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Abstract: This report contains findings emerging from an online survey to research infrastructures (RIs) managers. The survey was specifically addressed to collect evidence on the experience of RIs in carrying out/being involved in socio-economic impact assessment as well as on the practices and the approaches used by RIs for data collection and monitoring. It also addressed the main challenges faced. Overall 191 valid and complete responses were collected and processed. These results will contribute to the development of a conceptual framework for the Impact Assessment model (Deliverable 3.2).





Document Revision History

| Date | Version | Author/Editor/Contributor | Summary of main changes |
|------------|---------|---|--|
| 07.03.2018 | 0.1 | Gelsomina Catalano (CSIL) | A first draft of the questionnaire is circulated amongst the RI-PATHS partners. |
| 15.03.2018 | 0.1 | Ildiko Ipolyi, Emily DeYoung Becker (ESF) | Preliminary comments and revisions are suggested by ESF on the structuring of the questionnaire and on the classifications to be used in terms of typologies and scientific domains better known to the Research Infrastructures (RIs). |
| 3.04.2018 | 0.2 | Gelsomina Catalano (CSIL) | A second draft of the questionnaire is circulated amongst the RI-PATHS partners. |
| 11.04.2018 | 0.2 | Gelsomina Catalano, Silvia Vignetti (CSIL), Alasdair Reid, Elina Griniece, Jelena Angelis (EFIS) Ildiko Ipolyi, Emily DeYoung Becker (ESF) Henning Kroll (Fraunhofer ISI) | RI-PATHS partners discuss the overall design of the survey, its objectives and the most effective channels to be used for its dissemination (e.g. social media, e-mails, etc.). It is agreed that the questionnaire should include a brief introduction explaining the rationale of this survey and its added value as compared to previous surveys recently launched on the same topic. Focusing on the content of the questionnaire, the second version includes questions asking about the typologies of indicators and metrics used by RIs for measuring impacts. These questions are considered useless because of their overlapping with previous surveys (e.g. OECD) and therefore deleted. It is agreed that the main objective of the survey is to gather a more general evidence on the existing practices and needs for carrying out socio-economic impact assessments. |
| 16.04.2018 | 0.3 | Gelsomina Catalano (CSIL) | A third draft of the questionnaire is circulated amongst the RI-PATHS partners. |
| 30.04.2018 | 0.3 | Silvia Vignetti (CSIL), Elina Griniece, Jelena Angelis (EFIS) Ildiko Ipolyi, Emily DeYoung Becker (ESF) Henning Kroll, Andrea Zenker and Torben Shubert (Fraunhofer ISI) Gaston Garcia (ALBA) | RI-PATHS partners provide their comments and revisions on the third draft of the questionnaire (e.g. improving wording of the questions, add clarifications on the terminology used, improve the format of the survey by using mostly closed-ended questions, mandatory questions, etc.) |
| 07.05.2018 | 0.4 | Gelsomina Catalano (CSIL) | A fourth draft of the questionnaire is circulated amongst the RI-PATHS partners. |
| 11.05.2018 | 0.4 | Gelsomina Catalano (CSIL), Ildiko Ipolyi, Emily DeYoung Becker (ESF) | They discuss the fourth draft of the questionnaire and its structure on the on-line platform (by using SurveyMonkey software). A first proof-reading of the questionnaire is carried out by ESF. |
| 19.05.2018 | 0.5 | Gelsomina Catalano (CSIL), Ildiko Ipolyi, Emily DeYoung Becker (ESF) | They carry out preliminary tests of the on-line version of the questionnaire, discussing revisions to the wording and the format of some questions. |



| | | | |
|---------------------------|-----|--|---|
| 30.05.2018 | 0.6 | Gelsomina Catalano (CSIL), Ildiko Ipolyi, Emily DeYoung Becker (ESF) | They fine-tune the on-line questionnaire according to previous discussions and invite all the RI-PATHS' partners to join the testing phase before the official launch of the survey in order to check the clarity of the questionnaire and the proper functioning of the on-line system (e.g. launching, collection of the responses, etc.) |
| 04.06.2018 | 0.6 | Alasdair Reid, Elina Griniece (EFIS) Silvia vignetti (CSIL) Henning Kroll (Fraunhofer ISI) Gaston Garcia (ALBA) Johannes Gutleber (CERN) Andrew Smith and Corinne Martin (ELIXIR) | They provide their feedback from the testing phase by suggesting minor revisions and adjustments to improve the readability and clarity of the on-line questionnaire. |
| 11.06.2018 | 07 | Gelsomina Catalano (CSIL), Ildiko Ipolyi, Emily DeYoung Becker (ESF) | They fine-tune the on-line questionnaire according to the comments provided by the RI-PATHS partners. The survey is launched by ESF to the RIs included in the MERIL database. All the RI-PATHS partners support the dissemination of the survey through different channels (e.g. social media, other RIs contacts, etc.). |
| 31.07.2018 | 08 | Gelsomina Catalano (CSIL) and Zuzana Dostalova (ESF) | Preliminary results of the survey are processed and circulated amongst partners. |
| 20.08.2018 | 10 | Gelsomina Catalano (CSIL) and Zuzana Dostalova (ESF) | The survey is closed. Finale results processed and circulated amongst partners. |
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| 8.10.2018 | 18 | Gelsomina Catalano (CSIL) | Revising report on the basis of comments provided by the Advisory Board. |



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List of abbreviations used in this document

| Abbreviation | Meaning |
|--------------|---|
| EC | European Commission |
| ESFRI | European Strategy Forum on Research Infrastructures |
| GSF - OECD | Global Science Forum - Organisation for Economic Co-operation and Development |
| H2020 | Horizon 2020 |
| IA | Impact Assessment |
| KPIs | Key Performance Indicators |
| MERIL | Mapping of the European Research Infrastructure Landscape |
| OECD | Organisation for Economic Co-operation and Development |
| RIs | Research Infrastructures |



Executive summary

This report presents the findings emerging from an **online survey targeting research infrastructures (RIs)**. Along with 35 interviews with relevant stakeholders, this survey fits with the activities planned under Work Package 3 of the RI-PATHS project and specifically of Task 3.3 - Identification of needs, whose objective is to map the existing needs and challenges for carrying out socio-economic impact assessment. Findings from these activities will be used for the development of the Impact Assessment model.

The survey was specifically addressed to catch the RIs perspective on this issue and more in details to collect evidence on their experience in carrying out/being involved in socio-economic assessment, on the practices and the approaches used for data collection and monitoring and on the main challenges faced. For the purpose of this survey, socio-economic impact assessment was meant as any attempt (e.g. including measure, quantify or simply describe) to assess the impact of RIs on the economy and/or society.

Overall **191 questionnaires were collected between June and August 2018**, by relying on different dissemination channels, such as email invitation to RIs included in the MERIL database¹, social media (e.g. Twitter, LinkedIn, etc.), relevant RI initiatives and projects as well as networks of the RI-PATHS partners.

The sample of respondents is as follows. They are mostly EU-based: 83% of responses are from RIs located in 23 EU countries with a prevalence from Czech Republic and Germany. The sample **reflects different fields of actives**, including RIs acting in more than one field (49% of respondents) and mostly in the following four domains: Biological and Medical Science; Physics, Astronomy, Astrophysics and Mathematics; Environmental Science; Chemistry and Material Science. According to the international accepted classification, it is **mostly represented by single-sited RIs (103 RIs selected this option)**, followed by distributed, virtual and mobile. By referring to the RI-PATHS taxonomy (developed in the framework of Deliverable 3.1) - which focuses on the type of research activities carried out - the sample results are mostly composed of facilities providing scientific services (48%); other respondents distribute themselves almost equally amongst other categories. The majority of respondents are in operation from more than 10 years (45%) and have undertaken (overall 72%) or planned (11%) major updates. This sample represents existing RIs in a rather good way.

Responses provided by this sample have allowed to draw the **following main findings**:

- Overall, **40% of respondents have some experience with socio-economic impact assessment**. They equally distribute between those regularly carrying it out and those having some experience of measuring impacts.
- Amongst those respondents without any experience of socio-economic impact assessment, **there is evidence of RIs which have already considered its advantages and are planning to do it in the future (24%)**. Only a relative minor percentage of respondents (26%) has not yet thought about doing it.

¹ <https://portal.meril.eu/meril/>.



- **The need to comply with formal procedures for funding applications** is amongst the most common **external reasons** which have been driving the engagement of respondents in socio-economic impact assessment.
- **Socio-economic impacts assessment has been driven also by internal reasons.** These include mostly internal initiatives for strategic evaluation and reporting. It is comparatively less justified by the need to ensure public accountability.
- In the majority of cases, the socio-economic impact assessment has been carried out internally with RIs resources while **in few cases it has been externally contracted to an external consultancy/experts.** Amongst the aspects which have been analysed for measuring impacts, there are mostly **scientific outputs of RIs and education and skills improvement of young researchers spending a period at RIs.**
- Overall, most of the respondents who have an experience with socio-economic impact assessment (49 out of 77) report that **such kind of exercise had some consequences for the RIs,** mostly affecting the funding conditions, the evaluation/reporting practices and the management of RIs. Benefits from a reputational nature have been comparatively less evident.
- The reporting practices mostly rely on the collection of key performance indicators (KPIs), 49% of respondents. However, overall a **relatively significant share of respondents is used to collect indicator data (31%) or core impact indicator (9%) which are relevant for impact assessment purposes.** A small percentage of respondents collect data for accounting purposes (13%).
- **A systematic procedure for data collection and monitoring has been adopted by 48% of respondents** while another significant share (31%) has established some rules. A further 9% of respondents is considering the condition for implementing this procedure in the future.
- **Responsibilities with data collection and monitoring amongst RIs are mixed.** Both centralised (a department within the RI is charged with this task, 31% of respondents) and decentralised (each department collects its own data, 26%) approaches are in use. Alternative emerging practices adopted by respondents include the use of ad-hoc collection campaigns (20%) and collection of data regarding only financial data (11%).
- **Surveys on users' satisfaction are regularly performed for the purpose of data collection.** Other activities are found to be less frequently carried out or carried out only on an *ad-hoc* basis. **Surveys on taxpayers' willingness to pay are very rarely done.**
- Data collection and monitoring is mostly challenged by the lack of resources followed by the lack of systematic procedure.
- According to respondents' self-evaluation, **scientific and senior research as well as young generation of scientists and professionals** are the users which mostly benefit



from the activities carried out by the RIs: 95% and 88% of respondents assess very relevant their activity for these two groups, respectively.

In addition to the above issues, the survey also asked respondents about their opinion on the RI-PATHS taxonomy. Interestingly, **60% of respondents find that the RI-PATHS taxonomy proposed for the classification of RIs fits well with their purpose.** The remaining 40% suggest some improvements/face some difficulties in classifying its activity. These are mostly respondents whose activities can be described by combining more than one category, although prioritising is to some extent possible.



1. Background

There is a growing awareness about the need to engage in systematic exercises of socio-economic impact assessment of Research Infrastructures (RIs). Given the augmenting number and size of RIs, RIs managers are increasingly requested to provide evidence about the impacts the RIs generate from the society's point of view in order to compete for funding (e.g. for being included in the ESFRI Roadmap) or plan strategies for maximising impacts.

The table below shows some recent surveys addressed to RIs and related stakeholders about this issue. Amongst these, a recent survey (189 answers) carried out by DG Research and Innovation of the European Commission in 2016² conveyed that, despite this increasing concern, assessments of RI impact are often not carried out on a regular and systematic basis. While RIs are used to collecting and providing data regarding their scientific and technological activity, more comprehensive information about socio-economic impacts is usually less defined. There is not a common framework in place to measure overall impact and effectiveness on a consistent basis. The survey carried out by the Global Science Forum of the OECD (32 answers)³ in 2018 reports findings on a long list of indicators and metrics commonly used by RIs for measuring their impacts and/or used for accountability purposes.

Against this background, the objective of the RI-PATHS survey was to complement previous findings by providing a mapping of existing practices and needs - from the RIs perspective - for carrying out socio-economic impact assessments but also an assessment about perception on a possible common IA model. Findings are expected to contribute to the design of a model for the socio-economic impact assessment of RIs, which is indeed the ultimate objective of the RI-PATHS project.

² European Commission, 2016. *Report on the Consultation on Long Term Sustainability of Research Infrastructures*, Directorate-General for Research and Innovation.

³ OECD Global Science Forum, 2018. *International Workshop on Establishing a reference framework for assessing the socio-economic impact of Research Infrastructures 19-20 March 2018. Draft Summary*.



Table 1. Evidence from previous surveys

| Date | Survey | Target | Brief description | Response Rate | Main Findings | For more details |
|------|--|--|---|---|--|---|
| 2018 | Establishing a reference framework for assessing the Socio-economic impact of Research Infrastructures (OECD). | RIs Managers and external stakeholders. | The objective of the survey was gathering information on standardized definitions and data collection methodology for a set of indicators. Two types of questionnaire, one per target. | 21 respondents - all types of RIs. 11 stakeholders. | Responses showed a fairly good consensus on the main strategic objectives of RIs and on series of indicators for which data are collected and which are used in the various dimensions of impact assessment. | Draft summary |
| 2017 | Survey analysis and report on existing policies and data collection practices (MERIL). | RIs included in the MERIL database (871 RIs). | The aim of the questionnaire was to fine-tune the MERIL data model by gathering more information from RIs. In particular, the objective was to understand what kind of policy-related and other data RIs are currently collecting and making available (either publicly or exclusively with Meril). | 105 RIs coordinators (over 1124 invitations). | The main result of the survey was a comprehensive overview of information on existing RI data collection practices and policies including operational aspects such as access policies, information about users, scientific outputs, financial data and European and international collaborations. | Survey analysis and report on existing policies and data collection practices |
| 2016 | Consultation on Long-Term Sustainability of RIs (EC - DG Research). | RI stakeholders (ERA, ESFRI, European Research Consortia, ESFRI delegations, Members of the Programme Committee for H2020, e-IRG, EIRO Forum, International Organisations, RIs association). | The objective of this on-line consultation managed by the EC was to collect RIs' views on the interrelated pre-conditions that could ensure the long-term sustainability of RI and the potential actions/measures to tackle potential challenges. | 189 answers (total population not available). | <ol style="list-style-type: none"> 1. The majority of RIs has assessed socio-economic impacts at least once in their lifetime. However, socio economic impact assessment are not carried out on a regular basis. 2. It is widely recognised that there is not a "one-size fits all". However, any evaluation framework shall include direct and indirect effects. 3. There is an indication of the fact that indirect effects are still not fully taken into account as they remain poorly understood in empirical terms. 4. Five main elements shall be included in the RIs impact assessment: economic impacts, societal impacts, scientific impacts, human resources impacts, innovation impacts. 5. Even though RIs are aware of the relevance of potential benefits of their activities, systematic assessment is not a common practice. | Consultation on Long Term Sustainability of Research Infrastructures |



| | | | | | | |
|------|--|--|--|--|--|--|
| 2016 | Strategic Priorities, Funding and Pan-European Cooperation for RIs in Europe (Science Europe Working Group). | Members of Science Europe Organisation (43 members in 27 countries). | The survey aimed at gaining insights into the following subjects. 1) strategic priorities for RIs (respondents were asked to define the key priorities and the underlying decision-making process; 2) The use of the priorities to inform funding decisions in RIs (respondents were asked to describe how strategic priorities influence the funding decisions); 3) The status of cross-border co-operation (respondents were asked to evaluate the desirability of international cooperation). | 26 answers from European Member Organisations representing 19 countries. | <ol style="list-style-type: none"> 1. Strategic priority setting for RIs has become widespread. Ex-ante conditionalities in 2014-2020 partnership framework boosted this practice. 2. The decision-making level (national, regional, organisational) varies across the surveyed countries. 3. There is a variety of funding instruments and procedures for RIs across the surveyed countries. Their classification is not straightforward. 4. In almost all the cases, applications to RIs are evaluated through peer-review by an international expert. <p>As a general rule, there are three criteria underlying the funding decision: a) scientific impact b) RIs partnerships; c) memberships of other strategically relevant international infrastructures and/or research organisations.</p> | Strategic Priorities, Funding and Pan-European Co-operation for Research Infrastructures in Europe |
| 2007 | Trends in European Research Infrastructures (EC - DG Research and European Science Foundation). | RIs across all field of science. | The objective of the survey was to identify the current scenario of major RIs in Europe and respective trends and developments. It provided statistical information about the type of RIs, scientific domain, age, investment costs, operational costs, main sources of funding, staff, users' characteristics. | 598 valid responses. | The survey allowed to compare the situation of RIs by scientific domain and to identify differences in terms of types of infrastructures, finance sources, update patterns and user communities (detailed results are available in the full report). | Trends in European Research Infrastructures |

Source: Authors based on different sources⁴.

⁴ APRE and ESF, 2017. WP5 - RI Data Collection Strategies and Policy Maker Needs, DELIVERABLE 5.2 Survey analysis and report on existing policies and data collection practice, Project funded by the European Commission under Horizon 2020, G.A. N 654296; European Commission and ESF, 2007. Trends in European Research Infrastructures: Analysis of data from the 2006/07 survey; European Commission, 2016. Report on the Consultation on Long Term Sustainability of Research Infrastructures, Directorate-General for Research and Innovation; OECD Global Science Forum, 2018. International Workshop on Establishing a reference framework for assessing the socio-economic impact of Research Infrastructures 19-20 March 2018. Draft Summary; Science Europe, 2016. Strategic Priorities, Funding and Pan-European Co-operation for Research Infrastructures in Europe: Survey Report.



2. Survey strategy: from design to implementation

Objective of the survey:

The survey was designed to collect evidence and information from a sample of RIs about i) their experience in carrying out socio-economic impact assessment; ii) practices and approaches for collecting and monitoring data that can be helpful to measure different impacts; and iii) main challenges encountered during data collection and monitoring (e.g. what type of information cannot be collected for technical or other reasons).

Structure of the questionnaire:

The questionnaire consisted of 23 questions (17 mandatory, 6 optional) and was structured into three main sections:

- Part A: General Information
- Part B: Your experience with socio-economic assessment
- Part C: Data collection and monitoring for socio-economic impact assessment

Pt. A) The first section addressed the identification of the responding RI along various dimensions, such as the scientific field(s) of activity, the typology as from internationally accepted categorisation (e.g. single-sited, virtual, etc.) as well as the taxonomy specifically developed by the RI-PATHS team in the framework of Deliverable 3.1⁵. To complete this picture, the responding RIs were also asked to provide information about the relevance of their activities for different stakeholders and - in a series of optional questions - the description of their scientific mission as well as the timeline of their operation and updates.

Pt. B) The second section focused on the RIs experience with socio-economic impact assessment, meaning, for the purpose of this survey, any attempt to assess (e.g. measure, quantify or simply describe) the impacts of RI on the economy and/or society. Respondents were specifically asked to indicate whether they have experience with socio-economic impact assessment (by carrying it out and/or by being the subject of it) and if, yes, what were the reasons, what approach they applied or followed, which aspects were investigated to measure impacts and how they benefited from it.

Pt. C) The third section intended to get an insight into details of practices and approaches for collecting and monitoring data relevant for measuring different impacts. Specifically, responding RIs were asked to indicate what indicators are collected, what procedure is applied, how the responsibility for data collection is set, which are the main data collection activities carried out and what challenges are generally faced in dealing with this activity.

The full version of the questionnaire is provided in annex to this report. It is framed by an initial introductory page about the survey, with instructions on how to fill it in, and a concluding “Part D” consisting of two additional questions where the respondent was asked about their potential

⁵ For more details see https://ri-paths.eu/wp-content/uploads/2018/05/D3-1_Working-note-on-RI-typology_SUBMITTED.pdf



interest in participating in follow-up RI-PATHS activities and in case of a positive reply to provide their contact details⁶.

Setting the launch of the survey:

The RI-PATHS partners have extensively discussed the design of the questionnaire from March to May 2018. These discussions were driven by the need to define the scope of the survey itself with the objective to maximise its added value as compared to previous surveys to RIs related to socio-economic impacts assessment (see Table 1 above). Also, efforts were made to ensure the clarity and readability of the questionnaire for respondents (e.g. definitions used, length of questions, structure of sections, etc.) as well as to minimise the risk of drop out (e.g. by reducing compulsory questions, avoiding requests of sensitive data, etc.)⁷.

The questionnaire was administered on-line. It was uploaded on an online cloud-based platform - SurveyMonkey - which provides automatic storage possibilities and the export of summary data tables for further processing. The online visualisation of the survey followed its logical set-up, e.g.: the different parts were distinctly separated, and skip-logic was applied where needed, redirecting the respondent to the appropriate next question on the basis of a specific reply. The survey was based on closed questions, with the possibility of giving multiple-answers, but reverted to open-ended questions where needed, as well as matrixes/ranking scales. The respondent was able to comment on parts of the survey or provide complementary explanations to their reply where needed.

All the RI-PATHS partners, including the four RIs of the consortium - CERN, ALBA, DESY and ELIXIR - were invited to review preliminary versions of the questionnaire as well as to test the survey before its launch, specifically by checking the clarity of the questionnaire and the proper functioning of the online system. The final version of the questionnaire (provided in Annex 2) and its on-line structure reflect all the comments received during the design phase.

Launch and running of the survey

The survey was officially launched on 11 June 2018. It primarily targeted 926 RIs included in the MERIL database⁸ in order to engage a broad pool of RIs with known distribution in terms of scientific domains, size and scope. An invitation letter (provided in Annex 1 to this report) was signed by the RI-PATHS team and sent by e-mail⁹. Two reminders followed on 26 June and on 18 July.

In addition, contacting RIs present in the MERIL Database, dissemination of the survey was carried out mainly through two lines of communication in order to ensure the reasonable response rate with a good balance in the geographical distribution, typology, category and size

⁶ 117 responding RIs (representing 61% of the respondents) declared their interest in being informed about future RI-PATHS activities, including receiving invitations to join future events. The full list of these respondents is kept anonymous by the RI-PATHS team. Their contact details will be treated confidentially and in compliance with the EU General Data Protection Regulation 2016/679.

⁷ As a result of these efforts, only 12 partial responses were recorded.

⁸ The MERIL portal provides access to a database that stores information about openly accessible RIs in Europe, across all scientific domains, including the social sciences and humanities. The MERIL database includes 1023 RIs, as of 28/08/2018. This number was 977 when the survey was launched. Only RIs with a valid email address for their contact person received the survey information. See <https://portal.meril.eu/meril/>.

⁹ Invitations were sent by using the email address ripaths@esf.org which was specifically created for this purpose. The survey was launched and managed by ESF. Emily DeYoung Becker (ESF) was the contact person for respondents.



of the participant RIs: i) additional emailing to the network of the consortium partners and ii), via the social media (Twitter, LinkedIn and Facebook) accounts of the partners.

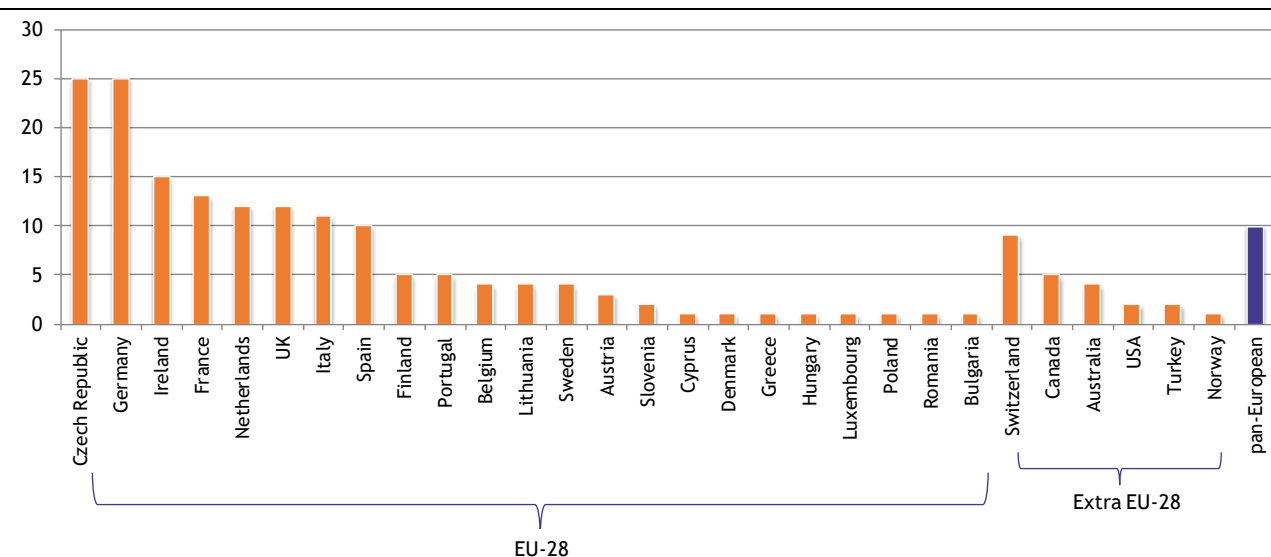
More than 1,000 email addresses were reached directly, as well as 4,800 LinkedIn, 5,300 Twitter and 2,800 Facebook accounts, assuring all together 191 responses to the survey.

The survey's closure was originally scheduled on 15 July. However, following several requests of RIs showing an interest in contributing to the survey while requiring some additional time to complete it, the deadline was extended to 19 August.

3. Sample description

The survey received **191 valid responses** that were then subject to evaluation¹⁰. 158 of the respondents represent EU-based RIs (covering 23 EU-28 countries), 23 Extra-EU-28 based (specifically in Australia, Canada, Norway, Switzerland, Turkey and USA) and 10 pan-European RIs. Germany and the Czech Republic are the most represented countries accounting for 25 responses in the survey each. From 7 countries - France, Ireland, Italy, Spain, Switzerland, the Netherlands and UK - the number of responses is in the range of 9-15. From other countries (see Figure 1 below for details), number of responses is in the range of 1-5.

Figure 1. Geographic distribution of responding RIs and the number of their responses



Source: Authors on the basis of survey data¹¹

The distribution of the responding RIs was then analysed by scientific field of activity, RI typology according to internationally accepted classification and the RI-PATHS taxonomy¹².

¹⁰ Overall 203 questionnaires were collected of which 12 partially completed. For the purpose of the analysis presented in this report, only complete questionnaires (191) have been considered. The majority of responses (123 out of 191) were provided by MERIL contacts while the remaining were collected through RI-PATHS social media and network of contacts. Our sample accounts for 21% of RIs included in the MERIL database.

¹¹ The geographic distribution of RIs was gathered by Authors by matching survey data (name of responding RI) and information from MERIL database and other sources.

¹² For more details on this classification see Deliverable 3.1 https://ri-paths.eu/wp-content/uploads/2018/05/D3-1_Working-note-on-RI-typology_SUBMITTED.pdf



Responding RIs were asked to indicate their fields of activity¹³ (more than one answer was allowed). Interestingly, while 51% of the respondents identify themselves with only one scientific discipline, 28% among them cover 2-3, 12 % of the respondents cover 4-5 and 9% among them cover more than 5 (See Figure 2.a below). The most represented scientific fields are ‘Biological and Medical Sciences’ (87 RIs have selected this option); ‘Physics, Astronomy, Astrophysics and Mathematics’ (66), ‘Environmental Sciences’ (62) and ‘Chemistry and Material Sciences’ (59). 50 and 44 RIs declare to be active, respectively, in the field of ‘Energy and Engineering’ and ‘Information Science and Technology’. RIs operating in the fields of Humanities and Arts and Social Sciences are somewhat less numerous in this sample population with 30 and 23 RIs, respectively. 18 RIs have marked ‘Other’ representing scientific disciplines that cannot be grouped under the other 8 scientific disciplines (e.g. including Earth science, analytical facilities, Plant and Agricultural Science, etc.).

Figure 2. Responding RIs by scientific fields of activities (multiple answers)

Fig. 2.a

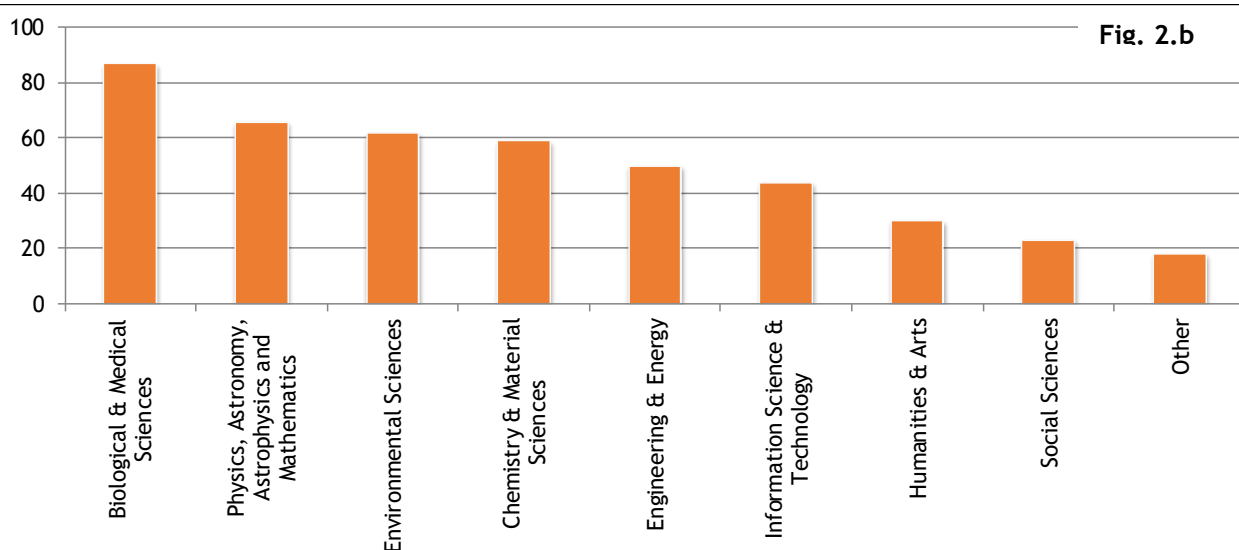
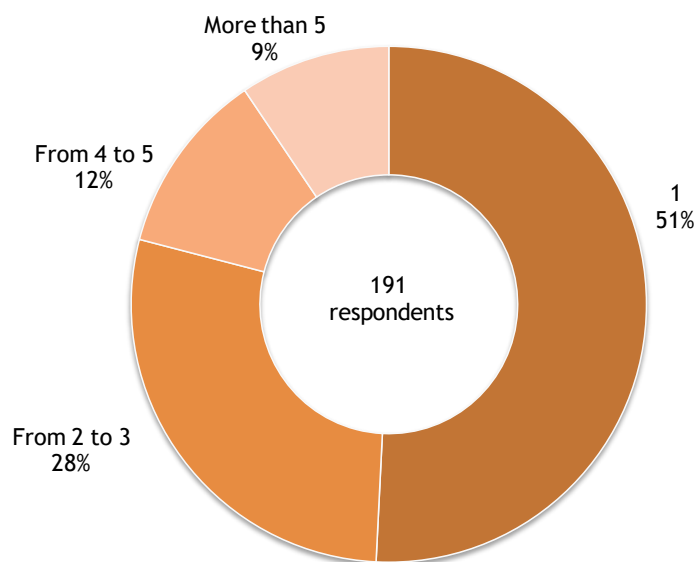


Fig. 2.b

Source: Authors based on responses to Question A.2 - “Scientific field of Research Infrastructure”.

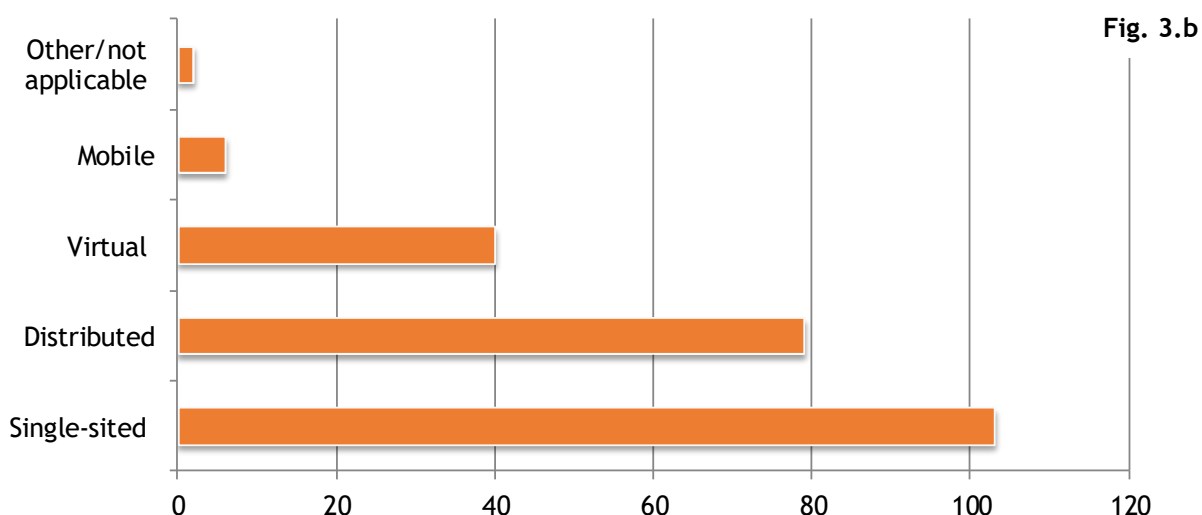
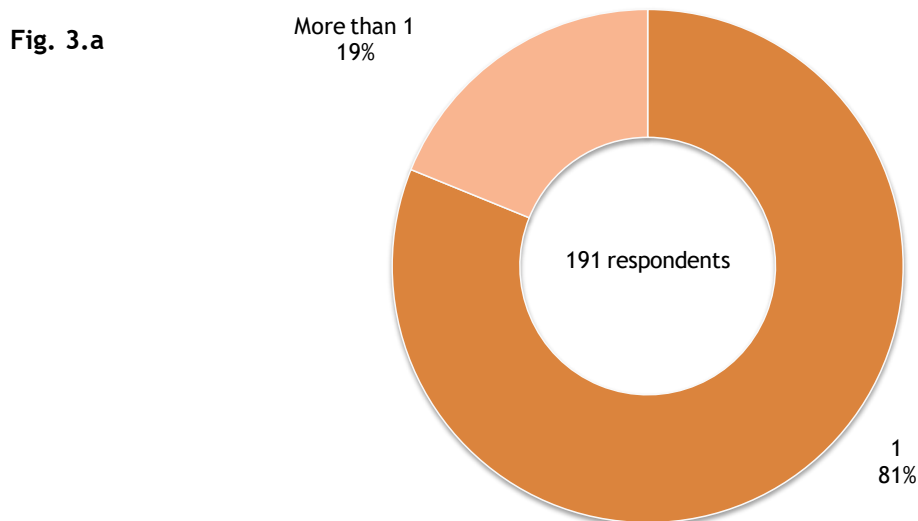
¹³ The scientific fields - used in the questionnaire - reflect the MERIL-2 RI Categories. For more details, see https://portal.meril.eu/meril/downloads/List_of_MERIL_RI_Categories.pdf



Note: Multiple answers were allowed. N° of respondents:191; N° of answers: 439.

As to RI Typology, 81% of respondents identify themselves with 1 typology while 19% of them with more than 1 (mostly two typologies; only 3 RIs indicated three typologies and 1 of them four). The most represented typology is single-sited (103 RIs marked this option), followed by distributed (79), virtual (40) and mobile (6)¹⁴.

Figure 3. Distribution of respondents as of RI typology (*multiple answers*)



Source: Authors based on responses to Question A.3 - “Type of Research Infrastructure”¹⁵.

Note: Multiple answers were allowed. N° of respondents:191; N° of answers: 230.

Responding RIs which have identified themselves as ‘distributed’ (79) were asked to specify their role. 46% of these respondents acts as the hub of the distributed RI, while 23% are the Country-

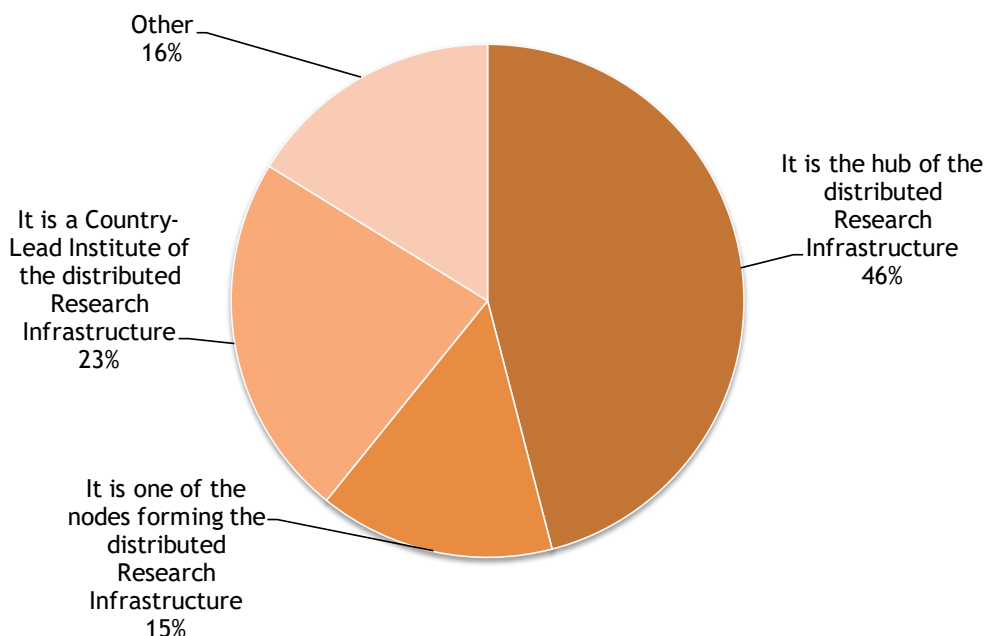
¹⁴ Only 2 responding RIs marked the option other/not applicable, without selecting other available options. They identify themselves as cross national studies and data centre.

¹⁵ The following definitions were adopted and provided to respondents. Single-sited facilities: unified single body of equipment at one single physical location; distributed facilities: a network of distributed resources: instrumentation, collections, archives, and scientific libraries; virtual facilities (e.g. ICT based system for scientific research, including high-capacity communication networks, and computing facilities providing services electronically); mobile facilities: vehicles designed for scientific research.



led institutes, 15% are nodes forming the distributed RIs while the remaining 16% selected the option Other, specifying in most cases that they represent a mix of the options provided.

Figure 4. Responding ‘distributed’ RIs by role played



Source: Authors based on responses to Question A.3.1 - “In describing your Research Infrastructure (Question A.3), you selected the option ‘distributed’. Please, specify what is the role played by your Research Infrastructure as part of this distributed model”. **Note:** Only one answer was allowed. N° of respondents: out of 77 RIs selecting ‘distributed’ in Question A.3, 74 provided an answer to this question while 5 skipped it.

Responding RIs were also asked to identify themselves with the taxonomy developed by the RI-PATHS team. This taxonomy distinguishes RIs according to the type of research they carry out, such as fundamental research, use-inspired research, pure applied research or provision of services. For the purpose of the survey, the following definitions were provided to respondents as well as the link to the full document explaining it, namely Deliverable 3.1 - Working note on RI typology¹⁶:

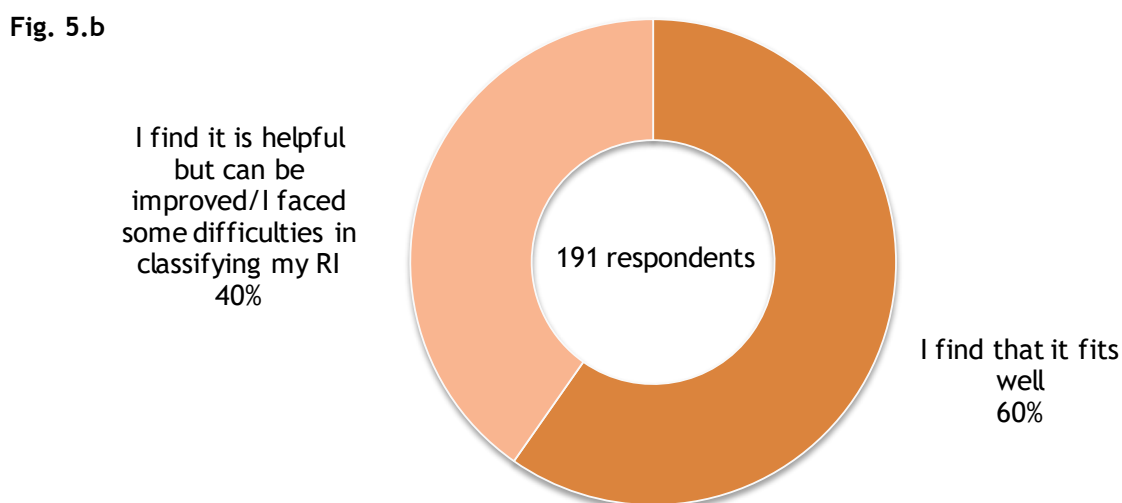
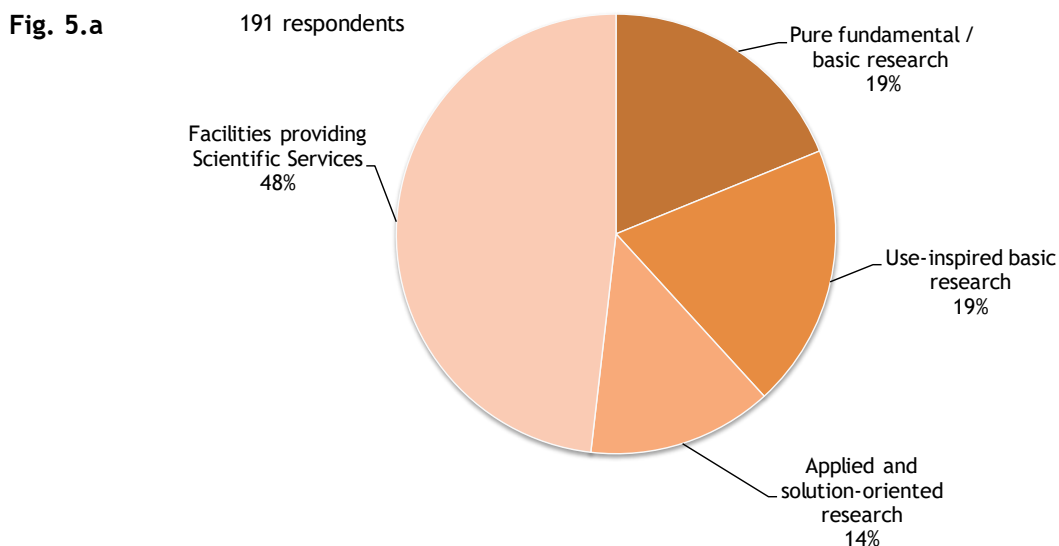
- **Pure fundamental/basic research:** Curiosity-driven research that advances human knowledge; generating socio-economic impact potentials is not the priority.
- **Use-inspired basic research:** Scientific research conducted with the clear ambition of solving known societal challenges or creating technologies for future economic applications.
- **Applied and solution-oriented research:** Research and development directly aimed at meeting public or business demands and at responding to well identified research or technological problems.
- **Facilities providing Scientific Services:** facilities designed to offer services to be directly used for the science community to efficiently carry out their research.

¹⁶ https://ri-paths.eu/wp-content/uploads/2018/05/D3-1_Working-note-on-RI-typology_SUBMITTED.pdf



As showed by the Figure 5.a below, 48% of the respondents located themselves in category ‘facilities providing scientific services’, 19% in ‘user inspired basic research’, another 19% in ‘pure fundamental / basic research’ and 14% in ‘applied and solution-oriented research’.

Figure 5. Distribution of respondents as of RI-PATHS taxonomy



Source: Authors based on responses to Question A.4 - “Which of the following category best describes the main emphasis of your Research Infrastructure’s current activities? Please select the answer which best describes your RI’s activity” (Figure 5.a) and Question A.4.1 - “Please provide your opinion about the classification used in the previous question” (Figure 5.b). **Note:** One answer was allowed. N° of respondents:191.

RIs have been specifically asked to provide opinion about the applicability of the RI-PATHS categorisation and provide suggestions on how it can be improved in order to properly reflect the RIs population. Interestingly, the majority of respondents (60%) finds that this taxonomy fits well with their purpose while 40% finds that it can be improved or have some difficulties in identifying with it (Figure 5.b). Amongst these, there are respondents which find it difficult to identify themselves with one category only. As many respondents highlighted (some quotes are reported below), the activities carried out by RIs can be described by combining more than one category. It may happen, for instance, that even though a RI is specialised in fundamental research, it also offers scientific services to users and/or does applied and solution-oriented research. Some respondents report that in their case the RI’s activity is equally distributed



amongst the four categories. Others point out that although all or more than one category describes the RI's activity, prioritising is possible.

RIs opinion about the RI-PATHS classification. Some quotes from survey's responses:

- *The RI we run is probably best categorised as Facilities providing Scientific Services, however our users run their own research infrastructures off it, which fit as the first 3 options. So different answers apply for different levels of usage of it.*
- *Our facility tends to fit in all categories. We do support a large user community who come to the lab and may work in collaboration with our staff in areas that range from fundamental studies to projects with private sector partners.*
- *We would be a mix of both providing scientific services, as well as applied and solution-oriented research through grants or collaborative projects.*
- *Our main goal is the advancement of basic science by developing chemical tool compounds. However, these tools can also be used for the development of therapies for human diseases or for new agrosience products.*
- *The activities of our infrastructure can be described only combining pure fundamental, use-inspired and scientific service provision. A single classification can not be exhaustive.*
- *Our in-house use of the facility is more applied or solution-orientated but we equally do pure research. The more problematic issue is that we are compelled to operate an access plan and treat it as a service-providing facility and this is the best description. If I were to make a modification, I would assign weights to each of those areas to reflect that large scale infrastructure is often a mix of these topics.*
- *Our research involved a mix of basic and applied research*
- *More than one option can apply equally well. Specifically, the mission of the RI is to maximize the science (curiosity-driven research) produced from the jointly operated (distributed) facilities, as a unified radio astronomy observatory. However, the RI provides very significant services, such as data analysis software, computing, and archives, to be directly used for the science community to efficiently carry out their research.*
- *We do the 4 things equally distributed*
- *Since, as in our case, all categories apply, it would have been more useful to provide a priority (e.g. ranking of importance 1--4)*

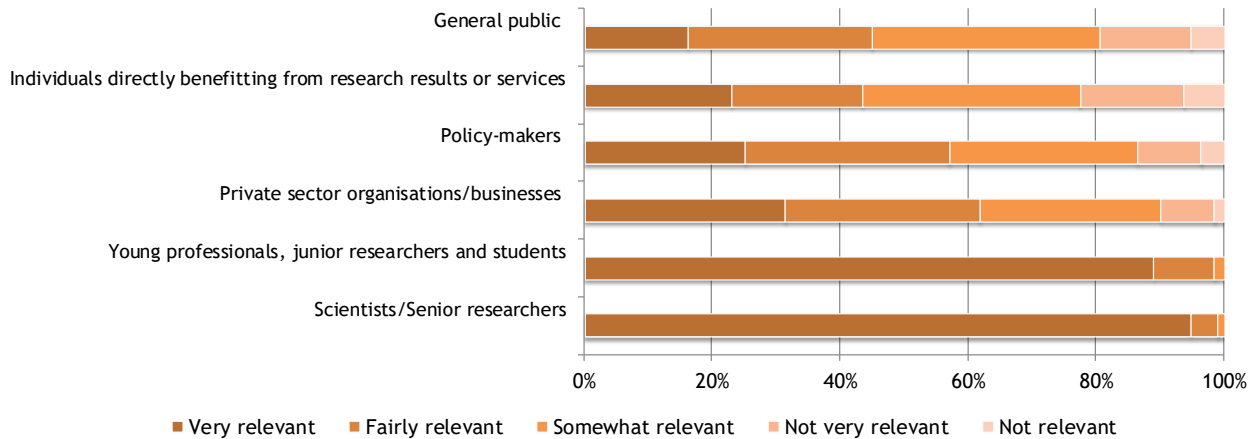
Source: Survey responses to question A.4.1

As of the self-evaluation of the relevance of the RIs activities for potential target groups, Figure 6 below clearly shows that 95% of the respondents consider their activities very relevant for scientists and senior researchers, 88% consider them very relevant for the young generation of scientists and professionals. Relevance for the private sector, policy makers, individuals benefitting from research results or services, and the general public is close to be evenly distributed on the scale of non-relevant to very relevant (judging by the responses received from the 191 RIs). Some respondents (39 out of 191) provided a comment and further specified their answer. For instance, several respondents believed that the private sector stakeholders can be further specified by dividing among start-ups, SMEs and large companies. In some cases, only a few of these subgroups may be relevant for the RI. Likewise, the groups “Scientists/senior researchers” and “Young professionals, junior researchers and students” can be better detailed. “Universities and Research Institutions” is for example a relevant category. For instance, some RIs actively collaborate with international and supranational research entities which are significant stakeholders. Moreover, some respondents pointed out that funders and funding agencies should also be included as significant stakeholders as they are likely to benefit from RI



research outputs. This is particularly evident when funders include NGOs or private foundations engaged in specific branches of scientific research.

Figure 6. Relevance of the RIs activity for the different stakeholder groups



Source: Authors based on responses to Question A.7 - “How relevant are your activities for these potential stakeholder groups”. Note: One answer was allowed per each item; N° of respondents: 191 per each item.

With the aim of sketching the profile of respondents and considering their experience with socio-economic impact assessment, the survey required each RI to indicate the timeline of its operation and major updates (if any). As showed by the Figure below, overall 9% of responding RIs are still under design (3 respondents) or under construction (14 respondents). 46 % are RIs aged between 1-10 years and 45% RIs that are operational from more than 10 years. Interestingly, the majority of responding RIs have undertaken (overall 72%) or planned (11%) major updates.

Figure 7. Operational age and updates of the responding RIs

Fig. 7.a

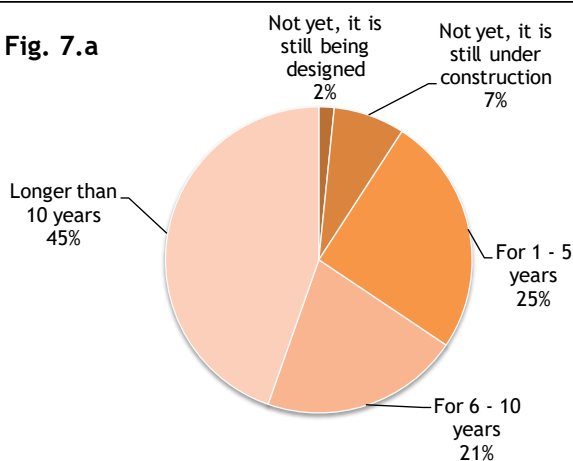
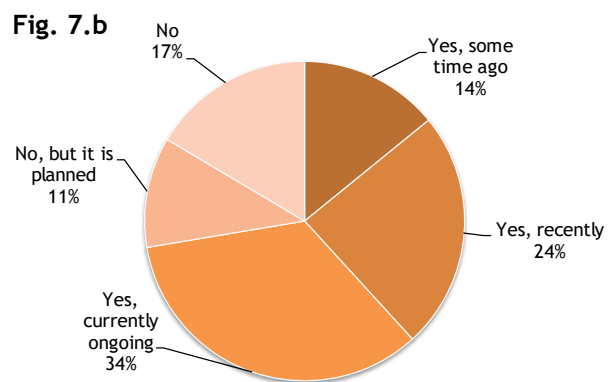


Fig. 7.b



Source: Authors based on responses to Questions A.5 - “Please indicate how long has your Research Infrastructure been in operation” (Fig. 7.a) and A.5.1 - “Have there been any major updates on your Research Infrastructure?” (Fig. 7.b). Note: One answer was allowed to both questions. Number of respondents: Q.A.5, 186 while 5 skipped it; Q.A.5.1, 170 while 21 skipped it.



4. Findings

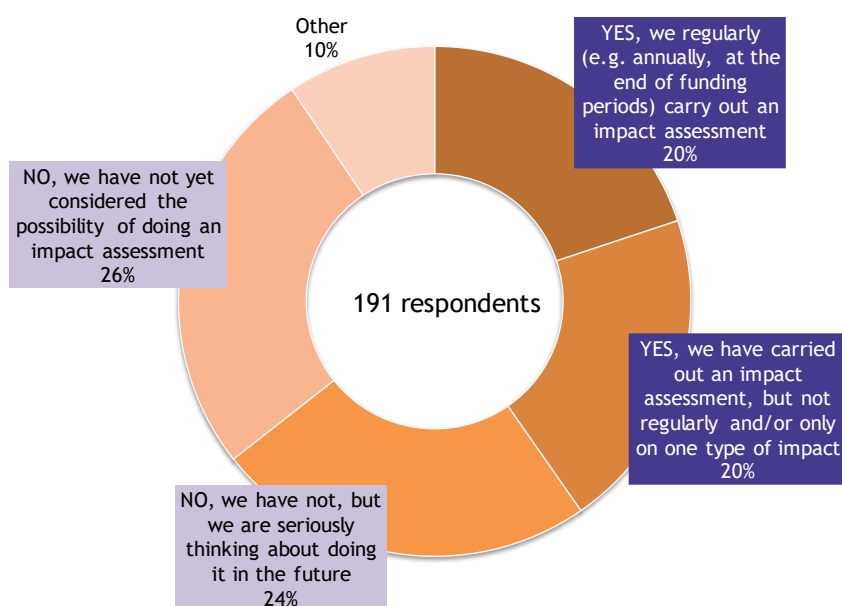
4.1 Experience with socio-economic impact assessment

Part B of the survey gathered information on the experience of the respondents on and with socio-economic impact assessment.

20% of the responding RIs carry out socio-economic impact assessment regularly and another 20% have some experience in impact assessment. 24% have already considered its advantages and are planning to do it in the future, while 26% have not yet thought of doing it.

In addition, some of the remaining 10% of the respondents are i) in the process of being evaluated now, ii) will probably do it in the future, but not in the process of planning it yet, iii) in a lifecycle stage where only specific issues are addressed e.g.: in construction or several years after shutdown or iv) only one of their parts/sections are considered for some level of socio-economic impact evaluation. Figure below shows the distribution of responding RIs according to their experience with socio-economic impact assessment.

Figure 8. Distribution of the responding RIs as of their experience with socio-economic impact assessment



Source: Authors based on responses to Question B.1 - “Does your Research Infrastructure carry out, or has it been the subject of, a socio-economic impact assessment (e.g. commissioned by a funding agency)? Please select the answer that best describes your Research Infrastructure’s situation”. **Note:** One answer was allowed. Number of respondents:191.

As Figure 9.a shows RIs identifying themselves with RI PATHS typology ‘facilities providing scientific services’ are close to evenly distributed among the four groups defining different experience level with socio-economic impact assessment. There is a slight shift visible towards the ‘no’ experience. In the group of RIs focusing on ‘applied and solution-oriented research’, there is a polarisation towards the presence of RIs with solid (regular) and no (have not considered engaging) experience. In the group of RIs in ‘user-inspired basic research’, RIs with solid experience are more numerous than those in the other typologies. While more



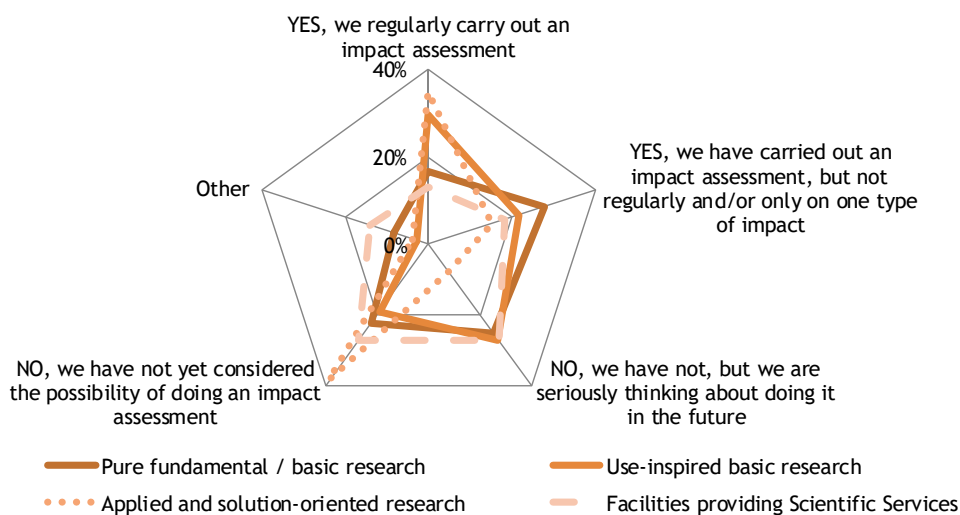
representatives of ‘pure fundamental / basic research’ typology seem to fall in the category that is characterised with moderate experience on the field, than in the other experience categories.

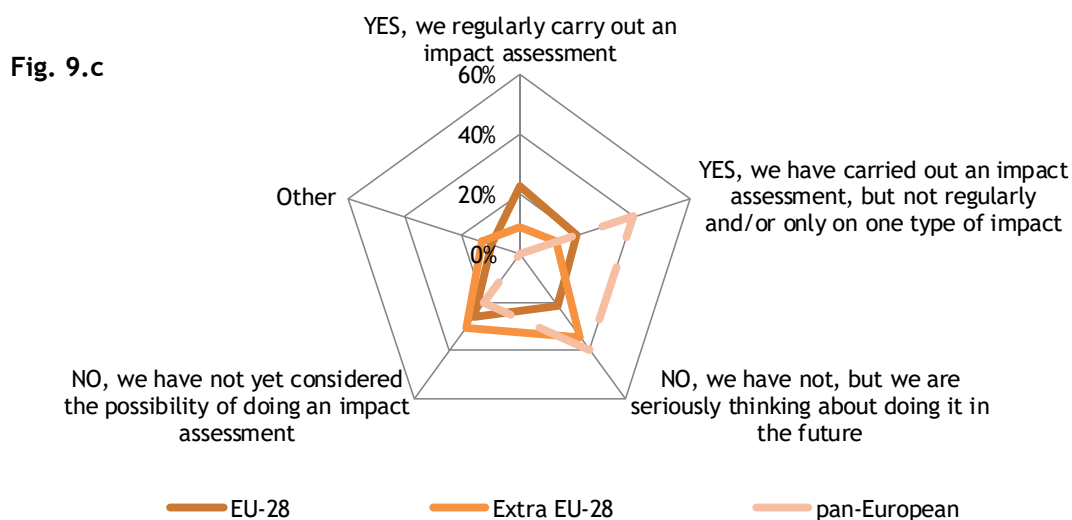
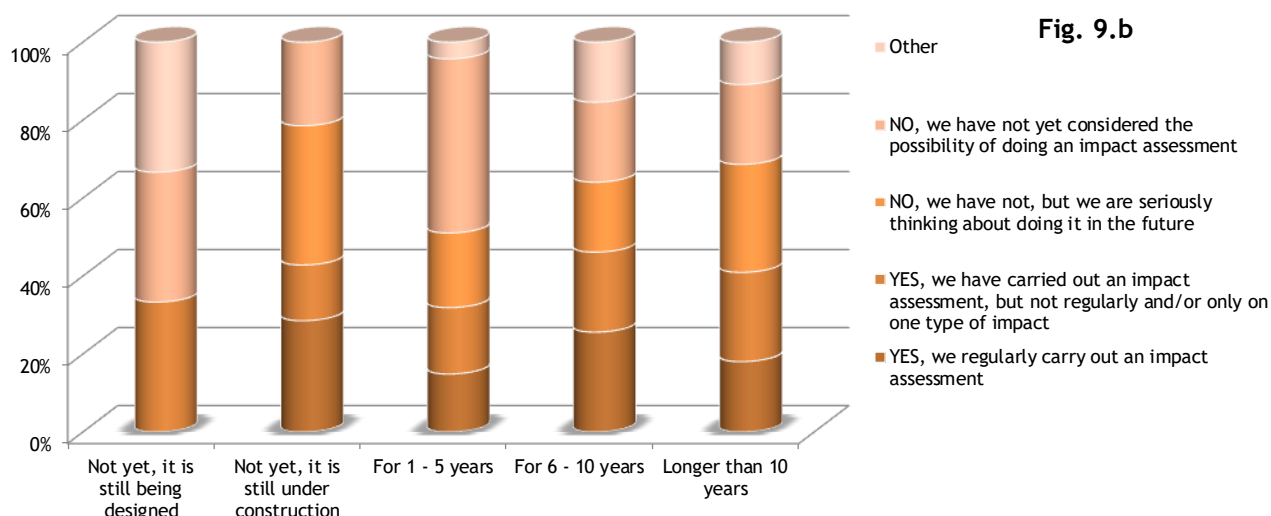
Figure 9.b shows that the operational age of RIs is not in an evident correlation with the experience RIs have in socio-economic impact assessment. Figure 9.b only underlines that independently of operational age, RIs may have solid or no experience at all in the field. Category ‘other’ was assigned by closely 10% of the respondents in this question. Some of the RIs in this category are currently undergoing impact assessment or a study under the umbrella of an EC-funded project, some have already planned for it and know the date of execution, some undergo regular partial (=scientific) evaluation, and some are considering the assessment on specific impacts, not necessarily socio-economic impacts.

By analysing the experience of respondents with socio-economic impact assessment from the geographic distribution perspective (Figure 9.c), no major differences can be highlighted amongst respondents from EU-28 countries, while respondents from Extra EU-28 countries are almost equally spread between those which have not carried it out but are seriously thinking about it in the future (35% of responding RIS from extra EU-28 countries) and those which have not considered this possibility (30%). As for the pan-European RIs, they are equally distributed amongst those which have carried out a socio-economic impact assessment (even if not regularly) and those which have not done it before but are currently planning to do it in the future.

Figure 9. Responding RIs as of their experience with socio-economic impact assessment by RI-PATHS taxonomy, operational age and geographic distribution

Fig. 9.a





Source: Authors based on responses to Question B.1 matched with responses to Q. A4 (Fig 9.a), Q. A5 (Fig 9.b) and geographic distribution (Fig 9.c). **Note:** Number of respondents: Figure 9.a: 191; Figure 9.b: 186; Figure 9.c: 191.

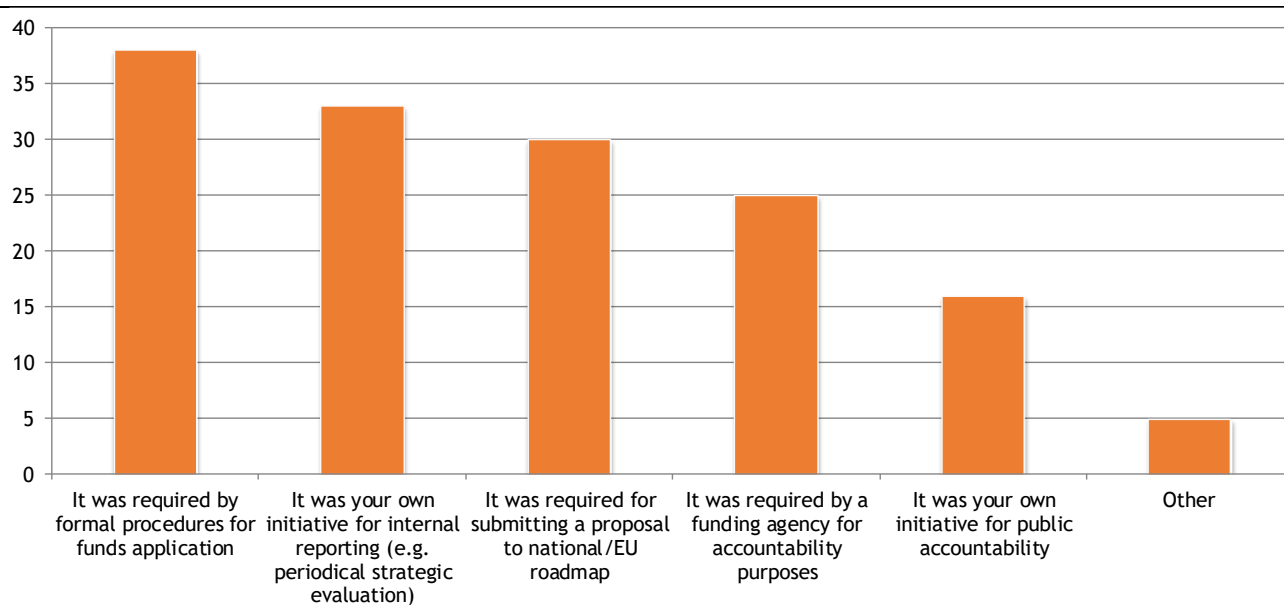
Overall, 40% (77 RIs, see figure 8 above) of the respondents have experience with the socio-economic impact assessment. This means that they may have carried out it or been the subject of a socio-economic impact assessment (e.g. commissioned by funding agencies). A number of questions¹⁷ were specifically addressed to these respondents in order to understand what the reasons were, what method they applied or followed, which aspects were investigated to measure impacts and what consequences they had. As showed by Figure 10 below, reasons provided by the responding RIs for carrying out socio-economic impact assessment or collecting impact related data are various. They mostly decided to engage because of existential reasons e.g.: it was a requirement by i) funds application (38 RIs selected this option), ii) funding agency for accountability reasons (25 RIs) and iii) for submitting a proposal to national/EU roadmap (30 RIs). In addition, there are respondents declaring that internal reasons were also taken into consideration in deciding to engage in such assessment, such as i) internal reporting such as for periodic strategic evaluation (33 RIs) and ii) public accountability (16 RIs). Figure below shows

¹⁷ It refers to Questions from B.1.1 to B.1.5 of the Questionnaire (see Annex). For these questions, the number of respondents corresponds to the RIs selecting 'YES' in Question B.1, namely 77 (Figure 8).



the relative distribution of motivation of RIs to carry out socio-economic impact assessment or collect corresponding data. Interestingly, 5 RIs selected also the answer ‘other’ to better specify their motivations for undertaking socio-economic impact assessment. Amongst these, there is the need to demonstrate the value generated by RIs to taxpayers (quotes are anonymously reported below).

Figure 10. The motivation of RIs to engage in socio-economic impact assessment and/or related data collection (*multiple answers*)



Source: Authors based on responses to Questions B.1.1. “What was the main reason for carrying out a socio-economic impact assessment and/or related data collection? Please select all that apply”

Note: Multiple answers were allowed. N° of respondents: 77; N° of answers: 147.

What was the main reason for carrying out a socio-economic impact assessment and/or related data collection? Some quotes from survey’s responses:

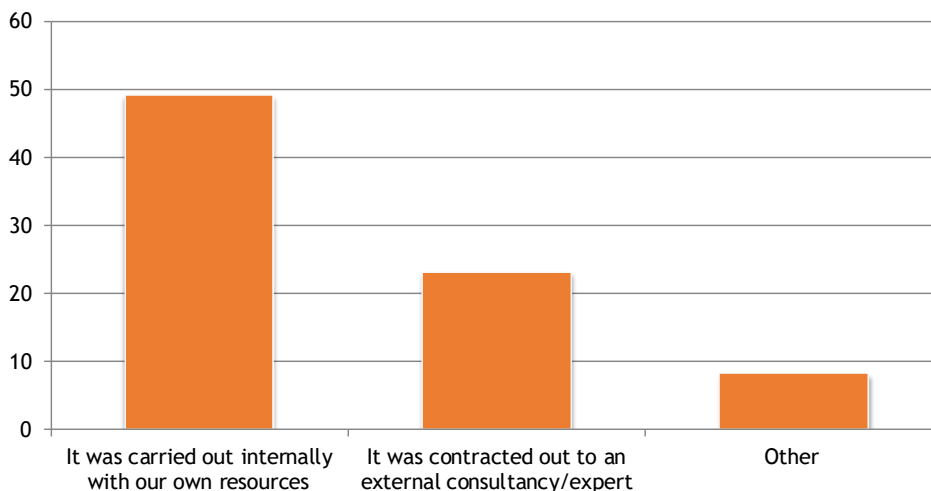
- *We commissioned it to demonstrate to member states the value generated for their country's science and policy making by their participation in RIs*
- *It is important to assess and demonstrate the impact of high-value equipment since it has been funded by the taxpayer.*
- *As public company we are obliged by our “owners”, government, universities and the wider public, to regularly conduct assessment. External assessment is also made to justify the position on the national RI roadmap.*
- *Relevant research for implementing new workflows in our routine set-up.*

Source: Survey responses to question B.1.1.

From the responses collected, the socio-economic impact assessment has been carried out mostly internally with RIs’ resources (49 RIs selected this option) while in some cases it has been contracted to an external consultancy/expert (23 RIs). Some respondents - ‘selecting other’ (8) - specify that they had to submit indicators for independent external assessment carried out by a funding agency, or a ministry, for example, while others had to submit a complex assessment document for peer-review.



Figure 11. The responding RIs' approach to engaging in socio-economic impact assessment and/or related data collection (*multiple answers*)

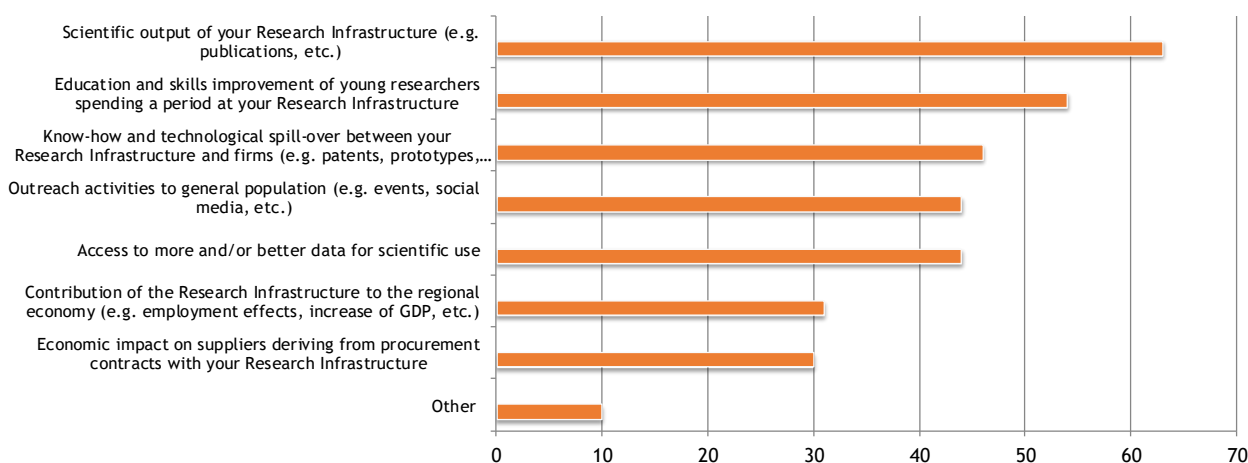


Source: Authors based on responses to Questions B.1.2. - "How was the impact assessment carried out?"

Note: Multiple answers were allowed. N° of respondents: 76, 1 skipped it; N° of answers: 80.

Looking at the aspects which have been investigated for the purpose of measuring RI's impacts, the following order results from the responses collected (from the most to least cited): 1) scientific output of the RI (e.g. publications, etc.); 2) education and skills improvement of young researchers who have spent some time at the RI; 3) know-how and technological spill-over between RI and firms (e.g. patents, prototypes, innovation developed, generation of spin-off, etc.); 4) access to more and/or better data for scientific use and outreach activities to general public (e.g. events, social media, etc.); 5) contribution of the RI to the regional economy and 6) economic impact on suppliers deriving from procurement contracts with the RI. 10 respondents mentioned even additional aspects, such as some impacts on government policies and management decisions, impacts on organisation and business using the RI, livelihood benefits to smallholder farmers using RIs' services, savings obtained through the provision of shared ICT services, impacts on health, etc.

Figure 12. The different aspects assessed in the frame of socio-economic impact assessment, from respondents' experience (*multiple answers*)



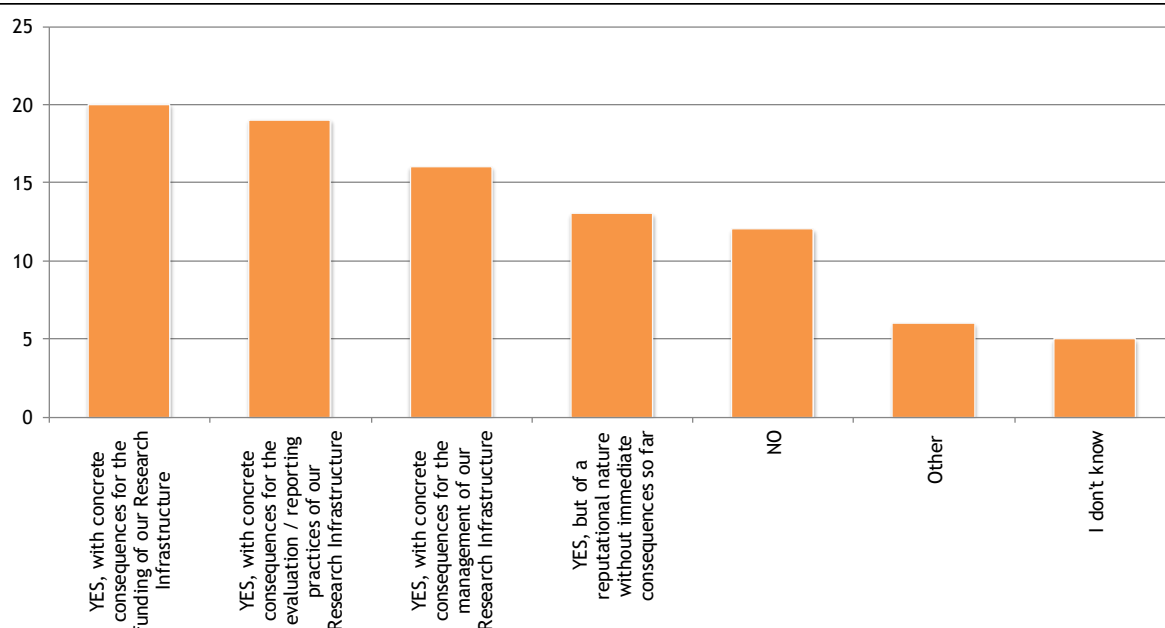


Source: Authors based on responses to Questions B.1.3. - “Which of the following aspects have been investigated in your assessment for the purpose of measuring impacts? Please select all that apply”.

Note: Multiple answers were allowed. N° of respondents: 77; N° of answers: 322.

Most respondents (49) found that engaging in a socio-economic impact assessment has brought about some consequences for the RI, 12 do not find it beneficial at all, 5 are not aware of this, while 6 selected other. Interestingly, amongst the consequences mostly mentioned by respondents they are in the following order: i) funding conditions (20 RIs selected this answer); ii), evaluation/reporting practices (19), iii) management of the RI (16). Interestingly, 13 responding RIs think that the benefits are more reputational than concrete.

Figure 13. The consequences of socio-economic impact assessment as from respondents’ experience (*multiple answers*)



Source: Authors based on responses to Questions B.1.4. “Has there been any follow-up on this socio-economic impact assessment? Please select all that apply”. Note: Multiple answers were allowed. N° of respondents: 72 while 5 skipped it; N° of answers: 93.

19 respondents provided some kind of reference or link to, this information is not reported in this report.

4.2 Data collection and monitoring: practices in use

Part C of the questionnaire addressed practices and approaches adopted by respondents for collecting and monitoring data that can be helpful for measuring different impacts of RIs. The majority of respondents (41%) declare that they have a list of key performance indicators (KPI) for which they collect data for management and compliance purposes (see Figure 14.a below). Interestingly, 31% of respondents are used to collecting indicator data which are considered potentially useful for an eventual impact assessment. 13% of respondents collect data only for accounting purposes while 9% have a list of core impact indicators which are collected for impact assessment purposes. Amongst others (9%), there are RIs that are developing their system of indicators and RIs which focus only on environmental or scientific impact indicators as part of their attempt to carry out socio-economic assessment.



When asked about the procedure of data collection (see Figure 14.b below), 48% of respondents declared that they follow a systematic procedure to ensure efficient collection of information and monitoring; 31% have established some rules but they don't have a systematic procedure in place. Overall, 17% of respondents declare that they do not follow any rules or procedures although some of them (9% of respondents) are considering the conditions for implementing it. Amongst respondents declaring 'other' (4%) there are RIs that have some kind of procedures which are currently under revision in order to be harmonised or expanded.

From responses collected, the responsibilities with data collection and monitoring is mixed (see Figure 14.c below). 31% of respondents declare that a department within the RI is charged with this task while 26% report that each department independently collects its own data and indicators. Interestingly, 20% rely on *ad-hoc* data collection campaigns which are periodically organised by management while only 11% collect data regarding financial aspects. Other respondents (12%) report about the adoption of mixed and different solutions. Amongst these, there are examples of RIs where part of data are collected centrally and part by each department, or RIs where each department/division collects its own data and indicators by closely interacting, in order to put together a complete and concise picture for reporting purposes towards various stakeholder groups and funders.

Figure 14. Practices for data collection and monitoring as from respondents' experience

Fig. 14.a

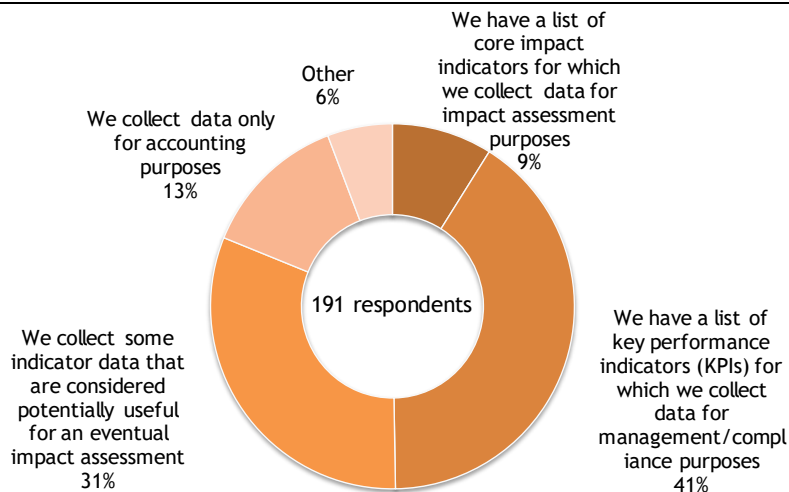


Fig. 14.b

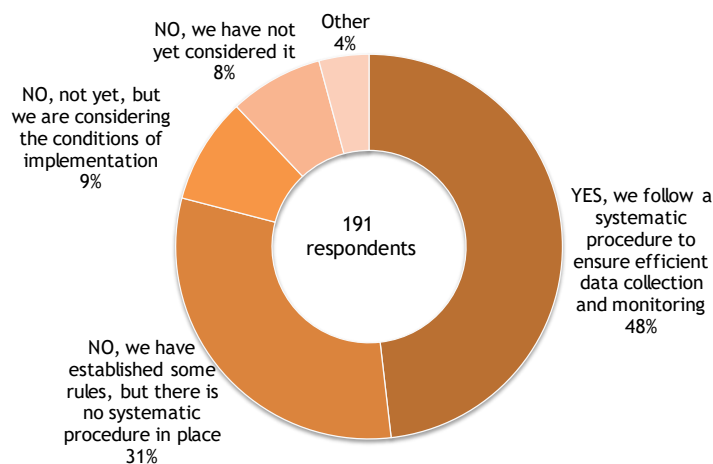
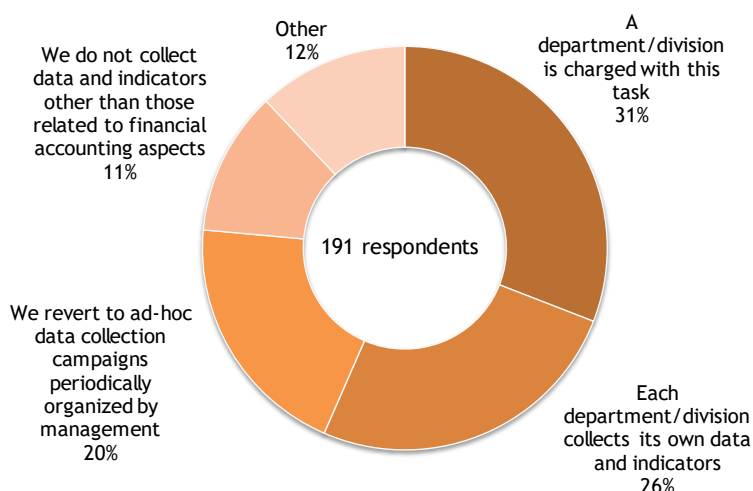




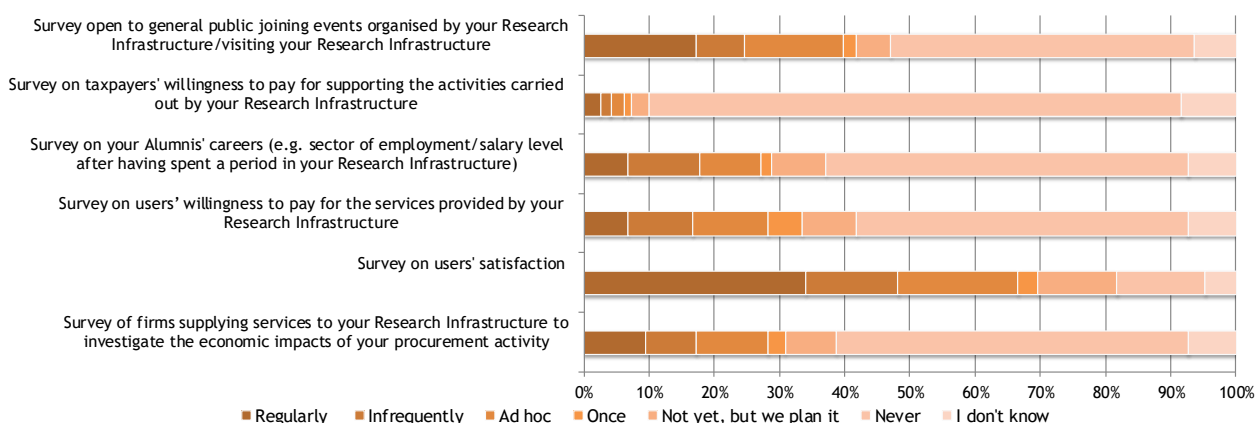
Fig. 14.c



Source: Authors based on responses to Questions C.1 “What data are you collecting that could be considered relevant for socio-economic impacts? Please select the answer that best describes your RI’s situation” (Fig.14.a); C.2 “Do you perform data collection and monitoring following a systematic procedure? Please select the answer that best describes your RI’s situation” (Fig. 14.b), C.3 “Who is responsible for the collection and monitoring of data that is considered relevant for impact assessment? Please select the answer that best describes your RI’s situation” (Fig.14.c). **Note:** One answer was allowed. N° of respondents: 191.

By focusing on the activities carried out for the purpose of data collection (see Figure 15 below), survey’s results show that the respondents (34%) regularly perform surveys on users’ satisfaction. Regarding other activities listed in the questionnaire, it was found that respondents have never carried it out (the share of respondents is close to 50% or more) or in some cases - such as survey of firms to investigate the economic impact of RIs, survey on the willingness to pay for the services provided, survey to the general public for joining the event - they carry it out most often following an ad hoc request. Interestingly, taxpayers’ willingness to pay is very rarely assessed (82% of RIs have never surveyed it).

Figure 15. Data collection activities as from respondents’ experience



Source: Authors based on responses to Questions C.4. “Please indicate which of the following data collection activities you have carried out”. **Note:** One answer was allowed per each item; N° of respondents: 191 per each item.

Respondents were further asked to indicate additional activities carried out or further specify the answers provided. Besides the data collection activities included in the questionnaire, it appeared that a significant share of surveyed RIs collect so-called key performance indicators



(KPIs). In general, these include number of subscribers/users, number of trained professionals, number of publications and patents. These data are mostly used for internal purposes as well as complying with reporting duties of the RIs. In some cases, data about usage and cost of services are used to assess value for money. Furthermore, it appears that RIs are particularly concerned in assessing user satisfaction. However, the methodologies used are rather different. In some cases, users are asked to express their overall satisfaction on the RIs activities and suggest possible improvements. This type of surveys is likely to be carried out without a defined schedule. In other cases, RIs conduct regular and frequent satisfaction surveys concerning various aspects of the service provided (such as quality, speed, trainings, efficiency). Other than surveys, respondents report on different methodologies used to collect and monitor data. For instance, one RI carried out a market study to assess expected impacts on procurement activity and private sector involvement. Another RI assessed the same impact via an input-output model. Alumni careers are monitored by a dedicated team which organise reunion events and meetings.

Comments regarding data collection activities. Some quotes from survey responses:

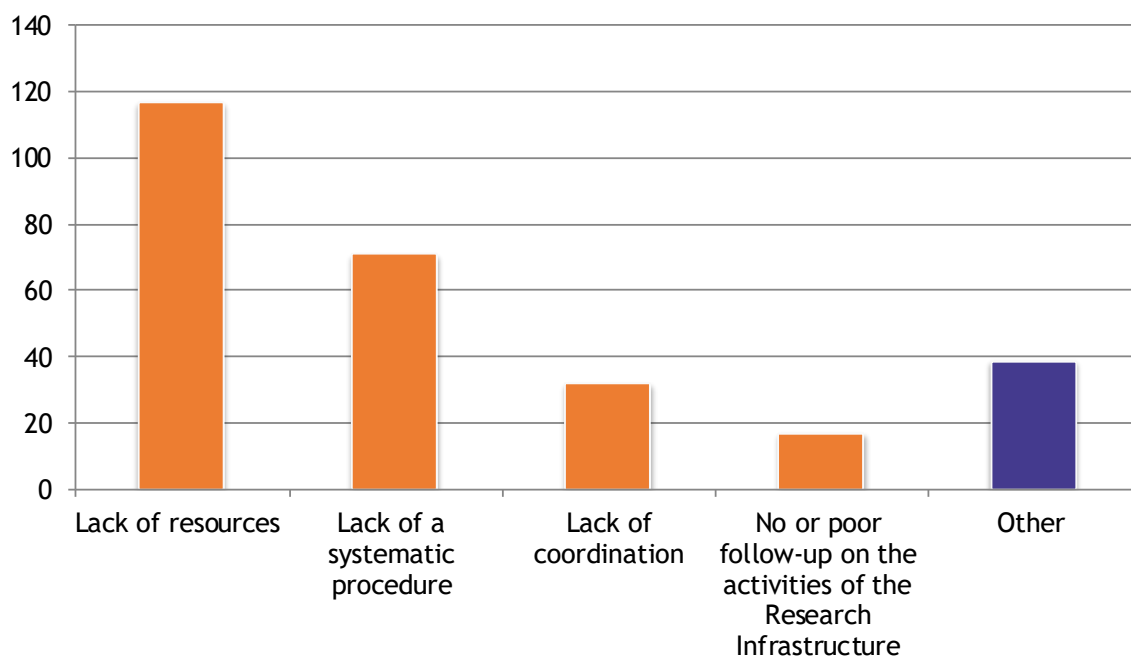
- *We collect metrics from transactional data (invoices) that provide significant metadata on geography, institution, funding source, research sector, private or public, scale of service provided etc.*
- *We regularly collect usage statistics over the internet (data downloads, page visits, service requests) which are the main KPI (in the millions/year).*
- *We collect data on users, e.g. numbers of registered/non-registered users, their affiliation, purposes of usage, data set downloads, etc. We organise regular surveys to get information on publications based on data obtained from our archive.*
- *We are currently establishing a list of PhD students and their respective nationalities since 2012. We have of course a database of the users having used our facility. We have to show the 'juste retour' for our associate countries in terms of supplier contracts.*
- *We conduct regular user satisfaction survey which is focused on satisfaction of users with various aspects of the service provided (e.g. quality, speed, trainings).*
- *Not all of these tasks have been done via survey. Impact of procurement has been done via an input-output model. Alumni are tracked via events and a dedicated team.*

Source: Survey responses to Question C.4.

The lack of resources is amongst the main challenges faced by respondents during the activity of data collection and monitoring (117 RIs selected this answer). The lack of a systematic procedure seems to be also critical for 71 responding RIs. In answering 'other', respondents further specify these challenges and also mention additional ones: i) the lack of time for RIs to deal with this activity; ii) the lack of users of RIs in providing data and information; iii) the lack of data format harmonisation; iv) the distributed nature of RIs and different services provided.



Figure 16. Main challenges faced in data collection and monitoring as from respondents' experience



Source: Authors based on responses to Questions C.5. “What are the main challenges faced in your Research Infrastructure during data collection and monitoring? Please select all that apply”. Note: Multiple answers were allowed. N° of respondents: 191; N° of answers: 276.

Main challenges faced in data collection and monitoring. Some quotes from survey responses:

- *Challenges of unique file formats requiring specific licences to view, volume of data generated, data protection concerns, ethical permissions.*
- *Lack of willingness of RI users, collaborators and general public to provide required information.*
- *Lack of information and cooperation with users of RI.*
- *Our data collection is based on crowdsourcing and is very poorly supported by law, so the main challenge is to persuade community to provide their data on time.*
- *We systematically collect quantitative data about our impact, but what we really need is qualitative data, but that is very time consuming, and we can't really afford to do it.*
- *It is given a high priority, is well described and coordinated. It is work intensive, but as a core activity manageable.*
- *We have a systematic procedure, but not all RI-facilities have adopted them yet.*
- *We do have a systematic procedure but the request of information from member countries and funding bodies is not systematic and requires ad hoc data collection.*
- *The distributed nature of our infrastructure, and the fact that we provide different types of services, are challenges.*
- *It is quite time-consuming.*
- *Data format harmonization.*

Source: Survey responses to question C.5

Figures 17 below show that practices and experience with data collection and monitoring are similar regardless the typology of responding RI as from the RI-PATHS classification. Some differences have been found with regard to RIs classified as ‘Facilities providing scientific services’, regarding responsibilities of data collection and monitoring (see Figure 17.c below).



They mostly declare that this activity is independently carried out by each department/division within the RI.

Figure 17. Responding RIs as of their experience and practices with data collection and monitoring by RI-PATHS taxonomy

Fig. 17.a

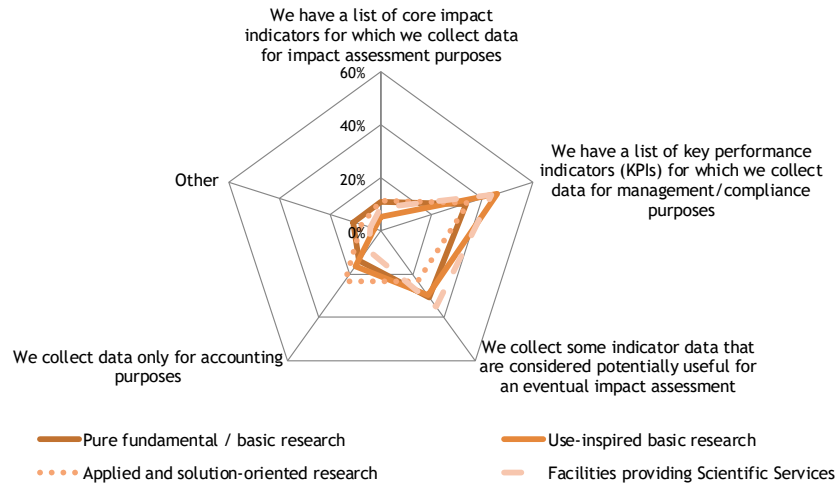


Fig. 17.b

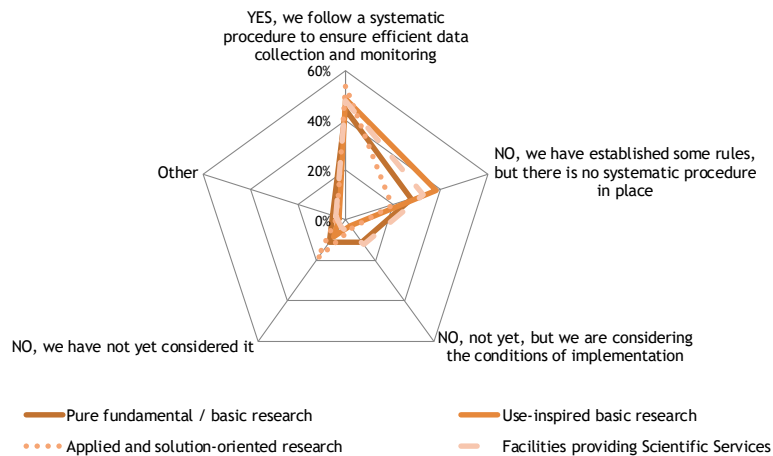
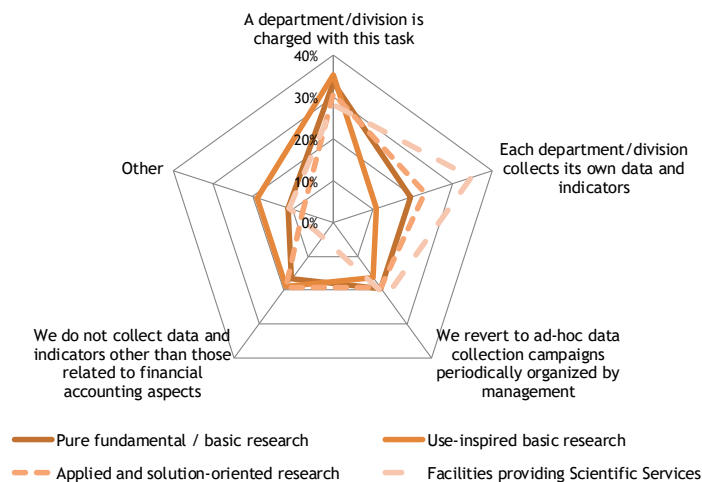


Fig. 17.c



Source: Authors based on responses to Questions C.1 (Fig 17.a), C.2 (Fig 17.b) and C.3 (Fig 17.c) and the self-classification indicated by respondents to Question A4. Note: Number of respondents to all questions considered: 191.



As showed by the Figures 18 below, no major differences in practices and experience of data collection and monitoring are found amongst respondents from EU-28 and Extra EU-28 countries. Some differences can be stressed for pan-European respondents. Specifically, these respondents mostly declare to have some rules for data collection or are considering the conditions for implementing some procedures. In addition, they mostly revert on *ad-hoc* campaigns for data collection.

Figure 18. Responding RIs as of their experience and practices with data collection and monitoring by geographic perspective

Fig. 18.a

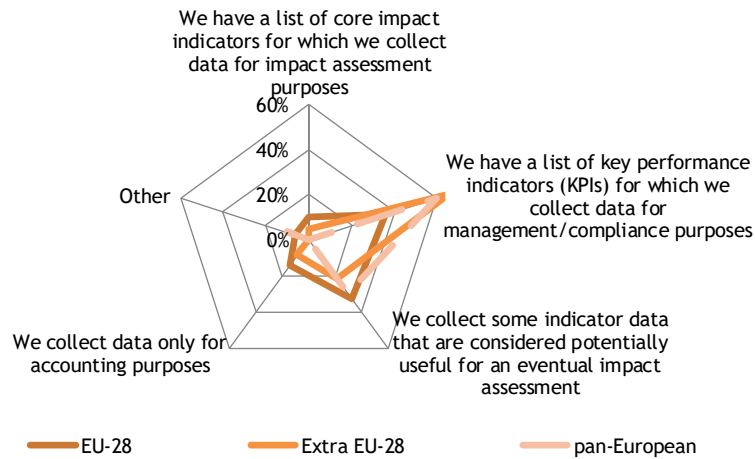


Fig. 18.b

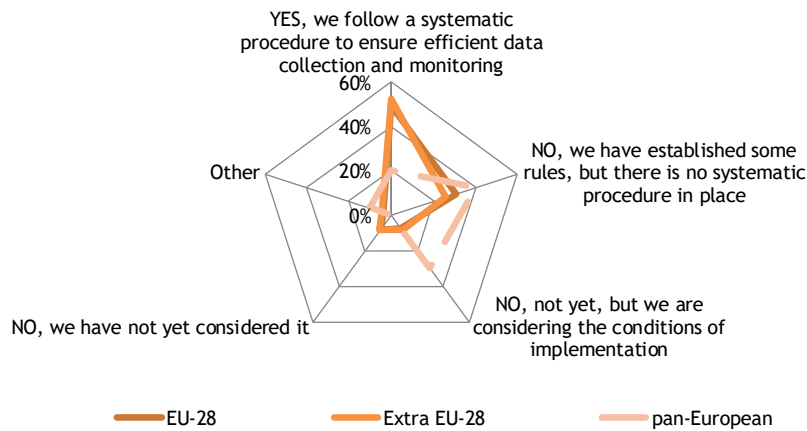
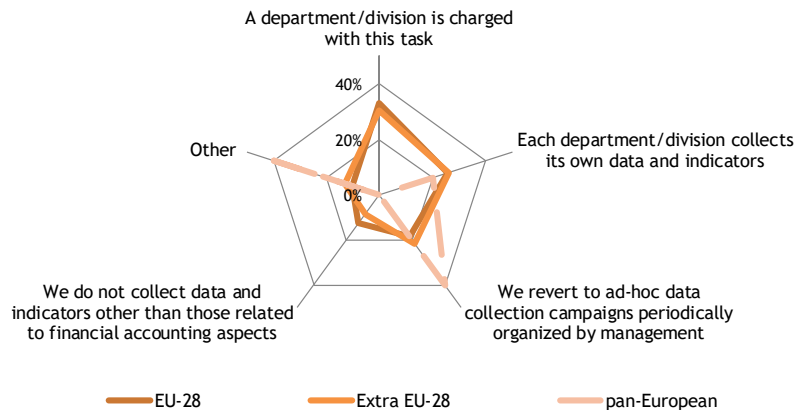


Fig. 18.c



Source: Authors based on responses to Questions C.1 (Fig 18.a), C.2 (Fig 18.b) and C.3 (Fig 18.c) matched with the geographic location of respondents. **Note:** Number of respondents to all questions considered: 191.



5. Conclusions

The evidence collected through this survey confirms that there is a concern toward socio-economic impact assessment from the RIs perspective. Several reasons have contributed to raise this concern amongst surveyed RIs, mostly related to the need to comply with formal procedures for funding applications. Even where there is no experience of socio-economic impact assessment, there is evidence of an interest to carry out it in the future and take advantages of it.

Regardless the experience with socio-economic impact assessment, results confirm that there is evidence of collection of data which is potentially useful for impact assessment. Systematic procedure or some general rules have been adopted/ planned to be adopted in the future for the purpose of data collection. The responsibilities and procedures in use are instead mixed. Data collection and monitoring is mostly challenged by the lack of resources.

Findings from this survey will be used in the framework of future RI-PATHS discussions on the development of a common model for socio-economic impact assessment of RIs.



Annex 1: E-mail invitation to the survey

Subject: RI-PATHS Survey on assessing RIs' socio-economic impacts

Dear Sir or Madam,

We cordially invite you to join our on-line survey, “**Assessing the socio-economic impacts of investments in Research Infrastructures (RIs).**” The survey is carried out in the framework of a research project --RI-PATHS-- funded by the Horizon 2020 programme under the grant agreement 777563, whose objective is to develop a model for describing the socio-economic impacts of RIs. The model will be developed in a modular manner, adapting it to a broad range of scientific domains and types of infrastructures.

A previous survey carried out by the European Commission¹⁸ highlights that the majority of RIs have assessed their socio-economic impact at least once. However, assessments are often not carried out on a regular and systematic basis. We are aware that recent surveys (in particular by the Global Science Forum of the OECD¹⁹ and by MERIL) have been carried out on the use of key performance indicators. Our survey differs from these previous efforts, as we are gathering evidence on existing practices and needs for carrying out socio-economic impact assessments.

No quantitative or sensitive data will be requested. Responses will be handled in the strictest confidence and will only be used as aggregates for the purposes of this H2020-funded project.

If you are not in the position to answer this survey, we would kindly ask you to forward this invitation to the appropriate person at your research infrastructure.

The estimated time for completing this survey is **15 minutes**. Please specify if you are part of a **distributed facility (acting either as hub or node)** in the relevant section. If, in addition to being part of a distributed facility, you carry out **additional, stand-alone research activities (independent from the ones of the distributed facility)**, please complete the survey a second time from this perspective (by using the same survey link).

To access the on-line questionnaire, please click on the link below.

[**Begin Survey**](#)

The deadline for completing the questionnaire is 15th July 2018.

¹⁸ EC (2015), Report on the Consultation on Long Term Sustainability of Research Infrastructures, https://ec.europa.eu/research/infrastructures/pdf/lts_report_062016_final.pdf

¹⁹ OECD Global Science Forum, 2018. *International Workshop on Establishing a reference framework for assessing the socio-economic impact of Research Infrastructures 19-20 March 2018. Draft Summary.*



Please feel free to contact **Emily DeYoung Becker** if you need further details: via e-mail ripaths@esf.org or by phone on +33 3 88 76 71 00.

Upon the completion of the survey, if interested we will keep you informed and will invite you to continue the discussion in the framework of the RI-PATHS' workshops.

Please feel free to forward the link to the Survey to any person you find eligible to participate: RI-PATHS Survey.

Thank you very much in advance for your valuable cooperation.

Kindest regards,

The RI-PATHS Project Team



Annex 2 : Online questionnaire



H2020 project - Grant Agreement number: 777563

Welcome!

This survey is carried out within the framework of the [RI-PATHS project](#) funded by the Horizon 2020 programme under grant agreement 777563. Your answers will be treated in a strictly confidential manner and will be anonymised for aggregate statistical analysis.

For any questions or technical problems, please contact Emily DeYoung Becker via email ripaths@esf.org or by phone on +33 3 88 76 71 00.

If you are not in the position to answer this survey, we would kindly ask you to forward this invitation to the appropriate person at your research infrastructure.

The estimated time for completing this survey is 15 minutes. Please note that until you complete the survey you may change any answers on previous survey pages. Once you have completed the survey, you may return to the survey link to create a completely new record. This is recommended for RIs which are part of a distributed facility (acting either as hub or node) and carry out additional, stand-alone research activities, independent from the ones of the distributed facility. You are cordially invited to fill in the survey from each perspective.

Deadline for completing the survey is 15th July 2018.

Our most sincere thanks for your valuable cooperation!

The [RI-PATHS](#) Project Team



PART A: General Information

| | |
|--|--|
| <p>A.1 Research Infrastructure (RI) Description</p> | <p>Full name of RI:</p> <hr/> <p>Acronym:</p> <hr/> <p>Name of the respondent (<i>optional</i>):</p> <hr/> <p>Position (<i>optional</i>):</p> <hr/> |
| <p>A.2 Scientific field of Research Infrastructure (RI): <i>Please select all that apply</i></p> | <p><input type="checkbox"/> Biological & Medical Sciences</p> <p><input type="checkbox"/> Chemistry & Material Sciences</p> <p><input type="checkbox"/> Environmental Sciences</p> <p><input type="checkbox"/> Engineering & Energy</p> <p><input type="checkbox"/> Humanities & Arts</p> <p><input type="checkbox"/> Information Science & Technology</p> <p><input type="checkbox"/> Physics, Astronomy, Astrophysics and Mathematics</p> <p><input type="checkbox"/> Social Sciences</p> <p><input type="checkbox"/> Other, please specify _____</p> |
| <p>A.3 Type of Research Infrastructure (RI): <i>Please select all that apply</i> <i>*For more details on this classification, see the Working note on RI typology drafted by the RI-PATHS team and available here.</i></p> | <p><input type="checkbox"/> Single-sited ((unified single body of equipment at one single physical location)</p> <p><input type="checkbox"/> Distributed (a network of distributed resources: instrumentation, collections, archives, scientific libraries) - GO TO QUESTION 3.1</p> <p><input type="checkbox"/> Virtual (the service is provided electronically - ICT based system for scientific research; including high-capacity communication networks and computing facilities)</p> <p><input type="checkbox"/> Mobile (vehicles designed for scientific research)</p> <p><input type="checkbox"/> Other/not applicable, please specify _____</p> |
| <p>A.3.1 In describing your Research Infrastructure (Question A.3), you selected the option 'distributed'. Please, specify what is the role played by your Research Infrastructure as part of this distributed model:</p> | <p><input type="checkbox"/> It is the hub of the distributed Research Infrastructure</p> <p><input type="checkbox"/> It is one of the nodes forming the distributed Research Infrastructure</p> <p><input type="checkbox"/> It is a Country-Lead Institute of the distributed Research Infrastructure</p> <p><input type="checkbox"/> Other (please specify) _____</p> |
| <p>A.4 Which of the <u>following category best describes</u> the main emphasis of your Research Infrastructure's current activities? <i>Please select the answer which best describes your RI's activity</i> <i>*For more details on this classification, see the</i></p> | <p><input type="checkbox"/> Pure fundamental /basic research: Curiosity-driven research that advances human knowledge; generating socio-economic impact potentials is not the priority.</p> <p><input type="checkbox"/> Use-inspired basic research: Scientific research conducted with the clear ambition of solving known societal challenges or creating technologies for future economic applications.</p> <p><input type="checkbox"/> Applied and solution-oriented research: Research and development directly aimed at meeting public or business demands</p> |



| | | | | | |
|---|---|-----------------|-------------------|-------------------|--------------|
| <p><i>Working note on RI typology drafted by the RI-PATHS team and available here.</i></p> | <p>and at responding to well identified research or technological problems.</p> <p><input type="checkbox"/> Facilities providing Scientific Services: facilities designed to offer services to be directly used for the science community to efficiently carry out their research.</p> | | | | |
| <p>A.4.1 Please provide your opinion about the classification used in the previous question.</p> | <p><input type="checkbox"/> I find that it fits well</p> <p><input type="checkbox"/> I find it is helpful but can be improved/I faced some difficulties in classifying my RI. Please explain how/why:</p> <hr/> | | | | |
| <p>A.5 Please indicate how long has your Research Infrastructure been in operation. <i>Optional</i></p> | <p><input type="checkbox"/> Not yet, it is still being designed</p> <p><input type="checkbox"/> Not yet, it is still under construction</p> <p><input type="checkbox"/> For 1 - 5 years</p> <p><input type="checkbox"/> For 6 - 10 years</p> <p><input type="checkbox"/> Longer than 10 years</p> | | | | |
| <p>A.5.1 Have there been any major updates on your Research Infrastructure? <i>Optional</i></p> | <p><input type="checkbox"/> Yes, some time ago</p> <p><input type="checkbox"/> Yes, recently</p> <p><input type="checkbox"/> Yes, currently ongoing</p> <p><input type="checkbox"/> No, but it is planned</p> <p><input type="checkbox"/> No</p> | | | | |
| <p>A.6 Please provide a brief description of your scientific mission. <i>Optional</i></p> | | | | | |
| <p>A.7 How relevant are your activities for these potential stakeholder groups?</p> | Very Relevant | Fairly Relevant | Somewhat Relevant | Not very Relevant | Not Relevant |
| <p>Scientists/Senior researchers</p> | | | | | |
| <p>Young professionals, junior researchers and students</p> | | | | | |
| <p>Private sector organisations/businesses</p> | | | | | |
| <p>Policy-makers</p> | | | | | |
| <p>Individuals directly benefitting from research results or services</p> | | | | | |
| <p>General public</p> | | | | | |
| <p>Please write your comments regarding a stakeholder group which is not listed above and/or if you would like to describe better your answers:</p> | | | | | |



PART B: Your experience with socio-economic impact assessment

Please note that the term “socio-economic impact assessment” adopted in the following questions refers to any attempt to assess (e.g. measure, quantify or simply describe) the impacts of your RI on the economy and/or society.

| | |
|--|--|
| <p>B.1 Does your Research Infrastructure carry out, or has it been the subject of, a socio-economic impact assessment (e.g. commissioned by a funding agency) ?</p> <p><i>Please select the answer that best describes your Research Infrastructure’s situation</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> YES, we regularly (e.g. annually, at the end of funding periods) carry out an impact assessment [GO TO QUESTION B.1.1] <input type="checkbox"/> YES, we have carried out an impact assessment, but not regularly and/or only on one type of impact [GO TO QUESTION B.1.1] <input type="checkbox"/> NO, we have not, but we are seriously thinking about doing it in the future [GO TO QUESTION C.1] <input type="checkbox"/> NO, we have not yet considered the possibility of doing an impact assessment [GO TO QUESTION C.1] <input type="checkbox"/> Other (please specify) _____ [GO TO QUESTION C.1] |
| <p>B.1.1 What was the main reason for carrying out a socio-economic impact assessment and/or related data collection?</p> <p><i>Please select all that apply</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> It was required by formal procedures for funds application <input type="checkbox"/> It was required by a funding agency for accountability purposes <input type="checkbox"/> It was required for submitting a proposal to national/EU roadmap <input type="checkbox"/> It was your own initiative for internal reporting (e.g. periodical strategic evaluation) <input type="checkbox"/> It was your own initiative for public accountability <input type="checkbox"/> Other (please specify) _____ |
| <p>B.1.2 How was the impact assessment carried out?</p> <p><i>Optional</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> It was contracted out to an external consultancy/expert <input type="checkbox"/> It was carried out internally with our own resources <input type="checkbox"/> Other (please specify) _____ |
| <p>B.1.3 Which of the following aspects have been investigated in your assessment for the purpose of measuring impacts?</p> <p><i>Please select all that apply</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Economic impact on suppliers deriving from procurement contracts with your Research Infrastructure <input type="checkbox"/> Know-how and technological spill-over between your Research Infrastructure and firms (e.g. patents, prototypes, innovation developed, generation of spin-off, etc.) <input type="checkbox"/> Access to more and/or better data for scientific use <input type="checkbox"/> Scientific output of your Research Infrastructure (e.g. publications, etc.) <input type="checkbox"/> Education and skills improvement of young researchers spending a period at your Research Infrastructure <input type="checkbox"/> Outreach activities to general population (e.g. events, social media, etc.) |



| | |
|---|--|
| | <input type="checkbox"/> Contribution of the Research Infrastructure to the regional economy (e.g. employment effects, increase of GDP, etc.) <input type="checkbox"/> Other (please specify) _____ |
| <p>B.1.4 Has there been any follow-up on this socio-economic impact assessment? <i>Please select all that apply</i></p> | <input type="checkbox"/> YES, with concrete consequences for the evaluation / reporting practices of our Research Infrastructure <input type="checkbox"/> YES, with concrete consequences for the management of our Research Infrastructure <input type="checkbox"/> YES, with concrete consequences for the funding of our Research Infrastructure <input type="checkbox"/> YES, but of a reputational nature without immediate consequences so far <input type="checkbox"/> NO <input type="checkbox"/> I don't know <input type="checkbox"/> Other (please specify) _____ |
| <p>B.1.5 Please name the study(ies) carried out and provide a link, if publicly available. <i>Optional</i></p> | |

PART C: Data collection and monitoring for socio-economic impact assessment

The aim of the following questions is to understand practices and approaches for collecting and monitoring data that can be helpful to measure different impacts of Research Infrastructures.

| | |
|--|---|
| <p>C.1 What data are you collecting that could be considered relevant for socio-economic impacts? <i>Please select the answer that best describes your Research Infrastructure's situation</i></p> | <input type="checkbox"/> We have a list of core impact indicators for which we collect data for impact assessment purposes <input type="checkbox"/> We have a list of key performance indicators (KPIs) for which we collect data for management/compliance purposes <input type="checkbox"/> We collect some indicator data that are considered potentially useful for an eventual impact assessment <input type="checkbox"/> We collect data only for accounting purposes <input type="checkbox"/> Other (please specify) _____ |
|--|---|



| | |
|---|--|
| <p>C.2 Do you perform data collection and monitoring following a systematic procedure?</p> <p><i>Please select the answer that best describes your Research Infrastructure's situation</i></p> | <p><input type="checkbox"/> YES, we follow a systematic procedure to ensure efficient data collection and monitoring</p> <p><input type="checkbox"/> NO, we have established some rules, but there is no systematic procedure in place</p> <p><input type="checkbox"/> NO, not yet, but we are considering the conditions of implementation</p> <p><input type="checkbox"/> NO, we have not yet considered it</p> <p><input type="checkbox"/> Other (please specify) _____</p> |
| <p>C.3 Who is responsible for the collection and monitoring of data that is considered relevant for impact assessment?</p> <p><i>Please select the answer that best describes your Research Infrastructure's situation</i></p> | <p><input type="checkbox"/> A department/division is charged with this task</p> <p><input type="checkbox"/> Each department/division collects its own data and indicators</p> <p><input type="checkbox"/> We revert to ad-hoc data collection campaigns periodically organized by management</p> <p><input type="checkbox"/> We do not collect data and indicators other than those related to financial accounting aspects</p> <p><input type="checkbox"/> Other (please specify) _____</p> |

The aim of the following questions is to understand practices and approaches for collecting and monitoring data that can be helpful to measure different impacts of Research Infrastructures.



| <p>C.4 Please indicate which of the following data collection activities you have carried out:</p> <p><i>*infrequently = on some occasions; ad hoc = relatively frequently but not systematically / periodically carried out; regularly = carried out in a systematic way (e.g. set deadlines, annually, quarterly etc.)</i></p> | Never | Once | Infrequently | Ad Hoc | Regularly | Not yet, but we planned it | I don't know |
|--|-------|------|--------------|--------|-----------|----------------------------|--------------|
| Survey of firms supplying services to your Research Infrastructure to investigate the economic impacts of your procurement activity | | | | | | | |
| Survey on users' satisfaction | | | | | | | |
| Survey on users' willingness to pay for the services provided by your Research Infrastructure | | | | | | | |
| Survey on your Alumnis' careers (e.g. sector of employment/salary level after having spent a period in your Research Infrastructure) | | | | | | | |
| Survey on taxpayers' willingness to pay for supporting the activities carried out by your Research Infrastructure | | | | | | | |
| Survey open to general public joining events organised by your Research Infrastructure/visiting your Research Infrastructure | | | | | | | |
| <p>Please provide any comments i) regarding data collection activities not listed above; ii) to better describe your answers (e.g. which kind of data you collect, when have you carried out this survey, etc.)</p> | | | | | | | |



| | |
|---|--|
| <p>C.5 What are the main challenges faced in your Research Infrastructure during data collection and monitoring?</p> <p><i>Please select all that apply</i></p> | <ul style="list-style-type: none"> <input type="checkbox"/> Lack of resources (e.g. there is no department specialised in this field and the activity is time-consuming). <input type="checkbox"/> Lack of coordination (e.g. data are collected by different departments which often do not collaborate effectively) <input type="checkbox"/> Lack of a systematic procedure (e.g. there is no unique format since data are collected on specific request) <input type="checkbox"/> No or poor follow-up on the activities of the Research Infrastructure (e.g. there is no interest in investigating certain impacts, such as publications) <input type="checkbox"/> Other (please specify) _____ |
|---|--|

PART D: FUTURE RI-PATHS ACTIVITIES

A number of workshops will be organised as part of the RI-PATHS project's activities in order to continue the debate on socio-economic impact assessment. Research Infrastructures are expected to play an active role in the design and structure of these events. It will be our pleasure to keep you informed, ask for your advices and suggestions (e.g. in setting the agenda, selecting key stakeholders, etc.) and invite you to join:

| | |
|--|---|
| <p>D.1 Would you be interested in contributing to the RI-PATHS project, for instance by joining future events with other stakeholders and continuing the discussion on this issue?</p> | <ul style="list-style-type: none"> <input type="checkbox"/> YES <input type="checkbox"/> NO |
| <p>D.2 You have chosen the option 'yes', please provide us with your contact details [*]:</p> | <p>Full name</p> <p>Email address:</p> |

[*] Please note that personal data will be treated confidentially and in compliance with the EU General Data Protection Regulation 2016/679.

THANK YOU FOR YOUR CONTRIBUTION TO THIS SURVEY!

[END OF THE SURVEY](#)