eatris

European infrastructure
for translational medicine

EATRIS ERIC Long-Term Sustainability Plan

2024-2030

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Acronyms

AI Artificial Intelligence

ATMPs Advanced Therapy Medicinal Products

C&S Coordination and Support

EATRIS European Infrastructure for Translational Medicine

EMA European Medicine Agency

ERA European Research Area

ESFRI European Strategic Forum on Research infrastructure

GSK GlaxoSmithKline

HTA Health Technology Assessment

NC National Coordinator

NCA National Competent Authority

PI Principal Investigator

RI Research Infrastructure

SMEs Small Medium Enterprises

EATRIS-ERIC Long-Term Sustainability Plan was developed within the framework of EATRIS-Plus project (2020-2023) that aimed to build further capabilities and deliver innovative scientific tools to support the long-term sustainability strategy of EATRIS. EATRIS-Plus was a 4-year project funded by the Horizon 2020 Research and Innovation Action of the European Union. Grant agreement number 871096.

1. Executive Summary

1.1 Purpose of this plan

The purpose of EATRIS' Long-term Sustainability Plan is to describe the high-level activities that ensure the long-term sustainability of the whole Research Infrastructure (RI). EATRIS' long-term sustainability plan is based on EATRIS ERIC sustainability – represented by the Coordination & Support unit - augmented by EATRIS nodes Strategic Development with each EATRIS node (14) having its own strategic and sustainability plan. This document shall not be considered as a replacement for these plans.

1.2 Introduction

Translational medicine is a key field of biomedical research that expedites the development of new diagnostic tools and treatments into patient benefit by using a multi-disciplinary and highly collaborative "bench-to-bedside-and-back" approach. The journey from scientific discovery to the implementation of a novel therapy in the clinic is long and complex, requiring close-knit collaboration amongst a broad range of expert domains. In its essence the translational medicine approach brings together patients and their clinicians, laboratory-focused biologists and the technologists that deploy cutting edge analytical technologies – all with the common goal to deconvolute complex disease mechanisms at a molecular level and understand how these parameters interact with disease progression and patient experience. Many barriers reduce the efficiency of the translational medicine process, including challenges in engendering multi-disciplinarity in inherently siloed disciplines, awareness of later stage requirements for entering clinical development, imperfect cross-sectoral collaboration amongst public and private entities, fitness of analytical technologies for the studies in which they're deployed, insufficient engagement of patients throughout the R&D lifecycle, and more.

Being aware of the challenges and barriers inherent to the field, EATRIS facilitates access to 150+ biomedical research institutions distributed across 14 European countries that provides services and knowledge to the European Research Area (ERA) to overcome barriers and accelerate the translational medicine process.

As a result of the coordinated effort of our members, EATRIS now occupies a central position in the European non-profit translational medicine domain and is positioned as a key driving force for delivering personalised and precision medicine for the benefit of European citizens.

2. EATRIS Mission and Strategic Objectives

2.1 Mission, Vision and Impact

EATRIS Vision

A world in which the translation of scientific discoveries into medical products is an efficient and effective manner to improve human health and quality of life

EATRIS Mission

To support researchers in developing their biomedical discoveries into novel translational tools and interventions for better health outcomes for society.

EATRIS Impact

EATRIS strives for a healthier future by transforming scientific breakthroughs into medical advancements for patients and society.

2.2 Strategic Objectives

The EATRIS strategy is to make the best use of the capacities available within our infrastructure and beyond, synchronizing the activities of multiple scientific disciplines, and different types of actors.

In the Strategic Plan 2023-2026 there are six strategic pillars:

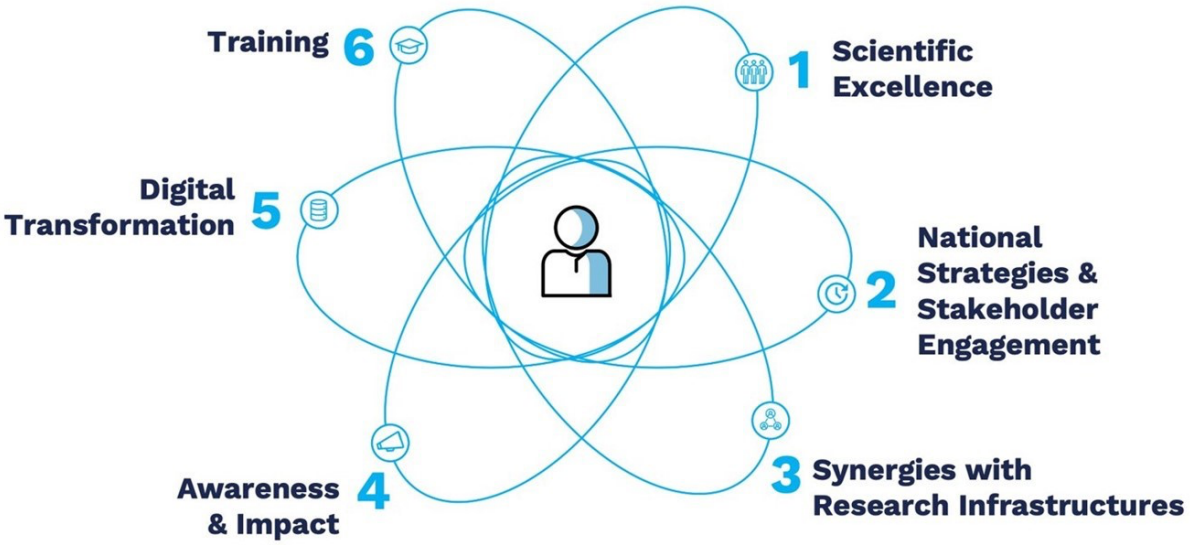

Figure 1 – EATRIS Strategic Pillars

1. **Scientific excellence** to impel the transformation of scientific breakthroughs into novel solutions for unmet medical needs;

2. **Stakeholder engagement** and supporting the Translational Medicine strategic agendas of the Member States for a coherent European identity and offering;
3. **Synergies with other Research Infrastructures** (RIs) as the main mechanism to defragment activities across the Research Infrastructure program;
4. **Raising the awareness and the impact** of EATRIS in European research ecosystems to facilitate responsible research policies and engage society in the research and innovation decision-making processes;
5. **Supporting the digital transformation** in Europe to unlock the power of data to improve health;
6. **Training** a broad range of stakeholders in the challenges and solutions of translational medicine, providing a holistic perspective of the research and innovation value chain.

3. Key activities

EATRIS operates along the biomedical innovation pathway, where novel knowledge and technological tools created by science require substantial multi-disciplinary and process-oriented efforts to mature towards clinical applications, and benefit for patients and society. Through its distributed infrastructure, which comprises 150+ leading research institutions in 14 European countries, EATRIS supports not only **public and private research entities** but **funders** and **patient organisations** as well. The EATRIS Scientific Platforms: Biomarkers, Small Molecules, Imaging and Tracing, Advanced Therapy Medicinal Products (ATMP), and Vaccines & Immunomonitoring represent and structure the scientific and technology offering of the RI.

Each **platform** offers a specific set of infrastructure services targeted to the needs of its users (industry, academia, charity funders and governments). EATRIS Scientific platforms are composed of **academic and non-profit research institutions** in biomedical translational research. All members possess well-established track records in entering clinical development, hosting unique infrastructures, licenses (such as Good Manufacturing Practice (GMP), laboratories or Good Clinical Practice (GCP)), and clinical expertise with access to a broad array of patient cohorts[1].

Advanced Therapy Medicinal Products (ATMPs) represent a new category of medicines with a wide therapeutic potential for treating different types of diseases such as cancer, neurodegenerative and cardiovascular diseases. They include Gene Therapy Medicinal Products (GTMP), Cell Therapy Medicinal Products (CTMP), and Tissue Engineered Products (TEP).
The ATMPs platform provides the most qualified and state of the art technologies for the critical issues in this development area, such as specialized GMP facilities, imaging facilities for in vivo animal studies, availability of dedicated/ tailored animal models, clinical expertise and access to patients for high prevalence and/or rare diseases, as well as to clinical facilities.)

The EATRIS Biomarkers Platform facilitates the validation and development of biomarkers for the prevention, diagnosis and prognostic assessment of disease as well as for the prediction of therapy response. The Biomarkers Platform has a variety of technological expertise, such as tissue-based biomarkers, multiplex assay and imaging expertise, as well as disease expertise, including cancer,

[1] Platform Leaflets - EATRIS

neurological disease, infection or inflammation. In alignment with the overarching EATRIS scientific agenda, the Biomarkers Platform is particularly active in the Personalised medicine domain.

The EATRIS Imaging and Tracing Platform provides a single point of entry to high-end expertise and cutting-edge translational imaging facilities. The Imaging and Tracing platform covers the entire scope of tracer development and molecular imaging and offers multi-centre clinical trials capabilities with validated imaging-based biomarkers, disease-specific tracers, contrast agents and radiolabelled drugs in combination with a full range of high-end multi-modal imaging techniques and advanced image analysis.

The EATRIS Small Molecules platform supports the pre-clinical and clinical development of drug candidates, specialized academic expertise around novel targets and molecular scaffolds, access to advanced screening facilities with innovative cell-based assays as well as integrated use of the latest biomarker techniques. Tailored animal models to study the mode of action of novel drug candidates and targets, supported by experts in pharmacology, medicinal chemistry, analytical chemistry and toxicology are key elements of the platform offering.

The EATRIS Vaccines, Inflammation and Immune Monitoring (VIIM) platform covers the entire vaccine development and production pipeline ranging from late-phase pre-clinical development to clinical trials. It includes specialized GMP provision with accompanying formulation and adjuvantation; disease specific animal models with facilities up to BSL3 containment; immune-monitoring, and access to clinical facilities with relevant patient groups up to phase IIa trials. The Vaccines platform has been particularly active in the context of the COVID-19 pandemic and has provided regulatory support to vaccine developers (SME) through the TRANSVAC-2 initiative (see: https://www.transvac.org/eatris-regulatory-support)

3.1. Infrastructure services and user access

The user access procedure for EATRIS is facilitates fast, resource-efficient and fair access of top-quality translational projects to the EATRIS infrastructure. At this stage of development, EATRIS does not have access to a discretionary project fund, and thus only projects with adequate funding or with a joint fund-raising strategy can be considered. Thus, the role of the C&S-operated user access process in this context is to:

1) Ensure that proposed projects display high translational potential with a significant expected impact on patient health and/or efficiency of the healthcare process.
2) Ensure that eligible projects are matched to top quality infrastructure with precisely the expertise and facilities required and with described activities fit for purpose towards development and clinical impact.
3) Facilitate a smooth and effective process, both in preparation and execution of projects.

Any type of relationship is possible – from single-site single study contract research (but respecting academic right to publish) to long-term, multi-site partnership with a rolling portfolio.

The access services at EATRIS fall broadly into 3 types:

- fee-for-service research services,
- consortium building for joint fund-raising, and

- expert support services providing to funders, organisations and individuals with high value advice.

3.1.1 Infrastructure services

Specific services within these categories:

Research Services: EATRIS C&S Office (EATRIS hub) provides support to ensure that project partners reach an agreement efficiently and to facilitate partnerships while the EATRIS member institutes execute the resulting study plans in direct collaboration with the users. The facilities are part of the Member State offering and as such the capital investments and human resources to build and maintain these facilities are the responsibility of Members. The EATRIS accession process ensures that in each country the facilities offered represent that members' leading facilities and expertise in translational medicine, and that our technology offering evolves at the speed of the national infrastructure investments.

Consortium Building: Like Research Services, Consortium Building is a quick way to identify potential partners for funding applications.

Innovation Management:

- **Exploitation and sustainability:** To identify key exploitable results and intellectually property (IP) protection required for the advancement of the project along the Research and Development path and prioritization of outputs to be transferred in translational medicine processes towards the development of novel products and services and opportunity to reaching the market, according to the following criteria: intellectual property, market analysis, unmet need verification, regulatory feasibility and likelihood to have the product reimbursed in standard of care.
- **Translational Assessment**: Our Translational Assessment is a unique service in Europe. With this service, we assess the translational feasibility of projects based on various elements such as the unmet medical need, the intellectual property at play, the regulatory context, and the end-product definition. This service is paid by funders and provided to researchers applying to a particular funding call.
- **Mentoring:** Mentoring is a new service complementary to our translational assessment. It is developed to provide experts input to Principal Investigators (PI) developing a proposal or while a project is under execution. It allows tailored made feedback at a moment of most pressing need in a proposal or project development.
- **Regulatory Support**: EATRIS offers early assessment of the regulatory requirements needed for successful translational projects. The regulatory experts working with EATRIS provide a range of services, including facilitating early dialogue with the European Medicines Agency (EMA) or National Competent Authorities (NCA), Orphan Drug Designation applications, Scientific Advice and more.
- **(early) Health Technology Assessment**: Through our early Health Technology Assessment (HTA), a multidimensional analysis is performed to provide information on the 9 domains considered in a HTA analysis based on the data available at the actual stage of development of the technology. It allows to understand the main strengths and limits of the technology, and to address research activities on the topics and issues that lacks evidence. Additionally, a headroom analysis may be performed to determine maximum reimbursable price of a new technology assuming the health care payer perspective.

Set-up and management of public-private innovation Hubs: This service is tailored to the needs of pharma companies willing to form a long-term collaboration with multiple academic partners. The Master Research Collaboration Agreement in place between the company and the institutions participating in a hub allows for fast initiation of collaborative projects.

3.1.2 User Access

User access is provided to any researcher with a legitimate project regardless of their territory (except sanctioned territories such as Russia) or organizational provenance (public/private).

The EATRIS portfolio of users is diverse, with academia accounting for the most users(55%). Biotechnology and pharmaceutical SMEs (25%) marketing is generally conducted at conferences and partnering events (EATRIS C&S has a dedicated business development manager in its staff) or via our network of National Coordinators (NCs). EATRIS performs extensive outreach – relative to the overall funding envelope - including to industry. On average 100 companies are met per year at large partnering events and conferences, which yields ca. 15-20 requests annually from the private sector. These SMEs often have straightforward research requests that can be handled by EATRIS Research Service; It allows companies and academics to very quickly identify the main challenges they will face along their development programme. This is especially true for complex products in the field of ATMPs.

Academic user engagement and marketing efforts go through EATRIS National Nodes and participating institutions, as well as EATRIS ERIC involvement in large scale initiatives like the European Joint Programme in Rare Diseases (EJP RD). To encourage EATRIS members to make use of the EATRIS services and increase members' capacity to prepare high quality funding applications, EATRIS developed a Funding Opportunities database (accessible by EATRIS members only) updated monthly. Further visibility towards EATRIS services is gained through relationship building with consultancy companies/grant writing companies.

3.1.3 Pricing

EATRIS does not impose uniform pricing across its RI, as this is impossible due to regional differences in costs. However, we apply a framework for costing, that allows for uniform construction of project costs. We also encourage tiered costing, with lower prices for academic and SME users, and higher costs for large pharma and biotech companies. This pricing framework follows generally accepted academiac pricing principles, And forms part of the EATRIS Framework Agreement, allowing standardised costing practices across the infrastructure..

3.2. New Technology and Service Development

In addition to infrastructure access (technology and expertise), EATRIS contributes to Translational Medicine through a portfolio of actions and initiatives dedicated to the development and validation of novel tools, methodologies and workflows. These span across all efforts of the organisation from standardisation and best practice exchange, digital competencies and innovative large-scale multi-disciplinary transformative efforts of the Translational Medicine operational processes.

EATRIS contributions to the development of Translational Medicine in the European Research Area include:

- Developing, validating and deploying novel technologies in the translational process;
- Developing and utilising novel collaboration models;
- Engaging regulatory bodies to advance regulatory science and regulatory awareness;
- Engaging policymakers to advance policy, disseminating and utilising methodological improvements;
- Providing training to the community;
- Supporting harmonisation, standardisation and optimisation of Translational Medicine processes, embracing robust research.

EATRIS leading efforts in the areas listed above can be illustrated with few examples of projects and initiatives EATRIS is engaged in:

- EATRIS Certificate of Commitment towards Quality. Launched last year, a recognition for EATRIS member institutions for their dedication to quality in translational research.
- Translation Together, a unique collaboration of leading translational research organisations from around the world with shared insight of the challenges facing translation, and a collective voice to advance the science and understanding of biomedical translation and with EATRIS being one of the original funders.
- EATRIS' participation in IMI project EU-PEARL as key partner leading the sustainability strategy contributing to the deployment of a set of tools to conduct patient-centric collaborative platform trials.
- Glaxosmithkline (GSK) Imaging hub, developed and managed by EATRIS for GSK (large pharma) to deliver a clinical and scientific expert network for the development and application of innovative imaging methods for inflammatory diseases. The long-term collaboration between GSK and 6 EATRIS institutions represents more than €4mn of financing from GSK to our institutions.
- REMEDI4ALL, an ambitious EU-funded research initiative launched in 2022, coordinated by EATRIS to drive forward the repurposing of medicines in Europe (23M euros, 24 partners)
- TransMedAcademy, the EATRIS online learning environment for translational scientists with a range of self-paced online courses, live courses, recorded webinars, and more, totalling 750 users of EATRIS E&T content in 2022.
- EATRIS collaboration agreement with the Critical Path (C-Path) institute to facilitate data sharing, and the development of data science and regulatory science best practices to improve translational medicine processes.
- EATRIS collaboration with CERN to transfer the knowledge generated at CERN to society and pioneer new frontiers in health solutions.

3.3. Assets

To overcome bottlenecks in Translational Medicine and provide further assistance to researchers, EATRIS offers a set of digital tools and education and training portfolio available upon certain conditions listed below:

- EATRIS database: at the heart of the infrastructure, a database designed to map the capacities, technologies, and expertise of the 150+ EATRIS Institutions. The database covers the full translational domain, including non-clinical and clinical research, production

facilities, quality assurance, regulatory affairs, project research management and training capacities within each EATRIS facilities. It defines the high-quality services and technologies that the five platforms can offer to the research community. The EATRIS database is the cornerstone of the EATRIS research service to industry and consortium building activities. It is operated by EATRIS Scientific Managers upon request from clients and requires an intimate knowledge of the field and the translational medicine processes. Sustainability depends on the maintenance of the database and high-level quality of the information gathered from the institutions. Long-term, AI tools available to augment the richness of the information stored and support queries search through automation will be explored.

- Self-service resources: Web-based tools available to the community bringing resources (e.g., guidelines, documents, protocols…) together around certain fields. Such tools have been developed under EU-funded projects and are currently owned and hosted by EATRIS in charge of the long-term sustainability and exploitability where possible. Hence, EATRIS' core budget is leveraged with EU grants funding for development and maintenance. EATRIS' portfolio of self-service resources will be further consolidated through harmonising branding and unified maintenance processes. Although EATRIS C&S will remain key partner in the development of new tools, it is foreseen that EATRIS nodes will increasingly take a role in the sustainability of newly developed solutions. Performance and usage of the resources and platforms is monitored on a bi-annual basis.

    - Regulatory Information System (RIS)[2]: A central resource for information about the regulatory requirements, guidelines and legislations from 27 EU countries (as well as Norway, Switzerland, Turkey and Israel) regarding drug and medical device development derived from the application of European legislation. The database is organized around product type and development phases to facilitate the navigation. Main seed funding: H2020 EATRIS-Plus. Sustainability: HE ERDERA (if funded)
    - Patient Engagement Resource Centre (PERC)[3]: An easy-to-navigate platform that features publicly available guidance, training and practical tools to help researchers get started with patient engagement, particularly in the early stages of biomedical research. Main seed funding H2020 EATRIS-Plus. Sustainability: EATRIS Core budget
    - Innovation Management Toolbox (IMT)[4]: library of resources in rare disease translational medicine designed to provide investigators with self-help resources specific to their needs. Main seed funding H2020 EJP RD. Sustainability: ERDERA (if funded)
    - Orphan The Orphan Drug Development Guidebook (ODDG)[5]: is a patient focused guidebook that describes the available tools, incentives, resources and practices specific for developing traditional and innovative drugs/therapies for rare disease indications and how to best use them. Main seed funding H2020 EJP RD. Sustainability: HE ERDERA (if funded)
    - Multi-omics toolbox (MOTBX)[6]: an open access web resource to help expedite translational research by making it easier for researchers in academia and industry

[2] eatris ris disclaimer
[3] Launch of new Patient Engagement Resource Centre - EATRIS
[4] EJPRD IMT – Innovation Management Toolbox (ejprarediseases.org)
[5] IRDiRC Orphan Drug Development Guide (orphandrugguide.org)
[6] Multi-omics Toolbox (MOTBX) – An open access web resource to help expedite translational research (eatris.eu)

to find relevant resources related to multi-omics analysis. The toolbox covers resources related to multiple -omics technologies including quality control and assessment, and data stewardship and integration. Main seed funding H2020 EATRIS-Plus. Sustainability: HE EATRIS CONNECT (if funded)

- Transmed Academy[7]: EATRIS online learning environment for translational scientists with a range of self-paced online courses, live courses, recorded webinars, etc.

4. Sustainability and revenue models

The financial model of EATRIS is based on contribution fees from Member States, competitive grants from EU funding programmes, and service fees from industry collaboration and expert services to research funders. Services fees are charged to large pharmaceutical companies and SMEs when EATRIS facilitates access to expertise or capacities of member institutions (matchmaking service, management of Innovation Hubs).

To unlock the full potential of the infrastructure and support financial stability, EATRIS aims to increase the number of members and to support a gradual shift towards the "Fraunhofer model". Fraunhofer's business model relies on an income of roughly one third each from member contributions, competitive grants, and industry collaboration. To this end in 2019 we constituted the following targets:

- Enlarge EATRIS' country membership by welcoming at least four new member states to the infrastructure in the next 4 years – maintain current membership constituency with better visibility of return for EATRIS member countries, country engagement dashboard to monitor national expectations from EATRIS participation and roadmap/national infrastructure evaluation processes, measures/tools to help achieve symmetry and equal activity across EATRIS members
- Reinforce the capacity of the national nodes by offering a mobility programme on key factors for sustainability and fostering best practices exchange among existing and new nodes.
- Increase the number of academic and industry users and revenues by developing novel collaboration models and accelerating outreach activities at regional, national, European and global levels

EATRIS ERIC audited finances showed in 2022 ca. 46% contribution from Member States, 12% industry/other income and 43% competitive funding. In 2023, EATRIS had welcomed two new countries as full member and continued to engage with potential new members with 4 MoU signed: BIH (Germany), Trinity College Dublin (Ireland), Academy of Athens (Greece) and Ghent University (Belgium), highlighting EATRIS' efforts to enlarge its membership.

[7] Transmed Academy - EATRIS

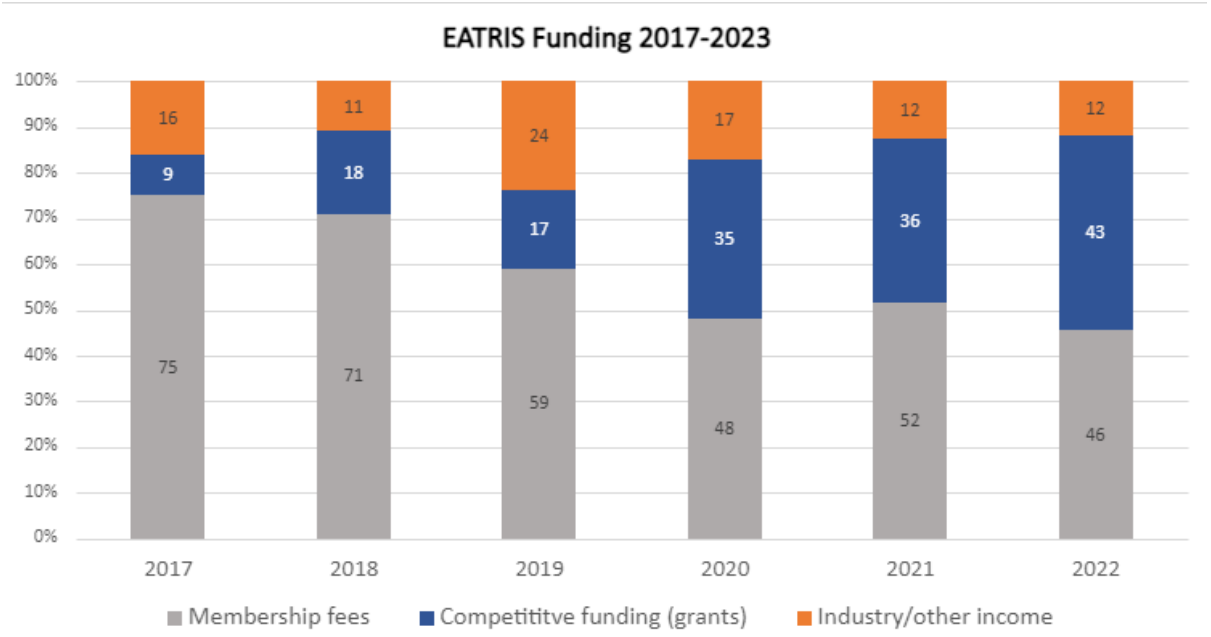

Figure 2 EATRIS Funding 2017-2022

The outlook with respect to the Fraunhofer revenue model is generally positive, with challenges expected in industry income. Since this target was established in 2019, the share of competitive grant income has risen quickly to more than 40% of total income, reducing pressure on the share of member contribution, which has reduced from more than 70% to ca. 50% and continues to decline relative to overall income. It is our goal to maintain the grant income at a 40-50% of overall income over the long term, with member contributions targeted to float in the 30-40% range. This means that we strive to increase industry and other income to 20%, up from the current ca. 12%.

To support long-term growth overall and maintain fiscal stability, we seek additionally to continue our membership growth. Our full member count is currently 14 EU member states, and we strive to enlarge the membership to 20-22 members by 2030. The underlying rationale for this growth is:

- Increasing EU policy and funding attention for applied research and impact-oriented infrastructures. EATRIS is uniquely positioned in the biomedical research space in this context;
- EATRIS is increasingly embedded in the academic networks that form the basis of national infrastructure initiatives. Through many international consortia formed by EATRIS, national academic consortia are better informed of the value of EATRIS, thereby stimulating them to initiate and consolidate new national EATRIS consortia and seek EATRIS ERIC membership;
- Our portfolio of tools and services matures, as does our reputation. Excellence in our operations, focus on patient benefit, professionalism in our approach and a growing suite of tools are contributing to a growing reputation for quality and needs-driven infrastructure services. This lowers the threshold to collaboration, increases our goodwill and makes EATRIS a key partner to foster innovation within ERA.

The most challenging element of the Fraunhofer model lies in increasing industry/other income. Currently mildly fluctuating around 10-12%, industry revenues are intrinsically in the ESFRI RI context the most difficult to obtain. Fees for industry services generally go the facilities conducting the research services, leaving little scope for this type of revenue for the central hub (ERIC). In this context are efforts are continuing to replicate the successful example of the GSK imaging hub. Additional income source is the Translational Feasibility and Mentoring services provided to

charities, impact venture funds and public funders. These services have been steadily growing in popularity and are continuing to do so. Currently this is limited to users in the Netherlands, with several charities and an impact fund that make use of the service, however, in order to further grow this high-potential service an Innovation Manager was hired in Q3 2023 to expand the service to more users in other countries.

Considering the growth of the Translational Feasibility and Mentoring service it is our expectation that Industry/other income can grow to 20% by 2028 and then remain stable in the 20-25% region.

Income volatility in project-based financing models

Given the temporary nature of project-based financing, we strive to limit grant income to maximum of 50% of the total annual income, so that disruptions from project endings, fluctuations in portfolio, gaps in funding rounds etc. do not disrupt our ability to perform effectively and professionally. With a portfolio currently numbering 25 EU funded projects, the strain of such a broad range of projects can limit the benefits to the ERIC of the additional income they provide. This risk is mitigated by a focused approach of applying for and participating in only these grants that conduct activities in or close to our core activity of translational medicine services and tools development.

ESFRI monitoring – EATRIS sustainability

Sustainability was a key point assessed in 2023 by the ESFRI monitoring committee in charge to evaluate ERIC landmarks. Individual recommendations and responses can be found in **Annex 1**. The general feedback from the monitoring process was highly positive stating that the performance of such a complex Landmark as EATRIS is fully satisfactory. In summary they found that the mission of EATRIS is clear, well defined and there are multiple initiatives, programmes, projects and alliances in place or planned.

5. Risk Management

1. Country Membership risk – in which Member States withdraw from the ERIC while institutes have infrastructure obligations. We mitigate this with the EATRIS Framework Agreement that binds institutes to complete their obligations (e.g. regarding project delivery) regardless of country membership status.

The financial risk of withdrawals is mitigated by reducing our reliance upon Membership Contributions, which is now just under 50% of total income and decreasing, as our project portfolio grows.
Of paramount importance in this strategy is to engage Members structurally to establish a dialogue to ensure a central awareness of national needs and provide high quality services, while supporting the national nodes in their structuring efforts. EATRIS appointed a dedicated "Member Engagement Officer" at the Hub since January 2023 as additional mitigation measure. This position will provide tailor-made national node support, focusing on nurturing and emphasizing country's national interests in relation to Translational Medicine and EATRIS' strategy. Further additional support to each country is envisioned during a dedicated 6-month period between the Combined Board meetings where each country will get the opportunity to rotate through. The Programme is titled "Empowering National Voices – Building EATRIS' Future, [Country] in Spotlight" and will be co-developed and further shaped along with the nodes that will be embarking on their rotations in 2024-2025. This programme shall provide the Countries with additional opportunities that will strengthen their commitment to the EATRIS ecosystem.

2. National node management risk – in certain countries the governing institution (e.g. Research Council) does not actively manage the national node, as this would be a conflict of interest. The node may be considered as a scientific project and must survive competitive calls. However, for long-term infrastructure investments, adequate monitoring and management is needed, especially in cases where a node is under-performing. However, EATRIS ERIC is not mandated to enforce corrective measures in its nodes, but can guide with tools and solutions, universally applicable in all national nodes.

We mitigate this by engaging members, maintaining a strong dialogue with node directors and training of national coordinators. As well, Terms of Reference for Good Scientific Governance of national consortiums was developed as a reference document to provide guidelines on national governance related roles and best practices for optimal governance.
All EATRIS nodes are also required to submit their long-term sustainability plan to EATRIS hub before the end of 2023. In addition, a workflow was developed and will be implemented in 2024 where a comprehensive info package from the hub to node will be provided annually in conjunction with the Annual Report release (and updated on demand) to support nodes with basic information in preparation of national infrastructure funding applications and demonstrating the members benefit.

3. Technology risk – in which the platforms and technologies are redundant and our services no longer relevant. Our infrastructure model has two modes of technology screening – via our Scientific Platforms, in which leading scientists from the field define the technology services, under the broader guidance of the Scientific Director. And via our national scientific board, the BoND, which brings regional scientific representation. Finally, our distributed model means that we have access to

all the latest technologies as soon as they enter academia, and we can support in validating these technologies for the more rigorous context of applied research and translation towards patients.

4. Scale up risk – EATRIS portfolio has increased rapidly in the last 5 years, which has led to the expansion of the staff employed by EATRIS hub. However, the growth of EATRIS must not be reflected only at the hub level, and EATRIS must be able to keep up with user demand while maintaining high professional standards and its reputation as reliable service provider. To mitigate this risk and ensure that the organisational growth is mirrored at all levels of the infrastructure, EATRIS developed a framework for decentralization of ancillary services through Expert Centres. The piloting phase was initiated in 2023 and 7 member institutions have been selected to deliver user services usually handled by the hub (e.g. innovation management, regulatory support, translational assessment, etc.).

6. Impact

In 2019-2020, EATRIS took active steps towards identifying areas of relevant impact by participating in the piloting exercise of the RI-PATHS project H2020 (2018-2020).

In 2022, EATRIS refined its initial thinking on impact with the support of the European Future Innovation System (EFIS), known expert in the field and former coordinator of the RI-PATHS project mentioned above, and identified main impact pathways:

1. *Accelerate professional development*

EATRIS contributes to the professional development of future innovation leaders by providing academic researchers (particularly early-career researchers) with the essential translational skills required for patient-centred, high quality and reproducible research, supporting scientific literacy of the public through patient education, and training the operators of the EATRIS national nodes through targeted capacity-building programmes.

2. *Enhance research quality, efficiency and its societal relevance*

Successful translation of discoveries into patient benefit requires high-quality research tools and services, that can then lead to the generation of reproducible research outcomes. EATRIS builds on already established research quality initiatives and continues to bring together the research community for the exchange of best practice, sharing of robust methods and nurture a culture that reflects those principles.

3. *Change research practices*

Conducting effective translational research with the patients at the centre requires a change in research practices mindset. EATRIS advocates for renewed responsible research practices which have a greater impact on translating scientific discoveries into patient benefit, as well as empowering and training patients to be meaningfully engaged in research.

4. *Foster innovation*

Translational research requires boundary crossing, breaking down disciplinary silos and collaborating across research areas and professions to collectively advance research and innovation for the benefit of patients. By engaging with multiple sectors and a wide range of stakeholders to collectively address bottlenecks currently hampering translational medicine, EATRIS fosters the deployment of European and national innovation ecosystems, capable to solve systemic challenges in translational research and support the exploitation of research results beyond the lab. In addition, by further strengthening its role as a bridge between academia and industry, EATRIS helps generate innovative translational approaches and scientific concepts, enhance health innovation and reduce barriers to public-private collaboration.

5. *Boost the economy*

EATRIS has served industry needs since its inception and continues to do so by facilitating matchmaking and knowledge sharing between academia and industry, escalating its service offering for industry, therefore contributing to more market-ready research and impacting industry's future technology advancement and economic value for society. Critical attention paid to the skills development of future innovation leaders also contributes to fostering an entrepreneurial mindset among young academic researchers.

6. *Improve health and well-being*

The raison d'être of EATRIS is to ultimately improve human health and well-being. EATRIS' continued commitment to develop relevant research and development tools for unmet medical needs, facilitate knowledge-sharing on emerging health threats and pandemics and increase meaningful patient engagement in translational research will contribute to more patient-centred biomedical research and healthier societies.

7. *Support science policy*

EATRIS has been actively engaging with research funders, regulators and policy-makers to raise awareness of the benefits and challenges associated with Translational Medicine, both in terms of the research process itself as well as the innovation ecosystems that can support effective translation.

8. *Contribute to science valorisation*

Citizens expect science to be a driving force that will support the transition towards a greener and fairer society. Translational research can play a crucial role in this transition if excellent research results and data are quickly made available and translated into practical use across Europe. Through its core mission and its next Strategic Plan, EATRIS strives to support the exploitation and uptake of research and innovation results beyond the "valley of death" thereby increasing the impact of research and innovation investment.

For each pathway, the study mapped in detail EATRIS' activities, related outputs, outcomes and main foreseen impact, providing EATRIS with a blueprint to assess, evaluate and communicate its impact to a broader audience.

This initial background work led to the refinement of EATRIS' impact pathways and impact statement as shown in the figure below.

Figure 3 – EATRIS Impact Statement and Pathways

In 2023, EATRIS focused on strengthening in-house expertise on impact assessment both at the node and at the hub level through:

- The setting up of a cross-department working group on Impact Assessment;
- The delivery of training sessions and workshops on impact for EATRIS National Directors and National Coordinators;
- The development of impact narratives, starting with the flagship EATRIS-Plus project;
- The initial development of a dedicated impact webpage;
- The setting up of a tracking system.

In 2024, EATRIS aims to publish its impact focussed webpage which will highlight consolidated stories on the infrastructure's socio-economic impact 10 years after its establishment. In addition a Node Impact Assessment Working Group is established to ensure that impact is appropriately considered and captured across the distributed RI.

Annex 1a: ESFRI recommendations and implementation

Following the 2016 Competitiveness Council, the European Strategy Forum for Research Infrastructures (ESFRI) published the "Long-Term Sustainability of Research Infrastructures" document where seven recommendations to RIs to ensure long-term sustainability were presented[8].

In addition, several recommendations to EATRIC ERIC specifically were provided in early 2023 subsequent to the ESFRI Landmark Monitoring process where EATRIS was included in the first monitoring batch. These individual recommendations and the implementation are discussed under the umbrellas of the seven general ESFRI recommendations.

General ESFRI Recommendation 1: *Establish and maintain excellence through the entire lifecycle of RIs by all appropriate means, by securing adequate framework conditions, and by opening the RIs up to the world.*

The unique specificities of translational medicine cannot be addressed by one infrastructural category, as e.g. high-throughput sequencing for genomics or mass spectrometry for proteomics, because no technology (or other single resource) exists for enabling translation from bench to bedside. Nevertheless, building blocks can be identified that allow for building individual bridges for translational medicine projects from basic research to patient care. EATRIS is a resource of those building blocks in the form of technology platforms as regards instrumentation and methods, best-practice and knowledge pools as regards regulatory procedures, registries for linking to data and biobanks, and, last not least, networks with industry for creating innovation partnerships.

The aim of EATRIS (as with most distributed RI) is not to replace existing organisations, efforts and support mechanisms in the field of clinical translation, but instead help SMEs, industry partners and researchers connect to the many actors on this scene depending on needs. The challenges of translational research are multiple and heterogeneous in nature and require a broad set of diverse approaches to provide solutions. The many components for medical translation "from bench to bedside" are often disperse and not easy to find or access. By creating a one-stop shop access to cross-disciplinary expertise, EATRIS aspires to integrate information and specific resources to facilitate translation.

Monitoring Recommendations:

- For demonstrating the scientific excellence, it might be helpful for EATRIS to focus more on tangible and specific measures involving critical stakeholders.

- Focusing on a more targeted approach to its activities EATRIS could create flagships, success narratives and indeed make visible and tangible advances in translational research.

- It might also be sensible to spell out more clearly the roles, complementarities or synergies of the various nodes. There could be a clearer plan for the role and organization of the various nodes.

Implementation:

To increase our needs-driven orientation, three high value programmes have been identified transversally linking our 5 platforms:

[8] ESFRI_SCRIPTA_VOL2_web.pdf

- Gene & cell therapy (ATMP) to tackle unmet medical needs in cancer, rare diseases and other medical conditions.
- AI-based solutions to be implemented in prevention, diagnosis and therapy.
- Maximizing the efficiency of repurposing drug strategies to increase the health care therapy portfolio.

Each programme enabling the development of flagship projects including harmonizing and sharing innovative approaches and best practices incl. quality control and reproducibility; lobbying for harmonisation of regulations, collaborating with other RIs and players in the areas to avoid fragmentation and redundancies, participating in the planning and designing of funding instruments and contributing to success narrative of the organisation.

General ESFRI Recommendation 2: *Ensure that research infrastructures have the right people in the right place at the right time, by strengthening and harmonising national research and educational systems to make sure that all essential skills are available.*

EATRIS ERIC supports the skills development and competency of National Coordinators (NCs) through a set of training activities and capacity building workshops that take place multiple times a year and vary greatly in topics covered (i.e. grant writing, impact assessment, patient engagement strategies, EATRIS 360 etc). This is complemented by weekly meetings chaired by the Member Engagement Officer and shared IT tools. Furthermore, NCs are encouraged to participate in internal working groups to facilitate further connection with the central hub (i.e. Go Green).

Regarding training of our user community, regular webinars and workshops are organized through the year to 1) inform users on EATRIS capabilities and services in various domains 2) provide expertise around certain technologies, or expertise according to identified needs from our user community.

Within EATRIS-Plus project (2020-2023) a comprehensive platform TransMed Academy was developed to consolidate all EATRIS-led or supported training initiatives into a one-stop-shop of a range of self-paced online courses, live courses, recorded webinars, and more.

Training opportunities from our members and beyond are advertised to the community through social media and other communication channels. In addition, EATRIS is also running a Training Network that consist of “training enthusiasts” across our member institutions. This network is an opportunity to exchange on the training needs and offers of various organisations as well as supporting members in their training development, sharing best practices and much more.

Monitoring Recommendations:

- It would be beneficial to collect qualitative statistics on the level of attendance, satisfaction, and impact of these training activities. This would allow for the identification of potential gaps and the subsequent enhancement of these.

Implementation:

Delivering training is identified as one of the 4 priority KPI for the organisation. Collecting qualitative data on participation and satisfaction is standard practice for our training offerings where possible (i.e. live workshops, self-paced online courses, webinars). To supplement the figures, we also collect testimonials through specialised impact questionnaires and interviews. This is also incorporated into

EATRIS Impact narrative. EATRIS training portfolio is further developed considering user feedback and changing needs of the translational medicine landscape.

EATRIS Training and Education operations sustainability is comprehensively considered in the respective plan “EATRIS Education and Training Sustainability”.

General ESFRI Recommendation 3*: Harmonise and integrate a vision for convergent operation of research infrastructures and e-Infrastructures in Europe to ensure cost-effective service provision to the user communities.*

Given its mission and ambition of promoting translational research in EU, EATRIS is in a unique position to articulate with and integrate efforts of other research infrastructures that are key for translating new findings into new products, diagnostic methods or otherwise health solutions for the benefit of the community.

In 2018, EATRIS started exploring closer collaboration with 2 other life science RI, which shared EATRIS’ vision and scientific scope to accelerate patient-centric research and where the most synergies could be found: BBMRI-ERIC, the RI for biobanking and ECRIN-ERIC, the RI for clinical trials. This collaboration is today known as the European Alliance of Medical Research Infrastructures (EU-AMRI) and was formally launched in Brussels in April 2022. The objective of EU-AMRI is first to jointly develop new tools and services that can support users from pre-clinical to clinical research and second to share operational resources (e.g. communications, public affairs, partnership development) and programmes (e.g. training, quality certification). EATRIS has been working closely with LS RIs through broad EU-funded projects, such as CORBEL, EOSC-Life and the recently funded projects ISIDORe and CanSERV, as well as through the LS RI Strategy Board, which EATRIS chaired in 2019-2020.

In addition, EATRIS has also established partnerships with other e-infrastructure providers to ensure that its researchers have access to the resources they need. EATRIS participates in the EU-funded projects EOSC-Life, EOSC-Future, and HealthyCloud representing collectively important opportunities for EATRIS to advance the field of digital transformation and translational medicine and to enable our community to contribute to, collaborate with, and utilise the European Open Science Cloud (EOSC).

EATRIS is planning to consolidate collaborative programmes, alliances or other forms of cooperation with a number of RIs belonging to the areas of life sciences as well as other relevant areas (AI, particle physics etc).

Monitoring Recommendations:

- Establish clear outcomes that can be used to assess the success of these collaborative initiatives.

Implementation:

EATRIS will continue to engage with BBMRI and ECRIN under EU-AMRI to further identified areas of complementarities in service provision – common efforts and positioning in the ERA. EATRIS is exploring collaboration with other ERICs regarding data management to avoid gaps and overlaps. A vision for data management is under development.

General ESFRI Recommendation 4*: Fully exploit the potential of research infrastructures as innovation hubs by incorporating strategies for their development into national and European innovation policies.*

The latest EATRIS Strategic Plan is a comprehensive effort outlining the long-term strategy including activity streams in national and EU policy and innovation.

The plan is structured around six pillars that aim to enhance the translational medicine ecosystem, exploit the capacities available within the EATRIS infrastructure and beyond, synchronizing the activities of multiple scientific disciplines, and different types of actors. Especially, Pillar 2 is dedicated to stakeholders' engagement and co-implementation of Translational Medicine strategic agendas at national levels.

1. Scientific excellence to impel the transformation of scientific breakthroughs into novel solutions for unmet medical needs.
2. Stakeholder engagement and supporting the Translational Medicine strategic agendas of the Member States for a coherent European identity and offering.
3. Synergies with other Research Infrastructures (RIs) as the main mechanism to defragment activities across the Research Infrastructure program.
4. Raising the awareness and the impact of EATRIS in European research ecosystems to facilitate responsible research policies and engage society in the research and innovation decision-making processes.
5. Supporting the digital transformation in Europe to unlock the power of data to improve health.
6. Training a broad range of stakeholders in the challenges and solutions of translational medicine, providing a holistic perspective of the research and innovation value chain

Monitoring Recommendations

- given its central role in the RIs of EU trying to promote translational research and innovation, perhaps EATRIS could have a more prominent role in policy making in EU, by participating in the planning and designing of funding instruments (both in EC and member states) aimed at facilitating translational research.

- EATRIS could have a role in lobbying for harmonization of regulations and encouraging best practices.

Implementation:

EATRIS has identified three high-value programmes cross linking EATRIS platforms to regional and national efforts. Those programmes of high user needs will provide the necessary focus and scientific excellence, fostering medical and technology innovations together with a collective voice to advance the regional, national and international policy framework. The development of a Nordic ATMP hub working in synergies with the EATRIS ATMPs platform represents an example of cooperation between regional and EU levels for the advancements of ATMPs at national and international levels.

General ESFRI Recommendation 5*: Set up effective means of determining the economic and wider social value of research infrastructures and incorporate these benefits into science-policy-society dialogues.*

EATRIS identified Impact Pathways it contributes to with efforts centred around “Improving health and well-being”.

1. Unlock professional development.
2. Implement and promote robust research practices.
3. Foster innovation
4. Boost the economy.
5. Improve health and well-being.
6. Support science policy
7. Contribute to science valorisation.

For each pathway, EATRIS mapped in detail activities, related outputs, outcomes and main foreseen impact, providing EATRIS with a blueprint to assess, evaluate and communicate its impact to a large audience from internal research community to society.

Monitoring Recommendations:

- Prioritisation of activities producing enduring outcomes and meaningful impact, could provide good narratives of success allowing for the wider engagement of additional partners/ stakeholders.

Implementation:

EATRIS is moving towards a needs-driven orientation, transversally linking our platforms and supporting prioritisation, meaningful impact generation together with success narrative. The effort was presented in November to EATRIS board members with good acceptance and buy-in.

Furthermore, in order to demonstrate EATRIS Impact going forward an internal working group was established in early 2023 to refine aforementioned Impact Pathways and develop a comprehensive internal system of monitoring and reporting impact. In 2023, workshops were organised including the National Coordinators and other RIs staff and EATRIS launched its impact statement “EATRIS strives for a healthier future by transforming scientific breakthroughs into medical advancements for patients and society”. In 2024 a node-wide Impact Assessment Working Group is formed.

General ESFRI Recommendation 6: *Establish adequate framework conditions for effective governance and sustainable long-term funding for research infrastructures at every stage in their lifecycle, together with effective management.*

The governance structure of EATRIS ERIC comprises of two main and two subsidiary bodies.

Main governance bodies are:

EATRIS Board of Governors (BoG) is the highest and ultimate governing body of EATRIS ERIC with full decision making. It is formed of representative entities from EATRIS member and observer countries. The BoG oversees adopting EATRIS ERIC strategies (long term strategic plan), annual budget and annual financial reports, and yearly operational plans. BoG also approves applications of new countries to become EATRIS ERIC members or observers.

EATRIS Executive Board is responsible for implementation of the strategies and supports EATRIS BoG. The Executive Board consists of the Operations and Finance Director (legal representative of

EATRIS ERIC) and the Scientific Director (strategic scientific development and scientific matters). The Executive Board is appointed by BoG decision for a mandated period.

EATRIS ERIC Coordination and Support office (EATRIS hub) is managed by EATRIS Executive Board, and it represents the central management and daily operations office of EATRIS ERIC.

EATRIS ERIC subsidiary bodies established by the BoG are:

EATRIS Board of National Directors (BoND) consists of National Directors (national scientific representatives of member and observer countries), and it is responsible to ensure scientific excellence of the infrastructure and develop and implement national scientific strategies. Each member state participating in EATRIS forms a node (national consortium of participating institutions). EATRIS Terms of Reference on Good Scientific Governance Principles for EATRIS National Consortium provides guidance on developing each EATRIS national node while aligned with the National Roadmap and in cooperation with EATRIS hub.

The Scientific Advisory Board of EATRIS (SAB) consists of external (independent and internationally recognized) scientific experts to inform and offer advice on new development and scientific trends based on request from the BoG and to provide feedback on EATRIS performance' on a yearly basis.

As an ERIC, EATRIS internal governance is organised through its Statutes, Rules of Procedure and Standing Orders. Relationship between EATRIS-ERIC and EATRIS institutions is regulated through an accession agreement - ***the EATRIS Framework Agreement*** signed by each institution individually. Each national government is responsible for national coordination and operations, and long-term infrastructure investments.

EATRIS ERIC Coordination and Support Office (hub) employs currently approx. 30 people under the responsibility and reporting duty of the Executive Board. Employees at national node coordinating institutions and participating facilities are not accounted as ERIC staff but remain under their national institutional employment contract without formal obligations towards EATRIS ERIC (except for National Coordinator for which a National Coordinator Agreement is in place).

Node activity reports are produced on a yearly basis and integrated within EATRIS Annual Report to be published around June of the following year. Key performance indicators are reviewed by the BoG once a year toward approved Operational Plan.

In summary, EATRIS has established clear procedures that are sufficient for the preparation of Annual Reporting and approval by the BoG. The structure of the BoG (representing the states), the BoND (representing research), and the Executive Office makes up the straightforward governance structure.

Monitoring Recommendations:

- Effectiveness and efficiency of the governing structure may be revealed through the administration of an internal survey that solicits feedback from nodes and/or institutions on matters relating to office operations and governance.

- to set up the necessary procedures for monitoring the new bodies/layer [*National Coordination*] with specific goals and KPIs right from their beginning.

Implementation:

With a view of fostering effective and sustainable governance, in 2023 EATRIS engaged in additional effort with its member countries with specific aim of understanding and mapping of national

particularities and processes on funding, national roadmaps, infrastructure reviews and evaluations and national node governance models. The effort resulted in comprehensive analysis and national dashboard overview of countries realities, including both, best practices and potential weaknesses in the national governing models. Analysis further provided valuable insight and premises for governance optimization through tools and measures addressing deficiencies and guiding towards best practices. Dashboard monitoring will be a continuous effort going forward and it will foster EATRIS sustainability and effective governance.

In addition to the dashboard monitoring further plans to gather feedback from the nodes on the operations of the C&S will be considered in 2024.

National Coordination efforts and nodes' overall performance are informally monitored through the year with participation in weekly meetings, and formally measured through the Annual Node Report with unified KPI system. Node Coordinator is not a position deriving from the statutes, and therefore the C&S office can promote and encourage its uptake by communicating the benefits, however at the same time it is the courtesy of the node coordinating institution to appoint this position depending on the funds available. The C&S office can assign funds for support of such position through European Infrastructure funding for capacity building projects (i.e. EATRIS-Plus 2020-2023).

General ESFRI Recommendation 7: *Foster broader coordination at National and European levels, when designing processes for planning*

EATRIS contributions to the development of biomedical sciences at National and European Levels include:

- Providing Europe with a comprehensive Research Infrastructure helping to respond to challenges in science, industry and society and enable researchers to address societal challenges with a global dimension.
- Improving quality and reproducibility in biomedical sciences by ensuring all work is performed according to best practices (EATRIS recently launched its own Certificate of Commitment towards Quality through the EATRIS Quality Initiative).
- Ameliorating the transfer of academic knowledge into innovation activities and capacities for the benefit of health.
- Strengthening the ERA position and role in the global research environment – by creating a truly multidisciplinary community of practice that defragments access to unique and high-end infrastructure and making this available to high quality research and investigators in Europe,
- Fostering capacity-building and Research Infrastructure operations human capital development in targeted/relevant regions – by delivering substantial education and training efforts, and mobilising researchers in exchange programmes,
- Closing the science and innovation gap between EU regions – through targeted educational and training activities conducted for and in lower-R&I performing states.
- Supporting progress towards the development of global research infrastructures agenda through global collaboration partnerships (i.e., Translation Together, NewFound).

Monitoring Recommendations:

- Be sensible to spell out more clearly the roles, complementarities or synergies of the various nodes.
- EATRIS could have a role in lobbying for harmonization of regulations and encouraging best practice.
- EATRIS could have a more prominent role in policy making in EU, by participating in the planning and designing of funding instruments.

Implementation:

Since cutting edge science and technology are international, policies and infrastructure development should reflect this and be coordinated at a national and European level. To ensure good visibility of national efforts at coordination level and across nodes and that EATRIS supports National scientific and technologic agendas, each EATRIS node developed its own Strategic Plan reflecting both its national efforts and contributing to EATRIS ERIC Scientific Plan. Bi-monthly teleconferences of the EATRIS National Directors and Node rotation efforts to provide visibility to National Voices are examples of complementary efforts tasked to bring closer National and European efforts.

Specific efforts of cooperations and alignments at regional and national levels can be exemplified through the development of the Nordic ATMPs hub where national infrastructure efforts in this field (Norway and Finland) – complement each other to foster innovation at regional levels. The appointment of a “Member Engagement Officer” is an additional measure to reinforce cooperation across nodes and consolidation of an European Translational Medicine agenda.