# D2.2. Report on the results of the BEYOND public consultation

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## BEYOND Consortium

| | ROLE | NAME | Acronym | Country |
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| 2. | Partner | European Network of Research Ethics Committees | EUREC | Belgium |
| 3. | Partner | French Office for Research Integrity | OFIS | France |
| 4. | Partner | French Research Institute for Agriculture, Food and the Environment | INRAE | France |
| 5. | Partner | Oslo Metropolitan University | OsloMet | Norway |
| 6. | Partner | Finnish National Board on Research Integrity TENK | TENK | Finland |
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| 13. | AP | Trilateral Research LTD | TRI | UK |
| 14. | AP | Heriot-Watt University | HWU | SCT |



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## Abbreviations

AI - artificial intelligence

CoARA - Coalition for Advancing Research Assessment

CSO - civil society organisation

EU - European Union

LMIC – low- and middle income countries

NGO - non-governmental organisation

RE/RI - research ethics/ research integrity



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# 1 Introduction

To explore and integrate public and stakeholder views on research ethics, research integrity and research misconduct, BEYOND organised a bottom-up and solution-oriented public consultation on research ethics/ research integrity (RE/RI) needs, knowledge, perspectives and real-life experiences of research misconduct and on the efficacy of RE/RI interventions. The results of the public consultation will be used for co-creation of a best practice manual, guidelines to supplement standard operating procedures, and roadmap to 2030.

The objectives of the BEYOND public consultation were as following:

- to define the most important RE/RI aspects from the point of view of society and different stakeholders;
- to define the most important consequences of research misconduct for society from the point of view of society and different stakeholders;
- to explore the society's and stakeholders' views on the prevention of research misconduct;
- to explore different stakeholders' views on their involvement in promoting RE/RI and in the prevention of research misconduct;
- to evaluate effectiveness of the existing RE/RI policies and interventions from the point of view of stakeholders;
- to identify gaps in the existing RE/RI policies;
- to identify gaps in RE/RI governance of citizen science;
- to explore the existence of safe spaces to express RE/RI concerns;
- to explore how research misconduct influences mental health and well-being of researchers and how these are problems addressed;
- to identify best-practice examples of building RE/RI culture, prevention of and reacting to research misconduct;
- to identify best practices for reintegration of researchers after research misconduct.

# 2 Methodology

The public consultation involved two methods to ensure the participation of various stakeholder groups: an anonymous online survey with multichoice and open questions and semi-structured in-depth interviews with various stakeholders.

## 2.1. Survey

The public online survey was developed by BEYOND project team and included closed and open-ended questions grouped in question blocks (see Appendix 1) and aimed at three groups of stakeholders:



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(1) directly involved in research practice (e.g., as researchers, PhD students, research managers, academic personnel, editors of a scientific journals etc.),
(2) students (Bachelor's, Master's and similar levels)
(3) the general public.

The survey was available from September 2023 to March 2024 on QuestionPro survey platform. The survey began with a participant self-identification after which they were redirected to a set of questions corresponding to the participant group – those directly involved in research practice, students and general public.

To ensure better accessibility, the survey was available in ten languages: English, Estonian, Finnish, French, German, Greek, Italian, Latvian, Norwegian and Dutch. The translations were carried out by initially using a translation tool to translate from English to other languages, and afterwards members of BEYOND consortium proof-read the corresponding languages they are fluent in, making corrections where necessary.

The recruitment for participation in the online survey was implemented by open calls on the BEYOND project website, social media (LinkedIn, Facebook) and via emails with an invitation sent to various organisations with a request to share the link to the survey with the team.

Prior to filling in the survey, the participants were introduced to the information about the BEYOND project, the survey and use of anonymous data. The average time spent on filling in the survey was 17 minutes. Answers to multi-choice questions were statistically analysed. The analysis of the responses was started by descriptive analysis to describe the sample and the responses. The factors that could possibly affect the views of the participants, like the field of science or belonging to a particular participant group (researchers, students and the general public) and their effect were analysed separately using Chi square test or Fisher's exact test if there were less than 5 observations in one of the groups. The limit for statistical relevance (alpha) was set to 0.05. Free text responses were analysed qualitatively by importing them into Atlas.ti program and applying the same qualitative content analysis method as for qualitative interviews (described in the next section).

It is important to acknowledge the limitations of the study due to potentially different interpretations on concepts such as ”effectiveness” or “misconduct” by participants. Similarly, responses to questions which require background knowledge, for example, about the existing institutional RE/RI policies or procedures, are subject to the awareness of the participant. The quantitative results should be viewed as a starting point for discussion, explored further through the open comments and interviews, rather than as descriptive metrics representing the participants' context.



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## 2.2. Qualitative interviews

As a part of BEYOND public consultation, 31 semi-structured qualitative interviews with 34 participants (one of the interviews involved three participants from the same NGO) were conducted in February-June 2024. For qualitative interviews, we mainly aimed to include representatives of those stakeholder groups which are usually not closely involved in discussions on RE/RI issues. Representatives of the following groups of stakeholders identified during the stakeholder mapping were invited to participate:

1) journalists and social media activists,
2) representatives of CSOs and NGOs,
3) representatives of industry

Additionally, we invited for interviews representatives of research policy makers and advisory bodies because they form a stakeholder group that possesses significant influence on most of the other stakeholder groups in the field of RE/RI:

4) research policy makers and advisory bodies.

For the list of participants see Appendix 2.

Two members of the team (SM and EL) conducted the interviews online. Both interviewers are female with significant experience in qualitative interviewing. The interviews were held in English. All interviews were audio recorded and transcribed verbatim. All participants signed informed consent forms.

Interview questions were developed by the BEYOND team and included the following topics:

- Experience and background of the interviewee; involvement in RE/RI
- Framing research misconduct (consequences, motivation, observations)
- RE/RI policies (effectiveness of policies, gaps, best practices)
- Public involvement (the role of general public and citizens in the promotion of RE/RI)
- Mental well-being of scientists (for research policy-makers and advisors only)
- Knowledge and skills (for research policy-makers and advisors only)
- Challenges and opportunities related to the use of AI

The transcripts were imported in Atlas.ti for qualitative content analysis[1]. The coding and analysis were carried out by three researchers. Analytical units of the text – one or several sentences - were systematically labeled with codes that represent specific concepts or themes. The codes were derived from the data and used to organise and categorise the textual material.

[1] Mayring, P. (2014). Qualitative content analysis: theoretical foundation, basic procedures and software solution.



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The coded segments were further grouped into categories based on similarities and relationships to identify broader themes and patterns within the data.[2]

Initially, two researchers (SH and SM) independently coded the first two interviews by familiarising themselves with the data and generating codes. The smallest unit of analysis was defined as a sentence. Development of the coding tree was based on the aims of public consultation and driven by the data. Both researchers attempted to develop and apply codes to the first two interviews. The coding was followed by a discussion on the results of independent coding, and the two researchers came to an agreement regarding coding discrepancies and revised the coding tree. The process of independent coding and consensus discussion was repeated with the next two interviews. The final version of the coding tree was developed by discussing the independent coding of the first four interviews and respectively revising the coding tree. The remaining transcripts were divided between two coders (SH and EL) to code independently. At the end of the coding process, redundant codes that were used the least or in the process gained too much similarity with other codes, were merged with similar codes.

In Mayring's approach to qualitative analysis[3] context plays a crucial role in understanding and interpreting textual data. The method emphasizes that the meaning of text can only be fully grasped when it is considered within its specific context. This context includes the cultural, social, and situational background of the text, as well as the broader discourse it is part of. Thus, context is integral to the process, guiding the categorization, coding, and interpretation stages, and ensuring that the findings are grounded in the social reality.

Context 1 - Academia / Research policy-makers / Advisory bodies

Academia is the central context for promoting good research practice and preventing research misconduct. It is done by educating researchers and students on ethical standards and ensuring they are aware of the consequences of unethical practices. Advisory bodies contribute to this process by setting standards and promoting best practices in the scientific community. Research policymakers establish RE/RI policies ensuring that institutions and funding bodies prioritize research integrity and implement effective oversight mechanisms.

The public consultation featured a strong representation of researchers and students, offering valuable insights into the current state-of-the-art in academia, as well as their perspectives and experiences. Among the stakeholders interviewed there were ten interviewees that represented various research policy makers and advisory bodies, including policy makers and advisors at institutional, national and international level. It is important to note that representatives of other contexts did occasionally contribute to this exploring this context as

[2] Ibid.
[3] Ibid.



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well, by sharing stories of their experiences and observations in academic environments, e.g. some of the social media activists are at the same time also members of academia or industry representatives have an experience as students.

The stakeholders in this context have in common an advanced understanding of the research practice and processes in academia, as well as often have an opportunity to participate in development and/or enforcing RE/RI regulations.

Context 2 - Social media activists and journalists

The second context of participants of public consultation was represented by four social media activists (also called epistemic activists or sleuths) and journalists. In the context of research integrity, terms "sleuths" or "epistemic activists" refer to independent investigators who actively investigate and publish cases of research misconduct. They use various methods to scrutinize scientific publications, data, or methodologies in order to detect data fabrication, falsification, plagiarism, or other unethical practices.

Social media activists and journalists play an important role in promoting research integrity by holding researchers accountable, uncovering errors or fraud, and promoting transparency in scientific practice. Online platforms such as PubPeer or Retraction Watch are spaces where such sleuthing activities commonly occur, and results of investigations are discussed in social and traditional media. The main aim of these activities is fostering self-correction of science. Although many of the social media activists and some of the journalists initially (or even currently) are from the academic context, they find that flagging and discussing research misconduct outside the academic context, e.g. in social media, is a more effective way than institutional whistleblowing.

Context 3 - NGOs and CSOs

The third context - NGOs and CSOs play an important role in fostering research integrity by using results of scientific research and advocating for research transparency, ethical practices, and accountability of researchers in their particular fields of interest - protection of environment, patient rights etc. Additionally, these organizations may promote public engagement in science to ensure that research is in line with priorities and needs of social groups represented by particular organization. Some NGOs and CSOs are also involved in citizen science activities.

14 of the interviewees were members of NGOs and CSOs in the fields of patient rights, animal rights, consumer rights and climate justice, as well as reproducibility networks - informal, peer-led groups of researchers aiming to foster transparent, reproducible and rigorous research practices. While their motivation for interest in scientific processes were varied, the access to trustworthy research results was something that was seen as important for this context.



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Context 4 - Industry

Among the stakeholders interviewed, four were representing industry context - pharmaceutical industry, AI, Extended Reality and scientific publishing. This context is defined by influence of commercial interests, relative independence and agility of private organizations, and a focus on optimizing processes. At the same time, industry may be actively involved in scientific research and must adhere to ethical standards to ensure the reliability of its findings, for example, in areas such as clinical trials. Additionally, industry often collaborates with academia, which can influence RE/RI practices by fostering shared ethical practices or, conversely, introducing conflicts of interest due to the commercial aspects involved. A successful partnership between the industry and other stakeholders opens doors to collaborations fostering more trustworthy science.

Context 5 - The general public

Finally, numerically the largest number of actors that the public consultation attempted to address, lie in the context of the general public/society. The opinions of the general public were gathered through the online survey. The general public is usually not directly involved in the discussion of trustworthy science, as research ethics and integrity often is seen as niche knowledge that mostly comes to surface through particular misconduct cases being covered in the media. Yet, the consequences of scientific misconduct directly impact the society, and some members of the society are also involved in the generation of scientific knowledge as research participants, citizen scientists etc.



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# 3 Results of public consultation

## 3.1. Survey

There were 328 participants who started to fill in the questionnaire, however 123 of them dropped out after answering some questions and were not included in the analysis. The survey was fully completed by 205 participants from 32 countries. Out of 205 participants that are included in the data analysis, 8 participants did not fill in the demographic information (gender, age, country), so they are not reflected in demographic distributions.

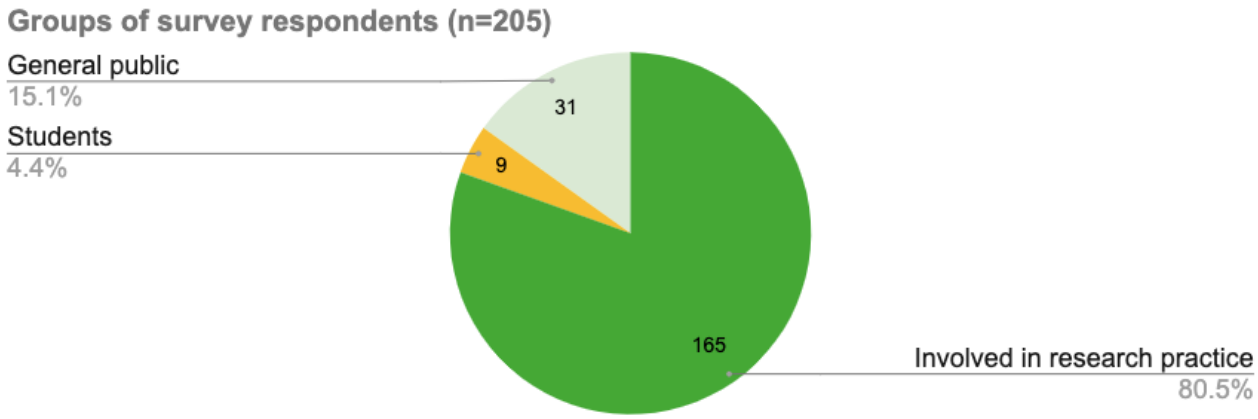


*Figure 1. Distribution of survey participants*

Among the participants, the majority (80.5%, n=165; in tables labelled as Involved in research) described themselves as being directly involved in research practice, 15.1% (n=31, in tables labeled as General public) identified as members of the general public, but 4.4% (n=9) were students. The representation of different age groups was more even (see Table 2). Notably, despite the efforts to equally involve all targeted groups, there was a much higher participation rate of stakeholders directly involved in research practice than members of the general public and students.

The majority of the participants (64%) were female (see Table 1). The participation was remarkably higher in four countries - Latvia, the Netherlands, Norway and the United Kingdom, allowing for comparison (see Table 3).



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| | | | Group | | | |
|---|---|---|---|---|---|---|
| | | | Involved in research practice | General public | Students | Total |
| What is your age group? | 18-24 | Count | 1 | 0 | 5 | 6 |
| | | % within Group | 0,6% | 0,0% | 55,6% | 3,0% |
| | 25-34 | Count | 41 | 5 | 0 | 46 |
| | | % within Group | 24,8% | 21,7% | 0,0% | 23,4% |
| | 35-44 | Count | 51 | 4 | 1 | 56 |
| | | % within Group | 30,9% | 17,4% | 11,1% | 28,4% |
| | 45-54 | Count | 34 | 5 | 3 | 42 |
| | | % within Group | 20,6% | 21,7% | 33,3% | 21,3% |
| | 55-64 | Count | 30 | 6 | 0 | 36 |
| | | % within Group | 18,2% | 26,1% | 0,0% | 18,3% |
| | 65-74 | Count | 8 | 3 | 0 | 11 |
| | | % within Group | 4,8% | 13,0% | 0,0% | 5,6% |
| Total | | Count | 165 | 23 | 9 | 197 |
| | | % within Group | 100,0% | 100,0% | 100,0% | 100,0% |

*Table 1. Distribution of participants based on age*

| | | | Group | | | |
|---|---|---|---|---|---|---|
| | | | Involved in research practice | General public | Students | Total |
| What is your gender? | Female | Count | 108 | 11 | 7 | 126 |
| | | % within Group | 65,5% | 47,8% | 77,8% | 64,0% |
| | Male | Count | 38 | 11 | 2 | 51 |
| | | % within Group | 23,0% | 47,8% | 22,2% | 25,9% |
| | Non-binary | Count | 4 | 0 | 0 | 4 |
| | | % within Group | 2,4% | 0,0% | 0,0% | 2,0% |
| | Do not wish to disclose | Count | 15 | 1 | 0 | 16 |
| | | % within Group | 9,1% | 4,3% | 0,0% | 8,1% |
| Total | | Count | 165 | 23 | 9 | 197 |
| | | % within Group | 100,0% | 100,0% | 100,0% | 100,0% |

*Table 2. Distribution of participants based on gender*



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| Country | % of respondents |
|---|---|
| LV | 20.39% |
| NO | 16.02% |
| NL | 11.65% |
| GB | 7.77% |
| BE | 6.31% |
| FR | 5.34% |
| CY | 4.85% |
| DE | 3.88% |
| FI, SE | 3.40% |
| EE | 1.94% |
| CH, IT | 1.46% |
| US, DK, PL, PT, ES, ET | 0.97% |
| LU, SA, SG, SK, GR, NP, IE, AM, IL, AT, RO, AU, KR | 0.49% |

*Table 3. Distribution of participants per country*

Students and participants directly involved in research practice (n=174) were asked to indicate the field of science they associate themselves with. 40% (n=70) participants represented social and behavioural sciences, 28% (n=48) - life sciences and medicine, 18% (n=32) - arts and humanities, and 14% (n=28) - natural sciences and engineering.

### 3.1.1. Effectiveness of the RE/RI policies

When answering the survey question "*In your view, how effective are the existing research ethics and research integrity policies in preventing research misconduct at your research institution?*", 41% of all participants of public consultation who were asked this question (students and directly involved in research practice - 174 participants in total) regarded policies as 'effective' or 'very effective', 26% chose 'neutral', 22% evaluated policies as 'ineffective' of 'very ineffective' and 11% found it hard to say (see Figure 2). Latvians more often replied 'neutral' and less often 'ineffective', compared to Norway and the UK (see Table 4), and this difference is statistically significant (Fisher's Exact test p-value=0,009). The responses to this question did not differ significantly based on the field of science or gender.



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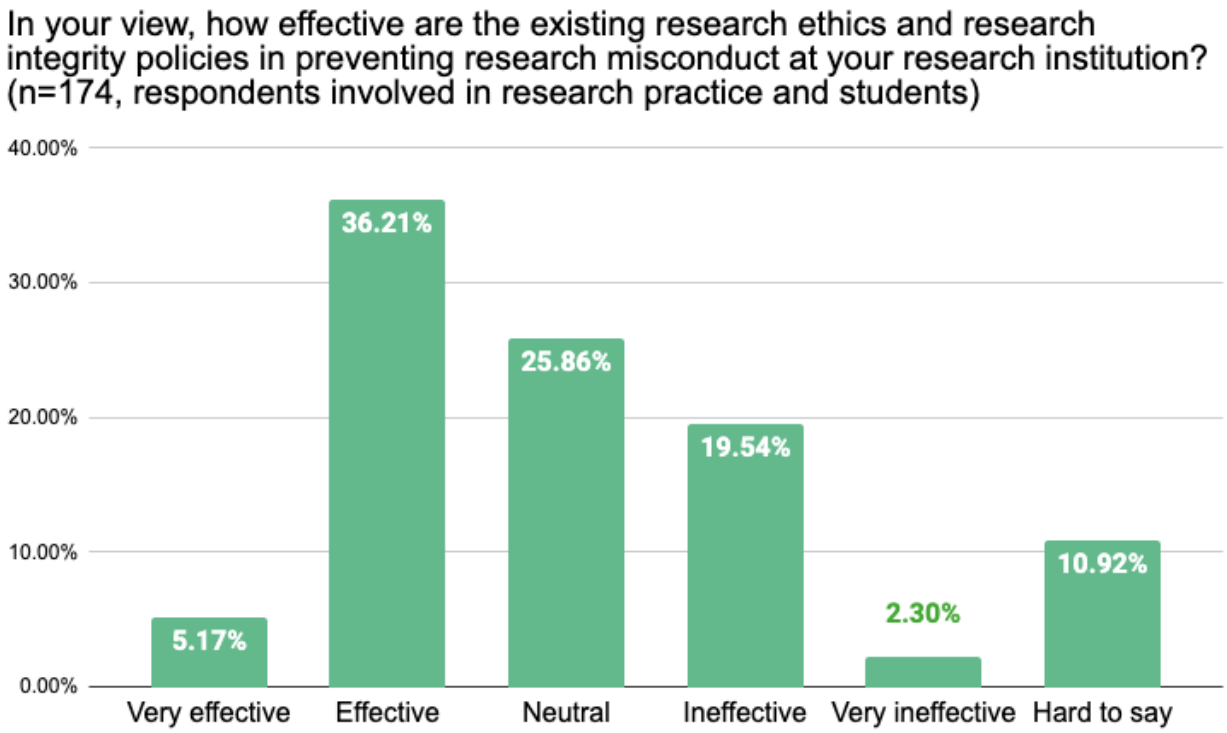


*Figure 2. Effectiveness of the existing research ethics and research integrity policies*

| | Involved in research practice | | Students | |
|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Very effective | 8 | 4,8% (2,3%…8,9%) | 1 | 11,1% (1,2%…41,4%) |
| Effective | 57 | 34,5% (27,6%…42%) | 6 | 66,7% (34,8%…89,6%) |
| Neutral | 43 | 26,1% (19,8%…33,1%) | 2 | 22,2% (4,9%…54,4%) |
| Ineffective | 34 | 20,6% (15%…27,3%) | 0 | 0% (0%…0%) |
| Very ineffective | 4 | 2,4% (0,8%…5,7%) | 0 | 0% (0%…0%) |
| Hard to say | 19 | 11,5% (7,3%…17%) | 0 | 0% (0%…0%) |

*Table 4. Distribution of participant groups*

The participants were also invited to comment on the effectiveness of the existing RE/RI policies in preventing research misconduct at their research institutions by adding free text responses.

In the free text responses some participants answered that they have no doubts about effectiveness of RE/RI policies or that there is "*a strong ethical culture*" in their institution. Nevertheless, most comments were about problems. The most present sub-theme emerging in the comments was **lack of auditing and measuring the effectiveness of RE/RI policies** and their implementation, as well as lack of consequences which might be a sign of formal, implementation of RE/RI policies or lack of tools for measuring the effectiveness:



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> *"If you follow them, they* [RE/RI policies] *are effective. If you don't, there doesn't seem to be much ramification."*

> *"There are many commendable initiatives such as mandatory courses for PhD students, dedicated web pages, ombudspeople, etc., and research conducted in this area. The point is that whenever I talk to PhD students or researchers from other units that are not directly involved in ethics, I feel like tearing my hair out. Bad practices are standard practices (authorship, p-hacking…) and various research integrity policies are seen only as useless formalities, things that need to be done for bureaucratic reasons."*

> *"It is important to realise that guidelines are only one element; it is difficult to assess their effectiveness."*

Some of the free text responses pointed out that there is **lack of positive, actionable information** on RE/RI and practical implementation of policies:

> *"The problem is that although there are guidelines for dealing with misconduct, there is hardly any information on what constitutes good scientific practice, ethical behaviour, or integrity, and how to implement it in everyday life."*

Several participants critically addressed **the role of senior researchers** and supervisors in implementing RE/RI policies, proposing putting more focus on the leadership roles and RE/RI training aimed at this group.

> *"Too little focus on training senior researchers and supervisors; i.e. those who cultivate the research culture that exist in a research group."*

Regarding **different fields of science,** the survey participants in their free text responses mentioned medicine and life sciences as highly regulated fields, and the challenges of direct application of policies from these fields to other fields of science or other contexts:

> *"The research ethics procedure is copied and pasted from the hard sciences/medicine and has no real relevance to arts/humanities and social sciences. Because it takes so long and develops a very risk averse and formulaic approach to research, it incentivises people to cut corners."*

One participant mentioned that a problem is lack of **harmonisation of RE/RI policies among different institutions and countries** leading to limited effectiveness:

> *"The policies in my institution are very effective - however, as we take part in many transnational research projects, their effectiveness becomes limited when we are dealing with prevention of research misconduct in partner organisations, hence the downgrading to 'effective'."*



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### 3.1.2. Consequences of research misconduct for society

In the survey, a question ''*What do you think are the most significant consequences of the following research misconduct case for society?*'' was asked to participants directly involved in research practice and students. The most popular answer was 'loss of public trust in science', followed by 'misguided policies and decisions' and 'adverse impact on public health and safety'. Female participants were more likely to select the 'misguided policies and decisions' option than male participants, while male participants choose 'wasted public resources' more often than female participants (Fisher's Exact test p-value=0,017).

Participants from natural sciences and engineering less often chose the option 'loss of public trust in science' (which was mostly selected by the representatives of social and behavioural sciences) while choosing 'wasted public resources' more than participants from any other field. The option 'adverse impact on public health and safety' received the most picks by participants from the life sciences and medicine who were also the least likely to choose the answer 'misguided policies and decisions' (see Table 5). The difference is statistically significant (Fisher's Exact test p-value=0,038).

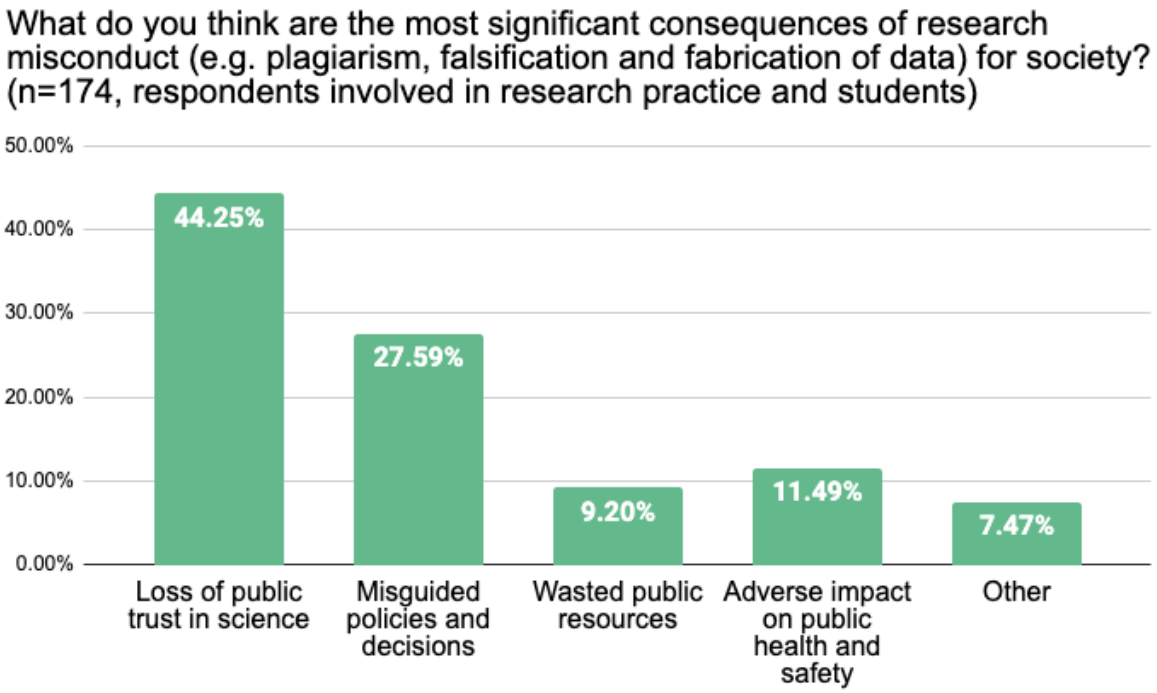


*Figure 3. The most significant consequences of research misconduct*



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| | Involved in research practice | | Students | |
|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Loss of public trust in science | 74 | 44,8% (37,4%…52,5%) | 3 | 33,3% (10,4%…65,2%) |
| Misguided policies and decisions | 43 | 26,1% (19,8%…33,1%) | 5 | 55,6% (25,4%…82,7%) |
| Wasted public resources | 16 | 9,7% (5,9%…14,9%) | 0 | 0% (0%…0%) |
| Adverse impact on public health and safety | 20 | 12,1% (7,8%…17,7%) | 0 | 0% (0%…0%) |
| Other | 12 | 7,3% (4%…12%) | 1 | 11,1% (1,2%…41,4%) |

*Table 5. Distribution of the participant groups*

In the free text responses on the consequences of research misconduct for society participants both commented on the multiple-choice answers provided in the survey, as well as suggested additional consequences. For example, **loss of trust in science** was viewed as a broader problem closely connected with epistemic challenges and sometimes even direct harm to people:

> *"I think all mentioned consequences are serious enough (wasting of resources, misguided decisions…), but loss of public trust in science is most grave for me, because it leads to a loss of public support for science and funding of science, a rise in misinformation/ conspiracy theories and a societal move away from rational, evidence-based governance and solving of problems towards forces that are willing to exploit ignorance (like far right, populists and dictatorial regimes). Science misconduct of course is not the only reason for this, but it provides an excuse for defamation of science as a whole."*

> *"In a changing public debate where complex societal issues need to be addressed to secure the future, where fake news and populism reign, there is a great need for a clear, reliable source of knowledge acquisition."*

Additional consequences mentioned included a **potential lack of volunteers for scientific studies** that might affect the future feasibility of research. The participants mentioned that losing trust in science might decrease willingness to participate in research. Also, misconduct in the form of breach of data protection regulations might directly influence decisions of potential research participants.

> *"According to me, all other consequences stem from the first point* [loss of trust]*, therefore it's the most important. Additionally, considering the past missteps in many scientific fields, research ethics should also entail a commitment to research participants that they are protected, that they can retract their data, that they have rights, etc."*



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Among other negative consequences mentioned were some related to the scientific community - wasting personal efforts and resources of researchers, losing mutual trust in the scientific community, impacting reproducibility and applicability of results, inducing potential cut in funding for scientific research and causing young researchers to leave academia. Some participants mentioned that research misconduct puts **additional workload on scientific institutions** because of the time and workforce necessary for handling cases of misconduct.

> *"Loss of trust is the first step, all other consequences follow from it - funding decreases, political decisions rush to solve something, disputes arise over resource allocation, and all supporting administrative bodies are temporarily overwhelmed with all sorts of queries and issues. Everyone suffers."*

Participants from the general public (n=31) were also asked to respond to questions about the most significant consequences of research misconduct for society, yet instead of a question for this group there were offered three research misconduct scenarios and the participants were asked to choose one or several consequences for each vignette (see Figures 4, 5, 6).

> ***Vignette 1**. A researcher well-known for her research on cancer has been exposed by a whistleblower for fabricating data in one of her published research studies, shattering her reputation and casting doubt on her previous scientific contributions.*
>
> ***Vignette 2.** A public health researcher has come under media scrutiny after it was revealed that he had undisclosed financial ties to the tobacco industry. The journalists have proved that his work is biased, potentially trying to influence the public's perception of the risks associated with smoking.*
>
> ***Vignette 3.** A prominent politician has faced a serious controversy when it was revealed that significant portions of his doctoral thesis written 5 years ago were plagiarised from various sources. The discovery led to an academic investigation and concerns raised about the politician's integrity casting a shadow over his political career.*

For all three vignettes, the most popular answer was 'loss of public trust in science' (61.29% in the first vignette, 54.85% in the second, 41.94% in the third). In the first (see Figure 4) and the second vignette (see Figure 5), the answers followed a similar pattern. In both 32.26% of the participants chose 'adverse impact on public health and safety') as a second most important consequence, yet the second case was seen as more pertaining to 'misguided policies and decisions' which was chosen by 12.9% of participants for the second vignette and 6.45% of participants for the first vignette. In the third vignette (see Figure 6), however, 35.48% of the participants did not see any of the offered options as relevant, and the third most prominent consequence chosen was 'misguided policies and decisions' (16.13%).



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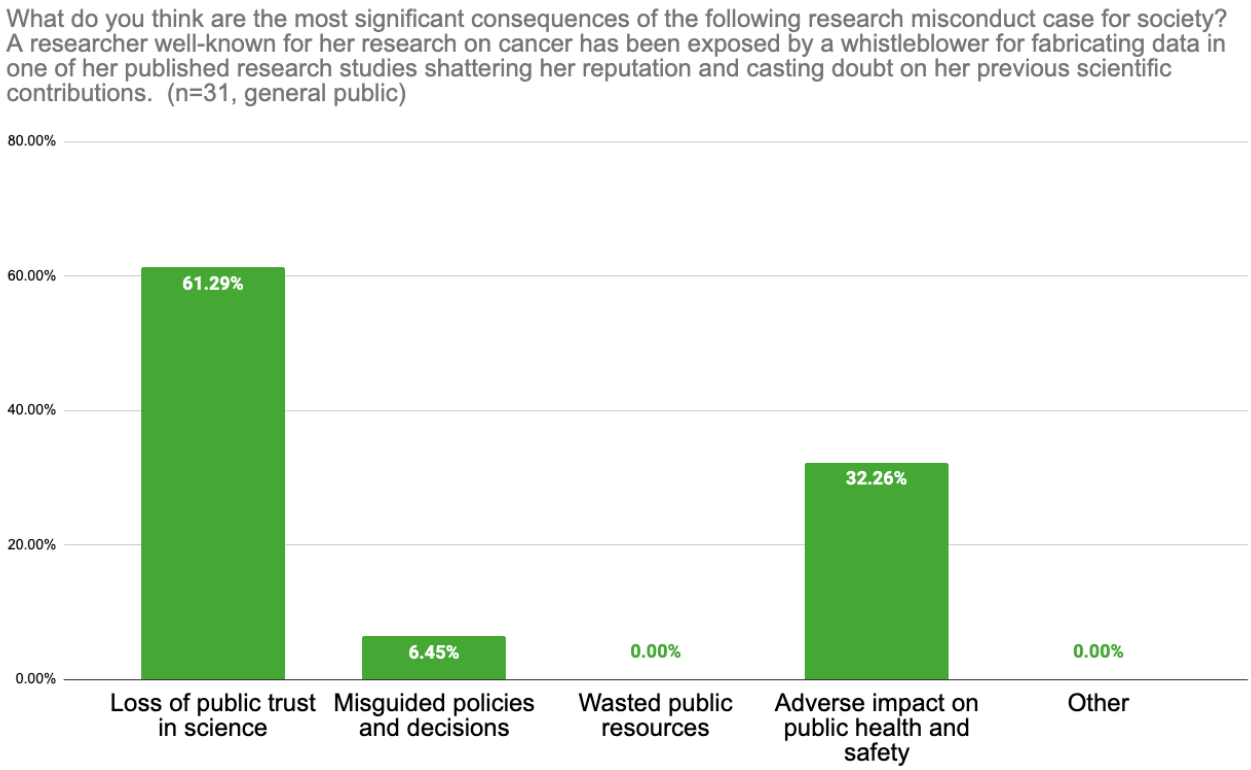


*Figure 4. First vignette for general public participants*

When commenting on the case, participants emphasized the potential harm done to the patients and resulting in the lack of trust in science.

> *"I find this very bad and harmful. Science exists to conduct independent research so that decisions can be made that benefit society based on correct, factual and validated research results."*

> *"When ticking 'loss of public trust in science' , I also think that it will imply a loss in trust in how policies are made, the knowledge base of our society, and a hostile attitude towards public funding of science."*



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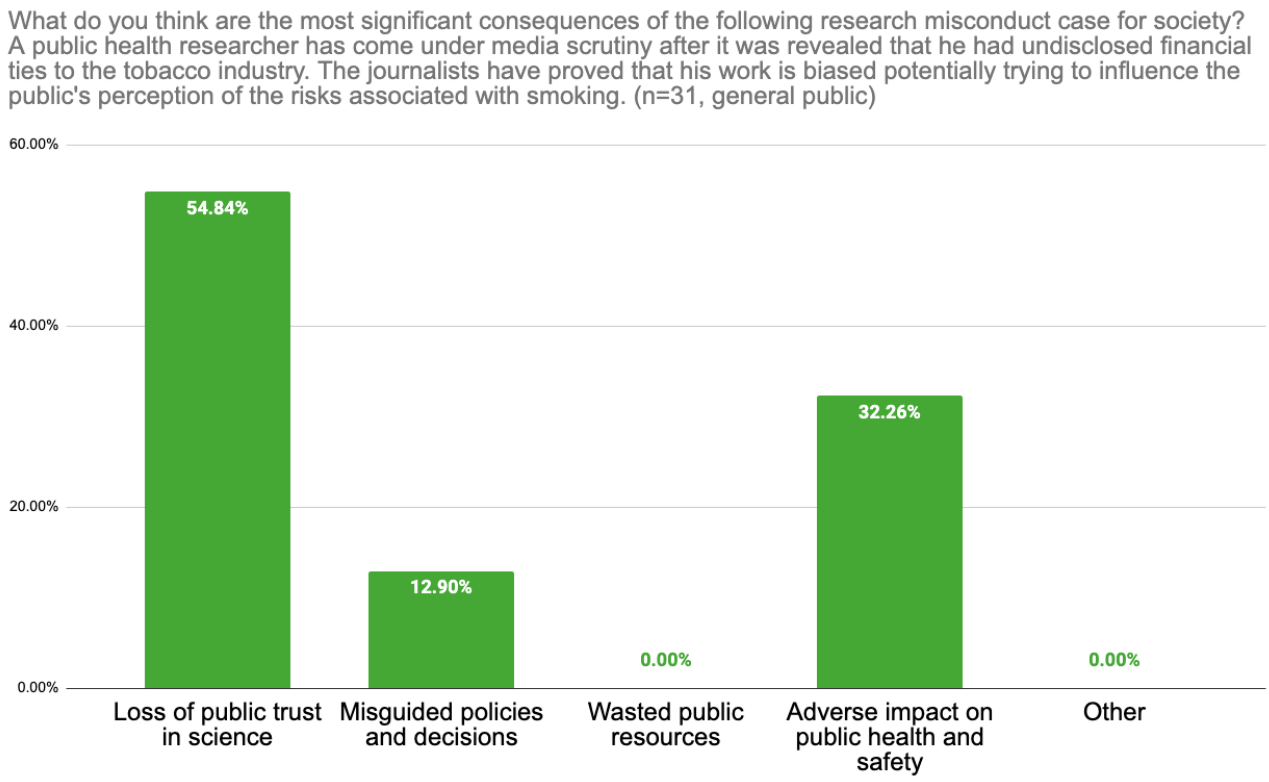


*Figure 5. Second vignette for general public participants*

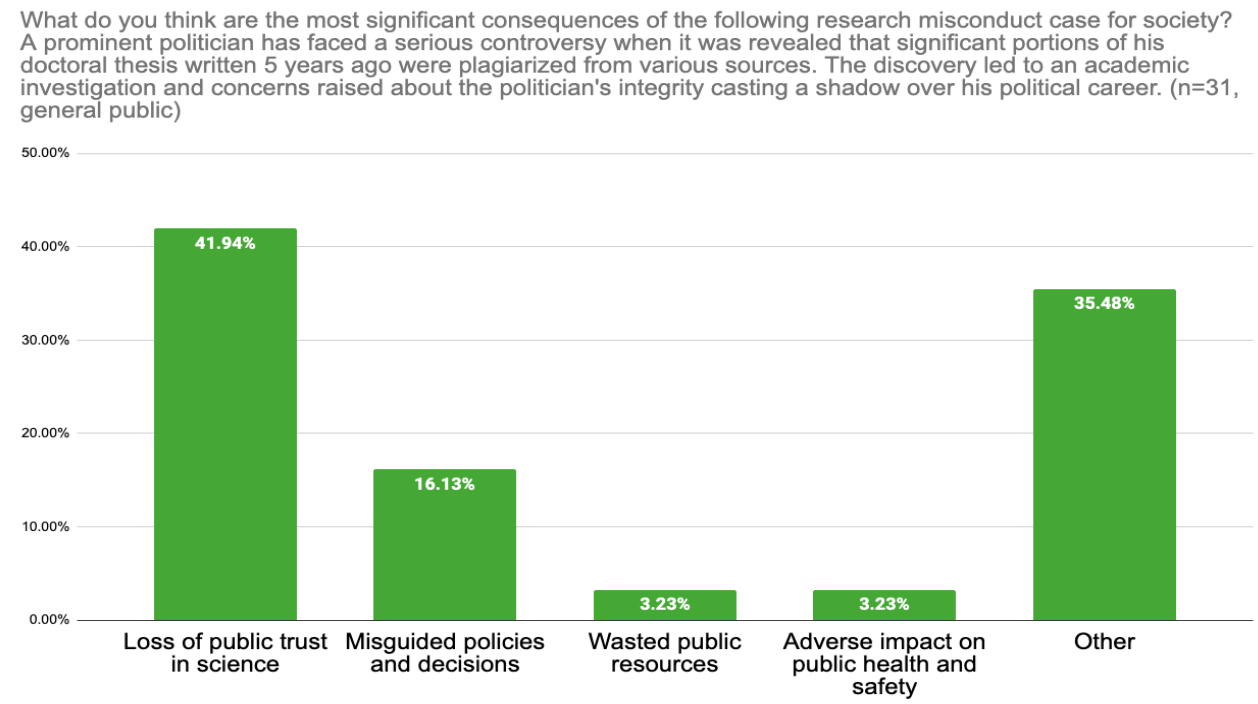


*Figure 6. Third vignette for general public participants*

In general, the participants referred to the third vignette as least damage-causing. Among other consequences of the third case, participants named loss of trust in academic integrity of an



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institution, loss of public trust in political decisions and, most prominently - simply reputational damage affecting the politician.

> *''Question of politician's reputation / Question of educational institutions. In this case, I would lose trust in the politician himself, as well as in the educational institution that did not catch the plagiarism (although it depends on how long ago the politician obtained his education and what plagiarism prevention measures were available at that time).''*

### 3.1.3. Perceptions of prevalence of misconduct

When answering the question "*How common are research misconduct cases in your country?*", most of the participants (32,68%) believed that research misconduct in their country happens occasionally, with no significant differences related to the group, gender or the field of science the participant belongs to.

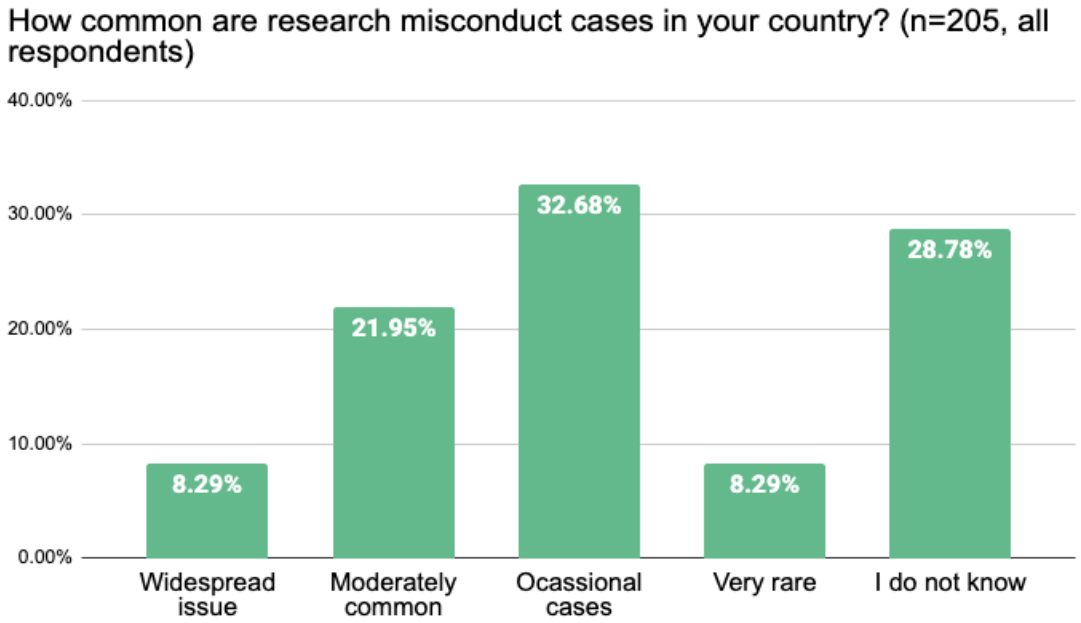


*Figure 7. Perception of prevalence of research misconduct cases*

| | Involved in research practice | | General public | | Students | |
|---|---|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Widespread issue | 16 | 9,7% (5,9%…14,9%) | 1 | 3,2% (0,4%…14,1%) | 0 | 0% (0%…0%) |
| Moderately common | 40 | 24,2% (18,2%…31,2%) | 4 | 12,9% (4,5%…27,8%) | 1 | 11,1% (1,2%…41,4%) |
| Occasional cases | 52 | 31,5% (24,8%…38,9%) | 12 | 38,7% (23,2%…56,2%) | 3 | 33,3% (10,4%…65,2%) |
| Very rare | 13 | 7,9% (4,5%…12,7%) | 3 | 9,7% (2,8%…23,6%) | 1 | 11,1% (1,2%…41,4%) |
| I do not know | 44 | 26,7% (20,4%…33,8%) | 11 | 35,5% (20,5%…53%) | 4 | 44,4% (17,3%…74,6%) |



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*Table 6. Distribution of the participant groups*

The free text responses to this question showed a general perceived **lack of information and transparency** about research misconduct (only four participants in their comments referred to research data on prevalence of misconduct) and linking back to the lack of auditing and measuring the effectiveness of policies and their implementation mentioned above.

> *"This information is not easy to gather. No systematic reporting and transparency."*

> *"As a whistleblower, on a case discovered by sheer chance, and all the difficulties I had to face, I believe that only a small fraction of scientific misconducts are actually detected, investigated, and sanctioned. Occasional cases are what we know - but monitoring of research misconduct is not well developed in my country, so it can also be a tip of iceberg."*

In some cases, participants referred to misconduct cases published in media in their assessment, yet still emphasized the lack of data:

> *"I am not aware of specific data on this. However, it recently made headlines that the Italian Minister of Health published 1 article every 12 days even after taking office, which speaks volumes. And this story has had no consequences for him and his role, both as a scientist and as a minister, in a country where many people distrust science and vaccines (see COVID-19). Apparently, more than data on misconduct, the public's trust is influenced by political affiliation."*

In some answers, participants shared their belief that cases of misconduct are deliberately ''swept under the rug'' to protect particular interests.

> *"In Latvia, such things only recently began to come to light. Usually, they are swept under the rug. Habit is a powerful force."*

### 3.1.4. Transparency of investigations

For the question "*How transparent should an investigation of research misconduct cases be?*", the most popular answer given by general public (64.5%) and students (66.7%) was that the information about the investigation process and results should be available to the journalists, media and society, while participants directly involved in research gave more diverse answers (see Figure 8). That is a statistically significant difference (Fisher's Exact test p-value<0,001). (see Table 7)



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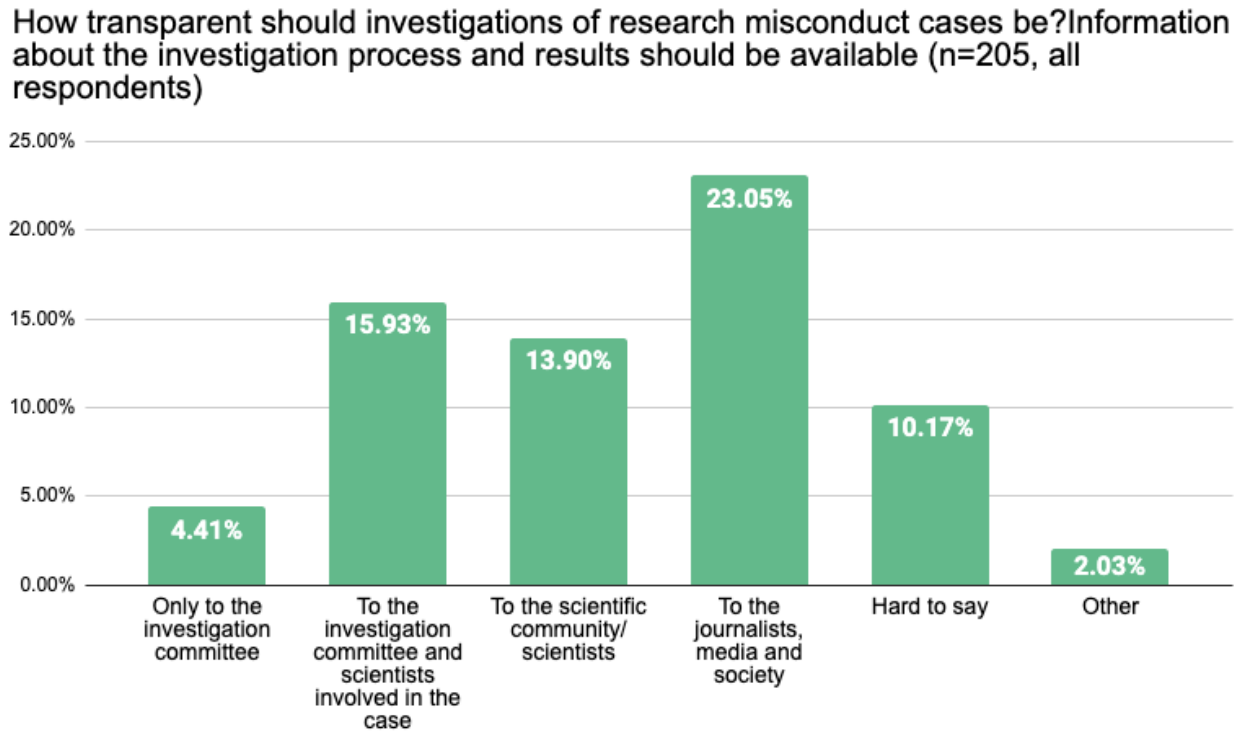


*Figure 8. Transparency of investigation process and results*

| | Involved in research practice | | General public | | Students | |
|---|---|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Only to the investigation committee | 12 | 7,3% (4%…12%) | 1 | 3,2% (0,4%…14,1%) | 0 | 0% (0%…0%) |
| To the investigation committee and scientists involved in the case | 44 | 26,7% (20,4%…33,8%) | 1 | 3,2% (0,4%…14,1%) | 2 | 22,2% (4,9%…54,4%) |
| To the scientific community/ scientists | 33 | 20% (14,4%…26,6%) | 8 | 25,8% (13%…42,9%) | 0 | 0% (0%…0%) |
| To the journalists, media and society | 42 | 25,5% (19,3%…32,5%) | 20 | 64,5% (47%…79,5%) | 6 | 66,7% (34,8%…89,6%) |
| Hard to say | 28 | 17% (11,8%…23,2%) | 1 | 3,2% (0,4%…14,1%) | 1 | 11,1% (1,2%…41,4%) |
| Other | 6 | 3,6% (1,5%…7,3%) | 0 | 0% (0%…0%) | 0 | 0% (0%…0%) |

*Table 7. Distribution of the participant groups*

This question gave the highest number of free text responses. The answers by the general public and students were significantly more directed towards broader and more transparent coverage of investigation of research misconduct cases compared with answers of those directly involved in the research practice.

Those participants who **called for more transparency** referred to fundamental value of transparency and its positive implications:



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*"Increasing the transparency will help the research sector to drive up standards across the board."*

*"Transparency of process is essential for trust."*

*"The more transparency there is, the more we can change mentalities."*

Nevertheless some of the participants pointed at a **need for a step-by-step approach** - less transparency about investigation and more transparency about the results and proved misconduct:

*"Allegations of misconduct should be handled *very* carefully. Slander and libel are serious issues, and such accusations should only be released a) if they have been absolutely and convincingly proven. b) possibly further, if the release of that information serves the public good over an above the effect on the individuals concerned. Innocent until proven guilty is a fundamental principle that these days is being lost with cancel culture increasing from all sides and freedom of speech being diminished."*

Those involved in the research were much more cautious in their approach and mostly advocated for a nuanced decision, to avoid such negative consequences as increasing mistrust in science or unfair and premature presumptions of guilt.

*"It is hard to say because it is a case-by-case question. Generally, transparency for sure need to be there for the parties involved (however, if the whistleblower is external and/or for example publishes internal documents, then transparency has boundaries). I'd vote for having the research community and society informed, but if a researcher turns out to be innocent, the damage is done already to their reputation. I'd say we are not as far with regard to the stigma attached to an investigation to go fully public."*

*"If only the investigation is carried out, the accused must also be protected. Otherwise, too much harm can arise."*

Potential solutions to this challenge that were offered by some of the participants intended for a "**tailored and proportionate" approach**, depending on the particular case, while respecting the right of the society to be kept informed.

### 3.1.5. Safe spaces for expressing RE/RI concerns

When answering the question "*Do you feel safe to express concerns on research ethics and research integrity or report suspected research misconduct at your university, college etc.?*", 51.15% of the participants among students and those being involved in research stated that they feel safe, 27.01% answered that they do not feel safe, and 21.84% chose the answer I do not know (see Figure 9). There were no statistically significant differences related to the participants' demographic characteristics (see Table 8).



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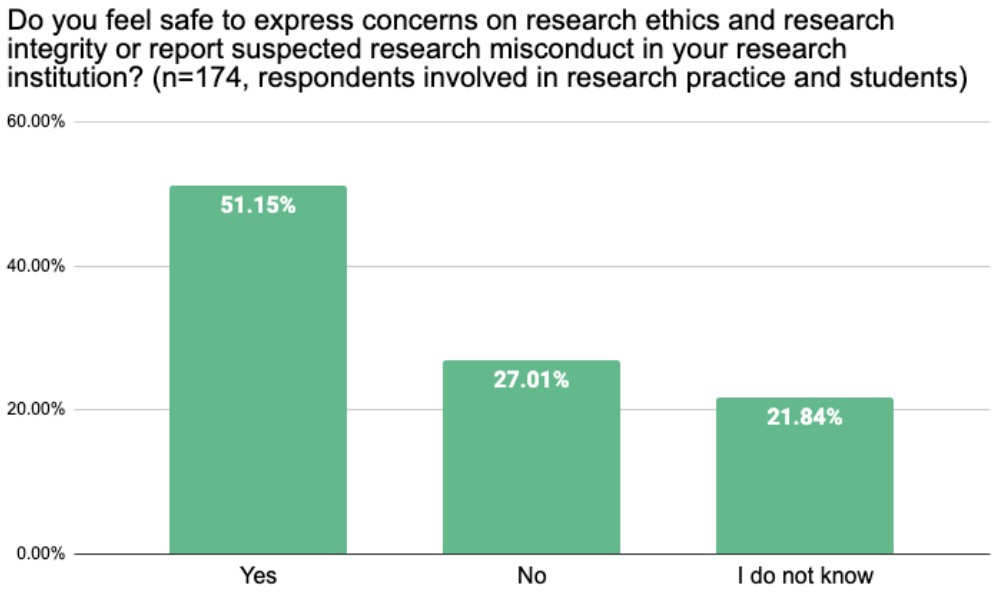


*Figure 9. Safety of wistleblowers*

| | Involved in research practice | | Students | |
|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Yes | 84 | 50,9% (43,3%…58,5%) | 5 | 55,6% (25,4%…82,7%) |
| No | 46 | 27,9% (21,5%…35,1%) | 1 | 11,1% (1,2%…41,4%) |
| I do not know | 35 | 21,2% (15,5%…27,9%) | 3 | 33,3% (10,4%…65,2%) |

*Table 8. Distribution of the participant groups*

In free text responses some of the participants reported **lack of knowledge on where and how they could express their concerns** about RE/RI and misconduct, e.g., *"I don't know where I could turn to on this issue."*

> *"Since some forms of research misconduct can be quite subtle and common (e.g. co-authorship for people who have not contributed much), it is difficult to know what to do about this. For more explicit cases of misconduct, I would feel more comfortable about reporting it."*

Meanwhile, a few participants who were well aware of the designated way for expressing concerns in some cases questioned the **trustworthiness of ethics committees** or other responsible bodies handling whistleblowers' reports.

> *"I'm questioning the independence/impartiality of the ethics committee in my workplace."*

To further unfold the topic, several participants commented on their **feelings of lack of safety** referring to power relationships, stress, toxic environment and other factors. This was especially concerning for junior researchers who experience power relationships and are still working towards particular career achievements. At the same time, a participant who is



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currently in retirement shared that he feels he can now more freely express their views'. More than once participants mentioned potential harm to their career that could be caused by undertaking the act of whistleblowing.

> *"I would not fear to discuss it because I am outside of a typical 'career path', but I understand if students or young researchers don't feel confident to face senior researchers in positions of power."*

> *"I haven't defended my doctoral thesis yet, and knowing my university [..] , its love for hierarchy and censorship, no - I don't feel safe."*

Some participants expressed their views regarding **anonymity of whistleblowers**, showing both positive and negative aspects of it. Among the pros of anonymity, safety of the whistleblower was mentioned, while more critical takes pointed at the decrease in accountability of anonymous whistleblowers.

> *"There are safe channels for reporting non-compliance including research misconduct. Our policy protects and guarantees anonymity."*

### 3.1.6. Impact of gender differences

When answering the question "*To what extent do you believe that gender differences influence the prevention of and reaction to research misconduct?*" the participants had various views, most often choosing the answer 'hard to say' (25.29%) which was followed by the answer 'moderately' (22.41%). There were no statistically significant differences based on the field of science, country or gender. Only two of the total thirty-something participants of the qualitative interviews did mention vague connections of the gender aspect in research integrity. Although these statistics imply gender differences are perceived as having no impact on the RE/RI field, the free text responses following the survey question showed a spectrum of different views and experiences.



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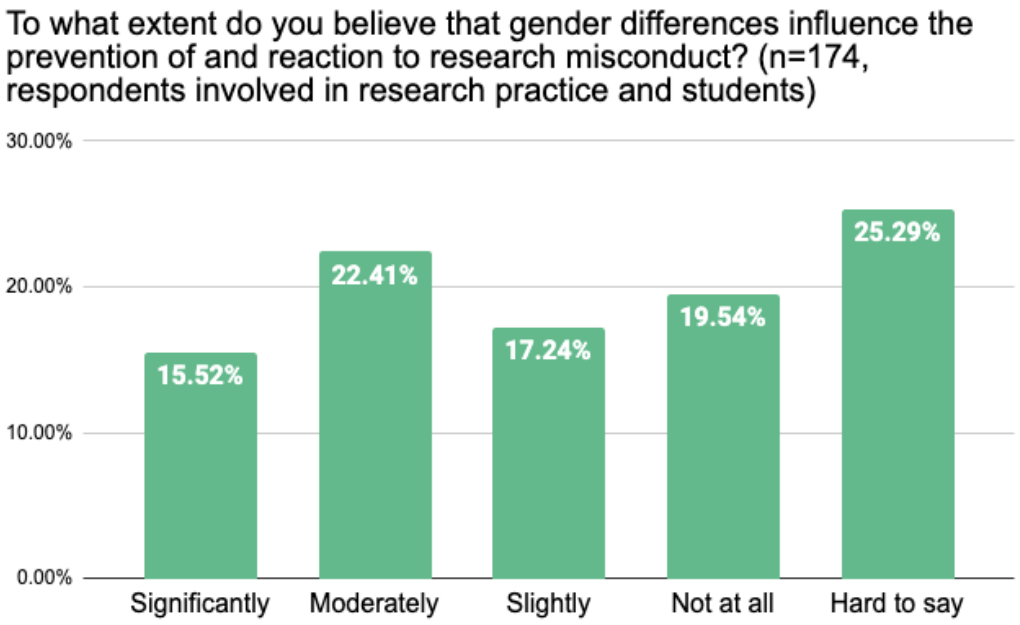


*Figure 10. The influence of gender differences*

| | Involved in research practice | | Students | |
|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Significantly | 26 | 15,8% (10,8%…21,9%) | 1 | 11,1% (1,2%…41,4%) |
| Moderately | 36 | 21,8% (16%…28,6%) | 3 | 33,3% (10,4%…65,2%) |
| Slightly | 28 | 17% (11,8%…23,2%) | 2 | 22,2% (4,9%…54,4%) |
| Not at all | 31 | 18,8% (13,4%…25,3%) | 3 | 33,3% (10,4%…65,2%) |
| Hard to say | 44 | 26,7% (20,4%…33,8%) | 0 | 0% (0%…0%) |

*Table 9. Distribution of the participant groups*

In general, the same **gender stereotypes existing in society** were transferred to the academic environment. The open responses to the question regarding gender issues in the context of RE/RI included references to the influence of gender roles:

> "*There is a hidden form of sexism still present in our society, which influences a lot of things, like inequality in care access. This could also play a role in research, especially in hierarchical structures like academia*."

The opinions expressed by the participants were not unique to academia, as it can and often is affected by the same life factors as in other areas of employment, such as the obstacles faced by women of reproductive age. At the same time, some participants emphasized that in academia the impact of professional life upon private life can act as a trigger for research misconduct and questionable practices for members of all genders.

In some free text comments participants pointed at the perception that **women's work has lower credibility**: "*work done by women is much more subject to criticism by their male peers*". A



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recurring theme in the responses was the notion that work by female researchers is often subject to greater scrutiny and criticism compared to that of their male counterparts. This might contribute to creating an unsafe environment where women feel the need to be flawless, which can in turn discourage them from taking risks or speaking out against research misconduct, although some responses pointed out that women are more careful about both their and others' mistakes.

> *"Women are more ready to talk about it* [research misconduct] *and address it."*

> *"Men's research, presumably, will be less questioned."*

Some participants expressed concern that a **focus on gender might cloud other critical factors** that impact research ethics. They argued that while gender may play a role, it is not the primary factor – instead it is power dynamics and hierarchical structures within academia that are more prominent. One participant suggested that equality can be reached "*without focusing on groups that are victim of misconduct and oppression*". Several participants wrote they have not observed gender issues and pointed to other power relationships related to leadership as problematic.

> *"I never perceived any difference in behaviour related to gender but a lot related to junior/senior position. There is definitely a power imbalance and youngers are often advised not to create problems for their superiors to avoid hampering their own career."*

> *"More than gender, position in organization, seniority is emphasized in my organization. Women tend to be quicker to admit wrongdoing."*

> *"I think culture is more of an issue than gender."*

At the same time there were also parrticipants emphasizing that ensuring gender balance and addressing biases and stereotypes is a crucial step in preventing misconduct and fostering a safe environment.

> *"It is highly individual. In some issues (like plagiarism, data falsification, paper mills… etc), gender is almost irrelevant (although I noticed some research stating that men are more prone to take risks of misconduct, especially if it promises high gain - but I do not believe that such claims are strong enough to be translated into any kind of policy), while in others (as harassment) it is an important factor (including victim blaming, or career damage after whistleblowing - such situations force women out of academy more frequently, so I think additional support and protection of women facing misconduct would be reasonable)."*

An abundance of slogans inviting to smash the patriarchy were observed, such as "*we live in a patriarchal society so there are obviously gender differences in reporting misconduct (..)*", yet mostly they were lacking substantial justification, e.g. sharing personal experience. However, it must



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be noted that some participants were aware of the speculative nature of their statements. It shows that sometimes the attempt to address the significance of gender issues in academia may turn into a vicious circle of combating stereotypes with other stereotypes.

### 3.1.7. RE/RI in citizen science

When answering the question about risks of research misconduct in citizen science, more than half of participants (59.51%) believed that citizen science involves risks of misconduct; however, 37.07% of participants stated that they 'do not know' (see Figure 11). Students and those directly involved in research practice from social and behavioural sciences were most likely to answer by confirming, while participants from life sciences and medicine were the least likely to choose the answer 'yes'. More than half of the participants from the field of life sciences and medicine answered 'I do not know'. The difference is statistically significant (Fisher's Exact test p-value=0,005).

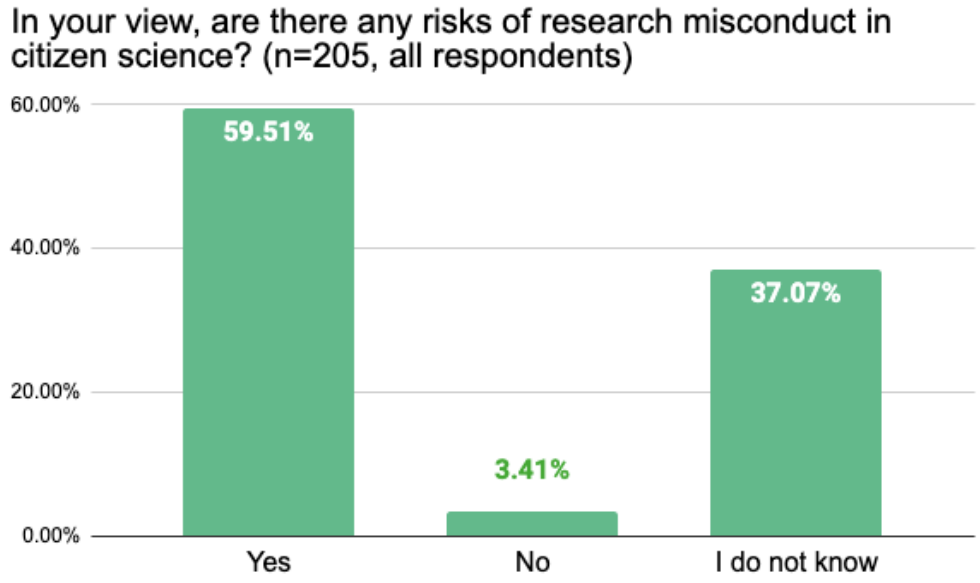


*Figure 11. RE/RI risks related to citizen science*

| | Involved in research practice | | General public | | Students | |
|---|---|---|---|---|---|---|
| | Count | Percent (95%CI) | Count | Percent (95%CI) | Count | Percent (95%CI) |
| Yes | 104 | 63% (55,5%…70,1%) | 13 | 41,9% (25,9%…59,4%) | 5 | 55,6% (25,4%…82,7%) |
| No | 6 | 3,6% (1,5%…7,3%) | 1 | 3,2% (0,4%…14,1%) | 0 | 0% (0%…0%) |
| I do not know | 55 | 33,3% (26,5%…40,8%) | 17 | 54,8% (37,5%…71,3%) | 4 | 44,4% (17,3%…74,6%) |

*Table 10. Distribution of the participant groups*



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The free text responses to this question indicated a general lack of knowledge about citizen science in part of the participants.

> *"Not familiar with this type of research. Research should be conducted by people informed about the ethical principles of research integrity and not left to untrained citizens."*

Among those informed about citizen science, a group of the responses elaborating on the risks of misconduct in citizen science referred to potential lack of knowledge and skills of citizen scientists that might unintentionally lead to research misconduct. Ensuring the **training of the citizen scientists** was most often seen as the responsibility of the scientists who are running the research projects involving citizen scientists - emphasising that people participating in citizen science activities might simply not be aware of some RE/RI aspects.

> *"I suppose in citizen science the problem might be that the public lacks knowledge about appropriate data collection, etc. However, this is more related to ignorance. Scientists should clearly explain to the public how, when, and why to collect and report data."*

> *"Ethical violations due to randomness or ignorance; there should be accessible courses for citizen scientists on these issues."*

Participants referred to several **potential ethical risks** in the context of citizen science, for example, conflict of interest, unacknowledged bias and falsification/fabrication of data.

> *"People have agendas. Where there are conflicts of interest, there are risks of research misconduct."*

> *"Citizens, as well as researchers, might alter the observations/results to prove an hypothesis they strongly think is right."*

Another issue brought up in the free text responses was power relationships and **risk of exploitation of citizen scientists**, which may take different forms and it was recognized that citizen scientists have very limited means of defending themselves in such situations.

> *"Ownership of data; open data; validation; geolocalization; improper acknowledgement of author contributions, etc."*

> *"Lack of transparency towards the involved citizens, regarding what is done with the data/findings or lack of transparency about the contribution made by citizens. They can defend themselves even less than scientific peers!"*

The most frequently mentioned risks affecting citizen scientists were related to issues of **authorship and acknowledgement of the work of citizen scientists**.



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*"The risks include the issue of inclusivity of citizen scientists as scientist, acknowledgment and publication."*

### 3.1.8. Gaps in the existing RE/RI policies

Those participants who are involved in the research practice and students were also invited to give free text responses to the question "*In your opinion, what are the most important gaps in the existing research ethics and research integrity policies in your organization or country?*"
Similarly as when responding on effectiveness of policies, one of the main issues mentioned in free text responses to this question was **"publish or perish"** and such research assessment approaches as bibliometric evaluation. In a couple of cases the connection between the pressure to use quantitative metrics and funding opportunities was explicitly stated.

*"I think there is too much of an emphasis on "publish or perish", such that academic or research misconduct becomes the most "reasonable" option"*

*"[..] above all, there is a lack of effort to limit bibliometric evaluation."*

Another group of answers pointed at the **lack of accountability and consequences for wrongdoers**. Participants emphasized that there are gaps in all stages of reaction to research misconduct - the monitoring, the investigation, the follow-up and corrective practices.

*"No consequence. A researcher who faked results should have to leave his/her position to make space for an honest scientist. Today, more publications mean more funding and power."*

Many participants mentioned **lack of open discussion and explanation** of RE/RI policies. The most frequently mentioned issue was the stakeholders having lack of knowledge or different interpretations of what RE/RI means. As potential solutions, participants suggested discussions with colleagues, easily available and usable information on RE/RI that would help to properly react in cases of questionable research practices or research misconduct.

*"I don't know if the problem lies in the guidelines; rather, it's that there isn't enough discussion about it. Ethics is often perceived as something self-evident, but everyone perceives it differently."*

Some participants pointed at the **lack of specific guidelines and processes**, specifically mentioning AI, collaboration with non-EU countries (especially with LMIC countries), social sciences and citizen science. A couple of participants hold the view that attention should be paid to contexts with less expertise in RE/RI that are nevertheless producing scientific outputs, for example, arts.

*"In the field of practical research, especially in the arts, students lack appropriate courses and knowledge, even though research is expected."*



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> *"There is a gap in research collaboration measures with LMICs when it comes to RI, because policies in both countries are different."*

> *"Guidelines for studies testing wellbeing and healthcare products outside the healthcare system and academia - there are no guidelines for that."*

An important topic was **leadership and prioritising implementation of RE/RI policies,** with participants stating that there should be actors, mainly in leadership positions, that remind of and inspire others to follow the good practices. Some participants expressed the feeling that RE/RI topics are rarely seen as integral to the scientific practice itself.

> *"Leadership support - priority setting for research integrity."*

> *"Support from leaders, not sanctions or blaming."*

Finally, one of the participants mentioned the **role of industry and private funding** as not sufficiently covered by the current RE/RI policies and regulations:

> *"The most important gap is based on the organisation of research itself; partial fundings from private companies impact the integrity of research by putting pressures on researchers. It is not necessarily simple to publish results which are going against the expectations from a private company included in the project. Some refuse to participate/finance in another project after such events. It is particularly difficult for young researchers. 100% public funded research would improve research integrity. "*

### 3.1.9. Best practice examples

Those participants who are involved in the research practice were additionally invited to give free text responses to the question "*What are the best-practice examples of building research ethics and research integrity culture, prevention of and reacting to research misconduct in your organization or country?*".

The beneficial practice mentioned most frequently was **creating a safe space** for discussing matters related to RE/RI and research misconduct. This can be done in different ways - it can happen on a research group level, where the leader shows an initiative, yet any teammate can raise the topic. Another option is discussions initiated by ethics committees, as well as events organised cross-institutionally for an exchange of experience and good practices.

> *"Some heads of departments in my organization have introduced these topics, including adherence to internal codes of conduct in their regular team meetings and evaluation. Peer review and openness about data collection practices are everyone's business in these departments."*



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> *"That research group leaders have a focus on this and allow for regular discussions related to how the practice within the research group is - that it is a daily thing and a habit to ensure that research is conducted properly and honestly, assessing risks of harm whenever it is needed."*

Some participants did not particularly mention safe spaces but expressed the value of a **possibility to ask for advice** when needed. One participant mentioned the importance of ''teaming up'' with other scientists interested in RE/RI to carry out joint projects.

> *"The ability to ask advisors for advice - prevents misconduct resulting from ignorance or incompetence. It is also important that the advisers are separate from the case handlers, so one would expect that there would be more trust in the advisers as there is no risk of them being forced to handle the cases they hear about."*

> *"The ethical committee where I often submit has an open platform to discuss possible questions and outcomes."*

Another part of comments focused on improving the accountability for research misconduct - either by establishing effectively working investigation committees or by ensuring a broader **transparent coverage** of the research misconduct cases. Participants also emphasised the importance of quality of investigations.

> *"Transparency about the specific process (i.e., seeing that a violation was addressed and the victim was defended)."*

> *"Institutional buy-in from both the top-down and bottom-up are crucially important. Neither is sufficient by itself. When it comes to reacting to research misconduct, the quality of investigations is key (independence and expertise of investigators are highly important factors), as well as a clear procedure describing who is responsible for implementing corrective and restorative measures."*

Some participants mentioned the need for clear and accessible **guidelines for investigation of research misconduct cases**. In several responses it was emphasized that development and implementation of such guidelines should include feedback at all levels of the institution and form different stakeholders to ensure that the scientific community feel that RE/RI is a common concern.

> *"The establishment and implementation of guidelines with us was a lengthy, feedback-based process involving both professors and students. We made many corrections throughout the year, discussing them in the ethics guideline group, which was open to everyone, not just the 'working group'. I believe this is very important."*



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A few participants shared their views that training can be helpful for prevention of research misconduct, yet it should **involve all levels of seniority**.

> *"Education/training of the research community at ALL levels."*

### 3.1.10. Public involvement

A handful of free text responses to the question "*How do you see the role of the general public and citizens in the promotion of research ethics and integrity and in prevention of research misconduct?*" indicated that part of those involved in research practice hold a view that the general public simply does not have a reason to be concerned with RE/RI matters due to the lack of expertise and involvement with research and academic context.

Some other participants believed that the society may play a role and that the involvement would be beneficial, yet that the **science literacy** including both understanding of the scientific method and the RE/RI topics in general public is insufficient and demands extra knowledge and education. It was seen as a prerequisite that needs to be met before a fruitful involvement can be reached.

> *''Public education is needed not only on research ethics but on research in general, as there is currently a noticeable threat to the reputation of science due to a lack of education and understanding - society lacks trust in science and its results.''*

> *''I don't really know. I am not sure that even fellow researchers from a different field can do much, not to talk about the general public. I guess just paying attention and following issues that are being shown and exposed. However, as we all know, not many of the 'general public' can really evaluate research...''*

Several participants stated that the role of the public might be maintaining interest in topics related to science and asking questions about RE/RI and transparency, acting as an **additional oversight mechanism**. A few participants believed that the necessary form of interaction would be more similar to a discussion that allows for scientists and the general public to have an equal dialogue - and not to simply question, but to be actively involved in planning the research agenda and deciding on what's important. Some participants believed that the attention to RE/RI matters paid by the general public would put an extra layer of accountability on the scientists and in this way nudge them towards a more ethical research practice.

> *"Additional oversight mechanisms. And this is a good argument to motivate researchers to follow seemingly trivial and tedious rules.''*

> *''The role is to be critical and interested."*

> *''Society should be involved in determining research agendas - particularly publicly funded research - and assessing if research priorities are met.''*



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When it comes to the communication between the general public and scientific community, the participants expressed two different views: while some emphasized that the society should "demand" information and actively push for transparency, others believed that the scientific community holds the main responsibility in providing the general public with clear and accessible information without the general public asking for it.

> *"Demand for it. As taxpayers they are entitled to demand that their money is spent in a manner that is ethical and without misconduct. Losing trust is not just from bad research, it also comes from the sense of people getting away with it."*

In several responses the general public was seen as a subject whose **trust should be earned** or regained in order to achieve a positive outcome for the society, with one participant referring specifically to the role of science in the society.

> *"Science is part of the core development of the state. How ethical science will be also reflects on development. If we want society to trust science, then scientists must work according to research ethics principles."*

Further unfolding the topic of **interconnectedness** between the scientific community and the general public were participants who believed that values prevalent in the wider society might affect the culture in the scientific community, thus one should not address these environments as isolated.

> *"The public should be the guardian of a social atmosphere where ethics and integrity are given more importance than 'winning the competition', with special emphasis on values of truth (no tolerance of lies in public space), transparency, democracy, thoughtfulness, kindness, and environmental consideration. General public is the source all the scientists come from - and also the final recipient of benefits (or problems) science brings to society. Both (academy and public) should communicate more, not losing sight of ethics for the sake of commercial or power gain."*

Finally, participants had suggestions to **include members of the general public** in specific science-related bodies - for example, joining the committees investigating research misconduct cases, get more actively involved in research projects and various research panels.



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## 3.2. Stakeholder interviews

### 3.2.1. Effectiveness of the RE/RI policies

Similarly as in survey free text responses, also in interviews there were stakeholders who shared their observations regarding positive developments in the RE/RI governance and policy developments. Several interviewees pointed at recent visible **improvement in implementation of RE/RI policies**, as indicated by this patient NGO representative:

> *"[..] if I see some of the ethics policies or consent forms from two or three years ago and then I compare them with the current ones now, I can see a difference. There's much more consideration, some more things are there and there's more consideration around it. So, there's less space for something that the researcher could maybe take advantage of and not show to the participants. Because everything is listed, they know what they're doing, I feel." / 3_G1*

At the same time, interviewees mentioned diverse examples of gaps and problems, for example, **lack of knowledge, passivity and unwillingness to really implement the policies** at different levels, starting with individual and institutional level:

> *"[..] when we talk face-to-face, then everyone seems to agree and understand these* [RE/RI] *issues. But again, even then looking at the publications of the same people with whom you talked about that, then you see that they do not fully follow all these guidelines, for example, and so on." / 3_G1*

> *"[..] the president of the university doesn't want to make decisions and it's public, it's known in all university. The president is sending messages that say, 'We have to inquire, we have to go, I am against misconduct', but when he is in a position to make decisions or to publicize some cases, he doesn't want it at all. And everybody knows that in this university. Which is very strange. So, it's much more having actions at the top level, top level presidents and all the vice president and so. Because their objective is also the competition between universities. Their objective is to protect their image and so and so." / 1_G2*

Interviewees emphasized that there are cases when the potential damage of institutional reputation may keep the leadership of the university from sufficiently addressing the cases of misconduct. As stated by one of the interviewees, similar attitudes also lead towards situations where the leadership hesitates to provide the **resources** needed for fostering the awareness of RE/RI issues, such as establishing positions responsible for the matters.

> *"We have no research ethics advisors or research integrity advisors that can serve as consultation bodies or consultation points for students, for researchers, or for professors. This is not established at all in the country. We have asked for establishing such positions for*



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*the last 20 years, but the understanding of university management is that this is not necessary. Why?'' 16_G3*

Another concern is the lack of knowledge about RE/RI principles and their implementation that may keep the institutions from performing meaningful actions towards improving the practices. It was emphasized that it is not enough to write the policies and regulations, it must be also clear **who is responsible for implementing** them and monitoring the results, as well as ensuring the consequences in case of misconduct. The practice varies among countries, with some striving towards centralised regulations, but some leaving it in the hands of individual institutions. Some interviewees emphasized that RE/RI regulations must be established and monitored at the national level (as it is already done in some EU countries). While in theory state and lawmakers seem like a good ally in reaching the goal, such an approach would be based on an assumption that research ethics and integrity is something that is valued on a national level, which might not always be the case.

*''It was being commented on across all relevant bodies in the legislation process. [..] Some ministries completely rejected this. This is ethics, this is nothing that should be included in the law. This is time consuming; this is finance consuming. Please exclude this issue from the law.'' / 16_G3*

Even when national bodies are established to ensure implementation of RE/RI policies, there may be cases where the achievable impact is limited due to disinterest of policy-makers. One of the interviewees shared personal experience of being part of a national level research ethics body, which in reality is formal and without having meaningful influence due to a lack of support from policy-makers.

Furthermore, funding institutions were mentioned as examples of not always being willing to implement the RE/RI policies and sanctions in a case of misconduct:

*“Funding players are starting to do a little bit because when you have to submit a project now you have to sign forms, you have to prove that you are doing open research. So, funding agencies are moving a little bit. But in our country, they never request to send back the money if there is a high case of fraud. As we don't have fraud, they cannot request money, you know.” / 1_G2*

Another interviewee was critical towards industry’s attitudes towards implementing RE/RI policies, mentioning hindering the publishing of clinical trial data and the negative impact of it on public health as an example.

Another challenge related to regulations was the **number, complexity, and sometimes, the contradictory nature of regulations** in different fields on different levels - for example,



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university, public vs. private sector, state, EU-level. This was seen as something that makes further efforts related to development of new regulations as redundant.

> *"I am quite often very nasty because we have directives, we have guidelines, we have everything. We have pages and pages of how to do research, responsible research, we have everything, okay? And we continue sometimes to publish new guidelines, update guidance. It's useless."* / 1_G2

> *''Yeah, these are already the bigger and higher political statements and agenda, but then there are really research field specific guidelines as well. And different societies and so on, and then people find it, often depending on the field, and they find it difficult to orient between those. Sometimes they are just repeating each other, sometimes they are maybe even in a conflict, and then people may just ignore them in the end. If there is no consensus what is now then... Well I don't know whether it is good or bad to have one and only way, but [at least] to have some sort of consensus of what is really the best practice in our field.'' / 3_G1*

Notable importance was assigned to the **negative influence of the institutional environment** in which scientific activities are carried out, specifically the pressure to ensure a maximum number of publications that often begins already during PhD studies.

> *''Slow science would be fantastic, yeah. Yeah, yeah, yeah, absolutely. I remember when I was an undergrad student, and I was just doing my thesis basically. It was the master thesis. So, I was working in the lab at that time. Everything was slow, no pressure to get a publication. I enjoyed it so much that it was really just great. Then when you enter science, it's all about ''aaah'' [hurry, stress], when you enter the real research and you start being a PhD or even a postdoc, everything gets complicated.''/ 21_G1*

A similar aspect to be mindful of is the daily **bureaucracy** that might negatively influence implementation process and cause scepticism towards the RE/RI regulations among the scientists because they believe that meeting detailed research ethics requirements takes away time from performing more valuable tasks. One of the interviewees shared disappointing experience in communication with research ethics committee:

> *''Send them off to university, wait a few weeks, then they come back and say - oh, you know, actually we can't approve this because the grant for this is being managed by another university. So, I have to get like a different set of forms, I have to fill them out and now, I'm not making this up, I had to print out 17 copies of all these forms we'd filled out, of all this crap, you know, about 200 pages in total, and we had to post it to them! Go to the post office and send them a parcel with the hard copies for them to do their ethics approval and they charged us a few hundred euros for it.'' 15_G1*



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Consequently, the same interviewee proposed the evaluation of the outcome of particular elements in the process of research ethics committee review as a way to gather data-based insights on efficiency and the actual impact of the different stages of the research ethics review process.

From a slightly different perspective, another interviewee regarded that the burden of conforming with procedures related to ensuring ethically sound research would be more manageable if the **practices would be standardised across institutions**.

> *''So, there is a need for standardisation around the approvals processes and consistency around decision making and maybe refreshing some. I mean, and again, this is from my limited knowledge, but naturally over time there's new issues to consider and the need to bring new expertise to bear in ethics committees and things like that. [..] So you can imagine lots of health services sites around the country where people want to conduct research and dealing with the local ethics committee, again, it throws up challenges." / 29_G3*

#### 3.2.1.1. Solutions and good practices

A general attitude among different stakeholders was that policies and regulations will not result in any improvements, unless they become an integral part of the scientific process, meaning implementation, **changing the institutional culture and internalisation of values**.

> *''The political issue is that we want to go beyond compliance. So, we are not interested in compliance at all. We want to do good work. We think that if we do good work, then we're compliant, right? Because often what we want to do sort of goes beyond just a tick-box exercise. This is why we developed our own in-house research integrity training." / 11_G1*

> *"[..] in order to have good practice, you've got to have a good culture. So, I think integrity and culture are just absolutely intricately linked. And the culture part is what drives people's behavior." / 12_G3*

Another aspect pointed out by an interviewee was the belief that hard skills in academic context should not overshadow the soft skills and the values when scientists are making their way up the career ladder. **Reflection on personal motivation and values** is likely something that should be included in various training contexts, fostering professional confidence.

> *''[..] in general, as we're developing professionals, there's such a huge focus on the technical skills and those proficiencies and not enough focus on personal development. And maybe a bit more focus on personal development will remind people of their values, so that they're less likely to go down those pathways and would build their confidence to stand up to strong negative forces. " / 29_G3*



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Such an approach does put the extra **responsibility on senior researchers** to discuss these topics with the team, to introduce new research assessment practices, and, additionally, ensure that the mental well-being and workload of the researchers is appropriate for being able to reflect on values and ethics issues. A reproducibility network representative emphasised that the change in attitude, including that of senior researchers, may come with realising the impact of particular RE/RI activities. Consequently, the RE/RI training should sufficiently address the ''why'' component, before switching to ''how''.

A representative of a reproducibility network believed that the key to change in the practice is **choosing the most relevant guidelines** and ensure them to be memorised and implemented, in addition to keeping in mind the generational differences.

> *''So, in my field, I think it's eventually when trying to promote good research practice, really to stick to one or two, the most established guidelines and then really to repeat and repeat, and emphasise these examples to the people so that it really gets imprinted to people's mind and brains that this is the way. And then this goes over generations also. It's when we discussed in the beginning that I think young researchers who are just entering the field are still very receptive. [..] But then, of course, they still face the rigidity that is imposed by 50-year-old PIs or even older. And so it takes time to change.'' / 3_G1*

Some of the interviewees emphasized the general role of scientific community and institutions in **promoting well-being of researchers** and implementing the idea of "slow science" - instead of allowing for a strong pressure to reach quantitative results to transfer from one level of institutional hierarchy to the next one.

> *"In my role, I call myself a senior advisor to the rectorate. And my privilege is that I'm close both to the rectorate, but also very close to many of our researchers. And I'm warning the rectorate that we have to do things to make the university somehow a happier place. And asking for more happiness is not a question of weakness, I think." 17_G3*

Related good practice examples highlighted by a couple of interviewees from different contexts put the emphasis on reevaluating the common practices of assessing the contribution of scientists when applying for a new position or funding opportunities. It was emphasized that **qualitative assessment of researchers and research** in the spirit of CoARA agreement and other international initiatives gives time and place for reflection on their contribution to science. Approaches such as narrative CVs were also mentioned as positive. Another well-regarded approach mentioned by the interviewees was focusing on **various research outputs for research assessment** that for long have not been perceived as equally valuable as scientific publications, for example open data sets, publication of negative results, public communication etc. While admitting the slow nature of changes, an interviewee from a funding agency shared



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that being a part of an established movement, such as CoARA, and following shared guidelines is helpful in their work.

> *''I think we quite systematically go through the elements of CoARA and think about how we can actually reform our way of doing things in order to live up to the ambitions of CoARA. '' 6_G3*

To support researchers in attempts of doing open science, in some institutions a good practice of having dedicated team members supporting open data processes - **data stewards** - has been introduced. Considering other approaches, a reproducibility network representative mentioned the reproducibility of research to be a good indicator for research assessment, however, admitting that such an approach might be resource intensive. Another interviewee similarly emphasized that for promoting reproducibility and using it as an element in research assessment there is more funding needed for reproducibility research.

> *''So, the ideal approach would be to have the same data and different groups to analyse the same data and to have an outcome [..]. For example, I just got a grant from the Italian ministry and we are two groups. One here in Trento and the other one in southern Italy, Chieti. And we are doing exactly the same thing, but half subjects here, half subjects there. And so, we are sort of replicating everything in two different environments, in two different groups. [..] We will analyse data, they will analyse data and we'll see if we come out with the same results. The final goal will be to have just one single database.'' 13_G1*

More than once, interviewees stated that it is helpful to have a **community of like-minded experts** where the problematic cases and open topics can be confidentially discussed, and knowledge can be exchanged - both on an international and on a national level. Elements of learning and gaining transnational perspective were perceived to be of value.

> *"And at ENRIO, the same, so at the European level, to have a network in which sharing experiences, how other countries are working - this is something that raises awareness and generates knowledge among peers that can be applied in each centre afterwards. So it's a learning experience. It's a peer-to-peer learning experience, which is extremely useful.'' / 9_G1*

Thinking of how to engage a larger network of universities in paying attention to the good practices of RE/RI and being aware of their importance, **rankings** can be considered as a potential tool of raising interest. As one of the interviewees who is working on promoting transparency in clinical research suggested:

> *''I mean, we started off mainly by targeting institutions, large institutions that weren't doing what they were supposed to be doing under US law, under EU guidelines. We published ratings and rankings, you know, okay, this is how this institution is doing, this is how this one is doing. It was like, you know, bar charts, a really clear ranking that you can then share on social*



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*media, and you can say - okay, Johns Hopkins is doing fantastically, but these people are doing really badly. And that was immensely successful, I think, at driving forward the conversation, the change." 15_G1*

Notably, the same interviewee, emphasised the importance of **simple reminders on regulations** via email or other means of communication. This approach does not require large resources, but it has been proven to be efficient in particular contexts where the busy everyday life of the target audience is a factor negatively affecting the adoption of new practices.

An impactful role in ensuring that scientists follow the RE/RI requirements is often performed by the funding agencies. An interviewee working for a national level funding agency in Ireland, shared how they use the chance to grow the participation numbers for a national level research integrity training.

*"And so, an example of what we've done in that area is we developed policies in relation to research misconduct and we've also stipulated in our grant terms and conditions. So, this is for every award we make, the people employed on those awards will have to undertake research integrity training to a minimum level. And then we ask them about that in their annual report, have they undertaken it, and just to specify which type. And we often ask more probing questions, just to get some kind of feedback from the community as to whether it's a good thing, is it working for them. We take a look at that. And I suppose that some of that has come about through our role in our National Research Integrity Forum."/ 29_G3*

Adding to the good practice, the same interviewee also noted the importance of being mindful of the difficulty of adapting new practices and the power of information and repetition.

When it comes to thinking of what a good starting point in an institutional context would be, a good practice shared by one of the interviewees involved **identification of the "pain points"** in the particular context and finding solutions that are tailored to the specific problems.

*"We had a very big survey of the staff, so researchers as well as research enabling staff, on the research culture. [..] The aim of that survey was to identify the challenges that people have and feel. One of the big things is that there were no cases of bullying or things like that. But people do feel a lot of stress... [..] From that survey, we developed a sort of a transversal research culture program where... Actually, on Monday, there was an interview for a research culture manager who will then need to go with each of the schools to help them develop an action plan to help them foster and do better, to have a better research culture." 11_G1*

Furthermore, taking as an example open science and data sharing, even in the case where notable resources are not available, **appreciation and giving kudos to "champions"** can create a change, as pointed out by an interviewee.



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> *''I mean, that's one thing that I see a lot of what Transparamed has done. It's like - it said thank you to the institutions that have done the right thing and to the funders. You know, there's like lots of people working away, you know, sitting through endless meetings, and then they have to do this endless data entry. Nobody ever says thank you to them. And then for the first time, you know, these strong efforts that they've made, got some visibility and some recognition where suddenly, you know, the Dean of the University sees in the newspaper - oh wow, you know, we're number one.'' / 15_G1'*

Finally, to create a positive environment the RE/RI policies should **support researchers with different needs**. A representative from a national funding organization shared their good practice of attempting to provide equal opportunities for all in the context of gender issues, including a system of calculation that helps to decrease the impact of parental leave on the assessment of a researcher.

Read more quotations on effectiveness in the appendix.

### 3.2.2. Quality of RE/RI training

Training was mentioned as an important part of RE/RI policies and their implementation throughout interviews. Nevertheless, interviewees pointed at several gaps in RE/RI trainings. One theme that was emerging in several interviews from different contexts was the observation that RE/RI **training is mainly being aimed at younger researchers**, and there is still a struggle with finding ways of getting more experienced researchers, professors and leadership involved in training and changing their attitudes and practices.

> *''I am doing a lot of presentations in universities, I'm quite often invited. [..] So everybody is very, very, very happy with this policy - we train young researchers and that's a solution. I disagree with this way of presenting research integrity. It's useful. It's a good way, but it's not sufficient because it could take 30 years to move on. '' / 1_G2*

> *"[..] training is key for me, and a gap is how to reach, you know, the more senior people." / 9_G1*

This leads to a risk that the negligence towards RE/RI issues could be inherited by the younger generations of scientists in the form of **"hidden curriculum"**.

> *''And so the main goal is to tell them* [junior researchers] *- look, be aware that, if you want to proceed in this way, you have to be very critical and also be aware that there are people that are actually adopting these kinds of behaviours and these behaviours are producing something that is not any worth for anyone.'' / 13_G1*



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Interviewees with experience in academic settings named **specific topics that are not but should be included in the curriculum** as early as possible, such as the procedure of peer review, the context of the publishing industry, cases and consequences of misconduct etc.

In addition to making sure that the motivation of all involved parties lies in the right place, **sustainability and adaptability** to the existing everyday chores are also crucial features to consider when looking for the most impactful approaches to training.

> *"We want to do it in a sustainable way. I really like the model of VIRT2UE where I can train trainers that sit in their own schools and they can do their logistics for their own things, depending on their own calendars." / 11_G1*

### 3.2.3. Handling and consequences of research misconduct

#### 3.2.3.1. Causes of misconduct

The **pressure to publish** and **lack of incentives promoting new types of research assessment** mentioned above came up repeatedly throughout the public consultation, being referred also to be one of the main causes of misconduct. The widespread numbers-based research assessment system pushes scientists to not only stretch their limits, but to also think of how to go beyond limits. Ethically questionable practices may be chosen to reach the maximum productivity level, partially due to a lack of incentive to follow ethics principles and values in the process.

> *" [..] wrong incentives also hinder researchers from being more transparent and being more open. So that's a topic I'm more involved in - open science. But there is no real incentive to be open and to share data. It actually causes more work and more bureaucracy, and so researchers don't like it." / 10_G1*

Furthermore, the number of publications and grants may not only serve as fuel for quicker career development, but also provide immediate financial return - such setup may lead the scientists into not paying their full attention to the quality of the process and output.

> *"I'm working at university, but before I was also working in a research hospital and the Italian government was giving money based on the number of papers and that's very bad because you push people to publish, no matter what the results are, as long as you can publish something - that is perfect. I was involved in this kind of game and I was producing a lot of papers. At some point I said - stop, where are you going? This is not science." / 13_G1*

An aspect that is also contributing to the research misconduct is the lack of know-how and **insufficient monitoring** across various potentially responsible institutions - funding agencies, state institutions or the actors in the publishing industry.



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A specific type of risk to research integrity is posed by **conflicts of interest**, when personal, business or other interests might conflict with conducting research that is beneficial to society. Most commonly, interviewees referred to financial interests, usually emerging in spaces where science and industry intersect. Prominent was the belief that conflicts of interest are unavoidable, thus the focus should rather be put on ensuring transparency of related interests.

> *'' [..] when it comes to medicines and medical research, there is a lot [..] of connections between researchers and industry. Sometimes because they're in a partnership, sometimes because the companies do research using university facilities and researchers. I mean, it's very linked. [..] and this is why it's important, at least to have transparency and to take these things into account. '' / 5_G1*

> *''I don't think that any party is free of bias and interest. But what is important is that interests are disclosed, that they are communicated, so that they can be understood. And when you read a publication, you need to know what interests have been on the table.'' /* 18_G4

To increase transparency, one of interviewees highlighted the role of publishers in development of rules and the recommended procedures supporting disclosure of conflicts of interests, e.g. by asking detailed questions about potential conflicts of interests.

> *''[..] it's also the job of journals, etc. to make clear what you have to disclose. You don't leave it up to the person because we all have our biases. [..] You have to ask exactly because I think that if you ask someone they cannot lie. I mean, they will not lie. I don't think they will hide. Many people will not reply, but if you never ask them and just say 'disclose a conflict', many people might say 'Ah, but I don't have a conflict', so I think it's also about being prescriptive. '' / 5_G1*

Another aspect related to the cooperation between the industry and the academia has to do with the transparency regarding the process itself - an NGO representative expressed concern about the role of industry in some calls for research projects in medicine that already start with a certain level of comprehension regarding what type of a project would get the grant, while the call is misleadingly presented as one that provides equal opportunity.

Read more quotations on the causes of misconduct in the appendix.

#### 3.2.3.2. Investigation of research misconduct

The articulated motivation for activities by social media activists and journalists was the **inability or unwillingness to successfully deal with research misconduct** on an institutional, funding, publishing or other contexts.



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> *''[..] we've got a dataset from the UK health research authority for every clinical trial that was approved in the UK and whether that trial was registered or not. Now, you could very easily go through those and you could file a few hundred ethics complaints tomorrow. Has a health research authority done that? No. Has anyone else done that? No. Might I do that? I'm actually considering it because I'm getting fed up with it, with nobody else doing it, you know? '' / 15_G1*

Furthermore, from the point of view of a science journalist, the traditional ways of **peer review** of scientific publications are often failing.

> *''[..] the self-correction in the scientific communities is not working. It's a fairy tale, as it is a fairy tale, the peer review system and the post publication peer review. It exists in principle, you can cherry pick good examples all day. But the reality, the sad reality is that the system is failing. And the scientific community always tends to, I mean, every single scientist who is in good faith, and it may be surrounded by a very small community of good guys, to simplify, they always tend to say - don't attack science, because if you attack science, you attack me. But they don't know it, they don't realise that outside of what they directly know, there is such a mess.'' / 26_G2*

One of the biggest challenges and a rather demotivational factor reported by the social media activists was the **lack of reaction** following their discoveries, mostly when communicating with publishers. Due to the slow reaction of the stakeholders responsible for reacting to the potential misconduct, activists emphasised the challenges in reaching out to the right person to ensure the reaction, which may be very context-dependent. And even in cases when actions, such as retraction, follow, the role of the activists frequently remains invisible.

> *''Some of our colleagues, the sleuths, believe that there are loopholes in the* [publisher's] *flowcharts. In order to make a decision, sometimes you need to inform the authors and there is no timeout, what we call timeout in the computer sense. Just like - you have two weeks to reply, otherwise we will proceed. [..]. And that's quite frustrating for many scientific detectives, not to get the papers retracted, not to see the publishers recognizing the work or even citing the source where they found the report - like a link to Pubpeer would be appreciated. And instead of that, you can see that in the retraction notices you have - ''it came to our attention that...''. The publishers write this in a passive voice'' / 7_G2*

> *''Because if you send the email to a very skilled editor that is very careful about what he's publishing he will perhaps handle the thing very well. But if you have a sloppy editor, nothing will happen. And then you should reach the publisher and not the editor. And so depending on the channel you use to trigger or to flag the problem, things can go very differently.'' / 14_G2*



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When the attempts to receive a reaction from the editor or another responsible actor fail, journalists and social media can provide a platform for amplification of the epistemic activists' message, frequently resulting in the necessary extra pressure required for action.

> *''So, the data was entirely made up in that study. It was published very prominently, but it was soon realised by Twitter channels that this study can't be true. And it got retracted two or three weeks later. And because it was in the headlines all over the world, also this researcher got into big trouble and then he had to talk to the university board. '' / 10_G1*

> *''A completely generated paper, it was in 2009, 2010, something like that. And I started to report them. [..] And then a few years later, there were more and more of them. And I had to do something. So, I just sent emails to the publisher. And yeah, it was very long. And like, for a paper that really does not mean anything. In several months, nothing had happened. And then my email of complaint reached a journalist in Nature News and he did an article on this generated paper, and then suddenly, in 15 days, everything was gone.'' 14_G2*

Some of the interviewees pointed to the **dangers of acting as an social media activist**, especially in cases when the activities are aimed at bigger players, e.g. paper mills, citation cartels or predatory journals.

> *''For me, I'm not wishing for anything to change, but for other people I'm wishing that their skills would be recognised, especially for, I have one person in mind who has been there way before me, maybe 10 years ago, he was already active, fighting paper mills, knowing about paper mills, because he's living in a region where paper mills are active. Posting on Pubpeer every day, but anonymously because it's impossible that he would use his identity. He's frightened for his safety, but still he's doing this work, earning no recognition.'' / 7_G2*

When performed in accordance with what the scientific community regard as ethical, the actions of activists undeniably contribute to revealing and acting upon cases of misconduct. Nevertheless, the work done by social media activists sometimes gets ambiguous assessment. The activism can look very different based on the context - mostly when it comes to the communication of the findings. Specifically because of this, some interviewees see particular **risks in sleuths activities**, such as the potential for research misconduct weaponization.

> *''One could make a case for the ethics of going after the most important people, just like, you know, the Henry Beecher paper did back in the day. But you can also imagine that going very wrong, with people saying, like we're doing in the States right now, people saying - I'm going to look at everybody at Harvard for plagiarism, all of your faculty, right? I'm going to target them. And, you know, so you can make an argument for certain kinds of targeting, but it's not subject to any oversight or comparison or anything.'' / 22_G1*



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For example, an interviewee representing advisory and policy-making bodies acknowledged the unique function that has been undertaken by the social media activists, at the same time noting that they operate outside of a regulated system of accountability.

> *''I think they [sleuths] play a really important role. But I think we have to be careful as well that it isn't, you know, there's always unintended consequences with these things. People aren't, let's say in Pubpeer, abusing the platform to actually vilify somebody for reasons of their own, for personal reasons. And how do you stop that, I don't know. But I mean, generally speaking, I think that the data sleuths have risen, and have really made people more aware of the level of data manipulation that's been going on." / 12_G3*

This leads to the other group of actors contributing to investigation of research misconduct - science journalists. As one expert pointed out, the task of a science journalist is to continuously question. Similarly to epistemic activists, science journalists investigating research misconduct often do not get recognition and reward due, making this choice of career unlikely, and consequently resulting in lack of expertise in scientific journalism.

An interviewee emphasised that journalists' attempts to reveal cases of research misconduct can take a long time and be hindered due to the protection from allegations a scientific subcommunity can provide to its members. In some cases, the work done by journalists might lead back to the same concerns described above in the context of epistemic activists - premature judgements and scandalous publications in the media driven by questionable motivations.

> *''That case did not go to the media. In some cases in Finland, it has gone there. And then it's really bad because often the judgement is done already before the research is done.'' / 23_G3*

> *''Because* [the media] *want to make a buzz, you know. So they want scandals, they want big scandals, they want all big scandals, but misconducts are small, let's say, borderline practices. It's too difficult to explain to the lay public that changing a statistical test is misconduct. So, they will not buzz or fuss about all misconduct practices." / 1_G2*

During the interviews, notable emphasis was put on the importance of ensuring that when misconduct is proved, it has **consequences for wrongdoers**:

> *''Because otherwise, if there is no consequence for researchers that don't do it properly, why would they do it properly?'' / 2_G1*

A wish to see tangible action, for example, funding reimbursement, after discovering misconduct was often expressed, pointing out that without it, the attempts of striving towards more trustworthy research might be ineffective.



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> *''In the past six months, we had meetings with those advisors to ministers and we told them that if there is misconduct, if there is fraud, could you push hospitals to pay back the money they have got? Nothing happened. [..] So it's not a high level of money, it's not research fundings by research agencies, it's just the money that is paid back by hospitals. So, it's currently not done and not possible. So, if we don't have small actions, it will be difficult to move on. And it's not a big decision to reimburse 30,000 euros because the paper was retracted. Okay? I'm not talking about 700,000 euros of funding the project.'' / 1_G2*

In the experience of the interviewees, the reaction to misconduct very much differs based on the context - institution, state, involved parties, motivation. Even in the contexts where procedures are established, they are still not regarded as entirely helpful due to the **complexity of execution** in most cases and due to the fact that the sanctions may be unable to undo the harm done - for example, the dissemination of citations from a faulty research paper.

> *"Usually what happens is - either you are suspended from your PhD program and you are out of the program or your paper is retracted and it takes a lot of time to retract the paper and once it is retracted, the paper has already been cited so often that it is difficult to get the knowledge out of the circuit. In terms of the institutional level or the board level, people try to cover it up.'' / 19_G1*

Read more quotations on the identified problems in handling misconduct in the appendix.

#### 3.2.3.3. Solutions and good practices

Oftentimes, the interviewees admitted that neither policies nor training will be beneficial, unless the values are internalised, and the institutional culture is changed. Consequently, the reaction to research misconduct should involve **self-reflection and seeking for answers to fundamental questions**.

> *''So, in this kind of reflection in the first place, it's not just - punish someone because he did something wrong, but what makes these people behaving like they behave?'' /17_G3*

Several interviewees from different contexts stated that **more transparency on research misconduct cases** would not only increase the level of accountability, but also foster changes in the perception of research misconduct in science, encouraging positive change. Throughout the public consultation, interviewees reported some institutional practices contributing to transparency, but most examples of initiative for case disclosure stemmed elsewhere - for example, from social media activists or journalists.

> *''So, I think that one thing that would be important is to have transparency about what happens, without identifying people, of course, so that we can have a clear view of the*



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*landscape and understand. Because we only get to know these cases when they are real fraud and they come up in the media - social media, scientific media, and so on. '' 19_G1*

Notably, in the online survey, the general public respondents and students most frequently stated that the information regarding misconduct cases should be available to the journalists, media and society, while respondents being involved in research practice most frequently indicated that it should be disclosed only to the investigation committee and scientists involved in the case. Also, some of the interviewees suggested caution regarding the timing and the form of the information shared, to ensure that such practices are not abused or do not result in harm by accident. Another risk to avoid was the damage that could be done to a scientist's reputation without sufficient proof.

*"[..] for sure I think the university should be... the best thing is being transparent from the beginning. I know that's not easy because you have to identify the problem and you cannot kill someone before, I mean, deciding that he really falsified whatever the data. I think the university should be transparent." / 13_G1*

When it comes to detecting misconduct in scientific publications, one solution mentioned involves **collaboration between social media activists and the publishers** - more specifically, sharing expertise, data, approaches and good practices.

*'' [..] we stayed in contact and I managed to have them change the way they write their notice of retraction. And also, I managed to get them to subscribe to Pubpeer and also post on Pubpeer. Whenever they are taking a case, they will indicate that they are investigating, or when a paper is retracted, they post it on Pubpeer to give back to the community.'' / 7_G2*

Read more quotations on the good practices in handling misconduct in the appendix.

### 3.2.4. Public involvement

#### 3.2.4.1. Communication with public

Although seemingly in a bubble, scientific practice exists in the context of society, mainly linked to it by streams of financing and information exchange: scientists give to the community and the community gives to science. Yet, if the gap between the scientific community and the rest of the society increases, it becomes more complicated to ensure that research corresponds to the society's needs and there is mutual trust.

Interviewees from various NGOs provided their perspective on the current quality of collaboration with scientists, information exchange, and the necessary improvements. Firstly, they emphasized the importance **of raising science literacy in the society and improving science communication**.



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> *''And then I guess also raising public awareness about what science means, what does it mean - scientific research, what these types of results are, what type of impact the produced results will have on you as a citizen. You know, making people aware, avoiding this stigma between the scientific community and the society at large. I think the society should be involved in the dissemination of science.'' 21_G1*

Science literacy was seen as something that might help people navigate their everyday life and make better decisions based on scientific information. Frequently the representatives of NGOs believed that the education at school is not always sufficient in teaching scientific ways of thinking.

> *''Generally, the promotion of research and teaching people from a very young age to be able to tell what is good research and what isn't, it's like a basic skill these days. And that would avoid these situations, like mentioned earlier, that in the same newspaper or magazine you read on one page that coffee is good for you and on another one that coffee is bad for you. And I mean, in my other life, I am a dietician, so believe me I've seen it a lot. But you know it's just teaching people not to focus on small things, but looking at the bigger picture and seeing how it all fits in.'' 2_G1*

Allocation of public funding for science requires efforts by scientists to get societal acceptance - more than once it was mentioned that, in order for the public to be more involved and interested in scientific activities, the **scientists need to be able to explain their work** in a way that is understandable for a broad audience.

> *''I'm pretty sure it's in every country also, if there are research projects that Research Council of Finland is funding yearly, for example, and the titles of the projects and then short abstracts are opened. Then there is a lot of public discussion, actually. Well, why should we fund something strange, survival of some rare language or some cultural things, extreme and then so on? Biomedicine maybe has an important role, but in social sciences, in humanities, there are a lot of questions. [..] Researchers really need to learn how to explain their research to the public in order to get positive feedback from them also, not that they are just always disregarded.'' / 3_G1*

A reproducibility network representative also marked the risk of miscommunication in public communication of scientific work that could be prevented by **making public involvement more interactive**.

> *''Some people who belong to the public, to the so-called public, did not really understand that science is about this. And so, they thought that everything was very much confusing. And this is why you have people saying - don't take vaccines, don't trust scientists, they don't know what they are doing. [..] So we are trying to engage citizens, we are trying to engage citizens*



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*in the studies, we are trying to get citizens involved by saying what they need, how they react to the experiments that are being taken, what they expect from technologies. '' / 19_G1*

Consequently, improved science literacy in the general public may lead to a wider discussion and more attention paid to research misconduct and RE/RI issues which are difficult to present as significant to the public without background knowledge on how science works.

Science communication to a broader audience often attain very limited results, only reaching people that are already interested in science. During the public consultation, we stumbled upon a challenge of gathering a sufficient number of survey responses from the general public, despite inviting everyone to fill in the questionnaire. The **difficulty of broad public engagement in science** was also reported by the interviewees.

*''And we also start to have also ''Rencontres de l'Esprit Critique'' - critical appraisal meetings in some French cities. [..] It's good anyway, but when you look at the population attending those public meetings - it's three thousand, we have support. It's large, 1500 people -, that's the social category of people who are educated teachers, engineers, and so, who come and attend such meetings. [..] When you want to educate the lay public, the sessions are attended by educated people, okay? And still, I have no solution for the rest of the population." /* 1_G2

The dialogue between the scientists and the public may be fostered by **recognizing opportunities and creating spaces for ensuring an open dialog**. It is important to make sure that in these spaces all participants feel equally empowered to speak up.

*''It's interesting, yeah, because, I mean, we also had an initiative recently [..]. I think it was to inform our national research and innovation strategy, which would have been published in the last couple of years. But prior to that, there was a huge citizen engagement exercise around research. [..] And so it's how to educate the public with the right amount of information that they can actively... so that it's not a kind of just tick-box or, you know, tokenism. That it's genuine, we actually value what you have to say and we value that if, you know, we're talking about the same thing.'' / 29_G3*

Another good practice shared by an expert during the public consultation was involving children in scientific activities, giving a chance to experience the research process thoroughly.

*''It's the SMART programme, that's an acronym. It comes from the Trials Methodology Research, TMRN in Galway here in the West of Ireland. And they do trials with children. So, the children develop the trial and run the trial. So to learn about research and evidence and where it comes from. This is a really nice one, actually. And so, I think, but that's just one and it's not in every school. It's around, you know, interested science minded teachers who sign up to it. But it's a lovely example of training children from a really young age on what, so this*



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*is primary school, ages 8, 9, 10, teaching them at this young age on this is all about. [..] It's harder to educate the adults who have certain mindsets."* 29_G3

#### 3.2.4.2. Patient engagement

There are particular activities aimed at narrowing the gap between science and society that deserve to be looked at separately. One of them is patient engagement in medical research, perceiving them as important stakeholders in different stages of research, for example, the review of funding applications for medical research or during the implementation of research study.

*''And certainly back in the funding agency, because we were a health funder, we had moved to the point where we had mandatory PPI* [public/patient involvement] *in the application. And also, applications for funding were reviewed by a public panel, which was really interesting. Because they would say things like, you know - yeah, that's all very well. But actually, this particular patient group, this isn't what they need at all. [..] You need to rethink how you're doing this. And I think it's been very good for the researchers because they're starting to understand much better what the needs of that particular group are. '' / 12_G3*

Another issue was raised by the representatives of a patient organisation, asking if the patients are there for just validating and contributing to the ideas put forward by scientists or industry, or perhaps the cooperation could be more meaningful if patients would be involved throughout the process, including the flagging of the issues to be solved by science.

*''R1: Yeah, looking at the whole process. I'm just starting to think, have we ever been approached by a researcher at this early stage, the stage of designing the research? R2: No, it's usually that we are usually the last ones they contact.'' / 2_G1*

While generally seen as a positive practice by the interviewees, patient engagement comes with its own ethical considerations. The first of them is **ensuring that the process is sufficiently explained to the participants**, and here the patient organisations may play a crucial role - if the necessary information is provided by the scientists. Furthermore, attention should be paid to not only explaining the process, but the essence of the scientific method as well, not regarding anything as self-explanatory.

*''And you can have completely different results, not confirming your hypothesis, but you have to explain this to the patient organisations, [..]. And I think for them* [patients] *it's really hard to understand that after one year, money's over and the project is finished. '' / 24_G1*

Some potential communication-related solutions offered by the interviewees representing patient NGOS were, for example, **creating opportunities for communicating the patient needs to scientists** - in the form of designated events or otherwise.



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> *''Because we might even consider some kind of, if symposium is too big a word, but some kind of, you know, gather around with the scientists and tell them what the patient would like to see to be researched or something that could be done for the benefit of the patients.'' / 2_G1*

A positive example of patient empowerment was presented by an interviewee from an NGO participating in the curation of an **educational program** for their members and a broader group of patients that allows for the patients to better understand such aspects as the medicines' development process and the uncertainty of preclinical research.

> *''We have, for example, this concept of Open Academy, where they learn from online materials and also in our in-person workshop, which is one week in June in Barcelona about how to become an organised patient organisation, how to fund research, how to establish a scientific advisory board, and to really understand the complexity of the drug development process to make them understand why preclinical research often does not move on. Because there is no collaboration between the groups.'' 24_G1*

Notably, as patient involvement has become a requirement in many projects, a risk of simply following the requirements without reflection and understanding the potential added value appears, creating a false impression of patients being sufficiently engaged.

> *''Very often also what happens in EU projects is that it's a checkbox and these organisations, they feel it, you know, they're like - okay, we are here and they're invited to many consortia, but in the end it's like - okay, is it a real patient engagement? Are they really being listened to? Or is it just like - oh, the commission asks for it, this increases our chances for funding. And let's check the box. That's like something that we hear a lot.' / 30_G1*

Last but not least, an interviewee emphasised an important factor when working with patients that should not be overlooked **- the ability to maintain an empathetic tone in communication**.

> *''I went to several research conferences, he said, and they didn't even, they explained, for example - oh, we did super nice, great experiments, it was even fun. And for the patient, it was like - no, it's not fun having a disabled child. So, they couldn't even properly communicate this. And I was like - yeah, this is so, in the end you are doing this and I think some researchers are forgetting this especially in the rare diseases. Yeah, doing this for the patient community. They're not doing this because it's so fun.'' / 24_G1*

Read more quotations on the public and patient involvement in the appendix.

#### 3.2.4.3. Citizen science

Another form of involving a broader audience into the process of science is through citizen science activities, yet this form of involvement also comes with its own ethical risks and



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considerations. Important for preventing research misconduct in citizen science (both by scientists and citizen scientists) is **sufficient explanation of RE/RI principles** and keeping in mind the particular audience.

> *''And then the question is - when you have citizens that are maybe, as I said, a marginalised group or like youth that doesn't have so much critical thinking developed or doesn't know what questions they need to ask or what to expect. So, I would say maybe for citizens for whom it is their first time participating, there needs to be more attention paid to explaining at the beginning.'' 4_G1*

Importance was assigned also to proper training regarding more technical details in the scientific process.

> *''I really have the hope that citizen science in general is a methodology that could perhaps counteract this distrust that a lot of people feel. Just by making people more aware of how research actually works and how the experts actually come to their opinions and why they're called expert opinions and why they shouldn't be cast aside so easily as they are today in the society.'' / 20_G1*

An interviewee closely related to the field turned the attention to the importance of considering the relationships between the scientists and citizen scientists. For building the necessary trust and achieving a positive impact, **consistency and commitment** are key.

> *''Another thing is that it's really important to have consistency. For a lot of people, it isn't nice to be approached by a different researcher every time you're in contact with the research team. So, there should be someone who's in it for the long haul. It's like - oh, I'm going to be in this area for a year or two, so that they have the same face. [..] And if you can arrange it, it is, of course, really nice to have someone on the research team who is actually from a certain town or a certain area or from a certain patient population, because that opens the most doors.'' / 20_G1*

Alternatively, the well-intended involvement of citizens might achieve the opposite effect, potentially damaging the perception of the scientific community.

> *''I heard this expression once, but starting a citizen science project is a bit like getting a tattoo on your forehead. You have to be committed. [..] Also in rounding up your project. If you don't close the project properly, then they won't welcome new researchers. [..] So you really have a responsibility to people who might come after you as well. I think that's true of all research, but especially citizen science.''* / 20_G1

A concern was raised regarding the **unclear handling of misconduct** that may occur in the context of citizen science activities, thus the need for adapted guidelines emerges.



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> *''What do you do if a citizen scientist publishes a paper and they're accused of misconduct? There's nothing you can really do about it, except if it's published in a journal - you could retract it, right, but they aren't subject to any kind of sanctions, and so some of the work that I'm trying to do in the book is to articulate how citizen science or participatory science or any of these areas could set up their whole own systems to demonstrate that they're doing things rigorously, ethically, etc.'' / 22_G1*

Another risk worth keeping in mind is that in some citizen science activities, **conflicts of interest** might appear, with the involved citizens having a preference for a particular outcome of the research - for example, in the case of hunters contributing to animal population estimates or similarly.

> *''I think one of our objectives is that we have a more heterogeneous group of people, that there are also others rather than hunters. For example, those who are interested in nature, because there is this motivation those people have. [..] Or maybe the population wasn't even low, because when we are considering, for example, the bear, it has quite a good level at the moment, but anyway, they haven't got any hunting licences. And then they are saying that - okay, we start to strike. We don't send you any observations. We don't send you any samples. And so that's the reason why we would like to have a much more heterogeneous group of people.[..] It has been more like talking than actually the action, but that kind of talking there is every now and then.'' / 23_G3*

Read more quotations on citizen science in the appendix.

### 3.2.5. AI in the context of RE/RI

The expansion of generative AI was perceived with caution across all contexts of public consultation. The concern that was repeated most frequently is related to the speed of generative AI development and increased accessibility that has led or might lead to **new or more intensive types of research misconduct**, such as use of AI by paper mills, submitting AI-generated papers, using AI for fabrication of data sets or submitting AI-generated peer reviews.

> *''I think, yeah, you mentioned paper mills and I don't know, it's again like, well back to the sports and doping, I think they are always one step ahead of chasers.'' / 3_G1*

An example of generative AI application that was perceived as a clear case of misconduct was **fabrication of fake data sets** by using AI that are difficult to recognize and that might lead to a large number of fraudulent publications.

> *''I have to say, I'm really, really pessimistic about the impact of AI. [..] So in my second prompt, I said: "Can you rewrite this by making the statistics significant, please?" And it did it. It actually*



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*changed the values. There is work demonstrating that you can have ChatGPT create fake data. Ultimately, that means that there will be a lot of noise, a lot of added crap papers." / 11_G1*

Another use case that was highly unacceptable from the point of view of interviewees would be **using AI for generating peer review reports**. At the same time, acknowledging the inevitability of AI-generated contributions to peer review, an expert coming from the publishing industry suggested examples of what might be acceptable applications of AI in the peer review process - for example the, generation of questions or specific requests for comments in the paper that would then be answered by the peer reviewers. From this interviewee's viewpoint a publication or peer review written by AI might not be a breach of research integrity, if the researcher has validated the content and properly disclosed use of AI.

More than one of funding body representatives mentioned the unclarity in regard to **establishing rules for use of generative AI in writing funding applications** and in the process of review of grant proposals, and again mentioned need to get insight on the practices of similar institutions.

*"It's very much in our domain to be able to say - we do not want, as a funder, we do not want reviews that have been conducted with the help of AI. But it's more complex in the area of applications. So we haven't put a statement out there yet in relation to how you put together an application. And we are going to wait and listen to what other people are saying and other people are doing before we jump on that one." / 29_G3*

However, on more than one occasion, interviewees concluded that the inevitable contamination of academic context with AI-generated content will require the scientific community to **reevaluate the current practices**, putting more importance on the quality, creativity and uniqueness of a scientific work.

*"This is my solution to the AI crisis, that we should go back to the roots of wanting to do good work and doing research to understand, not to publish." / 11_G1*

Several interviewees considered **sharing of experiences, regulations and best practices** as one way to move forward in the new contexts related to AI use, e.g. using generative AI in writing of scientific project proposals. Notably, it is important to provide spaces for exchanging experience among various institutions.

*"It's very much in our domain to be able to say - we do not want, as a funder, we do not want reviews that have been conducted with the help of AI. But it's more complex in the area of applications. So, we haven't put a statement out there yet in relation to how you put together an application. And we are going to wait and listen to what other people are saying and other people are doing before we jump on that one." / 29_G3*



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The majority of the interviewees referred to **general lack of ethical oversight of AI** with the regulations sporadically emerging on different levels (institutional, state-level, EU-level) with different scope and application. Nevertheless, the most applicable solution from the point of view of several interviewees was an open discussion on what applications of AI are acceptable from a standpoint of RE/RI.

> *''Until recently there was no regulation on how to use artificial intelligence at the EU level. And I think, since these things are developing so fast, and the regulations are not so fast to be developed, there's always a blurry line.'' / 4_G1*

> *''I think that the issue that we are having here is that since there is going to be a lot of innovation and new techniques that will come out, it's not possible to have regulation that will encompass everything. So, the best approach is rather to build knowledge as soon as ideas come out, but have people that will actually think about it and say - okay, this is acceptable, this is not acceptable, this is too dangerous, this is okay, let's be cautious about this scenario'' / 11_G1*

Oftentimes, the interviewees felt positively towards using different types of AI for performing particular tasks that were perceived as technical or less complex, where the user is able to understand how the output was generated and discloses AI use. In such cases AI was seen as a useful tool.

> *'' [..] in certain applications, you would say - okay. If it's to generate data, it's not a good idea. If it's to correct text or draw pictures faster based on data, it would be a good idea. '' /* 8_G3

The fine line between the AI use being acceptable or not was often drawn based on what can be regarded as **transparent**. This highlights the need for **in-depth knowledge for the users** prior to them working with AI, as insufficient understanding might lead to outputs based on bias and other issues. As in example on biased use of AI for recognition of fraudulent papers mentioned by one of the interviewees:

> *''So, if the AI would flag each and every Pakistani's paper, each and every paper coming from Malaysia, Russia and Iran. That's not effective. And the humans, the editors, already integrated this type of criteria. And this is really hurting science.'' / 7_G2*

When it comes to responsibility, one of the interviewees pointed to the **responsibility of the developers** of any information technology tool, including AI. Developers should do what is possible in order to ensure that the technology cannot be used malevolently. Yet, it does not remove the responsibility of the users and the regulators.

Returning to the challenge of coming up with relevant regulations on time to match the fast pace of AI advancement, an interviewee suggested that the best solution for institutions would



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be to have **AI experts participating** in the bodies where there is need for such expertise, e.g. in research ethics committees reviewing applications involving use of AI. As it is quite unlikely that all institutions that need AI expertise will have the resources to attract experts (also related to the observation of the interviewees that the number of AI experts so far does not grow quickly enough for it to be sufficient) there are some EU-level initiatives that intend to support compliance with the new AI Act, e.g. in the process of development of AI-based tools.

> *''Actually the sandbox itself is Article 53 of the AI Act, which requires a member state to actually develop one. It's basically to support AI innovation so that companies or research institutes or basically any researcher or developer, whatever, doesn't really matter, that wants to use AI for a specific use case, can apply to the sandbox and get feedback on - is my interpretation of the law correct? [..] For example, mobility - counting people is not the same as recognizing people's faces when they're in the streets. So their privacy is actually quite strong and we cannot do that. [..] So to answer those types of questions and interpretation of privacy laws as well as AI regulation and so on, you need this type of structure that will tell you - okay, this you can do or this you cannot do.'' / 8_G3*

In the meantime, professionals and advisory bodies across the scientific community are self-organising to meet the increasing need for context-specific guidelines - potentially later resulting in a high complexity regarding the interaction of different levels of guidelines, as earlier mentioned in the context of general RE/RI guidelines.

Read more quotations on AI in the appendix.



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# 4 Conclusions

In the public consultation the key observations regarding gaps in the existing RE/RI policies, consequences of research misconduct and other aspects often aligned between participants from different contexts, yet, each context also contributed by supplementing its unique perspective.

Among the biggest gaps in RE/RI governance identified during the public consultation is the lack of measuring effectiveness of RE/RI trainings, policies and their implementation. Participants repeatedly expressed concerns that without these mechanisms in place regulations aimed at supporting RE/RI could be easily ignored or undermined. Another key observation highlighted the need for support and understanding not only from the leadership within research institutions but also from state authorities responsible for development of national RE/RI policies. Without this backing, many valuable initiatives risk stagnating due to insufficient resources or lack of enforcement authority.

On the other hand, many participants emphasized also the importance of building institutional culture and internalization of RE/RI values. The most frequently mentioned best practice approach for achieving this goal was education, specifically through organized training sessions or peer-to-peer discussions and exchanges of experience. However, many participants raised concerns about varying levels of responsiveness to training based on career seniority. While PhD students and early-career researchers were generally described as participating in training, eager to learn and receptive, there is still a need to organize RE/RI trainings aimed specifically at senior researchers and supervisors and raise their motivation to participate in such trainings. This poses a risk that, despite receiving training, younger researchers may in some cases face a “hidden curriculum” and adopt similar attitudes as their more experienced colleagues.

Additionally, some participants believed that RE/RI regulations and policies are not always clear and may lack explanations, particularly when there are discrepancies between different regulations. A key consideration for several participants was the actionability of RE/RI regulations - they should be concise, memorable, and applicable. The procedures for enforcing compliance should be streamlined to avoid unnecessary bureaucracy. Another recommended best practice for implementing regulations was the use of reminders and regular communication about RE/RI. It might be implemented by providing more simple, positive, actionable information on RE/RI and practical implementation of policies, e.g., best practice examples on how to implement RE/RI in everyday practice, short information on RE/RI procedures researchers have follow. In the view of participants of public consultation, this approach can help mitigate issues of non-compliance stemming from the fast-paced nature of scientific practice and ingrained habits. In their view, pressure of the "publish or perish" culture and prevailing quantitative assessment of research is one of the causes of questionable research practices and misconduct. This was contrasted with the concept of “slow science”,



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which advocates for a more thoughtful approach, removes pressure, supports mental well-being, gives more time for implementing research, supports qualitative approaches to assessment of researchers and values diverse research outputs. Some stakeholders were also emphasizing need for reflection on personal motivation and values for researchers who have committed research misconduct.

The statistically significant differences in the survey data suggest that perceptions of the effectiveness of RE/RI policies in preventing research misconduct vary by country. For example, participants from Latvia more frequently chose a "neutral" stance and less often rated the policies as "ineffective" compared to participants from Norway and the UK. This could indicate lack of information on RE/RI policies or lack of interest in implementation of RE/RI policies in Latvia, while participants from Norway and the UK might have stronger opinions or be more exposed to information or RE/RI. These differences may reflect variations in policy implementation, cultural attitudes toward misconduct, or awareness of RE/RI policies in these countries. However, further analysis is needed to understand the underlying reasons for these differences.

Beyond regulations and training, participants suggested specific strategies to promote research practices aligned with RI/RE values. One such approach is ensuring that every researcher has access to a safe environment for seeking advice and discussing RE/RI issues, whether within their own institution or through a cross-institutional network. Additionally, when developing new guidelines or regulations, it is crucial to involve all relevant stakeholders and researchers from different fields of science. This inclusive process helps ensure that researchers and other stakeholders from different contexts, across different levels and disciplines, view the guidelines as relevant and applicable to their work.

Particularly science journalists and social media activists (epistemic activists or "sleuths") expressed concern over the failure of academia and the publishing industry to adequately address the volume of poor-quality science being published. Sleuths have taken independent action, identifying and reporting instances of AI-generated papers, tortured phrases, plagiarism, image manipulations, violation of authorship criteria, falsification and fabrication of data and other cases of research misconduct. While there have been positive examples of collaboration between sleuths, the publishing industry and academia, such as sharing of investigative methods and official investigation of misconduct cases based on reports from activists, their independence raises concerns among more conservative academic actors. These stakeholders worry about the potential misuse of research misconduct allegations, naming the suspects and the resulting damage to individual researchers and the public perception of trustworthiness of science. Additionally, the role of the media was seen as an area requiring



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careful attention, as participants from academic context were worried about a tendency for media outlets to focus on more scandalous cases and narratives.

The statistically significant difference in responses to the question on transparency of investigations of research misconduct suggests that there may be a significant divide between the general public and students, and those directly involved in research. The majority of the general public and students believed that information about the investigation process and results should be made available to journalists, media, and society, indicating a strong preference for transparency. In contrast, those involved in research provided more varied responses, suggesting they may have more nuanced or cautious views on the extent of transparency, mostly due to concerns about confidentiality, reputation, or the complexity of the investigation process. It highlights the different perspectives between those inside and outside the research community. A balanced approach ensuring more transparency about handling misconduct cases and protecting the confidentiality of those involved during the investigation process might be needed.

Various stakeholders noted that the rise of AI tools further exacerbates the issue of overproduction in academic publishing and the decline in quality of papers and peer review, extending to the new challenges, e.g. AI-generated fake datasets. Some participants even speculated that AI might completely transform how researchers' contributions to science are assessed.

Answers on the question on the role of gender in the field of RE/RI suggest that efforts to address gender issues in academia can sometimes fall into a cycle of countering the existing stereotypes with new ones. It seems that to truly understand the impact of gender on research integrity, it is essential to move beyond vague statements and focus on real cases and personal experiences. While quantitative methods may not fully capture these complexities, qualitative interviews could offer deeper insights into these dynamics.

When considering the role of the public in relation to RE/RI many participants felt there was still potential for mutual benefit through collaboration between the scientific community and society at large. Participants, especially representatives of NGOs and CSOs expressed hopes for increased dialogue, an additional layer of accountability, and greater public involvement in shaping more relevant and applicable research agendas. During the interviews with patient organizations, the value of an active dialogue with the patients throughout all stages of biomedical research was emphasized, suggesting more relevant and beneficial treatments as an outcome. However, this collaboration was seen as contingent on the public science literacy and increasing understanding of the scientific method, a challenge that many representatives of academic context felt needed to be addressed through improved public education. At the same time, researchers were encouraged to be more mindful of how they communicate their



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work, ensuring that information is accessible to the general public, especially since scientific research is often funded by taxpayers.

Participants also noted that support for RE/RI practices should not come solely from research policymakers and researchers, but also from external actors such as industry, media and government. Additionally, several participants suggested more actively involving members of the public in RE/RI bodies to foster greater transparency and trust. Trust was also a key concern in discussions about citizen science. The main risk highlighted in this context was the lack of detailed RE/RI policies for citizen science, potential exploitation of citizen scientists by researchers, followed by concerns about quality of data and unacknowledged biases that could undermine the integrity of citizen science projects.



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# 5 Appendices

## Appendix 1. Questionnaire

**ONLINE RESPONSE FORM**

1) I have read and understood the information above and agree to take part in the survey for BEYOND project public consultation purposes.
   ☐ yes
   ☐ no

2) Which of the following best describes you?
   a. I am directly involved in research practice (e.g., as a researcher, PhD student, research manager, academic personnel, editor of a scientific journal etc.) (*go to Part I*)
   b. I am currently a student at a higher-educational institution (*go to Part II*)
   c. I am a member of the general public (I am neither directly involved in scientific research practice, nor a student at a higher-educational institution) (*go to Part III*)

**Part I – questions for respondents involved in the research practice**

1) Which best describes your main role in the research process?
   a. Junior researcher
   b. Senior researcher
   c. Research manager
   d. Research policymaker
   e. I work for a research funding organization
   f. I work for a scientific publisher
   g. I work for a research integrity office
   h. I am not involved in the research practice (*go to Part III*)
   i. I am a student at a higher-educational institution (*go to Part II*)
   j. Other _____

2) Which field of science are you (mostly) associated with?
   a. Social and behavioral sciences
   b. Arts and humanities
   c. Natural sciences and engineering
   d. Life sciences and medicine

3) In your view, how effective are the existing research ethics and research integrity policies in preventing research misconduct at your research institution?



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a. Very effective
b. Effective
c. Neutral
d. Ineffective
e. Very ineffective

***OPTIONAL*** Please, comment on the effectiveness of the existing research ethics and research integrity policies in preventing research misconduct at your research institution. _____

4) In your view, what are the most important consequences of research misconduct (e.g. plagiarism, falsification and fabrication of data) for society:
   a. Loss of public trust in science
   b. Misguided policies and decisions
   c. Wasted public resources
   d. Adverse impact on public health and safety
   e. Other (please specify) _____

***OPTIONAL*** Please, comment on the consequences of research misconduct for society _____

5) How common are research misconduct cases in your country?
   a. Very rare
   b. Occasional cases
   c. Moderately common
   d. Widespread issue
   e. I do not know

***OPTIONAL*** Please, comment on the prevalence of research misconduct in your country _____

6) How transparent should an investigation of research misconduct cases be? Information about the investigation process and results should be available:
   a. Only to the investigation committee
   b. To the scientific community/ scientists
   c. To the journalists, media and society
   d. Other (please specify) _____

***OPTIONAL*** Please, comment on the investigation of research misconduct cases _____



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7) Do you feel safe to express concerns on research ethics and research integrity or report suspected research misconduct in your research institution?
   a. Yes
   b. No
   c. I do not know

***OPTIONAL*** Please, comment on expressing concerns on research ethics and research integrity or reporting suspected research misconduct.
_____

8) In your view, how important are gender differences for building research ethics and research integrity culture, prevention of and reacting to research misconduct?
   a. Very important
   b. Important
   c. Neutral
   d. Not very important
   e. Not important at all

***OPTIONAL*** Please, comment on the importance of gender differences for building research ethics and research integrity culture, prevention of and reacting to research misconduct.
_____

9) In your view, are there risks of research misconduct in citizen science[4]?
   a. Yes
   b. No
   c. I do not know

***OPTIONAL*** Please, comment on research misconduct risks in the context of citizen science
_____

10) What are the best-practice examples of building research ethics and research integrity culture, prevention of and reacting to research misconduct in your organization or country?

[4] UNESCO defines citizen science as «[..] models of scientific research conducted by non-professional scientists, following scientifically valid methodologies and frequently carried out in association with formal, scientific programmes or with professional scientists with web-based platforms and social media, as well as open source hardware and software (especially low-cost sensors and mobile apps) as important agents of interaction.» *UNESCO Recommendation on Open Science (2021)*



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11) In your opinion, what are the most important gaps in the existing research ethics and research integrity policies in your organization or country?

12) How do you see the role of the general public and citizens in the promotion of research ethics and integrity and in prevention of research misconduct?

_____

**Part II – questions for students**

1) At what level are you currently studying at a higher-educational institution:
   a. I study for Bachelor's degree
   b. I study for Master's degree
   c. I study for higher professional qualification
   d. I study for doctoral degree - PhD studies (*go to Part II*)
   e. none of above (*go to Part I*)

2) What is your field of study?
   a. Social and behavioral sciences
   b. Arts and humanities
   c. Natural sciences and engineering
   d. Life sciences and medicine

3) In your view, how effective are the existing research ethics and research integrity policies in preventing research misconduct at your institution?
   a. Very effective
   b. Effective
   c. Neutral
   d. Ineffective
   e. Very ineffective

***OPTIONAL*** Please, comment on the effectiveness of the existing research ethics and research integrity policies in preventing research misconduct at your higher-educational institution.

_____

4) In your view, what are the most important consequences of research misconduct (e.g. plagiarism, falsification and fabrication of data) for society:
   a. Loss of public trust in science



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b. Misguided policies and decisions
c. Wasted public resources
d. Adverse impact on public health and safety
e. Other (please specify) _____

***OPTIONAL*** Please, comment on the consequences of research misconduct for society _____

5) How common are research misconduct cases in your country?
   a. Very rare
   b. Occasional cases
   c. Moderately common
   d. Widespread issue
   e. I do not know

***OPTIONAL*** Please, comment on the prevalence of research misconduct in your country _____

6) How transparent should an investigation of research misconduct cases be? Information about the investigation process and results should be available:
   a. Only to the investigation committee
   b. To the scientific community/ scientists
   c. To the journalists, media and society
   d. Other (please specify) _____

***OPTIONAL*** Please, comment on the transparency and other aspects of investigation of research misconduct cases _____

7) Do you feel safe to express concerns on research ethics and research integrity or report suspected research misconduct at your university, college etc.?
   a. Yes
   b. No
   c. Other (please specify) _____

***OPTIONAL*** Please, comment on expressing concerns on research ethics and research integrity or reporting suspected research misconduct. _____

8) In your view, how important are gender differences for building research ethics and research integrity culture, prevention of and reacting to research misconduct?
   a. Very important



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b. Important
c. Neutral
d. Not very important
e. Not important at all

***OPTIONAL*** Please, comment on the importance of gender differences for building research ethics and research integrity culture, prevention of and reacting to research misconduct.

_____

9) In your view, are there risks of research misconduct in citizen science[5]?
   d. Yes
   e. No
   f. I do not know

***OPTIONAL*** Please, comment on research misconduct risks in the context of citizen science

_____

10) In your opinion, what are the most important gaps in the existing research ethics and research integrity policies in your higher-educational institution and country?

_____

11) How do you see the role of students in the promotion of research ethics and integrity and in prevention of research misconduct?

_____

12) How do you see the role of the general public and citizens in the promotion of research ethics and integrity and in prevention of research misconduct?

_____

**Part III – questions for the general public**

1) In your view, what are the most important consequences of a following research misconduct case for society?

[5] UNESCO defines citizen science as «[..] models of scientific research conducted by non-professional scientists, following scientifically valid methodologies and frequently carried out in association with formal, scientific programmes or with professional scientists with web-based platforms and social media, as well as open source hardware and software (especially low-cost sensors and mobile apps) as important agents of interaction.» *UNESCO Recommendation on Open Science (2021)*



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*A researcher well-known for her research on cancer, has been exposed by a whistleblower for fabricating data in one of her published research studies, shattering her reputation and casting doubt on her previous scientific contributions.*

a. Loss of public trust in science
b. Misguided policies and decisions
c. Wasted public resources
d. Adverse impact on public health and safety
e. There are no consequences for society
f. Other (please specify) _____

***OPTIONAL*** Please, comment on the consequences of this type of research misconduct for society

---

2) In your view, what are the most important consequences of a following research misconduct case for society?

*A public health researcher has come under media scrutiny after it was revealed that he had undisclosed financial ties to the tobacco industry. The journalists have proved that his work is biased, potentially trying to influence the public's perception of the risks associated with smoking.*

a. Loss of public trust in science
b. Misguided policies and decisions
c. Wasted public resources
d. Adverse impact on public health and safety
e. There are no consequences for society
f. Other (please specify) _____

***OPTIONAL*** Please, comment on the consequences of this type of research misconduct for society

---

3) In your view, what are the most important consequences of a following research misconduct case for society?

*A prominent politician has faced a serious controversy when it was revealed that significant portions of his doctoral thesis written 5 years ago were plagiarized from various sources. The discovery led to an academic investigation and concerns raised about the politician's integrity, casting a shadow over his political career.*

a. Loss of public trust in science
b. Misguided policies and decisions
c. Wasted public resources
d. Adverse impact on public health and safety
e. There are no consequences for society



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f. Other (please specify) _____

***OPTIONAL*** Please, comment on the consequences of this type of research misconduct for society

---

4) How common are research misconduct cases in your country?
   a. Extremely rare
   b. Occasional occurrence
   c. Somewhat common
   d. Widespread
   e. I do not know

***OPTIONAL*** Please, comment on the prevalence of research misconduct in your country _____

5) How transparent should an investigation of research misconduct cases be? Information about the investigation process and results should be available:
   a. Only to the investigation committee
   b. To the scientific community/ scientists
   c. To the journalists, media and society
   d. Other (please specify) _____

***OPTIONAL*** Please, comment on the investigation of research misconduct cases _____

6) Have you ever participated in citizen science[6] activities?
   a. Yes
   b. No
   c. I do not know

7) In your view, are there risks of research misconduct in citizen science?
   a. Yes

[6] UNESCO defines citizen science as «[..] models of scientific research conducted by non-professional scientists, following scientifically valid methodologies and frequently carried out in association with formal, scientific programmes or with professional scientists with web-based platforms and social media, as well as open source hardware and software (especially low-cost sensors and mobile apps) as important agents of interaction.» *UNESCO Recommendation on Open Science (2021)*



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b. No
c. I do not know

***OPTIONAL*** Please, comment on research misconduct risks in the context of citizen science

_____

8) How do you see the role of the general public and citizens in the promotion of research ethics and integrity and in prevention of research misconduct?

_____

**Demographic questions (for all):**

1) What is your gender?

a. Female

b. Male

c. Other

d. Do not wish to disclose

2) What is your country of residence?

Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Iceland, Liechtenstein, Norway

3) What is your age group?

a. 18-24

b. 25-34

c. 35-44

d. 45-54

e. 55-64



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f. 65-74

g. 75+



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## Appendix 2. List of interview participants

| Code | Interviewee | Gender | Group |
|---|---|---|---|
| 1_G2 | Epistemic activist | M | Journalists, social media activists |
| 2_G1 | Representatives of NGO working on fertility and reproductive health (three participants) | F<br>F<br>F | CSOs, NGOs,<br>networks |
| 3_G1 | Representative of reproducibility network | M | CSOs, NGOs,<br>networks |
| 4_G1 | Representative of climate NGO | F | CSOs, NGOs,<br>networks |
| 5_G1 | Representative of a consumer NGO | F | CSOs, NGOs,<br>networks |
| 6_G3 | Representative of a research funding organization | M | Research policy makers and advisory bodies |
| 7_G2 | Epistemic activist | M | Journalists, social media<br>activists |
| 8_G3 | Representative of an advisory body focusing on AI | M | Research policy makers and advisory bodies |
| 9_G1 | Institutional policy maker | F | Research policy makers and advisory bodies |



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| | | | |
|---|---|---|---|
| 10_G1 | Representative of a reproducibility network | M | CSOs, NGOs, networks |
| 11_G1 | Representative of a reproducibility network | M | CSOs, NGOs, networks |
| 12_G3 | Representative of a policy-making/advisory body | F | Research policy makers and advisory bodies |
| 13_G1 | Representative of a reproducibility network | M | CSOs, NGOs, networks |
| 14_G2 | Epistemic activist | M | Journalists, social media activists |
| 15_G1 | Representative of NGO focusing on clinical trial data transparency | M | CSOs, NGOs, networks |
| 16_G3 | Representative of a funding organization | F | Research policy makers and advisory bodies |
| 17_G3 | Representative of a policy-making/advisory body | M | Research policy makers and advisory bodies |
| 18_G4 | Representative of industry association | F | Industry |
| 19_G1 | Representative of a reproducibility network | F | CSOs, NGOs, Networks |
| 20_G1 | Representative of citizen science NGO | F | CSOs, NGOs, Networks |
| 21_G1 | Representative of animal rights NGO | F | CSOs, NGOs, |



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| | | | |
|---|---|---|---|
| | | | networks |
| 22_G1 | Representative of citizen science NGO | F | CSOs, NGOs, networks |
| 23_G3 | Institutional policy maker | F | Research policy makers and advisory bodies |
| 24_G1 | Representative of a patient NGO | F | CSOs, NGOs, networks |
| 25_G3 | Representative of a policy-making/advisory body | F | Research policy makers and advisory bodies |
| 26_G2 | Science journalist | M | Journalists, social media activists |
| 27_G4 | Representative of XR industry | F | Industry |
| 28_G4 | Representative of XR industry | M | Industry |
| 29_G3 | Representative of a research funding organization | F | Research policy makers and advisory bodies |
| 30_G1 | Representative of a researchers' network | M | CSOs, NGOs, networks |
| 31_G3 | Representative of a policy-making body/ scientific publishing industry | F | Research policy makers and advisory bodies |



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## Appendix 3. Quotes

In this section, the most significant quotations from both the interviews and the survey free text responses are listed based on the topic. The quotations provide additional insight into the argumentation and the experiences of the public consultation participants that foster further understanding of the factors impacting RE/RI and perception of research misconduct.

### Appendix 3.1. Free text answers from survey participants

***Effectiveness - RE/RI policies***

*"My organization has good policy in place but not checking compliance with it effectively. Implementation mechanisms are disperse and responsibilities unclear."*

*"The existence of proper and relevant policies, or a code and some law regulations do not prevent the unethical behaviours if they are not introduced and discussed with a research team or the organisation employees."*

*"Even professors who teach research ethics and research integrity show breaches in their own research groups, these mainly pertain to ghost authorship, discouraging junior researchers to find and work with collaborators with more expertise, being insufficiently involved in the research design, refusing to determine authorship of involved researchers before the start of a project, turning a blind eye when master students do not sufficiently meet research integrity standards, etc. From these breaches I conclude that it is too easy for (senior) researchers and supervisors of PhD students to circumvent the guidelines, thereby questioning their effectiveness."*

*"More focus on research ethics as laws and regulations, less focus on research ethics as an integral part of research quality."*

*"The policies and practices are almost entirely an honour system. There is no auditing or report checking. The system relies on researcher honesty."*

*"Effective measures are those that are also supported and enforced by the university management."*

*"Nothing happens since those in power don't seem to care or suffer any consequences for their misconduct."*

*"The guidelines are correctly established. The question is only about how seriously they are taken into account."*

*"They [policies] are fine, but they are not practiced. It is impossible for co-authors of published articles to comply with the Vancouver guidelines. Too much is published, and the quality of studies declines."*

*"Such guidelines exist, but not everyone is familiar with them. "*



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*"Firstly, the existence of such policies is noteworthy. Secondly, we ENFORCE the policies through training sessions and use in-house anonymized case studies to convey take-home messages of non-compliance, research misconduct and questionable research practices."*

*"In my opinion, they* [policies] *are correctly developed. However, their practical implementation could be better. Moreover, not all employees/students are aware of the content of the guidelines or where to find them. I assume that there are also research ethics violations that are not addressed, thus not included in statistics."*

*"In major emblematic cases, there is an absence of consequences after proven breaches of scientific integrity."*

*"They* [policies] *are merely recommendations. Even if misconduct can be proved, there is no higher authority or board to turn to in case no action follows."*

*"The existence of rules undoubtedly contributes to informing and raising awareness about the importance of ethics and integrity, but the extent to which these rules also impact the prevention of misconduct is largely unknown. The deterrent effect is likely to be very limited."*

*"A problem is that persons higher in hierarchy don't necessarily know the guidelines or think they are not valid for them. But when a problem is brought up, things can be solved based on the existing regulations. However, there is sometimes room for interpretation of the guidelines and a big problem are the unspoken/informal ways of retaliation in research. So people might not dare to speak up even though we have regulations."*

*"It is difficult to assess* [effectiveness] *because there is no information about their compliance. Compliance with the principles largely depends on trust that scientists adhere to them. There is little explanation and written agreements specifying how to adhere to these principles. Most likely, most scientists believe they adhere to these principles, even though everyone acts in their own way."*

*"They* [policies] *exist, but there is not enough precise, unambiguous information (explanation) about the procedures that researchers should follow in various research cases."*

*"There is too little focus on those researchers who determine what kind of research integrity culture that exist in a work place; i.e. the senior researchers."*

*"It's part of each and especially the supervisor's professional culture. I left my previous job because I did not support the disregard of specific norms."*

*"People mostly follow the established traditions of the institution or their direct supervisor."*

*"There is no repeated training for permanent faculty, but I think researchers and lab personnel should be made to go through training every 5 years."*

*"Active Senior leadership support is essential."*



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*"It also depends on the type of research - clinical trials are much better regulated than lab research."*

*"There is a misconception, or lack of insight into the history of REC versus research ethics that concerns the humanities and social sciences (in Norway guided by NESH, see www.etikkom.no). In short, the critical analysis of present society by the humanities and social sciences seems to be undermined by the new responsibilities for ethics. [..] When medical ethics and research ethics concerning the humanities and social sciences are mixed up, the voice of vulnerable individuals, groups and peoples are not supported or protected, but paternalistically marginalised. To ensure that this is not the case, Universities and Uni Colleges need to be well enough trained in research ethics to not only know, but also understand the difference in risks and purposes of research that is conducted within or outside of the Norwegian health regulation."*

*"I am an anthropologist, and it is important to emphasise this when discussing research ethics. Considering that our field of research is very unpredictable and lengthy (starting with the fact that we live with our research participants for extended periods of time (a year or more), and we also return to them, not working with rigid hypotheses, but changing them according to where our research participants lead us, and finally, anything can happen in the research field), it is actually impossible to include everything in research ethics guidelines. It is important for anthropologists to have separate guidelines that try to make them as flexible as possible and close to practice, but even at my university, separate guidelines for anthropologists were only introduced in the first two years. Before that, we had to adhere to general guidelines that did not cover half of the specifics of our field. Another problem we are constantly facing is that research ethics guidelines, especially forms of consent from research participants, are designed for university protection (against lawsuits, especially characteristic for US schools), rather than for the protection and defense of research participants. Research ethics guidelines that are adapted to anthropology should definitely exist, but at the same time, there should be much more emphasis on research ethics and its application in practice (all challenges, difficulties, inconsistencies) during studies. This is important because guidelines cannot cover all the complications that occur in the research field, so it is necessary to discuss them early, taking real case studies as a basis."*

***Consequences of research misconduct***

*"The biggest problem over recent years is the lack of trust people have in science, statistics and 'experts'. But this is a wider issue than just research ethics. It's a societal shift that is frightening."*

*"[..] deterioration of scientific literacy among citizens and the proliferation of misinformation."*

*"Society then loses its anchors based on facts/science and becomes adrift. No more substantiation for positions leads to arbitrariness and social instability. People who shout the loudest get their way regardless of the scientific basis for it."*



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*"Even though severe forms of misconduct are relatively rare, they have the biggest impact. Just think about the research that linked vaccines and autism. It was proven problematic at every level and yet it still steers many parents away from vaccines. Lack of trust in research leads people to discount scientific data and to refuse interventions that might be good for them."*

*"In my environment (Drug Regulation) people get hurt because of misconduct."*

*"Creation of a false body of knowledge that may lead to specific policies and decisions."*

*"In a changing public debate where complex societal issues need to be addressed to secure the future, where fake news and populism reign, there is a great need for a clear, reliable source of knowledge acquisition."*

*"The worst consequence to me is the fact that information that might be inaccurate will be seen as the truth (if the research misconduct is not discovered). This can not only have an adverse impact on public health and safety, but also on the way certain people and issues and seen and approached in society, which can have negative consequences."*

*"We're already at a point where trust in science is thin and still thinning, so each case of research or academic misconduct adds further evidence to that distrust."*

*"It's an ethical issue but also, and perhaps above all, an epistemological issue. Bad practices produce bad science. Bad science means imprecise, approximate, incomplete, even false knowledge. If we believe in false things, our decisions, even if they were most rational (which is not always the case), would be condemned to be wrong and ineffective."*

*"If we base our actions on a mistaken or too partial understanding of reality, our actions will not have the expected consequences."*

*"Research relies on volunteers. Without volunteers, there is no research. Why would anyone volunteer to serve in a capacity that they cannot trust."*

*"By violating data confidentiality, other participants in future research would be reluctant to participate if they know that their data could be leaked."*

*"Not only funds but also time and researchers' personal efforts could be wasted in case of research misconduct."*

*"Loss of trust from both society and fellow researchers."*

*"It also causes a lot of young academics to leave science."*

*"I believe both the loss of trust in science but also the implications in science are devastating. Citing works, their analysis, findings, and interpretations, is a crucial part of science. When we all rely on data that has been manipulated in some form, we will never be able to get to the 'truth' and understand an issue."*



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*“Obviously, it also diminishes the public's trust in research, as well as that of young future researchers (mainly students) who might view the process with cynicism or consider these practices as commonplace and permissible.”*

*“[..] mistraining of the next generation.”*

*“Ethical violations related to research results directly affect the future progress of science and the reproducibility and applicability of results. In this way, significant resources and time are wasted, which could be used to improve the quality of life and address problems in various ways (depending on the field of science).”*

*“ Also, it discourages junior researchers from applying for funding, it is demoralizing and gives a sense of arbitrariness about how grants are given. Loss of trust among researchers.”*

*“Challenges to research domains after data falsification scandals may have serious consequences [..] even insufficient research funding.”*

*“Society loses trust in science, significantly hindering the work of scientists (scientists who have not violated research ethics have to spend a lot of time and energy to regain this trust from the public). Additionally, damaged trust in a scientific field can lead to indirect negative consequences regarding funding for that scientific field.”*

***Consequences of research misconduct - vignettes (3)***

***Vignette 1***

*''The most important consequences are mainly personal in nature. His authority and credibility are seriously damaged. '*

*''Loss of confidence in politicians People can lose confidence in politicians and politics, which in extreme form can have negative effects on (confidence in) democracy''*

*''Taking into account that Latvian society in general already has little trust in science, such an ethical violation would further worsen the situation, undermining the reputation of scientists overall.''*

*''A great number of people may stop trusting official health advises, and thereby public health costs may grow unnecessary.''*

*''If people trust science and scientists, then by listening to a scientist who says that the risks of smoking are not significant, the number of smokers may increase, and the amount of cigarettes smoked by each smoker may increase.''*

*''Once again this erodes trust. In this way, studies lose their credibility. In addition, it will have an impact on decision-making and possibly on public health. However, I assume multiple studies are being looked at for this and not just this scientist's research.''*



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*''As a result, people can also lose confidence in scientific research on other research fronts and generally no longer care much about it and no longer let it guide their decisions.''*

*''due to misconduct, science is no longer taken seriously. There will be discussion about whether science is not just an opinion.''*

*''The main consequence is the dificulty to get volunteers for research and lost of developing knowledge and also funding.''*

***Vignette 2***

*''Loss of public trust in political decisions. The public will stop trust in any advices given by politicians.''*

*''Loss of trust in academic integrity of an institution. Questions regarding the academic integrity of the institution he graduated from'''*

*''How can one know if other scientists have obtained their degrees honestly?''*

*''An individual unethical case that has no consequences for the politician themselves. If it is not related to decision-making.''*

*''Loss of reputation. More likely, it affects the reputation of the politician himself, unless the relevant knowledge is required for his position (doctorate).''*

*''Loss of confidence in politics. Personally, I don't mind this as much, as long as the quotation is correct ;-)''*

*''I cannot weigh all the possible consequences, but if something is disclosed in the media, it usually brings a negative societal reaction overall to science.''*

***Vignette 3***

*''Fabricated research results can lead to incorrect treatment and endanger patient health and lives.''*

*''Very reprehensible, especially in medical research.''*

*''Both loss of trust and adverse consequences for public health and public safety. I can only choose 1 answer. Fabricating data, especially on such important topics, seriously affects confidence in science. Decisions are made, medicines are prescribed, etc. based on scientific research. Trust in science is therefore essential''*

*''This is very straightforward; researchers by definition are looking for truth, fight for true if they do not that the main principle of science doesn't apply to them anymore. And if your talk doesn't not correspond to your walk than the trust is gone. You can not built upon without trust. It was seen during COVID pandemia - opponents were those people who didn't have trust in researchers, not science. This is a shortcut for our brain, trust in science, but science is done by researchers, people have no trust in.''*



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*''Fabricating data will deliver false results that might compromise the provisions for the treatment of patients with cancer.''*

***Perceptions of prevalence of RM***

*"Only severe cases become known; little is known about the grey area."*

*"I have not information from media and University"*

*"Rare because of efficient check and reporting systems."*

*"This data is not provided at all, but seems to be proportional to others: politicians, priests"*

*"Providing more insight into what forms of scientific misconduct there are, how often it occurs, how recognition is possible and what is done about it in a scientific environment / how action is taken against it."*

*"I think you only hear about the big cases that make the news headlines (and potentially cases in your own surroundings), so it is difficult to know the number of cases."*

*"Again talking about clinical trials and clinical research, in most cases there are at least some irregularities, in some cases there are severe adverse events which are not reported/ published. However, regulatory agencies do not care if bigger pharmaceutical companies are involved."*

*"I do not know any official data regarding such offences in Cyprus, although I imagine they exist."*

*"We can't say for sure as numbers are rarely collected/published."*

*"Very rare cases are public. I don't know how many cases don't reach the public."*

*"It's an opinion, as data are scarce."*

*"Most of the cases are not publicly discussed or even hidden from public view. The results of investigations, evidence processes or, finally, the results of actions carried out, are not publicly known or available to a few people."*

*"While individual cases are more widely heard of, I assume that within universities and scientific institutes, more cases are internally addressed than are brought to the public's attention. The issue of academic integrity is not well known to the majority of the public."*

***Transparency of investigations***



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*"The general public should be informed as widely as possible so that society regains trust in both science and the investigative process itself, ensuring that the investigation process is essentially followed and that the violator is punished."*

*"I would like to separate: - in the investigation process - only those who need to know. Like any investigation process, it should be protected from too much publicity, which could negatively affect the work of the investigators. - results - for everyone."*

*"Media should talk about it more and louder. If only the involved parties or the scientific community know about it, the 'ordinary' student, for whom this information is also very relevant, disappears from the information field."*

*"I think transparency is key in rebuilding trust and maintaining it."*

*"If this information becomes public, it will only increase mistrust in science and research for the superficial reader or viewer."*

*"If this information becomes public, it will only increase mistrust in science and research for the superficial reader or viewer... Even in universities, implementing EU projects and simultaneously educating about academic integrity, it can be concluded that people do not realise the seriousness of their violation."*

*"Due to politics I feel most investigations are kept hush-hush"*

*"It depends on whether it concerns generalities or personal data. If it's about generalities, I'm fine with it being public, but if names are explicitly mentioned, then no."*

*"The cases I know were treated in close environment. Protection of organization interests and reputation was primary goal. If cases end up being leaked to media, repair work is priority. Merits of complains often left to second place."*

*"During the investigation process, I think that details should be available only to the investigating committee and to the involved scientists. However, the general procedure that is followed should be available to all."*

*"I would say investigation results and process should be public. But a strong system should be put in place to assure someone who has not been found guilty after the process can still continue his/her career without being penalized."*

*"Information about investigations should only reach the media/public once misconduct has been proven. Before that, the presumption of innocence applies."*

*"Finding a balance is difficult. In an ideal world, everything should be public. Unfortunately, in Italy, the news that someone is under investigation translates into a presumption of guilt in the newspapers and public opinion. The same could happen with investigations into cases of misconduct."*



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*"In principle, scientists from the respective specialty communities should also be informed. However, it is difficult to reach them without making it available to the entire public. The latter could also lead to damage to reputation, etc. I think, no perfect solution has been found for this yet."*

*"It would depend on the level of misconduct and the (initial) impact of the science/scientist on society. The bigger the impact, the more the information about it should be publicly available."*

*"Hard to say because balancing the presumption of innocence with public interest is justified and necessary. However, what can happen in research misconduct investigations is that the lack of transparency helps the one committing the misconduct, by allowing them to 'fix' data, publications as if nothing happened. It is perfectly fine to do this amicably as a result of, e.g., mediation, but it risks giving the impression that investigations focus on making misconduct cases go away rather than tackling the actual misconduct. This is detrimental all around."*

*"Of course, it also depends on the case, on who is involved. A single case of plagiarism is not worthy of media attention, but for example, the treatment of research subjects should be widely reported"*

*"There's a huge variety of cases and processes. They need to be tailored and proportionate to the problems/fraud uncovered and the ongoing risk."*

*"In general, I tend to lean towards the scientific community, although I believe that the broader society also has the right to know. If transparency were truly a strengthened practice, I believe it would yield fruits. Then, the broader society would see that even if there are bad apples in the scientific community, mechanisms have been developed to deal with it, and that does not necessarily mean that the entire industry is like that. However, I fear that both sides need to reach such a level of transparency and public trust."*

***Safe spaces for expressing RE/RI concerns***

*"I don't know where I could turn to on this issue."*

*"I don't know the correct process and path to solve this."*

*"I just started working recently and have not thought about it. However, since i'm only a junior I do not know how seriously I would be taken."*

*"There is a strong sense of threat when a procedure is reported, especially when it concerns senior researchers."*

*"Currently, I work in a good team. But overall, the situation in the entire institution could be better. I've had a negative experience in another institution. At that time, I was quite new to the scientific environment, and I didn't have much knowledge about my rights protection. The work environment*



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*from the management was toxic, so I didn't dare to speak up. The cases I started and discussed with the management turned out worse for me than for the management."*

*"One may not feel safe raising concerns about research ethics and integrity or reporting research misconduct because dishonest people use every dishonest defense available to them."*

*"The perceived balance of power complicates the situation."*

*"I have [reported], and it only caused me stress and no positive ways forward were given."*

*"It may be that my actions can harm me and my career."*

*"I am retired and can express my views. It's not the situation of most researchers."*

*"As a leader in the field I have the freedom to raise concerns immediately. However, as a junior researcher this would have been far more difficult."*

*"In my current role on the funding side yes, but in previous roles in academia I only reported when anonymous routes were available."*

*"I don't feel safe if ethical violations are committed by my direct supervisor."*

*"Of course, if you're not at the top, then you probably don't feel completely safe either, like you definitely can't..."*

*"I have no experience dealing with research misconduct, but given the treatment students suspected of plagiarism in exams have received in recent years, I don't feel confident that these processes and punishments (which occur before the cases have been dealt with) are either fair or just."*

*"My concern is that I would not want to express concerns if the concerns turned out to be wrong and if it became known to the researcher that it was I who had raised the concern. I would worry that in today's social media driven society I would be the one who would be negatively affected, not the one with dubious research practices."*

*"I do not feel safe putting forward critique of any sort. The academic discussions have changed dramatically during the last 25-30 years. From a fairly public and harsh climate in the 1980s and almost through the 1990s, the productive and interesting discussions have almost faded away. It mirrors the uncertainties in academic practices of today - regarding teaching, research founding, the new public management arrangement of governance in academia, the constant evaluation of productivity and so forth. It is as if no academic of today is appreciated for their knowledge and presence in academia. So - sure, to report misconduct might in itself be safe, but to initiate or be involved in a larger discussion locally is not safe - and if the latter is not safe, the former has limited long term value."*



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*"Having myself reported scientific misconduct, I believe that the responsible individuals in my institution are not attentive to protecting the whistleblower and are not in a hurry, even though careers are at stake."*

*"The opportunity to report violations anonymously should be strengthened."*

*"We have a safe, anonymous channel for reporting that is independently managed."*

*"In my current role on the funding side yes [I feel safe], but in previous roles in academia I only reported when anonymous routes were available."*

***Impact of gender differences***

*"The Retraction Watch leaderboard shows that among the 31 researchers with more than 30 retractions, nearly all are male https://retractionwatch.com/the-retraction-watch-leaderboard/"*

*"In general female researchers that I work with are more concerned about making mistakes, so they take more care and discuss it more often."*

*"Women compared to their male counterparts are less empowered and mostly belong to lower positions."*

*"In my experience, gender differences, i.e. being a young woman researcher or lecturer, plays a significant role. Women are more exposed to male dominant way of managing resources and position in the management. It is not acceptable. In countries where family background is rooted in orthodox culture, the issue is more visible. This should be dealt with more and effective measures in academia."*

*"In my opinion, as in almost any field, men are trusted more and for longer, their credibility is less questioned compared to women. The same applies to science; women are expected to be flawless in any field. The academic environment has traditionally protected, for example, men - academics who have sexual assault cases. Therefore, I have no illusions that the same would not happen with research ethics violations, especially if this person holds a high position, is a tenured professor with many publications, etc. - universities have policies, primarily trying to protect themselves."*

*"We live in a patriarchal society so there are obviously gender differences in reporting misconduct, dealing with misconduct, media and other promotion of misconduct etc."*

*"I believe the influence of gender differences are inherent in all organizations."*

*"Possibly there has been an overrepresentation of alpha males as offenders, but not exclusively."*

*"Male researchers are seen as more authoritative by the public, even when there are cases of misconduct. Similarly, within the scientific community, they enjoy more freedom (even to engage in harmful practices). Female researchers have to make more efforts to achieve the same positions and results. This unfair pressure could push them towards bad practices (a supposition not supported by facts). Transgender and gender non-conforming individuals remain invisible as in the rest of society."*



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*"I think that within academia it is easier to take a position as a man, and that women who commit misconduct could potentially be judged more seriously, and that women may have more incentive to commit misconduct due to their disadvantaged professional position within academia. However, I have no experience with this, this is purely speculative."*

*"As always, in interactions between a man and a woman or a non-binary or transgender person, the man is the main focus. I (as a woman) recently encountered an uncomfortable situation when I wanted to discuss ethics in class, to which the male lecturer responded very aggressively, making me and the other classmates feel uncomfortable."*

*"I do think there is more personal and professional risk to women, both in instances of misconduct and in instances of whistleblowing. There is also the additional risk of sexual harassment and misconduct."*

*"This is just an intuition, but I feel that all of the professors at our institute are male and most of the PhD students are not. The 'old white men' seem stuck in their ways and have power over us. I do think gender is a factor simply because they grew up academically in ta different time and value and communication styles that might by some be considered more feminine are hard to express."*

*"The decisive factor is certainly the power dynamics within the research group, which may be partly influenced by gender. Gender likely plays a role, but it's not the main factor."*

*"Gender related alertness may hinder or progress recognizing misconduct. Traditional oppressed-ones or good fellow-thinking may be more general among certain genders than others."*

*"In principle, I do not believe that gender differences are important in establishing a culture of research ethics and research integrity and in preventing and responding to research misconduct. However, I recognize that in many cases, gender differences do occur in various ways. I do not believe that it is appropriate for universities or research organizations to establish policies based on gender differences to establish research ethics or prevent research misconduct, but rather that it is important to ensure that there is no bias or discrimination based on gender."*

*"I am quite sure they play a role because power issues often play a role is research integrity related conflicts, and gender affects power. I do not know of any data indicating the magnitude of the effect, though. So my answer is essentially a guess only."*

*"I can imagine that power dynamics related to both gender, nationality/ethnicity and age can all play a role in research misconduct and reporting of research misconduct. The more power differences, the more difficult reporting can be."*

*"In my case, I think there are other mechanisms such as COI and open corruption."*

*" I would also add age or professional stages, especially due to imbalance in power relations."*



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*"I do not believe that gender differences contribute to the prevention of misconduct."*

*"Few, if any , studies have been conducted to look into this."*

*"In my opinion it is completely irrelevant. It would never even cross my mind. Misconduct is misconduct is misconduct. End of story. I do not have the statistics if it has any effect on the consequences. But if it did, then there are some more people, who need to be investigated and disciplined. Gender, sex or whatever is completely irrelevant, quality, ethics and other actual aspects of research are the only important factors."*

*"In all organizations with a strong hierarchical structure, and where prestige and power is at stake, those who succeed do so because someone let them succeed. So, yes, to a certain degree gender (not sex) matter, as gender do structure socialization and behavior. Though at the same time, if to succeed means plying the game of those running the game, the reproduction of power will be at play too. Overall, it is the plurality of viewpoints and critical thinking that is at stake, which is much broader than gender, and can be analyzed in therms of all social categories that is well and alive in society at large. And at the same time, academia do have good leaders too - despite the anti-intellectual drivers at play from societal stake holders that wants academia to be means, and not a vibrant fields on its own terms."*

***Citizen science***

*"The concept of citizen science is not yet completely clear to me: is this feasible? Do citizens have sufficient (scientific) knowledge and research capabilities?"*

*"Citizen scientists are not always embedded in regulatory and educational infrastructures that provide normative guidance to researchers."*

*"The risks of misconduct in citizen science exist, as in any other scientific approach. Every project should educate participants and have measures to control possible misconduct in an appropriate manner (e.g. photographic verification of observations, cross-checking or expert checking data from citizen scientists - all, if possible, or at least random sample to estimate the level of inaccuracy). It is also good to think carefully about motivation of every actor in the project (e.g. .not to motivate participants for quantity over quality of results or 'tempt' them by financial rewards if it could lead to questionable situations) and have some responsible person available to advice or help participants in doubt or ethical dilemma."*

*"Risks associated with being less familiar with research methodology, academic skills, what is permitted and what is not."*



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*"Of course. I have no guarantees whether discussions about research ethics even take place there. Whether it's talked about, if there are guidelines, or to a large extent, it might happen precisely because there are many grey areas."*

*"Knowledge of research ethical principles may be lacking."*

*"They have no training."*

*"They may be related to a lack of knowledge."*

*"People collecting data may not know how to handle confidential information."*

*""Expertise and knowledge seem to be less present, which leads to easier crossing of ethical boundaries. For example, testing something without permission from a committee, under the guise of 'acting responsibly.'"*

*"If it's citizen science, then of course, these people don't have the resources to adhere to guidelines as well."*

*"Well depends, most tools need some form of training or understanding at least to be applied."*

*"Yes, this could e.g. not using the research methods correctly (whether this is on purpose or not)."*

*"Citizens are not scientists. Some forms of misconducts can be done in good faith if the proper methods are not explained appropriately (this is a responsibility of the scientists but one cannot foresee all the cases). Also, citizens are equally as biased as scientists and might introduce biases even with the best intentions."*

*"I think any kind of research misconduct is harmful. Especially when lay people are involved at the receiving end, who are not trained to understand statistics."*

*"Ignorance of the rules often leads to (unintentional) misconduct. Therefore, it should also be a goal in the field of citizen science to educate about good scientific practices."*

*"Maybe awareness and thinking is less and mistakes are easier to make."*

*"The desire to participate can create motivation to falsify data. Or anonymity may create the temptation to provide false information as a joke."*

*"Yes, citizen science also has advantages for citizen researchers and can therefore generate conflicts of interests that lead to scientific misconduct. For example, research leaders could still falsify data."*

*"Power relation between the academic researcher and citizen scientists. The implications of the status and value of the work of the citizen scientists which is considered voluntary, less, and insignificant compared to other researchers. The current situation could be exploitative to them due to their ambiguous status and role."*



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*"There are risks of misconduct in all research, so of course also in research where citizens are involved. Though this is not an argument against citizen research. A question is, though, how research and academia is meant to be interrelated in citizen research. I do not propose something here, I just find it important that the relation is made transparent and a topic for reflection and discussion in such research."*

*"Citizen scientists are not always embedded in regulatory and educational infrastructures that provide normative guidance to researchers. In collaborations between citizen scientists and professional researchers, there might be a risk of marginalizing citizen scientists when it comes to acknowledging their work because there are few standard operating procedures researchers are aware of on how to do so."*

*"I have a tough view on citizen science in general, not because I consider it lower quality, but I consider it a way for researchers to avoid providing necessary credit and authorship."*

***Gaps in the existing RE/RI policies***

*"Lack of radicalism: there is a need for a big change. It's not enough to teach about the publish or perish culture. People who conduct research need to be evaluated differently (see Universiteit Utrecht). It's not enough to say that journals should also publish negative results. There should be an internal policy not to submit articles to journals that don't do this, regardless of the impact factor. This, of course, is risky; there could be negative consequences for prestigious universities financially. But it's a choice between money and the quality and integrity of research."*

*"There is still a focus on quantitative metrics for evaluations and access to funds."*

*"The pressure on performance and outcomes in science."*

*"Genuine consequences for research integrity breaches. Research ethics and integrity breaches cause genuine harm. Researchers and institutions should be held to account for that. Participants put their trust in researchers and there should be ramifications for breaching that trust. Funders put their faith in supporting research in the hope of improving people's lives. Breaching that trust with the public deserves sanctions, not just paying back funds and apologising. There should be a transparent auditing regime that reports publicly."*

*"[..] adopting new practices such as pre-registration and open science for accountability."*

*"Especially in the supervision of doctoral students, ultimately the opinion of the supervisors counts, and it still happens too often that dependency relationships are exploited. Misconduct in the context of supervision should therefore be investigated and punished more often."*

*"Lack of close follow up, identifying of gaps timely manner and taking corrective actions timely."*



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*"There is no audit, people are basically free to do what they want in research, no prevention of fraud or p-hacking practices."*

*"There is no accountability link and correction mechanism."*

*"Explanation of what research ethics and research integrity mean"*

*"With regards to the policies, I am not sure. But proper open communication is sometimes missing, and this can affect research ethics and research integrity as well."*

*"Research integrity allegations are often used to pursue other kinds of interests than a true concern for integrity. E.g., revenge and personal issues."*

*"Trust and transparency in the process."*

*"It is recorded in a system, but I miss conversations about it with colleagues."*

*"[..] much more emphasis should be placed on thorough ethics education, especially in anthropology, based on discussions of case studies, as there are many unpredictable factors in our field for which guidelines will never keep pace. Accordingly, the question is how much and to what extent we can stretch them, how much responsibility rests on the researcher's shoulders, on their moral standards, which cannot be captured in guidelines."*

*""There is no unified mechanism for introducing researchers to guidelines; there are various interpretations."*

*"[..] easily understandable process schemes for action in different situations (there are guidelines, normative documents, but there is a lack of information in the 'easy' language)."*

*"I miss readily accessible information available to people in research. For example, a simple website about what to do in case of integrity issues."*

*"[..] the way research methodology has replaced theoretical discussions and expectations to general knowledge in the area that is being analyzed. This is most obvious when qualitative methods are used. Method is described in detail, as if rigorous details about individual steps in the analysis is enough. Though first of all, interpretation of qualitative data, in particular narrative texts, presupposes knowledge in the area that is to be analyzed, and the areas of knowledge that is used to contextualize the interviews need to be argued for and explained. Thus ethics is not merely a question of method and transparency, it is also a method of knowledge, and how knowledge is included or excluded, put in the centre or marginalized, taken for granted or discussed and argued for. "*

*"Updating and clarifying policies regarding new developments, such as use of AI tools in research."*

*"I think clear regulations for use of AI in research is an important gap in research integrity policy and ethics."*



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*"I think my institution has strong ethics committees to guarantee the studies go well, it has very helpful and instructive research ethics and research integrity policies. However, whenever we would like to collaborate with researchers outside of EU, the institution does not have many clear policies/rules about these collaborations."*

*"There are few regulations specific enough to cover individual disciplines and there's room for interpretation."*

*"A gap with citizen science projects is that grass-roots organisations rarely have someone with expertise on this topics; and the process of applying to ethical committees is hindered and not clear. National bodies for research ethics should have clear protocols and processes adapted to those who do not come from research institutions, universities or hospitals in order to foster citizen participation in leading citizen science projects. Moreover, research ethics committees' members should have expertise in citizen science."*

*"Translating them to practice."*

*"Limited resources, especially people and time, to delve into these issues."*

*"The tendency to see research ethics as something additional to research activities, rather than an integrated part of conducting quality research."*

*"That institutions are sluggish, outdated, and traditional. They do not integrate guidelines, it takes far too long. There needs to be change agents as intermediaries between ethics and institutions."*

*"The most significant flaw could be that while everything looks good on paper, in practice, there's a lack of reminders, teaching, and perhaps insufficient implementation."*

*"There is a lack of funding to support the improvement of research ethics guidelines, ensuring procedures (lack of funding in science --> excessive workload for researchers --> lack of time to address various research-related issues)."*

**Best practice examples**

*"Established a research excellence framework built from societies such as the market research society, that enable teams to work independently but with guidance. Development of a research process to ensure the fundamental questions of design, methodology, and analysis are considered. Give teams a safe space, ro raise questions to assist their knowledge gaps."*

*"Researchers openly discussing mistakes among themselves."*



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*"I always find other academics who are also trying to improve the situation. For example, I teamed up with a bioethics expert to expose ethical issues in current clinical trials in a rare disease. However, so far, not much effect despite we sent the peer-reviewed publication on the matter to the relevant authorities and stakeholders."*

*"We give wide publicity to every case of research misconduct, identify violators and everyone who contributed to the violations, and hold annual nominations – 'Falsifier of the Year', 'Plagiarist of the Year', 'Accomplice to Deception' etc."*

*"Workshops discussing research integrity, ethics, and failure in a 'brave' space, so people feel it is OK to raise issues."*

*"In my opinion, there is quite a bit of thinking, communicating and training in our organization about scientific misconduct. I think this is important to create a culture where it is clear that people can acknowledge and talk about wrongdoing, but also that it can be detected. Our organization also has a system to curb scientific misconduct, through an investigative committee that investigates possible cases of misconduct."*

*"The case discussions are a good idea. It makes things a lot more concrete and they can show a real impact of misconduct. It also creates a safe space to ask questions related to good/bad practices and receive answers without judgments. The moderator should be someone external though not someone from the same department."*

*"There is good research practice in Estonia, which is approved in many research institutions. Many universities have research ethics advisers and a system of ethics committees has been built."*

*"Good research practice advisors, who have been working at a larger university for some time."*

*"The PhD candidates presented a joint complaint with proposals for solutions to their conditions to the permanent staff. The permanent staff received this in a very good way. I know that this is not the case everywhere, but I believe that we need to talk openly about this. If we don't talk openly about it, then we don't know about it and then we can't find ways to deal with it. We also have a public debate about this in Khrono, which is important."*

*"Implementation of mandatory training of senior researchers in research ethics and research integrity."*

*"Improved training programmes for researchers at all levels of seniority."*

*"All students have to participate in research integrity online education in the beginning of their studies."*

*"Following ISO best practices for whistleblower management systems."*



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*"Open access publication and sharing not only the results of a study, but also the supplements about the research process and analysis of the data."*

*"Having access to an ethical representative is a clear indication that the organization takes ethics seriously and understands it can be a complex topic that should be discussed when needed. Also, as an employee when you know there will be no repercussions for negative results or refusing to work in a domain or project that is unethical in your opinion is very empowering and reduces the chances of research misconduct."*

*"I think the ongoing re-evaluation of the 'tellekantsystemet', the critique of how quantitative measurements (how many text have you produced), and prestige (impact factor) is important. Today researchers rarely read each others texts, research history is taken out of curriculums and replaced with 'present consensus in my fish pond', participation in lectures, and international travels for research collaboration have all been in decline this millennia. I could have answered differently, but stick with the theme of my answers through out this questionnaire. Fraud and misconduct is part of academic practice and culture - thus to me, best practice for building research ethics and integrity culture is closely related to building academic culture."*

*"Research ethics support (by experts in ethics) and scientific ombudspersons."*

*"Accessible clear policies, procedures and guidelines."*

*"Co-creation of research integrity code."*

*"Use of plagiarism control software before publishing, digital platforms to warn of a possible research misconduct, courses."*

*"Publications and reports on high-profile cases of research misconduct The movement 'ichbinhanna' which raised awareness on workplace culture in academia."*

***<u>Public involvement in RE/RI</u>***

*''The public should demand reliable information, but at the same time, they should also handle information critically. Dealing with information and the consequences of misinformation should be addressed in private settings and especially in schools.'''*

*''I don't think that is beneficial, as many people do not know what current codes of scientific research entail''*

*''The public needs to hold research to account and question research, however, this can only be done through education.''*

*''It can be decisive, but it requires training and a better understanding of scientific methods.''*



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*''The majority of the public is not familiar with basic principles of research. It could demand the rational use of research funds with accountability to the relevant institutions (e.g., IDEK).*

*''The public can do a lot, such as demanding accountability for cases of misconduct and malpractice. Unfortunately, in Italy, even in mainstream media, the narrative about scientific research does not provide the public with the appropriate tools to understand research methods and practices.''*

*''Only through education can awareness of this be raised''*

*''Critical thinking in society should be promoted and developed. An informed and interested society can make a significant contribution to the research process and its ethical control by monitoring funding usage, involved individuals (for example, whether one researcher can physically be the author of numerous scientific papers, raising questions about the quality of these results), and the obtained outcomes.''*

*''I think that first, there should be a broader discussion about what research ethics are and what the consequences are if they are violated. Because currently, part of society lacks understanding of the consequences. Part of society has normalized the idea that one can complete university studies if someone else writes their thesis. It should be ensured that society as a whole has zero tolerance for plagiarism or forgeries in academic papers and qualification works. Perhaps this awareness should start in schools, not necessarily by punishing cheating, but by making cheating impossible and explaining the consequences of cheating and plagiarism. So that students wouldn't feel it's normal to act unethically but would feel it's normal to advise their colleagues and report such cases.''*

*''[..] well in my opinion, they should be aware of their rights and how research should be applied ethically. Revolves around knowledge. Additionally, people should be careful who they trust with their overall health.''*

*''A greater understanding of how science works and how to evaluate research results should be basic knowledge for everyone. This way, poor or less qualitative research can be exposed and critically examined more quickly. This equips citizens against fake news & fake claims, but also allows for quicker correction of bad science or researchers.''*

*''I see it very important. By questioning the research integrity related topics the great public learns to demand high quality and morally relevant research.''*

*''Provide adequate oversight to ensure the integrity and transparency of researchers and the research community.''*

*''Asking critical questions; requesting clarification where needed.''*

*''The public should investigate the scientific basis for any new or controversial fact.''*



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*''I see it very important. By questioning the research integrity related topics the great public learns to demand high quality and morally relevant research.''*

*''The public should question more whether something is true instead of blindly following every hype.''*

*''Discuss the matter. Publicize good and bad practices in the medias.''*

*''I think a good example could be the Dr. Drew podcast, where various topics are often discussed, including violations of research ethics, as well as the latest Covid issues, etc. Mostly knowledgeable people participate - scientists, doctors, but even outsiders may find such information interesting because it serves as a kind of education about various processes. Society definitely should have access to some information about these processes, but promoting ethics may only be done by the state and established responsible commissions.''*

*''Society can express and argue its opinion, especially if it involves taxpayers' money.''*

*''Partnership. Research governance should integrate public debate''*

*''They can pressure politicians and fund those initiatives.''*

*''I think it's important to include general public in these discussions''*

*''They have a deterrent role in the sense that researchers may think twice before they engage in misconduct in fear of being hang out in media.''*

*''The public should acknowledge the importance of academic integrity, and then condemnation of violations by the public would be an effective tool.''*

*''Accountability- They will push scientists to be accountable for their research and results''*

*''Journalists and general public attitudes towards fraud and misconduct are the values in society that are sources for prevention.''*

*''Very often, the public appreciate and applaud scientific results and are distressed by the (occasional) misconduct cases that make the headlines. I feel that we could raise awareness of research integrity and RI practices so that they appreciate the mundane 'behind-the-scenes' things. This could help the public see both RI and research misconduct in context, and improve their trust. Additionally, positive reactions and affirmation from the public can be a great motivator for scientists to maintain RI.''*

*''Difficult question. I believe that scientists should be the experts and leading in that respect. However, their research and any resulting decisions also affect the general public. Openness and transparency therefore seem desirable to me. A lack of this causes a decrease in trust.''*

*''The general public needs to have trust in science again, and I believe that can only happen with transparency. Being able to show the data, all the notes every step of the process''*



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*"The public needs to be aware that when misconduct is identified, this is actually a sign of the scientific process working, so this should actually strengthen trust in science''*

*''I consider the role of the general public and citizens in promoting research ethics and integrity to be paramount."*

*''Awareness and developing a public moral compass is good for the next generation researchers, also that it becomes more easy to talk about and to signal it.''*

*''In general I think the Biotechnology in the European Public project (or rather program, with projects all over Europe) was right in their analysis of how to increase knowledge - it depends on whether or not the topic is part of public debate, in a way that also includes private discussions across the kitchen table. The 'literacy' strategy of science communication is well criticized, and the importance of arenas (digitale interactive pages, as well as off-line, for example the way museums have become agoras, stages for discussion, houses of literature and so forth). As I see the academic practice, in particular misconduct and fraud, as partially driven by society at large, we need to ensure a culture where knowledge, in a broad sense, is appreciated, where critical analysis of society and culture is encouraged and not ridiculed, and where we have talks about topics that is studies, not as debates, but as dialogues where we actually want to understand the other parties thoughts, arguments, experiences and feelings. Norway is in many ways the country of Habermas, though dialogue and discourse as Habermas approach it could be cultivated much more. So to me, the role of the general public and citizens is dual, to actually be involved in discussions on how ethics is fundamental for sustainable lives in general, that we are all co-responsible for ensuring a culture where this is upheld and cherished, and secondly to be involved with knowledge in ways so that knowledge is perceived as something to be respected, whether or not individual academics or fields of academics are subjugated to critique.''*

*''I feel that concerns in research misconduct is more perceived and understood by the research community and perhaps members of the the public could join investigative committees''*

*''Active participation or involvement of citizens in research projects''*

*''Lay panel members are important."*

*''In my opinion, any guidelines should also be developed from the perspective of the general public - potential participants in the research. If they participate in study X, what worries them, what is important to them? The opportunity to report violations anonymously should be strengthened.''*

*''If citizens for whatever reason obtain knowledge about possible misconduct, they should have easy access to whistleblowing tools. They might contribute, moreover, to a culture that values responsibility and integrity. I am not sure, though, if they play a big role in promotion and prevention as they are not usually directly involved in the research system.''*



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*"Journalists and other content creators have a duty to critically and adequately cite their sources."*

*"I don't think an ordinary resident without any experience or knowledge of research can address this issue. I don't think it's desirable either. I believe only researchers themselves should talk more about it."*

## Appendix 3.2. Quotes from interviews

***Effectiveness - Problems***

*"Each institution is basically dependent on itself to implement, in the way that institutions, organizations, universities implement or don't implement the regulations that we have. And this is why I think these regulations can be effective, but they are not always effective, particularly because of the lack of knowledge about them. So, if the institutions don't publish them, don't disseminate and don't discuss, the researchers will not really know what is the framework, except for the situations when they have to submit projects for funding, and in that case, of course, they will have to comply with ethical and integrity regulations. But that does not mean that those regulations will be effectively applied in everyday life of the researchers." / 19_G1*

*"We talk a lot within the community, but it's focusing mainly on policy solutions to this. So we're saying this is actually a political problem. It needs a political solution. It's not enough for professors to sit around in a circle and talk about best practices, you know. You also need sort of policy frameworks, you need laws, you need regulations, you need oversight, you need incentives, you need all those things." / 15_G1*

*"But I'm afraid that the work of such* [national level] *committees is almost formal. I can observe the situation in the Ministry of Health Care, because we are not allowed to publish our opinions or our outcomes or reports publicly. We are only allowed to send our opinions to the Minister or Office of the Minister, and this office will decide if the opinion or decision can be published. I have been a member of this committee for three years, and none of our opinions have been published, or are publicly available. It's a very disappointing situation." 16_G3*

*"I worked a lot in the past on the problems of non-disclosure of clinical trial data, and that's obviously a major issue. And there it's clear that the industry for a long time was pushing the results for being as secret as possible because they don't like that there's a lot of scrutiny. I experienced firsthand the amount of lobbying from the industry to prevent the EU from having very ambitious laws - like clinical trials regulation that mandates that, for example, all clinical study reports have to be published. They also lobby to the EMA because the EMA also tried to go beyond and have some proactive publication policy. So, they've always tried to limit this initiative as much as possible. [..] But just to say that, of course, the problems or consequences of not publishing clinical trial data are major. I mean, from the perspective of research, it's because you risk duplicating a lot of clinical trials unnecessarily,*



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*putting more patients at unnecessary risk. And, of course, once the medicines are approved, we need to know everything about the safety and efficacy, and the safety profile of the medicine. I mean, the doctors, patients. So, the consequences of not publishing this information for public health are serious." / 5_G1*

*''I mean, you could cut down the whole approval process, you could streamline it to just the three most important things, cut the workload 50% there, and then you do sample checks with the time that you freed up, you know. Or, you know, you study systematically whether any of this actually makes any difference whatsoever, you know. I guess you can't do that ethically, but it would be really interesting to just randomise people to either have to go through an ethics committee or not, and then see whether the studies are any different.'' / 15_G1*

***Solutions***

*''[..] there always seems to be like this sort of dynamic where, especially in academia, where the people in this area, they just sort of float off onto like, you know, a very ambitious level, and talk about how the perfect world could look like rather than just like looking for very small and simple things that could easily be fixed.'' / 15_G1*

*"Self-regulation and regulation is put in place, but if nobody actually monitors and supports its implementation, practically trains and informs people about what it means in practical terms and gives the tools to implement, then it makes no sense. To give you one example, we've done some work on the culture of care, on animal testing. We know that it's all good to actually provide this culture of care recommendations, but if you don't do regular training, if this is not part of the vision at the organizational level, if this is not part of objectives at the organizational level, this is not happening. So we should spend as much time in creating those policies as in deploying them in practice at the institutional level." / 18_G4*

*"In my role, I call myself a senior advisor to the rectorate. And my privilege is that I'm close both to the rectorate, but also very close to many of our researchers. And I'm warning the rectorate that we have to do things to make the university somehow a happier place. And asking for more happiness is not a question of weakness, I think. When we know what we want is that people are creative and come up with new ideas, and the new ideas are not coming up when you have a 16-hour day job. [..] So, we know where good ideas are coming from somehow, but I'm not sure if we are always preparing the right environment for this, even if we could. But I also think that when PhD candidates are pressured by the supervisors to publish more, the supervisors feel pressured by the leadership of the university to publish more because the ministry wants the university in their country to be in the ranking up to something." / 17_G3*



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*“[..] more and more papers, more and more submissions, more and more reviewers and reviews to be collected. Yeah, it's just too much. And then I'm asking myself... Actually, I was reading somewhere about what's the percentage rate that your published paper will be read by anyone? It's astonishingly low. So, we're publishing a lot that nobody reads in the end. It's ridiculous.” / 21_G1*

*''It's not like we are research integrity officers doing just this all the time. It's just a part of many other things that we are doing, to have a community. And for us, there are two critical communities, the PRBB group - so this is a share, and there are, these are the integrity officers, but a senior PI from each centre. So, we share in a confidential way cases that we might have, and we jointly organise activities for the whole community. We organise world cafes, we bring people to talk about, for example, authorship, supervision, and this really works well because we learn from each other. And at ENRIO, the same, so at the European level, to have a network in which sharing experiences, how other countries are working - this is something that raises awareness and generates knowledge among peers that can be applied in each centre afterwards. So it's a learning experience. It's a peer-to-peer learning experience, which is extremely useful.'' / 9_G1*

*''In 2014, they adopted this guidance status saying our clinical trial results should be made public. They put an announcement on their website. [..] They couldn't force anyone to do anything. They couldn't offer any financial incentives, which I think would have been great, actually - please upload your results, and we're going to give your research department 5000 euros, you know, compared to the cost of a trial that would have been marginal. They didn't do that. All they did was like send out email reminders and that already made a huge difference. And then you had some national regulators like in Germany and Austria going further where they also sent out their own email reminders. And then the European Medicines Agency, they put up training materials online. You know, so this is actually how you work our completely unworkable system.'' / 15_G1*

*''We kind of encourage before we put in the rules and we give the lead in time, we don't just go - okay, that's a rule now. So, with the research integrity we started by, in our annual progress reports that we sent out to teams with our funding, we said - in next year, you're going to be required, there's going to be a change in our terms and conditions where you have to undertake training. It is available through this national forum. It is available in your institution. If you need more information, here's the link and things like this. [..] And then the following year - so, as we said last year, now it's mandatory.''/ 29_G3*

*''For instance, if you lead a team, what do you value? Is the team, the performance of the team, or that the people are satisfied with the job? Or do they have the place to develop and grow? Or is it just that the team is performing? Yeah. And it's not just A or B. It's not just say that one is right and the other is wrong. But if you say in our department for us it's important that they don't say, oh, God, it's Monday, but oh, hey, it's Monday. I can go back to the office. I want to meet my colleagues. So it's an*



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*environment where I can flourish, so to say. I can grow. I can develop. I can speak up, whatever." / 17_G3*

*"At the same time, all the European regulations that you have about data management plans, for example. This is a very good example of a very good practice. At the beginning, senior researchers thought - this is a burden, another thing to do, another thing to prepare. Then when they start doing it, and they start to understand how they can influence the behaviour of the younger researchers in the lab, and how important it is to plan ahead, they understand that it is a guideline that will have a practical benefit for them. And so they engage. [..] When they understand, they endorse the issue, they endorse the guideline, they endorse the policy." / 19_G1*

*"And one of the problems that we identify is like, of course, and I guess any other funding organization, that it is a problem for female researchers, younger female researchers, that they tend to have a lot of parental leave and that can of course leave them behind. And that can be very, very stressful. So that is one thing we have focused very much on and we have done that by making a system where you can take your parental leave and multiply it by two and then the councils have to take that into account when they evaluate your production. So we have a system for that." / 6_G3*

*"[..] it has been a very interesting experience for researchers to have to write narrative CVs for funding in Portugal and other funding agencies who require narrative CVs. And so, you start having researchers thinking - am I a good researcher, by the way? If I don't have, if I don't include all my papers that I published in high impact factor journals, how am I going to prove that I'm a good researcher? And this has made them think about other contributions for the community." / 19_G1*

*"I know that in Cambridge – and of course, it's easier for them to do it because they are Cambridge, you know. But they changed from this kind of classical academic theory to a narrative theory, where a candidate really has to mention how he or she made an impact to the field. So that they are forced to read a real text and say - this is what I have achieved so far. This is how I contributed. This is what I did as a kind of an academic service to the community." 17_G3*

*"So, if we evaluate quality and impact more and quantity less, then I think we are a part of the solution to the problem, because we're then not rewarding that you publish a lot of bad science in bad journals. We are rewarding you if you publish good science in good journals. So that is a part of the solution to the problem." / 6_G3*

*"But then I would prefer an evaluation for scientists where you just try to look at other few products of the research. Which can be something that is not a publication. It could be like a data set or it could be like participation in a new program or new, yeah, something else that can be used by others. Or I don't know, according to the field, there are different kinds of research outputs." 14_G2*

*"In all these empirical sciences which dominate science, I would trust the paper much more if it shares data. And on a repository, not just with the statement - data will be available on request. That's*



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*actually for me a sign of untrustworthiness, but really that the data is somewhere and I can look at it, and I can redo the analysis with the code they provide.'' / 10_G1*

*''For example, at our university we have new positions that are responsible for open data, for management of open data, for access to the research data, and so on. [..] Data stewards, yes.'' / 16_G3*

*''In terms of incentives, I would really, really – it has not been implemented, but I would really like to see the scientific system in general rewarding papers, rewarding authors of papers for the reproducibility of the experiments. But in order to do that, you have to have money to reproduce and you have to have time to reproduce. '' / 19_G1*

*''How can you know how to be a good supervisor if you haven't been trained to be a good supervisor? I mean, when I was in the research office, we organised training, supervisor training, and lots of the younger researchers turned up, which was brilliant, but not the older ones. Because, well, as far as they were concerned, they knew how to do all of this. How dare you suggest that I'd need training? So, you know, it's always a problem to pull in the more established researchers.'' /12_G3*

*“I think the most important thing to build culture is when you provide the researchers with the opportunity to discuss practical issues and then to set the connection, the link between what they live in their real life and what is written in the policy documents. And I think this is the thing that I feel has worked better. It is bottom up. I have also tried to do it with seniors, with the leaders. Some of them are very open and they enjoy also participating in sessions of reflecting upon the ethics and integrity issues. With others it's more difficult. And so, I think the big challenge is not to get the researchers on board, it's to get the leaders on board.” .19_G1*

*“So, to have a more clear guidelines on what the consequences should be would help. That's one of the gaps, I think. And then, training is key for me, and a gap is how to reach, you know, the more senior people.” / 9_G1*

*''We are time to time asked by students: ''Please, I have this topic of my thesis, my experimental thesis, but I guess, from your courses on bioethics, that this is an ethical issue, that we need informed consent and so on, but my supervisor doesn't work with informed consent. What can I do?'' It was not very unusual, this situation. We usually said - please connect us with your supervisor. And in this way we can identify several research projects in which a supervisor was not aware about any basic responsibilities in the area of research ethics. But I am optimistic because the students are sensitive to this.'' / 16_G3*

*''We want to do it in a sustainable way. I really like the model of VIRT2UE where I can train trainers that sit in their own schools and they can do their logistics for their own things, depending on their own calendars.'' / 11_G1*



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***Causes of misconduct***

*''Well, the alternative would be that the institutions would do that, like in the state or in the funding agencies, but I don't see the necessary skills in these places to detect fraud. Like Elisabeth Bik, you have three people in the world I know that are able to do that. And I don't see my agency in France hiring her, which is bad. That's the way. Then the publishers, they should have a larger department of integrity, but they don't have. Whenever we had a talk with a representative from the publishers, they would say that they are doing the best they can, they are understaffed, there are so many reports and it's demanding so much effort that they are doing the best they can. '' / 7_G2*

*''But I've also seen, I mean, there are journals where, with authors that work for the industry, they disclose it now. I don't know, would you not allow them to publish? I don't know. I think at some point, one might say - well, people who work in the industry also have experience in developing medicine, in medical research, etc. I'm not sure if I would ban them completely from publishing, as long as, obviously, it's clearly disclosed that this person works for the industry.'' / 5_G1*

*''[..] we have calls out there, which, you know, let's be honest, have been decided already by the industry involved. And then everybody puts a lot of effort in, a lot of time to work on this. And, yeah, you see that actually the input, the effort that you're putting is not, yeah, it's not even useful. And this, I think it's a bit of a lie. I think it's a bit like lying to people because they already know who they want. So I'm like, either you just say like - look, we have this project - and you're very transparent about it. Like, OK, industry wants to focus on this project and they are looking for public partners who want to join. Why not? You know, like, but then you need to be honest. And maybe a lot of people will protest against that approach.'' 30_G1*

*"I think around 80% of the misconducts are related to authorship. And this is really, really linked to how we assess science and also about dynamics that are there for a very long time. And this we can only break through training the younger generation and the senior ones also, but that's a bit more difficult. Because I think some of the practices, people might not even be aware that it's not the proper way of going, related mostly to authorship. I mean, fraud, falsification and plagiarism, everybody knows that's not correct, but these are really extreme cases. So, I think competition is a big issue, and how we assess science and the indicators we use, it's really linked to it." 9_G3*

*"But I think the pressure is increasing around the world, and maybe Turkey is a good example, that there's something like 100 to 200 new universities every year in Turkey. You know, making new... It's becoming more accessible, people going to universities, people are going into graduate studies more. It's just more and more people who have to produce more because they need to try to stand out if they want to move up." 28_G4*



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*" Again, just as a practitioner, you engage in ethical reflection from time to time. It's almost unavoidable as a human, as a bearer of ethics, that I'm doing something to people. Now the issue is - because individuals are doing it, depending on the power, the decision making authority of that individual, you'll have people who are instructed to do things in their company that are against their ethics, but it's the job. You know, and then how do you disassociate yourself between what you're doing and what you'd like to be doing, what you think you should be doing." 28_G4*

***Problems - handling misconduct***

*'' I think they [sleuths] play a really important role. But I think we have to be careful as well that it isn't, you know, there's always unintended consequences with these things. People aren't, let's say in Pubpeer, abusing the platform to actually vilify somebody for reasons of their own, for personal reasons. And how do you stop that, I don't know. But I mean, generally speaking, I think that the data sleuths have risen, and have really made people more aware of the level of data manipulation that's been going on." / 12_G3*

*''So, we have less and less expert journalists in the market, because if you are expert enough, you are tempted to change jobs. You go into communication, you go into academia, you move where you find the suitable salary and the stability, which is less and less guaranteed in the media ecosystem. But the issue is that the risk that we are facing is that the only journalism that remains is the journalism that is not competent enough so that they will not realise what's going on until there is so such a big issue that they will end up shooting in a way without realising who's the enemy and who's the friend that needs to be protected and cherished against the enemy.'' / 26_G2*

*''And it took the medical establishment 10 years to realise that they had to retract that famous paper that had huge consequences for society. And we are still paying the price for that. And it was only after many, many years, it was clear that it was a fraud by Andrew Wakefield. But for many, many years, he was protected by the medical community in the UK against the allegations by the journalists. And so, it took a lot of courage and a lot of strong arms and strong shoulders for Brian Deer to resist until at the very end he was also commended by the medical community and thanked for his effort. So, this is a second huge example of why we need a strong, strong media.'' / 26_G2*

*''Because* [the media] *want to make a buzz, you know. So they want scandals, they want big scandals, they want all big scandals, but misconducts are small, let's say, borderline practices. It's too difficult to explain to the lay public that changing a statistical test is misconduct. So, they will not buzz or fuss about all misconduct practices.'' / 1_G2*

***Solutions - handling misconduct***



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*''So, they didn't find, the publishing industry, a way to combat tortured phrases. What they do is they ask me if they can use the list of 5000 fingerprints that I curate myself every day and I told them all yes, but I know that they will make money out of it afterwards. They only acknowledge it's coming from the PPS. I don't really mind because my main goal is not to make money, but to have the literature decontaminated. [..] Some people advise me to keep that secret or to start a company. And yeah, there is this kind of mindset as well. My mindset is that as an academic I'm paid by my government. I earn enough. I have success in my research. It's useful for the community, for society. So we need to have this open and everybody should be able to use it.'' / 7_G2*

*''Two steps could help to move the system, but they are not discussed at all in France. Publicise the investigation reports. I'm not telling all the reports, but at least an executive summary of two pages for each case or one page.'' / 1_G2*

*“[..] back to the issue of transparency in misconduct cases. That's very tricky, because, you know, everyone is innocent until proven guilty, but if their name suddenly appears in the papers before there's been an investigation or before the allegations have been proven true or false, you know, you can really vilify somebody in the media. So, releasing names before the conclusion of a case, I think, is a really bad idea. But if it's a serious misconduct, then I think the person's name probably should be released once it's proven. The difficulty, of course, with that is that if it's not contextualized for the public, you know, through print media, social media, etc. It can just seem then like all researchers are lying and fabricating and making things up.” / 12_G3*

*''I'm a translator by background. [..] I didn't know there were data integrity questions, because nobody is teaching us that. So, I think that, you know, the first step towards better engagement of society and better respect is better information and better communication. And I think that today that's at a zero level.''* / 18_G4

*''And I know just from my own experience when I tell people about some of the cases, they're really shocked. They want to believe that researchers are doing good etc. [..] So this is why I'd say it needs to be contextualised for them. But yes, I mean, I think that if the public, well, the public provides the funding through their taxes, so they have a right to expect that money to be well spent.'' / 12_G3*

*''But this is again I think a way to really make sure that everybody, yeah, we put everybody at the same level and independent if you're a professor or a patient, you have your experience and your expertise in the meeting. So, this is what I can say about the patient meeting.'' / 30_G1*

*'' And then in practice, because we organised quite a lot of, yeah, deliberation, let's say, spaces with different kinds of participants... So, it's always been important, especially to construct this consent form in a way that's understandable for everyone: different countries, with different educational levels. And also, to be able to understand why we're doing this, because we also have very different formats within our research. [..] Yeah, I think in general I can say a good practice is that we always*



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*have good communication with the research partners in our projects, and then we can together understand what needs to be done. And because often we are the ones that need to bring in the people, because of our network, because of our outreach, we bring the people that will take part in the deliberation too.'' 4_G1*

*"[..] the more critical cases should have serious consequences. If you alter the scientific record... I mean, science is based on trust. I mean, I make my hypothesis from what people previously have done, and the others will build on my research. This is kind of sacral. I mean, if this doesn't work, the full scientific enterprise fails. So if the misconduct really affects these foundations of science, consequences would be really big. I think it should be, you know, how do you say, to cut the contract with the... And also it should be public because you can do this at the organisation. I think NIH have their page, and it's public. So, it's true that people can change, but serious consequences should be, when proven, it should be proportional, but it should provide a really clear message. And not do research until you really have, I mean, to put several... You really need to be sure that this cannot happen again. And there needs to be serious consequences - like not supervising, stopping contracts, but also you need to be very careful on how this affects the people in the group. If this is a senior scientist, there might be people in the group that were not involved in that. And you can ruin also the careers of other people that did not participate and that's also tricky." 9_G3*

***PPI in research***

*''I think especially patient organisations need first to understand how the ecosystem works and they can advocate for transparency. Because especially when we use their data, their personal data, health records or whatever, they deserve transparency. And they deserve that science is communicated in the right way and they deserve also to know where their money is going, if they fund research and what's eventually going on.'' / 24_G1*

*''So, we have developed, in different projects, and I can send you eventually after this call a link, guidelines on how to properly do patient engagement, and also for the patients - how to report conflict of interest. So, as we know, for example, in the Paradigm project, a patient cannot be a consultant of the European medicine agency if they are in direct contact with industry. And I think these are some kind of principles, especially in the rare diseases and in the ultra-rare diseases, where you eventually have five or seven patients in whole Europe, something that they need to know before they are embarking on this very nice journey on patient engagement during medicines development.'' / 24_G1*

*''R1: Yeah, looking at the whole process. I'm just starting to think, have we ever been approached by a researcher at this early stage, the stage of designing the research? R2: No, it's usually that we are usually the last ones they contact.'' / 2_G1*



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*''But when you ask the patients, for them, what is the most pressing clinical symptom? It's not the seizures. Even if it's the prominent feature, it's not the seizures because the seizures can in some kind of way, even hardly be controlled. But it's the gastrointestinal problems. It's the sleeping problems they have 24-7.'' / 24_G1*

***Citizen science***

*''I really have the hope that citizen science in general is a methodology that could perhaps counteract this distrust that a lot of people feel. Just by making people more aware of how research actually works and how the experts actually come to their opinions and why they're called expert opinions and why they shouldn't be cast aside so easily as they are today in the society.'' / 20_G1*

*''So, in that sense it's also important to educate those people. So, to get more valid data and also maybe that people understand what they are doing and why they are doing it.'' / 23_G3*

*''We always have some photos, contact persons, for example, we explain what was the situation this year, and how many samples we got, and how they influence [it], and so on. And then the media is really interested in that.[..] We always have an event for the media every year when we publish the estimation. And also for the stakeholders. So, we try to explain it because it's quite a complicated model already.'' 23_G3*

*''When you start a project like this and you don't have experience, there will be a time when you're not treating your citizens equally. It's almost inevitable. [..] You have to be willing to sort of look in the mirror and say - well, I did not do that very well. I was wrong there. And that's not something scientists are generally known for, that they do this very well, this type of reflection. '' / 20_G1*

***AI in the context of RE/RI***

*''So, I think one way forward could be, as I mentioned, instead of asking reviewers to do a report, they might just annotate a PDF. As I said, you know, the AI points at the paper and says - here, there, there, there. We have questions. Can you answer it as an expert in the field? Does it look... Because the AI will become intelligent enough that it's going to be able to tell you if it thinks that there was another method that the person could have used to do that. So how about the AI writes all of this on an annotated PDF? And then you have two reviewers that just review all of these annotations and say - yes, no, maybe - and maybe additional comments if they want. And then at the end, they do have to put their name on the paper. So it's not like you can read it diagonally, have a fake report, and then you're done. And so we would know who has been reviewing the paper, and if they do a poor job over and over, then they lose reputation.'' /* 31_G3



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*''So at the moment, I'm positive because I'm planning to use artificial intelligence to try to help me in preparing my class, the questions for students or stuff like that. In terms of research, I don't have a clear idea. For sure it might help us in doing some job that before took us a lot of time and maybe produced a lot of errors. Then if people use it to falsify data, then, well, it might happen. [..] I want to see more positive aspects than negative ones.''* / 13_G1

*''[..] AI in itself is not a problem, it's just condensing all those different questions into one single box because then you've got one tool to interpret that. Let's say that you make an analysis of a lot of different doctors that have different ways of behaving with regards to their patients, showing that there is a trend between all those doctors is actually quite difficult because you don't have access to the reasoning mechanism of the doctors. If you have one single AI system that you can analyse, it's actually easier. So the AI itself is not problematic. It's rather that you finally have the tools to investigate what's happening and then afterwards you need to make a choice between what you want to do with that and how do you even categorise it, is it discriminatory or not.'' / 8_G3*

*''So, when you look at the regulatory requirements of developing medicines and the regulatory requirements for developing medical devices, they use different words for the same things. Now imagine that we need to work in the AI space altogether, and we are in the same messy situation of using different words for the same thing or calling with the same name completely different things. [..] And therefore, this dialogue I was talking about, it's really necessary. Today, we need to work more together and across disciplines in order to first get clarity, because integrity and compliance comes with clarity and understanding. '' / 18_G4*

*''So, for example, Chat-GPT generated articles or images generated by DALL-E. Nobody has a tool that detects that. Even OpenAI who created Chat-GPT, their tool is, I think, 60 percent accurate. So, this is not helpful. And there's a lot of controversy with people being accused of having generated text with Chat-GPT that then it's false.''* / 31_G3

*''Like there's always been a standard format. So why don't we just have an AI just write it? But then it needs to be validated by the researcher. You need to have the right citations. Then you would spend time on validating what has been written, but you wouldn't spend time on actually writing it in the first place. So for me, that aspect, I don't see as being that problematic.''* / 31_G3

*''It took a bit of time for them to understand the extent of the problem. Now they finally understood. But as you know, making a change for the way that the university works or the way that we teach and do the programs, everything from the exam next year is decided this year or the year before. It's already too late to do anything for this exam session, I'm telling you. I think it is already too late for the next exam session, so maybe we'll have some policy in place in two years or something like that.'' / 11_G1*



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*''Of course, one of the problems is that we can make rules if we want to, but it's very, very hard to enforce them because it's impossible to know whether people use these tools or not. So we have to think about how this changes the way applications work. I'm sure it will change a lot of things, but we don't really know yet. We have to collect some experience, I guess, and also have to talk to other funding institutions in Europe about their experiences.''/ 6_G3*

*"So I don't have a crystal ball, but as everything it has, I mean, it [AI] is a huge opportunity, but it carries many challenges. So it's important. We keep human control on understanding how it is, what does it do? And to be aware of the biases it might generate and the uses it can take. So it's a huge opportunity. Science is about change, so we will keep on adapting, but we need to make sure it does not go into, you know, one of the challenges is to make it ethical and equitable, you know, but for many of the issues." /9_G3*

*''When the tool itself is being developed, you definitely need some safeguards to protect it from abuse. An example would be that every time one of those large language models comes out, you can see specific protections for people who try to trick it into saying something, and if you don't really protect it, to begin with, then it will be an issue. The second aspect is definitely that there needs to be some documentation about - this is what the intent of the tool is. This is how to use it properly. And this is what it can be used for, or this is how it's safe and reliable. But at the same time, the users themselves should also be self-aware of how to do that. The best analogy to me is with cars. [..] So, it's, to me, a shared responsibility on different levels to make it safe.''/ 8_G3*

*''Okay, but I would say that's specifically what you need to do - keep the ethics committee that you have, because the work and the concept itself is actually very good. It's just that you need some AI experts on board that will help you understand exactly what's happening. So it's a little bit putting different skills around the table, because it's like when you're doing a regulation on AI, if you only have lawyers around the table, the AI developers will not be happy and they don't really know how to interpret that or implement it afterwards. If you only have AI developers, well, they don't know what the regulation is or what legal constraints are. So it needs different skills around the table. And if you want to do AI in medicine, you need hybrid profiles to be able to help you out with that.'' / 8_G3*

*''So, we had established a group, people from different fields, and we asked them to write, to propose to us* [ideas about] *how to write recommendations for universities. So, it will be done in English as well in some, in months, something like that. Because I already received it in email, so we will translate and we will publish and we will introduce it to all universities - how to correctly and ethically use artificial intelligence, guidelines for the future. So, I think it is very important as well to see in Europe, how it's going.'' / 25_G3*

*"And another thing is also, that's why we are working on these building blocks, where we see also our linear way of legislation is not aligned with these context-based technologies, where you need to think more in building blocks. And you, depending on what context you are in, you detach or attach certain*



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*aspects where at the center it's always human rights, right? That needs to be the core of it. But dependent, for instance, I walk around with the glasses on the street and I see a crime scene. Can policy and the police access the data that I just saw? Those are things where from a privacy perspective, it's not solved. There is no policy, no legislation for these things." / 27_G4*



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