

Managing responsible innovation in European healthcare living labs: aligning ethical goals with operational realities

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Abstract

Purpose – This paper investigates how European Healthcare Living Labs (HLLs) operationalize principles of Responsible Research and Innovation (RRI) within their innovation management practices. Rather than adopting RRI as a fixed framework, HLLs use it as a flexible, guiding orientation to navigate complex organizational and institutional environments.

Design/methodology/approach – The study combines a systematic mapping of 89 HLLs across Europe and a thematic analysis of 16 in-depth interviews with HLLs project managers and stakeholders.

Findings – HLLs enact RRI as a dynamic process, aligning innovation goals with ethical and inclusive values. They develop reflexive management practices that reconcile normative commitments with innovation imperatives, fostering collaboration and inclusiveness. The study contributes to understanding RRI as a situated practice rather than a fixed protocol.

Research limitations/implications – Findings are context-specific to European HLLs. Future research could examine similar dynamics in other innovation ecosystems or regions, or outside the healthcare sector.

Practical implications – We identify and describe tools and strategies, such as stakeholder co-creation, iterative evaluation, and adaptive governance, that help innovation managers integrate societal values into innovation processes.

Social implications – By embedding RRI principles, HLLs promote inclusive, ethically aware innovation in healthcare, enhancing responsiveness to societal needs and trust in innovation systems.

Originality/value – The study offers a perspective on how RRI can be strategically embedded in Healthcare living labs, linking normative ambitions with operational realities in innovation management.

Keywords Healthcare living labs, Responsible research and innovation, Innovation management, Participation, Market

Paper type Research article

1. Introduction

In recent years, ways of managing open and participative innovation have become a central topic in the literature on innovation and management studies (Bamel *et al.*, 2024). Also in social sciences literature, such as science and technology studies (STS), there has been a growing interest in exploring spaces of technoscientific participation and co-production, driven research focused on fostering participant engagement and examining their roles in technoscientific innovation projects (Gaudion *et al.*, 2015; Sarmiento, 2015; Bischof *et al.*, 2018; Parsons *et al.*, 2020; Hodson *et al.*, 2023), the openness and communalisation of the discussion on the relationship between science and society (Sorgner, 2016; Jünger and

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Fähnrich, 2020), the ability to find spaces where conflicts and disagreements of a socio-technical nature can be managed with openness and flexibility (Hakkarainen and Hyysalo, 2013) or the inclusion of new knowledge, methodology and actors in the (co)production and (co)design processes (Stirling, 2008; Hyysalo and Hakkarainen, 2014; Evans *et al.*, 2015; Puerari *et al.*, 2018; Mitlin *et al.*, 2020; ERAB, 2012).

To ensure these innovation practices align with societal needs, values and expectations, the European Commission developed the Responsible Research and Innovation (RRI) framework, a guideline for innovators and researchers to achieve an open, inclusive and ethically relevant innovation (De Saille, 2015; Owen *et al.*, 2021; Tabarés *et al.*, 2022). Following its standard definition, RRI ensures “a comprehensive approach of proceeding in research and innovation [. . .] to obtain relevant knowledge on the consequences of the outcomes of their actions [. . .], to effectively evaluate both outcomes and options in terms of societal needs and moral values, and to use these considerations as functional requirements for design and development of new research, products and services” (European Commission, 2013, p. 3). To do so, RRI has grown upon four big dimensions: anticipation, inclusion, reflexivity and responsiveness (Stilgoe *et al.*, 2013). In practice, a large part of this RRI has been articulated through mechanisms such as living labs (see Demers-Payette *et al.*, 2016; Hossain *et al.*, 2019; Monteleone, 2020; Schuurman *et al.*, 2016; Winickoff *et al.*, 2016; Zipfel *et al.*, 2022), what highlights a clear connection between these spaces and Responsible Innovation (for similar examples see Campos and Marín-González, 2023; Fauth *et al.*, 2024a; Gardezi *et al.*, 2024).

In general terms, Living Labs are designed to promote collaborative innovation by facilitating stakeholder participation in the development, testing, and evaluation of services and technologies, which constitute a cornerstone of economic activity within the European industrial and service sectors (see, e.g. Neuberger *et al.*, 2024; Yaghmaei *et al.*, 2024), emphasising the active involvement of end users as co-designers (Almirall and Wareham, 2008; Ballon and Schuurman, 2015; Leminen *et al.*, 2016). In recent years, these spaces have gained popularity and are consolidating themselves as essential tools for hosting experiences and methodologies based on open innovation, participation and co-production.

Since the application of RRI to living labs has already been examined, particularly in sectors such as environmental transitions (see Campos and Marín-González, 2023; Santos Ayllón *et al.*, 2025), it is especially pertinent to situate this analysis within the specific context of healthcare innovation, given the growing recognition that a high-tech healthcare system may exacerbate and perpetuate social and health inequalities (Weiss *et al.*, 2018; Khilnani *et al.*, 2020; Timmermans and Kaufman, 2020; Farre *et al.*, 2023; Chiaraluce and Levine, 2024). In this regard, RRI provides a framework for promoting social and health equity and for supporting “just transitions” in health and technology systems (Pacífico Silva *et al.*, 2018; Thapa *et al.*, 2019; Koch, 2020). The relevance of developing open innovation approaches in this sector also stems from the fact that it serves particularly vulnerable populations, whose needs require nuanced and context-sensitive responses. Consequently, fostering participatory processes in the design and implementation of healthcare solutions is not only an ethical imperative but also a pragmatic strategy, as it enables the development of more effective, situated, and responsive interventions (Backhaus and John, 2025). From this need for participatory and open approaches, living labs have been defined as platforms for innovation in healthcare practice and research involving the collective collaboration of multiple stakeholders (Archibald *et al.*, 2021; Cyr *et al.*, 2022), and have emerged as a key instrument for operationalising open innovation approaches in the sector (Hyysalo and Hakkarainen, 2014). Accordingly, their relevance is reflected in their growing use: a review of the literature shows that approximately 52% of living lab activities focus on health and wellbeing (Archibald *et al.*, 2021).

To understand how healthcare living labs and its projects can be operated and managed under Responsible Research and Innovation logics, we have interviewed the managers and

stakeholders of 16 healthcare living labs to find out which practices, approaches and dimensions of RRI are contemplated in their everyday activity. This work has allowed us to identify some tensions between the ideal and expected scope of RRI and its practical application. Throughout the article, we show how, rather than adopting RRI as a fixed framework, HLLs use it as a flexible, guiding orientation to navigate complex organisational and institutional environments.

In doing so, this work contributes important elements in two ways. On the one hand, at a theoretical level, it allows us to gain a deeper understanding of the concept and definition of RRI, a particularly important issue now that the European Commission seems to have integrated this perspective under a broader umbrella of “citizen participation” in its initiatives (Zwart *et al.*, 2024; Gudek *et al.*, 2025; Tauginienė *et al.*, 2025). On the other hand, the practical contribution of our research allows us to consider which forms of leadership and governance of innovation processes manage to consider the elements necessary for responsible innovation. In this way, understanding the theoretical and practical gaps between the theoretical approach to RRI and its practical application allows us to create a more complete understanding of it.

To this end, we will continue by presenting some specific insights about the innovation carried out in living labs, and we will then present the methodology followed to carry out this research. Finally, we will discuss how healthcare living labs are reconfiguring innovation in this field and examine the extent to which this approach aligns with RRI.

1.1 Living labs and innovation

Current debates on innovation governance highlight a growing concern about the distance between citizens and decision-making processes, which has renewed calls, particularly within STS, for the democratization of innovation and knowledge production (Domènech, 2017).

Within this call, living labs are presented as organizational platforms that facilitate learning and innovation in real-life contexts (Følstad, 2008), enabling the incorporation of stakeholders into the scientific process, overcoming the gap between experts and non-experts, and involving a practice that is more inclusive and representative of social diversity (Aceros *et al.*, 2022). Defined by the European Network of Living Labs (ENoLL, 2025) as “spaces that enable collaborative innovation and facilitate the stakeholders’ participation in the development, testing and/or evaluation of services and technologies, emphasising the active involvement of end users as co-designers”, it is claimed that living labs have the potential to act as platforms where both scientific facts and societal concerns are valued (Menny *et al.*, 2018; Veeckman and Temmerman, 2021), and that represent good tools to embed RRI into innovation practices (Van De Poel *et al.*, 2017; Boenink and Kudina, 2020; Long *et al.*, 2020).

As discussed earlier, living labs represent one of the most used approaches for fostering innovation in the healthcare sector. However, the way health living labs articulate RRI in practice has not been thoroughly explored. Some challenges specific to these spaces have been identified, such as the difficulty of dealing with technical problems, the need for coordination and maintenance of long-term partnerships, and funding urgencies (Kanstrup, 2017), as well as the fact that economic constraints could potentially divert innovators’ attention from social responsibility (Evans *et al.*, 2015; Fauth *et al.*, 2024).

In addition, the natural tendency of living labs to intertwine with the different actors in our economies (see Galway *et al.*, 2021; Kesselring *et al.*, 2023; Leminen *et al.*, 2020) can link their practices to market dynamics. This has been identified as a risk of orienting innovation towards fostering economic growth and market investment rather than towards developing solutions that are more tailored to specific challenges (Fougère *et al.*, 2017; Abildgaard and Jørgensen, 2021; Aibar, 2023). To understand how health living lab managers address these threats and the role that Responsible Research and Innovation plays in their strategies, we next present the methods, results, and discussion derived from the interviews and information provided by the managers.

2. Materials and methods

2.1 Identification and analysis of living labs

For this research we chose a qualitative perspective based on semi-structured interviews and a thematic analysis. This methodology allows to capture the complex, situated and context-dependent ways in which Healthcare Living Labs operationalize Responsible Research and Innovation (RRI). Following qualitative principles, the methodology foregrounds the lived practices, strategies, and tensions experienced by managers and stakeholders, providing nuanced insights that a quantitative approach could not offer.

Firstly, we carried out a mapping of health living labs in Europe through two phases. During the first phase, we turned to the European Network of Living Labs, and created a database with the name, contact and website of living labs categorised as “health and Well-being” according to the ENoLL network. As of 25 May 2024, the list of living labs on the ENoLL website was 54. In the second phase, we expanded the list using a snowballing technique by analysing the collaborations that these ENoLL health living labs mentioned in their infographics.

To complement the results further, we identified other 35 healthcare living labs after conducting a search for visibility on the Internet using the Google search engine using the keywords “Living lab” and “Healthcare”. The criteria for including these new healthcare living labs were that they were based in Europe, that their websites explicitly stated that their main purpose was related to healthcare and that they have had some kind of activity during the last 5 years.

After the two phases, we came up with a total of 89 health living labs. We classified the living labs into different categories according to their sector location (companies and/or consortia of companies; in research centres, such as universities or research institutes; health and care institutions, such as hospitals, nursing homes or care centres; in public administrations; and 10 others in citizens’ associations, third sector organisations or NGOs) and its focus (being to develop products for the market; the improvement of the general well-being; the development of healthcare devices; environmental management; elderly; urbanism; education; research and unspecified ([Table 1](#)).

2.2 Interviews

Once we identified the living labs, we created a random order list for the living labs in each of these categories. In order to have an equal distribution of each category, the order of the interviews was done in such a way that one living lab from a different category was interviewed at a time, maintaining a balance between the different categories and ensuring an equitable geographical distribution across the European continent, until we reached the saturation point ([Hennink et al., 2017](#)). The interviews were conducted online and in-person, depending on the interviewees’ location and preferences. All interviews followed a shared structure and were conducted by the same two researchers, which reduced interviewer variability and ensured procedural consistency ([Coleman, 2021](#)). In total, we conducted 16 interviews that ranged from 45 min to 1 h, of which 12 were telematic and 4 in-person. Interviews conducted remotely were done via video calls on the Teams platform.

All interviews were semi-structured, allowing the emergence of new questions during the conversation. Informants were always people responsible for managing or assisting projects within the Living Labs. To avoid response bias, no explicit reference was made to the dimensions of RRI or specific methodologies (e.g. focus groups, interviews, consensus conferences, etc.). Instead, we inquired about the techniques and methodologies used to foster participation in each specific case. Thus, the interviews were planned to focus on the everyday practices, techniques, tools, and strategies of each Living Lab.

The gender distribution of the informants consisted of 7 men and 9 women. The interviews were carried out with 6 people in charge of health living labs, 8 managers and/or project leaders within living labs, and 2 health professionals who had participated in projects within health

Table 1. Categorisation of identified living labs

Focus	Number of living labs	Sector/Location
Improvement of the general well-being	7	Research centres, universities or institutes: 2 Companies or consortia companies: 2 Health and care institutions: 2 Public administrations: 1
Develop products for the market	8	Research centres, universities or institutes: 2 Companies or consortia companies: 4 Public administrations: 2
Development of healthcare devices	5	Research centres, universities or institutes: 1 Public administrations: 1 Citizens' associations, third sector organisations or NGOs: 3
Environmental management	5	Research centres, universities or institutes: 1 Companies or consortia companies: 2 Public administrations: 1 Citizens' associations, third sector organisations or NGOs: 1
Urbanism	27	Research centres, universities or institutes: 14 Companies or consortia companies: 10 Health and care institutions: 1 Public administrations: 2
Elderly care	16	Research centres, universities or institutes: 7 Companies or consortia companies: 2 Public administrations: 4 Citizens' associations, third sector organisations or NGOs: 3
Education	4	Companies or consortia companies: 1 Public administrations: 1 Citizens' associations, third sector organisations or NGOs: 2
Basic Research	2	research centres, universities or institutes: 1 Companies or consortia companies: 1
Unspecified	15	

living labs, following principles of maximum variation regarding the sampling strategy (Leung, 2015; Coleman, 2021).

2.3 Analysis

An inductive approach was used for data analysis. Initially, a thematic analysis was conducted independently, examining both the public data collected during the mapping process and the transcripts of the interviews. This process involved identifying and organising key themes and patterns within the data, adhering to the guidelines described by Clarke and Braun (2016) and ensuring systematic progression from familiarisation to theme refinement.

First, all interviews were listened to in full to gain an overall understanding of their content and to begin noting preliminary analytic impressions. They were then transcribed verbatim using Whisper, an automatic transcription tool, after which the transcripts were carefully checked against the audio recordings to ensure accuracy and completeness. Following these preparatory steps, we undertook an inductive thematic analysis consistent with Braun and Clarke's guidelines. This involved generating initial codes, iteratively reviewing them, and refining emerging themes in relation to both the data and the RRI framework. Coding was revisited multiple times to ensure internal coherence within themes and clear distinctions

between them. Throughout the process, analytic memos were produced to document interpretive decisions and enhance reflexivity (Coleman, 2021). Finally, the resulting themes were connected with relevant theoretical concepts, providing a comprehensive account of how narratives about healthcare environments are reshaped when innovation is approached through a living lab model.

Ethical considerations were taken into account throughout the interview process. First, we obtained informed consent from the participants, providing them with details about the study's aims, methods, and potential risks. In addition, we also ensured the confidentiality and anonymity of the informants when transcribing the interviews by deleting the audio recording and anonymising the transcripts. Likewise, participants were informed of their right to withdraw from the study or have their data deleted at any time without facing any consequences. Lastly, the data was stored in the University's official repositories, which comply with current security regulations to ensure their protection.

3. Results

The results are structured in four sections, each corresponding to one of the four dimensions of RRI proposed by Stilgoe *et al.* (2013). In each section, we will relate the ideas, practices or specificities identified, which define the practice of innovation in living labs within the principles of responsible research and innovation.

In general terms, the presence of RRI on the websites of the healthcare living labs identified in the mapping is not very common. Only a few sites, for example the IrsiCaixa Living Lab, explicitly mention the concept of RRI alongside with other perspectives outlining their methodological framework (Irsicaixa, n.d.). The rest of the websites reviewed do not reference RRI, indicating that its adoption is not yet widespread in living labs, or at least not specifically recognised.

It is insufficient to conclude that RRI's absence from living lab websites means it is not present in their daily practices. While formal references to RRI are almost non-existent on the websites of the healthcare living labs, we aim to investigate whether their practices align with RRI principals. To do this, we examined how interviewees described their activities related to anticipation, reflexivity, inclusion and responsiveness in their daily work.

3.1 Anticipation

Anticipation refers to the integration of societal concerns and perspectives into the innovation process, while considering the contingencies, what is known, what is probable, what is plausible and what is possible (Stilgoe *et al.*, 2013). The principle of anticipation emerges from the need to improve the ability to foresee the outcomes, impacts, and effects of innovations. In this way, it emphasizes the importance for researchers and organisations to consider a prospective analysis of the possible consequences and opportunities associated with technological innovations (Nordmann, 2014).

When informants were asked how they anticipate the effects of their work, the most common response was that they participate in funding calls that already define specific criteria for developing solutions to specific problems. As they described, this was a way of placing their innovative activity in a global movement, tuning it with broader funding programmes that had already worked on identifying, delineating and assessing the solutions for the specific challenges:

We always refer to the shared agendas, which are the ones used in the territory. We look at their objectives and identify the major challenges and we start to consider how to provide solutions, direct all our activity and coordinate it towards these objectives (Interview 13)

Another important strategy for anticipation is to involve stakeholders in the design or proposal process. By engaging experts' and users' different perspectives, types of knowledge, risks,

fears, and opportunities are raised, ensuring that what is conceived and designed addresses the interests and concerns of all parties involved (for applications of Anticipation in other fields, see, e.g. [Aicardi et al., 2025](#)). Thus, anticipation in living labs may not consist of explicitly considering social impacts and concerns through a prospective analysis exercise carried out by designers. Rather, anticipation is expected to be carried out through (1) the participation of the different agents involved and the incorporation of their knowledge and assessments, as we can see in this excerpt:

We have a large network of collaborations and depending on what we need, we will look for those who have the expertise on the subject. So between all of us and the users, we manage to think of the best solution for the problem we have in front of us (Interview 11)

The use of socially responsible scales of technological development was also considered relevant. A frequently mentioned example of this is the so-called Social Readiness Level (SRL). SRLs are an addition to the Technology Readiness Level (TRL) that promote greater responsiveness to the values, needs, and expectations of society in relation to the projects proposed ([Bernstein et al., 2022](#)). While the TRLs classify technologies at different stages of development going from a mere idea to a prototype on the verge of commercialisation ([Héder, 2017](#)), the SRLs allow a greater assessment of the social impact of projects by focusing on the contingencies and particularities of each context:

We follow the TRL model of technological development phases, that of NASA, but we add the SRL, the Social Readiness Level, which says that in each phase you must always look at the ecology, the market, the regulations and the impact of what you are doing (Interview 6)

However, while innovation in living labs is framed by funding programmes that have already identified the challenges to be addressed, we have found that this approach can also be problematic.

Recurrently, we find that informants point out that the participation they actively advocate for including market-related dynamics. As it has been stated in the literature, the participation of actors linked to the business world introduces mercantilist logics into innovation (see [Brand and Blok, 2019](#)). This situation has been stated by the interviewees as a risk when developing effective solutions, since it can mean incorporating priorities linked to commercialisation. As an informant commented, above all, *“the main challenge is to make something that appeals to people and that they will use”*.

In this way, we find that anticipation in healthcare living labs is articulated based on promoting stakeholder participation, as well as the use of categories and analysis strategies such as the Social Readiness Level (SRL). However, we have seen how the incorporation of different market-related interests and adherence to public-private funding programmes can lead to anticipation being conceived not only in relation to the best possible social impact of the technology or service, but also in relation to economic benefit and its marketisation.

3.2 Reflexivity

Reflexivity refers to the institutional capacity to recognise what is known and what is not known by innovators, allowing them to examine and question their own activities, commitments and assumptions and to be aware that an approach to a given issue may not be universal ([Stilgoe et al., 2013](#); [Reber, 2018](#)). In this sense, reflexivity is constituted under multidisciplinary collaboration, promoting an adequate ethical technology assessment, and advocating for moratoriums or the design of codes of conduct ([Taebi et al., 2014](#)).

In the interviews, we have seen how the health Living Labs have factors in their daily practices that facilitate reflexivity, as well as factors that hinder it. On the one hand, interdisciplinary collaboration is approached as a fundamental pillar of the work in all the living labs analysed. Similarly to the anticipation strategies, through the quadruple helix scheme living labs create teams and collaborations where each actor can set out their

possibilities, capacities and limits, and a balance is sought so that all the necessary aspects for innovation are covered jointly (Afonso *et al.*, 2012; Nguyen and Marques, 2022; Tran *et al.*, 2024). Networking with deeply diverse and heterogeneous actors is a constant quality in the work of living labs, as the literature amply demonstrates (Del Vecchio *et al.*, 2017; Leminen *et al.*, 2020), and as we see in this interview excerpt:

We have engaged with hundreds of small and medium enterprises, with organisations across the region, with the NHS hospitals, with the primary care delivery, we are working with football clubs, rugby clubs, with multinational enterprises some pharmaceutical and of course we work with users across the region (Interview 5)

Multidisciplinary collaboration entails the need to create framework agreements for this collaboration, both to include different types of designers and users. This inclusion leads to efforts to determine the appropriate ethical framework to guide responsible innovation processes. At this point, the willingness to jointly articulate frameworks for reflexivity and to guide ethical assessment is very much present, and there are often figures to direct and ensure the right fit of all parties and proper ethical assessment, as this social psychologist and manager of a hospital living lab told us:

We are working on the development of an ethical framework for participation. We've done a day with professionals and now we've done one with users. I am very afraid of extractive practices, that we are going to ask people but then the decisions are previously taken, and it can become just a procedure to be able to legitimize certain things. In the healthcare sector there are dynamics that often lead you to pervert these processes. One of my roles is to ensure that this is not the case (Interview 8)

Apart from the effort to build ethical frameworks for innovation, interesting in this excerpt is the reference to the dynamics that institutions have on the processes and operations of the laboratory itself. This is a common element in almost all the cases analysed. Informants often refer to the fact that the institution(s) they are part of or depend on have a strong influence on the way activities in healthy living labs are approached.

Health is a sector historically closely linked to the processes of institutionalisation and the configuration of strict social orders (e.g. Foucault, 1994; Goffman, 1990), and this institutional dominance over living labs can determine, and even compromise, some of the work done in them (Tercanli and Jongbloed, 2022). According to the informants, the institutional influence on the activities of a health living lab may direct the ethical assessment towards uniquely institutional protection, rather than towards the development of a common field where responsibility may involve institutional protection at the same time that the stakeholders' opinions, views and concerns. In the previous excerpt we can see how living labs try to formulate their own ethical frameworks focused on guaranteeing responsible innovation and egalitarian participation, avoiding a participation not oriented towards what the informant described as "extractive practices" or tokenism, meaning using stakeholders merely as information sources, and not involving them as co-designers with responsibilities and rights in the decision making processes (Vaughn and Jacquez, 2020). In other cases, the institutional ethical-legal framework takes precedence over a framework that is particularly sensitive to responsible innovation in living labs, as this doctor and head of another health living lab told us:

If you want to do a project, it must go through the hospital's ethics committee. But the ethics committee doesn't tell you whether you can do the project or not, or whether it's appropriate or not. It says if you meet the ethical criteria of the hospital. And in the end you change your own criteria to be able to adapt them to what they tell you (Interview 9)

In this way, a living lab may be forced to incorporate the institutional logics of the organisation to which it belongs, which places the task of reflexivity not under the logic of the technological developments of the lab itself but towards the objectives and security of the main institution, as host of the innovation processes.

What we can see in this excerpt, is that although the theoretical logic behind living laboratories is one of openness, democratisation and interdisciplinary collaboration between organisations, institutional dynamics can sometimes exert pressure on laboratories to operate according to principles like those of the structures of which they form part, as if they had never attempted to open up.

Thus, reflexivity can be identified in healthcare living labs through the articulation of interdisciplinary and inter-organisational collaboration, creating ethical frameworks for these new ecosystems to achieve responsible innovation and ethical counselling. However, institutional inertias present in the health sector may push living labs to accommodate their ethical frameworks and practices towards traditional and institutional healthcare ethical frameworks. While living labs are good tools for finding new ways to innovate and reflect, there is a constant tension between the openness work promoted by the labs themselves and the historical dynamics of the sector in which they are located.

3.3 Inclusion

Inclusion in research and innovation involves challenging and dismantling traditional power dynamics. It requires rethinking the participation of diverse users and stakeholders by addressing the entrenched power structures that have shaped the historical processes of scientific and technological progress. Therefore, true inclusion entails diminishing the dominance of experts and hierarchical, top-down policies, fostering a more collaborative and participatory approach that amplifies new and diverse voices in the governance of science and innovation (Stirling, 2008, 2024; Stilgoe *et al.*, 2013).

We have seen how in health living labs, the active participation of users as “co-designers” serves as a crucial asset for challenging the power structures inherent in traditional innovation. When experts and designers collaborate with users to develop solutions, diverse expertise is acknowledged, valued, and integrated into a dialogue. This collaborative process ensures that perspectives and experiences of all participants are considered, fostering an environment where knowledge is shared, and power is redistributed more equitably:

When you ask different people about a problem, they define it differently. If you ask which solution should be applied, they also see different solutions (Interview 4)

Following this idea, incorporating non-expert perspectives and valuing lay and context-specific knowledge in problem definition and solution design (see Campbell, 2017; Von Hippel, 2001) have the potential of leading to the reconfiguration of existing hierarchies in traditional innovation processes. This shift challenges experts to step away from their roles as the sole authorities, compelling them to embrace a more collaborative attitude. As one project manager expressed, this transformation requires experts to move beyond their prescriptive stance and learn to share authority:

There is a problem here with people who until then had a monopoly on the ability to decide or consider what was important and what was not. They need to be a bit more flexible and be able to incorporate criticism or suggestions from profiles that were not in this position until then (Interview 12)

References to frameworks like open innovation and user-centred design, along with methodologies such as interviews, focus groups, and citizen panels, were consistently noted among all informants. For the health living labs interviewed, the selection of techniques and strategies is broad and flexible, tailored to each of the projects as well as its specific possibilities and needs.

However, certain elements pose challenges to the full inclusion of users, particularly in setting priorities and questioning established expert authority structures. One major difficulty lies, again, in the rigidity of institutional structures. For instance, in one case, reluctance from medical and nursing staff hindered the seamless integration of a living lab approach into the daily operations of a hospital:

There are also reactions against our work, because the hospital needs respirators, masks . . . very basic material and here we spend money on a wooden house, chairs and post-its. There are also reactions like how much money are they spending on innovation, on making this lab, on bringing robots, when what we lack are hands and healthcare staff (Interview 8)

The management of this sort of frictions that may arise between the living lab and its affiliated institution(s) significantly impacts the inclusivity of the process. Interviews reveal that there are no established protocols to standardize the resolution of conflicts between experts and non-experts or between the living lab and the institution itself. Without a clear framework for conflict management, informants highlighted that conflict resolution is often left to the soft skills of managers. This reliance presents a significant disadvantage for inclusive processes, as it can lead to inconsistencies and hinder the ability to challenge existing power structures. Consequently, proposals that aim to question or change these structures may be abandoned or overlooked, impeding progress and inclusivity in the innovation process:

For now [conflict resolution] would be a top-down resolution, because the instruments don't exist yet. I honestly don't think they will ever exist. At the end of the day it's about hierarchy . . . these are projects that are born within a city council and political credibility is at stake. There are results that are of no interest at the political level and these results will never reach the citizens (Interview 15)

This dynamic can mean that the relationship between users and experts is not always truly equal. We identified instances where despite seeking users' opinions and proposals, experts retain their privileged positions as ultimate decision-makers. For example, a doctor responsible for a hospital's living lab mentioned that, although user input is solicited, experts often maintain control over final decisions:

Philosophically we say: we do not hold assemblies to make decisions. Decisions are made by those who have responsibilities. What happens is that those who have responsibilities, since they are smart, want to hear all opinions. And therefore, it is in our interest to diversify the sources of information. (Interview 9)

In summary, while health living labs aim to foster "inclusion" by actively involving users as co-designers in innovation processes, significant limitations remain when it comes to effectively challenging existing power structures. This co-design approach recognizes diverse forms of knowledge and encourages a collaborative, inclusive environment that can potentially disrupt traditional hierarchies in science and technology. However, in more institutionalized settings, resistance often arises from within the institution itself. Additionally, the absence of clear protocols for resolving conflicts and disagreements between users, experts, and institutional priorities means that managers must rely heavily on their interpersonal skills to manage these challenges. This reliance can hinder the success of inclusive initiatives, especially when political, institutional, or market interests are at play, ultimately affecting the sustainability and depth of user inclusion.

3.4 Responsiveness

Responsiveness refers to the capacity to adapt and shift the course of a project or innovation in response to new perspectives, emerging visions, and unforeseen challenges. It embodies the adjustment of actions as an acknowledgement of incomplete knowledge and limited control, tying directly to the ability to redress (Stilgoe *et al.*, 2013; Reber, 2018). Responsiveness also encompasses the development of regulatory frameworks that integrate alternative intellectual property regimes, the facilitation of transfer channels, and the establishment of regulatory and standardization frameworks relevant to research and innovation activities. From the analysis of the interviews, this aspect clearly poses significant challenges for informants.

The interviews revealed that iterative process design is the primary tool used by living labs to enable projects to adapt and change direction as new problems arise. Iterative processes are characterized by their non-linear nature, allowing teams to revisit earlier stages of a project to

reassess and rethink various aspects (De Blois, Lizarralde and De Coninck, 2016). This flexibility makes it possible to incorporate new insights and adjustments, ensuring that the project can evolve dynamically in response to challenges and emerging perspectives, as we can see in this extract:

Here we can incorporate this logic of thinking as we go along. It is not about being linear in our designs and processes, we can rethink them as problems arise and correct them or incorporate changes (Interview 13)

The use of scales such as the Social Readiness Levels, as discussed in previous sections, plays an important role in identifying when a process needs to be reconsidered. These scales may help assess the social feasibility and preparedness of a project, serving as a guide for determining when adjustments or shifts in direction are warranted.

However, the interviews also revealed that iteration is not always driven by emerging needs during the project. Instead, it is usually pre-planned before the project begins. This is rooted in the nature of healthcare living labs' funding, which typically comes from structured funding programs that require methods, tasks, expected outcomes, and deadlines to be defined in advance. This structured approach can determine both the actions undertaken and the flexibility available for making changes during the project, and it limits the ability to adapt to unforeseen developments. As highlighted by the following excerpt, pre-defined frameworks can constrain responsiveness and iterative adjustments:

The grant really decides the work plan (Interview 5)

The specifications and conditions of each funding program significantly influence the degree to which innovation processes can be adapted or reoriented as they unfold, limiting the ability to respond to contingencies that arise during implementation. Although some studies suggest that project-funded research governance can serve as a means to introduce RRI principles into organisational governance (Wicher and Frankus, 2024), our interview data indicate that the more project-dependent a living lab becomes, the less responsiveness it is able to integrate into its everyday operations. For instance, the economic dependency of some healthcare living labs and their reliance on securing competitive projects can push responsiveness practices to the background in favour of prioritizing the overall viability of the lab. This challenge was expressed by some of the managers, perfectly represented by the following excerpt in particular:

We can't spend as much time as we would like on the projects, as we are almost only looking for ways to be funded (Interview 6)

Given the numerous pressures and challenges faced, one might expect that some projects would not be completed. However, it is noteworthy that none of the interviewees reported having abandoned a project before its conclusion:

If we are involved in the project we go until the end of it. If the project owner wants us to stop the project for any reason, is their decision not ours. [...] If we are not convinced that we can bring something to them we don't enter, but if we begin the project we go to the end (Interview 3)

From this, we can deduce that completing the project as originally planned takes precedence over acknowledging and addressing mistakes or limitations that would require significant changes. As a result, the commitment to see a project through to the end can be to the detriment of responsive practices, meaning that they are sometimes set aside to ensure projects' completion.

In terms of alternative ownership regimes, we found only one example of open access among all the interviewees. This indicates that the concept is not widely adopted or practiced within the living labs studied. While this single case advocated for making knowledge equally accessible to all participants, it still operated within the boundaries of conventional intellectual

property practices, where patent ownership of designed products or prototypes remained unchallenged. This meant that if a participant discovered an interesting product or proposal, they were required to contact the owner and negotiate for its use, exploitation, or adaptation. Other living labs did not incorporate any alternative intellectual property regimes or regulatory frameworks, which suggests that while the idea of open access is present, it has yet to gain significant traction within these innovation spaces.

In summary, responsiveness in health living labs is managed through the use of iterative projects that enable teams to revisit, adjust, and redirect their efforts as issues arise. However, this capacity for adaptability is significantly limited by the funding frameworks themselves, which prescribe actions, impose rigid timelines, and set predetermined outcomes, restricting true flexibility. Additionally, living labs encounter challenges related to intellectual property. While some labs advocate for open access, the majority continue to follow traditional ownership regimes.

4. Discussion and conclusions

Managers in Healthcare living labs address the dimensions of Responsible Research and Innovation in unique and evolving ways, necessitating continuous adjustments to align its ethical demands with their operational realities. Core RRI dimensions -anticipation, reflexivity, inclusion, and responsiveness-are embedded in living lab management. However, these dimensions often intersect, and at times conflict, with the established dynamics of the institutions in which living labs are situated, with funding structures and with market-driven pressures (see Table 2). This intersection places healthcare living labs' management in a state of persistent tension between profit and competitive environments, on the one hand, and responsibility and social impact, on the other (see also Alday et al., 2025).

Table 2. Summary of the constraints of the institutional and market environments that hinder the adoption of RRI principles by Healthcare Living Labs

Institutional/market constraint	How it manifests	Why it hinders RRI adoption
Legal frameworks of host institutions	Projects must comply with institutional ethics committees	Redirects genuine ethical deliberation toward bureaucratic compliance
Hierarchical decision-making	Experts (e.g. doctors, administrators) retain ultimate authority over project decisions	Prevents the democratization of innovation processes, undermining inclusion and shared decision-making
Resistance from traditional healthcare staff	Staff perceive living lab activities as costly or irrelevant	Generates scepticism toward co-design and participatory activities
Lack of standardized conflict-resolution mechanisms	Conflicts between stakeholders are managed ad hoc by managers' soft skills	Leads to inconsistent inclusion practices and weakens participatory governance
Project-based management culture	Dependence on short-term, competitive funding	Discourages reflexivity and sustained anticipation of societal impact beyond project timelines
Competitive funding programs	Funding calls predefine research agendas, outcomes, and timelines	Restricts living labs' ability to shift direction based on new societal insights
Commercialization priorities	Business partners' involvement introduces profit-oriented logics	Reorients practices toward market viability rather than social benefit
Economic pressures and resource scarcity	Managers focus on obtaining funds	Limits time and resources for reflexive, anticipatory, or inclusive activities
Conflicting temporalities between market speed and participatory processes	Market and institutional imperatives demand fast, measurable outcomes	Creates tension between efficiency and deliberation

Comparing these results with the broader literature on RRI in Living Labs reveals a clear convergence in positioning living labs as intermediaries capable of enacting RRI, yet constrained by governance structures and funding logics across different fields (Fauth *et al.*, 2024). Our research, however, contributes sector-specific operational nuance in the healthcare domain. Whereas studies in fields like the energy transition suggest that living labs may reproduce exclusionary practices when activities are short-term (Campos and Marín-González, 2023) such temporal dimensions appear less central in healthcare contexts, where project-based funding logics instead drive similar risks of exclusion. Moreover, our findings highlight how conflicts between users and experts are frequently mediated through managers' interpersonal skills rather than formalized protocols, which increases the risk of "extractive" participation and limits genuine power-sharing in decision making. Taken together, the Healthcare Living Labs' findings resonate with other research on, for example, inclusivity and justice, while extending it by illuminating healthcare-specific institutional pressures (e.g. hospital ethics governance, clinical hierarchies) and by identifying practical tools such as the integration of Social Readiness Levels (SRL) alongside Technology Readiness Levels (TRL).

However, even though living labs' activities may be grounded in participatory design and RRI principles, the outcomes and impacts of their work are often presumed to fall under the responsibility of funding agencies and the design of funding schemes, rather than the living labs themselves. In other words, when a funding call supports a specific application or solution, it is frequently assumed that the proposal has already been assessed and positively evaluated with respect to its social implications. As a result, *anticipation* and other *RRI dimensions* become effectively delegated to the design of the funding call itself.

Similarly, although living labs are based on collaboration and networking, the need to attract market stakeholders often requires innovation to be economically profitable, which has an impact on the struggle for developing alternative models of ownership (see also Arora *et al.*, 2021; Wilkinson and De Angeli, 2014).

In some ways, what we see in the living labs' management is an attempt to make possible the coexistence of various modes of ordering (Law, 1994). Modes of ordering' refer to the different patterns or logics that human and non-human actors -technologies, objects, etc.- use to organise, manage and give coherence to their practices and environments. What we see when we analyse healthcare living labs is that managing these spaces ultimately bring into dialogue two modes of ordering we have identified: the slow pace of the logics of participation on the one hand, and the fast-paced logics demanded by the market and the healthcare institutions on the other. Each of these are shaped by rules that are not fixed, but present fluid and variable ways of acting and coordinating in the world, and it is in living labs that the two meet, conflict, overlap and coexist in complex ways. Yet, we argue that this very tension presents a valuable opportunity to reconfigure and reshape healthcare innovation ecosystems.

If it has been suggested that the ways in which innovation is organized can shape specific society forms (Abildgaard and Jørgensen, 2021), then the struggle present in healthcare living labs goes beyond simply managing different goals of innovation: it embodies the potential to create an entirely new space for innovation and, consequently, of society order (Hyysalo and Hakkarainen, 2014; Kanstrup, 2017; Leminen *et al.*, 2020). Through this process, living labs are positioned not just as mediators of existing practices but as pioneers in establishing a more collaborative and adaptive innovation ecosystem and actors capable of hosting the functions, changes and regulations required to innovate responsibly.

Therefore, living health laboratories should not be seen as battlegrounds between advocates of the democratisation of innovation processes on the one hand, and those seeking more closed and institutionalised innovation systems on the other. These laboratories should be recognised as dynamic spaces where different ways of organising innovation and research converge. We propose that if Living Labs aim to align all economic sectors, both public and private, with the principles of Responsible Research and Innovation, innovation funding should go beyond merely offering financial support to those developing new treatments, technologies, or services. Funding should actively promote the creation of new markets, policies, and

frameworks that establish shared objectives and inspire collaboration among all stakeholders toward meaningful, impactful change. This strategy has been recognised in the European context, exemplified by the development of initiatives like Agenda 2030, which aims to engage various economic and societal actors under the United Nations' Sustainable Development Goals (SDGs) and values (Cling *et al.*, 2020; Silander, 2020; D'Adamo *et al.*, 2022). Our research supports this assertion, and we maintain that Living Labs are well positioned as privileged actors in this endeavour, although some adjustments are necessary to ensure that their management appears useful in promoting social change through technological innovation.

Healthcare living labs managers must skilfully translate RRI principles into practical, feasible actions within the constraints and opportunities of their institutional and market environments (Kulkov *et al.*, 2023). This requires a nuanced understanding of how to adapt RRI practices effectively, balancing ethical and inclusive goals with economic and operational realities. Thus, managers have to see RRI and its dimensions not as a collection of rigid, predefined criteria to be checked off, but as an overarching objective that guides a continuous journey of improvement and reflection in innovation management and development (see also Klaassen *et al.*, 2017).

Similarly, it is crucial to train those responsible for living laboratories in RRI, because they often seem to follow it only intuitively. It would be very beneficial to design specific training tools or programmes for managers that enable them to address RRI explicitly. These tools would help them master the concepts and techniques related to RRI, enabling them to integrate this perspective more consciously, practically, and systematically into their daily work.

Given that managers of living health laboratories face the constant risk of losing sight of RRI principles due to daily operational challenges, economic pressures, and the possibility of being subsumed by neoliberal agendas, this underscores the urgent need to strengthen these living laboratories and their management capacity by providing them with the necessary resources and infrastructure to maintain their commitment to responsible innovation. By reinforcing these practices, living labs can remain resilient centres that successfully balance inclusivity, adaptability, and ethical standards with market logic, ensuring their vital role, and RRI's paper, in fostering transformative and socially conscious innovation.

References

- Abildgaard, A. and Jørgensen, K.M. (2021), "Enacting the entrepreneurial self: public-private innovation as an actualization of a neoliberal market dispositive", *Scandinavian Journal of Management*, Vol. 37 No. 4, 101179, doi: [10.1016/j.scaman.2021.101179](https://doi.org/10.1016/j.scaman.2021.101179).
- Aceros, J.C., Martín García, A.V. and Gutiérrez Pérez, B.M. (2022), "Livinglabs como modelos de innovación abierta. Análisis a partir del concepto de extitución", *Pedagogía Social. Revista Interuniversitaria*, No. 41, pp. 161-178, doi: [10.7179/PSRI_2022.41.11](https://doi.org/10.7179/PSRI_2022.41.11).
- Afonso, O., Monteiro, S. and Thompson, M. (2012), "A growth model for the quadruple helix", *Journal of Business Economics and Management*, Vol. 13 No. 5, pp. 849-865, doi: [10.3846/16111699.2011.626438](https://doi.org/10.3846/16111699.2011.626438).
- Aibar, E. (2023), *El Culto a La Innovacion*, Ned ediciones, Barcelona.
- Aicardi, C., Mahfoud, T. and Rose, N. (2025), "Experiments in anticipation: learning from responsible research and innovation in the human brain project", *Futures*, Vol. 173, 103650, doi: [10.1016/j.futures.2025.103650](https://doi.org/10.1016/j.futures.2025.103650).
- Alday, E.I., Arthur, K.N.A., Blok, V., Garst, J., Owen, R. and Stahl, B.C. (2025), "Embedding RRI in competitive environments: stakeholders, structures, and systemic tensions", *Journal of Responsible Innovation*, Vol. 12 No. 1, 2529047, doi: [10.1080/23299460.2025.2529047](https://doi.org/10.1080/23299460.2025.2529047).
- Almirall, E. and Wareham, J. (2008), "Living labs and open innovation: roles and applicability", *eJOV: The Electronic Journal for Virtual Organization and Networks*, Vol. 10, p. 21.

- Archibald, M.M., Wittmeier, K., Gale, M., Ricci, F., Russell, K. and Woodgate, R.L. (2021), "Living labs for patient engagement and knowledge exchange: an exploratory sequential mixed methods study to develop a living lab in paediatric rehabilitation", *BMJ Open*, Vol. 11 No. 5, e041530, doi: [10.1136/bmjopen-2020-041530](https://doi.org/10.1136/bmjopen-2020-041530).
- Arora, A., Wright, A., Cheng, T.K.M., Khwaja, Z. and Seah, M. (2021), "Innovation pathways in the NHS: an introductory review", *Therapeutic Innovation and Regulatory Science*, Vol. 55 No. 5, pp. 1045-1058, doi: [10.1007/s43441-021-00304-w](https://doi.org/10.1007/s43441-021-00304-w).
- Backhaus, J. and John, S. (2025), "Generalization as local and translocal embedding: interrogating governance and deconstructing democratization in living labs", *Sustainability: Science, Practice and Policy*, Vol. 21 No. 1, 2450856, doi: [10.1080/15487733.2025.2450856](https://doi.org/10.1080/15487733.2025.2450856).
- Ballon, P. and Schuurman, D. (2015), "Living labs: concepts, tools and cases", *Info*, Vol. 17 No. 4, doi: [10.1108/info-04-2015-0024](https://doi.org/10.1108/info-04-2015-0024).
- Bamel, N., Kumar, S., Bamel, U., Lim, W.M. and Sureka, R. (2024), "The state of the art of innovation management: insights from a retrospective review of the European journal of innovation management", *European Journal of Innovation Management*, Vol. 27 No. 3, pp. 825-850, doi: [10.1108/EJIM-07-2022-0361](https://doi.org/10.1108/EJIM-07-2022-0361).
- Bernstein, M.J., Nielsen, M.W., Alnor, E., Brasil, A., Birkving, A.L., Chan, T.T., Griessler, E., de Jong, S., van de Klippe, W., Meijer, I., Yaghmaei, E., Nicolaisen, P.B., Nieminen, M., Novitzky, P. and Mejlggaard, N. (2022), "The societal readiness thinking tool: a practical resource for maturing the societal readiness of research projects", *Science and Engineering Ethics*, Vol. 28 No. 1, p. 6, doi: [10.1007/s11948-021-00360-3](https://doi.org/10.1007/s11948-021-00360-3).
- Bischof, A., Kurze, A., Totzauer, S., Storz, M., Lefevre, K. and Berger, A. (2018), "Initiating participation: methodological and practical challenges of living lab projects for early stages of research and development", *Research and Innovation Conference Proceedings*, pp. 381-395, available at: <https://iris.unito.it/retrieve/a1db7669-be09-47f9-ac44-5823afda8460/OLLD18%20Conf%20Proceedings.pdf#page=381>
- Boenink, M. and Kudina, O. (2020), "Values in responsible research and innovation: from entities to practices", *Journal of Responsible Innovation*, Vol. 7 No. 3, pp. 450-470, doi: [10.1080/23299460.2020.1806451](https://doi.org/10.1080/23299460.2020.1806451).
- Brand, T. and Blok, V. (2019), "Responsible innovation in business: a critical reflection on deliberative engagement as a central governance mechanism", *Journal of Responsible Innovation*, Vol. 6 No. 1, pp. 4-24, doi: [10.1080/23299460.2019.1575681](https://doi.org/10.1080/23299460.2019.1575681).
- Campbell, A.D. (2017), "Lay designers: grassroots innovation for appropriate change", *Design Issues*, Vol. 33 No. 1, pp. 30-47, doi: [10.1162/DESI_a_00424](https://doi.org/10.1162/DESI_a_00424).
- Campos, I. and Marín-González, E. (2023), "Renewable energy living labs through the lenses of responsible innovation: building an inclusive, reflexive, and sustainable energy transition", *Journal of Responsible Innovation*, Vol. 10 No. 1, 2213145, doi: [10.1080/23299460.2023.2213145](https://doi.org/10.1080/23299460.2023.2213145).
- Chiaraluce, C.A. and Levine, L. (2024), "Health carework and digital inclusion as super social determinant of health", in Levine, L. (Ed.), *Studies in Media and Communications*, Emerald Publishing Limited, pp. 129-141, doi: [10.1108/S2050-206020240000025005](https://doi.org/10.1108/S2050-206020240000025005).
- Clarke, V. and Braun, V. (2016), "Thematic analysis", *The Journal of Positive Psychology*, Vol. 12 No. 3, pp. 297-298, doi: [10.1080/17439760.2016.1262613](https://doi.org/10.1080/17439760.2016.1262613).
- Cling, J.-P., Eghbal-Teherani, S., Orzoni, M. and Plateau, C. (2020), "The interlinkages between the SDG indicators and the differentiation between EU countries: it is (mainly) the economy", *Statistical Journal of the IAOS*, Vol. 36 No. 2, pp. 455-470, doi: [10.3233/SJI-190507](https://doi.org/10.3233/SJI-190507).
- Coleman, P. (2021), "Validity and reliability within qualitative research in the caring sciences", *International Journal of Caring Sciences*, Vol. 14 No. 3, p. 2041.
- Cyr, G., Pomey, M.-P., Yuan, S. and Dionne, K.-E. (2022), "User engagement in healthcare living labs: a scoping review", *International Journal of Innovation Management*, Vol. 26 No. 10, 2230004, doi: [10.1142/S1363919622300045](https://doi.org/10.1142/S1363919622300045).

- De Blois, M., Lizarralde, G. and De Coninck, P. (2016), "Iterative project processes within temporary multi-organizations in construction: the self-eco-re-organizing projects", *Project Management Journal*, Vol. 47 No. 1, pp. 27-44, doi: [10.1002/pmj.21560](https://doi.org/10.1002/pmj.21560).
- De Saille, S. (2015), "Innovating innovation policy: the emergence of 'Responsible research and innovation'", *Journal of Responsible Innovation*, Vol. 2 No. 2, pp. 152-168, doi: [10.1080/23299460.2015.1045280](https://doi.org/10.1080/23299460.2015.1045280).
- Del Vecchio, P., Elia, G., Ndou, V., Secundo, G. and Specchia, F. (2017), "Living lab as an approach to activate dynamic innovation ecosystems and networks: an empirical study", *International Journal of Innovation and Technology Management*, Vol. 14 No. 5, 1750024, doi: [10.1142/S0219877017500249](https://doi.org/10.1142/S0219877017500249).
- Demers-Payette, O., Lehoux, P. and Daudelin, G. (2016), "Responsible research and innovation: a productive model for the future of medical innovation", *Journal of Responsible Innovation*, Vol. 3 No. 3, pp. 188-208, doi: [10.1080/23299460.2016.1256659](https://doi.org/10.1080/23299460.2016.1256659).
- Domènech, M. (2017), "Democratizing science. A continuing challenge today", Vol. 11 No. 2, pp. y-af, doi: [10.3917/rac.035.0126](https://doi.org/10.3917/rac.035.0126).
- D'Adamo, I., Gastaldi, M. and Morone, P. (2022), "Economic sustainable development goals: assessments and perspectives in Europe", *Journal of Cleaner Production*, Vol. 354, 131730, doi: [10.1016/j.jclepro.2022.131730](https://doi.org/10.1016/j.jclepro.2022.131730).
- ENoLL (2025), "What are living labs, what is ENoLL?", available at: <https://enoll.org/about-us/> (accessed 28 March 2024).
- ERAB (2012), *The new Renaissance: Will it happen? Innovating Europe out of the Crisis: Third and final report of the European Research Area Board*, Publications Office, available at: <https://data.europa.eu/doi/10.2777/84667>
- European Commission: Directorate-General for Research and Innovation (2013), *Options for Strengthening Responsible Research and Innovation : Report of the Expert Group on the State of Art in Europe on Responsible Research and Innovation*, Publications Office: European Commission, p. 78, available at: <https://data.europa.eu/doi/10.2777/46253> (accessed 17 October 2024).
- Evans, J., Jones, R., Karvonen, A., Millard, L. and Wendler, J. (2015), "Living labs and co-production: universities as platforms for sustainability science", *Current Opinion in Environmental Sustainability*, Vol. 16, pp. 1-6, doi: [10.1016/j.cosust.2015.06.005](https://doi.org/10.1016/j.cosust.2015.06.005).
- Farre, A., Fang, M., Hannah, B., Makita, M., McFadden, A., Menezes, D., Rodriguez, A., Sixsmith, J. and M Gray, N. (2023), "Exploring the use of digital technology to deliver healthcare services with explicit consideration of health inequalities in UK settings: a scoping review", *Digital Health*, Vol. 9, 20552076231185442, doi: [10.1177/20552076231185442](https://doi.org/10.1177/20552076231185442).
- Fauth, J., De Moortel, K. and Schuurman, D. (2024), "Living labs as orchestrators in the regional innovation ecosystem: a conceptual framework", *Journal of Responsible Innovation*, Vol. 11 No. 1, 2414505, doi: [10.1080/23299460.2024.2414505](https://doi.org/10.1080/23299460.2024.2414505).
- Følstad, A. (2008), "Living Labs for innovation and development of information and communication technology: a literature review", *Living Labs*, Vol. 10, pp. 99-131.
- Foucault, M. (1994), *The Birth of the Clinic: An Archaeology of Medical Perception*, Vintage Books, New York.
- Fougère, M., Segercrantz, B. and Seeck, H. (2017), "A critical reading of the European Union's social innovation policy discourse: (re)legitimizing neoliberalism", *Organization*, Vol. 24 No. 6, pp. 819-843, doi: [10.1177/1350508416685171](https://doi.org/10.1177/1350508416685171).
- Galway, L.P., Levkoe, C.Z., Portinga, R.L.W. and Milun, K. (2021), "A scoping review examining governance, co-creation, and social and ecological justice in living labs literature", *Challenges*, Vol. 13 No. 1, p. 1, doi: [10.3390/challe13010001](https://doi.org/10.3390/challe13010001).
- Gardezi, M., Abuayyash, H., Adler, P.R., Alvez, J.P., Anjum, R., Badireddy, A.R., Brugler, S., Carcamo, P., Clay, D., Dadkhah, A., Emery, M., Faulkner, J.W., Joshi, B., Joshi, D.R., Khan, A.H., Koliba, C., Kumari, S., McMaine, J., Merrill, S., Mitra, S., Musayev, S., Oikonomou, P.D., Pinder, G., Prutzer, E., Rathore, J., Ricketts, T., Rizzo, D.M., Ryan, B.E., Sahraei, M., Schroth,

- A.W., Turnbull, S. and Zia, A. (2024), "The role of living labs in cultivating inclusive and responsible innovation in precision agriculture", *Agricultural Systems*, Vol. 216, 103908, doi: [10.1016/j.agsy.2024.103908](https://doi.org/10.1016/j.agsy.2024.103908).
- Gaudion, K., Hall, A., Myerson, J. and Pellicano, L. (2015), "A designer's approach: how can autistic adults with learning disabilities be involved in the design process?", *CoDesign*, Vol. 11 No. 1, pp. 49-69, doi: [10.1080/15710882.2014.997829](https://doi.org/10.1080/15710882.2014.997829).
- Goffman, E. (1990), *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates*, 1. Anchor Books ed, Anchor Books, New York, NY, (Anchor books).
- Gudek, L., Rao, M. and Broerse, J. (2025), "Stakeholder engagement in European research and innovation: an investigation into how and why EU R&I projects develop engagement tools", *Open Research Europe*, Vol. 5, p. 107, doi: [10.12688/openreseurope.19907.2](https://doi.org/10.12688/openreseurope.19907.2).
- Hakkarainen, L. and Hyysalo, S. (2013), "How do we keep the living laboratory alive? Learning and conflicts in living lab collaboration", *Technology Innovation Management Review*, Vol. 6, December, pp. 16-23, doi: [10.22215/timreview/749](https://doi.org/10.22215/timreview/749).
- Héder, M. (2017), "From NASA to EU: the evolution of the TRL scale in public sector innovation", *The Innovation Journal*, Vol. 22 No. 2, pp. 1-23.
- Hennink, M.M., Kaiser, B.N. and Marconi, V.C. (2017), "Code saturation versus meaning saturation: how many interviews are enough?", *Qualitative Health Research*, Vol. 27 No. 4, pp. 591-608, doi: [10.1177/1049732316665344](https://doi.org/10.1177/1049732316665344).
- Hodson, E., Svanda, A. and Dadashi, N. (2023), *Whom Do We Include and When? Participatory Design with Vulnerable Groups*, CoDesign, London, pp. 1-18. doi: [10.1080/15710882.2022.2160464](https://doi.org/10.1080/15710882.2022.2160464).
- Hossain, M., Leminen, S. and Westerlund, M. (2019), "A systematic review of living lab literature", *Journal of Cleaner Production*, Vol. 213, pp. 976-988, doi: [10.1016/j.jclepro.2018.12.257](https://doi.org/10.1016/j.jclepro.2018.12.257).
- Hyysalo, S. and Hakkarainen, L. (2014), "What difference does a living lab make? Comparing two health technology innovation projects", *CoDesign*, Vol. 10 Nos 3-4, pp. 191-208, doi: [10.1080/15710882.2014.983936](https://doi.org/10.1080/15710882.2014.983936).
- Irsicaixa (n.d.), "Living lab de salut, Metodologia", available at: <https://www.irsicaixa.es/ca/living-lab-salut> (accessed 28 October 2024).
- Jünger, J. and Fährnrich, B. (2020), "Does really no one care? Analyzing the public engagement of communication scientists on Twitter", *New Media and Society*, Vol. 22 No. 3, pp. 387-408, doi: [10.1177/1461444819863413](https://doi.org/10.1177/1461444819863413).
- Kanstrup, A.M. (2017), "Living in the lab: an analysis of the work in eight living laboratories set up in care homes for technology innovation", *CoDesign*, Vol. 13 No. 1, pp. 49-64, doi: [10.1080/15710882.2016.1146304](https://doi.org/10.1080/15710882.2016.1146304).
- Kesselring, S., Simon-Philipp, C., Bansen, J., Hefner, B., Minnich, L. and Schreiber, J. (2023), "Sustainable mobilities in the neighborhood: methodological innovation for social change", *Sustainability*, Vol. 15 No. 4, p. 3583, doi: [10.3390/su15043583](https://doi.org/10.3390/su15043583).
- Khilnani, A., Schulz, J. and Robinson, L. (2020), "The COVID-19 pandemic: new concerns and connections between eHealth and digital inequalities", *Journal of Information, Communication and Ethics in Society*, Vol. 18 No. 3, pp. 393-403, doi: [10.1108/JICES-04-2020-0052](https://doi.org/10.1108/JICES-04-2020-0052).
- Klaassen, P., et al. (2017), "The conceptualization of RRI: an iterative approach", in Asveld, L. (Ed.), *Responsible Innovation 3*, Springer International Publishing, Cham, pp. 69-92, doi: [10.1007/978-3-319-64834-7_5](https://doi.org/10.1007/978-3-319-64834-7_5).
- Koch, S. (2020), "Responsible research, inequality in science and epistemic injustice: an attempt to open up thinking about inclusiveness in the context of RI/RRI", *Journal of Responsible Innovation*, Vol. 7 No. 3, pp. 672-679, doi: [10.1080/23299460.2020.1780094](https://doi.org/10.1080/23299460.2020.1780094).
- Kulkov, I., Tsvetkova, A. and Ivanova-Gongne, M. (2023), "Identifying institutional barriers when implementing new technologies in the healthcare industry", *European Journal of Innovation Management*, Vol. 26 No. 4, pp. 909-932, doi: [10.1108/EJIM-02-2021-0093](https://doi.org/10.1108/EJIM-02-2021-0093).
- Law, J. (1994), *Organizing Modernity*. 1, publ. Oxford, Blackwell.

- Leminen, S., Nyström, A.G., Westerlund, M. and Kortelainen, M.J. (2016), "The effect of network structure on radical innovation in living labs", *Journal of Business and Industrial Marketing*, Vol. 31 No. 6, pp. 743-757, doi: [10.1108/JBIM-10-2012-0179](https://doi.org/10.1108/JBIM-10-2012-0179).
- Leminen, S., Nyström, A.-G. and Westerlund, M. (2020), "Change processes in open innovation networks – exploring living labs", *Industrial Marketing Management*, Vol. 91, pp. 701-718, doi: [10.1016/j.indmarman.2019.01.013](https://doi.org/10.1016/j.indmarman.2019.01.013).
- Leung, L. (2015), "Validity, reliability, and generalizability in qualitative research", *Journal of Family Medicine and Primary Care*, Vol. 4 No. 3, p. 324, doi: [10.4103/2249-4863.161306](https://doi.org/10.4103/2249-4863.161306).
- Long, T.B., Blok, V., Dorrestijn, S. and Macnaghten, P. (2020), "The design and testing of a tool for developing responsible innovation in start-up enterprises", *Journal of Responsible Innovation*, Vol. 7 No. 1, pp. 45-75, doi: [10.1080/23299460.2019.1608785](https://doi.org/10.1080/23299460.2019.1608785).
- Menny, M., Palgan, Y.V. and McCormick, K. (2018), "Urban living labs and the role of users in Co-Creation", *GAIA - Ecological Perspectives for Science and Society*, Vol. 27 No. 1, pp. 68-77, doi: [10.14512/gaia.27.S1.14](https://doi.org/10.14512/gaia.27.S1.14).
- Mitlin, D., Bennett, J., Horn, P., King, S., Makau, J. and Nyama, G.M. (2020), "Knowledge matters: the potential contribution of the coproduction of research", *European Journal of Development Research*, Vol. 32 No. 3, pp. 544-559, doi: [10.1057/s41287-020-00277-w](https://doi.org/10.1057/s41287-020-00277-w).
- Monteleone, R. (2020), "Forgotten publics: considering disabled perspectives in responsible research and innovation", *Journal of Responsible Innovation*, Vol. 7, sup1, pp. 84-91, doi: [10.1080/23299460.2020.1831366](https://doi.org/10.1080/23299460.2020.1831366).
- Neuberger, S., Paier, M. and Hörlesberger, M. (2024), "The effects of RRI-Oriented roadmapping on the digital transformation of regions", *Journal of Responsible Innovation*, Vol. 11 No. 1, 2414519, doi: [10.1080/23299460.2024.2414519](https://doi.org/10.1080/23299460.2024.2414519).
- Nguyen, H.T. and Marques, P. (2022), "The promise of living labs to the quadruple helix stakeholders: exploring the sources of (dis)satisfaction", *European Planning Studies*, Vol. 30 No. 6, pp. 1124-1143, doi: [10.1080/09654313.2021.1968798](https://doi.org/10.1080/09654313.2021.1968798).
- Nordmann, A. (2014), "Responsible innovation, the art and craft of anticipation", *Journal of Responsible Innovation*, Vol. 1 No. 1, pp. 87-98, doi: [10.1080/23299460.2014.882064](https://doi.org/10.1080/23299460.2014.882064).
- Owen, R., Von Schomberg, R. and Macnaghten, P. (2021), "An unfinished journey? Reflections on a decade of responsible research and innovation", *Journal of Responsible Innovation*, Vol. 8 No. 2, pp. 217-233, doi: [10.1080/23299460.2021.1948789](https://doi.org/10.1080/23299460.2021.1948789).
- Pacifico Silva, H., Lehoux, P., Miller, F.A. and Denis, J.-L. (2018), "Introducing responsible innovation in health: a policy-oriented framework", *Health Research Policy and Systems*, Vol. 16 No. 1, p. 90, doi: [10.1186/s12961-018-0362-5](https://doi.org/10.1186/s12961-018-0362-5).
- Parsons, S., Yuill, N., Good, J. and Brosnan, M. (2020), "'Whose agenda? Who knows best? Whose voice?' Co-creating a technology research roadmap with autism stakeholders", *Disability and Society*, Vol. 35 No. 2, pp. 201-234, doi: [10.1080/09687599.2019.1624152](https://doi.org/10.1080/09687599.2019.1624152).
- Puerari, E., De Koning, J.I.J.C., Von Wirth, T., Karré, P.M., Mulder, I.J. and Loorbach, D.A. (2018), "Co-Creation dynamics in urban living labs", *Sustainability*, Vol. 10 No. 6, p. 1893, doi: [10.3390/su10061893](https://doi.org/10.3390/su10061893).
- Reber, B. (2018), "RRI as the inheritor of deliberative democracy and the precautionary principle", *Journal of Responsible Innovation*, Vol. 5 No. 1, pp. 38-64, doi: [10.1080/23299460.2017.1331097](https://doi.org/10.1080/23299460.2017.1331097).
- Santos Ayllón, L.M., Jenkins, K.E.H. and Kerr, S. (2025), "Justice by design: integrating energy justice and responsible research and innovation (RRI) to deliver just energy futures", *Energy Research & Social Science*, Vol. 125, 103998, doi: [10.1016/j.erss.2025.103998](https://doi.org/10.1016/j.erss.2025.103998).
- Sarmiento, M.P. (2015), "Co-design: a central approach to the inclusion of people with disabilities", *Revista de la Facultad de Medicina*, Vol. 63, No. 3, Sup, pp. 149-154, doi: [10.15446/revfacmed.v63n3sup.49345](https://doi.org/10.15446/revfacmed.v63n3sup.49345).
- Schuurman, D., De Marez, L. and Ballon, P. (2016), "The impact of living lab methodology on open innovation contributions and outcomes", *Technology Innovation Management Review*, Vol. 1 No. 6, pp. 7-16, doi: [10.22215/timreview/956](https://doi.org/10.22215/timreview/956).

- Silander, D. (2020), "The EU and agenda 2030", in Karlsson, C. and Silander, D. (Eds), *Implementing Sustainable Development Goals in Europe*, Edward Elgar Publishing, doi: [10.4337/9781789909975.00005](https://doi.org/10.4337/9781789909975.00005).
- Sorgner, H. (2016), "Challenging expertise: Paul feyerabend vs. harry collins & Robert evans on democracy, public participation and scientific authority", *Studies In History and Philosophy of Science Part A*, Vol. 57, pp. 114-120, doi: [10.1016/j.shpsa.2015.11.006](https://doi.org/10.1016/j.shpsa.2015.11.006).
- Stilgoe, J., Owen, R. and Macnaghten, P. (2013), "Developing a framework for responsible innovation", *Research Policy*, Vol. 42 No. 9, pp. 1568-1580, doi: [10.1016/j.respol.2013.05.008](https://doi.org/10.1016/j.respol.2013.05.008).
- Stirling, A. (2008), "'Opening Up' and 'Closing down': power, participation, and pluralism in the social appraisal of technology", *Science, Technology and Human Values*, Vol. 33 No. 2, pp. 262-294, doi: [10.1177/0162243907311265](https://doi.org/10.1177/0162243907311265).
- Stirling, A. (2024), "Responsibility and the hidden politics of directionality: opening up 'innovation democracies' for sustainability transformations", *Journal of Responsible Innovation*, Vol. 11 No. 1, 2370082, doi: [10.1080/23299460.2024.2370082](https://doi.org/10.1080/23299460.2024.2370082).
- Tabarés, R., Loeber, A., Nieminen, M., Bernstein, M.J., Griessler, E., Blok, V., Cohen, J., Hönlmayer, H., Wunderle, U. and Frankus, E. (2022), "Challenges in the implementation of responsible research and innovation across Horizon 2020", *Journal of Responsible Innovation*, Vol. 9 No. 3, pp. 291-314, doi: [10.1080/23299460.2022.2101211](https://doi.org/10.1080/23299460.2022.2101211).
- Taebi, B., Correljé, A., Cuppen, E., Dignum, M. and Pesch, U. (2014), "Responsible innovation as an endorsement of public values: the need for interdisciplinary research", *Journal of Responsible Innovation*, Vol. 1 No. 1, pp. 118-124, doi: [10.1080/23299460.2014.882072](https://doi.org/10.1080/23299460.2014.882072).
- Tauginienė, L., Butkevicienė, E., Heinisch, B., Massetti, L., Ugolini, F. and Popov, S. (2025), "Making responsible research and innovation meaningful in citizen science", *Science and Public Policy*, Vol. 52 No. 3, pp. 329-342, doi: [10.1093/scipol/scae078](https://doi.org/10.1093/scipol/scae078).
- Tercanli, H. and Jongbloed, B. (2022), "A systematic review of the literature on living labs in higher education institutions: potentials and constraints", *Sustainability*, Vol. 14 No. 19, 12234, doi: [10.3390/su141912234](https://doi.org/10.3390/su141912234).
- Thapa, R.K., Iakovleva, T. and Foss, L. (2019), "Responsible research and innovation: a systematic review of the literature and its applications to regional studies", *European Planning Studies*, Vol. 27 No. 12, pp. 2470-2490, doi: [10.1080/09654313.2019.1625871](https://doi.org/10.1080/09654313.2019.1625871).
- Timmermans, S. and Kaufman, R. (2020), "Technologies and health inequities", *Annual Review of Sociology*, Vol. 46 No. 1, pp. 583-602, doi: [10.1146/annurev-soc-121919-054802](https://doi.org/10.1146/annurev-soc-121919-054802).
- Tran, D.V., Nguyen, P.V., Nguyen, S.T.N., Huynh, T.N. and Ma, K.V. (2024), "Determining the antecedents of digital transformation and performance: the roles of social capital, open social innovation, absorptive capacity and government support", *European Journal of Innovation Management [Preprint]*, Vol. 28 No. 8, pp. 4202-4224, doi: [10.1108/EJIM-08-2024-0917](https://doi.org/10.1108/EJIM-08-2024-0917).
- Van De Poel, I., Asveld, L., Flipse, S., Klaassen, P., Scholten, V. and Yaghmaei, E. (2017), "Company strategies for responsible research and innovation (RRI): a conceptual model", *Sustainability*, Vol. 9 No. 11, p. 2045, doi: [10.3390/su9112045](https://doi.org/10.3390/su9112045).
- Vaughn, L.M. and Jacquez, F. (2020), "Participatory research methods – choice points in the research process", *Journal of Participatory Research Methods*, Vol. 1 No. 1, pp. 1-14, doi: [10.35844/001c.13244](https://doi.org/10.35844/001c.13244).
- Veeckman, C. and Temmerman, L. (2021), "Urban living labs and citizen science: from innovation and science towards policy impacts", *Sustainability*, Vol. 13 No. 2, p. 526, doi: [10.3390/su13020526](https://doi.org/10.3390/su13020526).
- Von Hippel, E. (2001), "User toolkits for innovation", *Journal of Product Innovation Management*, Vol. 18 No. 4, pp. 247-257, doi: [10.1111/1540-5885.1840247](https://doi.org/10.1111/1540-5885.1840247).
- Weiss, D., Rydland, H.T., Øversveen, E., Jensen, M.R., Solhaug, S. and Krokstad, S. (2018), "Innovative technologies and social inequalities in health: a scoping review of the literature", *PLoS One*, Vol. 13 No. 4, e0195447, doi: [10.1371/journal.pone.0195447](https://doi.org/10.1371/journal.pone.0195447).
- Wicher, M.J. and Frankus, E. (2024), "Research governance for change: funding project-based measures in the field of responsible research and innovation (RRI) and their potential for

- organisational learning”, *The Learning Organization*, Vol. 31 No. 5, pp. 738-764, doi: [10.1108/TLO-10-2021-0119](https://doi.org/10.1108/TLO-10-2021-0119).
- Wilkinson, C.R. and De Angeli, A. (2014), “Applying user centred and participatory design approaches to commercial product development”, *Design Studies*, Vol. 35 No. 6, pp. 614-631, doi: [10.1016/j.destud.2014.06.001](https://doi.org/10.1016/j.destud.2014.06.001).
- Winickoff, D.E., Jamal, L. and Anderson, N.R. (2016), “New modes of engagement for big data research”, *Journal of Responsible Innovation*, Vol. 3 No. 2, pp. 169-177, doi: [10.1080/23299460.2016.1190443](https://doi.org/10.1080/23299460.2016.1190443).
- Yaghmaei, E., *et al.* (2024), “Exploring synergies: comparative analysis of technology assessment and RRI in European industrial contexts”, in Grunwald, A. (Ed.), *Handbook of Technology Assessment*, Edward Elgar Publishing, pp. 430-439, doi: [10.4337/9781035310685.00059](https://doi.org/10.4337/9781035310685.00059).
- Zipfel, N., Horreh, B., Hulshof, C.T.J., de Boer, A.G.E.M. and van der Burg-Vermeulen, S.J. (2022), “The relationship between the living lab approach and successful implementation of healthcare innovations: an integrative review”, *BMJ Open*, Vol. 12 No. 6, e058630, doi: [10.1136/bmjopen-2021-058630](https://doi.org/10.1136/bmjopen-2021-058630).
- Zwart, H., Barbosa Mendes, A. and Blok, V. (2024), “Epistemic inclusion: a key challenge for global RRI”, *Journal of Responsible Innovation*, Vol. 11 No. 1, 2326721, doi: [10.1080/23299460.2024.2326721](https://doi.org/10.1080/23299460.2024.2326721).

Further reading

- Chilvers, J., Pallett, H. and Hargreaves, T. (2018), “Ecologies of participation in socio-technical change: the case of energy system transitions”, *Energy Research and Social Science*, Vol. 42, pp. 199-210, doi: [10.1016/j.erss.2018.03.020](https://doi.org/10.1016/j.erss.2018.03.020).
- Guzmán, J.G., del Carpio, A.F., Colomo-Palacios, R. and de Diego, M.V. (2013), “Living labs for user-driven innovation: a process reference model”, *Research-Technology Management*, Vol. 56 No. 3, pp. 29-39, doi: [10.5437/08956308X5603087](https://doi.org/10.5437/08956308X5603087).
- Steen, M., Manschot, M. and Koning, N.D. (2011), “Benefits of Co-design in service design projects”, *International Journal of Design*, Vol. 5 No. 2, pp. 53-60.

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