¹⁷ Smith, R.D.J., Hartley, S., Middleton, P., Jewitt, T. (Forthcoming) *Knowing when to talk? Building institutional reflexivity in research policy*. Available on request.

Activity	Actors	Recommendation
All	All	1. Treat RRI as a form of knowledge production.
Strategic agenda setting	Funders	2. Open-up agenda setting processes and consider questions of public value.
Designing funding calls	Funders	3. Communicate the commitment to RRI early in the funding cycle and provide pre-application support to understand its goals.
Project design and conducting research	Researchers	4. Ensure work allocated to RRI is tailored to the project rather than generic. 5. Try to take a 'conception to grave' approach that cuts across the life of the project. 6. Apply 'researcher equivalence' to create a balance between researchers in the project. 7. Provide sufficient resources for the work badged as RRI to be completed and include it in the overall budget.
Evaluating funding applications	Reviewers Funders	8. Consider RRI as a substantive part of research projects, rather than as 'impact'. 9. Review RRI components thoroughly and appropriately. 10. Allow for emergent approaches to investigation. 11. Don't be overly prescriptive.
Capacity building	Funders Researchers	12. Help make connections. 13. Provide resources to connect RRI work across projects. 14. Support research into sites beyond the lab.
Grant monitoring and programme evaluation	Funders	15. Develop effective evaluation methods.

ERA [CoBioTech's](#) Recommendations for Responsible Research and Innovation.