AI-Mind

Policy brief: Transforming Dementia Care

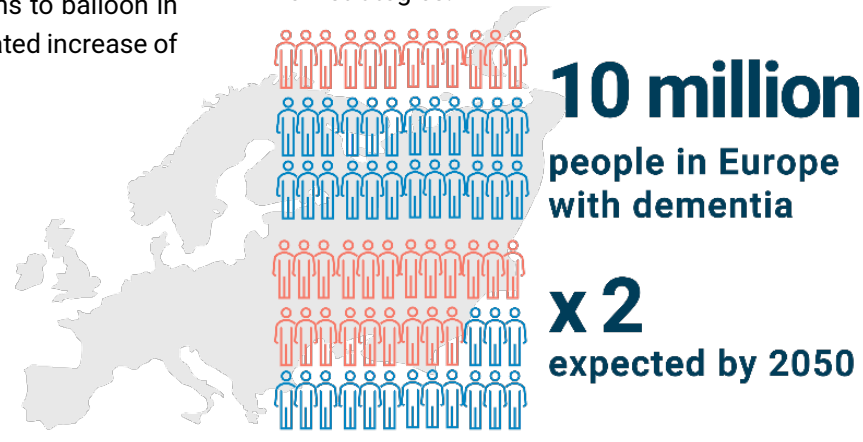
The AI-Mind Project Approach and its Translation to Clinical Practice

The scenario: the silent pandemic of dementia

Brain health is a global priority, with dementia as the most immediate concern already straining our healthcare systems and placing immense burdens on healthcare systems and communities. While often framed as a disease of old age, the escalating number of cases is rapidly evolving into a silent pandemic that will define the next century. This crisis is already being felt on the front lines, as clinicians and healthcare systems are increasingly overwhelmed by the complex and resource-intensive demands of dementia care.

Dementia already affects almost **10 million people in Europe**[1] - a number expected to **double by 2050** - and **57 million people globally** [2]. The **global cost of dementia** is already estimated at **Euro 1.12 trillion (2019)** a figure that threatens to balloon in the coming decades, with an estimated increase of 6.5% per annum[3].

Without any change in health policy the cost will reach **Euro 2.41 trillion** by 2030[4]. The attention should be paid to the long-term impact of the disease on overall economic output, growth trajectory, and wealth. Without any fundamental change in care models, the **global macroeconomic burden** of dementia is projected to reach Euro 12.490 trillion in 2050 with a dramatic and often catastrophic impact on families[5]. Indeed, **informal care** is pivotal for patients with dementia, covering from 50-90% of the total cost of care in EU countries[6] reaching a total expenditure ad EU level of Euro 392 billions[7]. This burden is exacerbated by **disease progression**, as the steep increase in costs associated with disease severity. Furthermore, health-care costs arise as early as **10 years prior** to a formal diagnosis[8]. This dramatic demographic shift underscore a critical need for new strategies.



The policy shift: from late diagnosis to proactive prevention

The current approach to dementia care is a reactive model, focused on managing the disease only after significant cognitive decline has occurred. This systemic failure is highlighted by the fact that the average time from the first symptoms to a confirmed diagnosis is of **3.5 years**[9].

This critical delay often means that by the time a patient is formally diagnosed, the window for effective therapeutic intervention has already closed. This is a system built for crisis management rather than for a long-term, chronic condition. It entirely fails to address the critical opportunity for prevention that exists in the earliest stages of the disease, years before symptoms appear.

By precisely identifying and managing **key risk factors**, now recognised to be **14 modifiable factors** across the life course, we must proactively intervene with personalised and population-level strategies, as this offers the potential to delay or prevent **nearly half** of dementia cases worldwide[10].

While interventions are most impactful when risk factor levels are decreased early and kept low throughout life (**the earlier, the better**), the evidence confirms that it is never too early or too late to reduce dementia risk, necessitating continuous efforts from childhood through later life, with targeted midlife interventions and necessary societal-level changes. This is the crucial shift AI-Mind project aims to accomplish.

As we see, current diagnostic practice lacks the necessary screening tools to identify those at risk of progression from MCI to dementia and the patient's trajectory is far from ideal.

Source: *Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission, Livingston, Gill et al. The Lancet, Volume 404, Issue 10452, 572–628*

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Alzheimer's Disease International
The global voice on dementia

Current diagnostics lack screening tools for MCI to dementia progression. AI-Mind offers an innovative AI approach for early assessment.

The breakthrough: unlocking early detection with AI-Mind

The Artificial Intelligence (AI) revolution provides a key to solving the challenge of late-stage dementia diagnosis. This innovation, coupled with a broader prevention, could help maximize the number of healthy life years and fundamentally reshape the global trajectory of the disease.

AI-Mind, an EU-funded project (under grant agreement No 964220), is an innovative, AI-driven platform designed to fundamentally transform dementia care into brain health by helping healthcare professionals predict dementia risks for patients with MCI (Mild Cognitive Impairment). In individuals with mild cognitive impairment, the cumulative risk of progression to dementia over five years may reach 30–40%. We currently lack the ability to accurately predict which individuals are at the highest risk of developing dementia, leaving clinicians and patients without a clear path forward for early intervention.

The core of **AI-Mind** is a cloud-based diagnostic platform featuring two integrated AI-based tools. These tools move beyond the limitations of traditional, time-consuming assessments by analysing routinely collected data in a novel way to detect subtle, pre-symptomatic patterns:

- **The AI-Mind Connector:** Analyses brain imaging data to identify early disturbances in the brain's functional network years before symptoms appear.
- **The AI-Mind Predictor:** Combines this data with clinical variables, such as cognitive test scores and blood biomarkers, to provide a highly accurate and personalized prediction of dementia risk. This data is already being collected during routine assessments for MCI.

This digitalised platform gives clinicians the ability to identify at-risk individuals with unprecedented accuracy and speed, transforming the diagnostic journey from years to days without any additional burden in terms of data collection. By opening a critical window for intervention, **AI-Mind** enables a decisive shift from crisis management to proactive prevention.

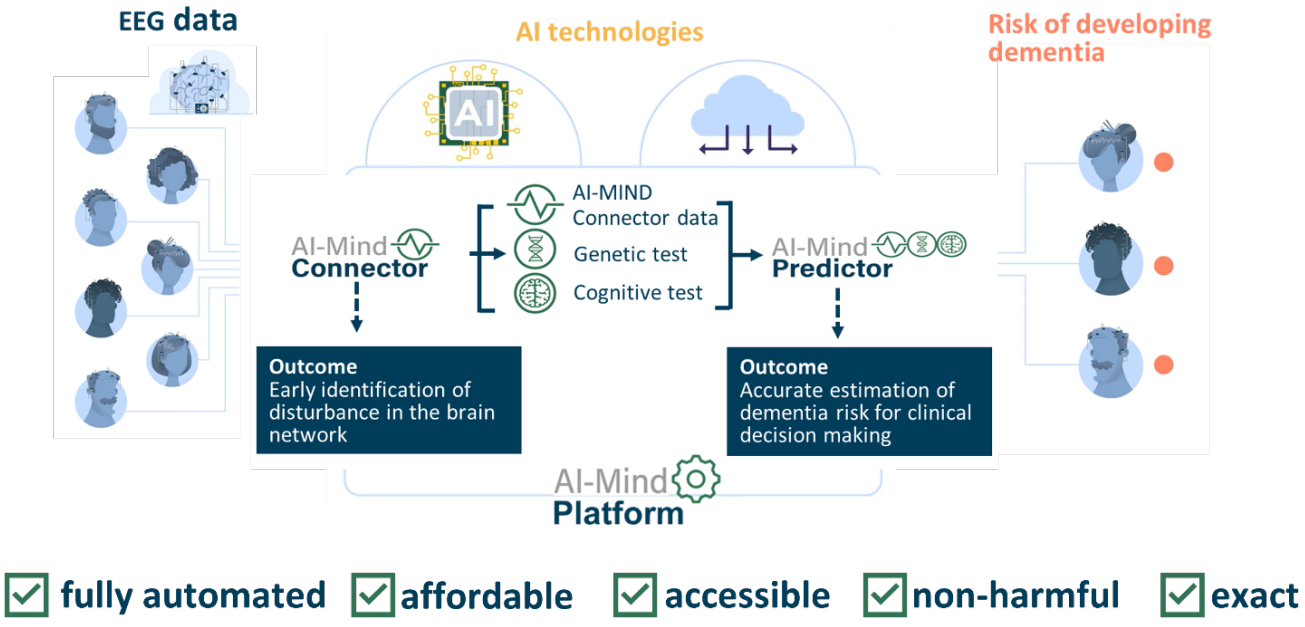


Figure 1: AI-Mind concept overview.

Figure 2: AI-Mind clinical study involves 1'000 enrolled participants with MCI across five clinical centres.

The AI-Mind platform's user interface is designed with a **human-cantered approach** to ensure that clinicians can easily and confidently interpret the AI-generated outputs, facilitating a smooth integration into their daily clinical workflow and strengthening the doctor-patient relationship by transforming the diagnostic journey from years to days, providing an unprecedented level of accuracy and speed.

The reliability of the **AI-Mind** approach is built on a rigorous, evidence-based foundation. The platform is being validated through a largest European clinical study[11] involving a representative sample of patient populations from five clinical centres across four European countries: **Norway, Italy, Finland and Spain.**

This multi-site, international trial ensures the AI-Mind tools are robust and generalizable across diverse patient demographics, a crucial factor for real-world applicability.

The project's success is further guaranteed by a **collaboration** between world-leading technical developers and clinicians. This synergy ensures the technology is not only scientifically sound but also clinically relevant and easy to integrate into existing workflows.

Finally, a dedicated focus on **Health Technology Assessment (HTA)** is central to the project's strategy by actively engaging with HTA experts, policymakers, and patients. This proactive approach is underpinned by a validated decision-analytic model for **Early HTA** that is designed to evaluate technology sustainability and economic viability during early development phases (visit: https://ai-mind.shinyapps.io/earlyHTA/).

This ensures the platform's long-term value and responsible adoption by rigorously addressing critical questions of clinical effectiveness, economic viability, and ethical considerations well before large-scale implementation.

The ROI of AI-Mind: from research to policy

Translating AI-Mind from a research project into a public health policy is a **strategic investment** with a clear and compelling return. The economic burden of dementia is not a static figure. It escalates dramatically with disease progression. Costs, particularly those associated with institutional and home care, more than double as a patient moves from mild to severe dementia. This reality underscores the immense financial value of delaying or avoiding disease progression.
By enabling early diagnosis, AI-Mind provides a cost-effective solution that shifts resources away from expensive, reactive crisis management toward proactive intervention.

Investing in preventive measures, like those enabled by AI-Mind's early detection capabilities, is significantly more cost-effective than managing the disease in its late stages. By identifying individuals at high risk and allowing for proactive interventions, such as lifestyle changes or future therapeutic treatments, we can reduce the long-term strain on healthcare systems and government budgets. The financial savings from delaying the need for expensive institutional care and reducing emergency room visits represent a clear return on investment.

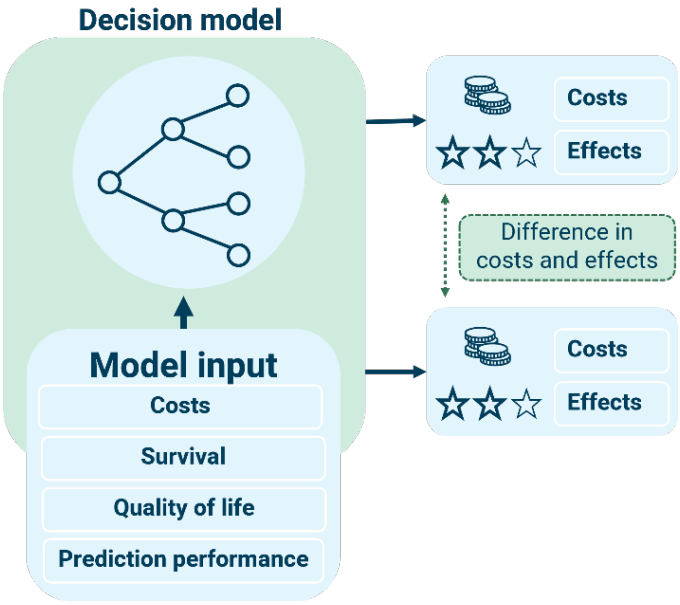
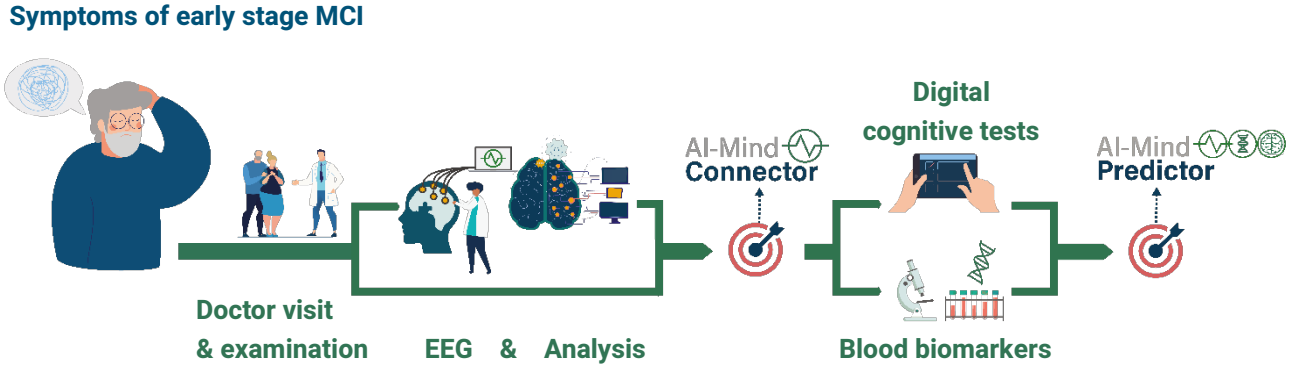


Figure 3: Overview of a decision model for Early HTA.

Beyond the numbers, the true value of AI-Mind lies in its ability to improve quality of life. For patients, early diagnosis provides a valuable opportunity to make informed decisions about their future and proactively manage their health. For caregivers, a delayed progression means more precious years of shared independence and well-being. By shifting the focus from reactive crisis management to proactive prevention, **AI-Mind offers a path** to a more humane and sustainable future for both healthcare system's future patients and their families.

Patient's journey with the AI-Mind solution



1 week later:
• Early risk estimation I • Personalised report I • Recommendations on lifestyle changes

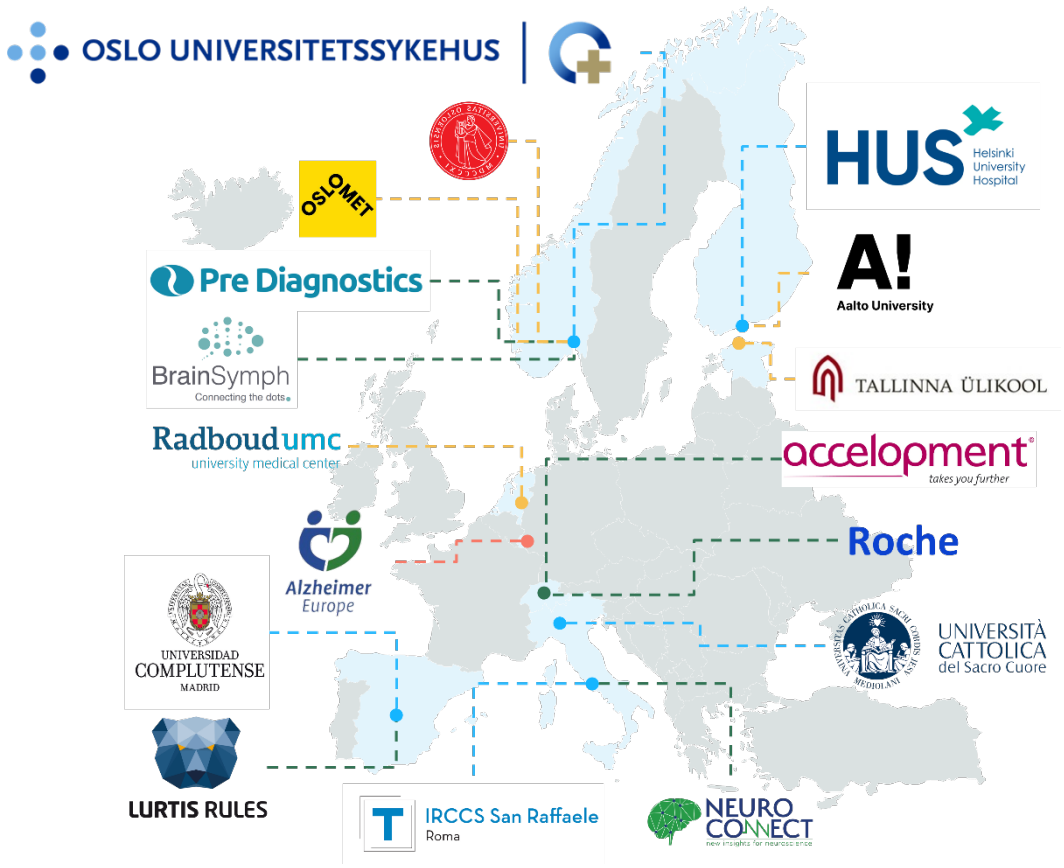
A New Standard of Care: Investing Now in Dementia Prevention

Based on the urgent need to address the "silent pandemic" of dementia and the demonstrated potential of AI-driven early detection, the following recommendations are advised for immediate policy action:

Action	Why?
✔ **Systemic Shift to Proactive Brain Health Care** Reallocate healthcare budget currently spent on late-stage crisis management toward proactive prevention and early intervention programs for risk factors and cognitive decline.	The current reactive model is economically unsustainable. Costs "more than double as a patient moves from mild to severe dementia." Investing in early diagnosis (like AI-Mind) is significantly more cost-effective than managing late-stage disease, reducing the long-term strain on budgets.
✔ **Combine early detection with prevention interventions** The true value of AI-Mind lies not merely in its technology, but in its integration into a new care model where its data-driven insights guide the definition of personalized plans to proactively address individual risk factors and enable true prevention.	The current crisis-management model is fundamentally flawed because it ignores the opportunity to intervene on modifiable risk factors, thus forfeiting the chance to significantly delay or prevent dementia.
✔ **Mandate High-Risk Stratification for Mild Cognitive Impairment (MCI) Patients** Incorporate an AI-driven predictive tool (like the AI-Mind Predictor) as the mandatory first-line risk stratification step for all patients who receive a non-specific MCI diagnosis within specialized memory clinics.	This directly leverages the AI-Mind's core strength, predicting who among MCI patients will progress to dementia, immediately opening the "critical window for intervention" by changing the established clinical workflow.
✔ **Strategically Fund and Integrate AI Diagnostics** Provide targeted funding for, and establish clear regulatory pathways for, the widespread integration of validated, cloud-based AI diagnostic platforms (e.g., AI-MIND) into routine primary and secondary care settings.	This leverages the AI revolution to achieve unprecedented accuracy and speed, transforming the diagnostic journey from years to days and opening a critical window for intervention that is currently closed due to delayed diagnosis.
✔ **Support Multi-Site and International Collaboration for Validation** Fund and incentivize continued, global collaboration between world-class AI developers and clinicians through large-scale, multi-site international clinical studies.	It is critical to rapidly exploit the robust and generalizable validation results already generated by foundational projects like AI-Mind and provide significant further investment into successor initiatives and platforms. This collaboration model adopted by the AI-Mind project's is essential to guarantee the technology is not only scientifically sound but also clinically relevant and universally applicable for "real-world applicability."

Project information

The AI-Mind consortium brings together an interdisciplinary network of 17 partners including academic institutions, medical centres, small and medium-sized enterprises, companies and patient association.



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Acknowledgement

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 964220.

Disclaimer

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