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Roadmap for action on artificial intelligence in health in the WHO European Region 2026–2033

This roadmap sets out a strategic vision for the responsible integration of artificial intelligence (AI) into health systems across the WHO European Region for the period 2026–2033. It responds to growing demand from Member States to harness AI to strengthen health system performance, improve population health and accelerate progress towards universal health coverage.

The roadmap envisions a future in which AI is safely, ethically and effectively embedded within health systems to enhance quality, resilience, sustainability and people-centred care. It positions AI not as a stand-alone technological solution but as a key enabler of broader health system transformation, supporting more integrated models of care, empowering individuals and communities, and reinforcing trust through transparency, accountability and strong governance.

To achieve this, the roadmap focuses on four interdependent strategic areas: governance and strategic leadership; ethical, regulatory and legal frameworks; data and digital infrastructure for AI uptake; and capacity-building, implementation support and learning. These areas are designed to be implemented as a coherent package, adapted to country contexts and levels of digital maturity.

Aligned with regional and global strategies, this roadmap provides a practical and scalable framework to guide Member States in adopting trustworthy AI that delivers tangible health system and population health benefits.

This working document, along with an information document, a background document and a draft decision, is submitted to the WHO Regional Committee for Europe for endorsement at its 76th session in October 2026.

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RATIONALE

1. WHO defines artificial intelligence (AI), more specifically machine learning, as the capability of algorithms integrated into systems and tools to learn from data so that they can perform automated tasks without explicit programming of every step by a human.[1] The subset of AI known as machine learning allows computer algorithms to learn to perform a task using data, without being explicitly programmed.[2] Large language models are a further subset of deep learning and are trained on vast amounts of textual data to understand, generate and respond to human language.[3] WHO recognizes the potential of AI to transform health care and help achieve universal health coverage but emphasizes the need for responsible and ethical development. WHO actively provides guidance on AI in health, develops ethical frameworks and supports countries in navigating the complexities of AI implementation.[4]

2. Responsible AI adoption in health requires whole system thinking, not piecemeal technological interventions. As AI becomes more widely integrated into health systems, it raises specific governance, ethical and societal challenges, alongside increasing concerns about environmental impacts and reliance on proprietary models that may have geopolitical implications. Moreover, the trustworthiness of AI systems depends fundamentally on the quality and reliability of the data on which they are built.

3. The proposed "Roadmap for action on artificial intelligence in health in the WHO European Region 2026–2033" directly responds to the Second European Programme of Work, 2026–2030 (EPW2),[5] which identifies "unlocking the potential of artificial intelligence for health" as one of its key transformational shifts for empowering people, supporting health workers, and building stronger and more resilient health systems.

4. Evidence from the regional AI report, *Artificial intelligence is reshaping health systems: state of readiness across the WHO European Region*,[6] based on data from 50 of the 53 Member States in the WHO European Region, has been used as a baseline needs assessment to produce this roadmap. This baseline shows strong interest and early progress in AI for health, as well as areas where further development is needed.

VISION

5. The proposed roadmap envisions a European Region in which AI is safely, ethically and effectively integrated into health systems to strengthen quality, resilience, sustainability and people-centred care. In this future-oriented vision, AI enables health systems to deliver more responsive, efficient and equitable models of care; empowers individuals and communities to make informed choices; and reinforces trust through transparency, accountability and strong governance. These health systems are underpinned by skilled and supported health and care workforces, robust data ecosystems and inclusive digital infrastructure that ensure no one is left behind.[7,8] To realize this vision, the roadmap focuses on building

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[1] Ethics and governance of artificial intelligence for health: WHO guidance. Geneva: World Health Organization; 2021 (accessed 4 September 2026).
[2] Regulatory considerations on artificial intelligence for health. Geneva: World Health Organization; 2023 (accessed 4 September 2026).
[3] Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models. Geneva: World Health Organization; 2024 (accessed 4 September 2026).
[4] Ethics and governance of artificial intelligence for health: WHO guidance.
[5] Second European Programme of Work, 2026–2030 – "United Action for Better Health". Copenhagen: WHO Regional Office for Europe; 2025 (accessed 4 September 2026).
[6] Artificial intelligence is reshaping health systems: state of readiness across the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2025 (accessed 4 September 2026).
[7] Leave no one behind. Geneva: United Nations Sustainable Development Group (UNSDG); 2026 (accessed 4 September 2026).
[8] Second European Programme of Work, 2026–2030 – "United Action for Better Health".

the foundations for trustworthy AI by (i) ensuring strong governance, sustainable financing and inclusive stakeholder engagement; (ii) addressing cross-country challenges in data quality, infrastructure and system readiness; and (iii) strengthening institutional, workforce and regulatory capacities.

STRATEGIC AREAS

6. To operationalize these priorities, the roadmap will be structured around four strategic areas that are interdependent and designed to be implemented as a coherent package. Actions are envisaged to be taken following a staged approach that prioritizes foundational data and AI governance and takes into account a Member State's level of digital and AI maturity as well as existing strategies and regulatory frameworks.

7. Alignment with existing standards, strategies and regulatory frameworks at the European level is also preferred, to avoid fragmentation of digital health and AI ecosystems, support data and system interoperability, and foster innovation in AI in health. Regulatory frameworks for AI in health should adopt a life cycle-based approach, linking pre-market assessment, controlled testing, post-market monitoring, reassessment and, where necessary, decommissioning.

Strategic area 1: governance and strategic leadership

8. Strategic area 1 focuses on strengthening governance and strategic leadership for AI in health across Member States through the development and implementation of national strategies, the establishment of oversight mechanisms, and whole-of-government coordination to ensure coherent and effective implementation. The proposed actions include the following:

- develop or update national AI-in-health strategies, or revise broader frameworks such as national digital health strategies, to ensure meaningful integration of AI within health systems;
- establish national AI governance structures (for example, an AI-in-health institutional body), either by creating a dedicated national agency or by assigning clear responsibilities to one or more existing governmental bodies;
- support community-building activities to effectively bring together all relevant stakeholders and develop knowledge management processes and tools that facilitate engagement and collaboration among key stakeholders;
- develop or update investment plans detailing how AI priorities can be integrated into national planning, budgeting and investment processes;
- develop practical guidance on how to operationalize the integration of human rights, patients' rights, ethical values, equity and public interest principles within AI strategies;
- conduct AI readiness self-assessments to enable evidence-based prioritization and differentiated support;
- establish mechanisms for transparency and accountability in public–private partnerships; and
- adopt a monitoring and evaluation framework aligned with global and regional frameworks to measure the progress of AI strategy implementation.

Strategic area 2: ethical, regulatory and legal frameworks

9. Strategic area 2 focuses on strengthening ethical, regulatory and legal frameworks for the use of AI in health, ensuring that AI systems are safe, accountable and subject to effective oversight. The proposed actions include the following:

- develop a national regulatory framework for AI in health, issuing specific legislation for governance and oversight requirements, including obligations for developers to assess and mitigate the environmental and energy impacts of AI systems;
- develop an operational guidance and compliance toolkit for the use of AI-in-health systems;
- develop or update health technology assessment frameworks to systematically evaluate AI-based technologies and their value in health systems;
- develop clear legal liability standards that define the duties, obligations and responsibilities of manufacturers and users to prevent and protect patients, health workers and other individuals from harm;
- establish reporting mechanisms for adverse events related to AI systems in health and define clear redress pathways, including compensation, for individuals and groups affected by AI-related harms;
- develop and disseminate practical, sector-specific guidance on selecting and integrating ethics-by-design AI systems for health;
- establish or assign responsibility to one or more regulatory authorities for the oversight and ongoing monitoring of AI systems in health under the applicable regulatory framework;
- establish an intellectual property framework in line with applicable international rules that provides robust intellectual property protection to incentivize commercial investment in AI in health;
- establish guidance on regulatory pathways, applying a proportionate, risk-based approach;
- develop a national approach for regulatory sandboxes to test and evaluate AI technologies in health; and
- establish continuous monitoring and post-market surveillance mechanisms for AI-in-health technologies to detect bias, performance drift and unintended harms, taking into account the continuously learning and evolving nature of AI.

Strategic area 3: data and digital infrastructure for AI uptake

10. Strategic area 3 focuses on strengthening data and digital infrastructure to enable the effective uptake of AI-in-health systems by improving data governance, interoperability, quality and secure access in national systems, aligned with relevant international frameworks. The proposed actions include the following:

- develop standardized procedures for managing and organizing high-quality, representative health data sets within national systems, promoting the findability of such health data assets;
- develop or update national health data governance frameworks that clearly define data stewardship roles;
- develop data-sharing agreements for public interest health research involving public and private entities;
- adopt thorough national data governance frameworks to support the public interest use of health data while ensuring robust safeguards and appropriate transparency;

- establish engagement platforms to promote transparency and public dialogue regarding data-sharing practices and culturally acceptable AI use;
- establish, designate or build the capacity of a health data access body with clear mandates to operationalize data governance;
- establish and build the capacity of secure data access environments, health data hubs and/or trusted research platforms that enable controlled linkage of data sets across systems and domains to support continuity of care and AI development;
- update regulations and measures for data protection, cyber-resilience and continuity planning for digital health infrastructure;
- establish or update a national health data interoperability strategy or policy, assigning responsibilities to relevant agencies and engaging standards development organizations; and
- develop national guidance on data quality assurance for AI in health.

Strategic area 4: capacity-building, implementation support and learning

11. Strategic area 4 focuses on capacity-building, implementation support and learning to enable effective AI adoption in health systems, recognizing AI's potential to support health and care workforce sustainability and mitigate workforce shortages, alongside developing new AI-related competencies among the workforce. The proposed actions include the following:

- develop a national AI-in-health competency framework defining knowledge and skills requirements for staff involved in AI use, with periodic skills assessments (and targeted training as needed) to prevent de-skilling and overreliance on AI;
- establish and expand pre-service education programmes by embedding AI literacy courses into health and care professional education curricula;
- develop in-service AI training opportunities for health and care professionals;
- establish targeted AI literacy programmes and platforms for the general public;
- establish targeted AI literacy programmes for the general public on the opportunities and limitations of AI in health;
- develop procurement guidance and training materials to strengthen the capacity of public procurers to procure AI solutions;
- develop targeted training programmes for regulators;
- establish a national AI-in-health use case compendium;
- establish cross-country learning platforms on AI in health to enable systematic peer learning, evidence generation and reduced duplication of efforts across countries;
- develop guidance on AI for developers in health covering the full AI life cycle, aligned with national and European health priorities and patient interests;
- establish mechanisms and a platform for feedback and evaluation from AI users, including patients and health and care professionals, to inform continual system improvement and updates;
- establish knowledge exchange platforms to support digital transformation and to enable the sharing of cross-country peer learning, case studies and experience from validated real-world AI deployments; and
- establish clear decommissioning and retirement guidelines for AI systems when their technology becomes obsolete or degrades in performance in ways that may result in unintended harm.

ALIGNMENT BETWEEN REGIONAL AND GLOBAL LEVELS

12. The proposed roadmap is fully aligned with EPW2 and delivers on the priorities of harnessing digital transformation, data and technology to strengthen health systems and improve population health. It is also closely aligned with the Framework for Resilient and Sustainable Health Systems in the WHO European Region 2025–2030 (document EUR/RC74/10; adopted in decision EUR/RC74(4)), contributing to the Framework's vision of trusted, high-performing and people-centred health systems that deliver the right care, at the right time, in the right place, without financial hardship.[9] At global level, the roadmap contributes to the implementation of the Fourteenth General Programme of Work, 2025–2028,[10] and aligns with the *Global strategy on digital health 2020–2025*[11] and its forthcoming update to 2033. At regional level, the roadmap builds on the Regional Digital Health Action Plan for the WHO European Region 2023–2030 (document EUR/RC72/5; adopted in resolution EUR/RC72/R2),[12] the Strategy on Harnessing Innovation for Public Health in the WHO European Region 2025–2030 (document EUR/RC75/18; adopted in decision EUR/RC75(4)),[13] and the Framework for Action on the Health and Care Workforce in the WHO European Region 2023–2030 (document EUR/RC73/8; adopted in resolution EUR/RC73/R1).[14]

13. The proposed roadmap seeks, to the extent possible, to promote alignment with key external regional regulations and instruments, such as the European Union's Artificial Intelligence Act (EU 2024/1689),[15] AI Continent Action Plan,[16] Apply AI Strategy,[17] European Health Data Space Regulation (EU 2025/327),[18] Medical Device Regulation (EU 2017/745)[19] and General Data Protection Regulation (EU 2016/679),[20] as well as the Organisation for Economic Co-operation and Development (OECD) policy checklist on scaling AI in health.[21] This level of coordination is necessary to ensure that the roadmap avoids duplication and supports the implementation of existing frameworks rather than introducing new parallel structures.

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[9] Framework for resilient and sustainable health systems in the WHO European Region 2025–2030. Copenhagen: WHO Regional Office for Europe; 2024 (accessed 4 September 2026).

[10] Global Health Strategy and Fourteenth General Programme of Work 2025–2028. Geneva: World Health Organization; 2025 (accessed 4 September 2026).

[11] Global strategy on digital health 2020–2025. Geneva: World Health Organization; 2021 (accessed 4 September 2026).

[12] Regional digital health action plan for the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2022 (accessed 4 September 2026).

[13] A strategy on harnessing innovation for public health in the WHO European Region 2025–2030. Copenhagen: WHO Regional Office for Europe; 2025 (accessed 4 September 2026).

[14] Framework for action on the health and care workforce in the WHO European Region 2023–2030. Copenhagen: WHO Regional Office for Europe; 2023 (accessed 4 September 2026).

[15] Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) (Text with EEA relevance). Brussels: European Union; 2024 (accessed 4 September 2026).

[16] AI Continent Action Plan. Brussels: European Commission; 2025 (accessed 4 September 2026).

[17] Apply AI Strategy. Brussels: European Commission; 2025 (accessed 4 September 2026).

[18] Regulation (EU) 2025/327 of the European Parliament and of the Council of 11 February 2025 on the European Health Data Space and amending Directive 2011/24/EU and Regulation (EU) 2024/2847 (Text with EEA relevance). Brussels: European Union; 2025 (accessed 4 September 2026).

[19] Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC (Text with EEA relevance.). Brussels: European Union; 2017 (accessed 4 September 2026).

[20] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance). Brussels: European Union; 2016 (accessed 4 September 2026).

[21] Scaling Artificial Intelligence in Health. Paris: OECD; 2026 (accessed 4 September 2026).

The role of the WHO Regional Office for Europe

14. The WHO Regional Office for Europe (WHO/Europe) will bridge research, innovation and policy in AI in health by synthesizing evidence, producing analytical reviews and policy briefs, and providing practical tools to support health ministries. Key focus areas will include liability, workforce transformation, digital literacy, cross-border data governance and advanced analytics.

15. To strengthen coordination and accountability, WHO/Europe will coordinate and support a technical network of national AI and digital health focal points to support communication, monitor progress and ensure alignment with regional and global frameworks. Technical support will be tailored to the applicable legal and institutional context.

IMPLEMENTATION THROUGH PARTNERSHIPS

16. Operationalizing the proposed roadmap will require sustained collaboration across governments, academia, industry, civil society and international partners. Building on its convening mandate and normative leadership role, WHO/Europe is well placed, working in tandem with regional organizations and existing governance mechanisms to support Member States in fostering inclusive, transparent and impact-oriented partnerships in AI.

17. Building on its Strategic Partners' Initiative for Data and Digital Health, WHO/Europe will foster collaboration among AI developers, regulators and national authorities to support the deployment of trustworthy AI across its full life cycle.

MEASURING PROGRESS

18. Progress in implementing the proposed roadmap will be measured using the 2025 regional report *Artificial intelligence is reshaping health systems: state of readiness across the WHO European Region* and its accompanying country profiles as the baseline. The indicators included in that assessment will serve as the primary reference points for tracking progress over time. Indicator development and data collection will be coordinated with relevant regional monitoring initiatives, using compatible definitions and existing reporting channels wherever possible to minimize duplication and reporting burden. The proposed regional indicators include measurable increases in:

- the proportion of Member States with a national strategy or policy addressing AI in health;
- the proportion of Member States with established legal or regulatory frameworks covering AI applications in health, including provisions addressing liability;
- the proportion of Member States that have operational guidance and oversight arrangements addressing the use of generative AI in health under the applicable legal and policy framework;
- the proportion of Member States with formal ethical guidelines and operational ethics-by-design frameworks related to AI in health;
- the proportion of Member States with national policies or strategies addressing digital health literacy;
- the proportion of Member States offering pre-service education on AI for health and care professionals;
- the proportion of Member States providing in-service AI-related training for the existing health workforce; and
- the proportion of Member States with established rules on secondary use of health data, including secure cross-border data-sharing.

19. Recognizing the rapidly evolving nature of AI, additional indicators may be incorporated into the monitoring framework over time to reflect emerging technologies, new regulatory developments, evolving ethical considerations and shifting health system priorities. Any expansion of indicators will be undertaken in consultation with Member States to ensure relevance, feasibility and comparability.

20. Targets will be proposed to monitor progress in implementing the roadmap across three priority domains: liability frameworks, AI literacy, and monitoring and evaluation. Given the technical and operational nature of the detailed targets and scoring methodology, they will be presented in the accompanying information document (document EUR/RC76/INF./3) to support implementation and monitoring of the roadmap.

21. A midterm progress report will be presented to the Regional Committee in 2029, followed by a final report in 2033. These reports will assess progress against the established baseline; highlight good practices; identify persistent challenges; and recommend adjustments to ensure the responsible, equitable and effective adoption of AI in health across the Region.

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