EBRAINS supports the European Neurological Health Strategy

Executive summary

EBRAINS has endorsed the Joint Declaration on Advancing Neurological Health [1]. The declaration calls on Ireland to champion the development of a comprehensive **European Neurological Health Strategy,** promote discussion among Member States, and work with the European Parliament and European Commission to advance coordinated action on neurological health across Europe.

EBRAINS research infrastructure (RI) is strategically positioned to become one of the **foundational pillars** of the European Neurological Health Strategy; more precisely, the digital infrastructure pillar. EBRAINS plays a pivotal role in enhancing the overall functionality of the neurological data ecosystem by enabling curated datasets, brain maps, brain simulations and advanced AI tools to interoperate in a unique digital platform for neurosciences.

This paper presents EBRAINS' vision for the European Neurological Health Strategy related to the impact that digital transformation can induce, and identifies the key requirements that the EBRAINS RI will fulfil, highlighting essential elements that will drive integration and collaboration across diverse neurological health communities throughout Europe.

EBRAINS vision for the European Neurological Health Strategy

EBRAINS envisions a transformative future where groundbreaking discoveries in brain medicine and brain-inspired technologies are accelerated at an unprecedented pace, supported by digital computing capabilities. For this, EBRAINS will provide a collaborative ecosystem, the **European Brain Data Space**, consisting of a suite of interoperable digital applications and services for managing, curating, analysing, and securely sharing brain data across Europe. Building on EBRAINS services, including linked data representations, curation workflows, workflow integration, and modelling and simulation tools across cloud, HPC and Trusted Research Environments, this ecosystem will enable researchers and clinicians to generate reproducible and replicable research, providing insights into brain structure, function and disease.

[1] See more details on the JOINT DECLARATION ON ADVANCING NEUROLOGICAL HEALTH , available from the Neurological Alliance of Ireland's website. The declaration was launched by the organisers and event partners for "Neurology at the Forefront of Innovation in Knowledge Based Healthcare and Research Across Europe", an associated event for Ireland's Presidency of the Council of the European Union which took place on World Brain Day (July, 22 2026).

EBRAINS aligns with stakeholder groups throughout Europe that have increasingly called for a dedicated coordinated European approach to neurological conditions. Growing momentum has seen dedicated funding streams for brain research in different parts of Horizon Europe and the explicit integration of neurological conditions into the EU "Healthier Together" initiative on non-communicable diseases. An important step was the launch of the European Partnership for Brain Health in January 2026, bringing together over 50 partner institutions – including EBRAINS – from more than 30 countries, united by a shared vision of improving brain health for everyone. A significant advance was reached in February 2026[2], when the European Parliament's Committee on Public Health (SANT) agreed to develop an own-initiative report on neurological health (European Parliament, 2026). This initiative responds to neurological conditions affecting over **150 million** people in Europe and costing healthcare systems nearly **€1.7 trillion** annually (Boon et al., 2025), aiming to bridge gaps in prevention, care, and research.

Neurology and Neuroscience have embraced the power of data science, informatics and digitalisation over the last years, in parallel with the transformative progress of Artificial Intelligence (AI). Europe has been an early mover in this area, majorly pushed forward by the EU-co-funded Human Brain Project from 2013-2023, and the founding of the EBRAINS research infrastructure in 2019. As a result, the computational tools, structured data and community stand ready for a strong digital element in the Neurological Health strategy.

EBRAINS role in the European Neurological Health Strategy

EBRAINS role is to provide the critical European infrastructure that acts like the central Neuro-related data steward and provider of novel analytical capabilities for the European Neurological Health Strategy, turning fragmented medical research data into coherent knowledge, in turn informing research strategies and clinical tools developments. EBRAINS RI has a key role for the European Neurological Health Strategy based on two pillars:

1. Neuro-Data Stewardship: The Data Pillar

- Data Stewardship: EBRAINS' role is to support the integration and stewardship of diverse brain-related data, collected across multiple modalities and spatial scales, from the gene and molecular to the whole-brain level. Rather than acting as a single secure data repository, EBRAINS connects to and interacts with secure institutional

[2] The European Parliament Committee on Public Health (SANT) is advancing the initiative report on the Neurological Health Strategy (2026/2053(INI)). The primary milestone was in Feb, 24, 2026: SANT held a dedicated public hearing on "Brain health: Policy challenges and opportunities to manage neurological diseases" to gather expert and stakeholder testimonies.

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and national storage solutions, shares non-sensitive data and rich anonymous metadata, and serves as a broker that helps the community find, understand and access data in protected environments. In doing so, EBRAINS contributes to making brain data more systematically described, comparable and reusable, in line with European and international best practices for FAIR data management.

- Harmonised Data Exchanges: Within the European Partnership for Brain Health (2026-2036), EBRAINS leads activities on standardisation across data platforms and harmonisation of data in cooperation with other research infrastructures[3] in Europe and globally. This includes shared data models, ontologies and workflow practices that enable interoperable data exchange and analysis across institutions, countries and computing environments.

- Data Governance: EBRAINS operates under robust data governance frameworks that ensure brain-related datasets are collected, used and reused in compliance with applicable laws and regulations, including data protection and privacy frameworks, and under appropriate ethical oversight. Governance procedures support responsible data sharing and analysis while protecting participants' rights and interests.

- Clinical Integration: Through the results of projects such as EBRAINS 2.0 and eBRAIN-Health[4], EBRAINS helps standardise how health and brain-related data are described, integrated and analysed across institutions and countries, enabling comparable results, robust data reuse and efficient collaboration in research and clinical practice. The focus is on building the capabilities and capacity to securely use and analyse health data within trusted environments, demonstrating that Europe can design infrastructures that deliver data-driven innovation while safeguarding privacy and data protection.

2. AI, Modelling and Simulation for Innovation in Diagnostics and Therapies: The Translation Pillar

The work in this pillar takes into account the EU AI Act, so that AI-based tools for diagnostics and therapies are developed in line with its requirements on transparency, data governance, human oversight and risk management.

[3] Other research infrastructures with a critical role are **BBMRI-ERIC** and **Euro-BioImaging ERIC**, supporting biobanking and imaging capabilities; **ELIXIR**, for life-science data interoperability; **EATRIS ERIC**, accelerating translational research; and **ECRIN ERIC**, supporting multinational clinical research.
[4] See also EBRAINS 2.0 and eBRAIN-Health website.

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- Digital Brain Twins: EBRAINS runs advanced AI models and simulates mechanistic physiology–based Digital Twins of brains, tailored to each patient. The unique hybrid approaches run on high-performance computers and may help predict how a disease might progress and respond to various therapies. Although this approach is not yet established clinical practice, EBRAINS is advancing it in collaboration with the Virtual Human Twin initiative in Europe, contributing its brain modelling expertise to a broader European ecosystem of virtual human twins for healthcare.

- AI Training Hub: It serves as a secure digital "medical laboratory" where researchers train large AI diagnostic models to spot early biomarkers of brain disorders, such as Alzheimer's disease, Parkinson's disease and epilepsy. Training and validation follow the principles of the AI Act, including the quality and governance of the data used.

- Exascale Computing Access: EBRAINS connects AI developers directly to Europe's most powerful supercomputers under the leadership of EuroHPC Joint Undertaking, accelerating the processing of massive neural datasets.

Synergies with Policymakers and Neurological Health Communities

1. Synergies with National Funds for Digital Infrastructure in 2027-2037

EBRAINS is planning to become a European Digital Infrastructure Consortium (EDIC) pooling European and Member States' funds for a multi-country project that serves both basic neuroscience and neurological health communities. EBRAINS aligns with the foundational policy communication (European Commission, 2025) adopted by the European Commission, setting out action lines for ecosystems, talent, access, and governance for a European strategy on research and technology Infrastructures. In addition, EBRAINS endorsed this year the Charter of Access for industrial users[5] introduced to streamline companies, including start-ups and scale-ups, access to services from European Infrastructures.

2. Synergies with European Health Data Space

EBRAINS supports the pooling and development of **AI-ready** brain data, together with the tools and services needed to develop scientific AI models and their technological and clinical applications. In doing so, and together with other major European RIs, EBRAINS aligns its data governance with the European Health Data Space (EHDS) Regulation, supporting trustworthy, secure and interoperable reuse of health data for research and innovation,

[5] See the communication of the European Commission "Charter of access for industrial users to research and technology infrastructures", (C/2026/4100) of 28.07.2026.

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thereby enriching the pilot phase of the Resource for AI Science in Europe (RAISE) while safeguarding privacy and data protection. Where the EHDS defines the legal and regulatory framework for health data use in Europe, the European Brain Data Space, provided by EBRAINS, will offer the practical, domain-specific digital infrastructure needed to operationalise these principles for brain data, including trusted analytics on sensitive data and provenance-aware workflows. As a partner in the SCAILED project, launched in October 2026, EBRAINS will contribute to the project's efforts to demonstrate the feasibility of making health datasets discoverable and accessible through the EHDS. In this way, the European Brain Data Space will translate EHDS regulatory ambitions into concrete tools and practices that support brain research and innovation for better health across Europe and beyond.

EBRAINS participates in the European Open Science Cloud (EOSC) Federation as a Thematic Node, enabling the integration of brain research into a broader European open-science framework for advanced cross-disciplinary discovery and data and tool sharing. The integration of EBRAINS with EOSC enables new cross-infrastructure use cases that accelerate treatments and diagnostics for neurological disorders, increasing the scientific impact of both initiatives. Together with EBRAINS' adherence to the EHDS Regulation, this provides a coherent European framework for the responsible secondary use of health data.

3. Synergies with Digital Health Research in Clinical Neurosciences

Recently, EBRAINS and the European Academy of Neurology (EAN) co-developed recommendations for prospective acquisition and integration of clinical and research core multi-scale human datasets for connectome analysis in stroke, Parkinson's disease, and glioma (Berger et al., 2026). These consented protocols provide a pragmatic framework for harmonising multi-scale data acquisition for connectome analyses in stroke, Parkinson's disease, and glioma. Further, these protocols allow future modular extensions for other datasets, e.g., neurophysiological data or non-imaging biomarkers, and serve as a role model for brain network analyses in other neurological disorders. As part of EBRAINS 2.0 project, over 8000 patients' scans from three pathologies (stroke, glioma, Parkinson's disease), enrolled from a dozen EU hospitals, have been harmonised and brain derivatives extracted for open access analyses by the clinical and scientific community (Pini et al., 2026).

Over the past year, the European digital neuroscience community has worked together to develop the 10-year **EBRAINS Roadmap**, a long-term vision identifying the scientific, technological and infrastructure priorities needed to maintain Europe's global leadership in digital neuroscience. The EBRAINS Roadmap was developed through an extensive bottom-up consultation involving researchers, clinicians, infrastructure providers, technology developers and policy stakeholders across Europe. Its intended conclusions were discussed

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during the EBRAINS Roadmap Symposium held in Munich in May 2026, where more than 150 experts refined priorities for the next decade.

As Europe accelerates investments in trustworthy AI, computational infrastructures and technological sovereignty, **neuroscience** is increasingly relevant – not only as a scientific discipline but also as a driver of next-generation AI, digital medicine, neurotechnology and data infrastructures. The EBRAINS Roadmap (to be published early 2027) provides timely recommendations for European policies on research, AI, health, data and digital infrastructures.

Based on the EBRAINS Roadmap 2026-2036 process and the EBRAINS RI Business Plan, the estimated annual budget required to implement the developments described above is approximately €10 million per year, including in-kind contributions.

Conclusion

The development of a European Neurological Health Strategy presents a timely opportunity to strengthen coordination across Europe and translate advances in neuroscience into tangible benefits for patients and healthcare systems. Realising this ambition will depend on a robust digital research infrastructure that can steward data securely, enable trustworthy AI, and support multi-scale modelling and simulation across Member States.

EBRAINS is ready to serve as the infrastructure pillar of such strategy. Through its dual role in neuro-data stewardship and in AI-enabled modelling and simulation, it can help turn the Strategy's ambitions into operational capabilities: harmonised, FAIR, privacy-preserving datasets; clinical–research integration; digital brain twins for personalised insight; and secure access to Europe's high-performance computing resources. These capabilities are already being developed in partnership with clinical networks, other European research infrastructures, and initiatives such as the European Partnership for Brain Health, EAN, EOSC and EuroHPC Joint Undertaking.

This position paper elucidates the contribution EBRAINS can make to the Strategy now under discussion in the European Parliament. It is complementary to the broader 10-year EBRAINS Roadmap, which will be published in early 2027 and will set out the longer-term scientific, technological, and infrastructure priorities for digital neuroscience in Europe. The two documents address related but distinct audiences and timescales; together they provide a coherent European offer.

We therefore invite the European Parliament's Committee on Public Health, the European Commission, and Member States to recognise EBRAINS as the digital research infrastructure pillar of the European Neurological Health Strategy. EBRAINS stands ready to contribute

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technical expertise, data standards, and implementation experience to the drafting and subsequent delivery of the Strategy, and to work with all relevant stakeholders to ensure that Europe's investments in neurological health are matched by the digital capabilities needed to realise their full benefit for patients, clinicians, and society.

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