

Monitoring the Evolution and Benefits of Responsible Research and Innovation - MoRRI

# Presentations MoRRI final event (D15) PART 1

Day 2 – Discussions on policy aspects

**Final Event – Discussion on policy aspects**

Date: 7 March 2018

Location: Fondation Universitaire – rue d’Egmont 11, Brussels

# Presentations

- RRI in the making: the researchers' perspective – Ralf Lindner
- Impacts of RRI: Findings from case study programme – Erich Griessler
- Clusters and indicators – Niels Mejlgaard
- Responsible metrics for RRI – Ismael Rafols
- Limits in measurement – Ingeborg Meijer

# RRI in the making – the researchers' perspective

Ralf Lindner, Fraunhofer ISI

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# Content

- Aim of the study
- Database
- Familiarity with RRI
- RRI in practice
- Main motives
- Perceived and observed benefits
- Supportive factors and barriers
- Discussion

# Aim of the study

- Analyse the activities and attitudes towards Responsible Research and Innovation (RRI) among researchers in Europe;
- Find out more about the benefits, but also about costs and risks when considering and implementing RRI issues in research and innovation projects and organizations;
- Analyze how perceptions and behavior are influenced by professional orientations (e.g. challenge versus curiosity driven research frames), institutional strategies (e.g. the existence of a Gender Equality Plan) and socio-demographics such as gender, academic age, scientific discipline and the institutional or national background;
- Investigate whether the EU funding context makes a difference regarding attitudes and activities towards RRI.

# Database

- Main target group: European researchers who had received EU-funding (H2020);
- Sample: over 22.000 researchers
- Response rate: very encouraging with over 3.000 responses and 2.700 completed questionnaires;
- In addition, we also included a control group approach – that is, researchers who did NOT receive any EU-funding within in the past 5 years.
- The control group was based on selected main characteristics of the EU researchers' group: country of work, gender and scientific discipline. We used the Scopus Author IDs to compile the control group.

# Database

	EU Database	Control Group
Number of contact persons	22,947	25,968
Net sample	22,274	17,723
No. of valid responses	3,117	1,264
No. of completed questionnaires	2,755	723
Response rate	14.0%	7.1%
Completion rate	12.4%	4.1%

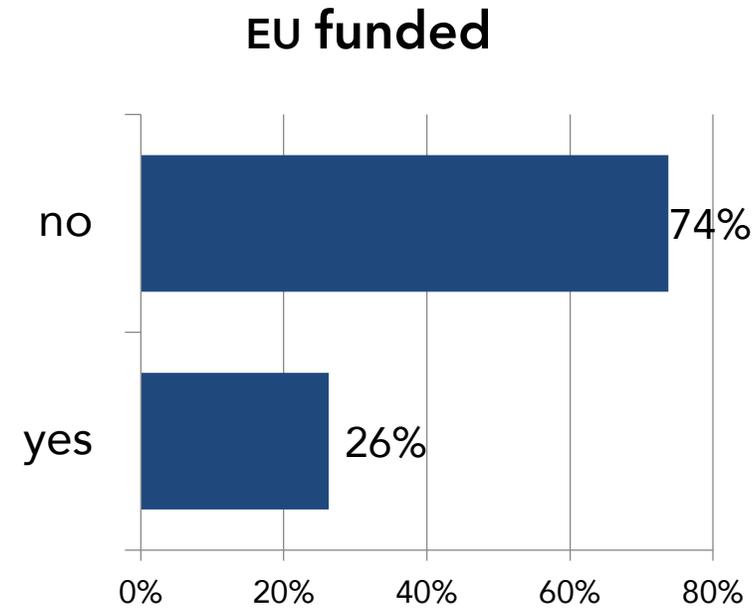
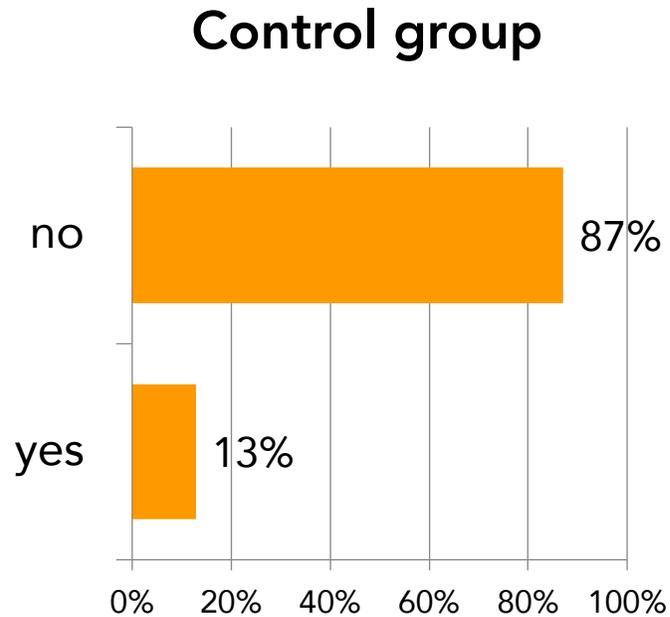
# Familiarity with RRI

## Key findings:

- The majority of the respondents is not (yet) familiar with the concept of RRI. But EU-funded researchers mention much more frequently that they know the concept compared to researchers from the control group;
- Those who indicated they had heard about RRI do not always associate it with the same dimensions that underlie the EC's RRI concept: only ethics, public engagement and open access are among the top five categories;
- Sustainability and transparency seem to be important properties of RRI in the understanding of the survey respondents.

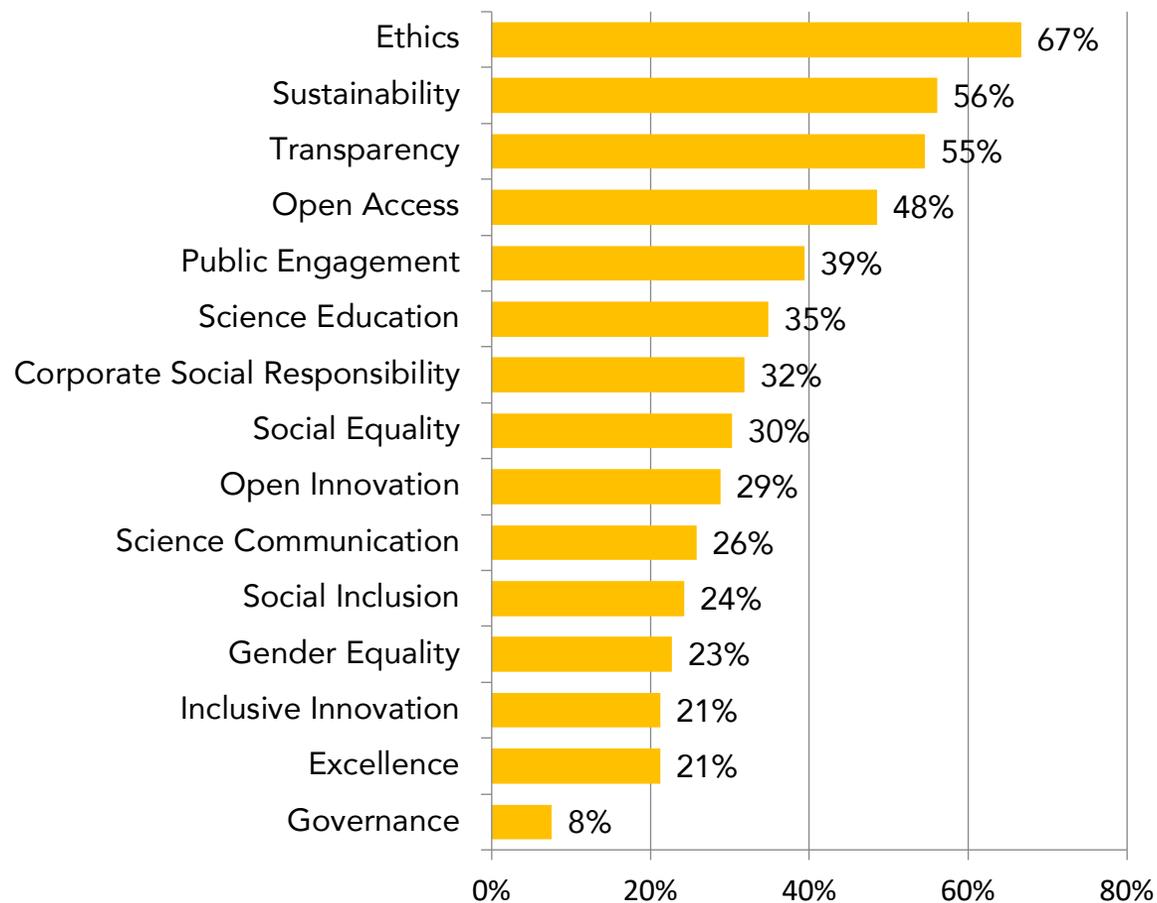
# Familiarity with RRI

Have you ever heard about the concept "Responsible Research and Innovation (RRI)"?

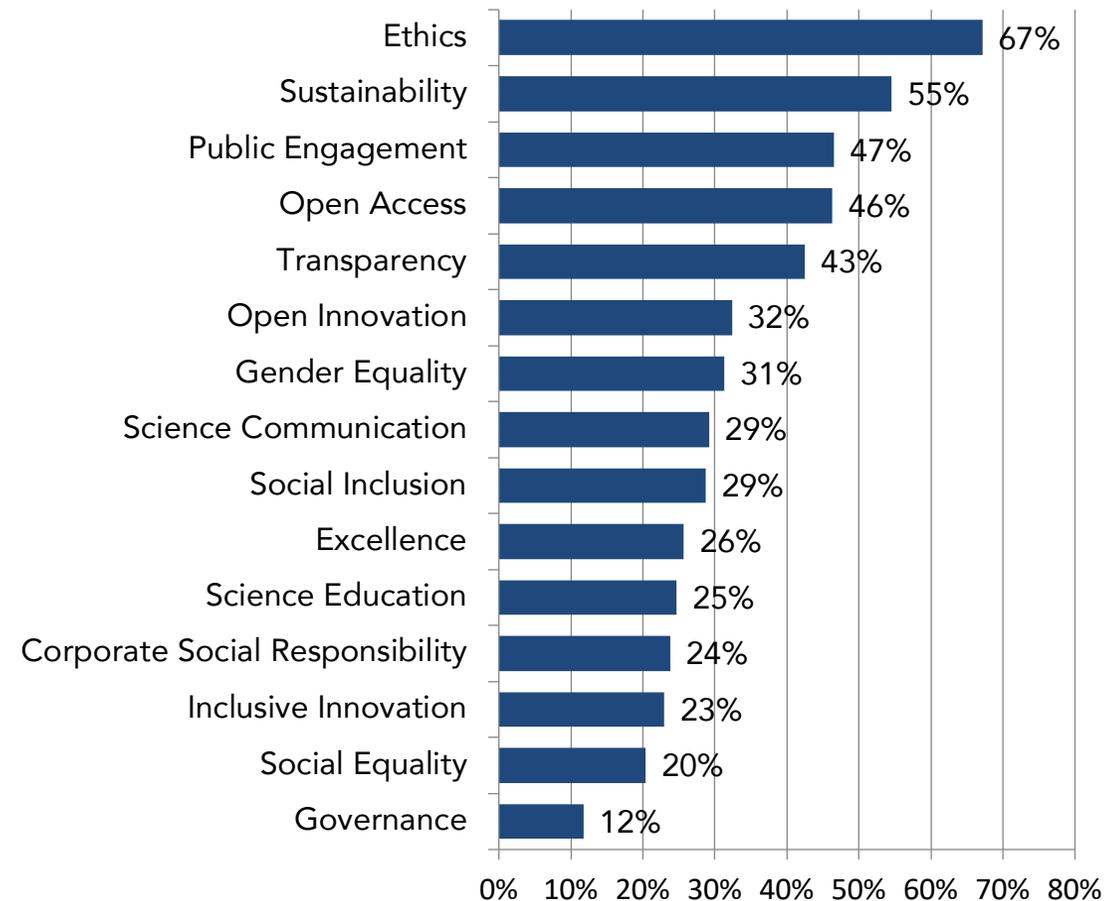


# Familiarity with RRI

## Control group



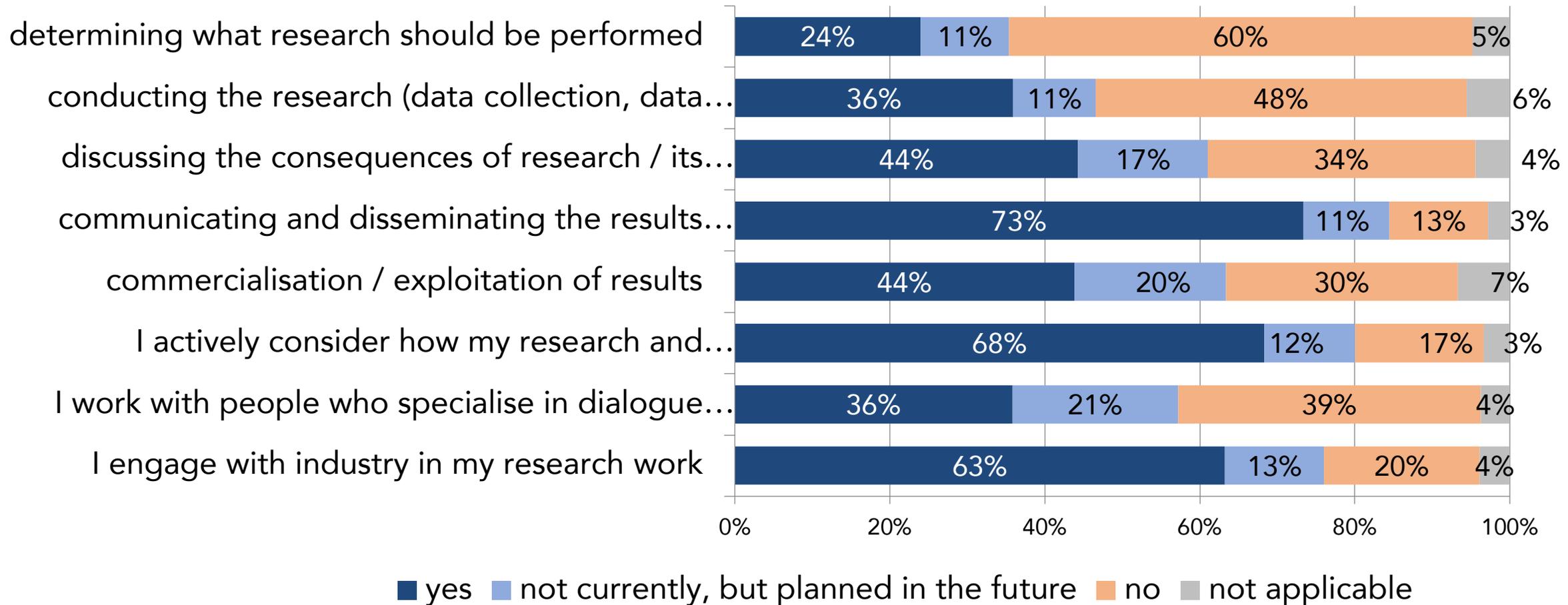
## EU funded researchers



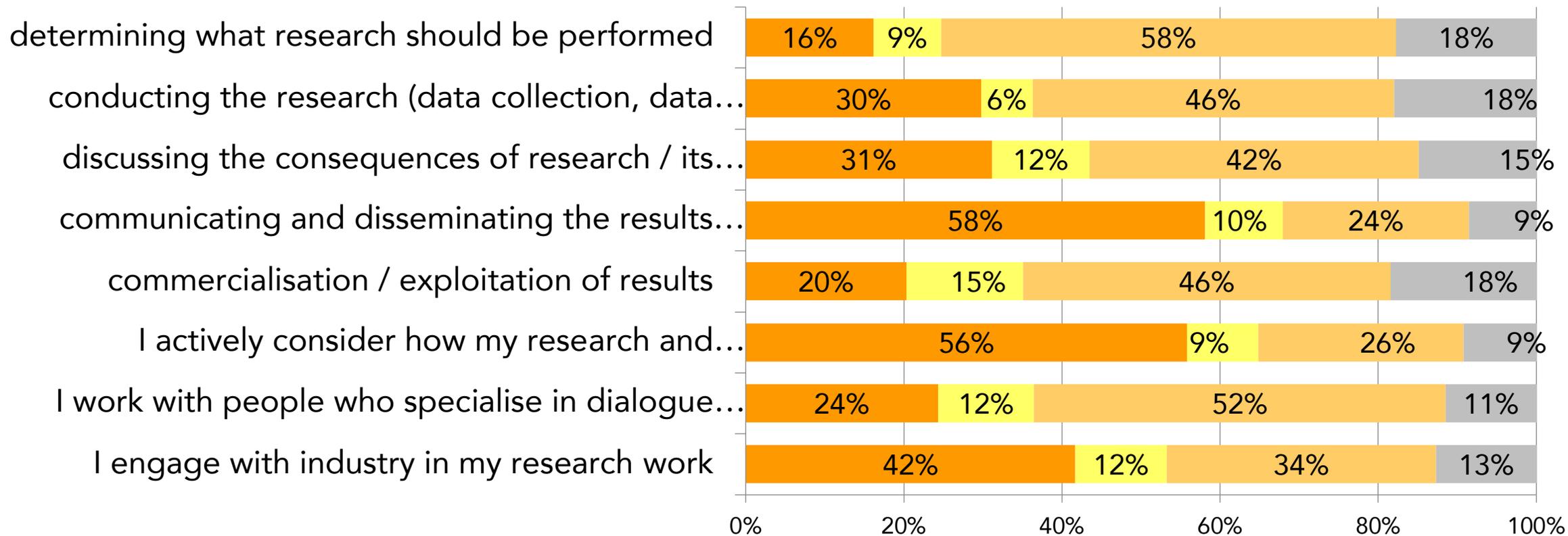
# RRI in practice

- Even if only a minority of researchers is familiar with the specific term „RRI“, many actually practice RRI;
- In the field of public engagement, it can be shown that the majority of researchers communicate and disseminate their research results to a wider public and also frequently reflect how the results will be used. Also close collaboration with industry is frequently mentioned. In addition, 24% of the EU-funded researchers even involve the public in determining which research should be performed;
- Regarding science education, articles in newspapers and blogs but also public lectures are rather common;
- Overall it can be observed that EU-funded researchers seem to be more inclined to engage in various RRI activities than the control group.

# RRI in practice: Public engagement (EU funded)

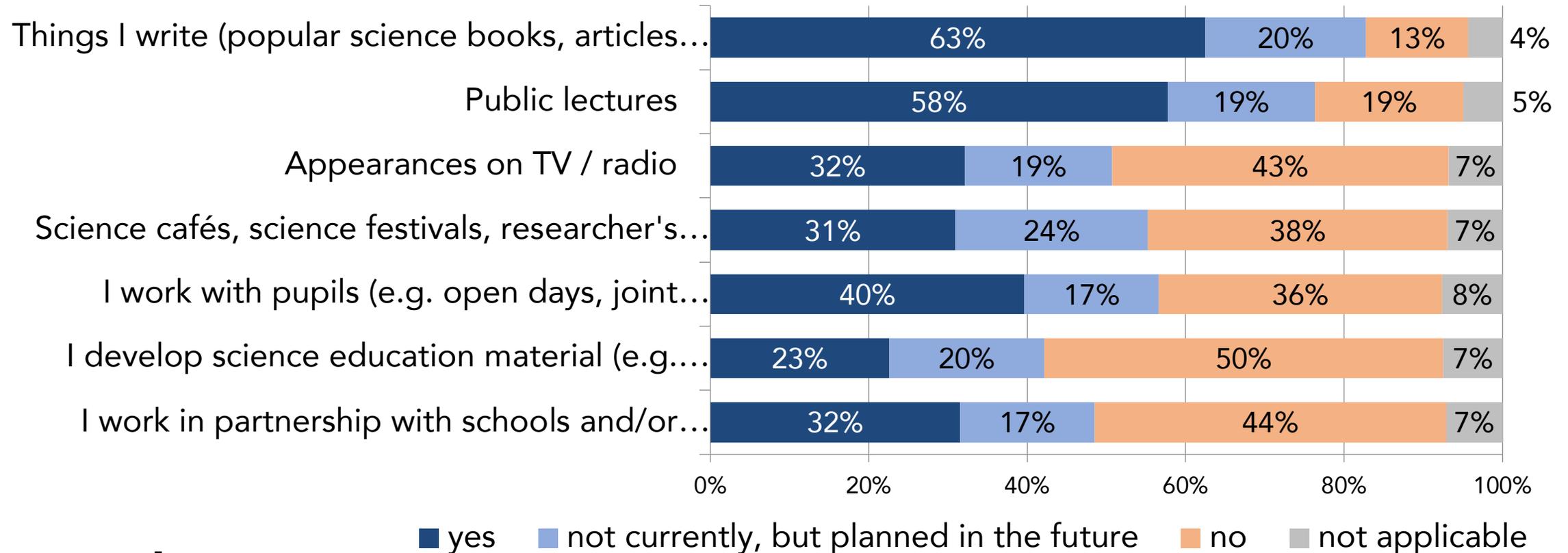


# RRI in practice: Public engagement (Control group)

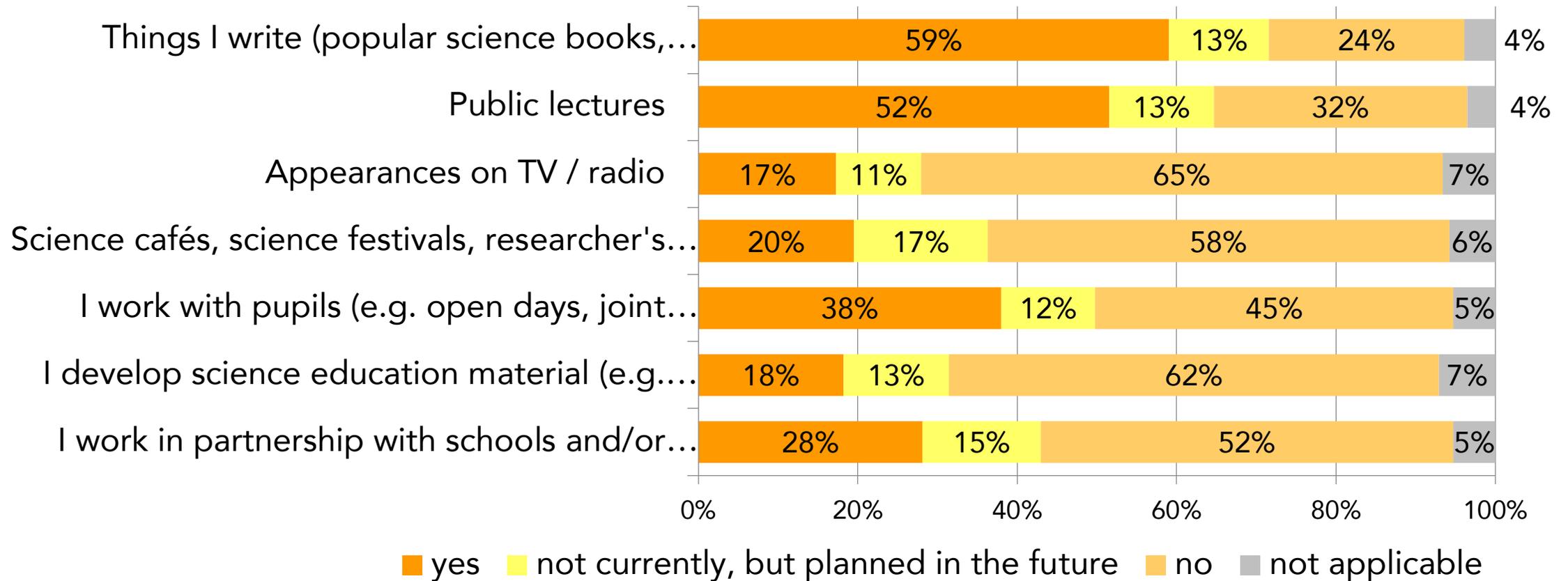


■ yes 
 ■ not currently, but planned in the future 
 ■ no 
 ■ not applicable

# RRI in practice: Science education (EU funded)



# RRI in practice: Science education (Control group)



# Main motives

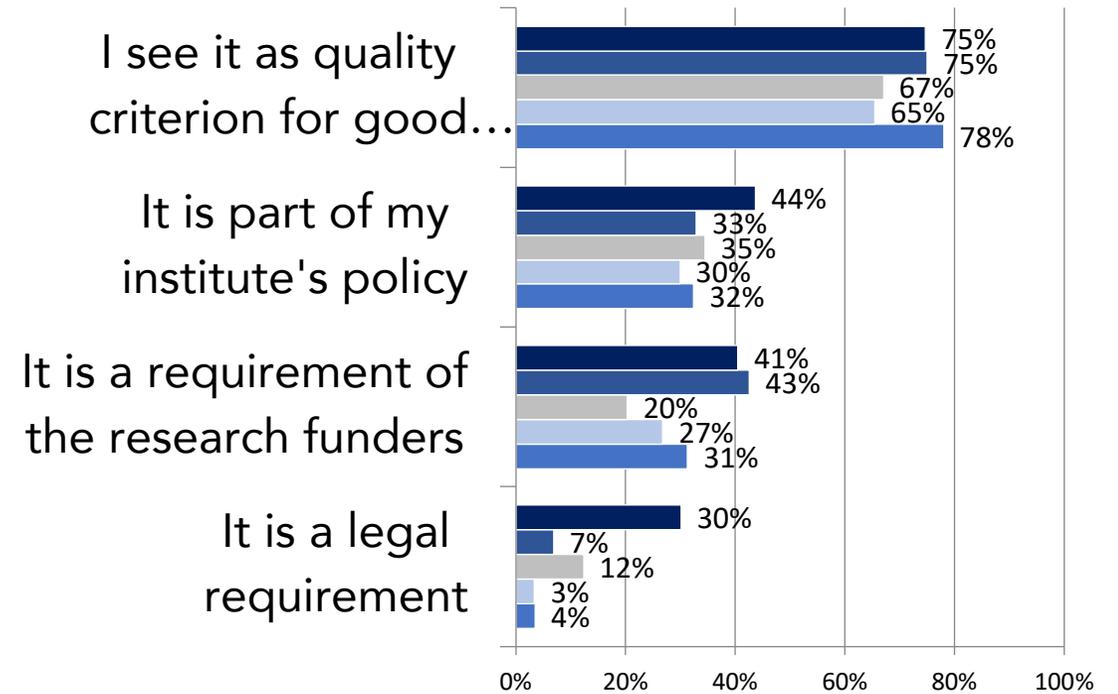
- We then asked the researchers about motives to engage in RRI activities („What is the main driver for RRI activities mentioned above?“)
- Here it is notable that large shares say that they see the RRI activities as quality criteria for good research – both EU-funded and in the control group.
- The second largest share of responses indicate that these activities are part of the institutional requirements or policies in which the researchers are based.

# Main motives

## Control group



## EU funded



- Ethics
- Gender Equality
- Open Access
- Science Education

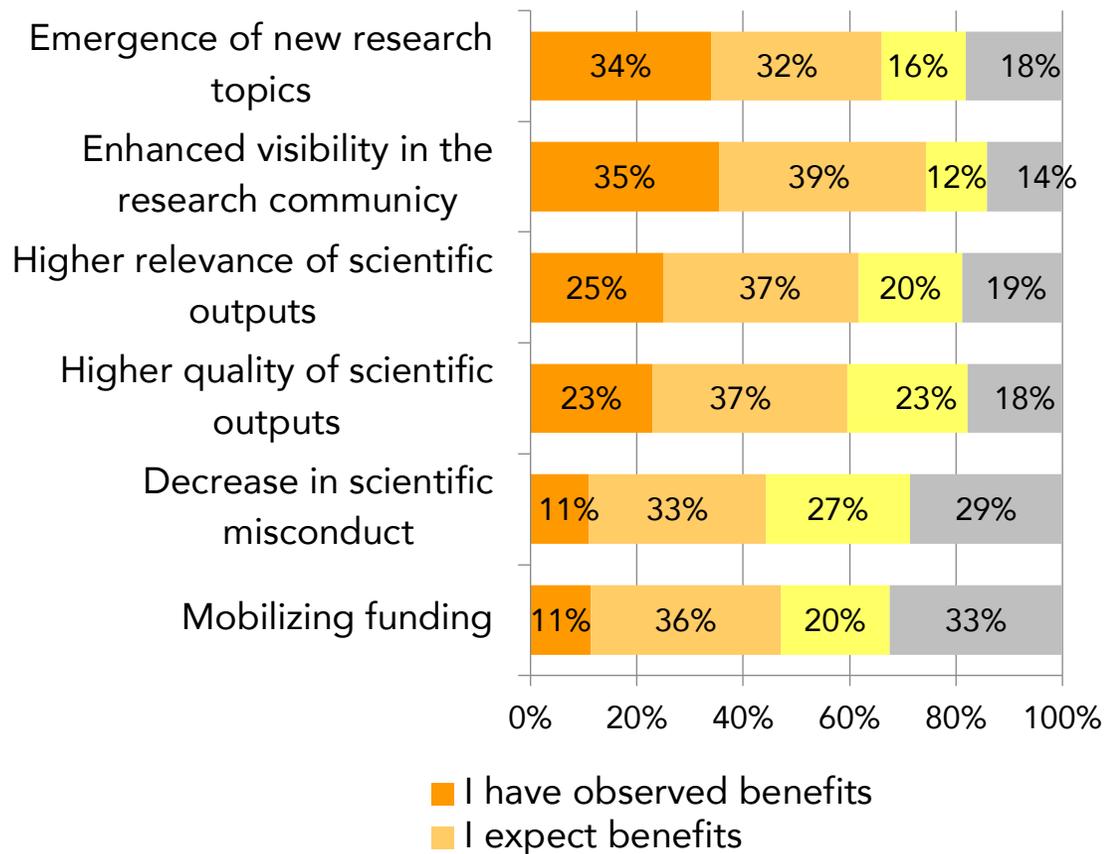
- Ethics
- Gender Equality
- Open Access
- Science Education

# Perceived and expected benefits

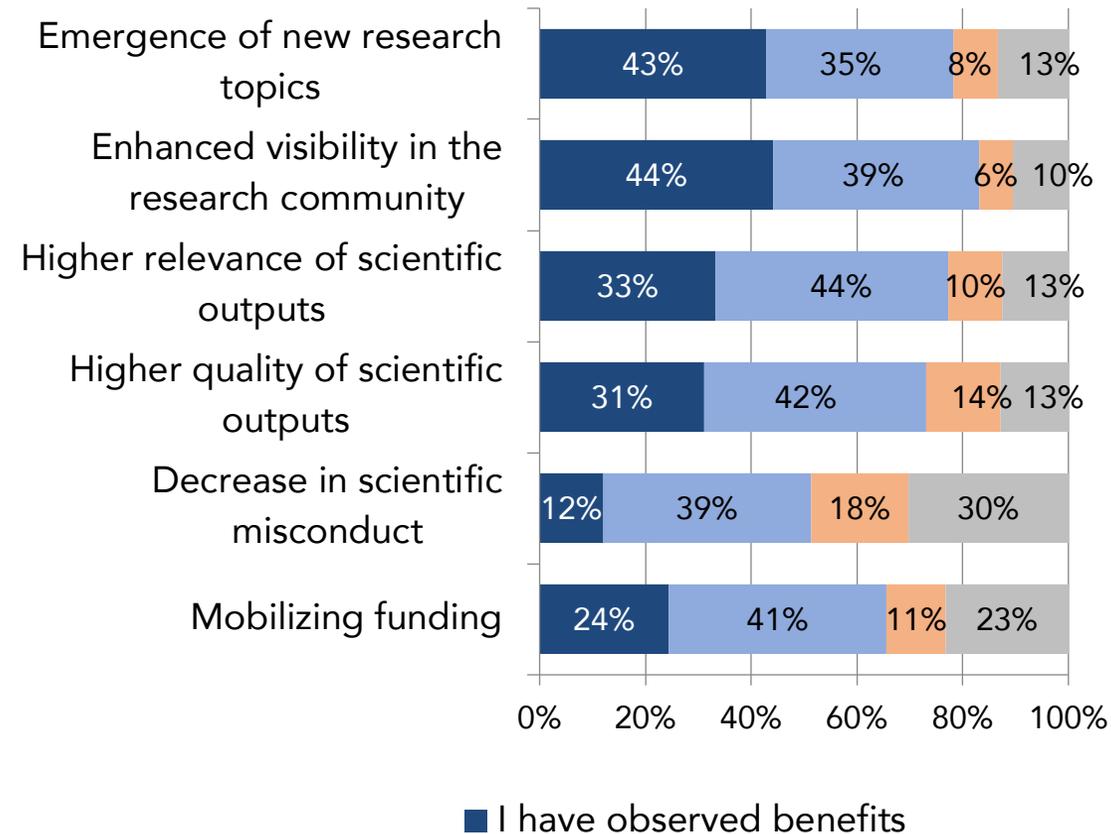
- Given the novelty of the RRI concept for most respondents, we asked about their perceptions and expectations regarding potential impacts of RRI. We structured the RRI benefits according to scientific, economic, democratic and societal benefits.
- First the **scientific benefits**: We asked: „Do or did you observe or expect any of the benefits listed?“
- For us – surprisingly – in both groups only a minority does NOT expect any benefits from RRI. This is particularly the case for the EU-funded researchers.
- The most important benefits associated with RRI are:
  - Emergence of new research topics
  - and better visibility in the research community.
- But also aspects related to scientific excellence – such as relevance for scientific output and quality – rank surprisingly high. This actually runs counter to many controversies about RRI which see scientific quality at risk if RRI is rolled out more broadly.

# Perceived and expected benefits

## Scientific benefits (control group)



## Scientific benefits (EU funded)



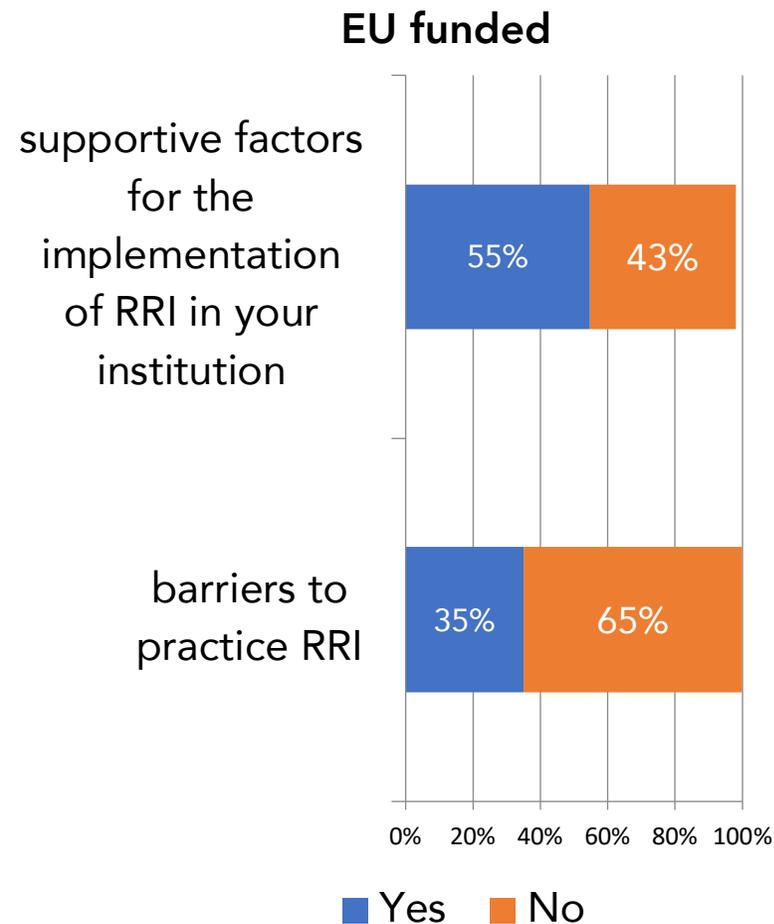
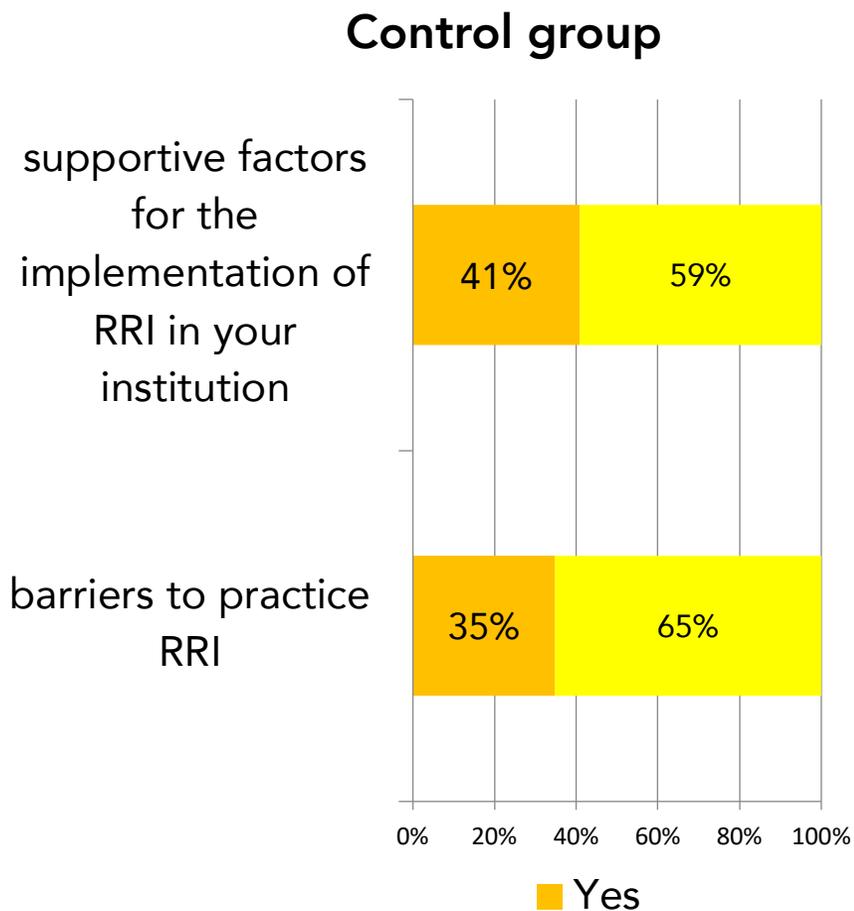
# Perceived and expected benefits

- Regarding the **economic benefits**, we see a similar pattern as with the scientific benefits. But here a higher share sees no potential economic benefits associated with RRI. But still – this view is only shared by a minority.
- Contributions to innovation and to diffusion are identified most often.
- Regarding **democratic benefits**, similar pattern occur again – we see that EU-funded researchers expect more benefits than the control group.
- In total, less benefits were observed than in the other areas (scientific benefits)
- And finally the expected **social benefits**: Same patterns again – only a minority doesn't associate social benefits with RRI. Interesting difference between the two groups:
  - The greatest benefits seen by the EU-funded researchers is about an expected increase in scientific interest,
  - whereas the control groups think RRI will contribute to a changed approach to risk.

# Supportive factors and barriers

- We asked the two respondent groups if they observe any supportive factors for the implementation of RRI and if they see any barriers to practicing RRI in their institutions.
- The EU-funded researchers see slightly more supporting factors than not; and at the same time they also point to barriers.
- This barrier question makes no difference between the groups, but the control group sees significantly less supporting factors in their environments.

# Supportive factors and barriers



# Supportive factors and barriers

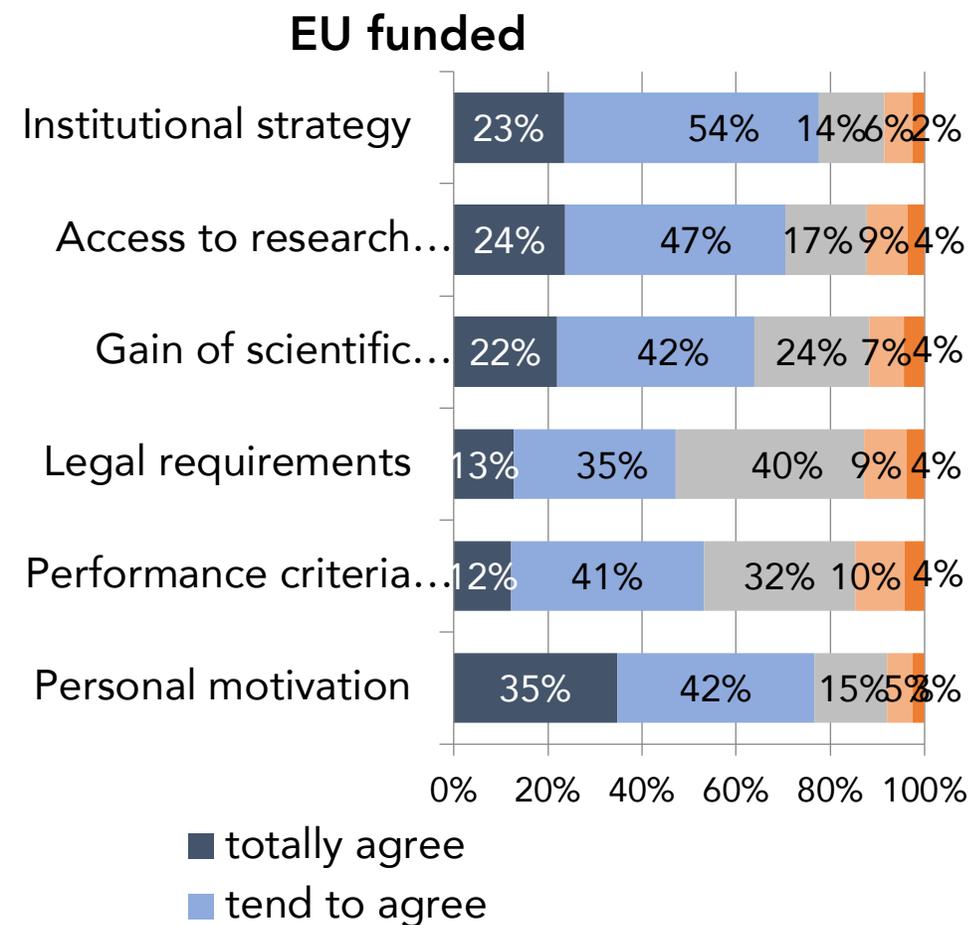
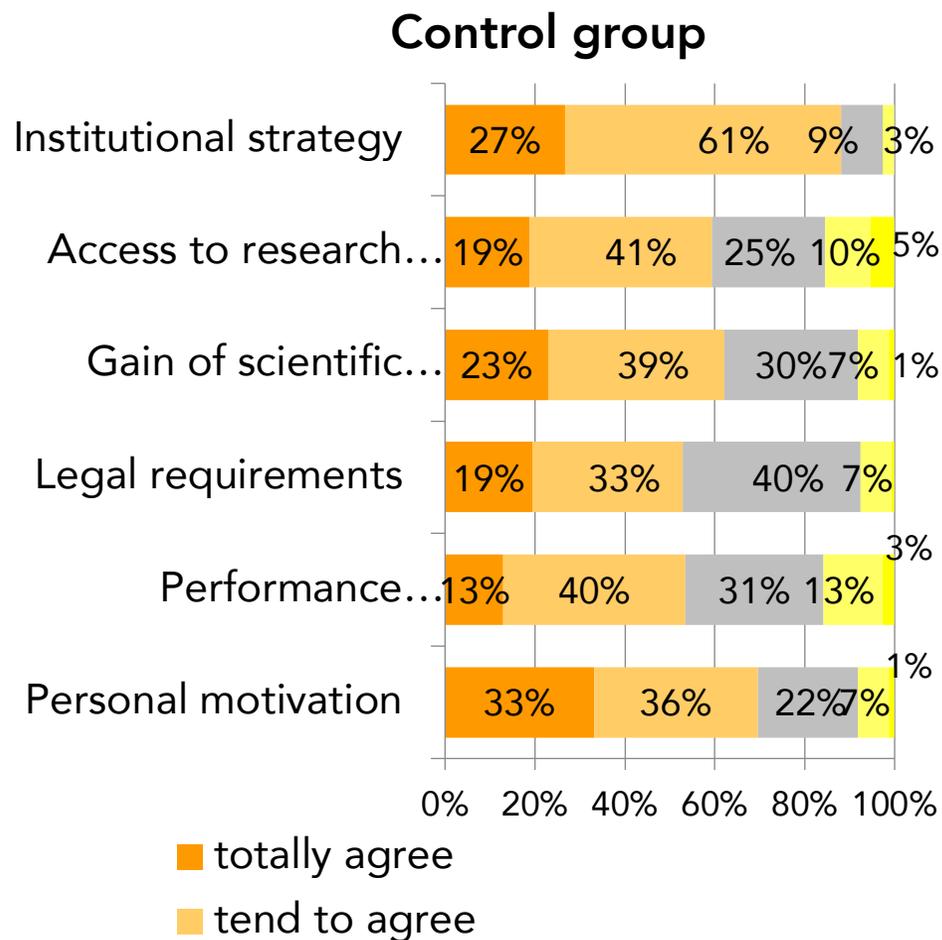
Additionally we asked the respondents to specify the **supportive factors** at their institutions:

- We see that there are nearly no differences between the groups re perceptions of supporting factors.
- Most important supporting element: personal motivation, followed by a more structural factor (institutional strategy).
- And again: the potential gain of scientific excellence is clearly emphasised.

If we also look at the **barriers** observed in the researchers' institutions, we can state that:

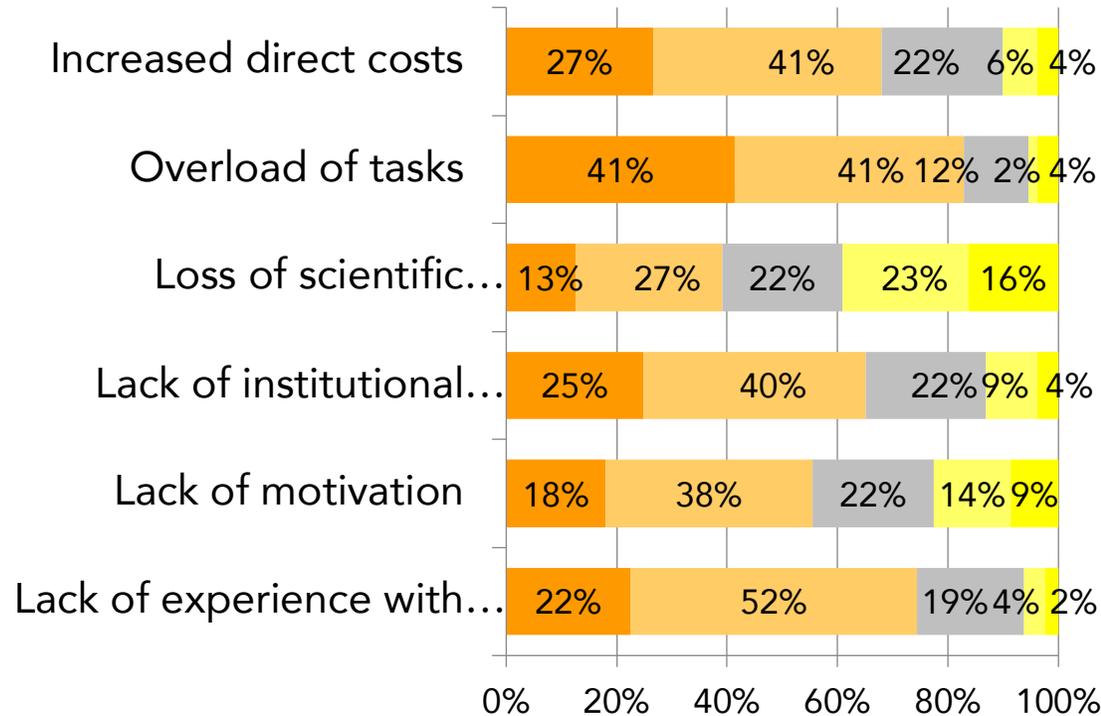
- The control group perceives barriers much more than the EU-funded researchers.
- Both groups see the greatest problem in a potential overload of tasks. And again very interestingly: a loss of scientific excellence does not seem to be an issue.

# Supportive factors



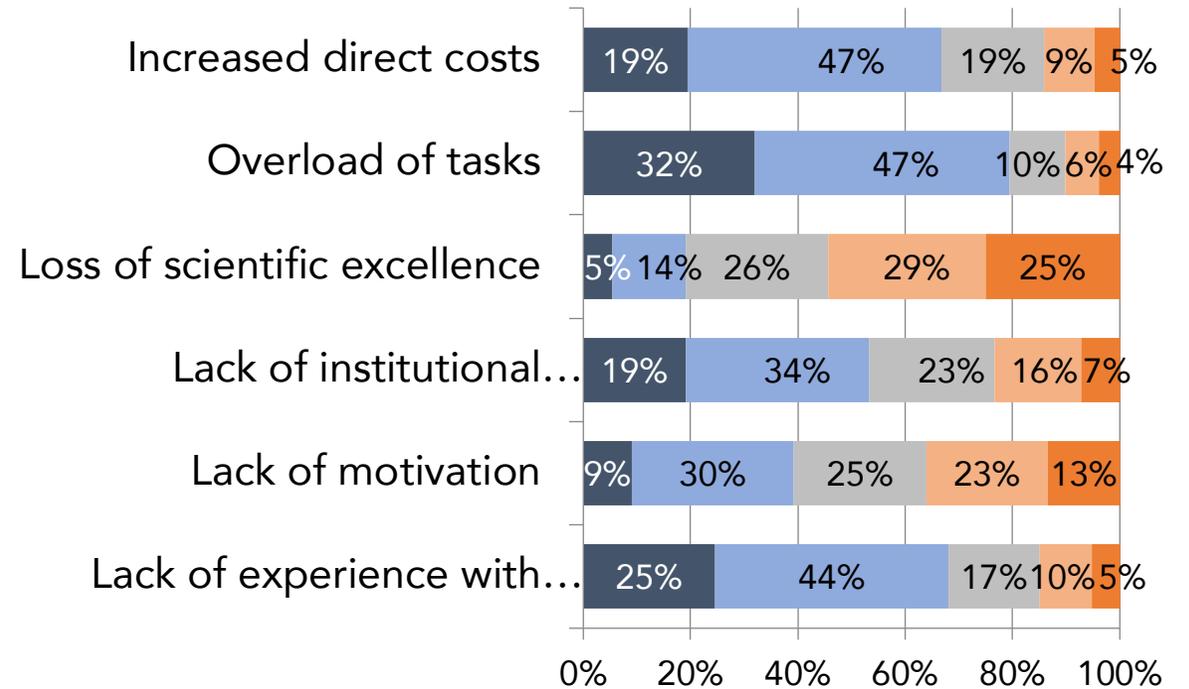
# Barriers

## Control group



■ totally agree  
■ tend to agree

## EU funded



■ totally agree  
■ tend to agree

# Discussion

- The EC's RRI mainstreaming efforts make a difference to the perception and practice of RRI:
  - EU-funded researchers are more familiar with the concept of RRI
  - They associate more benefits and supporting factors with RRI than researchers from the control group
  - They are more likely to practice activities related to the five key dimensions of RRI, i.e. open access, gender equality, science education, public engagement and ethics
- The institutional environment can positively influence the degree of RRI activities and the general attitudes towards more responsibility in research and innovation: Researchers working in an institutional environment that systematically supports RRI are more active in RRI practices than researchers who cannot rely on such structures.

# Discussion

- Factors which influence the practice of RRI and its perceived benefits are the scientific age and the scientific discipline of the respondents.
- The respondents report numerous benefits which have already been observed, particularly scientific and economic ones. Even if concrete benefits have not yet been observed, the respondents are still quite optimistic that these benefits will occur in the future. This attitude also applies to the control group.
- The respondents perceive more supportive factors than hindering ones. From the respondents' viewpoint, the most important supportive factors are personal motivation and the institutional strategy.
- The most important barrier is a strong overload of tasks. Lack of knowledge also acts as a barrier.
- The five RRI keys do not fully comply with the subjective views of researchers in Europe. In particular, the concepts of sustainability and transparency are worth being considered as important elements of RRI.

# Thank you for your attention

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Monitoring the Evolution and Benefits of Responsible Research and Innovation - MoRRI

# Impacts of Responsible Research and Innovation – Findings from Case Study Program

Erich Griessler, Alexander Lang, Milena Wuketich, Silvia Hafellner,  
Wolfgang Polt and the MoRRI Consortium

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# Objective

- ... to conduct in-depth case studies in order to analyze
- societal,
  - democratic and/or
  - economic benefits of certain dimensions of RRI
  - ... and added scientific benefit later

# 6 Keys

- Public Engagement
- Gender Equality
- Science Literacy and Scientific Education
- Open Access
- Ethics and Governance

# Case study program: Design

- 3 recursive cycles of case studies that build upon one another
- Objective: to fill all cells of the case study matrix as regards RRI dimensions, areas of benefit; providing variation of organisations/institutions
- Altogether 21 case studies
- 1<sup>st</sup> cycle:
  - Screening 67 EU funded projects
  - Selection of four case studies
- 2nd and 3rd cycle
  - Bottom-up approach involving consortium partners and dimension leaders to identify suitable cases
  - New case study templates developed
  - 17 new empirical case studies

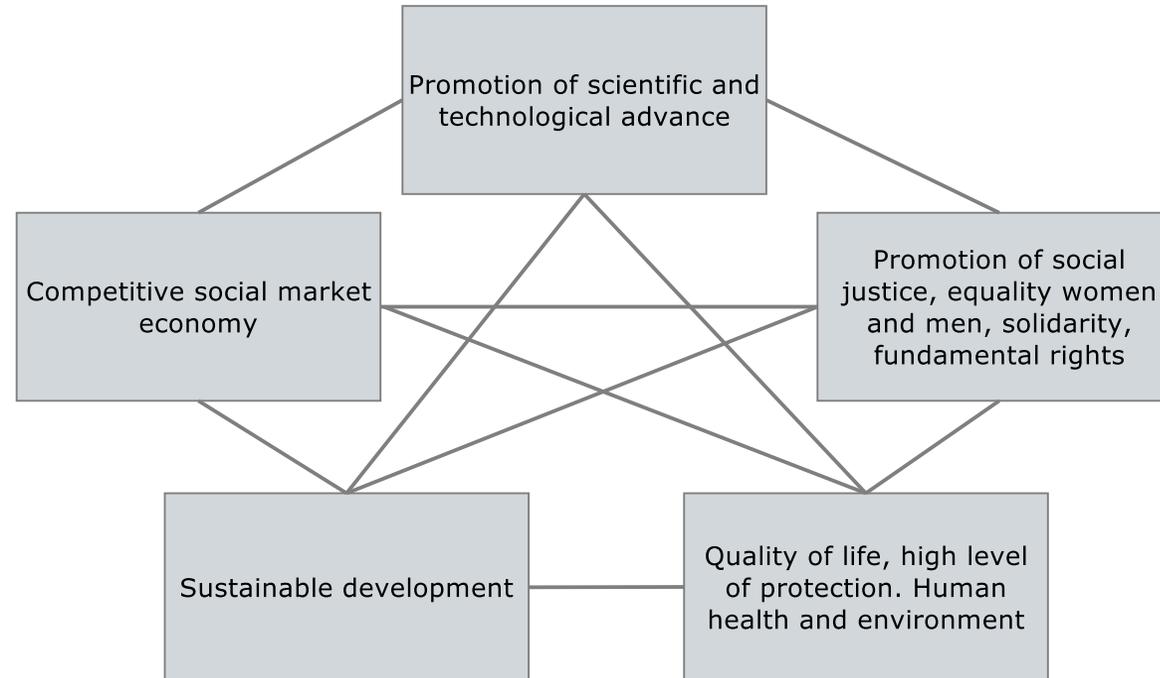
# Case Studies

No.	Case Study
01	Bridging the gap between science, stakeholders and policy-makers. Phase 2: Integration of evidence-based knowledge and its application to science and management of fisheries and the marine environment (GAP2)
02	Impact of Citizen Participation on Decision-Making in a Knowledge Intensive Policy Field (CIT-PART)
03	Women in Innovation, Science and Technology working group (WiST)
04	Promoting inquiry in mathematics and science education across Europe (PRIMAS)
05	Institutional Efforts to Ensure and Enhance Responsible Conduct of Research: Lessons Learned from Aarhus University
06	Gender and affirmative action: Lessons Learned from the Danish Council for Independent Research (YDUN)
07	Research Council of Norway
08	Austrian Agency for Research Integrity
09	European Molecular Biology Organization (EMBO)
10	UK Science Media Centre
11	Open Air Laboratories (OPAL)
12	National Open Access Policy in the Netherlands
13	Participatory Action Research (PAR) in Environmental Management
14	Nanotechnology RRI in the Netherlands
15	Infineon Technologies Austria AG
16	AVL List
17	FemPower Bonus for Female Project Leaders
18	Gender Criteria of the Austrian Science Fund (FWF)
19	Institute of Gender in Medicine at the Charité University Medicine Berlin
20	The European Bioinformatics Institute (EMBL-EBI)
21	ETH Zürich

# Impact I

- Democratic: impact of RRI on the democratic and political system of society
- Societal: various forms of impact of RRI on society in a broader sense
- Economic
- Science and Research: on the science and research system itself

# Impact II: Normative anchors points derived from the Treaty of the European Union



Source: von Schomberg 2013: 11

# Potential benefits of RRI in Public Engagement

Democratic	Societal	Scientific	Economic
<p>Involvement and participation contributes to citizen empowerment and more qualified decision-making (Smith, 2005; CS01, CS02, CS03, CS11, CS13).</p> <p>Including citizen knowledge into policy-making strengthens the democratic system (CS01, CS02, CS13; Newton and Geissel, 2012).</p> <p>However, unreflective public engagement (...) can close down vital debates in contentious areas (Stilgoe et al., 2014, p. 11).</p>	<p>Public gains knowledge and competences, which again can lead to higher awareness and more openness towards certain topics (CS01, CS02, CS11, CS13, CS14).</p> <p>Debate/communication between actor groups leads to new actor coalitions, new networks and increased trust building – especially between powerful and marginalised groups (CS01, CS02, CS11, CS13, CS14).</p>	<p>Addressing societal needs and RRI aspects leads to new and different research questions and outcomes (CS11, CS13).</p> <p>Participatory methods help to access previously unavailable data (e.g. Citizen Science) (CS02, CS13).</p> <p>Public engagement methods help researchers to acquire new skills (CS13).</p> <p>Improves higher education curricula (CS11, CS13).</p> <p>Inclusion of public into science and agenda setting (CS02, CS11, CS13).</p> <p>Public engagement increases sciences' direct and indirect contribution to and exchange with society (Vargiu, 2014; CS13).</p>	<p>Stakeholder involvement leads to cost-effective new outcomes and procedures (CS01, CS11, CS13, CS14).</p> <p>Public engagement mobilises additional research funding (CS02, CS11).</p> <p>Collective data collection and data usage generate cost savings (CS02, CS11).</p> <p>Knowledge can be generated about previously inaccessible areas (CS11).</p>

# Potential benefits of RRI in Gender Equality

Democratic	Societal	Scientific	Economic
Including gender sensitive research could contribute to better policy making, but can be curtailed by lack of funding (CS19).	<p>To increase the share of female researchers and female researchers in leading positions in R&amp;I is an intrinsic societal benefit (CS04, CS06, CS17, CS18).</p> <p>Society benefits from better targeted and diverse research and products for all of the population which has positive effects on different fields of society, e.g. in health (EC, 2013; CS17, CS19).</p>	<p>Addressing gender aspects in research leads to new and different research questions and outcomes (CS19).</p> <p>Diverse and inclusive scientific workforce is a benefit itself (Gilmer et al., 2014; CS04, CS06, CS17, CS18).</p> <p>Inclusion and diversity of researchers, teams, organisations, topics, and analysis lead to higher research quality and excellence (EC, 2013; Lipinsky, 2014; CS06, CS17, CS19).</p> <p>New gender-aware curricula are developed (CS19).</p>	<p>Involving different perspectives increases the quality of R&amp;I and therefore improves products and company performance (EC, 2013; Catalyst, 2014; CS03, CS15, CS17, CS19).</p> <p>Products (e.g. medicinal products) that match better with every part of society save costs and create new markets (CS17, CS19).</p> <p>Includes untapped human resources and creates a more diverse workforce (Gilmer et al., 2014; CS06).</p>

# Potential benefits of RRI in Science Literacy & Scientific Education

Democratic	Societal	Scientific	Economic
<p>Scientifically literate policy makers can make better-informed decisions and are able to assess risks and benefits of research and innovation (CS10, CS13).</p>	<p>Measures, promoting science literacy (information, training and participation) help society to better understand and participate in science (Miller, 1983; CS04, CS10, CS13).</p> <p>Both low and high ability students benefited from teaching, which contributes to an equal society in terms of chances for education (CS04).</p>	<p>Science literacy and science education raise awareness for societal impact of science and technology (Miller, 1983).</p> <p>Better information improves the image of science in society and makes public debates on science more informed (CS10).</p> <p>Science literacy and science education increases the numbers of competent students and researchers qualified to conduct science (CS04)</p>	<p>Science literacy and science education increase the number of a highly competent labour force (CS04).</p>

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# Potential benefits of RRI in Ethics and Governance

Democratic	Societal	Scientific	Economic
<p>Existing democratic institutions are strengthened or new ones are established (CS01).</p> <p>Instalment of new and transparent institutional practices contribute to trustworthy science as one basis for policy making (CS05).</p>	<p>Trust-building and facilitation of communication between different actor groups (scientists, policy makers, stakeholders) through ethics activities (CS01).</p> <p>Safer and more sustainable research and development that reduces negative externalities, e.g. by reducing negative effects on society and negative impacts on the environment (CS15, CS16).</p>	<p>Reputational gain and increase in trust in science and research (CS05, CS08, CS10).</p> <p>Increased funding chances because of improved reputation of scientific institutions and new funding opportunities (CS07, CS08).</p> <p>Change in scientific culture and new institutional processes (RIO; REC; CS07, CS08).</p> <p>Early-career researchers benefit from more open and transparent scientific culture (CS09).</p>	<p>Litigation costs are saved because research misconduct is prevented and conflicts mediated early (CS08).</p> <p>Economic success also depends on fulfilling clients' demands related to RRI. Compliance avoids potential business losses (CS15).</p> <p>RRI and ethics is perceived as inherent to the business purpose (e.g. products which use less energy and are sustainable)and has not to be justified by numbers (CS16)</p> <p>Addressing RRI issues and forming for that purpose new and broader networks can result in new clients/contracts (CS14).</p> <p>Development of new business cases and ideas (CS14).</p> <p>Saved costs because of risk assessments or sustainability assessment (CS14, CS15, CS16).</p>

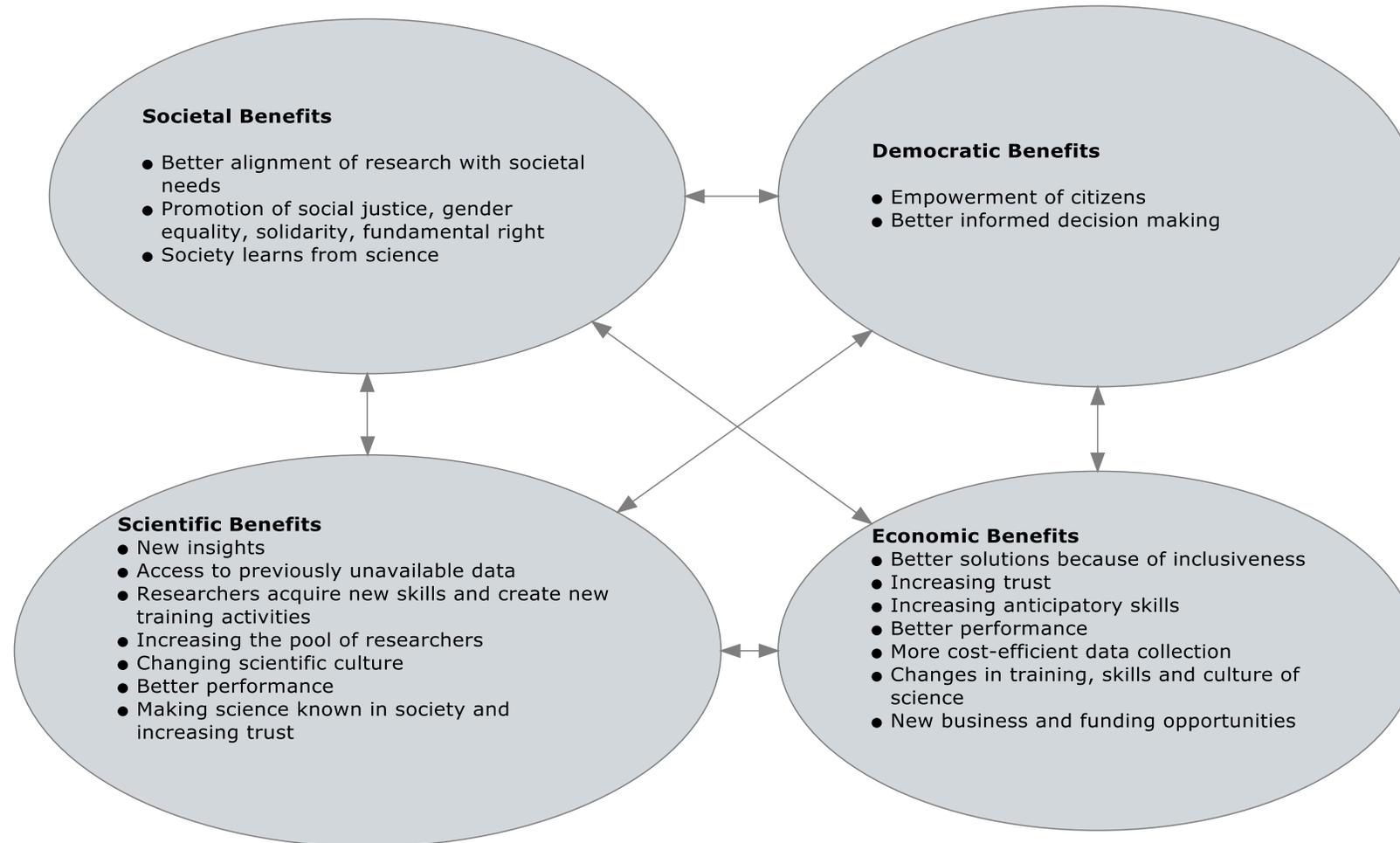
# Potential benefits in Open Access

Democratic	Societal	Scientific	Economic
<p>Not mentioned in the sample: It can be assumed that OA increases availability for data for policy debate and decision making.</p>	<p>Not mentioned in the sample: Societal benefit of OA “a general media advantage with OA (...) which can be used as a proxy or pathway to indicated greater societal impact (Tennant et al. 2016: 11).</p>	<p>Sharing results, data, and knowledge can advance research and innovation (Costas, 2013; Dallmeier-Tiessen et al., 2011; Davies, 2013).</p> <p>Higher visibility and recognition of scientists as authors and new publication opportunities (Dallmeier-Tiessen et al., 2011; CS20).</p> <p>New patents (CS20).</p> <p>Open Access to data and knowledge benefits early-career researchers and young scientists (CS09).</p>	<p>Sharing results, data, and knowledge can stimulate innovation and increase transparency (Dallmeier-Tiessen et al., 2011; Costas, 2013; Davies, 2013; CS20).</p> <p>New patents (C20).</p> <p>New funding opportunities (CS16).</p> <p>Time savings from use of existing open data (greater efficiency) (CS20).</p>

# Limitations

- Case studies had to rely on existing evaluations and assessments of RRI activities
- It was not always possible to generate the necessary empirical data in retrospect, also because of justified limitations in time and resources allocated to case study programme
- It is hard to establish in retrospect a causal link between input and output
- Often causality claims between RRI activities and impacts are based on:
  - anecdotal evidence from expert interviews
  - self-assessment by involved stakeholders or partners of the MoRRI consortium
  - limited and/or unsystematically collected data
- In order to track causal links it would be necessary to design new and large-scale empirical studies. This could be integrated as requirements into RRI calls.
- **Despite the limitations, it was possible to associate RRI measures and ascribed benefits**

# Benefits of RRI



Thank you

