



Mutual Learning Exercise (MLE) on Research Integrity Final Report

Horizon 2020 Policy Support Facility



MLE on Research Integrity – Final Report

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EUROPEAN COMMISSION

***Mutual Learning Exercise (MLE) on
Research Integrity***

Final Report

edited by:

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Table of Contents

ACRONYMS.....	4
MEMBERS OF THE EXPERT PANEL TEAM	5
EXECUTIVE SUMMARY	7
1 Introduction	9
2 General outline: the RI landscape.....	13
3 Particular challenges	18
3.1 Processes and structures	18
3.2 Incentives	20
3.3 Communication and dialogue	24
3.4 Training and education	27
5 Overarching recommendations	34
5.1 Authorised structures	35
5.2 Performance indicators (incentives)	36
5.3 Collaboration.....	37
5.4 Sensitivity	37
ANNEX 1: RECOMMENDATIONS FROM THE INDIVIDUAL THEMATIC REPORTS	39
ANNEX 2: OVERVIEW OF RI PROJECTS AND KEY DOCUMENTS	45
REFERENCES	47

List of Figures

Figure 1 Workflow of meetings and reports	11
Figure 2 Overall design of the Final Report	12
Figure 3 Topological outline of the research ecosystem	15
Figure 4 Narrative structure of the RI landscape	17

List of Tables

Table 1 List of recommendations in the area of Report 1: Structures and processes	39
Table 2 List of recommendations in the area of Report 2: Incentives	40
Table 3 List of recommendations in the area of Report 3: Dialogue and communication	41
Table 4 List of recommendations in the area of Report 4: Training and education ..	43

ACRONYMS

ALLEA	All European Academies
ENERI	European Network of Research Ethics and Research Integrity
ENRIO	European Network of Research Integrity Offices
EU	European Union
FFP	Fabrication, Falsification, Plagiarism
ISO	International Organisation of Standardisation
MLE	Mutual Learning Exercise
MOOC	Massive Open Online Course
PRINTEGER	Promoting Integrity as an Integral Dimension of Excellence in Research
QRP	Questionable Research Practices
R&I	Research and Innovation
RCR	Responsible Conduct of Research
RE	Research Ethics
RFO	Research Funding Organisations
RI	Research Integrity
RPO	Research Performing Organisations

MEMBERS OF THE EXPERT PANEL TEAM

Chair: Göran Hermerén

Göran Hermerén is senior professor of medical ethics, Lund University, Sweden. From 2002 to 2010 President of the European Group on Ethics in Science and New Technologies, Brussels, he is currently a member of the National Council on Medical Ethics, Stockholm and chair of the permanent working group for science and ethics of ALLEA (All European Academies). He has served on many governmental commissions in Sweden. In addition, he has served as external examiner in bioethics at the National University of Ireland, as a referee for international journals, and is involved in several on-going EU-funded research projects. He has published books and papers on research ethics, ethics of stem cell research, the goals of medicine and priority setting in health care and contributed to many encyclopedias.

Rapporteur: Hub Zwart

Hub Zwart is Dean of Erasmus School of Philosophy (ESPhil) at Erasmus University Rotterdam (EUR). He studied Philosophy (cum laude) and Psychology (cum laude) at RU Nijmegen (NL), worked as research associate at the Centre for Bioethics (Maastricht, 1988-1992), defended his thesis in 1993 (cum laude) and was appointed as research director / senior researcher of the Centre for Ethics (RU Nijmegen, 1992-2000). In 2000 he became full Professor of Philosophy at the Faculty of Science (RU Nijmegen), where he established the Centre for Society & Genomics (CSG) and the Institute for Science in Society (ISIS) as founding Director. He was involved in a number of EU projects such as NERRI (Responsible Research and Innovation in Neuro Science, FP7, 2013-2016, WP-leader) and PRINTEGER (Promoting Integrity as an Integral Dimension of Excellence in Research, H2020, 2015-2018, Coordinator).

Expert: Daniele Fanelli

Daniele Fanelli is a fellow in Quantitative Methodology at the London School of Economics, UK, where he teaches research methods and investigates the nature of science and possible issues with scientific evidence. His empirical research has been instrumental in quantifying the prevalence and causes of problems that may affect research across the natural and social sciences, and it has helped develop remedies and preventive measures.

Daniele co-chairs the Research Integrity Sub-Committee within the Research Ethics and Bioethics Advisory Committee of Italy's National Research Council, for which he developed the first research integrity guidelines. He is also a member of the Research Integrity Committee of the Luxembourg Agency for Research Integrity (LARI) and was formerly a member of Canada's Tri-Council Expert Panel on Research Integrity. Before joining the London School of Economics, Daniele worked at the University of Edinburgh, UK, at the University of Montreal, CA, and at Stanford University, USA, in the Meta-Research Innovation Center @ Stanford (METRICS).

Expert: Ana Marusic

Ana Marušić is Professor of Anatomy and Chair of the Department of Research in Biomedicine and Health at the University of Split School of Medicine, Split, Croatia. She is an Honorary Professor at the College of Medicine and Veterinary Medicine of the University of Edinburgh in the UK, and a Visiting Professor at the Lee Kong Chian School of Medicine, Nanyang Technical University in Singapore. Prof. Marušić chairs the Research Committee of the World Association of Medical Editors (WAME) and is the Co-Editor in Chief of the Journal of Global Health. She is on the Steering Group of the EQUATOR (Enhancing the Quality And Transparency Of Health Research) Network. She is also the Co-Chair of the Cochrane Scientific Committee. Prof. Marušić was the President of the European Association of European Editors (EASE), Council of Science Editors (CSE) and World Association of Medical Editors (WAME). Prof. Marušić has more than 200 peer-reviewed articles and was heavily involved with creating the policy of mandatory registration of clinical trials in public registries which helped change the legal regulation of clinical trials worldwide.

EXECUTIVE SUMMARY

Research integrity is essential for excellent science and is a cornerstone of societal trust in researchers and research institutions. Advancing research integrity across Europe is therefore of the utmost importance to ensure high-quality research that is relevant to society.

The aim of the Mutual Learning Exercise (MLE) on Research Integrity was to take stock of emerging challenges, current or planned policies and best practices at Member State level and beyond, and to facilitate the sharing of experience among policy-makers and national authorities on the formulation and implementation of policies promoting research integrity.

The MLE focused on four specific topics:

- Processes and structures
- Incentives
- Dialogue and communication
- Training and education

The group's contributions, discussions and reflections resulted in multiple recommendations for a range of stakeholders, such as: researchers, research-performing organisations (RPOs), research managers, funding agencies and policy makers.

RPOs, for instance, are encouraged to define what RI means to them, why it is important and how they implement RI in their organisations, or how they aim to meet professional standards for conducting research. They should be encouraged to indicate how they value and safeguard RI – for example, through their organisational websites.

Academics should be encouraged to devote a special section of their CV to relevant RI experience or to develop an RI skills portfolio by obtaining RI training, contributing to RI promotion/dissemination at the institutional level, or in academic and public debate, or by providing RI training in their role as research manager or supervisor.

The group's discussions suggested that soft measures can have broad effects, such as public recognition of significant institutional efforts to foster RI. Inspirational rather than competitive forms of incentives or acknowledgements can be implemented, such as recognition of the quality and transparency of integrity policies, activities to promote RI and to foster an environment that supports RI, and activities in the realm of training, coaching and teaching. It would be welcome if universities and other RPOs shift their focus from 'reputation damage control' to transparency and sharing of best practices and mutual learning.

The MLE's recommendations include the development of platforms for deliberation, where research communities address emerging challenges in a transparent and proactive environment based on mutual learning and where training material, good practice examples and other instruments are stored, curated and easily accessible.

RPOs need to invest in and care for their research culture. Fostering a supportive research ecosystem where responsible conduct of research is considered a joint responsibility of researchers, funding agencies and research managers is key. Codes and guidelines are important, but due attention should also be given to the institutional research climate, which should be one of transparency, honesty, inclusiveness and fairness. Promoting integrity requires a holistic RI approach, seeing RI as an integral dimension of good research, embedded, realised and practiced in a resilient research culture. This includes establishing forms of research integrity coaching, where experienced colleagues may offer advice to individuals or teams, as RI needs a local voice and a face to become less abstract and more supportive.

1 Introduction

To support countries in optimising their research and innovation (R&I) systems, DG Research and Innovation has set up a Policy Support Facility (PSF) under Horizon 2020, aimed at "improving the design, implementation and evaluation of R&I policies". The PSF provides best practice, expertise and guidance to EU Member States (MS) and associated countries. Among the services offered by the Horizon 2020 PSF are Mutual Learning Exercises (MLEs) which are demand-oriented, hands-on, focused on specific R&I topics of interest and are translatable into good practice.

Research Integrity is an inherent dimension of excellent science and quality care in research and a cornerstone of societal trust in researchers and research institutions. Advancing Research Integrity across Europe is therefore of the utmost importance in order to foster high quality research relevant to society.

In December 2015, the Council of the European Union put Research Integrity on its agenda for the first time and adopted conclusions recognising Research Integrity as the foundation of high-quality research and as a prerequisite for achieving excellence in research and innovation in Europe and beyond.¹ The Council underlined the contribution of Research Integrity to socio-economic development and the consequent high cost of research misconduct, stressing the importance of preventing research misconduct. It is recognised that advancing Research Integrity is a shared responsibility and should be a priority for all relevant stakeholders, including the European Commission, national governments and institutions as well as individual researchers.

At the level of Member States, many European countries have adopted laws, codes or guidelines aiming to promote Research Integrity and prevent research misconduct. Furthermore, ministries, research funding organisations (RFOs) and research performing organisations (RPOs) across Europe have established relevant policies and structures. However, to date, the policies, structures and definitions of Research Integrity and misconduct (when available) have been quite varied among Member States. This variability reflects, among other things, existing cultural differences and values. While respecting this diversity, Member States may benefit greatly from each other's experiences by exchanging best practices and sharing expertise. For that reason, a Mutual Learning Exercise on Research Integrity was initiated in 2018.² The scope of the MLE was to exchange national experience at the operational level and foster learning between peers, building on concrete existing practices in the field of Research Integrity. The final aim of this MLE was to support EU Member States and associated countries in designing, implementing and/or evaluating different policy instruments in relation to four topics in the field of Research Integrity identified in a scoping workshop. The intention of the exercise was to adopt a hands-on 'learning by doing'

¹ The Council of the European Union. Draft Council conclusions on research integrity. 2015. Available: <https://data.consilium.europa.eu/doc/document/ST-14201-2015-INIT/en/pdf>.

² Reports and other outcomes available at: <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>.

approach supported by external expertise.³ It was agreed that the MLE would involve five meetings plus a dissemination event. The MLE would follow the standard methodology for conducting Mutual Learning Exercises in the context of the Horizon 2020 Policy Support Facility 'Mutual Learning Exercise: a new methodology'.⁴ Fourteen participating countries appointed one or two representatives and the MLE was supported by four independent experts: a Chair (Göran Hermerén), two external experts (Ana Marusić and Daniele Fanelli, responsible for authoring reports on specific topics) and a Rapporteur (Hub Zwart, responsible for authoring the final report).

Participating countries:

Austria, Bulgaria, Denmark, Estonia, Finland, France, Greece, Ireland, Lithuania, Luxembourg, Moldova, Norway, Spain, and Sweden

At the kick-off meeting of our Mutual Learning Exercise (MLE) on Research Integrity (RI) in Brussels (14 November 2018) the 14 participating countries in this MLE presented the basic information about the RI framework in their countries. After the discussion sessions, the participating countries agreed on prioritising four topics for this MLE:

- Processes and structures;
- incentives;
- dialogue and communication;
- training and education.

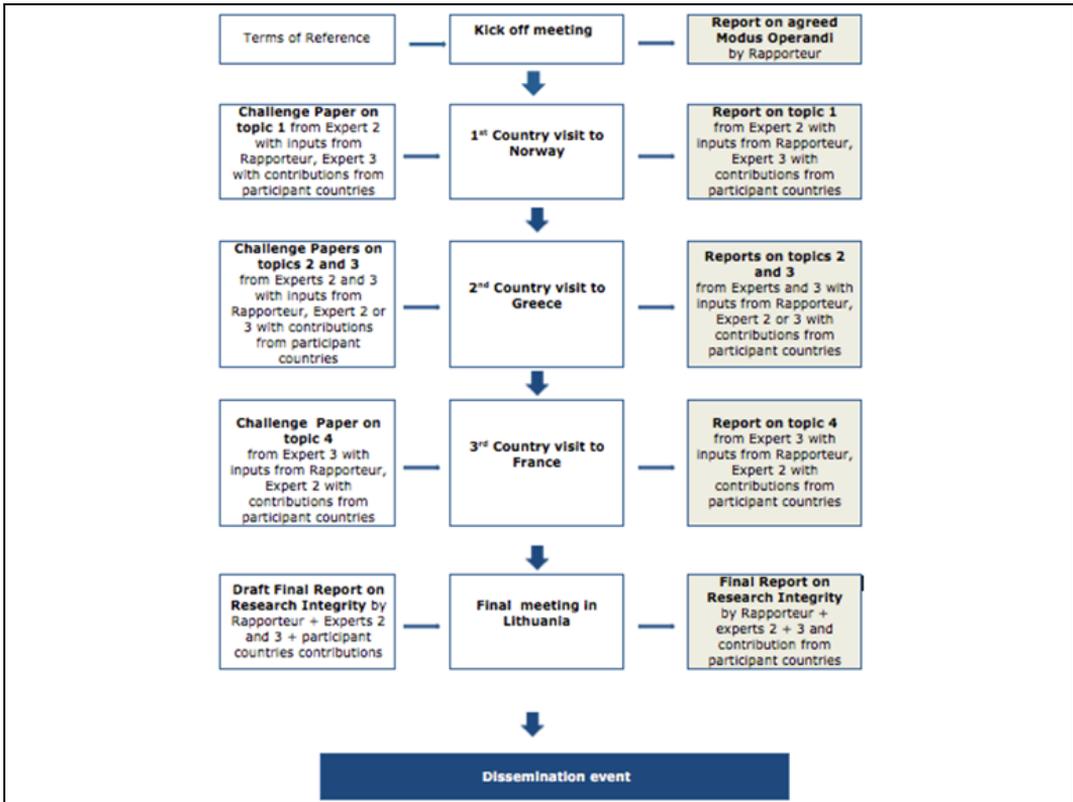
This resulted in the following workflow design for the MLE:⁵

³ European Commission, Directorate-General for Research and Innovation, Unit A.4 (2018): *MLE on Research Integrity: Modus Operandi* (p. 8).

⁴ Mutual Learning Exercises in the context of the Horizon 2020 Policy Support Facility Mutual Learning Exercise- a new methodology, Terttu Luukkonen, DG RTD.

⁵ We discussed Topic 1 in Oslo, while Topics 2 and 3 were discussed in Athens, and Topic 4 in Paris. All topic reports and workshop material are available at <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>

Figure 1 Workflow of meetings and reports



The aim of this final report is to present a comprehensive overview of our main results, building on:

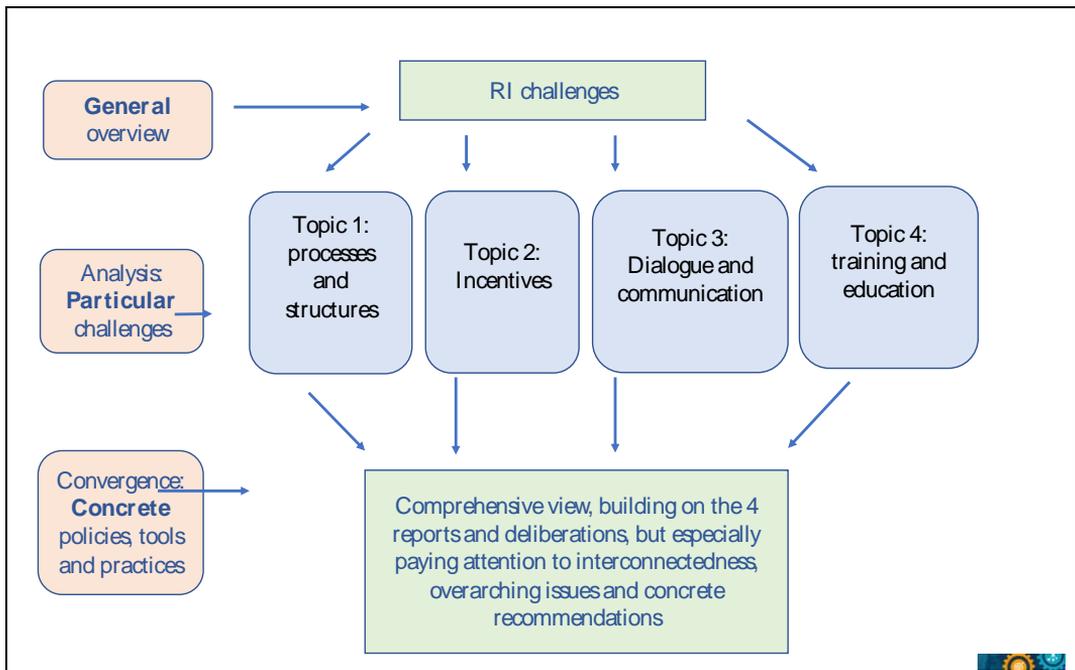
1. The four **reports** dedicated to the topics mentioned and available on the website for this MLE project;⁶
2. the input from the 14 participating countries, notably concerning inspirational **examples** and experiences;
3. the **deliberations** to which these topics gave rise during our meetings (country visits), especially paying attention to interconnectedness, overarching issues and concrete recommendations.

The design of the Final Report was discussed during the country visit to Paris (2019) and during the final meeting in Vilnius (2019). Its basic structure consists of three steps:

⁶ <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>.

1. A **general** outline of RI and Responsible Conduct of Research (RCR) challenges;
2. a summary of **particular** challenges as identified and addressed in the four reports;
3. a comprehensive aggregation of **concrete** recommendations and tools for fostering and practising RI in multiple contexts and settings.

Figure 2 Overall design of the Final Report



2 General outline: the RI landscape

There is widespread concern about and interest in Research Integrity, both in academic circles and in policy discourse (Horbach & Halffman 2017). Whereas, since the beginning of the nineteenth century, universities traditionally combined two functions, namely academic teaching and independent research (the von Humboldt model), in recent decades we have seen an increased emphasis on societal impact, relevance and valorisation as a third function, which implies the exposure of researchers to real-life settings (outside the 'ivory tower'), involving unprecedented challenges and tensions. Rather than shying away from societal interaction, universities and other research performing organisations are being challenged to rethink their missions and responsibilities and to establish best practices to address the tensions concerned. In recent years this topic has gained significant visibility on the European research agenda and the policy debate on research integrity has matured. For instance, Science Europe has played a key role in this process by providing evidence-based policy recommendations and through its advocacy work.⁷ To provide a concise overview of the current RI landscape, a series of European projects and a selection of key documents have been listed in chapter 6 of this report.

The first question to be addressed in the MLE is already a fairly challenging one: How can one define RI? What *is* research integrity? This question was tackled in the First Thematic Report produced by this MLE, dealing with processes and structures.⁸ The report notably looked at how RI was defined in the context of European (the EU's Research and Innovation funding programme for 2007-2013, Framework Programme 7 (FP7) and Horizon 2020) projects. The European Network of Research Ethics and Research Integrity (ENERI) project, for instance, sees research integrity as the attitude and habit of researchers to conduct research according to appropriate ethical, legal and professional frameworks, obligations and standards (p. 15) although, given the challenges outlined above, grey areas may emerge where it is not always clear what should count as 'appropriate'. This requires a scientific ethos which combines sensitivity to societal concerns with independence and close methodological attention. RI includes both external and internal norms for research: external in the form of laws/regulations, policies, codes or guidelines that govern researchers in their work, and internal, in the form of internalised norms or desirable practices.

On various occasions we also discussed the relationship between Research Integrity (RI) and Research Ethics (RE). In the First Thematic Report we concluded that research ethics 'addresses the application of ethical principles or values to the various issues and fields of research' and is therefore a more generic concept than RI (p. 13), also including issues pertaining to research with human subjects or the use of animals in research, while RI rather focusses on 'the attitude and habit of the researchers to conduct research according to appropriate

⁷ Advancing Research Integrity Practices and Policies: From Recommendation to Implementation (<https://www.scienceurope.org/>).

⁸ Directorate-General for Research and Innovation. Unit A.4 (2019). MLE on Research Integrity: Processes and structures – Thematic Report No 1, prepared by Ana Marušić, p. 15.

ethical, legal and professional frameworks, obligations and standards' (p.13), with a special focus on issues such as authorship, data management, conflicts of interest, responsibilities of supervisors, prevention of Fabrication, Falsification, Plagiarism (FFP) and questionable research practices, etc. Nonetheless, it is clear that there is considerable overlap between both domains. Indeed, in some languages, the same word is used for both RE and RI.

The promoting integrity as an integral dimension of excellence in research (PRINTEGER) project, moreover, indicates that researchers and policy-makers may have different perspectives on RI.⁹ While researchers tend to endorse a more bottom-up conception of RI, seeing it as a virtue that should be promoted and supported, policy-makers tend to opt for a more regulatory mode of discourse, focussing on norms, regulations and financial concerns. This is connected with a broader issue in the RI debate: Should we primarily focus on individual responsibilities or on institutional responsibilities, or both? In terms of diagnostics and therapy, there has been an initial tendency in integrity discourse to focus on individualisation: on detecting and punishing individual deviance from the relevant norms. This bias has resulted in a plea to focus more explicitly on environmental factors as well, e.g. on the quality and resilience of the *research ecosystem*, on institutional rather than individual responsibilities and on the quality of the research culture (Zwart & Ter Meulen 2019).

The importance of a culture based on Research Integrity has already been stressed by the Council of the European Union (1 December 2015), considering research integrity as the cornerstone of high-quality research and as a prerequisite for achieving excellence in research and innovation in Europe and beyond.¹⁰ Another example of this emphasis is the *Bonn PRINTEGER Statement* (Forsberg et al 2018). In the spirit of the All European Academies (ALLEA) Code of Conduct, the objective of this statement is to advise research managers and research performing organisations and to complement existing instruments by taking into account the daily challenges and organisational contexts of researchers (the work-floor perspective) and by focusing specifically on institutional responsibilities to strengthen integrity. This is not only because, in most disciplines, research is team work, involving intense collaboration and mutual dependence, but also because many contributors to the debate discern a connection between integrity issues (also in top quality science) and the extent to which the global research arena is becoming increasingly competitive, allegedly resulting in widespread symptoms such as scientific productivism, the increase of pace and scale, output indicator fetishism and the focus on quantity over quality.

In the public domain, individual cases such as the Schön case (Consoli 2006), the Hwang case (Gottweis & Triendl 2006; Zwart 2008), the Macchiarini case (Vogel 2015) and the Stapel case (Zwart 2017) attracted considerable attention. Rather than adopting an 'either/or' perspective (suggesting that we should *either* focus

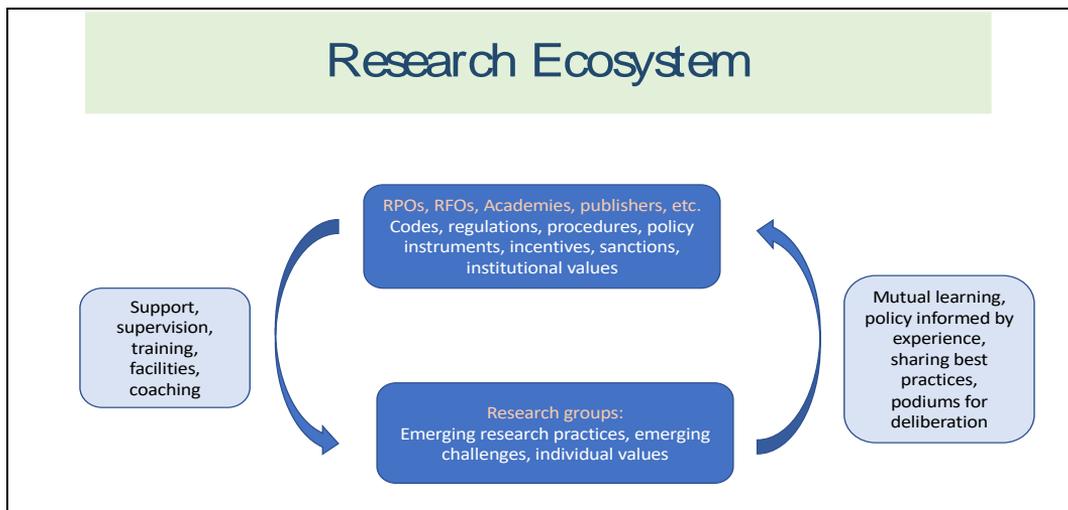
⁹ PRINTEGER. Deliverable 2.2. Promoting virtue or punishing fraud: mapping contrasting discourses on 'scientific integrity'.

Available: <https://printeger.eu/wp-content/uploads/2016/10/D2.2.pdf>.

¹⁰ <http://data.consilium.europa.eu/doc/document/ST-14853-2015-INIT/en/pdf>.

on individual *or* on institutional responsibilities), attention should be paid to both dimensions of the integrity landscape (see also the ALLEA Code of Conduct). Individual responsibility should be fostered and facilitated by institutional strategies, but these can only work effectively if they are endorsed in actual research practice:

Figure 3 Topological outline of the research ecosystem



High profile cases such as the ones mentioned above often involve extreme cases of fraud (FFP). Research integrity, however, is first of all about actual practices of good science, while integrity challenges are often rather subtle and 'grey', sometimes summarised as questionable research practices (QRP). The most common controversies in this grey area concern publication ethics, particularly authorship disputes (who should count as an author and why) and citation cultures (for instance: is it acceptable for peer reviewers to suggest references to their own work?).

Moreover, these high profile cases tend to convey a common narrative structure, starting with a spectacular ascent of the researcher involved, albeit based on fraud, resulting in a dramatic fall from grace and followed by an avalanche of academic and public comments (Zwart 2017). Extreme and highly visible cases can be misleading in other ways, for example by suggesting that scientific misconduct is more common amongst highly productive scientists and thus suggesting that pressures to publish are a direct cause of misconduct, whereas a careful analysis of retracted papers suggests that this is not, on average, the case (Fanelli, Costas and Larivière 2015).

This was one of the issues explicitly addressed in the Second Report produced by this MLE, which focused on the issue of incentives and was discussed during the Athens country visit (12 March 2019).¹¹ Like so many other institutions and

¹¹ Directorate-General for Research and Innovation. Unit 4.A. MLE on Research Integrity: Challenge paper: Incentives, prepared by Daniele Fanelli.

practices in modern society, the report argues, science is being radically transformed by powerful information and communication technologies (p. 9), allowing projects of unprecedented size and levels of complexity to be carried out, opening up new opportunities but also new challenges and this calls for renewed attention to matters of Research Integrity as well as other ethical issues. But should we conclude that we are actually facing an integrity 'crisis' (Fanelli 2018; Fanelli 2019), which may also be connected with similar issues of concern, such as a 'retraction epidemic' (Castillo 2014), a 'reproducibility crisis' (Baker 2016; Rhodes 2016)¹² etc.?

The concept of a 'scientific crisis' was already deployed by Husserl in 1935 in a gloomy exposé on the crisis in the European sciences (Husserl 1935/1977). In the public domain, the idea that we are facing a major scientific crisis, exacerbated by the irresponsible conduct of researchers, has been reinforced by genres of fiction. The crisis-concept has been systematically fleshed out, for instance in the science novels written by Michael Crichton (Zwart 2015). Should we indeed start from the conviction that we are facing an integrity crisis?¹³

The best evidence that we have does not support or even refute common concerns that the integrity and credibility of science has worsened or that common problems that are believed to drive problems with Research Integrity have increased (Fanelli 2019). This is not, of course, the same as saying that there are no problems with Research Integrity in science (Necker 2016), let alone that research and publication practices and policies have no room for improvement. The role of competition, pressures to publish and the misuse of performance metrics, for example, is complex and multifaceted. Science is a competitive enterprise and, whilst competitiveness in science is a vital driving force for scientific innovation, there is a risk that certain means (e.g. performance indicators such as *h*-scores developed to measure quality) become ends in themselves.

The best way to foster research integrity is by fostering *good science*. Although, due to the ways in which science is changing (increase in pace, scale, global collaboration, etc.), research communities are facing new major challenges, there is a risk involved in proclaiming the current situation to be one of crisis, namely paralysis. The crisis theme may result in the conception that there is a misconduct epidemic that has become too systemic to be effectively contained. Instead of either indifference or over-dramatisation, we should develop ways to foster the resilience of the research system. Good practice and effective policy require solid analysis rather than panic. Moreover, we can build on years of RI research. To address the challenges involved, there is a need for evidence and evidence-based policy and this MLE aims to contribute to that.

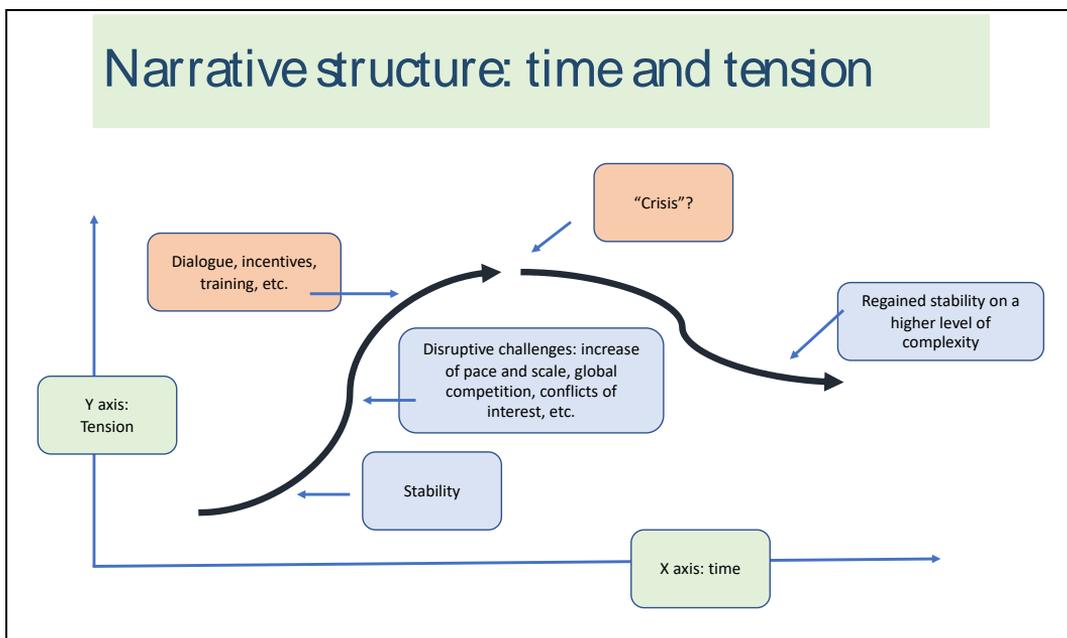
Perhaps we should think of integrity challenges in terms of the dialectical narrative curve (Freytag 1863; Todorov 1977), which begins with an initial situation of relative equilibrium (1), which is disrupted by emerging challenges

¹² See also <https://www.nature.com/collections/prbfkwmwvz/>.

¹³ See for instance: <https://www.enago.com/academy/facing-research-integrity-crisis/>.

(2). As soon as the disruption is recognised (3), however, attempts are made to contain and repair the damage (4). Ultimately, repair will result in the establishment of a new equilibrium, at a higher level of complexity: the dénouement stage (5). In the RI domain this means that, after an episode of latency (rising tensions), there has been a tumultuous stage of eruptions in the form of spectacular cases (often presented as the tip of the iceberg) which threatened to undermine ('negate') the credibility and prestige of science and triggered various reactive responses. Initially, the focus has been on the prevention of reputational damage, but gradually, more mature and informed strategies have emerged (the 'negation of the negation') aimed at developing concrete methods and means to effectively address the challenge and foster the resilience of the research ecosystem.

Figure 4 Narrative structure of the RI landscape



This MLE aims to contribute to what is referred to above as a situation of regained stability on a higher level of complexity. As indicated, the focus of the Final Report will be on four *particular* topics defined at the start of the mutual learning process and subsequently on the *concrete* recommendations generated by the MLE process.

3 Particular challenges

This section presents a summary of each of the four reports presented and discussed during our country visits and finalised on the basis of these deliberations. The first sub-section focuses on the first priority topic tackled in the First Report: Processes and structures to promote RI and deal with allegations of research misconduct.

3.1 Processes and structures

The First Report focuses on the first priority topic: *Processes and structures*¹⁴ and was based on a review of existing relevant literature and documentation, such as the ENRIO Handbook entitled 'Recommendations for the Investigation of Research Misconduct' (ENRIO 2019), but also on information about RI frameworks in 14 countries for Research Integrity (RI) presented at the kick-off meeting as well as on consultations with the representatives of the participating countries. This report also contains an overview of the currently existing processes and structures in the 14 participating countries (p. 33 ff.). The final input for the report was provided from the discussions during the first working meeting in Oslo on 30 January 2019.

'Structures' was chosen as a topic because participating countries were interested in comparing and exchanging national and institutional practices and in identifying possible directions and suggestions for the further development of RI systems in their countries. They were also interested in exchanging experience related to challenges in creating RI bodies, particularly in relation to what expertise is relevant for such bodies as well as how to deal with competing interests of members. Finally, the problem from the policy and funding viewpoint was how to monitor RI bodies in individual institutions. As to 'processes', the primary focus was on exchanging best practices for dealing with research misconduct. Major challenges were related to implementing RI principles and requirements in real life. In addition, the question of protection of both the whistleblowers and the accused in allegations of research misconduct was identified as a theme where exchange of good practices would be useful for participating countries.

RI policies should be responsive to the way in which the research landscape is changing. In the past, for instance, academic researchers tended to spend a significant part of their career at the same university. Many universities had a research culture of their own (e.g. outspokenly entrepreneurial or rather connected to a particular religious denomination, etc.) which required commitment. In the current research landscape, however, mobility is encouraged and considered a strength. Researchers tend to migrate between universities, which is now seen as a positive sign, an indication of ambition, a strength of someone's academic CV. In short, mobility is becoming the default. However, mobility between institutions may lead to problems. Besides questions of ownership (of research grants; research data; Ph.D. projects and premiums) this

¹⁴ <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>.

may also affect RI. Whereas performance in terms of education, acquisition of funding and publication track records can be assessed on the basis of indicators such as student evaluations, citation databases, etc., this is not the case with RI. Should we therefore consider the introduction of an RI certificate or RI portfolio (comparable to similar practices in academic teaching)?

Horizon 2020 is funding a collaborative project to develop tool kits for the promotion of research integrity and standard operating procedures that can be used by interested organisations as part of their considerations for establishing flexible and effective internal structures.¹⁵

Although the exchange of experience from participating countries showed great variance in structures and processes for fostering RI, some general recommendations regarding this topic were nonetheless defined:

POLICY RECOMMENDATIONS:

- a) A definition of Research Integrity and research misconduct should be agreed at the national level to harmonise the processes at all levels in a country's RI system and to increase the level of security and trust of researchers and other stakeholders in the fairness and objectivity of RI structures and processes. It should allow for a clear division of roles of RI and ethics bodies and for fair and transparent handling of RI allegations by organisational frameworks.
- b) Professional standards as well as capacities and skills for RI should be harmonised across Europe.
- c) It is advisable to create a network of national RI structures (already in place in several countries) that help to coordinate, monitor, educate, communicate and promote research as well as facilitate communication with other countries, particularly in cases where international collaboration is needed.
- d) Countries should join the *European Network of Research Integrity Offices* (ENRIO) so that the discussions, exchange of experience and collaboration could be continued beyond occasional activities (such as this MLE). ENRIO has the potential to become a leading body through which to promote, discuss and research RI in order to ensure the translation of knowledge and evidence at national levels.

We also defined some specific recommendations:

- e) Cooperation between different research ethics committees is necessary but there should be a balance between the independence of the work and collaborative efforts in reaching decisions.

¹⁵ <https://www.sops4ri.eu/>.

- f) In the case of RI investigations, a system of appeal should be set up, especially in countries without national RI bodies where institutional bodies may face significant conflicts of interest.
- g) Committee members should be carefully selected to avoid conflicts of interest. International panels would have the least bias in this regard and should be considered at least at the level of the appeals.
- h) In view of increased mobility, a Research Integrity record for academics should be promoted, either in the form of a special section within a CV template or as an RI portfolio (similar to a teaching portfolio), indicating that the academic in question is a qualified researcher and research manager, able to effectively and responsibly address integrity challenges emerging in practice. This may include, for instance, integrity training as part of a mandatory management training programme. In this way, researchers/academics develop a record of integrity, which would be meaningful in the context of international collaboration, to ensure that all universities and academics involved have a solid background in addressing integrity issues.
- i) References to codes and responsibilities should be included in employment contracts at research performing organisations.
- j) In view of increased mobility and cooperation between private and public sectors, there should be more dialogue and communication between these sectors on RI.
- k) RI allegations and investigations can be extremely harmful for all parties involved (the accused, the whistleblower, the institution, members of the committee, etc). Therefore, procedures for RI investigations should maintain the important distinction between confidentiality and anonymity and should safeguard the confidentiality of all those involved in the RI investigations, as far as possible, given the legal framework in the country. Also, recovery support during the aftermath is an issue which, as yet, is insufficiently addressed. Whether validated or vindicated, both accusers and accused may want to seek advice or coaching.

3.2 *Incentives*

This thematic report¹⁶ addresses the second priority topic - Incentives for RI – and was based on a Challenge Paper developed with the aim of helping MLE participants prepare for the second working meeting that took place in Athens, Greece, on 12 and 13 March 2019. The overall scope of this topic was defined in the kick-off meeting that took place on 14 November 2018 in Brussels. The report also presents a list of concrete examples of activities to promote, prevent and set incentives for RI, provided by the 14 participating countries.

¹⁶ <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>.

During the scoping workshop and kick-off meeting, the 14 participating countries expressed an interest in comparing and sharing practices, experience and proposals on how to encourage good research practices at the institutional and individual level. In particular, it was decided that possible objectives of the MLE on incentives might include: 1) comparing approaches to promoting and encouraging the adoption of Research Integrity and/or open sharing policies at the institutional level; 2) comparing approaches to promoting and encouraging Research Integrity and/or open sharing of data and methods amongst individual researchers and lab leaders; 3) sharing experience, successful and unsuccessful, of setting either positive rewards (e.g. badges, criteria for promotion, prizes and awards) or punitive sanctions; and 4) gaining a deeper understanding of possible intended and unintended consequences (costs and benefits) of Research Integrity policies and data sharing requirements.¹⁷ One of the overarching priorities that emerged in the first kick-off meeting was that participants might have different understandings about what is meant by 'incentives' in the context of research integrity and how incentives relate to the mission of national research integrity offices (RIOs).

In the context of the MLE, the focus was on 'positive incentives' as a means to encourage desirable behaviours by offering rewards in the forms of benefits to career, reputation or even financial benefits. A powerful argument to re-align incentives in the research system comes from noticing how the system itself is being re-shaped. Like many other institutions and practices in modern society, science is being radically transformed by ever more powerful information and communication technologies. These transformations open up exciting new opportunities for research but at the same time create new challenges for Research Integrity and reproducibility. The subsistence of such challenges is acknowledged by relevant international documents and guidelines, for example the Montréal Statement on Cross-Boundary Research Collaborations.

Positive incentives are thus a complementary tool to the 'negative' incentives represented by sanctions and other forms of punishment, as part of an effort to help the system respond to old and new challenges.

An important question is of course: *What aspects of research integrity can be or do we want to see incentivised?* Besides the conduct of responsible research, potential targets for incentivisation are: 1) efforts made to improve the methods and standards of the research environment; 2) the setting up of structures that aid RI promotion and awareness, or the creation of events and initiatives to encourage open discussions, sharing and mutual learning; 3) training for oneself and actively training colleagues in research integrity; 4) actively promoting RI and preventing, reporting and amending behaviours that constitute research misconduct.

What kind of incentives can be offered? This may vary from informal acknowledgement (prestige) via more formal acknowledgement (RI badges, awards and other symbolic but official signs of recognition) up to access to key

¹⁷ Directorate-General for Research and Innovation. Unit a.4 (2019) *MLE on Research Integrity: Thematic Report 2, Incentives*. Prepared by: Dr. Daniele Fanelli.

resources. The report explicitly addresses the concern that the current reward system may increase the likelihood of perverse incentives (e.g. the notion that growing competition and pressures in research are causing an epidemic of fabricated, falsified, biased, sloppy and irreproducible research).¹⁸ Evidence, however, offers no conclusive support to the concern that pressures to publish and bibliometric evaluation may be undermining Research Integrity. In addition, major initiatives are mentioned, such as the San Francisco Declaration on Research Assessment (DORA) and the Leiden Manifesto, offering guidance to the responsible and nuanced use of metrics in assessing researchers and research teams. Therefore, the solution is unlikely to lie in a drastic reduction or elimination of quantitative metrics and publication expectations. It rather lies in striking a healthy balance. Meanwhile, innovative ideas and tools for incentivising RI have been put forward, such as integrity cafés, value visioning workshops and ethics reflection workshops (as mentioned by the Bonn PRINTEGER Statement, p. 16).

POLICY RECOMMENDATIONS:

In light of the background literature and analyses presented in the Challenge Paper and the ensuing dialogues at the MLE meeting, a series of recommendations for RI policy-making have emerged.

- a) Compulsory regulations and softer policy requirements should be complemented with positive incentives. The latter may take the form of informal or formal incentives, for example of the kinds outlined above, and could aim to reward actions and activities including: training, coaching, creating research environments that support dialogue and transparency, innovative methods of assessment of research performance and impact, and open science activities.
- b) The effects of any incentive or regulation should be closely monitored to ensure that the desired effects are achieved and to detect the possible occurrence of unintended consequences. Monitoring activities ought ideally to include the collection of data, but it is essential that an open dialogue is maintained with the research community and all other relevant stakeholders, whose feedback and experience should be collected and addressed with a spirit of constructive collaboration.
- c) RI systems should be able to respond to the emergence of unintended consequences and revise or adapt policies accordingly. It is an ethical imperative for research ethics and Research Integrity structures to be prepared to revise their policies (both positive incentives and compulsory regulations) promptly and effectively whenever new information suggests a need to do so. This follows not solely because new initiatives may have unintended consequences, but also because old initiatives may no longer

¹⁸ This issue, that perverse incentives may encourage researchers to adopt detrimental research practices, is also addressed by the WCRI 'Hong Kong Principles for assessing researchers' (Moher et al 2019); <https://osf.io/m9abx>.

adequately respond to the needs of the research community, whose practices, methodologies and cultures are in constant evolution.

- d) Research on the impact of RI incentives and policies should be fostered and sustained. Such support would come, first and foremost, from the collection, in each country, of relevant documentation on new RI interventions that are introduced and on data, qualitative or quantitative, on their results and effects. This information should be shared to any extent possible, when not published in the form of scientific reports and peer-reviewed studies.

We also discussed a number of more concrete instruments that could function as incentives:

- e) Symbolic awards in recognition of RI activities (training, coaching and deliberation) or evidence of particularly commendable behaviour. Such awards could come in the form of annual ceremonies, formal recognitions, certifications or badges,¹⁹ and could be given not just to individuals but also, for example, to teams or institutions that have shown special dedication and effectiveness in handling challenging cases.
- f) Credit systems. For example, countries could institute 'research integrity credits' given to academics who take active part in RI meetings and symposia or even those who act as whistleblowers. Alternatively, individuals and institutions could be encouraged to build their 'integrity portfolio', which includes integrity activities and performances such as training received, teaching activities, coaching, deliberation, active participation in events and initiatives and experience in managing cases and initiatives.
- g) Research Integrity Oath. The RI equivalent of the 'hippocratic oath' that medical practitioners take seems to represent a more positive and psychologically compelling incentive than the integrity compliance statements that some institutions currently require from researchers who receive research funding.²⁰ The oath would be part of the socialisation process not just for scientists, but for all actors in the research system, and would hopefully commit them to RI not just in academic research, but also in private and commercial R&D activities, collaboration between

¹⁹ As an inspirational example, we notably discussed the digital Badge in Responsible Conduct of Research, developed by the University College Cork (UCC) as a means to foster a responsible research landscape: <https://www.ucc.ie/en/teachlearn/projects/digitalbadges/>; We also saw the Athena Swan Award as an inspirational model: https://en.wikipedia.org/wiki/Athena_SWAN; <https://www.ecu.ac.uk/equality-charters/athena-swan/apply-award/>.

²⁰ The Norwegian *National Committee for Research Ethics in Science and Technology* has explicitly suggested such a oath in their guidelines: <https://www.etikkom.no/en/ethical-guidelines-for-research/guidelines-for-research-ethics-in-science-and-technology/proposed-scientific-oath/>.

academia and private partners, advisory roles in governmental organisations, contributions to public debate and more.

- h) Public rankings based on criteria relevant to RI. Aimed in particular at institutions, these rankings could follow criteria including: the presence, quality and transparency of integrity policies; activities to promote RI and to foster an environment that supports RI; and training, coaching and teaching activities.²¹ These are intended as incentives for institutions to make the shift from repairing reputational damage to transparency and proactivity. Rather than an RI 'ranking' (comparable to an Academic Ranking of World Universities' (ARWU) ranking / Shanghai ranking), we suggest less competitive, but rather inspirational forms of incentives or acknowledgements. The resulting rankings and acknowledgements of inspirational examples could be published on national or European web platforms.²²
- i) The effect of incentives should be closely monitored also to detect possible unintended consequences; in the case of unintended consequences, RI systems should be revised and adapted and research on (the impact of) incentives should be fostered and sustained.

3.3 *Communication and dialogue*

The Third Report focuses on the third priority topic – *Dialogue and communication* to promote RI and deal with allegations of research misconduct.²³ The Thematic Paper is based on the review of existing relevant literature and documentation and consultations with the representatives of the participating countries. It has been developed to help MLE participants prepare for the second working meeting in Athens on 12 and 13 March 2019. Besides analysis and recommendations, the report also provides an overview of activities and experience concerning communication and dialogue in the 14 participating countries.

Communication with the public and dialogue between different stakeholders is vital to foster and achieve a research environment that encourages good research practice. Openness and transparency between the public and between stakeholders are important in order to increase levels of trust in the research system. Communication should focus on effective ways to promote integrity rather than on penalising misconduct.

The opposite of responsible conduct of research – research misconduct – is a sensitive issue and often perceived as something that is best not discussed

²¹ A unique and inspirational example for a coaching model was developed by the Luxembourg Agency for Research Integrity (LARI). See: LARI Peer Coaching: <https://lari.lu/lari-services/lari-peer-coaching/> and Bramstedt (2019).

²² This may also work the other way around, in the sense that, in the case of misconduct, rather than punishing individual researchers, the institution could be punished. Norway is moving in this direction. It would underline the responsibility of RPOs in fostering integrity and preventing misconduct.

²³ <https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-research-integrity>.

openly. The important question here is: How can one find a 'comfort zone' for all stakeholders so that they can have common ground for communication and subscription to RI practices? Our Third Report first of all discusses existing research, notably surveys conducted on RI. Special attention was paid to EU projects. PRINTEGER, for instance, showed that media discussions tend to focus on (extreme) individual cases of misconduct rather than on initiatives to foster RI and strengthen the research ecosystem. CLUE (Collaboration and Liaison between Universities and Editors) recommendations were also discussed, aiming to foster communication between RPOs and journals / publishers via, for instance, the establishment of national registers of individuals or departments responsible for Research Integrity at institutions. Basically, we want to see a shift from the prevention of reputational harm (resulting in secrecy and cover-up practices) to transparency and sharing of experiences (while safeguarding confidentiality).

POLICY RECOMMENDATIONS:

Our key recommendations to develop a way forward can be summarised as follows:

- a) As a starting point, we should establish productive dialogue among all stakeholders in RI. This includes sharing experiences, ensuring transparency and confidentiality of communication concerning RI investigations.
- b) ALLEA and academies should be more involved in promoting RI dialogue, in several different ways. Academies in individual countries can be the platform for dialogue about RI between different stakeholders. Academies can also act as an important bridge for dialogue between policy-makers and managers at research performing or funding organisations and individual researchers or research communities. This is very important given that individual researchers often consider RI as something that relates to external, formal, top-down rules rather than being the result of scientific discussion. At the international level, ALLEA has already achieved recognition as a platform for such dialogue and can help by transferring this dialogue to the national level.
- c) Policy-makers should provide clear legal and regulatory frameworks for the responsible conduct of research and communicate the importance of RI to all stakeholders. They should also closely follow the impact of new policies on Research Integrity, such as privacy protection regulations and Open Science. Policy-makers should promote public engagement in assessing the existing and developing new policies for the responsible conduct of research.
- d) Research councils and other national funding organisations should become (more) involved in RI dialogue and communication with other stakeholders in the responsible conduct of research. Research funding organisations should also take active steps to communicate their procedures and have structures in place for dealing with irresponsible research and research misconduct. RI training and qualification should be considered an explicit strength in the research profile of researchers who

request funding, while integrity challenges and ways to address them should be highlighted in methodology sections.

- e) Research performing organisations should develop responsible research with other stakeholders at different levels in an open and transparent way. Open dialogue and clear communication are crucial. Research organisations should collaborate in defining basic principles for carrying out inter-organisational and international RI investigations. Training on RI should be mandatory and used as a platform for dialogue about the responsible conduct of research. Research performing organisations should clearly communicate their adherence to research integrity by officially adopting international standards, such as a European Code of Conduct for RI, and having clear, publicly available policies about and a structure for promoting RI and implementing RI investigations. With regard to communication in the context of RI investigations, research performing institutions should consider endorsing recently developed guidelines, in particular the CLUE (Collaboration and Liaison between Universities and Editors) Recommendations on Best Practice and the RePAIR Consensus Guidelines (Prevention and Management of Misconduct Related Retractions).
- f) Research Integrity bodies should be ambassadors of responsible conduct of research. They should have clear and publicly available procedures for dealing with RI allegations and for conducting RI investigations, combining transparency with confidentiality. RI bodies should clearly communicate the results of RI investigations, especially in the case of acquittal, in order to preserve or restore the reputation of a researcher.
- g) The commercial / industrial sectors should actively engage in the dialogue about RI with other stakeholders, particularly with regard to creating and harmonising RI principles. These sectors should clearly and transparently present their structures, policies and procedures to ensure responsible conduct of research and to communicate the results of RI investigations. They should also be aware of their financial conflicts of interest, particularly in relation to other stakeholders, including patients' organisations.
- h) Scientific journals should continue their collaboration with other stakeholders, particularly research institutions, to ensure the communication of the results of RI investigations. They should implement and promote recently developed guidelines on collaboration between research organisations and journals, e.g. the CLUE (Collaboration and Liaison between Universities and Editors) Recommendations on Best Practice and the RePAIR Consensus Guidelines (Prevention and Management of Misconduct Related Retractions). Scientific journals should also continue to provide a forum for dialogue on responsible Research Integrity by all involved stakeholders.
- i) The media have a significant impact when it comes to promoting an open culture of debate and have a significant responsibility for objectivity and respect for individual researchers involved in RI investigations. Media

managers are encouraged to provide training about research and RI to the reporters, which includes sensitivity to possible biases and the use of appropriate terminology when reporting about RI. Through proactive participation in media debates, researchers themselves can contribute to the quality of the debate, fostering dialogue between the research community, the public and the other stakeholders in RI, using media events as platforms for public engagement and reflection.

3.4 *Training and education*

The Fourth Thematic Report addresses the fourth priority topic, Training and Education for RI. It was developed from a Challenge Paper that aimed to help MLE participants prepare for the third and final working meeting that took place in Paris, France, on 14 May 2019, and benefitted from the discussions that took place during this meeting. The overall scope of this topic was defined in the kick-off meeting that took place on 14 November 2018 in Brussels, where representatives of all the 14 participating countries (Austria, Bulgaria, Denmark, Estonia, Finland, France, Greece, Ireland, Lithuania, Luxembourg, Moldova, Norway, Spain and Sweden) shared information about RI frameworks in their countries and discussed their learning objectives.

During the scoping workshop and the kick-off meeting, participants showed an interest in sharing and comparing experience and opinions about providing instruction on research integrity.²⁴ In particular, it was determined that the objectives of most immediate and relevant interest to participants were: 1) to compare training programmes on Research Integrity with regard to aspects including objectives, content and structure of the courses, mode of delivery (i.e. whether training is best delivered online rather than in person) and modes of assessment of the courses; 2) to share successful and unsuccessful experience about different aspects of training, including: mode of course delivery (for example, experiences with role playing and other interactive approaches), incentives for attending the course (for example, advantages and disadvantages of making the training mandatory rather than optional, as well as other ways to make the training more interesting and fun for participants) and career level and occupation of participants. Furthermore, two overarching objectives expected to be of general interest were: 3) to determine if and how each of the elements of RI training listed above needed to be tailored to the specific needs of a research field, a particular country or even a particular institution; and 4) if and to what extent course material could be shared across countries and in particular whether a repository of anonymised real cases of scientific misconduct or other ethical breaches could be created to provide instructional material for RI education across the EU.

In order to provide a scholarly accurate, empirical and theoretical context for the discussions that were held at the working meeting, the preparatory Challenge Paper presented a review of the relevant literature.

²⁴ Directorate-General for Research and Innovation. Unit A.4 (2019). MLE on Research Integrity: *Thematic report n4, Training and Education*. Prepared by Daniele Fanelli.

As the research literature on education in Research Integrity is enormously rich, the focus was on recent secondary literature (systematic reviews, meta-analyses, secondary analyses of empirical studies). Most of the current literature on Research Integrity (RI) education originates from the United States. Therefore, although the objective is to draw lessons that are relevant to the future of RI instruction in countries of the European Union (EU), the main source of research evidence concerning RCR instruction was literature authored by US scholars and derived from studies conducted on training for US researchers and students. The lack of research concerning the European context is one of the challenges to be addressed. Another limitation of the literature is that most policies, initiatives and academic studies on RI education to date have focussed on training graduate students in what is generally referred to as Responsible Conduct of Research (RCR). Therefore, although it is well understood that multiple other actors in the scientific system could benefit from other types of RI training, specific to their roles, there is very little research to draw lessons and recommendations for these other types of training.

Why is RCR/RI training important? It is widely acknowledged that education plays a role in preventing scientific misconduct. However, this preventive role does not seem to occur, as some might assume, because training in RCR will 'stop' scientists from committing scientific misconduct. Indeed, as the topic report discussed, there is no clear evidence that preventing individual research misconduct in this fashion is a realistic goal of RCR instruction. Rather, education and training exert a preventive role indirectly, by making individuals aware of RI issues. More accurately, following the terminology used in relevant educational literature, RI training can meet three educational objectives, by imparting 'knowledge' (about rules and policies), 'skills' (ability to identify, analyse and deal with integrity issues, conveyed via 'process-oriented' instruction) and 'affective' components. During the discussion, MLE participants suggested that the latter concept is best expressed as 'motivational' components in consideration of the fact that RI should be considered as an ethos or habit, or as a transferable skill, which can be applied in multiple areas of personal and professional life (something like integrity sensitivity or literacy).

As to the question about *who* should receive training, although most sources focus on students and early stage researchers, other documents (such as the PRINTEGER Bonn Statement and the ALLEA Code of Conduct) emphasise the importance of training all researchers and research managers. As to the question of *what* is taught under the RI heading, this may encompass many aspects, ranging from responsible authorship and publication via research planning and conflicts of interest to data management. As to *how* (p. 10), modes of delivery include face-to-face teaching but also online instruction (including interactive platforms, Massive Open Online Courses (MOOCs) and hybrid formats). The literature offers considerable evidence that each modality has strengths and weaknesses but that a component of face-to-face instruction is essential. Also of continuing importance is the need to evaluate whether teaching is effective as an important part of RI training and education: what do participants learn and how can instruction be improved? Ideally, the effectiveness of a course should be evaluated in a pre-test/post-test comparison against controls.

Notably during the Paris meeting, participants pointed to relevant activities and results from a number of European projects. Several European projects invest in developing RI training. Besides tools for research leaders and managers, PRINTEGER established an open access platform named UPRIGHT (<https://printeger.eu/upright/>). ENERI collated an overview of advanced training modules on research ethics and integrity especially for research ethics committees (RECs) and research integrity offices (RIOs) (<http://eneri.eu/online-available-training-options-for-recs-and-rios/>). The VIRT²UE project aims to develop a "train the trainer programme for upholding the principles of the European code of conduct". The Path2Integrity project and the INTEGRITY project aim to support formal and informal learning methods for secondary school students, undergraduates, graduates and young researchers.²⁵ Finally, the Open Science Massive Open Online Course aims to contribute to the transformation of the scientific publication system by instructing researchers and other stakeholders on the principles and practices of Open Science in its multiple components.²⁶ In addition, there are several platforms for collecting and exchanging educational materials such as EnTIRE²⁷ and EthicsWeb (www.ethicsweb.eu), but the Research Ethics Library of the Norwegian National Research Ethics Committee is also an active online resource aimed at offering introductions to the main issues in research ethics and at encouraging debate and reflection.²⁸ Finally, ENRIO (European Network of Research Integrity Officers) has an active website that also collects information on its member organisations, including resources on national legislation and training programmes.²⁹ As to effectiveness, meta-analytical evidence points to the importance of in-person activities to teach people how to examine and solve complex ethical issues. The active participation of students and researchers, rather than the exclusive use of online resources, is the most effective way to facilitate discussion and learning.

Thus, during the MLE working meeting in Paris, multiple and varied experiences of RI training were shared and compared by participants, facilitating the imparting of knowledge, of ethical values and decision-making skills, and of general awareness and appreciation of RI in decision-making and conducting research. In addition, it was argued that, although the diversity of institutional and national cultures in the EU is a reality to be reckoned with and to be valued, this pluralism is not to be confused with relativism. The core principles of RI lay claim to universal normative validity (Enebak 2007) but are implemented in contingent cultural, national and institutional structures that are diverse and in continuous historical evolution. These differences are manifest in how the RI is formalised, institutionalised, regulated and taught.

It was also generally acknowledged that there is a distinctly European approach to RI, which, compared for example to a more 'North American' approach, tends

²⁵ <https://www.path2integrity.eu/>.

²⁶ <https://opensciencemooc.eu/>.

²⁷ www.entireconsortium.eu.

²⁸ www.etikkom.no/en/library/.

²⁹ www.ENRIO.eu/resources.

to express a lower level of individualism and to focus more on institutional and structural responsibilities, and on the importance of building a scientific *ethos*. The ALLEA Code of Conduct (ALLEA, 2017; <https://allea.org/code-of-conduct/>), for example, embodies this philosophy in its emphasis on institutional and structural responsibilities. However, this 'EU versus US' distinction should not be overstated. There is considerable cultural and institutional diversity in the US, just as there is in the EU. Moreover, recent research and policy documents in the US put increasing attention on the role that institutional and working environments have in fostering RI (e.g. Martinson et al 2010).³⁰ Nonetheless, it was generally agreed that EU countries should pursue a distinctly EU approach to fostering and training in RI, by developing specific training programmes and adapting all training material developed outside the EU as necessary.

POLICY RECOMMENDATIONS:

In light of the background literature review and the discussions held at the meeting, the following recommendations about RI training and education were endorsed by all participating countries:

- a) RI training programmes in the EU need to strike an optimal balance between coordination and diversity, both across and within EU countries.
- b) Coordination across the EU and within countries is to be improved by sharing course materials, experience and data on RI training. Materials need to be collected in a curated and easily accessible form. An online platform should be identified for the scope and its continuing existence should be ensured.
- c) Diversity across the EU and within countries must be preserved by encouraging institutional autonomy in the design and delivery of RI training and by discouraging an uncritical re-use of material from other institutions or countries. Materials for a course, even when obtained from the sharing platform discussed above, should be adapted as necessary to the objectives of the course and to the culture and requirements of the institution or discipline for which the course is being designed.
- d) National-level RI officers (or other equivalent figures) are crucial mediators between the need to coordinate RI training and the need to foster its diversity within their own countries and across the EU. In particular: They should: (i) ensure the collection and sharing of material and information on RI training in their country; (ii) indicate the overall objectives and themes of RI training within the country. Institutions should then be allowed and encouraged to develop their own training programmes autonomously; (iii) facilitate dialogue and communication among stakeholders within the country to ensure some level of coordination; (iv) facilitate the conduct of research on RI training.

³⁰ 'Fostering Integrity in Research' (2017). <https://www.nap.edu/catalog/21896/fostering-integrity-in-research>.

- e) Research on RI training should be supported. Research funds should be devoted by the EU and by individual Member States to sustain the collection, sharing and publishing of qualitative and quantitative data on RI training in order to allow all RI programmes to continue to make progress.

Besides these core recommendations, we listed some other aspects and elements to be taken into consideration:

- f) Participants generally agreed that RI training could meet multiple objectives, notably: the imparting of knowledge, of ethical thinking skills and of a general awareness and appreciation for the role of ethics and integrity in research and decision-making.
- g) Attendance at RI training among students and early-stage researchers should be actively encouraged by institutions. This can already be done by simple acts such as offering a free meal or by connecting the training event to entertainment and a social activity, for example watching a movie. Giving course credits or digital badges for RI training are also seen as compelling incentives. RI training should also be strongly encouraged and incentivised for experienced researchers.
- h) The hardest audience to reach may be senior academics and institutional leaders, who are unlikely to be incentivised by any of the activities above. In this case, connecting training to career opportunities or research funds may be effective positive incentives and a possible alternative to making the training compulsory.
- i) RI policies and experiences should be part of quality assessments of research performing institutions. More formal ISO-type of certification schemes could encourage institutions, particularly if connected to public acknowledgements, as discussed elsewhere.
- j) Participating countries agreed on the importance of sharing materials, information and data on RI training activities. Sharing reports of real or realistic cases is of particular importance because such cases constitute relatable examples, which facilitate learning. Multiple resources and platforms for sharing these types of materials are already available. Coordination across the EU and within countries is to be improved by sharing course materials, experience and data on RI training. Materials need to be collected in a curated and easily accessible form. An online platform should be identified and its continuing existence should be ensured.

4 Practices / experience from participating countries

As indicated, this Mutual Learning Exercise benefitted from input and experience from fourteen participating countries. Besides challenge papers, reports, country visits and debates, we also shared and learned from experiences concerning existing inspirational practices in the participating countries. Depending on the context, such practices (developed to address specific integrity challenges) may provide examples for other countries as well. Multiple practices were mentioned and discussed, including the following:

- a) National ethics committees – such as the national research ethics committees (FEK, www.etikkom.no) in Norway, providing RI guidance and advice to researchers, which includes: preventive actions regarding research misconduct, investigation of serious misconduct cases, assistance/guidance to researchers and institutions as well as an oversight function.³¹
- b) RI websites – in various countries, research ethics and RI websites are available, providing information on responsible research, such as the Codex website in Sweden³² which offers comprehensive information on codes, guidelines and legislation that regulate the research process, addresses first and foremost those who are actively involved in research, but also the broader public.
- c) National RI forums - such as the National RI forum established in Ireland in June 2015 as a dialogue platform with representation from research performing organisations, research funder organisations and other stakeholders. Its aim is to ensure the continual development and adoption of good practice, fostering a strengthened approach to Research Integrity in Ireland.³³
- d) RI coaches – We notably discussed examples of RI coaches appointed in Finland and Luxembourg, providing support, encouragement and advice to researchers in addressing challenges involved in designing, conducting and reporting research, offering guidance as they progress along their project path, helping them to produce robust, ethical research.³⁴
- e) Digital RI badges awarded by institutions – As an inspirational example we notably discussed the digital Badge in Responsible Conduct of

³¹ <http://www.enrio.eu/news-activities/members/norway/>.

³² <http://www.codex.vr.se/en/index.shtml>.

³³<http://research.ie/assets/uploads/2017/07/National-Forum-on-Research-Integrity-Seminar-Report-Feb-2017-web-version.pdf>; similar organisations exist in other countries, such as the EARTHnet network in Greece, involving participants from various disciplines providing guidance notably for researchers working with emerging technologies. Other examples include the RI working group of the Association of Swedish Higher Education Institutions and the expert group on ethics in research funding at the Swedish Research Council.

³⁴ LARI Peer Coaching: <https://lari.lu/lari-services/lari-peer-coaching/> and Bramstedt (2019).

Research, developed in Ireland by the University College Cork (UCC),³⁵ to embed and foster the principles, key elements and core skills of RI, thereby addressing a gap in the skills portfolio of researchers.³⁶

- f) Mandatory RI training – Throughout Europe, a broad range of research ethics and RI courses and programmes is offered. We discussed mandatory RI training in Moldova and France, for instance, made compulsory by decrees issued by the Ministry of Education. In calls for (corresponding or full) membership of the Academy of Sciences of Moldova, RI training is explicitly mentioned as a requirement.
- g) Innovative RI training - During our MLE meetings, multiple and varied experiences of RI training were shared and compared. In France, many research institutions are developing RI training courses. Examples include a Massive Open Online Course (MOOC) developed by the Université de Bordeaux (Université de Bordeaux, 2018) and a two-step in-person course developed at the University Paris-Saclay by the Research Ethics and Scientific Integrity Council (POLETHIS).
- h) Train-the-trainers – Train-the-trainers programmes are offered in several countries, including Austria and Greece. These programmes are developed to demonstrate didactic methods fostering Good Scientific Practice (GSP).³⁷
- i) RRI accreditation – In a number of countries, such as Estonia, France and Denmark, RI is integrated into the accreditation process for research and higher education institutions as a requirement.

³⁵ <https://www.ucc.ie/en/teachlearn/projects/digitalbadges/>.

³⁶ <https://ukrio.org/guest-blog-digital-badge-in-responsible-conduct-of-research-at-the-university-college-cork-ireland/>.

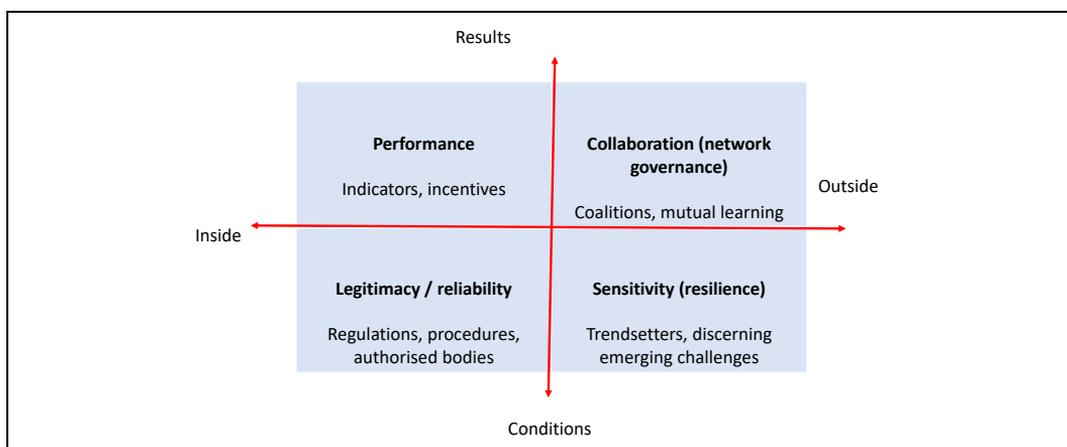
³⁷ <https://oeawi.at/en/training-train-the-trainer/>; cf. <http://www.enrio.eu/news-activities/train-the-trainer-for-good-scientific-practice/>.

5 Overarching recommendations

Our Mutual Learning Exercise on Research Integrity produced a wealth of insights, deliberations and shared experiences, resulting in a series of concrete recommendations for addressing RI challenges, notably at the institutional level. These recommendations are addressed to multiple audiences: ranging from researchers and academic teachers via research funders and research managers up to academic publishers, policy experts and governmental organisations.

During our final meeting in Vilnius, Lithuania, we discussed how to best present our overarching outcomes. In particular, the challenge was how to address institutional responsibilities for fostering Research Integrity. We proposed adopting the following quadrant as a framework via which to present our recommendations.³⁸ It is a figure which indicates how organisational responsibilities can be perceived from multiple perspectives:

Figure 5: Research integrity governance in outline



The more traditional approach is to look at institutional responsibilities starting from the inside: the internal regulations and procedures established to safeguard proper conduct. Should integrity challenges arise, these are mobilised to handle them in a responsible manner.

An alternative approach, however, takes external challenges and concerns as points of departure, starting from the outside, the changing institutional environment. Organisational responsibilities are designed in such a way that these can be proactively addressed.

We may also look at institutional responsibilities in slightly different terms, namely by focussing on conditions, such as: providing optimal training and guidance, creating a resilient research culture.

³⁸ This quadrant builds on a scheme for governance of public organisations proposed by Bourgon (2009).

Others, however, may prefer to focus on concrete results, measurable with the help of integrity performance indicators as well as incentives for encouraging proper research conduct. Extrapolating this figure to the research integrity debate results in the following figure, which allows us to produce a concise overview of the topics addressed:

Figure 6 Schematic overview of RI topics

<p>Performance indicators Integrity training: attendance, number of participants in courses, evaluations; Symbolic awards for recognition of RI activities; Credits systems Public acknowledgements (integrity “rankings”)</p>	<p>Collaboration Transparency about integrity cases Establish constructive dialogues among RPOs and other stakeholders Use / create platforms for dialogue Interaction between journals, publishers and professional bodies Sharing materials and training methods</p>
<p>Structures and procedures Definitions Professional standards RI bodies (local, national, international) for assessing allegations Systems of appeal, fair procedures, confidentiality etc. Integrity portfolio RI in contracts</p>	<p>Sensitivity Sensitivity to context RPOs as testbeds for developing best practices RI coaching Promote public engagement Develop / evaluate new options for policy Proactive role in developing educational tools Ambassadors for research integrity Contribute to media debate on RI</p>

5.1 *Authorised structures*

First of all, we encourage research performing organisations (RPOs) to define what RI means to them, why it is important, how they implement RI in their organisations and how they aim to meet professional standards for conducting research. In addition, RPOs should be encouraged to explain, on their organisational websites for instance, how RI is safeguarded by authorised institutional bodies and integrity counsellors.

An important institutional recommendation concerns the development of an RI track record. Academics should be encouraged (incentivised) to devote a special section of their CV to relevant RI experience or even to develop an RI portfolio consisting of components such as conducting and participating in RI training as well as participating in RI deliberation at the institutional level or in academic and public debate. They should also indicate their experience as a research manager and supervisor in addressing the integrity challenge via the supervision and RI training of students and early stage researchers, integrity coaching and advice. In this manner, academics develop an integrity record indicating their status and experience as qualified researchers, comparable to teaching portfolios. This would be especially meaningful in the context of international collaboration and mobility by ensuring that all universities and academics involved have a solid training and track record for addressing integrity issues.

We also recommend the adoption of an RI Oath. As discussed above, an integrity oath would represent a more positive and compelling incentive than integrity compliance statements that some institutions currently require from researchers as employees or recipients of research funding. The oath would be part of the socialisation process for all actors in the research system and would commit them to RI not only in academic research, but hopefully also in private and commercial activities (collaboration with private partners and societal stakeholders, advisory roles in governmental organisations, contributions to public debate).

Acquittal and rehabilitation - In the case of formal investigations, special attention should be paid to transparency while maintaining confidentiality. In the case of acquittal, clear communication is required. Also, transparent guidelines should be in place concerning the possibility of rehabilitation (resuming academic functioning after a period in which the person concerned is penalised). Or should serious misconduct entail an academic life sentence?³⁹

Prevention of abuse - In dealing with allegations, which often involves one case, the actual codes, guidelines, benchmarks and best practices should be given due attention. Integrity allegations may prove harmful weapons in cases of competition or organisational conflicts, so that special attention should be given to the development of guidelines, practices and fair procedures to prevent abuse of misconduct allegations. In the case of integrity allegations, proper professional regulations and channels should be used and respected. In most cases, mass media will be not be an optimal podium for addressing complicated individual cases. Whistle-blowers should be protected but witch-hunts should be prevented as well.

5.2 *Performance indicators (incentives)*

We recommend the development of forms of public acknowledgement of significant institutional efforts in the RI realm, based on criteria relevant to RI. We suggest inspirational (rather than competitive) forms of incentives or acknowledgements, which could include: acknowledgement of the presence, quality and transparency of integrity policies; activities to promote RI and to foster an environment that supports RI; and activities in the realm of training, coaching and teaching. Acknowledgements of inspirational examples could be published on national or European web platforms. Universities and other research performing organisations should be encouraged to shift their focus from reputation damage control to transparency, sharing of best practices and mutual learning.

RPOs should be encouraged to create safe, inviting and engaging spaces for mutual learning and integrity deliberation at the institutional level. RI teaching should not only involve early stage researchers and students, but senior staff as well (intergenerational learning). RI should not be framed as a soft (affective, etc.) skill, but as a (motivational and transferable) professional skill, as part of

³⁹ In Lithuania and Luxembourg, the penalty for misconduct is a five year ban from public funding. Decisions are based on a case by case assessment (in Luxembourg, this is carried out by the Luxembourg National Research Fund).

the ethos of science and as an informed attitude. Incentives could range from informal encouragement to badges and certificates (as an item on an academic's CV or as part of an RI portfolio). In addition, institutions should be encouraged to develop (formal and informal) integrity rewards, involving symbolic incentives for integrity work: acknowledgment of activities such as RI training, coaching and deliberation as important components of academic performance.

5.3 Collaboration

Under this heading, we recommend the development of platforms for deliberation, where research communities address emerging challenges in a transparent and proactive environment based on mutual learning. While institutions are responsible for creating such podiums, the deliberation should encourage bottom-up input from a work-floor perspective. Insights and experiences should be communicated and shared between RPOs both nationally and internationally.

During our MLE, the sharing of educational modules, materials and approaches, of data and experiences concerning RI training has been emphasised (notably: the Fourth Thematic Report on training and education, p. 27). Materials need to be collected in a curated and easily accessible form. An online platform should be identified for the scope and its continuing existence should be ensured.⁴⁰ In addition, the introduction of an RI Oath or an RI portfolio / RI section in academic CVs requires collaboration within academic networks.

Furthermore, as indicated, we encourage RPOs to join national and international networks (joining the ENRIO, for instance, formally adopting the ALLEA Code of Conduct, etc.).

5.4 Sensitivity

As an overarching recommendation, we encourage research performing organisations to invest in and care for their research culture. Fostering a research culture that is supportive of responsible conduct of research is a joint responsibility of researchers, funding agencies and research managers. Codes and guidelines are important but due attention should also be given to the institutional ecosystem or research climate, which should be a climate of transparency, honesty, inclusiveness⁴¹ and fairness. There is evidence that hierarchical organisations are more at risk of misconduct than organisations fostering a more open research culture (Horbach, Breit & Mamelund 2019). Promoting integrity requires a holistic RI approach, seeing RI as an integral dimension of good research, embedded, realised and practised in a viable research culture. A resilient research culture also involves establishing forms of Research Integrity coaching, where experienced colleagues may offer advice to

⁴⁰ Possible examples of such a platform are the ENRIO website, the EnTiRE wiki-platform, the EthicsWeb and the Research Ethics Library of the Norwegian national research ethics committees.

⁴¹ Inclusiveness here means allowing multiple voices to take the floor in terms of gender, discipline, generation, position within the organisation (both academic and support staff), etc.

individuals or teams. Universities and other RPOs should pay special attention to RI coaching as an institutional responsibility. RI needs a local voice and a face to become less abstract and more supportive (Bramstedt 2019).⁴²

Innovative teaching – Development, evaluation and assessment is an essential component of RI teaching. We should foster and facilitate sharing of materials and of tools for evaluation (via platforms such as the Embassy of Good Science Platform, where all materials produced by EU-funded projects (ENERI, ENRIO, EnTIRE, UPRIGHT, etc) will be collected. Teaching materials should not only highlight individual responsibilities, but also be sensitive to the importance of the integrity environment.

Public debate - Although media and journalists have their own roles and responsibilities, academics should be encouraged to actively contribute to the debate, seeing themselves as co-responsible for an informed, high-quality dialogue on RI in the public realm. Responsible communication of RI should involve both researchers and the public in discussions on RI issues. Preferably, attention should be refocussed from spectacular single cases to a realistic depiction of the research process and to emerging efforts to address integrity challenges and strengthen the resilience of the research system. Scandal sells but, in the long term, responsible journalism will increase trust.

Balancing harmonisation and sensitivity to context - On the international policy level, we should be sensitive to differences in culture (styles of communication) and history (e.g. many European countries were under the sway of communist regimes until 1989, but also other examples of important historic conditions affecting local or national research cultures can be mentioned). At the same time, European initiatives to transform and optimise research cultures (for instance: by fostering transparency) may be regarded by some as a threat to national culture (perceiving RI campaigns as a particular strand of globalisation of research). This requires a balance between harmonisation and contextual sensitivity (for instance, on the part of integrity coaches), seeing RI as a *process* of internalisation, institutional care and something to work through.

⁴² <https://lari.lu/lari-services/lari-peer-coaching/>.

ANNEX 1: RECOMMENDATIONS FROM THE INDIVIDUAL THEMATIC REPORTS

Table 1 List of recommendations in the area of Report 1: Structures and processes

Type of recommendation	Structures and processes
General	The definition of research integrity should be agreed at the national level in order to harmonize the processes at all levels in a country's RI system and increase the security and trust of researchers and other stakeholders in the fairness and objectivity of RI structures and processes.
General	The criteria for RI and research ethics (RE) experts should be harmonized across Europe.
General	While there is no "right" RI structure that would fit all historical, legal, cultural and socio-economic differences between countries, it would be advisable to create a national RI body that could help coordinate, monitor, educate, communicate and promote research integrity in a country.
General	It would be beneficial for RI in the European context that countries join the European Network of Research Integrity Offices (ENRIO).
Specific	<p>Overlap of different ethics committees and issues of cooperation</p> <p>Cooperation of different committees is necessary, but there should be a balance between the independency of work and collaborative efforts in reaching the decisions.</p>
Specific	<p>Appeals to the results of RI investigations</p> <p>Appeals should be possible, especially in systems without national RI bodies, where institutional bodies may have strong conflict of interest.</p>
Specific	<p>Conflict of interest</p> <p>RI committee members should be carefully selected to avoid conflicts of interest. International panels would have the least bias in this regard and should be considered at least at the level of the appeals.</p>
Specific	<p>RI investigations and mobility</p> <p>A RI portfolio, similar to teaching portfolio, could be established, consisting of a certificate indicating that this person is a qualified researcher able to address integrity challenges emerging in research (and this can include, for instance, integrity training as part of a mandatory management training program).</p>
Specific	<p>RI investigations and mobility across sectors</p> <p>There should be more open dialogue between the sectors on RI and mobility.</p>
Specific	<p>Whistle-blowers</p>

Policies and procedures for RI investigations should address the important distinction between confidentiality and anonymity and ensure safeguarding of the confidentiality at all times for all involved in the RI investigation.

Table 2 List of recommendations in the area of Report 2: Incentives

Type of recommendation	Incentives
Policy	<p>Compulsory regulations and “softer” policy requirements ought to be complemented with positive incentives.</p> <p>The latter may take the form of informal or formal incentives, for example of the kinds outlined above, and could aim to reward actions and activities including:</p> <p>training, coaching, creating research environments that support dialogue and transparency, innovative methods of assessment of research performance and impact, open science activities.</p>
Policy	<p>The effects of any incentive or regulation should be closely monitored, to ensure the achievement of desired effects and detect the possible occurrence of unintended consequences.</p> <p>Monitoring activities ought ideally to include the collection of data, but it is essential that an open dialogue is maintained with the research community and all other relevant stakeholder, whose feedback and experiences should be collected and addressed with a spirit of constructive collaboration.</p>
Policy	<p>RI systems should be able to flexibly respond to the emergence of unintended consequences.</p> <p>Whether in the form of positive incentives, or compulsory regulations, being open to revision is an ethical imperative for research ethics and research integrity structures.</p> <p>This follows not solely because new initiatives may have unintended consequences, but also because old ones may no longer adequately respond to the needs of the research community, whose practices, methodologies and cultures are in constant evolution.</p>
Policy	<p>Research on the impact of RI incentives and policies should be fostered and sustained.</p> <p>Such support would come, first and foremost, by the collection, in each country, of relevant documentation on new RI interventions that are introduced and on data, qualitative or quantitative, on their results and effects.</p> <p>This information should be shared to any extent possible, when not published in the form of scientific reports and peer-reviewed studies.</p>

Table 3 List of recommendations in the area of Report 3: Dialogue and communication

Recommendation for	Dialogue and communication
Academies and ALLEA	<p>ALLEA and academies should get more involved in promoting RI dialogue, in several ways:</p> <ol style="list-style-type: none"> 1. Academies in individual countries can be the platform for dialogue about RI between different stakeholders. At the international level, ALLEA has already achieved recognition as a platform for such dialogue, and can help by transferring this dialogue at the national level. 2. Academies can also be proactive in promoting formal endorsement of European Code of Conduct (ECoC) for Research Integrity by individual institutions. They could make a public list of institutions who subscribe to the ECoC, and maintain it at the national level. ALLEA could be a central gateway for this type of information. Such official “observatory” and formal subscription to ECoC could provide strong incentives for subscribing to and truly implementing ECoC in institutions and professional organisations. 3. Academies could be an important dialogue bridge between the policy-makers and managers at research performing or funding organisations and individual researchers or research communities. This is very important, as individual researchers often consider RI as something that is external, formal, top-down rules rather than the result of scientific discussion.
Policy-makers	<p>Policy-makers should provide clear legal and regulatory frameworks for responsible conduct of research and communicate the importance of RI to all stakeholders.</p> <p>They should also closely follow the impact of new policies on research integrity, such as privacy protection regulations and open science.</p> <p>Policy-makers should promote public engagement in assessing the existing and developing new policies for responsible conduct of research.</p>
Funding organisations	<p>Research councils and other national funding organisations should get involved in RI dialogue and communication with other stakeholders in responsible conduct of research. They should follow the above recommendations for academies to engage in a dialogue. They should also collaborate within and beyond Science Europe to encourage research performing institutions, professional organisations, and other stakeholders to subscribe to RI standard. As policy makers about research funding, they should engage in the dialogue with the scientific community and the public about responsible research, using different approaches for public and community engagement.</p> <p>Research funding organisations should also take active steps in communicating their procedures and structures in place for dealing with irresponsible research and research misconduct. Only by having clear policies in place, objective bodies and procedures and public report on the findings of RI investigation, research performing organisations can be the leaders in responsible research in their communities.</p>

Recommendation for	Dialogue and communication
Research performing organisations	<p>Research performing organisations continue their collaboration in ensuring responsible research with other stakeholders at different levels in an open and transparent way. It is also important to share experiences and learn from each other at a national and international level. This is particularly important as research is international and institutions from different countries may be involved in RI investigations. Open dialogue and clear communication are crucial in such cases and research organisations should collaborate on defining basic principles on carrying out inter-organisational and international RI investigations.</p> <p>Training on RI, which is mandatory at many research performing organisations, should be used as a platform for dialogue about responsible conduct of research.</p> <p>Research performing organisations should clearly communicate their adherence to research integrity by officially adopting international standards, such as European Code of Conduct for RI, and having clear, publicly available policies about and structure for promoting RI and implementing RI investigations. With regard to communication in the context of RI investigations, research performing institutions should consider endorsing recently developed guidelines, in particular the CLUE (Collaboration and Liaison between Universities and Editors) Recommendations on Best Practice and the RePAIR Consensus Guidelines (Prevention and Management of Misconduct Related Retractions).</p>
Research integrity bodies	<p>RI bodies should be ambassadors of responsible conduct of research.</p> <p>RI bodies should have clear and publicly available procedures for dealing with RI allegations and for conducting RI investigations. They have to ensure that their work is transparent and at the same time confidential, to ensure the rights of all involved. Anonymity and confidentiality during RI investigations should be carefully balanced.</p> <p>RI bodies should clearly communicate the results of RI investigations while respecting legal requirements. It is particularly important to communicate the results of RI investigations which result in acquittal, in order to preserve or restore the reputation of a researcher.</p>
Industry sector	<p>Commercial sector should actively engage in the dialogue about RI with other stakeholders, particularly about creating and harmonizing RI principles.</p> <p>It should clearly and transparently present their structures, policies and procedures to ensure responsible conduct of research, and communicate the results of RI investigations.</p> <p>It should also be aware of its financial conflicts of interest, particularly in relation to other stakeholders, including patients' organisations.</p>
Scientific journals	<p>Scientific journals should continue the collaboration with other stakeholders, particularly research institutions in ensuring the communication of the results of RI investigations. They should implement and promote recently developed guidelines on collaboration between research organisations and journals. CLUE</p>

Recommendation for	Dialogue and communication
	<p>(Collaboration and Liaison between Universities and Editors) Recommendations on Best Practice and the RePAIR Consensus Guidelines (Prevention and Management of Misconduct Related Retractions).</p> <p>Scientific journals should also continue to provide the forum for the dialogue on responsible research integrity by all involved stakeholders.</p>
Media	<p>Media should be aware of their responsibility in ensuring the transparency of responsible conduct of research and, at the same time, responsibility for objectivity and respect for individual researchers involved in RI investigations.</p> <p>It should provide training about research and RI to the reporters, manage its own biases and use appropriate terminology when reporting about RI.</p> <p>Media should have an active role in ensuring the dialogue between the public and the other stakeholders in RI by providing a platform for public engagement.</p>

Table 4 List of recommendations in the area of Report 4: Training and education

Type of recommendation	Training and education
Policy	<p>RI training programs in the EU need to strike an optimal balance between coordination and diversity, both across EU countries and within.</p> <p>There appears to be a distinctly European approach to RI, which training material developed in the United States does not reflect.</p> <p>A plurality of approaches to RI training is also, and more importantly, expressed across EU countries, and within each of them, across institutions.</p> <p>Not all sources and levels of pluralism are beneficial, however. Many participants reported how different and conflicting purposes of different institutions within a country were a source of considerable difficulties and obstacles in advancing a RI training agenda</p>
Policy	<p>Coordination across the EU and within countries is to be improved by sharing course materials, experiences and data on RI training.</p> <p>Materials need to be collected in a curated and easily accessible form.</p> <p>An online platform should be identified for the scope, and its continuing existence should be ensured.</p>
Policy	<p>Diversity across the EU and within countries must be preserved by encouraging institutional autonomy in the design and delivery of RI training and by discouraging an uncritical re-use of material from other institutions or countries.</p>

	<p>Materials for a course, even when obtained from the sharing platform discussed above, should be adapted as necessary to the objectives of the course and the culture and requirements of the institution or discipline for which the course is being designed.</p>
Policy	<p>National-level RI Officers (or other equivalent figures) are crucial mediators between the need to coordinate and that to maintain diversity within their own countries and across the EU. In particular:</p> <p>They should ensure the collection and sharing of material and information on RI training in their country.</p> <p>They should indicate the overall objectives and themes of RI training within the country. Institutions should then be allowed to develop their own training programs in autonomy.</p> <p>They should facilitate dialogue and communication among stakeholders within the country, to ensure some level of coordination.</p> <p>They should facilitate the conduction of research on RI training.</p>
Policy	<p>Research on RI training should be supported.</p> <p>Research funds should be devoted by the EU and by individual member states, to sustain the collection, sharing or publishing of qualitative and quantitative data on RI training, in order to allow all RI programs to make continuing improvements.</p>

ANNEX 2: OVERVIEW OF RI PROJECTS AND KEY DOCUMENTS

A. LIST OF RECENT EUROPEAN RI PROJECTS

PRINTEGER (*Swafs 2014-Garri 5*) Promoting Integrity as an integral dimension of excellence in research

TRUST (*Swafs 2014 –Garri 6*) Reducing the risk of exporting non-ethical practices to third countries

DEFORM (*Swafs 2015-Garri 9*) Estimating the costs of research misconduct and the socio-economic benefit of research integrity

ENERI (*Swafs 2015-Garri 10*) European Ethics and Research Integrity Network

ENTIRE (*Swafs 2016 – Topic 17*) Mapping the ethics and research integrity normative framework

PRO-RES (*Swafs 2017 – Topic 21*) Promoting integrity in the use of research results in evidence-based policy

VIRT₂UE (*Swafs 2017 – Topic 27*) Implementing a European Train-the-Trainers initiative with regard to Ethics and Research Integrity

Path2Integrity (*Swafs 2018 – Topic 2*) Rotatory role-playing and role models to enhance the research integrity culture (via formal and informal learning methods, this will contribute to establishing a culture of research integrity)

SOPs4RI (*Swafs 2018-Topic 3 Standard Operating Procedures for Research Integrity*) Promoting excellent research and a strong research integrity culture that aligns with the European Code of Conduct for Research Integrity

INTEGRITY (*Swafs 2018-Topic 2*) Empowering students through evidence-based, scaffolded learning of Responsible Conduct in Research

B. LIST OF KEY DOCUMENTS (SELECTION):

ALLEA (All European Academies) (2017) The European Code of Conduct for Research Integrity (Revised Edition). Berlin: ALLEA

Science Europe: Advancing Research Integrity Practices and Policies: From Recommendation to Implementation. <https://www.scienceurope.org/our-resources/advancing-research-integrity-practices-and-policies-from-recommendation-to-implementation/>

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Studies and reports

