



Join Us to Optimize Health Through Cohort Research

Factors Affecting Engagement and Uptake of RRI

Deliverable 2.3

Version 1.1

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Executive summary

In view of the pressing societal challenges we are facing, drastic changes are envisioned in the way in which scientific research is designed and conducted. New research methodologies are rapidly evolving, as research aspires to become more collaborative, inclusive, and interactive, more sensitive to societal expectations and concerns, and better equipped to effectively address urgent and complex societal needs. Within the European context, the Responsible Research and Innovation (RRI) concept was launched a decade ago. RRI experienced a pragmatic turn, putting concepts into practice, and JoinUs4Health aims to explore whether crowdsourcing offers concrete methodological opportunities to enable this trend towards inclusiveness and societal interaction in cohort studies. Rather than preparing society for what technoscientific innovation has in stall for us, the challenge of RRI is to tilt the perspective and establish in an interactive and co-constructive manner.

This Deliverable (D 2.3) is dedicated to identifying factors that affect engagement and uptake of RRI. Before zooming in on the experiences of the JoinUs4Health endeavour as such, we summarize experiences and results of previous Horizon 2020-funded projects in which we (partners from Erasmus University Rotterdam, leading Work Package 2) were actively involved. From the very onset, JoinUs4Health was seen as a learning process, a path participants follow together, sharing experiences with the aim of developing an approach in a co-constructive manner along the way, whilst learning from one another. The project aims to provide a concrete case study to explore how to implement RRI in cohort research, while at the same time contributing to reflections on how to make research more responsive, relevant, and trustworthy for society.

Some lessons learned: Making research responsive means slowing down, taking the time to reflect and learn from one another across projects. Ideally, for projects that aim to develop an RRI methodology, the design, and preparatory activities of RRI projects should be participatory and co-constructive as well, by engaging future users in the process. Also, since a new consortium assembles partners from various backgrounds, it is unlikely that there will be a common understanding of the scope and overall goal of an RRI project, shared by all from the very outset. Tensions may emerge for instance between participatory research as a mutual learning endeavour and the deficit model in public engagement. It is important to take time at the beginning of the project to make explicit all the assumptions held by each partner and consider how these assumptions influence project planning and execution. These assumptions and concepts should be revisited periodically. At the institutional level, drastically changing the way research is conducted and designed is a time-consuming process.

Recommendations for future projects:

- Co-create platforms with potential users from the beginning of the project and continue to do so iteratively throughout their project.
- Take time to create a common language and vision between project partners to ensure the manner in which the methodology is adapted realises the shared goals in the project consortium.
- Future projects are advised to embed their testing of the methodology into a structure of responsibility within institutions involved in the project, where stakeholders already embedded in knowledge-making within these institutions engage in mutual learning.
- Consortia must work on developing a common language and vision when it comes to the activities and goals of the project, seeing iterative reflections on the assumptions, goals and perspectives as an intrinsic dimension of the work.

Overall, the temporal dimension is an important factor in RRI. Most participants face time pressures. Academia is a competitive environment, focussed on quantifiable results, while RRI requires time for engagement and reflection. RRI requires us to slow down. Junior researchers work on temporary contracts and senior staff is faced with the necessity to combine work on RRI projects with a plethora of other tasks. This is not a “problem” requiring a “solution”, but rather a systemic challenge which must be addressed through mutual learning and reflections, informed by practice. RRI is neither a tool nor a method. RRI requires drastic changes in the way in which research is being conducted.

In recent years the focus in RRI discourse has shifted from conceptual work towards implementing RRI in research organisations. A tendency emerged to reduce RRI to a limited set of quantifiable indicators. Although quantifiable indicators may be meaningful to assess the impact of RRI initiatives, RRI should not be reduced to mere compliance. RRI is a basic attitude, and therefore more than the sum of its parts, emphasising how the various pillars are interrelated. To prevent that RRI becomes a bureaucratic endeavour, bent on quantifying quick wins, the focus should be on changing the research culture, the institutional ecosystem, making research as such more interactive and responsive. RRI should become a core dimension of organizing and conducting research. RRI can only be achieved if it becomes integrated in research and acquisition and is not seen as a separate task that can be outsourced or considered as optional.

Rather than disavowing the importance of scientific expertise, the concept of ubiquitous knowledge claims that, also for scientific experts, mutual learning is a more enriching experience than mere communication (“popularisation”) or implementation (“valorisation”) of research, whilst social participants learn more from active dialogue compared to more passive forms of public involvement. Mutual learning means that multiple forms of relevant expertise are taken into account and given the floor. The focus is not only on the expertise of experts, but even more so on our knowledge gaps: on the uncertainties, controversies, unknowns and blind spots involved in transformative innovation.

Acronyms

AIRR	Anticipation, Inclusion, Reflexivity, Responsiveness
D	Deliverable
EC	European Commission
MLE	Mutual Learning Exercise
NGO	Non-governmental organisation
QH	Quadruple Helix
RFO	Research Funding Organisation
RPO	Research Performing Organisation
RRI	Responsible Research and Innovation

1 Introduction

Triggered by the pressing societal challenges we are facing, drastic changes are envisioned in the way in which scientific research is designed and conducted. New research methodologies are rapidly evolving, as research aspires to become more collaborative, inclusive, and interactive, more sensitive to societal expectations and concerns, and better equipped to effectively address urgent and complex societal needs. Besides intense collaborations across research performing organisations (RPOs) and across disciplines and fields (interdisciplinarity), this involves interaction with society at various levels, not only during the implementation stage, but as an inherent dimension of the research trajectory as such (Stilgoe et al 2013; Zwart et al 2014 ; Blok & Von Schomberg 2023).

Within the European context, the Responsible Research and Innovation (RRI) concept was launched a decade ago as part of the *Science With and For Society* (SWAFS) programme. In principle, RRI has radical implications for the ways, in which research is conducted and for the future development of research methodologies. RRI is currently experiencing a pragmatic turn, putting concepts into practice, and JoinUs4Health aims to explore whether crowdsourcing offers concrete methodological opportunities to enable this trend towards inclusiveness and societal interaction in cohort studies. At the same time, however, besides addressing specific questions or challenges, RRI also entails the tendency to reflect and to zoom out, reflecting on methodological challenges while contributing to the development of a more comprehensive perspective against a broader timeline. RRI moves beyond addressing specific questions or challenges, offering a pathway for understanding such questions on a systemic level. Therefore, RRI fosters systems thinking, studying how challenges are interconnected, while identifying ways to effectively address them. Rather than preparing society for what technoscientific innovation has in stall for us, the challenge of RRI is to tilt the perspective and establish in an interactive and co-constructive manner what a worthwhile (rather than merely “acceptable”) technoscientific research and innovation program requires.

Although a dedicated *Science With and For Society* programme line for RRI in Horizon Europe no longer exists, a dedicated RRI research community emerged that engages with challenges such as *responsible* data governance, *responsible* AI, and *responsible* agro-ecology, focussing on the *implementation, institutionalization* and *management* of responsibility in research an innovation practices (Blok & Van Schomberg 2023). Against this backdrop, the focus has shifted from conceptual and experimental work to implementation and institutionalisation of RRI, and Joinus4health is part of this movement.

The overall aim of the JoinUs4Health project is to combine RRI and crowdsourcing as converging approaches to promote inclusive innovation and citizen engagement in cohort research. As will be explained in more detail below, RRI is an evolving signifier and has been adopted in varied ways in research and policy contexts: as a comprehensive vision on the relationship between science and society (Von Schomberg, 2013); a set of pre-determined issues to be integrated into policy actions (also called the RRI keys; Macq et al. 2020); as a participatory process aimed to foster responsive research (Stilgoe 2013); or an institutional-level process of organizational learning (Egeland et al., 2019). In this deliverable we will notably pay attention to two of these RRI conceptualisations, namely RRI conceived as keys EU policy pillars (focussed on quantifiable results) and the AIRR or process dimension (focussed on the quality of the participatory process). The objective of Deliverable (D) 2.3 is to assess and reflect on our experiences, against the backdrop of a series of efforts funded by the European Commission (EC) to make research more participatory and responsive to societal values and concern. Therefore, besides reflecting on experiences within the JoinUs4Health project as such, we will also include experiences from other RRI projects in our

analyses, notably projects we ourselves were directly involved in, so that these reflections are not only informed by desk research but also by practical experience.

Therefore, before zooming in on the experiences of the JoinUs4Health endeavour as such, we will first summarize experiences and results of previous Horizon 2020-funded projects as part of the EU's funding programme for research and innovation, in which we (partners from Erasmus University Rotterdam, leading Work Package 2) were actively involved:

- Responsible Research and Innovation in Practice (RRI PRACTICE)¹: 09/2016 – 08/2019
- Responsible Research and Innovation Networked Globally (RRING)²: 05/2018 – 04/2021
- Grounding RRI practices in research performing organisations (GRRIP)³: 01/2019 – 12/2022.

All three projects aimed at fostering the uptake of the RRI approach in research practices. Subsequently, we will zoom out again, to reflect on our experiences from a broader perspective, linking them to key challenges of RRI as a collective endeavour, notably focussing on the key challenge of epistemic inclusion.

¹ [Responsible Research and Innovation in Practice | RRI-Practice | Project | Fact sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)

² [Responsible Research and Innovation Networked Globally | RRING | Project | Fact sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)

³ [Grounding RRI practices in research performing organisations | GRRIP | Project | Fact sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#)

2 Previous engagement in RRI project: lessons learned

2.1 RRI Practice

The key objective of the RRI-Practice project ([RRI-Practice - Official Website](#)) was to understand the barriers and drivers to the successful implementation of RRI. Also, RRI Practice aimed to promote reflection on organisational structures and cultures of RPOs and Research Funding Organisations (RFOs) to identify and support best practices to facilitate the uptake of RRI in organisations and research programs, based on 12 case studies conducted in the context of the project. The project resulted in a series of recommendations to the EC to foster RRI uptake in different kinds of organisations and national cultures, in Europe but also worldwide. The project also developed a handbook offering guidance to RPOs and RFOs. The activities conducted in the context of this project focussed on bringing together communities and expanding agendas of research. The project focussed on the institutional challenges of RRI and the institutional tension encountered in the practice of doing RRI.⁴

Table 1. Two approaches to RRI: overview of key terms

RRI Key Pillars (measurable indicators)	AIRR (Process dimension)
Ethics	Anticipation
Science Education	Inclusion
Gender Equality	Reflexivity
Open Access	Responsiveness
Public Engagement	

Although the RRI key pillars and the AIRR dimensions were seen by participants in the project as different, they were not seen as being in conflict. Participants who conceived RRI primarily in terms of the keys saw the AIRR dimensions as supporting, expanding the keys into a bigger picture, and connecting them into a more cohesive conception of responsible research. At the same time, in discussions with policy makers and research managers, the AIRR dimensions were often seen as too abstract while the key made it easier to explain the added value of RRI for organisations (p. 5, this document). One important finding of RRI Practice was that successful implementation of RRI required structural institutional change. Some lessons learned:

- Structural change was seen as a particularly difficult objective in research practices and research organisation with little experience in working with RRI. In contrast, practices, and organisations where RRI had already gained a foothold were generally more responsive to further RRI implementation. In short, structural change is hardest to bring about where it is most needed (p. 6).
- In research areas with little RRI experience, transformative change involves a slow and contested process, requiring more time and collective effort than can be realised in RRI projects, which usually run for three years (p. 6).

⁴ Source: RRI Practice Deliverable 16.3: RRI Practice Internal RRI Review

- A similar experience applies to strategies of inclusion. This requires a more inclusive and diverse input from societal actors already during the design of the project, making room for participatory experiments (p. 10). -
- RRI projects require mechanisms to integrate reflexivity in all stages of the research.
- A major lesson for RFOs is that if they require projects to follow an RRI methodology, this requires dedicated resources for reflection, flexibility and co-design.
- RPOs and RFOs should identify and revise reward structures that are (perhaps unwittingly) at odds with doing RRI. Organisation should enable and support them to do RRI and stimulate researchers to structure their research according to RRI principles.

One of the key outcomes of RRI Practice was a *Handbook for Organisations Aimed at Strengthening Responsible Research and Innovation* (Wittrock & Forsberg 2019). According to the authors, RRI calls for inviting society into the research and innovation processes in order to align such processes and their outcomes with the values and needs of society. It calls for democratising research and innovation in the sense of broadening the scope of actors, acknowledging a diversity of scientific and value-related perspectives, and accepting that opening up means drawing on a broader range of capacities and competencies, increasing both the quality and impact of the research (p. 7). They emphasise that RRI is a response to current challenges such as mistrust of science, to some extent triggered by scandals related to research misconduct, but it may also involve questioning the quality and trustworthiness of research due to industrialised scientific production. RRI, according to the authors, aims to take such challenges seriously. In our summary we will highlight a number of recommendations for research institutions resulting from RRI Practice, but at the same time some provisional comments will be made and questions will be asked that will be taken up later on.

- Recommendation: decide on the **scale** of the implementation. Some RRI activities may not require mobilising the whole organisation. Some RRI activities may focus on specific RRI keys. Comment: although it may have practical benefits to focus on specific activities or a particular RRI key (e.g., fostering gender equality or public engagement activities), the question is whether this will result in structural changes in the longer term. Rather, RRI may require an ongoing interaction between specific activities and the need for structural change required to foster responsible research in the future.
- Recommendation: craft explicit **policies** for RRI. Comment: at the same time, to avoid RRI being a dead letter, staff and work floor involvement and support is important. Policies must be put into practice.
- Recommendation: provide RRI **incentives** both for individuals and for organisations. Comment: although incentives may encourage RRI, RRI may only work in the longer run if based on intrinsic motivation to contribute to responsible research.
- Recommendation: create **guidelines** to make RRI actionable for managers and employees. Comment: as the authors themselves already acknowledge, mere compliance with guidelines would not suffice, if only because compliance pressure on researchers is already quite substantial. In order to work, these guidelines should be informed by experience and practice and developed in an interactive manner, making use of actual experiences and dilemmas of the researchers involved.
- Recommendation: create daily **routines** supporting and facilitating the daily work. Comment: although this may have practical benefits, RRI is at the same time a learning process. RRI refers to a methodological attitude, rather than a protocol. This recommendation aligns better with the keys than with the AIRR process dimension.

- Recommendation: leverage internal and external **change processes**. Notably, organisational scandals concerning misconduct or harassment are mentioned as external triggers for change fostering internal reflection. Comment: institutional responses to scandals often entail top-down compliance (e.g., codes of conduct) but to address such issues convincing requires reflection and deliberation as an intrinsic dimension of the research ecosystem.
- Recommendation: work with your **external environment**. Collaboration with industry and societal stakeholders may drive RRI. Comment: although interactive and participatory approaches are crucial for RRI, some stakeholders may be more powerful than others while RRI also requires responsiveness to weaker signals and less powerful voices.
- Recommendation: create organisational **learning processes**. Comment: this is an important recommendation although RRI requires such learning processes to be participatory and mutual, informed by practice and the experiences of all researchers, staff members and societal stakeholders involved.
- Recommendation: create **pilot programs**. They have the potential of organisational learning. Comment: as mentioned in the document, although the recommendation is valid, the question will be how to transform pilot projects into best practices for organisational change.
- Recommendation: create a **coherent mix** of instruments and means. Comment: as mentioned in the document, RRI activities should not be an add on, but should become integrated in the modus operandi of research organisations.
- Recommendation: make use of **RRI champions**. Comment: although the recommendation is valid and individual initiatives can be a source of inspiration for others, in the long run RRI must be endorsed by at least significant parts of the broader organisation.

2.2 The RRING project

The overall project aim of the RRING project ([RRING Project – Responsible Research and Innovation Networked Globally \(RRING\)](#)) was to bring RRI into the linked up global world to promote mutual learning and collaboration in RRI. The project aspired to form a global RRING community network and by the development and mobilisation of a global Open Access RRI knowledge base. Core objectives were:

- Promote a linked up global world of RRI by creating the global RRING community network, thereby enabling mutual learning, collaboration and mobilisation of RRI concepts.
- Mobilise, promote and disseminate a global open access knowledge base of RRI based on the State of the Art (SoA) and comparative analysis across global regions
- Align RRI to the UN Sustainable Development Goals (SDGs) to provide a global common denominator for advancement of RRI, and address Grand Challenges globally.
- Determine the competitive advantages of RRI and also understand how and where RRI is perceived as a barrier and / or disadvantage.
- Create high level RRI strategy recommendations
- Promote inclusive engagement of civil society and researchers

The RRING project acknowledged that each region of the world is advancing its own agenda on responsible research. Therefore, RRING will not be producing a Global RRI framework or strategy that is meant to be enforced in a top-down manner. Rather, increased coherence and convergence should be achieved via a bottom-up approach, learning from best practices in RRI globally and from linkages, via the new RRING community, to develop the RRI linked-up world.

An important source for lessons learned is RRING D4.1: *Report on RRI Best Practices and Learning Opportunities*⁵. In this deliverable, it is explained that RRI is an evolving approach to research and innovation. Important current developments are referred to as a *pragmatic* turn (i.e., a shift of focus from developing concepts to developing tools and implementations) and a *global* turn (exploring opportunities for RRI from a global perspective, as well as identifying options for mutual learning). Klaassen et al (2017, 2019) argue that conceptual work on RRI is itself an innovative process and that a further conceptualisation of RRI must benefit from actually *practicing* RRI (“laying the path while walking it”). Researchers and their organisations should learn from experience, gradually adjusting their assumptions while trying out new behaviour. This also applies to learning RRI, which they see as a “collective experiment” (Klaassen et al 2019, p. 90). In a similar vein, Timmermans, Blok et al (2020) argue that the embedding of RRI in practice is still in process. The RRI community, they argue, is tasked with the dual objective of promoting RRI while at the same time trying to understand it. In order to make RRI into a practical reality, we need conceptual clarity and empirical evidence, but in order to gather empirical evidence, we have to presuppose that RRI already exists in practice. This apparent circularity, the authors argue, can be superseded by practicing RRI as a learning process, supported by learning methodologies, in their case the social labs methodology, embraces circularity as a key methodological principle. Whereas

⁵ <https://rring.eu/wp-content/uploads/2021/07/D4.1.pdf>

traditional research methodologies avoid circularity, RRI is practiced as an iterative learning process, developing the concept and methodology of RRI along the way.

RRI is not an easy objective to achieve. Various hurdles and barriers have been identified, both in RRING and in other projects. For instance, as stakeholder engagement can be quite demanding, how to actively involve societal partners as participants in the process? An important hurdle is the lack of sufficient practical reward for embracing RRI in a research culture based on competition and short-term contracts (Pain 2017). Today's academic research culture is not conducive to RRI, as competition, secrecy, temporary contracts and time pressure are unfavourable conditions for responsible research, while engaging in RRI is not sufficiently rewarded when research performance is assessed (Pain 2017). Various authors emphasise the detrimental role of publication pressure, with detrimental consequences, from burn-out up to questionable research practices and fraud (Fanelli 2009; Tjldink, Vergouwen & Smulders (2013); Elali & Rachid 2023). Thus, for RRI to work, internal (organisation) challenges must be addressed, affecting the way in which research is conducted (Forsberg 2018). RRI activities should not be seen as one-time events, but rather directed at developing relationships with societal environments. Also, transparent information about the objectives and challenges of RPOs is important. Finally, it must be clearly explained how the results of RRI, notably the engagement pillar (e.g., Quadruple Helix (QH) activities) will be used and integrated in the research process. It only works if there is a clear commitment to become more responsive and inclusive. It should be clear that RRI / QH activities are not cosmetic, but arise from a genuine concern to strengthen societal embedding of research.

As to the AIRR dimension of reflection, it is important that RRI researchers and consortia must practice what they preach. This entails mutual respect and sensitivity to plurality and diversity of research methods, research cultures and approaches, both between and within disciplines, as well as sensitivity to RRI key pillars such as gender and ethnicity. RRI requires mutual support, collegiality and the willingness to learn.

2.3 The GRRIP Project

The GRRIP project ([GRRIP Project – GROUNDING RRI PRACTICES IN RESEARCH PERFORMING ORGANISATIONS](#)) aimed to embed sustainable RRI practices in five organisations involved in marine and maritime research, through the development and evaluation of action plans for institutional and cultural change. Also, GRRIP aimed to establish and promote sustainable engagement with QH stakeholders and develop indicators for monitoring RRI, on the basis of a mutual learning approach, through series of mutual learning exercises (MLEs). Key experiences with implementing RRI are notably summarised in two deliverables, namely D4.4 (reflection and evaluation report for QH engagement) and D8.4 (mutual learning report: audit, design, implementation, evaluation).

According to D4.4, responsible research builds on the conviction that adopting an interactive, participatory and anticipatory approach is not only recommendable for deontological reasons (the democratization of research as an end in itself) but will also strengthen the external validity of research and societal uptake of research results, as it aims to make research more sensitive and responsive to societal values and concerns. This is especially relevant in marine research, since societal stakeholders in coastal areas tend to be very committed to issues such as sustainability and biodiversity.

In order to foster the relevance and external validity of research and to strengthen public trust in scientific expertise, GRRIP aims to support efforts to make research more participatory and inclusive. RPOs and societal actors (citizens, policy makers, companies, non-governmental organisations) should work together during the entire research process to better align its outcomes with the values, needs, concerns and expectations of society.

Ideally, RRI is not a top-down procedure, instigated by funding agencies, but a mutual learning endeavour. *Mutual Learning Exercises* (MLEs) bring together various groups of stakeholders (researchers, potential users, intermediaries, professionals, students, media, broader publics) to facilitate an interactive learning process, and to explore and exchange best practices through mutual exposure of views and experiences. The MLE approach entails a specific understanding of the role of expertise in the deliberative process. It moves away from the knowledge deficit model, where experts are expected to inform the public in a more or less one-directional manner, or where expert within the organisation inform and instruct colleagues within the organisation to engage in RRI. Rather, the starting point is that all participants are experts in the sense of representing important views and experiences concerning the societal and environmental impact of research.

GRRIP aimed to move away from a linear view on knowledge production (where societal stakeholders serve as recipients of new insights and findings via science communication) towards an interactive approach, where societal stakeholders become engaged in the knowledge production process from the very outset, not only as recipients of results, but as active contributors to agenda-setting and knowledge production, contributing to designing research in such a way that the knowledge is relevant for society and that trust in science is strengthened. This also means moving away from incidental forms of communications (report on websites, public lectures, etc.) to building long-term interactive relationships with societal stakeholders.

However, challenges are considerable and practicing RRI is not an easy objective to achieve. A number of challenges were listed as follows.

- In marine research, there is a long history of interaction with companies and commercial policy stakeholders who may act as funders of research. How to broaden the spectrum of involvement? There may be significant inequalities between

commercial and policy stakeholders (“established structures”) on the one hand and others, and there may be more intense collaborations with industry (as funders and co-designers of research) compared to the general public. Broadening the spectrum is important, not only to make research more open and democratic, but also because the practical and experiential knowledge of stakeholders to strengthen the external validity of research is of value. At the same time, this will raise awareness concerning science, not only about research results, but also concerning the research process, e.g., in the sense that research takes time, while societal actors often want or need results as soon as possible, or in the sense that many uncertainties are involved while societal stakeholders expect unambiguous results.

- Management of the relationships with stakeholders is important. RRI, notably QH engagement, requires time, resources, knowledge and skills. Good planning and preparation in advance, skills in reaching out to stakeholders and handling balanced discussions among different types of stakeholders, etc. are necessary for organizing successful QH engagement activities.
- RPOs and RFOs should make QH engagement a requirement and key performance indicator for applied research project, for instance by allocating part of the funding to local communities, but also by encouraging researchers to incorporate QH engagement experiences into their research projects.
- QH as a key dimension of RRI should not be a one-time event but requires mutual learning with other RPOs, adequate and co-constructive planning, but also a mechanism for ongoing monitoring, evaluation, and reflection.
- An important hurdle for participatory research is the use of technical language and academic vocabularies. Researchers and societal stakeholders may speak different languages and use different vocabularies. Paying attention to language use is of key importance when it comes to interaction with different types of stakeholders.

In D8.4, which assesses the results of mutual learning processes, it is explained that the mutual learning concept entails a specific understanding of the role of expertise in the deliberative and interactive processes. The MLE concept aims to move away from the knowledge deficit model, where experts are expected to inform the public (as outsiders) in a more or less one-directional manner, or where experts within the organisation inform and instruct colleagues to engage in RRI. Building on the MLE concept, all QH actors become active participants in an experimental deliberative exercise. MLEs aimed to bring together various groups of stakeholders (researchers, professionals, citizens, industry etc.) to facilitate interactive learning processes through mutual exposure of views and experiences. Innovative methods were employed to encourage active participation, allowing the MLE to become a stage where multiple (and sometimes unexpected) voices and perspectives mutually challenged each other. It aimed to provide a deliberative and distributed form of reflection. Instead of allowing a limited number of insiders or experts to analyse current developments in the Marine and Maritime RRI arena, the aim was to make reflection a joint and mutual learning endeavour.

Compared to more traditional deliberative settings, MLEs aimed to increase diversity and inclusion as well as responsiveness. While RRI and MLEs are time-consuming, they should not be seen as mere add-ons to scientific projects. Via MLEs, RRI reflection should become a deliberative praxis. Instead of the traditional situation of academic experts providing policy advice, experts are invited to become involved in a deliberative process meant to encourage RRI reflection not as an isolated phenomenon, but emerging in the context of a broader deliberative and reflexive research culture.

Again, however, when it comes to realising this concept, a number of challenges must be addressed:

- RRI aspires to realise significant changes in the way in which research is being conducted, making research more responsive and interactive towards society. Yet, research is experienced by many practitioners as a competitive profession with a considerable workload, while the realisation of RRI objectives requires time and commitment. It requires research to slow down, as Isabel Stengers (2013) argued, who distinguished fast (competitive) science from slow (reflective and interactive) science. RRI is a time-consuming process, both externally (establishing long-term interactions with societal stakeholders) and internally (making responsive interaction part of the research methodology and of the institutional reward system).
- The difficulty of embedding RRI as a holistic concept. Although the various pillars of RRI (gender equality, public engagement, open access, etc.) are easily recognisable and seen as relevant, RRI as a holistic concept is more challenging to implement. Is RRI more than the sum of its parts? RRI emphasizes how the various pillars are interrelated. To prevent that RRI becomes a bureaucratic endeavour, bent on quantifying quick wins, the focus should be on changing the research culture, the institutional ecosystem, making research as such more interactive and responsive. RRI should become a core dimension of organizing and conducting research. RRI can only be achieved if it becomes integrated in research and acquisition and is not seen as a separate task that can be outsourced or considered as optional.
- This implies that we should recognize the tensions between traditional academic performance (focused on fast science and on traditional metrics such as citation indexes and other quantitative performance indicators) and the RRI approach, which focusses on the quality and relevance of the research and on the long-term narrative and mission of RPOs. RRI only works if its importance is acknowledged and rewarded as a time-consuming priority. Mutual learning endeavours such as GRRIP offer real-world examples of how to organize RRI and QH engagement as a process of organizational commitment and awareness.

3 JoinUs4Health: lessons learned so far

In summarising our lessons learned so far, we will mainly refer to two published deliverables, namely D7.4 (“Experiences as a young consortium”) and D2.2 (“Benchmark methodology on implementing RRI and crowdsourcing for ongoing and future projects”).

From the very onset, JoinUs4Health was seen as a learning process, a path participants follow together, sharing experiences with the aim of developing an approach in a co-constructive manner along the way, whilst learning from one another. The project aims to provide a concrete case study to explore how to implement RRI in cohort research, while at the same time contributing to reflections on how to make research more responsive, relevant and trustworthy for society. The aim of RRI is to change the way research is conducted in the sense of making research more responsive to societal needs, values and concerns through developing interactive methodologies. This project offers opportunities to put RRI in practice, by supporting research groups in the transition process. It had the ambition of engaging cohort participants, citizens and other groups of societal actors (i.e. policy makers, business/industry, non-governmental organisations, education community) in a more co-creative manner, so as to make cohort research more sensitive to societal expectations and concerns and to promote equal access to science. As explained in D7.4, this process is worthwhile, but at the same time difficult and challenging.

An important factor is the **time dimension**. Three years is a short amount of time to (co-creatively) design an online platform, build an active (online) community, and mobilise potential volunteers, especially early on when the concept and potential applications may still be unclear. Making research responsive means slowing down, taking the time to reflect, and that is not always doable when staff resources are inadequate. Partners in academia, especially in university medical centres, work under high pressure given the need to adhere to tight timelines and combine multiple urgent tasks.

In D2.2 some important methodological lessons were drawn that can be summarised as follows:

- While the project aimed to develop a methodology rooted in RRI, **the design and preparatory activities** of RRI projects should ideally be participatory and co-constructive as well, for instance by engaging future users in the design of the platform.
- Since a new consortium assembles partners from various backgrounds, it is unlikely that there will be a **common understanding of the scope and overall goal of an RRI project**, shared by all from the very outset. Some partners, particularly the partners experienced in cohort research, tended to opt for a more pragmatic view on public engagement in science, seeing engagement and communication in terms of addressing knowledge deficits. Thus, a tension emerged between **participatory research as a mutual learning endeavour and the deficit model in public engagement**. Although this tension was regularly addressed, it was not fully resolved through deliberation. It is important to take time at the beginning of the project to make explicit all the assumptions held by each partner and consider how these assumptions influence project planning and execution. These assumptions and concepts should be revisited periodically in a structured setting.
- At the **institutional level**, drastically changing the way research is conducted and designed is a time-consuming process. While the project aimed to enact institutional changes in cohort institutions, it did not have a clear pipeline to ensure how those changes would be implemented and taken up. This also was an aspect developed along the way, although some noteworthy institutional changes were achieved, such

as, for instance, the launch of a science society minor at Erasmus MC, inspired by the project. In D5.2 the importance and challenges of building RRI into academic curricula was already discussed. This deliverable entails the story of how, although RRI took some time to digest, an academic team caught the RRI fever and became an RRI champion, notably by setting up the Minor program *From Science to Society*, empowering students to actively participate in science communication, open science, and public engagement.⁶

Recommendations for future projects:

- Co-create platforms with potential users from the beginning of the project and continue to do so iteratively throughout their project.
- Take time to create a common language and vision between project partners to ensure the manner in which the methodology is adapted realises the shared goals in the project consortium.
- Future projects are advised to embed their testing of the methodology into a structure of responsibility within institutions involved in the project, where stakeholders already embedded in knowledge-making within these institutions engage in mutual learning.
- Consortia must work on developing a common language and vision when it comes to the activities and goals of the project, seeing iterative reflections on the assumptions, goals and perspectives as an intrinsic dimension of the work.

It goes without saying that these recommendations are far from easy to realise. This goes, for instance, for involving stakeholders from the very beginning. The initial experience of joinus4health when reaching out was limited resonance, as if probing in a vacuum. Subsequently, initial responses often had the form of requests for information. Involving stakeholders in the process of agenda building requires a long-term relationship. We cannot presuppose a pre-existing need to become involved. The path from requesting information towards interactive and participatory agenda setting takes time, but we have to start somewhere. In the funding system of research as it currently stands, slow, participatory processes have to compete with project promising fast returns. This is also noticeable in the shift from the AIRR process dimension towards quantifiable keys. And we must be aware of the fact that to some extent at least, we are part of the system, often presenting our ambitions and results in technical and academic vocabularies. language, which again is a tension that cannot be easily resolved.

In fact, a 3-year project should be seen as the start of a long-term process and this points to limitations in the current ways in which RRI projects are funded. How to make the results sustainable during the post-project stage, when funding for RRI activities expire? Here again it is important to emphasise that RRI should not be seen as a temporary add-on, but rather as a process requiring an *organisational overhaul*, shifting from an understanding of research as a competitive individualised enterprise towards research as a more responsive, responsible, collaborative and deliberative arena. During the initial stage of the project, interactive events are important to draw the attention of potential participants, but in the longer term RRI is about strengthening the external validity of research, resulting in research that matters. In the case of Joinus4health, we may mention both the platform and the educational minor (ErasmusMC) as embedded results that will be maintained after funding for the project expires.

⁶ <https://www.eur.nl/en/impactatthecore/science-society>

4 Involving the crowd

JoinUs4Health saw crowdsourcing (Brabham 2012) as an approach that may allow society to become a living laboratory, including the insights and experiences of the crowds (i.e., the inhabitants of living laboratories outside academic premises) in cohort research. Rather than mere providers of data, the idea is that societal participants become active drivers and contributors to the research. Researchers are encouraged to actively engage citizens and other societal actors in mutual learning dialogues while designing, conducting and applying their research.

Historically, the concept of crowdsourcing juxtaposes a long tradition of **crowd phobia**, going back to the work of Gustav le Bon, who saw crowds as impulsive, irrational, easily inflammable, vulnerable to manipulation (“hypnotisable”), and so on (le Bon 1895). Although crowdsourcing entails a different basic attitude when it comes to listening to the crowd, there are nonetheless some challenges involved. Input from the digital crowd must be managed in a transparent manner, ensuring that suggestions and contributions adhere to minimum standards, avoiding the creation of bubbles, i.e., clusters of like-minded individuals to create parallel worlds. Another normative challenge is promise and expectation management. How to ensure that expectations of participants are realistic and can be met by expected outcomes of the project. Also, data sharing and data ethics (management of sensitive data in a transparent manner in accordance with the standards of data stewardship) is an issue of concern. Finally, how to make sure that participants are not reduced to providers of data, but involved in decision-making, agenda setting and design. Expectations from participants may be compromised if at the end of the day academic experts see academic performance as more important than societal impact.

This means that for crowdsourcing to work, institutional changes are required, for instance concerning the way in which academic performance is rewarded, as this is currently still largely based on impact factor metrics rather than on engagement and relevance. Examples of institutional changes that foster RRI are:

- Offer methodological training, notably to early-stage researchers.
- Encourage staff members to engage with societal stakeholders and acknowledge its value by aligning the current system of reward and promotion.
- Reflect on and share RRI experiences and best practices during academic meetings.
- Incorporate the specific challenges of interactive research practices in data management and ethical review.

Ideally, crowdsourcing provides opportunities to citizens regardless of societal or educational background to contribute and benefit from research, influencing research agendas and propose research questions. Participants are not seen as data providers, but as co-designers, and crowdsourced topics and materials may promote democratic, literate and deliberative citizen science. By bridging societal pockets and illustrating both the value and the limitations of research, by promoting both open discourse and targeted disseminations, this approach may counteract the pervasive influence of misinformation and fake news.

Crowdsourcing as an instrument for inclusive and anticipatory innovation aims to make society more resilient when it comes to addressing disruptive challenges. Rather than providing a rigid methodology, crowdsourcing provides a new way of working, which will further evolve through mutual learning along the way, providing concrete tools for researchers to make their methods more sensitive to societal experiences and concerns by engaging unexpected voices and perspectives, combining research with societal dialogue. Therefore,

crowdsourcing may broaden the toolbox of RRI as both crowdsourcing and RRI aim to include distributed public knowledge in research. While crowdsourcing offers a concrete methodology for practicing RRI, the critical deliberations that have evolved in the context of RRI discourse should be used to make crowdsourcing more sensitive to the epistemic challenges at work here, allowing crowdsourcing projects to explicitly consider their presuppositions and ambitions.

5 RRI and citizen science

Although citizen science is often considered a recent development, it actually builds on a longer history. The term “scientist” was coined in the early nineteenth century by William Whewell (1794-1866), who wanted to demarcate empirical research in the natural sciences from other forms of knowledge (Ross 1962). The epithet “scientist” pertained exclusively to what he referred to as “inductive science”, setting it apart from other knowledge practices (e.g., social sciences and the humanities, but also practical and experiential knowledge), precisely the divide which transdisciplinary research nowadays aims to supersede. At the same time, Whewell was well aware that the work of the “scientist” needed a supplement in the form of “citizen science”, allowing scientific experts to involve large numbers of volunteers for collecting measurements, in research areas such as meteorology, ornithology and tidal research. Whewell was practically involved in organising this, launching the first citizen science project in history by mobilising hundreds of volunteers internationally to study ocean tides. Thus, although Whewell’s term was meant to segregate knowledge produced by scientists from other knowledge practices, there was also an awareness that science direly needs input and support from citizens.

In the classical approach, citizen scientists are considered as an auxiliary work-force, whose standardised methodologies and assignments are determined (dictated if you like) by scientific experts (“top-down”) and whose results are incorporated in academic output. This top-down approach results in numerous epistemic tensions. First of all, citizen scientists are volunteers who tend to be highly motivated by normative value concerns, e.g. nature conservation (Ganzevoort & Van den Born 2020) and in the long-run recruitment is dependent on the extent to which participation in research allows volunteers to contribute to this value-driven objective. Moreover, in practice, a plethora of epistemic tensions may emerge between the linguistic grids and formal language games of academic research and the experiential and contextual knowledge of volunteers (Turnhout 2020).

This inherent challenge becomes even more pertinent as, in the current situation, we notice an intensification of the interaction between academic experts and citizen scientists, now that societies are evolving into living laboratories (Schumacher & Feurstein 2007). All the world is becoming a laboratory as it were, and all citizens are becoming research subjects, supporting global knowledge networks in measuring and tracking “everything”, however trivial or irrelevant it may seem. Participatory research is in vogue and currently emerging under various closely related labels (Open Science, Citizen Science, crowdsourcing, and the like), building on the conviction that the limited nature of mono-disciplinary knowledge can only be addressed through collaboration, not only across disciplines, but also with participants from outside academia (citizen scientists). After an extended period of exclusive professionalisation, research is again highly dependent on input from outsiders. Science requires distributed intelligence and participatory methodologies, not only for data collection, but most of all for securing the impact, relevance and external validity of research. This means that citizen science distances itself from the initial conception (amateurs as an auxiliary workforce for science) and rather opt for approaches that are genuinely participatory and co-constructive.⁷

Rather than seeing citizen science merely as complementary, as Whewell argued, they should become involved in a co-create process resulting in a comprehensive (holistic) understanding of societal challenges. At the same time, this ambition to open up (turning the

⁷ Strasser et al (2019) offer a historical analysis of the origin, development and promises of citizen science as an epistemic practice.

world into a global living laboratory) will not result in more inclusive research practices by definition and may even have the opposite effect. Instead of making research truly participatory and inclusive, it may also mean extrapolating power relationships (between researchers and research subjects, whose daily behaviour and existence is now captured in algorithms) to the outside world. Rather than empowerment, it may result in large-scale mobilisation and recruitment of citizens as data providers. Mobilising citizens to share data may result in “data colonialism” if it does not involve genuine participation, for instance through co-constructive agenda setting of research (Vegter et al 2020; Sadowski 2019). In other words, as argued above, for participatory research to be truly inclusive, a fundamental reflection on epistemic power and epistemic justice is required.

Thus, a shared experience of European projects is that the challenges of participatory research should not be underestimated. Often, participation remains marginal. To the extent that it becomes more genuine and intense, the dynamics of inclusion and exclusion, defining which views and perspectives are given the floor and which are not (e.g. conspiracy theories), becomes an exacting concern. Moreover, grand wicked challenges do not allow for unifying solutions, but rather affect various stakeholders in various ways.

In short, whereas the neologism “scientist” was introduced to exclude not only lay knowledge, but also humanities (“Geisteswissenschaften”) from the arena of scientific research, there has always been an awareness that a complementary approach was needed to make science work, especially when facing complex issues (from understanding ocean dynamics to human health). Currently, however, we notice the need for a more radical approach. A basic difference between citizen science as it was initially envisioned and emerging practices of participatory research is that, in the traditional format of citizen science, scientists were still evidently in charge, while citizens provided input in accordance with standardised formats. In order to address the global challenges we are facing, we must opt for a more radical form of inclusiveness, where participants are not only invited to share their data, but also their questions, criticism, suggestions and concerns. Technoscientific laboratories must be complemented by “citizen labs”, where citizens identify and address ethical questions regarding (medical) technology from the perspective of citizens and patients rather than medical or ethical experts, thereby producing complementary instances of knowledge.⁸ We are not only interested in social science data from questionnaires etc. (third person perspective), but first and foremost aim to involve experiential knowledge from a first-person perspective, more akin to the perspective of the humanities, where multiple perspectives are given the floor including first-hand experience. Spaces must be created to allow for knowledge-making to be initiated, involving participants from outside academia and traditional research performing organisations on an equal footing, where science can offer methodological frameworks to initiate the process, but scientific knowledge is not necessarily the starting point.

Instead of seeing citizens (or societal actors more broadly) as an ancillary workforce mobilised on behalf of science (as in Whewell’s case), citizen scientists are now seen as uniquely positioned to study and experience societal challenges and transitions *from within*. Whereas traditional citizen science reinforces the idea of scientists studying society from an external (objectifying) position, thereby putting science and society at a distance from each other, epistemic inclusion implies the endorsement of proximity and immanence, analysing and assessing these transitions from a position of engagement (science *in* society), thereby superseding the internal / external divide. A one-directional orientation (from academia to society) gives way to a participatory mutual learning process.

⁸ <https://ppverbeek.org/research/>

Opening up to society presupposes the awareness that there are other relevant sources of experience and insight and other knowledge practices besides academic ones. We must endorse epistemic pluralism, not in the sense that anything goes or that there is no value in expertise, but in the sense that multiple practices may result in valuable insights challenging and enriching one another. Processes of mutual learning may take research towards a more comprehensive level, able to meaningfully address the global challenges we are facing, involving citizens in the process of research and innovation from the very start and on a global scale. Entering the global arena implies that basic presuppositions of academic research may become questionable, i.e. the focus of neo-liberalism on egocentric individuals striving to maximize their benefits, moving towards community-oriented and value-based approaches which emphasise the mutual dependence of individuals, on each other and on the quality of their collective ecosystem.

6 The challenge of epistemic inclusion⁹

As indicated above, the concept RRI was introduced a decade ago in 2011 (Schomberg 2013; De Saille 2015, Owen et al 2021) in the context of European research policy (“top-down”), but adopted and further developed by a thriving academic Social Sciences and Humanities community (“bottom-up”), giving rise to several salient RRI accounts (Timmermans and Blok, 2018), notably resulting in the AIRR concept, which focusses on *anticipation, inclusion, reflexivity* and *responsiveness* as key components of the “process dimension” of RRI (Owen, Macnaghten, and Stilgoe 2012; Stilgoe, J., R. Owen, and P. Macnaghten. 2013).

Research and research-based innovation may contribute to effectively address global crises such as climate change, mass extinction and emerging viral threats, but how to ensure that this is done on a responsible and responsive manner? How to foster public trust in science instead of discontent? In a recent survey Novitzky et al (2020) signalled obstinate “discrepancies” between RRI ambitions as stated both in formal EC documents and in academic discourse, and their “implementation”, i.e., the actual uptake and awareness of RRI objectives among researchers and innovators actually working on EC-funded projects. Ten years after the introduction of the RRI concept, which gave rise to an impressive series of RRI projects funded by the EC, a reflection on its key ambitions is called for, and was already initiated by scholars closely involved in RRI discourse and RRI projects, – for instance in a recent paper entitled “An unfinished journey? Reflections on a decade of responsible research and innovation” (Owen et al 2021). Moreover, self-reflection is an ongoing process, an inherent dimension of the RRI endeavour as such.

Against this backdrop, special attention should be given to what we consider as the key challenge which RRI (as an evolving practice), namely the challenge of *epistemic inclusion*. From the very beginning, there has been the awareness that RRI – as an “interactive process by which societal actors and innovators become mutually responsive to each other” (Von Schomberg 2011) – must entail a willingness to become sensitive to and give the floor to multiple voices and perspectives, coming from academia, but also from society at large. Epistemic inclusion rests on the premise that all types of knowledge are finite in how they portray realities, so that knowledge practices should join forces to open up viable pathways of action. Epistemic inclusion implies the endorsement of proximity and immanence, analysing and assessing these transitions from within, from a position of engagement (science *in* society), thereby superseding the science-society divide. Instead of seeing societal actors as an ancillary workforce mobilised on behalf of science, citizen and societal stakeholders are often uniquely positioned to study and experience societal challenges and transitions *from within* the public arena and the lifeworld.

This evidently takes us beyond the deficit model, which focusses on shortcomings in public knowledge (Simis & Madden 2016). Rather, it is important to realise that, although academic disciplines represent impressive bodies of expertise, they inevitably face knowledge gaps as well, notably concerning the societal impact and uptake of their knowledge claims. We use the term knowledge gap not in a pejorative sense (as if to accuse researchers of sloppiness or narrowmindedness), but to emphasise the experience, emerging across disciplines, that the gap between the complex global challenges we are facing, and the insight provided by established research paradigms is widening. To amend this, we will argue, academics must reach out and learn from other forms of knowledge, insight, and experience,

⁹ Parts of this section are also used in a paper submitted to the *Journal for Responsible innovation* (under review).

through collaboration with other disciplines first of all, but also by seeking interactions with non-academic forms of knowledge, such as practical knowledge, but also indigenous knowledge (Ludwig & Macnaghten 2020). As Valkenburg et al (2020) argued, it is only by adopting a radically inclusive approach that the objectives of RRI can be realised. This requires the convergence and reconciliation of various forms of (academic and non-academic) knowledge, or rather: “knowledges”.

Knowledge producers (e.g., researchers and research performing organisations) are experiencing systemic knowledge gaps when addressing wicked global problems such as dramatic loss of biodiversity and ecological disruption. In order to address such global challenges, we have to radically broaden our epistemological scope and methodological repertoire. And this includes the ability to address antagonism and genuine epistemic difference and divergence. To supersede the traditional epistemic divide in an era of polarisation, knowledge must become more comprehensive, inclusive, and decentralised, linking established research-performing organisations with community-based knowledge sites, where epistemic inclusion not necessarily starts from the perspective of scientific knowledge, but rather from experiential knowledge and problem probing. Epistemic inclusion should *not* be seen as the occasional incorporation of pre-selected and carefully processed pieces of heterogeneous knowledge at the fringes of academic practices of knowledge production. However, epistemic inclusion can only live up to its concept if we adopt a committed and radical stance. Epistemic inclusion implies mutual exposure and mutual learning, a radical innovation of the way in which research is conducted and knowledge is produced, and a willingness to question and reconsider some of the accepted concepts, methodologies and processes involved.

RRI means science *for* society (“product-oriented RRI”, focussed on strengthening social desirability of research outcomes), but it also means science *with* society’ (“process-oriented RRI”, focussed on strengthening inclusiveness of research). And the latter entails both *social* inclusion (e.g. public participation, involving societal actors in the process of agenda setting) and *epistemic* inclusion (i.e. involving various forms of knowledge, especially knowledge “out there”, practical, everyday knowledge, outside academic quarters; Valkenburg et al 2019; Koch 2020). An important challenge of epistemic inclusion is how to reconcile various forms of (academic and non-academic) knowledge and experience. A starting point of epistemic inclusiveness is the concept of ubiquitous expertise (Collins 2014; Zwart et al 2017). Rather than disavowing the importance of scientific expertise, the concept of ubiquitous knowledge claims that, also for scientific experts, mutual learning is a more enriching experience than mere communication (“popularisation”) or implementation (“valorisation”) of research, whilst social participants learn more from active dialogue compared to more passive forms of public involvement.

Mutual learning means that multiple forms of relevant expertise are taken into account and given the floor. The focus is not only on the expertise of experts, but even more so on our knowledge gaps: on the uncertainties, controversies, unknowns and blind spots involved in transformative innovation. Mutual learning does not presuppose that other types of knowledge need to be validated using scientific knowledge as a standard, but rather that by comparing and contrasting knowns and unknowns in different knowledge systems, we can produce a more robust picture of the realities these knowledge systems attempt to describe (Tengö et al., 2014). Therefore, the engagement with other voices and perspectives stakeholder is not primarily aimed at “consensus”, at defining a common ground, but rather: using the stances and perspectives of others to discern our own blind spots and questionable preconceptions.

As indicated, there are two core dimensions to RRI, namely “science *for* society” (“product-oriented RRI”, i.e. social desirability) and “science *with* society” (“process-oriented RRI”, i.e. inclusiveness), while the latter is not only about *social* inclusion (public participation,

involving societal actors in the process of agenda setting) but also about “epistemic inclusion” (involving various forms of knowledge, especially knowledge “out there”, outside academic quarters). Moreover, whereas *responsibility* primarily entails a social relation (contributing to the common good, etc.: the social dimension), the term *responsiveness* rather refers to openness and sensitivity to different or even contrasting views (the epistemic dimension). And whereas in the past, innovation progressed at the expense of other knowledge forms, and even resulted in “epistemicide”, i.e. the active liquidation and elimination of other (e.g. traditional and indigenous) knowledge systems (Hall and Tandon 2017), time has come to counteract this trend through participatory research, knowledge democracy and mutual learning. This does not mean raising suspicion concerning the validity and importance of technoscientific expertise, but rather involving expert knowledge in a public agora of dialogue and interaction, recognising the importance, validity and added value of other types of knowledge as well. Mutual learning aims to bring together various groups of stakeholders (researchers, potential users, intermediaries, professionals, students, media, broader publics) to facilitate an interactive learning process through mutual exposure of views and experiences, expectations and concerns (Zwart, Brenninkmeijer et al 2017). In terms of knowledge production, it aims to supersede the divide between researcher and research subject or respondent. And in terms of communication, in contrast to more traditional forms of deliberation (such as lectures, panel discussions or question-and-answer sessions before a relatively large audience), innovative methods are developed to encourage in-depth dialogues, taking us beyond traditional “experts vs. lay audience” forms of exchange, thereby allowing participants to mutually probe and question each other’s views. We are all experts to some extent (Collins 2014). In other words, in society as a living laboratory, expertise has become ubiquitous. Besides a wealth of insights and knowledge, there are many knowledge deficits as well, notably in the sense that the future is open and indeterminate and it is difficult to predict how technologies will evolve and how the life-world will be affected.

7 Conclusion: some lessons learned

In terms of method, RRI does not involve a methodology in the sense of a strict protocol. Rather, RRI involves a continuous collective and mutual learning process. Although terms like “method” and “methodology” are often identified with rigid research protocols, notably of the experimental type, the literal (etymological) meaning of “method” rather suggests that it is something that is developed *along the way* (μετ’ + ὁδός in Greek, where ὁδός means “road”). From an etymological point of view, method means openness, a willingness to reconsider the path we have explored (Zwart 2022). In actual research practices such as cohort research, protocols are evidently necessary and valuable to ensure the validity of the research. Rather than offer alternative protocols, RRI encourages researchers to reconsider the implicit assumptions of their methods and to consider innovative ways to conduct cohort studies in an inclusive and responsive manner. This requires a process of mutual learning between cohort studies and RRI, which is precisely what JoinUs4Health intended to achieve. Also, it means travelling this path together, so that RRI is about establishing and mainlining relationships. Whereas the life of a single project is short, – three years in most cases –, learning the art of participatory research will take more time and requires us to build on the experiences of previous and flanking endeavours.

The temporal dimension is an important factor in RRI. Most participants in RRI projects face time pressures. Academia is a competitive environment, focussed on quantifiable results, while RRI requires time for engagement and reflection, in other words RRI requires us to slow down. Junior researchers work on temporary contracts and senior staff is faced with the necessity to combine work on RRI projects with a plethora of other tasks. This is not a “problem” requiring a “solution”, but rather a systemic challenge which must be addressed through mutual learning and reflections, informed by practice. RRI is neither a tool nor a method. RRI requires drastic changes in the way in which research is being conducted.

As to strategies of inclusion, RRI projects should not merely aim to implement the RRI approach into existing research traditions, but practice what they preach by involving societal actors in the design of the RRI endeavour. This requires a more inclusive and diverse input from societal actors already during the preparatory stage of the project, making room for participatory experiments. RRI projects require mechanisms to integrate reflexivity in all stages of the research. The design and preparatory activities of RRI projects should ideally be participatory and co-constructive as well, for instance by engaging future users in the design of the crowdsourcing platform.

In recent years the focus in RRI discourse has shifted from conceptual work towards implementing RRI in research organisations (Forsberg et al 2018). In some projects a tendency was noticed to reduce RRI to a limited set of quantifiable indicators in view of the difficulty of “selling” RRI as a holistic concept. Although quantifiable indicators may be meaningful to assess the impact of RRI initiatives, RRI should not be reduced to mere compliance. RRI is a basic attitude, and therefore more than the sum of its parts, emphasising how the various pillars are interrelated. To prevent that RRI becomes a bureaucratic endeavour, bent on quantifying quick wins, the focus should be on changing the research culture, the institutional ecosystem, making research as such more interactive and responsive. RRI should become a core dimension of organizing and conducting research. RRI can only be achieved if it becomes integrated in research and acquisition and is not seen as a separate task that can be outsourced or considered as optional.

As mentioned above, an important hurdle for participatory research can be the use of technical language and academic vocabularies. Researchers and societal stakeholders may speak different languages and use different vocabularies. Paying attention to language use is

of key importance when it comes to interaction with different types of stakeholders. Crowdsourcing aims to address this challenge. By encouraging people to interact, exposing them to multiple vocabularies and language games, they will learn to understand each other's language better. Yet, precisely for this reason, paying attention to language remains an urgent task in crowdsourcing practices. as well. Rather than familiarise broader audiences with the vocabularies of science, epistemic inclusion entails that multiple languages may actually open up different perspectives and experiences.

Closely connected with the concept of epistemic inclusion is the idea of ubiquitous expertise. Rather than disavowing the importance of scientific expertise, the concept of ubiquitous knowledge claims that, also for scientific experts, mutual learning is a more enriching experience than mere communication ("popularisation") or implementation ("valorisation") of research, whilst social participants learn more from active dialogue compared to more passive forms of public involvement. Mutual learning means that multiple forms of relevant expertise are taken into account and given the floor. The focus is not only on the expertise of experts, but even more so on our knowledge gaps: on the uncertainties, controversies, unknowns and blind spots involved in transformative innovation.

Several authors, including Wittrock and Forsberg (2019) mentioned above, have pointed to the link between responsible research and trust in science. Knowledge societies are facing multiple global challenges, aggravated by a climate of distrust and an omnipresent erosion of trust: in representative bodies and governmental organisations, in media and public information, but also in science, scientific expertise and innovation. Many voices in contemporary societies are questioning whether scientific information is sufficiently valid, disinterested and objective. At the same time, in order to effectively address the global disruptions facing Europe and the rest of the world, evidence-based insights and potential solutions provided by science are indispensable. Therefore, the credibility, reliability and trustworthiness of science is an issue of crucial importance (Oreskes 2019). In order to restore a trust relationship between science and society, science and society must be brought closer together. And to achieve this, it is necessary to look at both sides, considering both the scientific and the societal pole of the trust relationship. Distrust per se is not the issue, as fostering an attitude of scepticism and criticism is an intrinsic part of the scientific method, but how to distinguish between warranted and unwarranted trust? The IANUS project (*Inspiring and Anchoring Trust in Science, Research and Innovation*)¹⁰ builds on the conviction that warranted trust in scientific research can be strengthened by fostering participation in research as a co-creative and inclusive process, sensitive to societal values, concerns and needs. Thus, besides strengthening the external validity of cohort research and contributing to open and responsible science, participatory projects such as Joinus4health may also contribute to trust in science, e.g., the trustworthiness of cohort research, and evidently, this is more than a mere side-effect. The importance of participatory research and open science for fostering trust in science is widely acknowledged, notably in an era when disruptive technologies (AI, robotics, etc.), disruptive events (the Corona pandemic) and the growing dependence of research on private funding have contributed to distrust in scientific expertise (see for instance Blok & Von Schomberg 2023).

¹⁰ <https://cordis.europa.eu/project/id/101058158>

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