The translation of the scientific knowledge needs of stakeholders into relevant and usable health research portfolios

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Abstract

Objectives: NECESSARIES* aims to investigate to what extent and in what way the needs for scientific knowledge in health expressed by the different actors translate into research funding priorities and research portfolios useful for solving problems that affect different stakeholders. In particular, NECESSARIES seeks to understand O1) how the demands of the actors are translated and articulated in the research priorities, calls and criteria for the evaluation and selection of health research projects, O2) to what extent the description of research projects research and the content of academic publications correspond to the demands for scientific knowledge of the actors consulted, and O3) which actors use the scientific knowledge generated and how they use it to inform policies and clinical practices and strategies to address health problems.

Methodology: I this project I propose to combine quantitative analysis of funding, publication, social media and policy data with qualitative methodologies for the analysis of institutional documentation and interviews with expert actors, with the goal of understanding the translation of demands for scientific knowledge in health into a supply of knowledge in a diversity of national and institutional settings.

Training: Though this project I will develop and acquire theoretical and methodological skills and knowledge for the quantitative analysis of the interaction between the scientific community and society. This transfer of knowledge will allow me to analyse from a quantitative perspective the response of researchers to the knowledge demands of the actors in a context of multiple demands and the use by the actors of the scientific knowledge generated. Furthermore, I will acquire the skills to manage knowledge co-creation processes with a diversity of stakeholders including end users of scientific knowledge, members of the scientific community and decision makers.

* "NECESSARIES: The translation of the scientific knowledge needs of stakeholders into relevant and usable health research portfolios" is a research proposal submitted to HORIZON-MSCA-2023-PF-01. In this document I share the core of the project (part B-1) and include the Evaluation Summary Report from the peer reviewers at the end.

Part B-1

1. Excellence #@REL-EVA-RE@#

1.1 Quality and pertinence of the project's research and innovation objectives (and the extent to which they are ambitious, and go beyond the state of the art) #@QUA-LIT-QL@#

Research context: The model of scientific self-governance inspired by the essay "Science, the endless frontier" that postulates a science guided by scientific curiosity supported by robust government funding [1] has been questioned for its inability to meet the needs for scientific knowledge of the various sectors of society, particularly in the area of health [2, 3]. The reconciliation of the supply with the demand for scientific knowledge has been proposed as the central objective of public funding policies for research [4]. That is, promote and value the generation of scientific knowledge to the extent that it is relevant and usable for stakeholder decision-making [4]. A second generation of science governance models developed in the 1980s-90s was oriented towards promoting innovation processes that satisfy the technological needs of the industry to promote innovation through economic growth, which together with government institutions become influential actors [5]. But given the failure of this model to generate innovation for global challenges, a third generation seeks the articulation of interdisciplinary and intersectoral efforts aimed at solving the great challenges facing society, such as pandemics or climate change [5, 6]. In general, in these last two generations there is a diversification of stakeholders, with different values, visions and interests, which have acquired greater relevance and power in these new governance models to influence research funding priorities. The translation and articulation of the demands for scientific knowledge in health into relevant and usable research portfolios imply a series of decisions that have to be made about which stakeholders are consulted, what priority is given to the expertise of each stakeholder, what knowledge provided by stakeholders is considered and how to incorporate it in the drafting of calls and in project evaluation and selection guides. Finally, different knowledge users (stakeholders), may value the offer of scientific knowledge as very, little or not relevant to inform their decision-making processes in health, or it may be the case that those stakeholders who find the offer of scientific knowledge relevant are not in a position to make use of it [4, 7].

Objectives: I propose to investigate to what extent and in what way the needs for scientific knowledge in health expressed by the different actors translate into research funding priorities and research portfolios useful for solving problems that affect different stakeholders. In particular, I seek to understand **O1**) how the demands of the actors are translated and articulated in the research priorities, calls and criteria for the evaluation and selection of health research projects, **O2**) to what extent the description of research projects research and the content of academic publications correspond to the demands for scientific knowledge of the actors consulted, and **O3**) which actors use the scientific knowledge generated and how they use it to inform policies and clinical practices. **NECESSARIES goes beyond the state-of-the-art as** it proposes a transdisciplinary approach that integrates, on the one hand, the analysis of the evolution, structure, and articulation of the content of the financed projects, their derived publications, and their societal visibility (news, social networks clinical guidelines and policy documents) through the use of natural language processing (NLP), and, on the other, the systematic analysis of planning documents together with interviews with key actors to evaluate the process of translating the demands for scientific knowledge in health into portfolios of research. The societal visibility data, the institutional information and the interviews with key actors within the health sector will be triangulated to map the ways in which the stakeholders make use of the knowledge generated by the projects. **The importance of the objectives** proposed by NECESSARIES lies in the generation of strategic evidence that allows funding agencies, philanthropic entities and the scientific communities to adequately translate the scientific knowledge needs of the different sectors of society into relevant and usable scientific offers for the co-creation of solutions to health problems, enhancing the resilience of Europe's health systems

1.2 Soundness of the proposed methodology (including interdisciplinary approaches, consideration of the gender dimension and other diversity aspects if relevant for the research project, and the quality of open science practices).

Overall methodology: In NECESSARIES I aim to combine quantitative analysis of funding, publication, social media and policy data with qualitative methodologies for the analysis of institutional documentation and interviews with expert actors, with the goal of understanding the translation of demands for scientific knowledge in health into a supply of knowledge in a diversity of national and institutional settings in Norway, Spain, Sweden and the United

Kingdom, countries where the supervisory team has an extensive and solid policy network. **1)** In order to analyze the translation of the scientific knowledge needs of the different stakeholders consulted into financing priorities I will carry out a critical review of institutional documents to map the priority definition processes and their translation and articulation in institutional planning and evaluation documents as well as criteria for evaluation and project selection guides that instruct researchers in the development of their research projects. The information extracted from the review of the institutional documentation will be contrasted with the information obtained from interviews with experts of the prioritization processes in the analyzed institutions. The experts to be interviewed will come from the research policy network of the academic institutions participating in NECESSARIES and/or that have an institutional link with the supervisor. The experts interviewed will not necessarily have worked for the sources of funding for health research analyzed, but they must have participated in the processes of definition of priorities, institutional planning/evaluation, or have in-depth knowledge of the functioning of the funding agencies analyzed. The interviews will be open and will revolve around the following questions: Which stakeholders are consulted? What priority is given to the expertise of each stakeholder? What knowledge provided by stakeholders is considered? How is this information included in the drafting of research priorities, calls and evaluation and project selection guides? **2)** To determine to what extent the research efforts reflect the commitments made in the calls and in the approved research proposals with respect to satisfaction of the needs of scientific knowledge by stakeholders in the field of health, I will map the evolution of the research portfolios through the analysis of the content of the supported projects and their publications. For the analysis of the content, we will use various comprehensive databases available in-house in Centre for Science and Technology Studies (**CWTS)** of the university of Leiden, in particular the database Dimensions database [8], which articulates the information on research projects, their publications, and their impact in various dimensions, including social media and policy. Both for the projects and for their derived publications, the content analysis will consist of the generation of maps that allow exploring the structure of the content and generating hypotheses about health problems and challenges and the approaches or levels of research around which funded research efforts are articulated [9, 10]. It will also include the analysis of the distribution of terms coded by disease groups and research approaches from which health problems are addressed [11], and classification of projects and their publications via machine learning based on the type of health problems addressed [12]. **3)** For the analysis of the research portfolios of the analyzed institutions, the health challenge will be grouped according to a combination of pathological and etiological criteria into cardiovascular and cardiometabolic diseases, infection diseases, cancers, and mental disorders. The approaches from which health problems are investigated will be grouped by levels of research previously well defined in the scientific literature [13-15] into basic biomedical research, clinical research, epidemiological research, research on health services and research on the social determinants of health. While health interventions related to health projects will be grouped into pharmaceuticals, development of diagnostic and screening tools, surgical interventions, sociocultural and educational interventions, and health policies. **4)** To evaluate the capacity of different actors to incorporate scientific knowledge in the creation of strategies aimed at solving health challenges, I will conduct a cross-citation analysis between articles and policy documents and clinical guidelines in combination with interviews with experts and actors on how stakeholders perceive the usefulness of knowledge to inform the design and implementation of health interventions. This combined approach would include the following steps: a) Using NLP tools to analyze the information contained in the Overton Database [16] on clinical guidelines, social networks, news and policy documents (social visibility), which cite or mention the scientific literature produced to map the patterns of online use of the scientific knowledge generated by the projects. b) To contact and interview and conduct focus groups with stakeholders to explore their perceptions of the ability to make use of the knowledge generated for the design and implementation of health interventions at different levels by asking open questions about their experiences, challenges and successes in incorporating research knowledge.

Integration of methods and disciplines to pursue the objectives: This study sits at the intersection of three areas of scientific inquiry: scientometrics, research policy, and informatics, and demands in-depth knowledge of the spectrum of clinical and health biomedical sciences. In this study, scientometrics allows me to evaluate the impact of financing in the generation of the supply of scientific knowledge. The research policy allows me to analyze the decision-making processes and the knowledge management strategies implemented by health research funding agencies. Informatics contributes to the analysis and integration of various joint sources of information about institutions, projects, publications and their online societal visibility. Finally, the biomedical, clinical and health science knowledge guarantees the correct interpretation of the content analysis of projects and works.

Gender dimension and other diversity aspects: Intersectionality (the overlapping of categories such as gender, sex, ethnicity, age, socioeconomic status, and sexual orientation that combine to inform the identities and experiences of individuals [17]) is a fundamental aspect of NECESSARIES insofar as it impacts the way that the different stakeholders are listened to and in their capacity to benefit from the offer of scientific knowledge. That is,

there are sectors of the population that historically and to this day have not been sufficiently listened to in their needs and demands for scientific knowledge and technologies in health despite the fact that research and innovation processes have an impact on their daily lives [18, 19]. In this sense, the stakeholders mentioned in the research objectives that shape this methodology not only refer to the academic, industrial, and governmental sectors, but also consider the different groups of the population from an intersectionality approach, particularly women, gender and genetic diversities and racial minorities. In NECESSARIES we wonder about the way in which the health demands and needs of women, the LGTB+ community and racial minorities are consulted and translated into an offer of scientific knowledge that is relevant and useful to them. Regarding the possible use, development and deployment of AI systems, it is important to clarify that although NECESSARIES proposes the use of NLP tools, these tools do not fit the definition of AI systems of the European Commission or of the High-Level Expert Group on Artificial Intelligence insofar as they lack their own sensors and executors and require the human assistance of the researcher to operate and make decisions [20]. In addition, the use of NLP tools is limited to exclusively analyzing the content of public information reviewed by peers or that contains the endorsement of institutions of social interest.

Open science practices: The research plan, including data management, will be pre-registered in the Evidence in Governance and Politics (EGAP) repository, while the research results will be pre-published in SocArxiv. We will publish research results in open access peer-reviewed journals, whether specialized in scientometrics such as Quantitative Science Studies (MIT Press) and Publications (MDPI), or multidisciplinary such as PLOS One and Open Research Europe. More importantly, through workshops with the participation of stakeholders and the general public, more readable and useful maps will be co-designed on the research portfolios of the different agencies studied. INGENIO has a long tradition of citizen involvement and a set of methodologies for working with the public.

Research data management and management of other research outputs: There are no defined standards and practices in both qualitative research and scientometrics for handling data in accordance with FAIR principles. The data management and research results plan responds to a set of legal-institutional and epistemic commitments in tension given 1) the qualitative and quantitative nature of the data, 2) the obligation to protect personal and organizational data in accordance with the Europe General Data Protection Regulation (GDPR) and 3) the proprietary nature of the Dimensions and Overton databases. Documentary information from health research funding agencies is public and, in principle, there is no limit to sharing it openly, since they are institutions of public interest and with a commitment to transparency. The data from the interviews with stakeholders and experts must be protected following the guidelines of the GDPR, for which various anonymization and/or pseudonymization tools will be evaluated, seeking a balance that protect the identity of the interviewees while maintaining enough contextual information for effective interpretation. Given the interrelation of documentary and oral sources, in which they mutually provide context and corroborate each other, the anonymization and/or pseudonymization of the data from documentary sources will also be considered to protect the identity of the informants. The data generated along with the bibliographic information of institutional documents, the description of the nature and purpose of the data, and the analysis instruments will be pre-published in tabular format on figshare.com, a repository that allows sharing of data from any discipline in any format and allows generating DOI for persistent identification. Moreover, the data on the funded projects, their publications and their social visibility come from Dimensions and Overton, which are proprietary information sources, so it is not possible to share the data openly. While Dimensions maintains a public commitment to allow free access to its databases for research purposes, Overton does not. In both cases it is necessary to contact the suppliers. To facilitate as far as possible the findability and reusability of the information, the description of the information obtained from these databases, its processing and analysis strategy will be included in detail in the research plan that will be pre-registered in the EGAP repository. The maps generated on the research portfolios of the funding agencies and the social use of the generated knowledge will be previously published in various formats on figshare for possible reuse.

1.3   Quality of the supervision, training and of the two-way transfer of knowledge between the researcher and the host

Qualifications and experience of the supervisor: With more than 13,000 citations (Google Scholar), Pablo D'Este's research on the mechanisms of interactions between actors in science and innovation systems has had a significant impact in the areas of business & management, economics, education research and information science. P. D'Este, the main supervisor of NECESSARIES, has participated as a researcher in more than twenty projects with competitive financing. Eight of these projects are international collaborations with European funding through the Framework Programmes. Of particular interest to NECESSARIES is his recent research on the way in which biomedical researchers respond to the tensions that exist between different demands to achieve greater scientific

impact [21]. This study shows that researchers respond by accumulating legitimacy through their scientific social networks, prominence in the academic community, and direct involvement with the primary beneficiaries of the research [21]. This research is relevant to the first and second research objectives, where we ask ourselves how institutions and researchers translate the knowledge demands of the different stakeholders into scientific supply. Likewise, his recent research on the social visibility of science shows that interdisciplinary collaborations, particularly those involving non-academic actors, are significantly more visible in terms of their mentions in blogs, news, and policy documents [7]. This is related to the third specific research objective on the social visibility of funded research. Regarding his experience as a supervisor of researchers, P. D'Este has directed six doctoral theses, in addition to supervising three fellows of the MSCA program and two postdoctoral researchers within the Juan de la Cierva program of the Spanish government. **Supervisory team:** The main supervisor, P. D'Este, will be accompanied in his mission by a strong team of academics committed to providing knowledge, investigative tools, access to information sources and his political networks. This supervisory team will be made up of Jordi Molas-Gallart at INGENIO, Ismael Rafols and Alfredo Yegros at the CWTS. Professor J. Molas-Gallart, current director of INGENIO, has participated in 44 research projects, nine of them funded by the European Union. With 43 papers indexed in the WoS, J. Molas-Gallart has had a significant influence in the field of innovation policy evaluation, particularly those aimed at responding to the challenges facing society. Of particular importance to NECESSARIES is Molas-Gallart's expertise on the various stakeholder consultation mechanisms in the priority setting process (see [22]). Ismael Rafols, with 78 papers indexed in the WoS, is one of the most cited authors in the social sciences (in the top 0.1% according to the WoS), specifically in the areas of information Science & library science and business & economics. One of his most recent papers on health research agendas illustrates the relevance of I. Rafols' expertise as a member of the supervisory team. In said research, I. Rafols combines scientometric tools with focus groups and interviews to analyze whether the changes in the orientation of the research portfolios in cardiometabolic and mental health respond to the demands expressed by the stakeholders [10]. Alfredo Yegros, senior researcher at the CWTS, is an expert in the use and articulation of scientometric, bioinformatics and epidemiological information sources for the study of knowledge generation and innovation processes in health. [11].

Planned training activities: The training activities for the development of my scientific abilities will consist of continuous weekly work meetings with P. D'Este and/or other members of the supervisory committee throughout the research process. In these meetings, the research activities, concepts and methodologies to be used will be discussed in detail and will be complemented by continuous online communication. In some specific methodological aspects, the members of the supervisory team will manage for me spaces for exchange with specialists within their networks of collaborators. Particularly, it is important to mention that I will carry out a **three-month secondment at the CWTS** where I would receive intensive training and work on the use and management of the Dimensions AI and Overton databases to map the offer of projects, publications and their social impact. In order to transform NECESSARIES into a long-term line of research focused on social participation in science and innovation policies, **I will apply** with the advice and support of P. D'Este and the supervisory **team to at least three different research funding opportunities:** 1) Consolidator Grants from the ERC, 2) Grants for Ramón y Cajal contracts from the Spanish government (AEI), and 3) Grants for hiring researchers with PhDs of excellence to develop R&D projects from the regional government of Valencia. On the other hand, NECESSARIES implies an active work of managing political networks in Norway, Spain, Sweden and the United Kingdom made up of academics, officials and users of the knowledge generated. Throughout NECESSARIES and with the support of the members of the supervisory team, spaces for direct dialogue with the policy networks will be managed, as well as a continuous process of reflection in the work meetings on the interests, needs and values of the people. study participants. It is important to mention that INGENIO has a monthly seminar in the area of collaboration and knowledge co-creation, in which I will actively participate. Likewise, INGENIO is one of the 19 institutions that make up the European Forum for Studies of Policies for Research and Innovation (Eu-SPRI Forum) which seeks to organize the community of researchers working on policy and governance issues in the field of knowledge creation and innovation. During my postdoctoral stay at INGENIO I will participate in the annual conferences and summer schools for postdoctoral researchers organized by the Eu-SPRI Forum. More importantly, **I will participate as assistant supervisor of students from the Doctoral School** of the Universitat Politècnica de València (UPV) working in the innovation policy design & evaluation area of INGENIO.

Two-way transfer of knowledge: Both the members of the supervisory team and I are interdisciplinary researchers who have moved between different areas of knowledge and converge in the field of studies on science, technologies and innovation Additionally, NECESSARIES includes the participation of key actors who report on the knowledge needs in health of the different sectors of society and the process of defining funding priorities. Hence, the notion of a bidirectional flow of knowledge is not adequate to explain the multidirectionality of the knowledge

co-creation process that NECESSARIES implies and in which it will be difficult to determine who transfers what specific knowledge to whom. However, there are some specific issues that may arise in terms of knowledge flows between the applicant and the host institution as described below. **From the host institution to the applicant**: Through teamwork with P. D'Este and I. Rafols, I will develop and acquire theoretical and methodological skills and knowledge for the quantitative analysis of the interaction between the scientific community and society. This transfer of knowledge will allow me to analyze from a quantitative perspective the response of researchers to the knowledge demands of the actors in a context of multiple demands and the use by the actors of the scientific knowledge generated. Moreover, the challenge of analyzing the translation of scientific knowledge demands into funding priorities and research portfolios requires the ability to manage knowledge co-creation processes with a diversity of stakeholders including end users of scientific knowledge, members of the scientific community and decision makers. INGENIO, and in particular its director J. Molas-Gallart, has a long history in the design, implementation and evaluation of projects that involve establishing a dialogue with multiple stakeholders. The supervisory team, particularly professor Molas-Gallart, will accompany me in all the stages of the work with the stakeholders, training me during the first semester of NECESSARIES in the planning, management and conduct of the interviews, as well as in obtaining the approval of the CSIC ethics committee, and the processing and protection of information derived from the dialogue with stakeholders. **From the applicant to the host:** I will transfer to my colleagues at INGENIO a diversity of conceptual and analytical tools for the study of the translation of scientific knowledge needs in health into research portfolios. Throughout my doctoral and postdoctoral research, I have developed a series of scientometric methodologies for the study and modelling of the translation of biomedical knowledge into clinical knowledge, as well as to detect and analyze the emergence of interdisciplinary research areas (see my CV). I also will transfer newly developed methodologies for content analysis of grant-funded health research projects and their derived publications through the combination of various NLP tools. I have applied these new tools for the analysis of philanthropic and government funding for CRISPR research, and for the analysis of funding for health research by the NIH of the United States and FPs of the European Commission (see my CV). Finally, I will transfer skills and methodological tools in analysis and modelling of the structure and dynamics of complex networks in combination with language processing tools applicable to the analysis of societal visibility information.

Rationale and added-value of the non-academic placement: SIRIS Academic, founded in 2010, is a consulting company in the field of education and science that is 100% owned by a non-profit foundation. This company is made up of an interdisciplinary team of experts who, through a combination of qualitative and quantitative methods, have supported the strategic cycle (evaluation, decision-making, and implementation of solutions) of more than 100 organizations, including universities, research centers, government agencies and philanthropic foundations. SIRIS Academic also conducts research and development of NLP tools to analyze institutional portfolios of science, technology and innovation, and semantic and data visualization tools, achieving competitive funding for research projects from the MSCA, ERC, the European Commission and the Spanish government. An important aspect of this company is its commitment to open science, with all of its products being open source. In this sense, the main objective of my placement at SIRIS Academic would consist of exploring the use of sources of information on the portfolios of funded research projects that, unlike Dimensions and Overton databases, meet the requirements and standards of open science and FAIR principles. Through my participation in real projects that meet the needs of clients, I would participate in the development of tools that allow funders and academic organizations to share and replicate their data in a transparent and open manner. On the other hand, SIRIS Academic will collaborate from early stages in the development of methods based on machine learning and NLP to analyze and classify funded projects and their publications according to their research approaches and levels, and the problems they address. A placement in SIRIS will allow me to continue developing these tools and adapting them to the needs of the various institutions that are assisted by the company.

1.4   Quality and appropriateness of the researcher's professional experience, competences and skills

NECESSARIES is the natural continuation of my academic career focused on investigating the processes of knowledge generation and technological innovations in health. I have a solid track record of publication in four different research lines: (1) the analysis of the social process of constructing biomedical knowledge on disease (cervical cancer, Ebola fever and HIV/AIDS) and its relationship to marginalized patient groups, (2) the study of the social process of innovation in nanomedicine (metal nanoparticles and liposomal drugs) and genomic technologies like CRISPR/Cas9 and TALENs, (3) modelling the assembly of interdisciplinary teams in health research institutions and (4) the political economy of knowledge production, focused on the impact of co-funding networks of public, charitable and philanthropic organizations on the processes of generating knowledge in health and technological innovation. Recently, I prepared a report commissioned by the European Parliament on the

current situation of health research in the EU which includes options to increase the coherence and equity of health research efforts in the context of the response to COVID-19 [23]. The preparation of the report required a combination of qualitative methods such as interviews with experts and review of institutional documents with scientometric methodologies. In my most recent research, I analyzed and compared the evolution of the health research funding priorities of the US National Institutes of Health and the European Commission's Framework Programs [24]. In this study, I developed a methodology for content analysis and classification of more than 26,000 funded projects using NLP and machine learning tools. All this experience has allowed me to develop interdisciplinary skills and competencies in the use and management of tools and concepts from scientometrics, complex systems and the social sciences to ask practical questions about how science is done, for whom and how it could be better organized, as well as fundamental questions about democracy and equity in innovation.

2. Impact #@IMP-ACT-IA@#

2.1 Credibility of the measures to enhance the career perspectives and employability of the researcher and contribution to his/her skills development

In order to join an academic institution in an on-track position in my research area, it is not enough to have a track/trajectory of academic publications at the intersection of science, technology and society, but rather I need to strengthen my ability to collaborate with non-academic actors to understand the problems and challenges they face and promote the co-creation of solutions. I also need to strengthen my technical-scientific capabilities in the application of data science to the study of knowledge generation and innovation processes. Likewise, it is important to strengthen my battery of qualitative tools to interview and conduct focus groups with a diversity of stakeholders. Another fundamental aspect is developing the capacity to obtain funding in competitive calls. Even more important is to gain experience in training new researchers as assistant supervisor of doctoral students. **All these new skills will be developed during my stay at INGENIO as well as my secondment at CWTS and placement at SIRIS Academic.** In addition to INGENIO, there are several European research centers that might be interested to recruit a researcher with the professional profile that I will acquire at the end NECESSARIES such as the CWTS, the Nordisk institutt for studier av innovasjon, forskning og utdanning (NIFU) and the Science Policy Research Unit (SPRU) of the University of Sussex which collaborate actively with the INGENIO community. Another equally attractive alternative is to work as a scientific researcher in the consulting industry, specifically in the innovation management and policy sector. Furthermore, INGENIO is particularly interested to incorporate a researcher with the profile that I will acquire at the end of my MSCA postdoctoral project, either through joint application to the European, national and regional funding calls to researchers in the consolidation process, or through an on-track researcher position created with CSIC resources. Moreover, CSIC has an 18-month MSCA postdoctoral fellowship extension program focused entirely on supporting the preparation of an application for funding ERC projects. A placement at SIRIS Academic is essential since I would be directly involved in providing solutions tailored to the needs of clients, whether they are universities, government agencies or philanthropic foundations. The placement at SIRIS Academic would strengthen my ability to collaborate with interdisciplinary teams in the pragmatic application of qualitative and quantitative methods to offer the client the best possible solution in a context of industrial competition. On the other hand, both the research work at INGENIO and the placement at SIRIS Academic will allow me to understand in depth the needs and concerns of a multiplicity of institutional actors, who might be interested in my scientific profile.

2.2 Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities #@COM-DIS-VIS-CDV@#

Communication activities: 1) Cycles of conferences on the role of citizenship in scientific policy in the Casa de la Ciència (the House of Science of CSIC) in the city of Valencia (months 6 and 18). I will present to the public the advantages and challenges that a greater involvement of citizens implies in decision-making in science, technology and innovation policies. Indicators of satisfaction will be obtained through a survey. **2)** Informative notes addressed to the journalistic media about NECESSARIES. With the support of the SCIC Communication and Dissemination Office, notes announcing the scope and scientific and social implications of NECESSARIES will be drafted and sent to the media in the first month of the project. 3) "Scientia: Res Publica" - A monthly bilingual podcast on science policy and society. A monthly podcast with English and Spanish versions on the intersection of science, politics and society. Aimed at the general public, presenting interesting and relevant aspects related to NECESSARIES and the intersection of disciplines that provide context. Every month during the entire duration of NECESSARIES.

Dissemination activities: 1) Project website. Oriented to the academic community and end users and other stakeholders. From the beginning of NECESSARIES, a website will be created and constantly updated with the description of the project, the profile of its participants and links to all the products that are generated from the project. **2) INGENIO seminar.** Oriented to the INGENIO academic community. It allows receiving criticism and suggestions at an intermediate stage of the project. **3) Conference papers** will be presented at **20th ISSI conference** (Yerevan, Armenia, Summer 2025) and **Eu-SPRI Annual Conference 2026**. They are the main academic forums in the areas of quantitative studies in science, science and innovation policies, respectively. **5) Oral and written presentation of results addressed to the funding agencies studied.** As of month 20 of the project, a customized brief report will be delivered to funding agencies in plain language setting out the implications of the results, along with a set of observations and suggested policy options. Oral presentations will be scheduled for clarifications and discussing possible future collaborations. **6) Two research papers submitted to peer-review journals.** The first paper will report the results of the qualitative/quantitative analysis of the priority setting processes and their impact on the content of funded projects and their publications. The most appropriate journals would be *Health Research Policy and Systems*, *PLOS One* and *Open Research Europe*. The other paper will report the results of the analysis on the use of the scientific knowledge. This paper will be submitted to a specialized journal like *Quantitative Science Studies*. **Peer-reviewed Policy brief published in *F1000Research*.** At the end of NECESSARIES, a Policy Brief will be published in *F1000Research* reporting the main research findings in an integrated and synthetic manner, as well as a series of policy options aimed at ensuring that the interests and concerns of stakeholders are reflected in the funded research projects and their publications. **Exploitation activities:** P**roduct development.** During the stay at SIRIS Academic, it is It is planned to integrate monitoring tools on open source web-based platforms developed by SIRIS in its projects. These tools will mine health literature databases, patent offices, and government websites among other sources to extract, process, and integrate open information on the social impact of funded research. **Engagement and collaborative research with end users and policymakers.** The idea is that the platform adjusts and evolves based on the technological demand of SIRIS customers who will participate in its continuous development and implementation through a collaboration network INGENIO, SIRIS Academic and the CWTS. **Strategy for the management of intellectual property, foreseen protection measures:** The tools developed to meet the needs of stakeholders, funding agencies and SIRIS customers will be protected through a European Union Public License (EUPL) which guarantees open access to both the proposed development and subsequent work while complying with the European legislation.

2.3. The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts

NECESSARIES has a scientific and social impact through three key impact pathways: **Creating high-quality new knowledge.** This project will contribute to one of the most central discussions in the intersection of science, technology and society: the reconciliation of the supply and demand of scientific knowledge. This goal will be achieved through a novel approach that understands the translation of the needs of knowledge of society and research portfolios as an interdisciplinary and intercultural communication process which can be studied through the use of qualitative methods of documentary analysis, interviews and focus groups in combination with computational tools for qualitative analysis of the content of projects and scientific literature. The research results are expected to be highly novel and relevant justifying at least two peer-reviewed papers, which fit well within the editorial scope of several academic journals such as *Qualitative Science Studies* or *Health Research Policy and Systems*. **Fostering diffusion of knowledge and open source:** As mentioned in the open science practices section, all the knowledge generated including the research plan, the papers reporting the final results and the policy brief will be disseminated openly, while the applications and tools co-created in SIRIS Academic will be open source allowing others to reuse the methodologies, information and tools generated in NECESSARIES. The project is entirely oriented to **strengthening the uptake of research and innovation in society** through a set of strategies described above and among which the following stand out: co-creation processes that take place in interviews and focus groups with stakeholders, the co-design of the maps and the online platform with the assistance of the public, the reports directed to the research funding agencies, the policy brief at the end of the project and the podcast "Scientia: Res Publica."

#§COM-DIS-VIS-CDV§#

3.   **Quality and Efficiency of the Implementation** #@QUA-LIT-QL@# #@WRK-PLA-WP@#
#@CON-SOR-CS@# #@PRJ-MGT-PM@#

3.1   Quality and effectiveness of the work plan, assessment of risks and appropriateness of the effort assigned to work packages
Overall structure of the work plan, including deliverables (D) and milestones (M).

WP0-Project management: The objective of WP1 is to ensure the efficient development of NECESSARIES, as well as the correct compliance with the norms and standards of scientific practices through the following activities: Pre-registration of the project in EGAP **(D1)**. Evaluation and endorsement of the SCIC ethics committee for conducting and analyzing interviews, focus groups and co-creation activities with stakeholders **(D2)**. The **data management plan (D3)**. Planning, recruitment, information and hosting of interviewees **(M1)** and focus groups **(M2)**, as well as obtaining informed consent, respectively. Monthly meetings to evaluate project progress with the supervisory team.

WP1-Qualitative analysis of the processes of defining research funding priorities. The objective of WP2 is to analyze the translation of the scientific knowledge needs of the different stakeholders consulted into funding priorities through the following steps: Compilation and critical analysis of relevant institutional documentation on priority definition processes **(M3)**. Interviews with key actors with expert knowledge on the processes of definition of priorities **(M4)**. Triangulation of information, and classification, comparison, and mapping of the institutional processes for defining priorities **(M5)**.

WP2-Quantitative analysis of the content of funded projects and derived publications. The objective of the WP3 is to determine to what extent the research efforts reflect the commitments made with the satisfaction of the knowledge needs of the stakeholders, through the following steps: Qualitative analysis of the content of the financed projects listed in Dimensions **(M6)**. Scientometric and content analysis of derived publications **(M7)**. Co-creation of maps of the supply of scientific knowledge **(M8)**. Collective analysis of the balance of supply and demand for scientific knowledge **(M9)**.

WP3-Analysis of the social visibility of the knowledge generated and its use by stakeholders. The objective of WP4 is to analyze the ability of stakeholders to incorporate scientific knowledge in the creation of strategies aimed at solving health challenges through the following steps: Analysis of the social visibility of derived publications using the Overton database and NLP **(M10)**. Focus groups with stakeholders to explore their perceptions of the ability to make use of the knowledge generated for the creations of solutions to health problems **(M11)**.

WP4-Communication activities and public involvement. The objective of WP5 is not only to inform citizens of the scope and implications of NECESSARIES, but also seeks to contribute significantly to the construction of a culture of full citizen involvement in science through the following activities: Informative note to news media about the new project **(D4)**. *"Scientia: Res Publica"*- A monthly bilingual podcast on science policy and society **(D5-D34)**. Two cycles of conferences in the *Casa de la Ciencia* **(D35 and D36)**.

WP5-Dissemination activities and exploitation of results. The objective of WP6 is to enhance the scientific and social impact of NECESSARIES through the following activities: Project website **(D37)**. 1 INGENIO seminar **(D38)**. Two Conference papers will be submitted to 20th ISSI conference **(D39)** and Eu-SPRI Annual Conference 2026 **(D40)**. **Plan for the dissemination and exploitation (D41)**. Two research papers submitted to open peer-review journals **(D42 y D43)**. Oral and written presentation of results addressed to the funding agencies studied **(D44)**. Peer-reviewed Policy brief **(D45)**. Integrate monitoring tools on open source web-based platforms developed by SIRIS in its projects **(D46)**.

WP6-Professional development. The objective of WP7 is to develop my research profile as a highly competitive researcher in the process of consolidation through the following activities: **Mobility declaration (D47)**. **Career development plan (D48)**. Weekly work meetings with main supervisor and/or other members of the supervisory team **(Wm)**. Three-month secondment at the CWTS to receive training on the use and management of the Dimensions and Overton databases and novel scientometrics methods **(S).** Application to regional **(D49)**, national **(D50)** and European **(D51)** research funding opportunities. Participation in INGENIO monthly seminar **(Sem)**. Participation in the 2025 and 2026 annual conferences and summer schools for postdoctoral researchers organized by the Eu-SPRI Forum. Co-supervisor of students from the Doctoral School of the UPV **(DS)**. Placement at SIRIS Academic. **Evaluation questionnaire (D52)**.

Timing of the different work packages.

Gantt Chart. D=deliverables, M=milestones, P=placement, S=secondment. The coloring of the cells indicates activity related to the respective work packages.

	1st year												2nd year												3rd year
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
WP0	D1		D2	D3	M1											M2									
WP1				M3		M4	M5																		
WP2								M6	M7	M8		M9													
WP3															M10		M11								
WP4									D5-D34																
WP4	D4							D35										D36							
WP5		D37										D38	D39										D40	D41	
WP5																				D42		D43	D44	D45 D46	
WP6	D47				D48	D49			D50					S						D51					
WP6										Wm, Sem, DS															
S																									
P																									

Mechanisms in place to assess and mitigate risks: The progress of the project will be monitored continuously, meeting every week with the main supervisor or a member of the supervisory team, reporting in writing to the rest of the members the conclusions of each meeting. I will also meet with the INGENIO management and support team once every two months to evaluate the administrative aspects of the project. The main project risks identified are the following: **1) Delay in obtaining endorsement from the CSIC ethics committee** (WP0; **low likelihood**). Mitigation and contingency measures: At the time of being notified of the result of the MSCA Fellowship, we will begin in advance the preparation and procedures to obtain the endorsement of the CSIC ethics committee. We will elaborate the request with the highest level of quality possible to reduce the possibility of it being returned to us requiring major revisions. We will rely on Prof. J. Molas-Gallart from the supervisory committee who is an expert in this type of procedures and on the specialized technical team at INGENIO and at the CSIC level. In the event of failure to obtain the approval of the ethics committee within the scheduled time, work will begin on the analysis of institutional documents, projects and papers while addressing the committee's observations and recommendations. **2) Low diversity of participants in interviews and/or focus groups** (WP1 & 3; **high likelihood**). Mitigation and contingency measures: Recruitment is based on participants' interest in generating evidence that improves the ability of funding agencies to promote research portfolios that are relevant and usable for society. That is why it is essential to clearly inform potential participants of the implications and scope of the project and how their participation can help improve the status by expressing their experience, visions, interests and concerns. Recruitment efforts will be supported by the policy networks of the members of the supervisory team and the institutional resources of INGENIO-CSIC and the CWTS. A brief questionnaire will be made to the guests inquiring about their reasons for participating or not in the interviews or focus groups. These activities will be online and may allow participation anonymously. The reasons for those who did not want to participate will be addressed and adjustments will be made as necessary to diversify participation. An online questionnaire aimed at underrepresented sectors that allows information to be collected anonymously will remain open at least during the first year of research. The composition of the participants will be clearly reported and taken into account at each step of the project. **3) Incomplete or outdated information on projects and publications in Dimensions and/or Overton** (WP2 & 3, high likelihood). Mitigation and contingency measures: The information contained in Dimensions about the projects comes from the information published by the same funding agencies as well as what is extracted from the publications metadata. It is therefore feasible to go to the original sources, measure the missing information and correct it. Regarding the scientometric information contained in Dimensions about the publications, other databases contain information that connects publications and projects through what is reported in the acknowledgments section of the papers. Such is the case of WoS, which has this information systematized and to which access is available from both the CWTS and the CSIC, allowing the information in Dimensions to be complemented. Finally, information on the visibility or social impact of publications contained in Overton overlaps with information from Dimensions in the categories relevant to the analysis: policy documents, clinical guidelines, news and social networks. Therefore, the lack of information from one source can be complemented by another. **4) Failure to win any of the three calls for research funding contemplated in the project.** (WP6; high likelihood). Mitigation and contingency measures: Taking into account that we plan to apply for very competitive calls (ERC, AEI and Generalitat Valenciana) the chances of winning one of these opportunities are low. I will count on the experience of the supervisory team and the support of the staff of the CSIC international programs area to improve the quality of the applications. Furthermore, CSIC has an 18-month MSCA postdoctoral fellowship extension program focused entirely on supporting the preparation of an application for funding ERC projects.

3.2   *Quality and capacity of the host institutions and participating organisations, including hosting arrangements*

INGENIO-CSIC functions as a highly autonomous academic department organized around five subject areas, with NECESSARIES located at the intersection of "Collaboration and Knowledge Co-creation," and "Policy Design and Evaluation." At INGENIO, I will have my own office and work alongside other INGENIO researchers in a collaborative and congenial environment. Besides the mentoring and guidance of my supervisory team, INGENIO will contribute my career development of the candidate by a senior researcher making available the necessary technical and physical infrastructure to conduct NECESSARIES. INGENIO is a mixed research center that is simultaneously part of the CSIC, the larger public research organization in Spain, and the Polytechnic University of Valencia (UPV). This institutional framework will allow me to have access to the support services and infrastructure of both institutions. Belonging to the UPV allows me to have access to teaching opportunities and to supervise doctoral students, as well as access to bibliometric databases (such as the Web of Science or Scopus) and specialized journals. Furthermore, the UPV is part of the Network of Valencian Universities for the promotion of Research, Development and Innovation, which is a EURAXESS Center that promotes opportunities for their professional development and facilitates their mobility and their families. On the other hand, the CSIC received the HR Excellence in Research logo, in recognition of the institution's commitment to developing a human resources strategy for researchers, to reinforce its alignment with the Charter & Code principles. The CSIC has a successful talent attraction and retention policy, being the main institution receiving MSCA funding, offering in my case support at all stages of implementation of the action, in addition to an MSCA fellowship extension program aimed at prepare my application for an ERC grant. On the other hand, CWTS-Leiden is one of the most prestigious research centers in the world in the application of data science and complex systems in the study of knowledge generation and innovation. The participation of CWTS researchers in NESSESARIES will allow me to receive specialized training in these methodologies, as well as access databases such as Dimension and Overton and computer tools for their processing and analysis. Finally, SIRIS is made up of an interdisciplinary team of experts from twelve different countries in fields ranging from archaeology to astrophysics, and philosophy to biology. The way of working in SIRIS is highly horizontal, forming ad hoc work teams according to the challenges of the institutions that request its services, in addition to reserving part of the time and resources for the R&D of tools that facilitate access, analysis, integration. and representation of scientific knowledge. In that sense, I would collaborate with ad hoc teams on projects that work at the intersection of science and health, while working with the support of SIRIS experts in exploiting the results of NECESSARIES.

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#§CON-SOR-CS§# #§PRJ-MGT-PM§# #§QUA-LIT-QL§# #§WRK-PLA-WP§#

Proposal Evaluation Form

	EUROPEAN COMMISSION Horizon Europe Framework Programme (HORIZON)	**Evaluation Summary Report - Postdoctoral Fellowships**

Call:	HORIZON-MSCA-2023-PF-01
Type of action:	HORIZON-TMA-MSCA-PF-EF
Proposal number:	101151590
Proposal acronym:	NECESSARIES
Duration (months):	24
Proposal title:	The translation of the scientific knowledge needs of stakeholders into relevant and usable health research portfolios
Activity:	EF-SOC

N.	Proposer name	Country	Total eligible costs	%	Grant Requested	%
1	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	ES	181,152.96	100.00%	181,152.96	100.00%
	Total:		181,152.96		181,152.96	

Abstract:

NECESSARIES aims to investigate to what extent and in what way the needs for scientific knowledge in health expressed by the different actors translate into research funding priorities and research portfolios useful for solving problems that affect different stakeholders. In particular, NECESSARIES seeks to understand O1) how the demands of the actors are translated and articulated in the research priorities, calls and criteria for the evaluation and selection of health research projects, O2) to what extent the description of research projects research and the content of academic publications correspond to the demands for scientific knowledge of the actors consulted, and O3) which actors use the scientific knowledge generated and how they use it to inform policies and clinical practices and strategies to address health problems.

NECESSARIES aims to combine quantitative analysis of funding, publication, social media and policy data with qualitative methodologies for the analysis of institutional documentation and interviews with expert actors, with the goal of understanding the translation of demands for scientific knowledge in health into a supply of knowledge in a diversity of national and institutional settings.

Through NECESSARIES, the researcher will develop and acquire theoretical and methodological skills and knowledge for the quantitative analysis of the interaction between the scientific community and society. This transfer of knowledge will allow me to analyze from a quantitative perspective the response of researchers to the knowledge demands of the actors in a context of multiple demands and the use by the actors of the scientific knowledge generated. Furthermore, the researcher will acquire the skills to to manage knowledge co-creation processes with a diversity of stakeholders including end users of scientific knowledge, members of the scientific community and decision makers.

Evaluation Summary Report

Evaluation Result

Total score: 79.20 % (Threshold: 70 /100.00)

Criterion 1 - Excellence

Score: **4.20** (Threshold: 0 / 5.00 , Weight: 50.00%)

- **Quality and pertinence of the project's research and innovation objectives (and the extent to which they are ambitious, and go beyond the state of the art).**
- **Soundness of the proposed methodology (including interdisciplinary approaches, consideration of the gender dimension and other diversity aspects if relevant for the research project, and the quality of open science practices).**
- **Quality of the supervision, training and of the two-way transfer of knowledge between the researcher and the host**
- **Quality and appropriateness of the researcher's professional experience, competences and skills.**

Strengths
- The relevance of the research and innovation objectives is very good, being scientifically and societally relevant in examining how scientific knowledge in the health domain is produced and used, and the role of different stakeholders in this process.

- The research questions and objectives are reasonably precise, and in this sense they are measurable and achievable.

- In general, the methodology is convincingly described with much detail and comprises a sequence of logical and well-considered research processes, both qualitative and quantitative.

- The highly ambitious research is truly interdisciplinary, and justifies well the need for, and integration of, disciplines including scientometrics, research policy, informatics, and clinical/biomedical sciences.

- The gender dimension is very good, as intersectional forms of discrimination and epistemic injustice are recognised as significant. Suitable measures are taken to ensure gender and other diversity aspects are acknowledged and accounted for.

- Open science practices are fully aligned with current best practice guidelines and exemplary in their extent and expected reach.

- The proposed AI deployment consists of using Natural Language Processing (NLP) tools for analysing information retrieved from research databases. Since no personal data will be processed, it is technically robust.

- The researcher will be guided by an excellent and outstanding supervisory team that matches the proposal very well. The supervisory team has an excellent a track record and is sufficiently experienced in supervising researchers.

- The variety and quality of training opportunities are excellent, especially with regards to scientific processes.

- The rationale of the non-academic placement is very well justified. Its added value for the proposed work is appropriate and significantly enhances the quality, scope and expected reach of the proposal.

- The researcher's CV is very good with a sufficient record of publications, attained grants, conference presentations, and teaching experience.

- All in all, the researcher's professional experience is highly relevant to the proposed work and mostly convincing.

Weaknesses
- The proposal does not provide a sufficiently strong justification for how it will significantly advance the state of the art, and the complexity and local variety of health across Europe remains underexplored.

- The mechanisms by which there will be transfer of knowledge to and from the researcher are not convincingly articulated.

Criterion 2 - Impact

Score: **3.60** (Threshold: 0 / 5.00 , Weight: 30.00%)

- **Credibility of the measures to enhance the career perspectives and employability of researchers and contribution to their skills development.**
- **Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities.**
- **The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts.**

Strengths

- The researcher makes a compelling, very detailed justification for how the new skills they would acquire through the proposal would contribute towards their future research career.

- Together with the training received during the secondment and the non-academic placement, the planned training activities will contribute to the future career of the researcher by addressing important skills gaps. The considerable extension of the collaboration with non-academic actors through secondment and non-academic placement, will significantly enhance the researcher's career prospects.

- The proposal presents a very ambitious and detailed dissemination, exploitation and communication plan that identifies appropriately various, well considered target groups, adequate channels, and messages.

- A relevant strategy for the management and protection of intellectual property is very briefly and sufficiently described.

Weaknesses

- In terms of public engagement, there is little evidence of two-way public engagement, and the proposal may not be communicated in the most effective way in terms of expected outcomes.

- The impacts of results on society beyond the end of the proposal are not well elaborated, with insufficient consideration of mechanisms for translating and endorsing the findings to ensure they have either immediate or enduring impact.

- The expected scientific impacts are outlined in broad terms and their magnitude and importance are not sufficiently well explored, making it difficult to identify tangible and notable benefits.

Criterion 3 - implementation

Score: **3.90** (Threshold: 0 / 5.00 , Weight: 20.00%)

- **Quality and effectiveness of the work plan, assessment of risks and appropriateness of the effort assigned to work packages.**
- **Quality and capacity of the host institutions and participating organisations, including hosting arrangements.**

Strengths
- The work plan is coherent with sufficient detail and contains all required information about tasks, relevant milestones, deliverables and timing.

- In general, the proposal presents an appropriate risk management plan that identifies most of the research and administrative risks that might endanger the proposed work alongside suitable mitigations.

- The quality of the hosting arrangements, the integration of the researcher in the institution, and all required support services available to the researcher, are described in sufficient detail.

- The host organisation has good infrastructure, logistics and facilities at their disposal.

- The organisation for the non-academic placement has all capacity required for the proposed research and training. The infrastructure is good, and provides important extra facilities necessary for the proposal.

Weaknesses
- The activities in the different research work packages are insufficiently detailed and it remains unclear whether efforts assigned are appropriate for all tasks. The efforts assigned to the qualitative analysis of some tasks is not sufficient and the relationship between the time allocated to research and dissemination activities is not well justified in the proposal.

- The Gantt chart does not provide a good overview due to formatting problems and remains inconsistent and lacking in clarity.

- A minor weakness is that risks arising from the recruitment of interviewees, and respective workload, are not appropriately considered.

Scope of the application

Status: **Yes**

Comments (in case the proposal is out of scope)
Not provided

Exceptional funding

A third country participant/international organisation not listed in the General Annex to the Main Work Programme may exceptionally receive funding if their participation is essential for carrying out the project (for instance due to outstanding expertise, access to unique know-how, access to research infrastructure, access to particular geographical environments, possibility to involve key partners in emerging markets, access to data, etc.). (For more information, see the HE programme guide)

Please list the concerned applicants and requested grant amount and explain the reasons why.

Based on the information provided, the following participants should receive exceptional funding:
Not provided

Based on the information provided, the following participants should NOT receive exceptional funding:
Not provided

Use of human embryonic stem cells (hESC)

Status: **No**

If YES, please state whether the use of hESC is, or is not, in your opinion, necessary to achieve the scientific objectives of the proposal and the reasons why. Alternatively, please state if it cannot be assessed whether the use of hESC is necessary or not, because of a lack of information.
Not provided

Use of human embryos

Status: **No**

If YES, please explain how the human embryos will be used in the project.
Not provided

Activities excluded from funding

Status: **No**

If YES, please explain.
Not provided

Do no significant harm principle

Status: **Not applicable**

If Partially/No/Cannot be assessed please explain
Not provided

Exclusive focus on civil applications

Status: **Yes**

If NO, please explain.
Not provided

Artificial Intelligence

Status: **Yes**

If YES, the technical robustness of the proposed system must be evaluated under the appropriate criterion.

Overall comments

Not provided