

Developing health research impact assessment in Italy: the case of the Piedmont Region

GUIDO RESANI¹, GUGLIELMO PACILEO^{2,3}, ERICA PICASSO^{1,2,3}, ANTONIO MACONI^{3,4}, MARTA BETTI^{3,4},

ANNALISA ROVETA^{3,4}, VALERIA DOMENICA TOZZI⁵, FRANCESCA UGO^{3,4}, GLORIA SPATARI^{2,3,6}, ANNA ODORE¹

¹Department of Public Health, Experimental and Forensic Medicine, University of Pavia, Pavia, Italy; ²Local Health Authority of Alessandria, Alessandria, Italy; ³DAIRI (Department of Integrative Activities for Research and Innovation); ⁴SS. Antonio e Biagio e Cesare Arrigo University Hospital of Alessandria, Alessandria, Italy; ⁵SDA Bocconi School of Management, University of Milan, Italy; ⁶Department of Health Sciences (DISSAL), University of Genoa, Genoa, Italy

Keywords

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Summary

Background. Research Impact Assessment (RIA) is complex and still in the process of being defined. The most appropriate RIA framework should be selected and adapted according to the context and the specific purpose.

The real challenge is experimenting with RIA and sharing the findings with the scientific community.

Italy has a National Health System in which the Regions are granted with significant legislative authority in the healthcare sector.

The Piedmont Region has a healthcare system based on 12 Local Health Authorities (LHA) and six autonomous public hospitals.

The Piedmont Region has entrusted DAIRI (Department of Integrative Activities for Research and Innovation), an interinstitutional department of the Alessandria LHA and Alessandria Hospital, with the task of monitoring regional health research.

Aims. This study aims to identify an RIA framework that can be applied to health research organisations in Alessandria Province and subsequently at the regional level.

We aim to disseminate the results of these evaluations to contribute to the advancement of RIA within the scientific community and initiate a continuous RIA process.

Methods. We approached the study in two phases. First, a literature review to identify a range of frameworks suitable for our context; second, a focus group to determine the most appropriate framework from this pool.

Findings, discussion and conclusion. Since adopting an existing framework requires tailoring it to the specific needs of the research organisation, we decided to select the framework proposed by Banzi et al. (2011) and adapt it to the context in which DAIRI operates.

Background

The need to optimize the results of research investments is increasingly pressing. Hence, there is a growing interest in developing and applying processes for measuring the impact of research [1].

This work aims to identify a framework to conduct a research impact assessment (RIA) to be applied to health research organizations in the Italian Piedmont Region.

Frameworks are valuable in RIA to collecting, organising, and analysing data, providing methodological guidance, and offering the possibility to compare the impact of research across different disciplines, institutions, and countries [1].

RIA employs mixed methods and multiple data sources to examine the research process to maximise its societal and economic impacts, such as intellectual property, spin-out companies, health outcomes, public understanding and acceptance, policy-making, sustainable development, social cohesion, gender equity, cultural enrichment, and other benefits [1]. Frameworks utilising associated measures are also helpful in informing impact categories. The term “research impact” refers to any output of research activities that can be considered a “positive

return” for the scientific community, health systems, patients, and society in general [2, 3]. It also refers to any identifiable benefit to or positive influence on the economy, culture, public policy or services, health, environment, quality of life, or academia [4].

The York Research Impact Statement describes research impact as “...when the knowledge generated by our research contributes to, benefits and influences society, culture, our environment and the economy” [5].

For the ARC (Australian Research Council), Research Impact is the contribution that research makes to the economy, society, environment, or culture beyond the contribution to academic research [6].

Organization for Economic Co-operation and Development’s (OECD) Development Assistance Committee’s (DAC) definition of impact: “Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended” [7].

UK Research and Innovation (UKRI) defined the impact as “an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia” [8].

US National Science Foundation (NSF) defines broader

impacts as the potential to benefit society and contribute to achieving specific, desired societal outcomes [9].

RIA practice is still in its creation and definition phase; therefore, there are no internationally validated and approved standards and procedures despite the development and dissemination of several RIA methodological frameworks worldwide [1].

Nevertheless, significant work has been done on Research Assessment: The Declaration on Research Assessment (DORA) recognises the need to improve how scholarly research outputs are evaluated. DORA is a worldwide initiative covering all scholarly disciplines and all critical stakeholders, including funders, publishers, professional societies, institutions, and researchers [10].

Five experts have proposed ten principles for measuring research performance to support researchers and managers: the Leiden Manifesto for Research Metrics [11].

The impact of research is complex to analyse; it is not linear, often difficult to predict, involves different processes, individuals, and organisations, and can be observed in the short, medium, and long term [1, 3, 4, 12]. Generally, RIA is *ex post*, while it is also essential to have an *ex ante* evaluation [2, 4].

In RIA, there is a widespread tendency to “count what can be easily measured” rather than measuring what “matters” in terms of more significant and lasting changes [3, 13].

Traditional academic indexes of research productivity assessment (such as the number of articles produced, journal impact factors, citations, research funding, and estimation measures) are widely used but primarily measure the dissemination of research findings rather than their impact [4].

These measurements hardly allow us to fully evaluate the results of the research [14] and are not sufficient to fully determine its value, as they say little about the advantages it brings to the system in which it is applied [3]. Therefore, there is a growing interest in RIA on the systems that constitute the world in which we live beyond the individual academic world [1].

There is no consensus on systematic approaches to conducting RIA [1, 2, 4], but there is growing consensus about the need for principles/guidelines [1] and on using mixed methods and multiple data sources; no RIA tool has proven superior, and we do not know enough about the influence of health research on broad systems such as health policy and practice [3].

Conducting RIA takes a considerable amount of time and resources, and attributing specific contributions to the impact of research, transaction costs, and administrative burdens associated with collecting and analysing data is challenging. Collecting standard metrics is of significant value but can be time-consuming, resource-intensive, and challenging; two characteristics are fundamental in the development of standard metrics: burden and value. It is also essential to take into account the credibility of frameworks, which can have a significant impact on their effectiveness [2-4, 12, 15-18].

We have identified many experiences worldwide that

have institutionalised the RIA process through various methodologies [1]. We anticipate increasing interest in it.

The Research Excellence Framework (REF) is the system for assessing the excellence of research in UK higher education providers. Its objectives are to provide accountability for public investment in research and produce evidence of the benefits of this investment; to provide benchmarking information and establish reputational yardsticks for use in the higher education sector and for public information; and to inform the selective allocation of funding for research [19].

Australia’s national research assessment is ERA (Excellence in Research for Australia), administered by the ARC. It identifies and promotes excellence in research in Australia’s higher education institutions through comparisons with international benchmarks. ERA aims to promote excellence, inform decisions, demonstrate quality, and enable comparisons. No ERA evaluation round will not be conducted in 2023 because the ARC will develop a plan to transition ERA to a modern, data-driven approach [20].

In the Netherlands, VSNU (Association of Universities in the Netherlands), KNAW (Royal Netherlands Academy of Arts and Sciences), and NWO (Netherlands Organisation for Scientific Research) are responsible for the quality of research at their institutions. As part of their quality assurance cycle, all academic research in the Netherlands is evaluated every six years. The executive board of the relevant university, the board of NWO, or the board of KNAW commissions the research assessment and determines which research units will be evaluated each year. To coordinate the assessment, all research organisations associated with VSNU, KNAW, and NWO use the Strategy Evaluation Protocol (SEP). The main goal of a SEP evaluation is to assess a research unit in light of its aims and strategy [21].

In the United States, the NSF funds scientists and engineers in charge to conduct research that advances discovery and innovation.

The NSF funds scientists and engineers to perform research aimed at advancing discovery and innovation. The agency also expects the work of researchers to have broader impacts: the potential to benefit society and contribute to achieving specific, desired societal outcomes [22].

As the range of RIA methods expands, it is crucial to select the most appropriate method for the various contexts (and purposes) in which RIA must be conducted [12]. Numerous frameworks for RIA and several reviews in the literature help elucidate its advantages and limitations. However, we have found few examples of RIA practice published in scientific journals (perhaps because many look at RIA as “an administrative duty rather than a research activity” [2]). Thus, the primary challenge for research organisations is to practically adapt and experiment with RIA approaches within their context and to share their findings with the scientific community [1-3, 12, 15].

THE ITALIAN AND PIEDMONT REGION CONTEXT

Italy has a National Health System (NHS) established in 1978. In 1992 and 1993, the government approved the first reform of the NHS (Legislative Decrees 502/1992 and 517/1993), devolving healthcare powers to the Regions, along with a parallel delegation of managerial autonomy to public hospitals and Local Health Authorities (LHA). In 2001, with the amendment to Title V of the Italian Constitution, the Regions were further entrusted with the legislative power in the health field [23].

The Piedmont Region is the second-largest region in Italy, located in north-west of the Country. The health system within the region is based on 12 LHAs, which aim to protect and promote public health in their respective areas, as well as six autonomous public hospitals.

National Institutes for Scientific Research (IRCCS) conduct research activities in the biomedical field and the organisation and management of health services. They also provide high-specialty hospitalisation and care services or carry out other activities characterised by excellence. The Ministry of Health is responsible for the supervision and control of IRCCS; Regions are responsible for the legislative and regulatory functions related to the assistance and research activities carried out by the Institutes. The establishment of new IRCCS must align with the health planning of the Region (and with European regulations regarding research organisations). The entity seeking recognition as an IRCCS submits an application to the Region, which then reviews and, if appropriate, forwards the application to the Ministry of Health. The Minister of Health appoints an evaluation commission and submits the documentation to the State-Regions Conference for approval. Following an agreement with the President of the relevant Region, the Minister of Health approves the request by decree [24].

In our case, the Piedmont Region, through the Regional Council of 18 May 2021 No. 10-3222, mandated the Alessandria LHA and Alessandria Hospital to establish the IRCCS for environmental diseases and mesothelioma and assigned DAIRI the task of leading the process. DAIRI is an interinstitutional department of the Alessandria LHA and Alessandria Hospital.

In March 2022, a resolution by the Piedmont Region identified DAIRI as the coordinating and supporting infrastructure for the regional “governance” of clinical and biomedical research, ensuring organisational homogeneity and proper functioning of these activities through the promotion and integration of research and innovation programmes of the Regional Health Authorities (RHAs).

In order to promote research and innovation as a condition for excellence in the Italian National Health Service, it was necessary to establish an integrated and coordinated “research system,” at the level of the Piedmont Region, aimed at ensuring organisational homogeneity and proper functioning of research activities by fostering a higher level of governance, integration, collaboration, and coordination among the RHAs.

Methods

We pursued the study objective in two steps. First, we carried out a literature review to identify a pool of frameworks suitable for the needs of our context. The inclusion criteria were restricted to reviews published in English between 2012 and 2022 to ensure access to synthesized, high-level evidence of pre-validated models. Primary studies were excluded unless cited by the selected reviews as foundational. Furthermore, grey literature was intentionally excluded to prioritize peer-reviewed methodological rigor, ensuring that the starting point for regional governance was based on internationally recognized standards. Secondly, we used a focus group (composed of the DAIRI board) to identify the most appropriate one to use among this pool of frameworks.

The literature review took place in June-July 2022 by searching for the terms: “research impact”, “research impact assessment”, “research impact evaluation”, “health research impact”, “health research impact assessment”, “health research impact evaluation” using the PubMed and Embase biomedical research archives, as well as search engines such as Google.

We selected the literature published between 2012 and 2022 to obtain the most recent data.

We considered only reviews published in English, analysing titles and abstracts.

To identify an RIA framework to be applied to our context, we chose the reviews that selected and described the most used and widespread RIA frameworks.

The reviews that have turned out to be more exhaustive in this regard are one systematic review [4] and three narrative reviews [3, 12, 15] that have been read in full text and analysed.

We evaluated the citations reported, and we have selected one review [2], one guideline for conducting RIA processes [1], three RIA frameworks [14, 25, 26], as well as four publications on organizational experiences of the impact of research and its evaluation [16, 17, 27, 28].

The authors of two reviews [2, 4] describe a pool of existing RIA frameworks and propose their framework.

To achieve our purpose, we selected the frameworks proposed by two reviews [2, 4] and the three frameworks identified by the systematic review [4] as more [14, 25, 26] (Tab. I).

Consequently, we shared the literature analysis results with the focus group.

Findings

Adam et al. [1] proposed a guideline for RIA applicable to all research disciplines articulated in ten points that suggest: 1) analyse the context, 2) reflect continuously on your purposes, 3) identify stakeholders and their needs, 4) engage with stakeholders early on in the process, 5) choose conceptual frameworks critically and use when appropriate, 6) use mixed methods and multi-data sources, 7) select indicators and metrics

Tab. I. Table of Frameworks Comparison.

Framework	Description	Categories of Impact Assessment
Assessing the impact of healthcare research: A systematic review of methodological frameworks	Analyses 24 research impact evaluation frameworks, obtaining a framework based on 5 categories with related subcategories; The 5 categories describe the impact of the research and are grouped by timeline (Short, Medium and Long Term Impact)	<ol style="list-style-type: none"> 1. Primary research-related impact 2. Influence on policy-making 3. Health & health systems impact 4. Health-related & social impact 5. Broader economic impacts
Conceptual frameworks and empirical approaches used to assess the impact of health research: an overview of reviews	Adaptation of the CAHS Framework through a review of reviews. It includes five categories of research impact and offers a series of indicators for each domain. Results are obtained using bibliometric analysis, surveys, audits, document review, case studies, panel evaluation, and impact of the research in question on management decisions	<ol style="list-style-type: none"> 1. Advancing Knowledge 2. Capacity Building 3. Informing policies and product development 4. Health and health sector benefits 5. Economic and social benefits
Research Impact Framework	Developed in the UK from the union of 12 works, the Framework is applied by researchers as a guide for semi-structured interviews aimed at identifying the impact of their research. It is built around four impact categories, within each of which further subcategories are identified	<ol style="list-style-type: none"> 1. Research-related impact 2. Policy impact 3. Service impact 4. Societal impact
The Health Service Research Impact Framework	Framework developed in Australia, which derives from the union of three frameworks. It provides a system for monitoring research, the nature and level of impact of research to ensure that health service policies and programs are based on rigorous evidence. The results are obtained by analysing data, administrative databases, bibliometric data plus, possibly, surveys of individuals or groups relevant to the evaluation. It has 4 categories of impact assessment.	<ol style="list-style-type: none"> 5. Research – related Impact: “<i>Advancing knowledge</i>” 6. Policy impact: “<i>Informing decision making</i>” 7. Service Impact: “<i>Improving health and health systems</i>” 8. Societal Impact: “<i>Creating broad social and economic benefit</i>”
Framework Canadian Academy of Health Sciences (CAHS)	Built by a group of international experts, approved by 28 Canadian bodies and refined with public consultation. It allows a careful evaluation of the context and consideration of the impacts in five categories, for each category a set of metrics and measures is offered. The CAHS can be used to track impacts within any of the four “pillars” of health research (basic biomedical, applied clinical, health services and systems, and population health or within domains that cross these pillars) and at various levels (individual, institutional, regional, national or international).	<ol style="list-style-type: none"> 1. Advancing Knowledge 2. Capacity Building 3. Informing Decision Making 4. Health Impacts 5. Broad Economic and Social Impacts

responsibly, 8) anticipate and address ethical issues and conflict of interest, 9) communicate results through multiple channels, 10) share your learning with the RIA community. The guidelines help anyone who wishes to perform RIA in any scientific field at any level of assessment. Rivera et al. [4] reviewed and analysed twenty-four RIA frameworks [14, 25, 26, 29-39] and then propose their framework that identifies five categories of research impact subdivided into sub-categories: primary research-related impact, influence on policy-making, health and health systems impact, health-related and societal impact, and broader economic impact. We found a description of these frameworks and a table with a category/sub-category of impact. This table gives an immediate and intuitive picture of the completeness of each framework regarding the topics covered. The framework proposed five impact categories in a timeline (short, medium, and long-term impact); this allows us to consider the elements and metrics for a prospective impact assessment in the design phase of a study. The authors also state that literature supports collecting other forms of impact besides academic indicators. The impact of research on complex systems is more challenging to measure. It takes time for the impact of research to occur, and different processes, individuals,

and organizations are involved. It is also essential to have an ex-ante assessment of the impact of research with early stakeholder involvement and well-designed dissemination. No evaluation tool is the best, and the most appropriate for a given study will depend on the needs of stakeholders.

The proposed framework allows researchers to select its components and create a tool to facilitate the study's optimal design and maximise its impact. Using a multidimensional approach is helpful. Among the frameworks analysed, we selected those able to address a more significant number of impact categories/sub-categories, *i.e.*, Research Impact Framework [14], Health Services Research Impact Framework [25], and Framework proposed by the Canadian Academy of Health Sciences (CAHS) [26].

In the narrative review of Milat et al. [3], authors extrapolated from the literature thirty-one primary studies and one systematic review and described the three most representative frameworks [2, 14, 29]. Among these, we selected and analysed for our work the Research Impact Framework [14] and the framework proposed by Banzi et al. [2], as well as a work describing the implementation of the CAHS framework in a Canadian research organization [17].

The authors of this review point out that using mixed methods to assess impacts is crucial. Governments point out that research quality metrics are insufficient to determine its value because they say little about the benefits it brings in the real world. RIA should regularly involve end-users of research in addition to researchers. Research often takes a long time to reveal its impact, and there is a low propensity to publish RIA results in scientific journals.

The revision of Greenhalgh et al. [12], starting from the analysis of revisions and publications, selected six RIA tools and proceeded with a description of them; among these, there are also the Research Impact Framework [14] and the CAHS Framework [26] used for the development of our work. Authors state that narrative accounts are needed when exploring less directly attributable aspects of the research-impact link and that short-term RIA is simpler than long-term RIA. They argue that in RIA, it is essential always to find the compromise between quality and completeness and, in addition to developing impact assessment methods, also to put them into practice.

The revision of Kamenetzky et al. [15] argues that many RIA frameworks and tools exist. Still, how organizations practice this activity is unknown and unshared. It aims to describe the experiences of research organizations in putting RIA activities into practice by combining the analysis of published RIA examples [16, 27, 28, 40, 41] with interviews with RIA professionals. They state that theoretical and conceptual RIA models abound, and the research organization's challenge is to adapt and experiment with practical RIA approaches in their context. This review guides research organizations preparing to run RIA: 1) get set up, 2) work together, and 3) recognize benefits. Among references for this review, we selected and analysed two articles [16, 27] and a guideline for the RIA [1] because they are relevant to our work.

In the revision of Banzi et al. [2], the authors included twenty-two publications from four systematic reviews and fourteen primary studies and also gave a qualitative description of ten popular RIA frameworks, including the Research Impact Framework [14]. They developed a framework derived from the CAHS framework with five impact categories: Advancing knowledge, Capacity Building, Informing Policies and Product Development, Health and Health Sector Benefits, and Economic and Social Benefits. They proposed each category's indicators, data collection methodologies, and application levels. It indicated which existing evaluation models support the specific impact category and the advantages and disadvantages for each. The authors state that RIA is evolving and focuses on 1) theoretical frameworks and models to assess research impact concerning multidimensional and integrated categories, 2) methodological approaches to the evaluation exercise, and 3) the development of valid and reliable indicators and metrics. They also state that a shared and complete framework is not available and that multidimensional frameworks seem adequate. Planning RIA and carrying it out simultaneously with developing research programs is helpful.

The Research Impact Framework by Kuruvilla et al. [14] was born from the union of twelve works and consisted of a guide to carry out semi-structured interviews to be submitted to researchers to help them assess the impacts of their research [3, 12]. It identifies four impact categories with sub-categories: 1) Research-related impacts, 2) Policy impacts, 3) Service impacts (health and intersectoral), and 4) Societal impacts.

The Health Service Research Impact Framework by Buykx et al. [25] comes from the union of three frameworks, including the Research Impact Framework [14]. They identify four impact categories with sub-categories: Advancing knowledge, informing decision-making, improving health and health systems, and creating broad social and economic benefits. They worked through mixed methodologies. They described the audience involved in the specific categories. They divided the impact evidence into active dissemination, *i.e.*, the efforts made by researchers to disseminate research to the target audience, and uptake, *i.e.*, how much the target audience has received and actively uses the research results. Authors say that data requiring qualitative and quantitative assessments are more challenging to measure than others.

The framework proposed by the Canadian Academy of Health Sciences (CAHS) [26] is an adaptation of the Payback Framework [29], which takes a more remarkable account of the various nonlinear influences involved in health research systems [12]. It comes from an international group of experts, endorsed by twenty-eight Canadian stakeholder bodies, and refined through public consultation [12]. This framework divides the impact of research into five categories: advancing knowledge, capacity building, informing decision-making, health impacts, and broad economic and social impacts. Each category has sub-categories, metrics, and measurement methods. Users are encouraged to tap into it flexibly to suit their needs [12] best. It is a complete framework that, in addition to providing impact categories, also provides indications on what data to analyse and how to collect this data.

Searles et al.'s RIA approach [27] proposes a framework that, in addition to the impact of the research, allows for evaluating and predicting the translation of the research, which is considered a prerequisite for having an impact. The RIA approach of Rubio et al. [16] describes the development of a methodology to [1] generate potential metrics, [2] define and operationalize the most promising metrics, and [3] assess the feasibility of collecting data for the metrics. We find six categories for fifteen metrics: Clinical Research Processes, Careers, Services, Economic Return, Collaboration, and Products. This project represents the verification of the feasibility of the three metrics of the first category. It turned out that all those who are interested must clearly define metrics; it is helpful to test metrics on a few institutions; data collection takes a long time: some are easy to collect, while others are difficult; context variables are crucial; wanting to manage too many metrics can make the work impossible; when developing metrics, it is critical to

consider the burden and value of them, focusing on high-value metrics whose collection represents a low burden; it is essential to work dynamically using a formative assessment methodology; collecting data across multiple institutions is difficult.

Alberta Innovates Health Solutions has developed and applied a framework based on the CAHS framework [17]. The authors say the process has taken much time and resources. Data acquisition and reporting are challenging, and developing common, shareable, and applicable data standards throughout the research cycle is helpful. In addition to traditional scientific indicators, it is beneficial to include measures of greater interest to the broader community of stakeholders while challenging: the benefits to society are difficult to measure directly. Many think that the CAHS Model proved helpful; it is flexible enough to be customized to the needs of an organization, offers a practical guide to carry out RIA, and can be applied at multiple levels. The framework appropriately assesses the impacts on the entire spectrum of health research. Implementing the impact framework has changed how the AIHS monitors and evaluates its investments in research.

MEETING WITH THE FOCUS GROUP

We shared the literature review results with the DAIRI experts (focus group). We provided them with the elements to decide whether to adopt an existing evaluation framework or create an ad hoc one. Considering that adopting an existing framework requires adapting it to the needs of the research organization, we agreed to choose the Banzi et al. Framework [2] and to proceed by shaping it to the reality in which DAIRI operates for an RIA on research organizations in the province of Alessandria.

Discussion

It is increasingly important to evaluate the impact of health research. However, it is not simple to link research to its impact because the factors that characterize it are multiple and interconnected, and research results can emerge slowly and be absorbed gradually [2, 4].

Short-term impacts are more easily attributed; long-term effects are more complex and sometimes impossible to grasp [12]; so, especially for those, the possibility of *ex-ante* evaluation is essential.

It is necessary to plan for conducting RIA, and it is suggested that policymakers have an early involvement in the research project, together with a good dissemination strategy. Interactions between stakeholders and researchers from the early stages of the research process are essential [4].

RIA should also involve end-users and users/organizations engaged in the research and network analysis. It should assess multidimensional impacts using mixed methodologies. Therefore, in addition to bibliometric and econometric methods, for example, interviews with researchers and intermediate/end users of research, peer evaluations, case studies, surveys,

analysis of documents, databases, and others [1, 3].

Considering that no RIA tool has proven superior, the most appropriate framework for a study should be chosen based on the context and the specific purpose [1, 4]. Beyond its intrinsic adaptability, the selection of the Banzi et al. framework over alternatives like CAHS or RIF was driven by its superior operational balance. While the CAHS framework provides an exhaustive list of metrics, its implementation in a regional system like Piedmont one is likely to impose a prohibitive administrative burden. Conversely, while the Research Impact Framework (RIF) is excellent for qualitative narratives, it lacks the structured indicators necessary for institutional benchmarking. The Banzi framework was selected because it bridges this gap: it provides five clear impact categories with specific indicators and data collection methodologies already mapped, offering a 'turnkey' structure that minimizes transaction costs while maintaining multidimensional depth.

It is crucial to use selected categories for each specific field and to choose a time frame appropriate to the research type and the impact size; it should also be as flexible and adaptable as possible [2].

We can say that choosing a framework with multidimensional and integrated categories is crucial to carrying out an RIA and developing valid, reliable, and practical methodological approaches, indicators, and metrics.

For a multidimensional RIA, it is necessary to find the right balance between completeness and feasibility [3]. This balance implies considering many stakeholders and identifying the proper impact categories for each field. Using mixed methods of survey and adapting the frameworks according to the evaluation is crucial. Finally, it is requested to identify the right metrics, also considering the specific organisations' possibilities (it is helpful to test the metrics on a small sample) [16].

Many RIA frameworks are from the literature, but few publications describe their application. This fact is negatively affecting RIA development.

Conclusion

This work aimed to support DAIRI in identifying and selecting an RIA Framework for research organizations in the Alessandria Province and Piedmont Region. At the regional level, the Health Directorate set up a working group with the regional health organizations' research representatives. The aim was to share with them both the RIA literature review and the results of the first RIA activity carried out by DAIRI in Alessandria Province to apply the framework at the regional level in the future.

For several reasons, the RIA at the regional level requires an incremental approach. It allows a progressive adaptation of the selected framework to the organizations' needs. It also gives time to find the resources and involve the stakeholders. It helps to select the optimal metrics for the evaluation's best cost/benefit ratio.

We aim to disseminate the results of these evaluations to

contribute to the growth of the RIA process within the scientific community and to establish a continuous RIA process at the regional level.

A critical first step in realizing the goal of promoting research and innovation within the Regional Health Services has been the mapping of the research activities of Piedmont's Hospitals and LHAs, carried out through a survey conducted by all eighteen Piedmont's Hospitals and LHAs (Twelve Local Health Authorities, three Public Hospitals, three university hospital authorities), which collected research organization, research results (publications, clinical trials, funding, and collaborations), research infrastructure and research training.

The mapping revealed the need to centralize and coordinate the organizational aspects of research, which is also being addressed through the creation and operation of working groups dedicated to the development of research areas deemed priorities for the Regional Health Services, the implementation of a shared training system on health research, networking to increase the system's ability to attract funding, a biobanking network and the role of research administrators.

Our research was helpful to DAIRI in building the mapping of regional health research activities for the year 2022. The detailed results of this mapping will be the subject of subsequent dissemination activities.

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Conflicts of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' contributions

GR: performed the literature review, was one of the two main contributors in writing the manuscript, and presented the findings to the focus group; GP: performed the literature review, was one of the two main contributors in writing the manuscript and gave the results to the Focus group; EP: performed the literature review; AM: took part in the focus group as responsible of DAIRI; MB: contributed to developing the conclusions of the paper; AR: took part in the focus group as affiliated to DAIRI; VDT: contributed to developing the conclusions of the paper; FU: took part in the focus group as affiliated to DAIRI; GS: revised and edited the paper; AO: contributed to developing the conclusions.

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Correspondence: Gloria Spatari. Clinical Governance, Quality, Research Unit (Local Health Authority of Alessandria - ASL AL), Via Venezia 6, 15121 Alessandria (AL). E-mail: drgloriaspatari@gmail.com

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