



RESPONSIBLE
RESEARCH AND
INNOVATION
IN PRACTICE

RRI-Practice Policy Recommendations and Roadmaps

Responsible Research and Innovation in Practice

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Responsible Research and Innovation in Practice (RRI-Practice)

RRI-Practice Policy Recommendations and Roadmaps

Deliverable D.16.2. RRI road map, targeted towards the EC

The recommendations in short:

Change the incentive regime to promote an organisational culture for RRI.
Broaden the concept of excellence and impact.
Build capacity and a culture for RRI through training and resourcing.
Support RRI as a creative and adaptive learning process.

Dissemination level: Public



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Introduction

The following policy recommendations aim to support the European Commission (EC) and national policy makers to strengthen Responsible Research and Innovation (RRI) based on insights and findings from the work undertaken in the RRI-Practice project. The recommendations are presented as cross cutting themes emerging from the cross-comparison reports completed for each of the RRI keys (and notably recommendations emerging from these). These cross-comparison reports in turn collate and synthesise insights from the national case studies undertaken by consortium partners during the project. The recommendations were further developed following

a series of deliberations at the final Consortium meeting (Padova, March 2019) which included feedback from the Project's Advisory Board and at a policy-oriented workshop held with stakeholders from the EC and beyond in Brussels in May 2018.

In addition to outlining general recommendations, we provide advice to the EC in the form of more specific actions (roadmaps) aimed at strengthening RRI in Europe. While the recommendations in this publication are about RRI in general, recommendations for each of the so called 'RRI keys' are presented on the RRI-Practice website¹.

What is the purpose of the RRI-Practice project?

The RRI-Practice project responds to the EC SWAFS ISSI-5 2015 topic that focuses on changes to institutional practices and cultures in research performing and research funding organisations, with a view to fostering and embedding RRI as a set of sustained organisational practices. RRI is an interpretively flexible term. One framing reflects a broad ambition for innovation, and science aimed at this, to be undertaken 'with and for society', responding to societal values, needs and expectations in a way that is anticipatory, reflective (e.g. on ethical dimensions), inclusive and open. It can be viewed in this

respect as a broad organising principle. RRI is also related to the advancement of selected actions prescribed within the EC SWAFS work programme: promoting greater gender quality in science, open access to scientific results, public engagement with science, enhancing science education and research ethics and integrity. The project has explored organisational and institutional change in relation to RRI framed in both these ways, while remaining open and sensitive to situated contexts and interpretations of responsibility in research and innovation.

¹ www.rri-practice.eu

What have we done in RRI-Practice?

We have looked at the current landscape of RRI in research funding and research performing organisations and reflected on the barriers and opportunities facing RRI in these organisations, highlighting areas of good or promising practice. We have compared findings across our national case studies, drawing conclusions and making recommendations for organisational change. In the project we have analysed and worked with 23 organi-

sations (e.g. universities and research councils) in 7 European and 5 non-European countries. This work has involved both document analyses and interviews with a broad range of stakeholders. While the main focus in the project is on publicly-funded organisations, it is important to note that RRI also relates to other kinds of organisations beyond those considered in our project (e.g. innovation within private companies).

What have we learned?

Our analyses suggest that most of the organisations we have studied agree that whilst RRI can at times be perceived as being vague and unclear, it still serves as being a useful catalyst for reflecting on the configuration of responsibility norms in research and innovation. They also agree (to varying degrees) that there is a need to adapt and change the research and innovation system, orienting this towards urgent societal challenges and aligning this with societal values, although the socio-political frame for this can vary considerably. Many agree that working more closely and meaningfully with stakeholders and publics is necessary to achieve this change. Our analyses suggest that there also needs to be space and freedom for curiosity-driven research and independent, critical enquiry.

The responsibility norms associated with knowledge production that is not directed at innovation (e.g. norms articulated as research ethics, integrity, conduct and open access) are, in the main, established and, to varying degrees, codified in most of the organisations we have studied. We have witnessed the initiation or continuation of a number of concrete

activities in organisations that are oriented to 'doing better' in these areas. Notable are initiatives promoting greater gender equality in science and open access. That said, our analyses suggest considering gender alone is insufficient, with the need for greater appreciation of diversity in its wider sense and intersectionality (e.g. sexual orientation, ethnicity, special needs, etc). More generally, in a number of the organisations there is significant scope for improvement, harmonisation and implementation of good practice: for example, around public engagement, where activities are observed to be fragmented and often constituted as forms of one-way communication/dissemination, around tackling sexual harassment and around open access, where compliance is currently patchy and understandings of what open access means can vary considerably. Our studies suggest that ethics and integrity can be narrowly constituted and perceived as being a matter of following codes as bureaucratic, 'tick-box' procedures best delegated to dedicated committees and officers. Systematic, critical reflection on the transformative power of science and technology and associated uncertainties is rarely considered

as being part of the current approach to ethics, with little understanding of how to encourage and implement a reflective attitude in practice.

The responsibility norms above also apply to knowledge aimed at driving innovation, whether this is explicit (e.g. new technologies aimed at new products and services) or promissory (e.g. narratives of innovation-led impact potential in grant applications). However, for this modality of knowledge production there are additional responsibility norms implied by RRI: these we find tend to be poorly articulated and poorly codified in the organisations we have studied. Our analyses suggest a lack of engagement with and reflection on how responsibility norms should be (re)configured to account for knowledge production that brings with it expectations of valorisation, commodification and economic and societal impact, often under the umbrella of 'innovation'. Despite the increasing characterisation of research performing organisations as 'entrepreneurial' and 'innovation-oriented' entities, these rely on existing norms of conduct and ethics that, whilst important, are insufficient for addressing the societal interactions and implications of, for instance, artificial intelligence and other emerging technologies.

As a result, we have witnessed numerous ongoing processes of organisational development that are strengthening performance around (largely existing) norms and associated practices framed around one or more of the so-called 'RRI keys'. We have noted for example a number of practices aimed at promoting gender/diversity in science, strengthening research

ethics and integrity, fostering open access/science/data, and programmes of science education, outreach and communication. We believe this advancement of RRI as ongoing practices related to these keys represents the situation in many organisations in the European research system, and possibly beyond.

In contrast, we have seen very little evidence of systematic practices of knowledge co-creation and co-production that accord with the EC's broader definition of and ambition for RRI², integrating capacities for anticipation, reflexivity and inclusion in the design or implementation of projects, programmes or institutions i.e. 'doing differently'. While there is evidence in our organisations of some small scale, creative and inspiring experiments, these tend to be modest, time-limited and not routinely or systematically embedded and sustained in organisations. This reflects a number of significant barriers, including engrained norms, political pressures and priorities, and a lack of resources, incentives, reward structures, infrastructures, training and sustained leadership. The same barriers also present challenges for the furthering of the EC RRI keys, even if these responsibility norms are better established in the current research system.

From these overall insights, we have inferred a number of recommendations for European and national policy makers and organisational decision makers, grounded in our findings and how these relate to organisational theory. The recommendations relate to both individual RRI keys and more generally about RRI as a more integrated conception.

² "Responsible Research and Innovation is an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation... [and] implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society."
<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>

Policy Recommendations

A Change the incentive regime to promote an organisational culture for RRI

Our studies show that, however RRI is framed, current disciplinary norms and organisational incentives present major challenges for practice. Our analyses suggest that stakeholders from across the academic and non-academic spectrum need to see the value in engaging in RRI before they will engage in a meaningful way. There are currently few incentives to engage with RRI, few rewards for engaging, significant trade-offs (e.g. time) and risks to careers (particularly for early career researchers). Recruitment and career progression criteria, and performance evaluation schemes do not sufficiently embed RRI considerations. Changes to incentive regimes are essential for RRI to gain traction and for meaningful organisational change to occur. Organisations should incentivise behaviours configured around RRI principles and then monitor and reward staff for these behaviours, making it attractive to engage in RRI related activities. Indicators linked to research evaluation and career progression instruments in the research system (e.g. related to publications and winning external funding) currently function as significant barriers to RRI and need to be re-assessed. These

indicators of ‘research excellence’ (see below) not only identify where excellent research is being undertaken, but are the foundations of a competitive market system, feeding into funding arrangements, institutional rankings and through this competition for students. RRI faces significant challenges if it is perceived as destabilising or threatening organisational competitiveness in this respect.

Clear incentives for RRI are substantive policy instruments emerging from national funders and the EC. This includes national policies and hard and soft regulatory instruments (e.g. codes and guidelines), linked explicitly to funding arrangements. Our analyses highlight a number of successful policy initiatives in this respect, for example around Open Access. National funders and the European Commission are in a unique position to effect change, as they have the agency, influence and funding instruments. Our studies suggest that this influence has already been demonstrated in areas such as open access, where national policy and involvement in or proximity to EU programmes have been key factors in raising awareness of and fostering individual commitments.

Potential actions in a Roadmap for EC policy makers:

Changes to reward and incentive regimes are on the horizon, but are still not sufficient. Active steps could be as follows:

1. To establish a working group internally in DG RTD. The responsibility of the working group would be to ensure adequate progress in the process indicated below, as well as communication internally in DG RTD/EC and with key external stakeholders.

2. To establish an expert group. The responsibility of the expert group could be I) to propose an overall framework for career progression criteria and performance evaluation schemes that sufficiently embed RRI considerations, and II) to propose concrete models for funders to integrate RRI requirements into calls for proposals. This could link up with the current EC Expert Group on Indicators for Researchers' Engagement with Open Science and its Impacts, the EC Working group on Rewards, the group behind the Leiden Manifesto for research metrics, the former EC Expert group on RRI indicators and the current ALLEA working group on reforming the incentives and reward system in research, as well as other relevant initiatives.
3. When the expert group has concluded, the working group in DG RTD could organise a conference with Member States and key ERA stakeholders. In this conference, the expert group's recommendations could be discussed in order to inform the development of EU policy. The conference would also function as an important policy signal to Member States and stakeholders in the European research system.
4. The working group could then organise a period of public consultation in order to obtain additional views from stakeholders and for further political discussion in the EU. The process could conclude with a Commission Recommendation and a Council Conclusion (of the Council of the European Union) and should be widely disseminated in Member States to influence national policy making.

B Broaden the concept of excellence and impact

Linked intimately to the question of incentive regimes are definitions of research quality and excellence which frame performance evaluation and career progression criteria at organisational and national levels. Our analyses suggest that a narrowly defined understanding of research quality and excellence, and how these are evaluated, is a significant barrier to RRI as RRI is seen to take attention and time away from the pursuit of excellence. We recommend that RRI should be embedded and integrated into quality definitions and evaluations at national and EU levels. Overall, the EC, along with other national funders, should re-evaluate the definition of research excellence and quality, where

these should be assessed to include considerations of how research is to be (or has been) conducted and the quality of that process related to RRI principles. This should be linked to funding instruments. Moreover, promissory statements of 'impact', increasingly sought by funders from grant applicants and reviewed during the application process, should be subject to greater and broader reflection and scrutiny in line with the EC's RRI definition. Our studies show that the impact agenda can be a driver for RRI, especially if impact is understood as positive impact on values embraced by the broader society, and not simply economic added value.

Potential actions in a Roadmap for EC policy makers:

This policy goal is related to the previous one and this topic would have a place in the expert group above, the conference discussions and the resulting policy. However, as the notion of excellence (and impact) is also a matter of norms and values internally in research communities, certain more specific steps could be planned for reaching this goal in the European research system. Here, actions that reach the research institutions themselves would be important, in order to nudge cultural change. Such steps might be:

1. Fund a Coordination and Support Action (CSA) with the specific topic of assessing the concepts of excellence and impact, their current significance and effects on the European research system, alternatives to narrow understandings of excellence and impact, potential consequences of such alternatives, and conditions for successful broadening of these notions internally in research organisations and in the European research system. A specific requirement for the CSA could be to liaise with existing initiatives.
2. Based on the outcomes of this Action, DG RTD could fund a conference with a global scope, with the goal of developing a Declaration on Research Quality and Impact (in a similar format as the Rome Declaration on RRI). This conference could be aimed at researchers interested in the topic, research leaders and policy makers. Significant resources would then have to be dedicated for dissemination of this Declaration.

The DG RTD working group mentioned under A above could be responsible for properly integrating relevant parts of the outcome of the CSA and Conference/Declaration in the policy work on incentives.

C Build capacity and a culture for RRI through training and resourcing

Whilst changes to incentive regimes are essential, these are not sufficient for achieving success if organisations do not build capacity for RRI within their institutions. In several good practice examples highlighted in the project we see that change is the result of persistent, systematic work related to raising awareness, effective communication, changing cultures, investing in organisational infrastructures, establishing commitment and leadership and supporting innovative experiments. RRI should be viewed as a decadal project requiring sustained

commitment, leadership and political will. A key insight from the project is that, overall, the level of commitment and resourcing is currently insufficient. Resources are needed to invest in innovative pedagogies, to change the configuration of research and training programmes in universities and publicly funded research institutes, enhancing professional services and investing in infrastructural support to enable this. Research support functions, we know, can play a very important role in implementing RRI practices. Training at all levels, but in particular

for students and early career researchers, is critical in order to raise awareness and build capacity to rise to the challenge of RRI. Our studies have shown that even in such well-established areas as research ethics and integrity, training can be insuf-

ficient. Combining training with sufficient resources (both time, money, guidance documents and material for training), in combination with changes to incentive regimes is, we suggest, key to change.

Potential actions in a Roadmap for EC policy makers:

This policy goal is closer to roll-out as there are some resources for RRI training already developed in projects like RRI-Tools, HEIRRI, etc. Our studies also show that most research performing organisations would welcome training material and support for RRI related training, so actions to meet this goal would be related to practical measures. The steps here could be as follows:

1. Make a Tender for professional marketing, dissemination and training of RRI. This Tender could call for professionals in the area of pedagogics and could include:
 - a. Establishing a dedicated website with updated pedagogical tools, instructional videos, curricula, etc. This could build on valuable work carried out in the HEIRRI project and elsewhere. It could be set up by a contractor as a project, but when established it should not be dependent on project funding, as projects mostly only have a 3-4 year time horizon.
 - b. Developing printed material for use in training. This could be based on existing resources, but could be improved to be more pedagogically effective, if necessary. This material could be made available for free by DG RTD.
 - c. A network of train-the-trainers in all Member States that would invite national stakeholders to training sessions in RRI.
2. Establish a fund where institutions could apply to participate in training, to give internal courses or to develop material in their respective national languages. There would need to be a predictability to this fund so that institutions (universities, etc.) can plan their training actions over years. The effectiveness and efficiency of this fund could be evaluated after five years. The working group mentioned under point A above could be responsible for setting up this fund and for its subsequent evaluation.

D Support RRI as a creative and adaptive learning process

Our analyses emphasise the need for RRI to be treated as an ongoing, flexible and adaptive learning process. The organisations we have studied are all differ-

ent in nature and are at different stages of development with respect to RRI. They are also located in socio-political contexts that vary considerably across countries.

RTOs (Research and Technology Organisations) are not the same as Universities in terms of their remit, ratio of private to public funding and configuration. In some countries we have studied there is a sense that science, scientific institutions (and funding for these) are under considerable threat and that RRI may serve to (perhaps inadvertently) undermine these even further. RRI implementation needs to be sensitive to these contexts, and needs to draw on a manifold of actors in the organisational environments in order to build RRI coalitions. In this sense, RRI initiatives can build on structures and motivations in institutions (such as the sustainable development goals largely shared by all research organisations or as embedded in quality control procedures), rather than necessarily conceptualising this as a normative shift to something completely new.

Our studies also highlight the importance of creativity. The ability to experiment, make contributions however small, take risks, learn from failure and be creative in novel and innovative ways is key. RRI should be seen as an opportunity to open up and be creative rather than close down and restrict ideas. From

the RRI-Practice studies, we have identified successful RRI experiments that encourage researchers to be reflexive about their own values and assumptions in their scientific fields and about the future, be open to constructive criticism and prepared to change their research in response to new developments or stakeholder concerns.

In the course of such experiments, researchers and stakeholders can experience the added value of engaging with RRI in a positive way that builds communities, capacity and learning. Experiments can also give visibility to universities and RTOs as innovative organisations committed to creating positive change. However, in order for such experiments to effect more sustainable change in the research organisations sustained, top-level support and resourcing are critical. Pilot projects should serve to inform and catalyse organisational change with clear organisational goals and criteria for success. Such success criteria must be related to real change in researchers' (and research leaders') perceptions, behaviours and actions, as a process of adaptive learning and transformation.

Potential actions in a Roadmap for EC policy makers:

The role of the EC in this policy goal would be support and coordination. We consistently see that RRI experiments are local and uncoordinated, and that there is a need for a structure for learning across institutions here. The steps here could thus be:

1. Set up an annual RRI award, for instance in the model of the EFARRI Award. This could be broadly marketed and the prize should be attractive. It could include a financial award for the responsible institution, meant for upscaling experiments. It could also include an award event with significant prestige, for instance a prize ceremony with the Commissioner for Research and Innovation at the annual conference of the European Open Science Forum (ESOF).

2. Based on the nominated cases received for the award in step 1, a webpage could be set up that disseminates such good practices, in order to create learning across the European – and global – research policy landscape. This could also include lists of individuals that would be willing to assist in organising such experiments, creating a flow of expertise across Europe and globally. This website could be connected to the website in point C above. The webpage could be the responsibility of a dedicated person in DG RTD, but in order to ensure appropriate anchoring in the DG it could relate to a broader working group, which could be the internal working group from point A above.

Annex: Relation to the EC Open Science policy

Our recommendations relate to actions in the EC Open Science policy, as described in the Expert Group on Indicators for Researchers' Engagement with Open Science and its Impacts, the Open Science Working group on Skills and the Open Science Working group on Rewards. In the RRI-Practice project we support the focus on Open Science, but would like to highlight the differences between an Open Science strategy and RRI:

- RRI recognises that innovation is socially, politically and ethically entangled, not an apolitical thing and it tries to come to grips with the broader ethical, social, environmental and political dimensions of science, technology and innovation as they are happening.
- Open Science obviously includes the RRI key Open Access. Open Science can also, to a certain extent, include the RRI keys societal engagement and science education, as more open science will provide more information to the public. Moreover, citizen science (sometimes included in the Open Science agenda) can strengthen science education, and when it enables citizens to influence research agendas, methods or outcomes, can be seen as a form of societal engagement.
- While research integrity is sometimes mentioned as an effect of the Open Science policy (as more open science facilitates better peer review), opening up science in itself does not imply a greater focus on ethics of research agendas and conduct.
- On the contrary, the real value of Open Science seems to better come to the fore when responsibility in research and innovation is expressed as the overall value of Open Science. So Open Science is a means for responsibility; RRI is not a means for Open Science. In addition to including openness in science, responsibility in research and innovation needs to be anticipatory,

inclusive, reflexive and responsive, including considerations of fairness (social, gender, etc.) and sustainability (ref. the EC Expert Group on policy indicators for RRI).

We recommend to build on the important work carried out in the Open Science policy, but expand this from a more narrow focus on open access, open data, etc. to incorporating all aspects of RRI. This is also expressed as an expectation shared by many in the *Validation of the results of the public consultation on Sci-*

ence 2.0: Science in Transition, EC 2015: 'A substantial number of respondents are in favour of extending the scope of open science. These include issues such as scientific integrity, societal relevance of research, and reviewing the science-policy relationship'. We therefore propose a new external expert group. The current Open Science working group does not have competence on all aspects of RRI and does not have a scope that covers RRI as a more integrated approach to responsibility in research and innovation.

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This document is available on the project's website:

www.rri-practice.eu/knowledge-repository/recommendations/



Photo: The RRI-Practice consortium, Oslo, September 2016

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