

Emotional artificial intelligence for healthier, happier and safer ageing at home: a system-level approach to human-centred digital transformation (ID 448)

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Background: European health systems are facing unprecedented challenges driven by population ageing, increasing prevalence of chronic and neurodegenerative conditions, workforce shortages, and growing health and social inequalities. In response, digital transformation has become a strategic priority, reinforced by the COVID-19 pandemic and by policy initiatives such as the European Health Data Space. While Artificial Intelligence (AI), robotics and digital monitoring tools offer significant potential to improve care delivery and efficiency, their successful adoption depends not only on technological maturity but on trust, human integration and alignment with care values. In ageing populations, emotional wellbeing, social connection and treatment adherence remain under-addressed dimensions of digital health innovation.

Objective: This work introduces AiMa as an emerging research initiative exploring the role of Emotional Artificial Intelligence (Emotional AI) within health systems to support healthier, happier and safer ageing at home. The objective is to examine how Emotional AI-enabled digital companions may complement existing health and social care structures by supporting emotional wellbeing, preventing depression, enhancing treatment adherence, and assisting both formal and informal caregivers across diverse care settings.

Conceptual Approach: AiMa is conceptualised as a people-centred digital support layer, not as a replacement for human care. It focuses on the integration of Emotional AI into health systems to detect and respond to changes in mood, behaviour, and engagement over time, particularly in older adults living alone or in care environments. The approach emphasises hybrid care models that combine human caregivers, social environments, and digital tools, aiming to reduce caregiver burden while preserving relational continuity and dignity in care.

Rather than pursuing a one-size-fits-all technological solution, this initiative explicitly acknowledges the heterogeneity of health systems across WHO member countries, including differences in governance, financing, digital maturity, and social support infrastructures. Economic gaps and unequal access to technology represent critical constraints that shape adoption, scalability, and impact.

Relevance for Health Systems: From a system perspective, Emotional AI raises key questions addressed in this track:

- How can digital health innovation strengthen, rather than weaken, the human dimension of care?
- What governance and ethical frameworks are required to build trust in emotionally responsive AI systems?
- Can emotionally aware digital tools contribute to better population health outcomes by preventing depression, improving adherence to treatment, and supporting ageing in place?
- What is the potential impact on health and social care costs through delayed institutionalisation and improved caregiver efficiency?

Expected Contribution and Ongoing Research: Ongoing research with AiMa focuses on defining evaluation frameworks for emotional well-being outcomes, caregiver support metrics, and system-level indicators relevant to sustainability and equity. The initiative seeks to contribute evidence and conceptual clarity to the debate on how Emotional AI can responsibly support digital transformation in ageing societies, while respecting the diversity and economic realities of European and global health systems.

Conclusion: Digital transformation in healthcare cannot succeed without placing people at its core. Emotional AI represents a promising, yet complex, avenue to humanise technology and support healthier ageing. AiMa invites interdisciplinary discussion on how health systems can responsibly integrate Emotional AI to enhance wellbeing, trust, and resilience in the care of older adults.