From Chips to Healthcare Services

How Europe's digital innovation continuum is reshaping the future of health and wellbeing

INSIDE Industry Association

Aeneas

EPoSS. European Association on Smart Systems Integration

1. Executive summary

Europe stands at a turning point. Ageing population, chronic diseases and rising costs are putting pressure on healthcare, while Europe's engineers drive a technological revolution. The global market for semiconductor components in healthcare, worth USD 6.4 billion in 2024 and projected to reach USD 8.7 billion by 2030, accounts for only 1 % of the total semiconductor market. Yet this gap is a major opportunity: healthcare is both a social imperative and a technology frontier. New components are driving stronger semiconductor demand in healthcare, making it an increasingly semiconductor-intensive field. Edge computing combined with MEMS and sensor-driven devices are transforming digital health, reshaping traditional MedTech and accelerating semiconductor demand in healthcare. This shift unlocks new growth and innovation for Europe's healthcare semiconductor sector, presenting a strategic opportunity the EU must seize to strengthen its leadership.

Strengthening this field means reinforcing Europe's sovereignty in both health and digital innovation through research and innovation that deliver, transforming breakthroughs into trusted, deployable solutions that bring digital intelligence from the lab to the clinic, from the chip to the citizen.

The initiative "From Chips to Healthcare Services" embodies this connection. It shows how Europe's industrial and scientific excellence can flow seamlessly along a single continuum – from semiconductor, high-tech and clinical research laboratories, through development, certification and manufacturing, to care environments and homes – creating a new generation of health systems that are predictive, preventive, personalized and participatory (called P4 model).

Grounded in Europe's excellence across the ECS and healthcare value chains – from silicon and sensors to embedded intelligence and connected analytical and diagnostic medical systems – and leveraging the collaborative frameworks of Chips JU and IHI, the initiative connects these strengths into a European healthcare innovation continuum. It builds on Europe's ability to design trusted, impactful technologies and ensures that each breakthrough can be validated and deployed across Member States.

The initiative brings together the Chips Act, AI Act, European Health Data Space, EU Digital Health and Lifesciences Strategies, linking innovation, technology, trust and governance into a single European framework for digital health.

Together, these frameworks form the backbone of Europe's healthcare strategic autonomy. Yet to make them real, Europe must connect innovation islands into a federated network of pilot lines, testbeds and clinical validation hubs, allowing results to scale across borders. Each breakthrough – a biosensing chip, an edge-AI module, a secure connectivity platform, etc. – must deliver impact along the value chain until it becomes a trusted robust link in the healthcare continuum improving citizens' lives.

This mission calls for integration, federation and trust, integrating technologies from silicon to services. It federates ECS and life-science industries, startups, SMEs and healthcare professionals and embeds trust at every layer, from secure hardware to transparent AI and citizen-controlled data. From Chips to Healthcare Services is more than a research line. It is a European call to action to ensure that innovation born in Europe serves life itself: healing, protecting and empowering its citizens.

Building on this vision, the whitepaper unfolds across four main sections that structure the path from technology to healthcare services:

- Section 2 sets the strategic context for the entire whitepaper. It explains why Europe must urgently modernise its healthcare systems, outlines the demographic and systemic pressures they face, and frames the need for a coordinated shift toward integrated digital health services. This section establishes the rationale for the vision "from chips to healthcare services" and connects Europe's broader societal objectives with the technological and policy foundations that follow.
- Section 3 describes how semiconductors, embedded systems, edge AI, connectivity, and interoperable data spaces together form the technical continuum that enables personalised, predictive, and preventive healthcare services.
- Section 4 examines the regulatory and market landscape that supports this transformation, including the Chips Act, the AI Act, the European Health Data Space, and the Digital Health Strategy, as well as the role of the MedTech industry, startups, and public–private partnerships.
- Section 5 identifies the structural and systemic issues that still limit the adoption and scaling of digital healthcare across Member States. These include fragmentation, lack of interoperability, uneven digital maturity, skills shortages, and persistent inequalities in access.
- Section 6 outlines the research and innovation pathways needed to operationalise the full continuum from semiconductor technologies to patient-facing services. It proposes integrated value-chain approaches, patient-centred and sustainable design principles, and a shared European governance model to accelerate large-scale deployment.

2. Positioning Europe's healthcare transformation

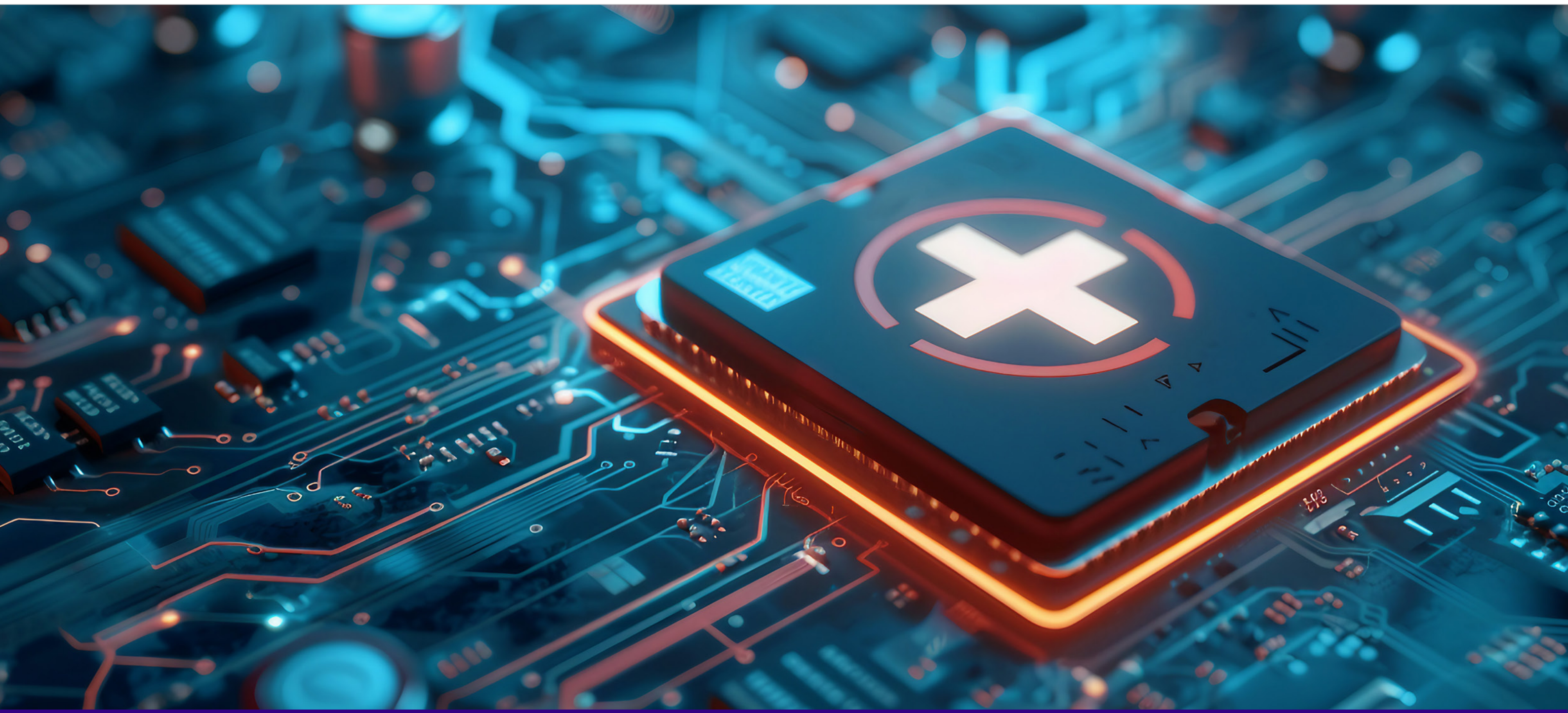
Healthcare is undergoing one of the most profound transformations in its history. Digitalization has reached the point in healthcare where value is shifting from stand-alone products to solutions comprising systems, smart devices, software and services. Healthcare is evolving into a fully connected ecosystem – where data and intelligence flow seamlessly from silicon to services, enabling smarter workflows, predictive insights, and more personalized patient care. This shift, powered by electronics components and systems (ECS), embedded artificial intelligence, and edge-to-cloud infrastructures, is not just about technology. It's about rethinking how care is delivered, how data is shared, and how citizens engage in their own health.

The vision of *"From chips to healthcare services"* encapsulates this evolution. It recognizes that the next generation of healthcare innovation will emerge from the deep integration of hardware, software, connectivity and data, from energy-efficient chips designed for AI at the edge and cloud based high performance computing, to interoperable data platforms that enable secure sharing of medical knowledge, to human-centric digital services that empower patients and healthcare professionals alike.

Europe needs to seize the opportunity to take part in this transformation, bridging the gap between technological primacy and social impact, with strong industrial capabilities in ECS, a trusted regulatory framework, existing initiatives involving complementary actors in the healthcare value chain (e.g. clinical research, large scale pilots, hospitals, care givers, etc.) and R&I programmes such as the Chips Joint Undertaking.

In this whitepaper, we explore the continuum that connects digital technologies, the policy and market frameworks, and the research and innovation efforts, showing how together they form the backbone of Europe's emerging digital health ecosystem.

The journey from chips to services is not just technical: it is a journey towards a healthier, more inclusive, and more resilient Europe.



3. From silicon to healthcare: the digital foundations of healthcare

3.1.

The technological continuum

At the core of today's digital healthcare transformation lies a seamless technological continuum, from silicon to software, from embedded intelligence to distributed data infrastructures. This continuum starts with semiconductors, the essential enablers of sensing, actuation, computation, and connectivity. Advanced ECS now integrate sensors, microcontrollers, and AI accelerators that bring intelligence to all parts of the healthcare ecosystem. This evolution structurally increases the semiconductor content of healthcare technologies: every new generation of wearable, implantable, or home-monitoring device, along with hospital, clinic or laboratory-based diagnostic or research equipment, integrates a richer combination of sensors, microcontrollers, AI accelerators, and power-management modules. European semiconductor manufacturers are pioneering biosensors, micro-electromechanical systems (MEMS), and secure microcontrollers specifically designed for human-centric applications, including wearable and implantable devices. These systems combine low-power connectivity, embedded AI, and advanced security features to support reliable and energy-efficient monitoring of vital signs such as ECG, EEG, and blood oxygen saturation.

This foundational layer of hardware is complemented by embedded systems that convert raw sensor signals into meaningful health information through local processing, AI and secure communication. Advances in edge computing architectures, lightweight AI models, and energy-efficient design now allow medical devices and equipment to execute real-time analysis directly in the device or equipment, minimising data transmission, reducing latency, and strengthening privacy protection. These capabilities enable a new generation of intelligent, autonomous, and connected healthcare devices and equipment capable of indicating information for taking decisions locally without relying on continuous cloud connectivity, thus supporting continuous, personalised, and resilient monitoring, diagnosis and research both for prevention and treatment.

The next layer is the edge-to-cloud infrastructure, which ensures that data generated by thousands of distributed devices can be securely stored, processed, aggregated, and analysed. In healthcare, the edge serves as the first decision layer, filtering and anonymising data, while the cloud enables large-scale analytics and model training. Recent studies show that such hybrid architectures reduce network dependency and enhance both privacy and resilience.

Finally, data spaces – a cornerstone of Europe's digital strategy – provide the interoperability layer that connects heterogeneous data sources into a trusted ecosystem. The European Health Data Space (EHDS) initiative embodies this vision, ensuring that data collected from hospitals, devices, and research centres can flow securely and in compliance with the AI Act and GDPR frameworks.

3.2.

Convergence towards personalised, predictive and preventive healthcare

When combined, these technological layers enable a transition from reactive to predictive, preventive and personalised healthcare. The integration of ECS, embedded and distributed intelligence, and data spaces supports the so-called “4P” model of medicine: predictive, preventive, personalised, and participatory.

For example, the convergence of new generation of smart sensor, trusted data fusion, and AI-driven analytics creates new opportunities for continuous health monitoring, early diagnostics, and post-care prevention. High-precision optical, pressure, and inertial sensors can capture a wide range of physiological parameters – from heart-rate variability to posture and respiration – while AI algorithms at the edge translate these signals into meaningful insights.

At the same time, the systemic challenges that must be addressed to make this convergence viable include biocompatibility, devices calibration, energy efficiency, interoperability, and data security & privacy. From this perspective a broader European approach should be adopted: digital health innovation requires multidisciplinary collaboration between chip manufacturers, MedTech industry, software developers, clinicians, and regulators, as well the patients.

Indeed, Europe’s leadership in trustworthy and energy-efficient ECS thus becomes a foundation for a human-centric healthcare ecosystem, in which patients are continuously supported through intelligent devices, secure data sharing, and adaptive digital services.

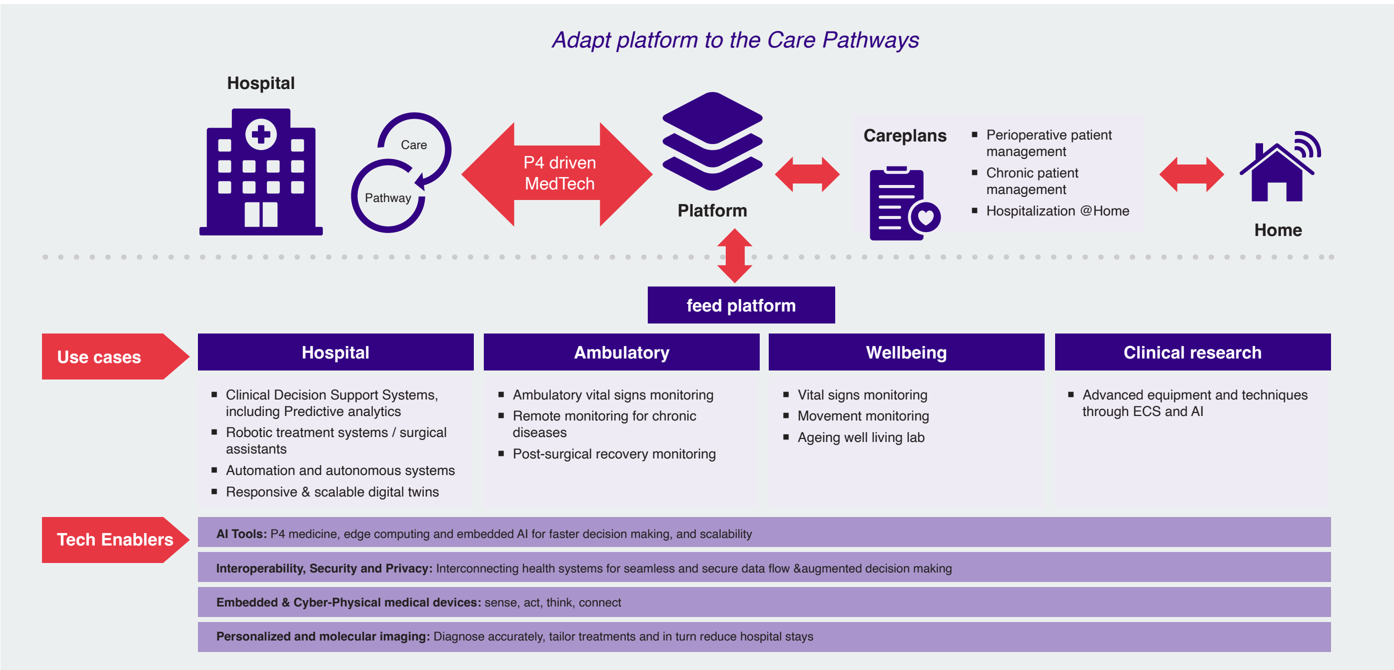
The convergence of these technologies also empowers AI in medical imaging. For example, ECS innovations – from image sensors and compute platforms to AI accelerators – are crucial to next-generation imaging systems capable of real-time image reconstruction, diagnostic support, and treatment guidance. Embedded AI enhances diagnostic accuracy, improves workflow efficiency, and reduces clinician workload, particularly in the treatment of non-communicable diseases that account for nearly 80 % of Europe’s disease burden.

Advances of ECS technologies, together with AI, also enable and drive innovations of equipment in the laboratory used for diagnosis as well as research (e.g. genetic sequencers, PCR tools, electron microscopes, and spectrometers, etc.). Advanced instruments enable more accurate and efficient diagnostic testing and research into the underlying causes of disease and infection. This results in deciding the most appropriate treatment plans for individual patients, as well as new treatment development (e.g. at the molecular scale), along with the validation of other medical techniques or equipment. Faster and broader investigations and quicker identification or development of effective treatments, will lead to, amongst other benefits, more successful medical outcomes at the personal and cohort levels, pandemic preparedness, etc.

Together, these advances embody a continuum of digitalisation: from chips that sense and process, to platforms that connect and analyse, to services that deliver personalised care. They enable healthcare systems to evolve into learning ecosystems, capable of turning data into knowledge, and knowledge into action.

Across Europe, concrete implementations already show how advances in electronics, sensing, connectivity and AI translate into new models of care, from wearable biosensors and remote-monitoring solutions to AI-enabled imaging systems, intelligent laboratory instruments and data-driven hospital operations (see section 3.3). These examples demonstrate how technological progress at the component and system level is beginning to shape real clinical and organisational practices.

Taken together, these examples illustrate a profound reconfiguration of how electronics and intelligence are embedded into healthcare. The rapid expansion of diverse biosensing capabilties, the shift to continuous home-based monitoring, the emergence of AI-enabled imaging, and the rise of smart-hospital infrastructures all rely on increasingly dense and heterogeneous semiconductor components. Edge computing plays a central role in this shift: by enabling real-



time, on-device analytics, it requires new generations of low-power processors, secure microcontrollers, photonic and inertial sensors, and connectivity modules engineered for medical reliability. This evolution broadens the innovation landscape of MedTech and expands the range of semiconductor technologies required across use cases, positioning healthcare as an increasingly semiconductor-intensive domain.

3.3.

Illustrative examples

▪ Wearable devices and biosensing

European companies are at the forefront of developing wearable biosensors for continuous vital-sign, and for example have introduced electronic skin patches that measure biopotentials, sweat composition, and other biomarkers using flexible and biocompatible materials. These devices integrate multiple ECS technologies, from low-power wireless communication (BLE, LoRa, NB-IoT) to AI-enabled microcontrollers, ensuring both comfort and accuracy.

▪ Remote monitoring and home care

As the population ages and chronic diseases rise, remote patient monitoring is becoming essential. Edge computing allows real-time analysis of physiological data directly at the patient site, reducing reliance on cloud infrastructures and enabling cost-efficient, continuous care as well as enabling patient's data mobility. For example, in post-operative recovery or rehabilitation scenarios, embedded AI can detect anomalies and trigger alerts to healthcare providers without exposing sensitive data to external networks.

▪ Medical imaging and diagnostics

In advanced diagnostics, AI-enabled imaging systems are transforming radiology and intervention. They enable more accurate image interpretation, delivering higher-quality and more reliable medical images, and enhancing diagnostic confidence and treatment precision. Furthermore, by streamlining clinical workflows through automated imaging and report generation, these solutions significantly reduce clinician workload and minimize errors, ultimately improving patient outcomes and operational efficiency across healthcare systems.

▪ Artificial intelligence across the continuum

AI has become the analytical engine of Europe's healthcare continuum. Machine-learning models are now embedded in diagnostic devices, clinical decision-support systems, and operational platforms. Beyond image analysis, AI supports personalised treatment planning, patient-specific digital twins, and predictive maintenance for medical equipment. The current research frontier focuses on trustworthy, explainable, and energy-efficient AI, ensuring that algorithms remain transparent, auditable, and aligned with EU ethical and regulatory frameworks.

▪ Healthcare laboratory and scientific research equipment

At the molecular scale, healthcare innovation increasingly depends on the ability to observe, model, and manipulate biological structures with precision. Advances in semiconductor-based analytical instruments are enabling scientists to visualise complex biomolecules, decode disease mechanisms, and accelerate the discovery of targeted therapies. A leading example of this transformation are Cryo-Electron Microscopy (Cryo-EM) platforms combine high-performance sensors, precision motion systems, and AI-assisted image reconstruction to reveal the architecture of proteins and viruses at near-atomic resolution. Powered by ECS, these instruments bridge the worlds of microelectronics and life sciences, demonstrating how technological excellence at the chip level can translate into breakthroughs in molecular medicine and drug development, such as investigating e.g. viral infections (e.g. COVID, zika virus, novavirus, influenza), virus mutations, vaccine development and gene related illnesses.

▪ Smart hospitals and data-driven operations

At the system level, hospitals are increasingly adopting IoT, robotics, and edge-cloud orchestration to optimise operations and improve patient experience Smart hospital infrastructures can manage asset tracking, predictive maintenance, and patient roaming using distributed intelligence and data-driven dashboards. These implementations reflect the edge-to-cloud paradigm in practice, where data moves efficiently across physical and digital boundaries to support real-time decisions.

▪ Next-generation connectivity

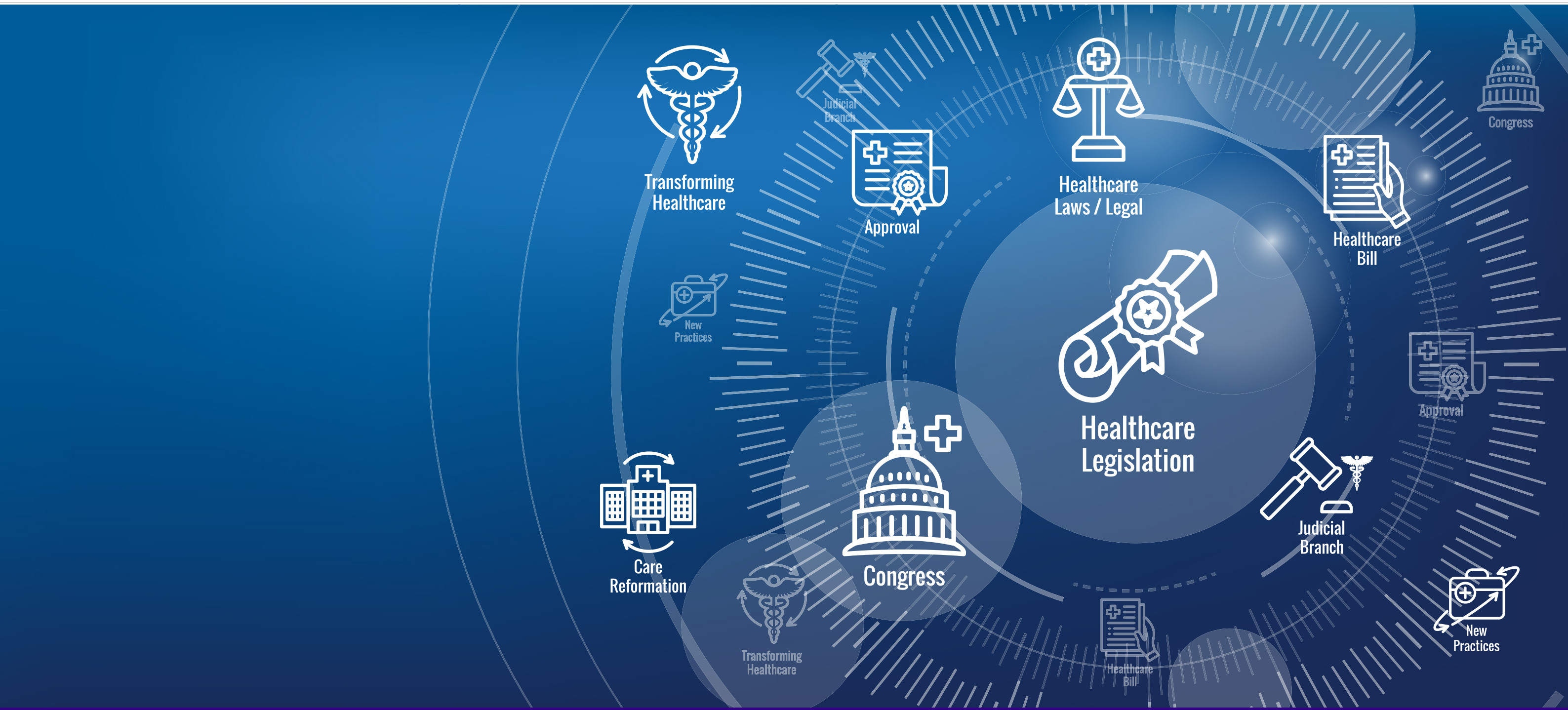
Healthcare applications increasingly depend on reliable, low-latency communication between devices, caregivers, and data platforms. The deployment of 5G and the emergence of network slicing and private campus networks allow differentiated quality-of-service for critical clinical functions. Combined with satellite and optical-fibre backbones, these networks enable continuous monitoring in remote areas and mobile healthcare units. Connectivity thus becomes an essential layer of resilience, ensuring that data-intensive services remain available even under stress conditions.

▪ Edge-to-cloud integration platforms

The most dynamic development in digital health lies in orchestrating computation and data flows between edge devices, local gateways, and cloud infrastructures. New integration platforms manage this continuum through containerisation, workload optimisation, and secure data pipelines. They provide a unified environment for running analytics close to data sources while maintaining synchronisation with hospital or regional data centres. This architecture supports real-time decision-making and enables scalable, privacy-preserving services across Europe's health networks.

▪ Interoperability and data spaces

Interoperability forms the connective tissue of digital healthcare. The progressive implementation of the European Health Data Space (EHDS), together with open standards such as HL7 FHIR and IHE profiles, it establishes a common framework for sharing and re-using health information across borders. Combined with semantic ontologies and secure data-exchange protocols, these standards make it possible for devices, hospitals, and research institutions to collaborate within a federated European ecosystem, ensuring that innovations developed in one context can be replicated throughout the continent.



4. Policies and markets: building Europe's healthTech ecosystem

The digital foundations of healthcare, built on the interplay of ECS, embedded intelligence, and secure, interoperable edge-to-cloud continuum infrastructures, represent not only a technological necessity but also a strategic asset for the resilient European health system of the future. They represent the enabling fabric for Europe's strategic autonomy and competitiveness in the health domain. Yet, translating these technological capabilities into accessible and trusted healthcare services requires a supportive policy and market framework, one that aligns regulation, investment, and innovation.

4.1. EU strategic frameworks

Europe's policy architecture for digital health is built on four interdependent pillars that together enable the transformation from chips to healthcare services. Each pillar addresses a different layer of the digital-health value chain — from the electronic components at its foundation to the trusted data and governance that connect innovation with clinical practice — and their interaction forms a single, coherent ecosystem.

At the technological base, the European Chips Act[1] ensures that Europe possesses the capacity to design and manufacture the semiconductors, sensors, and computing platforms required for tomorrow's health systems. These components provide the intelligence, energy efficiency, and security that digital healthcare demands. Yet their true value emerges when they feed into the next policy layer — the European AI Act[2] — which defines how the intelligence enabled by those chips can be used safely and ethically in healthcare. The two frameworks work hand in hand: the Chips Act guarantees technological capability and control over hardware, while the AI Act guarantees trust and accountability in how that capability is applied. Together they establish a European environment where the same principles of reliability and transparency govern both the devices that capture health data and the algorithms that interpret it.

Indeed, the European AI Act establishes the world's first comprehensive regulatory framework for artificial intelligence, introducing a risk-based regime designed to ensure safety, transparency, and accountability, principles that are particularly critical in healthcare. Medical devices, diagnostic algorithms, and clinical decision-support systems fall under the "high-risk" category, requiring conformity assessment, quality management, and human oversight

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2023.229.01.0001.01.ENG
[2] https://artificialintelligenceact.eu/

before market deployment. By setting a common standard for trustworthy AI across Member States, the AI Act provides the regulatory certainty needed to accelerate responsible innovation in digital health while safeguarding patients and practitioners alike.

The European Health Data Space (EHDS)[3] extends this synergy from technology to information. It provides the legal and technical foundation and infrastructure for secure, interoperable, and citizen-centred data exchange, enabling the data generated by AI-enabled medical devices to move safely across borders and care settings. It is also designed to make electronic health data seamlessly accessible and reusable for care delivery, public health management, and research, under common governance and privacy rules. For clinicians and patients, EHDS ensures that medical information can move securely with the individual across borders, enabling continuity of care, safety, and informed decision-making. For researchers and innovators, it provides the framework for the secondary use of anonymised and pseudonymised data through the HealthData@EU infrastructure, driving progress in AI-assisted diagnostics, predictive analytics, and personalised medicine. In practice, this means that AI systems trained on secure EHDS-governed datasets can continuously improve, feeding their insights back into clinical workflows and into the next generation of ECS-based devices produced under the Chips Act.

By aligning with the GDPR[4] and complementing the EU Digital Health Strategy[5], the EHDS embeds trust, interoperability, and ethics into the heart of Europe's digital health ecosystem. It also provides the data foundation for the edge-to-cloud architectures and AI systems emerging under the Chips Joint Undertaking and related initiatives. These technologies can draw on EHDS-governed datasets to train and validate algorithms, enabling trustworthy, evidence-based, and regulatory-compliant AI for healthcare applications. Together with MyHealth@EU[6], which facilitates the secure exchange of clinical data and prescriptions, the EHDS forms a pan-European data backbone linking information generation, intelligent processing, and healthcare delivery, a critical enabler of Europe's vision to move *from chips to healthcare services*.

These four pillars are orchestrated by the EU Digital Health Strategy, which ensures coherence across programmes, stakeholders, and national health systems. It provides the coordination framework through which EHDS standards are implemented, AI governance is integrated into clinical practice, and the hardware capabilities fostered by the Chips Act are deployed where they create societal value. In this sense, the Digital Health Strategy acts as the bridge between industrial innovation and public-health policy, translating Europe's technological strength into accessible, high-quality services for citizens.

When viewed together, these four instruments do not operate in isolation but as parts of a self-reinforcing system:

- The Chips Act secures Europe's technological sovereignty and supplies the trusted computing backbone.
- The AI Act defines the ethical and regulatory environment that allows this technology to be used safely in healthcare.
- The EHDS provides the interoperable data fabric that connects devices, algorithms, and institutions.
- The Digital Health Strategy integrates all three within a coherent policy and deployment framework.

Their synergy ensures that innovation can travel smoothly along the entire healthcare continuum – from the design of a microchip to the delivery of an AI-assisted clinical decision, from laboratory discovery to citizen empowerment. This interaction of technology, intelligence, data, and governance turns Europe's digital-health policy landscape into a unified engine for trustworthy, human-centric healthcare innovation.

The European Life Sciences Strategy[7] fully aligns with these instruments by underscoring the need to optimise the R&I ecosystem through strengthened collaboration and enhanced use of data and AI. It further emphasises the importance of establishing a regulatory and investment environment that enables rapid market access for innovations, ensuring that these solutions are driven by user needs in order to maximise their societal impact.

4.2.

Market dynamics: European MedTech industry, startups and public–private partnerships

The European health technology market reflects the continent's ambition to transform its strategic policy frameworks into tangible industrial and societal outcomes. The healthcare ecosystem is increasingly shaped by the convergence of established MedTech manufacturers, emerging digital health startups, and public–private partnerships (PPPs) that bridge technological innovation and clinical adoption.

At the industrial core lies a mature and diversified MedTech sector, one of Europe's most research-intensive and export-oriented industries. It encompasses a wide spectrum of technologies, from advanced imaging systems, diagnostic and research equipment to connected medical devices and software-as-a-medical-device solutions, and provides high-skilled employment across all Member States. Yet the sector is now facing dual pressure: on one side, the need to comply with evolving regulatory frameworks (MDR and IVDR) that strengthen patient safety and data protection; on the other, the imperative to accelerate digital transformation through AI, cloud-edge integration, and data-driven services.

Complementing this industrial base is a growing network of startups and scale-ups driving innovation at the interface between technology and care[8]. These young companies are reshaping patient engagement, telemedicine, and remote monitoring by leveraging AI, sensor fusion, and real-time analytics[9]. Despite cyclical investment fluctuations, the European venture landscape in healthtech remains resilient, with strong investor interest in solutions that combine clinical value, sustainability, and regulatory readiness.

At the same time, public–private partnerships, notably the Chips Joint Undertaking and

[3] https://health.ec.europa.eu/ehealth-digital-health-and-care/european-health-data-space-regulation-ehds_en
[4] https://eur-lex.europa.eu/eli/reg/2016/679/oj/en
[5] https://digital-strategy.ec.europa.eu/en/policies/ehealt
[6] https://health.ec.europa.eu/ehealth-digital-health-and-care/digital-health-and-care/electronic-cross-border-health-services_en
[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025DC0525
[8] https://www.medtecheurope.org/about-the-industry/facts-figures/
[9] https://www.eu-startups.com/2025/05/ai-meets-healthtech-10-promising-european-startups-leading-the-change-in-2025/?utm_source=chatgpt.co

the Innovative Health Initiative (IHI)[10], play a pivotal role in connecting the semiconductor and digital industries with the health and life-science domains. By pooling resources from public authorities, research organisations, and industry leaders, these partnerships create shared platforms for experimentation, standardisation, and cross-sector collaboration. Together, the Chips JU and IHI mobilise more than €14 billion in combined public–private investment between 2021 and 2027. IHI, having a medical focus, brings together biopharma, MedTech, and digital technologies for patient-centred solutions, while Chips JU, having a technology focus, supports microelectronics, photonics, and edge AI as key enablers of healthcare innovation. More than 150 organisations, including hospitals and SMEs, participate in their collaborative projects, which function as living laboratories for Europe's healthcare continuum.

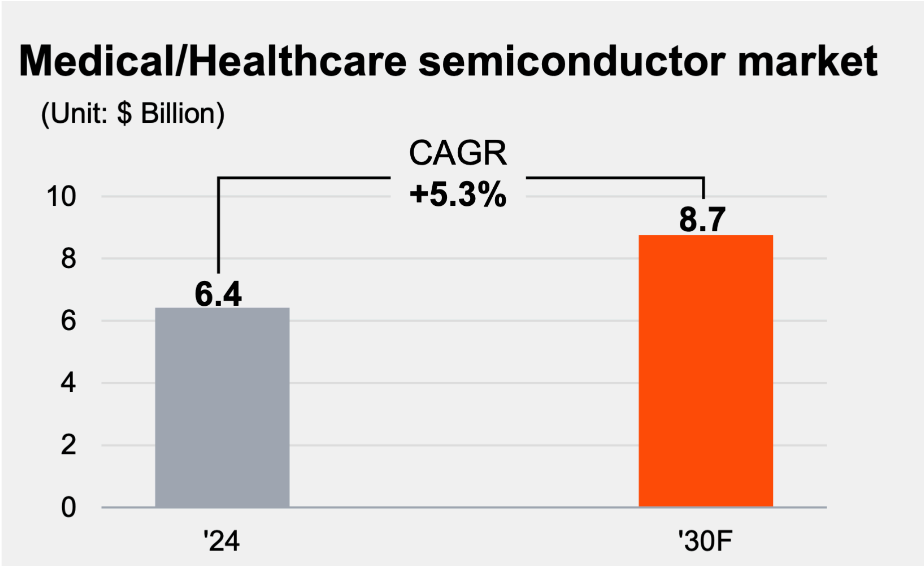
Together, these industrial and entrepreneurial forces form the economic backbone of Europe's emerging digital-health ecosystem, translating policy ambition into market impact and ensuring that innovation reaches hospitals, caregivers, and citizens alike.

4.3.

The European semiconductor industry and healthcare: chips enabling care

The healthcare sector is rapidly emerging as one of the most strategic application domains for semiconductors worldwide. According to the PwC "Semiconductors and Beyond 2026" report[11], the global market for semiconductor-enabled medical applications (including biosensors, diagnostic equipment, and wearable technologies) was valued at around USD 8 billion in 2023 and is expected to exceed USD 15 billion by 2030, growing at an annual rate of more than 9 %.

While this represents a small fraction of total semiconductor demand, it is among the fastest-growing and most innovation-driven segments, reflecting the convergence between electronics, data, and healthcare delivery. The transformation of health-system architectures has direct implications for semiconductor demand. Healthcare semiconductor demand is no longer driven



solely by high-end imaging, diagnostic and IT platforms; while innovation and demand in these areas continues to grow rapidly, it is also increasingly shaped by distributed, sensor-rich, edge-enabled devices operating in hospitals, laboratories, homes, and community settings. New generations of MEMS, biochemical, optical and other sensors, trusted microcontrollers, power-efficient AI accelerators, and secure connectivity modules are becoming essential building blocks of everyday care. As clinical and research workflows integrate continuous monitoring and predictive analytics, the semiconductor footprint of healthcare devices and equipment expands both horizontally (more components per system) and vertically (greater diversity and sophistication of each component). This shift accelerates the growth of the healthcare semiconductor market and reinforces Europe's leadership opportunity.

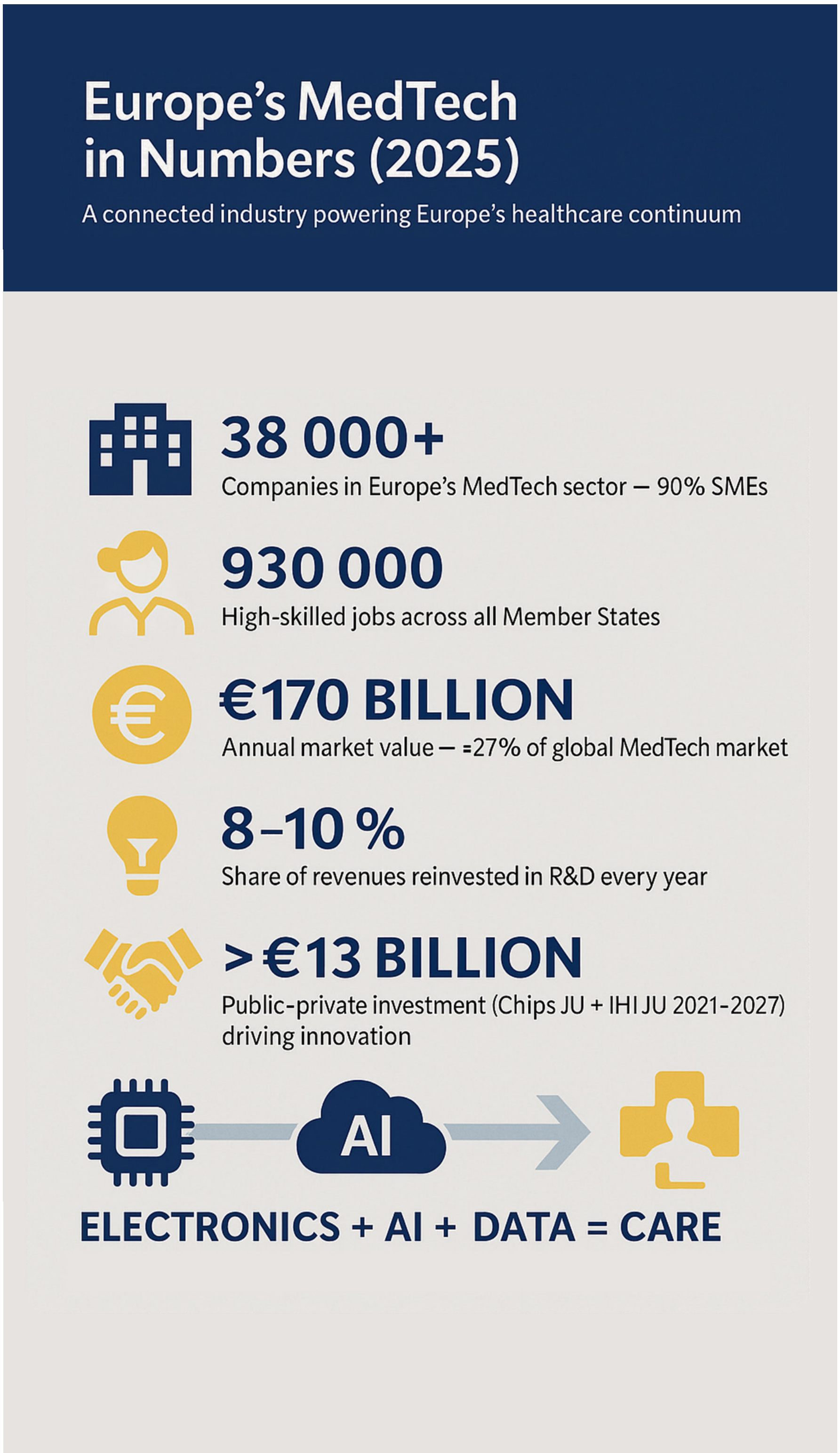
For Europe, healthcare semiconductors represent a strategic intersection between industrial policy and public health. The continent already accounts for over 20 % of global semiconductor consumption in medical and industrial equipment, supported by strong regional clusters in many European countries.

European firms hold leading positions in sensor design, power management, MEMS, and mixed-signal electronics, key building blocks for medical devices, diagnostic imaging, and lab instrumentation. Market reports show that European semiconductor companies are recognised as global suppliers for biosensing, optical diagnostics, and implantable electronics, bridging the gap between microelectronics and life sciences. With the Chips Act, Europe's goal is to secure its place in the global semiconductor value chain while ensuring that critical healthcare applications can rely on trusted, energy-efficient, and locally manufactured chips.

Although the United States and East Asia dominate semiconductor production, Europe's comparative advantage lies in specialised, high-value medical applications rather than volume manufacturing. PwC estimates that by 2030, more than 40 % of innovation in medical devices will depend directly on semiconductor or electronics-based components.
This growing dependency strengthens the argument for Europe to anchor its semiconductor strategy to societal needs, with healthcare as a priority domain combining economic, technological, and ethical significance.

In this context, the Chips JU and its industrial partners are called to connect pilot lines, competence centres, medical-device and healthcare equipment ecosystems, ensuring that the design, prototyping, and validation of healthcare semiconductors and their use in high impact applications take place within Europe's trusted framework. The objective is not only to secure supply but to foster an environment where innovation in chips directly translates into innovation in care. And the evolution of semiconductors for healthcare illustrates the core idea of Europe's digital continuum: hardware, intelligence, and data as an integrated fabric.

10 https://www.ihi.europa.eu/about-ihi/ihi-funding-model?utm_source=chatgpt.com
11 https://www.pwc.com/gx/en/industries/technology/pwc-semiconductor-and-beyond-2026-full-report.pdf



4.4.

A robust MedTech industry

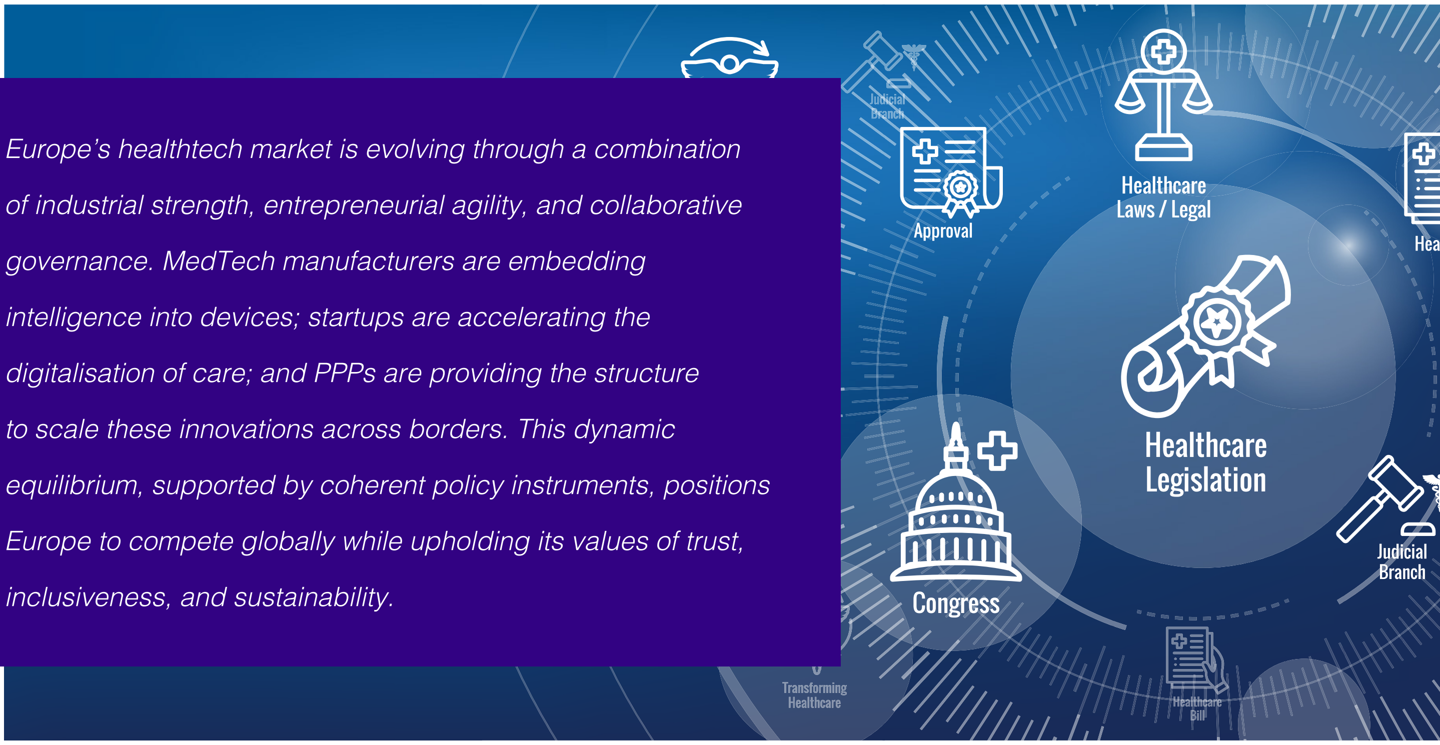
Europe's medical technology sector remains one of the continent's most strategic and innovative industrial pillars. According to MedTech Europe Facts & Figures 2025, the sector comprises more than 38.000 companies, around 90 % of which are SMEs, and provides employment to over 930 000 people across Europe[12]. It generates an annual turnover of approximately €170 billion, accounting for nearly 27 % of the global MedTech market, and remains one of Europe's most R&D-intensive industries, with 8–10 % of revenues reinvested in research and development each year[13].

However, the transition to the Medical Device Regulation (MDR) and In Vitro Diagnostic Regulation (IVDR) has introduced new conformity-assessment processes that have temporarily affected supply chains. To safeguard market stability and patient access, the European Commission extended key transition periods, particularly for IVDs, while maintaining the strengthened clinical-evidence and safety requirements that underpin Europe's regulatory framework[14].

At the same time, the industry's technological trajectory is being reshaped by digitalisation and data-driven innovation. Companies are increasingly embedding intelligence, connectivity, and cloud-edge integration into their solutions, transforming products into smart platforms incorporating e.g. continuous patient support, (semi-) autonomous operation, and predictive maintenance, etc. These trends align closely with the strategic priorities advanced through the Chips JU and IHI, which promote interoperability between hardware, software, and data infrastructures.

As medical devices and equipment become nodes within a wider edge-to-cloud healthcare continuum, the MedTech industry's competitiveness will increasingly depend on its ability to merge advanced electronics, embedded software, secure data infrastructures, and clinical validation

12 https://www.medtecheurope.org/datahub/introduction/
13 BVMed (2025). Über 930 000 Jobs in Europa: MedTech Europe veröffentlicht Facts & Figures 2025.
14 European Commission (2024). Extension of MDR and IVDR Transition Periods to Safeguard Medical Device Availability.



Europe's healthtech market is evolving through a combination of industrial strength, entrepreneurial agility, and collaborative governance. MedTech manufacturers are embedding intelligence into devices; startups are accelerating the digitalisation of care; and PPPs are providing the structure to scale these innovations across borders. This dynamic equilibrium, supported by coherent policy instruments, positions Europe to compete globally while upholding its values of trust, inclusiveness, and sustainability.

into trusted, interoperable, and market-ready solutions that reinforce Europe's leadership in global health innovation.

4.5.

A dynamic venture landscape reinforced by PPPs

Europe's startup ecosystem remains an essential engine for disruptive health innovation. In the first quarter of 2025, European startups raised $13.9 billion, a 17 % increase compared with the previous year, with AI and healthtech among the most resilient verticals[15]. France, Germany, the Netherlands, and the Nordic countries host vibrant clusters focused on digital health, remote care, and medical imaging AI. According to Dealroom, Europe is witnessing a steady rise in late-stage healthtech investments, signalling renewed investor confidence in scalable, clinically validated solutions.

The success of this entrepreneurial landscape is reinforced by Europe's dense network of research infrastructures and innovation programmes. Horizon Europe and its predecessors have nurtured high-growth deep-tech startups through technology transfer and co-funding. Moreover, public–private partnerships have become a defining feature of Europe's technology enabled healthcare landscape. The Chips Joint Undertaking connects the semiconductor ecosystem to vertical domains such as healthcare, creating pilot lines, testing infrastructures, and supply-chain alliances that accelerate the transition "from chips to services." Meanwhile, the IHI JU brings together pharmaceutical, MedTech, and digital sectors to co-develop interoperable, patient-centred solutions. These partnerships reduce duplication of effort, align technology roadmaps with regulatory and clinical requirements, and enhance Europe's strategic autonomy in critical health technologies.

Such collaborations extend beyond funding: they shape standards, certification pathways, and data-governance frameworks. By integrating small and large actors, PPPs ensure that breakthroughs in semiconductors, edge AI, and cybersecurity can scale within the European regulatory and industrial context. This cooperative model exemplifies how Europe transforms policy intent into an innovation continuum that links laboratories, manufacturing sites, and hospitals.

As Europe strengthens its healthtech ecosystem through industrial capacity, entrepreneurial dynamism, and collaborative partnerships, a new set of challenges emerges. Ensuring that these innovations remain sovereign, interoperable, and trusted is now paramount. The success of Europe's digital-health transformation depends not only on technological excellence or market performance, but also on the ability to guarantee that the systems, data, and algorithms serving healthcare align with European values of security, transparency, and fairness.

[15] https://dealroom.co/uploaded/2025/04/Dealroom-Europe-Q1-2025-report.pdf

5. Obstacles, gaps, and challenges in Europe's digital-healthcare transformation

5.1.

Current obstacles: structural and operational barriers

Despite significant policy momentum, Europe's digital-health transition continues to face deep structural obstacles that limit its capacity to scale innovation and deliver impact across the healthcare continuum.

At the governance level, fragmentation remains the single greatest obstacle. Health systems are managed through national or regional authorities that often adopt differing technical standards, data models, and investment timelines. This lack of coordination prevents the creation of a genuinely European digital-health market and hinders the interoperability needed to connect medical devices, electronic health records, and AI analytics platforms.

A second barrier is short-term policy and funding cycles. Health technology development requires sustained investment and long validation processes, but public funding often prioritises short-term results. This leads to "pilot fatigue," where promising innovations are repeatedly tested but rarely scaled.

Legacy infrastructure and data silos compound the problem. Decades-old hospital systems and incompatible EHR platforms remain widespread, limiting the capacity to exchange or reuse data effectively across care settings. According to the Nortal–TalTech 2024 report[16], while more than 90 percent of OECD countries have national electronic health portals, fewer than half allow patients to fully access or manage their data online, underscoring the gap between digital availability and meaningful engagement.

Finally, there are persistent human and cultural barriers. Many healthcare professionals feel excluded from the design of digital solutions, fuelling scepticism and reluctance to adopt new systems. Combined with limited digital literacy among health administrators, this slows integration of AI and analytics tools into daily clinical practice. The World Economic Forum (2025) also highlights financing mechanisms as a bottleneck: most health budgets are structured for operational expenditure rather than continuous innovation, leaving little room for AI experimentation or lifecycle maintenance[17].

[16] https://info.nortal.com/hubfs/WP_National-Healthcare_web.pdf
[17] https://reports.weforum.org/docs/WEF_The_Future_of_AI_Enabled_Health_2025.pdf

5.2.

Systemic gaps: missing links in the digital-health value chain

Beyond structural barriers, Europe's healthcare ecosystem still exhibits critical systemic gaps that prevent digital transformation from becoming sustainable and equitable.

The first is the interoperability gap. Although the European Health Data Space (EHDS) and HL7 FHIR standards are establishing the technical foundations for data exchange, implementation remains uneven across Member States. Many national systems still depend on proprietary or outdated architectures, making cross-border care and multi-country research unnecessarily complex.

Closely linked is the data governance and trust gap. Citizens are increasingly aware of how their health information is used, yet most European systems still lack transparent frameworks for consent, traceability, and ethical reuse of data. Estonia provides one of the few mature examples of citizen-controlled data access, where individuals can view when and by whom their records have been consulted. Scaling such trust models across Europe is essential for the wider acceptance of AI-assisted healthcare.

A third weakness lies in digital and data literacy. The WEF 2025 white paper warns that limited understanding of AI among healthcare executives often leads to delegation of technical decisions to non-clinical experts, resulting in tools that fail to align with actual clinical workflows. Closing this gap will require new forms of multidisciplinary training that bridge medical, engineering, and ethical domains.

Another structural absence is the lack of a Digital Public Infrastructure for Healthcare (DPIH): few European countries have yet integrated the technical and governance layers that connect healthcare, social care, and administrative data into one coherent ecosystem[18]. Without such an infrastructure, data remains fragmented, reducing the ability to deliver coordinated and preventive services.

Finally, an equity gap persists. Rural areas, smaller hospitals, and older citizens remain underserved by digital services. Uneven broadband coverage and the high cost of connected devices reinforce existing social divides, risking a new form of digital exclusion that undermines the principle of universal access to care.

5.3.

Emerging challenges: trust, scale, and resilience

As Europe strengthens its healthtech ecosystem through policy, industry, and research initiatives, a new generation of challenges is emerging and are affecting more the systemic capacity to integrate, govern, and sustain innovation:

- **Building and maintaining public trust**
  Trust remains the cornerstone of digital health adoption. Citizens and clinicians alike must believe that AI-driven systems operate transparently, respect privacy, and are subject to human oversight. The WEF highlights that public trust in AI-enabled healthcare remains fragile, especially when data provenance and algorithmic transparency are unclear. Establishing auditable validation frameworks and post-market monitoring for medical AI systems will therefore be essential to balance innovation with accountability.
- **Scaling innovation sustainably**
  Europe's digital-health landscape is rich in research pilots and start-up initiatives but poor in sustained deployment. Many successful prototypes fail to transition into healthcare procurement pipelines or reimbursement systems. To overcome this "pilot trap", the European Commission and Member States need aligned incentive models, where reimbursement reflects clinical value rather than service volume, and long-term investment tools that encourage continuity across project cycles. This shift from project-based to outcome-based funding will be crucial to transforming experimentation into durable healthcare services.
- **Ensuring inclusiveness and resilience**
  The third major challenge concerns the resilience and inclusiveness of digital-health systems. New AI-driven architectures require not only reliable computing and data infrastructures but also societal inclusiveness. Systems must be designed to operate in multiple languages, reflect diverse populations, and remain functional during crises, from cyberattacks to public health emergencies. Embedding cybersecurity, redundancy, and accessibility standards into every layer of Europe's digital-health architecture will ensure that innovation serves everyone, not only the digitally privileged.

5.4.

From challenges to action

Europe's progress in digital health demonstrates that technology alone is not enough. Achieving the vision "from chips to healthcare services" requires governance structures that integrate hardware, data, and intelligence into a shared framework of trust and accountability.

By addressing structural obstacles, closing systemic gaps, and overcoming emerging challenges, Europe can transform its fragmented digital landscape into a cohesive, resilient, and equitable healthcare continuum. The next step will be to operationalise this vision through coordinated implementation, aligning national health reforms, research investments, and industrial partnerships under a single European roadmap for digital health.

[18] United Nations Development Programme. (2024). Digital Public Infrastructure

6. Outlook on future research: a European vision for the healthcare continuum

Europe's next phase of healthcare research and innovation must consolidate what has been achieved in projects and pilot lines into a coherent, scalable, and sustainable continuum, one that connects technological excellence with societal impact. The vision is to build a European healthcare ecosystem where innovation flows seamlessly from semiconductor laboratories to research, hospitals, homes, and community care, ensuring that every technological advance translates into better health outcomes for citizens.

This vision is based on four pillars.

6.1.

From innovation islands to a European-scale continuum.

Future research must overcome the fragmentation that has long limited digital health adoption. The goal is to create a federated and interoperable network of innovation sites, linking research laboratories, clinical centres, and industrial hubs, so that breakthroughs achieved in one region can be replicated and scaled across Europe. Common architectures, shared validation frameworks, and harmonised data models will allow results to be transferred effortlessly between use cases and healthcare systems. This "network of networks" approach will enable Europe to act as a single innovation space for healthcare, ensuring inclusiveness, efficiency, and equity of access .

Europe's healthcare innovation landscape remains rich but fragmented. Research on semiconductors, sensing technologies, edge computing, and AI is often carried out in isolation from the clinical and service environments where these technologies are ultimately applied. To realise the vision of "from chips to healthcare services", future research must focus on connecting these isolated innovation domains into a coherent European continuum, a pipeline in which advances at the component level directly translate into digital solutions that improve care delivery.

The objective is to establish a federated, interoperable network of innovation sites that link semiconductor pilot lines, embedded-systems testbeds, digital-health platforms, and clinical validation environments. Such a network would allow breakthroughs developed in one part of the value chain, for example, a new biosensing chip, an edge-AI accelerator, or a photonic component, to be rapidly integrated, tested, and validated within medical devices and healthcare workflows elsewhere in Europe.

Achieving this continuum requires common architectures and shared validation frameworks that connect the design and manufacturing stages supported by the Chips JU with the data and service layers enabled by the European Health Data Space. By aligning hardware, software, and data infrastructures, Europe can ensure that innovations flow upward through

the technology stack, from sensing and computation to data analytics and patient-facing services, in a traceable and trusted manner.

This integration also demands harmonised data models and reference interfaces to ensure that the outputs of R&I projects are compatible by design. A chip developed for medical sensing in one country should be able to operate within a certified device in another; an AI model trained on European health data should run efficiently on energy-optimised edge platforms designed in Europe; and the resulting digital service should comply with the same interoperability and ethical standards across Member States.

By creating such a network of networks, Europe can transform its patchwork of research efforts into a true innovation continuum, one where each layer of the ecosystem reinforces the others. This approach would allow Europe to act as a single innovation space for healthcare, ensuring that technological breakthroughs made in microelectronics and computing do not remain confined to laboratories, but reach hospitals, clinics, and homes as part of a seamless, trusted, and human-centric digital-health environment.

6.2.

Integration across the entire value chain, from chips to services.

To transform Europe's technological excellence into tangible healthcare impact, research and innovation must pursue true vertical integration along the value chain, from semiconductor design to patient services. This means ensuring that every technological breakthrough at the component level can be seamlessly embedded into digital platforms, validated in clinical environments, and ultimately delivered as a trusted healthcare service.

At the foundation of this continuum lies Europe's strength in electronics and embedded intelligence. Energy-efficient processors, advanced photonic sensors, and neuromorphic architectures are redefining how data is captured, processed, and transmitted at the edge. These components form the hardware backbone of a new generation of medical devices capable of continuous monitoring, adaptive control, and on-site analytics.

However, the vision "from chips to healthcare services" demands that these components are not developed in isolation. They must be co-designed with the software, data, and service layers that will transform raw signals into medical insights. This integration requires coordinated R&I pathways that bring together chip designers, MedTech industry, software developers, system integrators, and clinical users within shared innovation frameworks.

For example, a biosensing chip developed through the Chips Joint Undertaking can achieve its full societal value only if it interfaces natively with edge-AI algorithms, secure connectivity modules, and data platforms compliant with the European Health Data Space. Each layer — hardware, middleware, and service — must therefore be developed with interoperability and traceability in mind. This enables transparency throughout the product lifecycle, from design to deployment, and facilitates regulatory compliance under the AI Act and the Medical Device Regulation (MDR).

Equally important is the integration of human factors and clinical workflows early in the innovation process. Embedding usability, safety, and trust into device and service design ensures that technologies reach daily healthcare practice without friction. This user-centred co-design approach transforms engineering outputs into clinically meaningful solutions, accelerating the transition from laboratory prototypes to reimbursable healthcare services.

Through this systemic integration, Europe can build a self-reinforcing innovation cycle: semiconductors enable intelligent devices; devices generate structured, interoperable data; data fuels AI and service innovation; and feedback from healthcare delivery informs the next generation of chips and systems. This circular dynamic is the essence of Europe's "from chips to healthcare services" continuum, a model where industrial leadership, digital trust, and public value evolve together in a unified innovation ecosystem.

6.3.

Patient-centred, data-driven and sustainable healthcare.

The "from chips to healthcare services" vision is ultimately about people.

At its core lies a commitment to ensure that technological excellence, from advanced semiconductors to AI-driven digital platforms, translates into human-centric, equitable, and sustainable care. Europe's future research agenda must therefore place the patient, rather than the technology, at the centre of the innovation continuum.

Patient-centred innovation begins with enabling individuals to understand and manage their own health. Advances in biosensing and wearable electronics, powered by ultra-low-energy chips and embedded intelligence, are turning the human body into a continuous source of health insight. These devices can detect physiological and biochemical changes long before symptoms appear, supporting early diagnosis and personalised intervention. But their value depends on secure connectivity and trusted data governance: citizens must remain in control of how their data are collected, stored, and used. The European Health Data Space and the AI Act will together ensure that these data flows are both ethically managed and clinically reliable, embedding transparency and accountability into every digital interaction.

As information moves up the continuum, it feeds into data-driven healthcare ecosystems where AI algorithms, clinical platforms, and public-health infrastructures learn from real-world outcomes. Feedback loops between care delivery and research allow systems to continuously improve their precision, safety, and efficiency. Semiconductor and computing innovation provide the necessary foundation for this transformation: energy-efficient processors and edge-AI accelerators enable data processing close to the source, reducing latency and preserving privacy; secure hardware modules guarantee data integrity; and scalable architectures make it possible to combine local insight with population-level intelligence.

Equally, the European model recognises that healthcare innovation must be environmentally and economically sustainable. Every layer of the continuum, from chip fabrication to device operation, must minimise its ecological footprint. Future R&I efforts will promote green electronics, circular materials, and longer product lifecycles, ensuring that digital health growth aligns with Europe's climate and resource-efficiency goals. Edge computing and adaptive power management will play a decisive role in lowering the energy demands of connected devices, while the reuse and recycling of components will reduce waste throughout the supply chain.

By aligning patient empowerment, data-driven intelligence, and environmental responsibility, Europe can shape a new paradigm in which technological progress reinforces societal values. The result is a learning and sustainable healthcare ecosystem, where each innovation, from a nanoscale sensor to a continent-wide data platform, contributes to better health outcomes, stronger trust, and a lighter environmental footprint. This convergence embodies the true spirit of "from chips to healthcare services": a Europe where every technological advance serves both the individual and the planet.

6.4.

A shared European governance and innovation framework.

Achieving the "from chips to healthcare services" continuum requires more than technological excellence, it demands collective governance that unites every actor along the healthcare value chain. Europe must evolve from a landscape of parallel initiatives into a coordinated innovation ecosystem, where industrial strategy, digital policy, and healthcare objectives are pursued as parts of a single mission.

This governance model should bring together policy makers, technology developers, healthcare providers, researchers, and citizens within a common framework that aligns research priorities, regulatory standards, and deployment pathways. The Chips Act, the AI Act, and the European Health Data Space already provide key components of this structure. The next step is to ensure that these instruments operate in concert, translating Europe's industrial capabilities in semiconductors and computing into health outcomes that are safe, ethical, and socially trusted.

A truly European innovation governance framework would function as a cross-domain coordination platform, ensuring coherence from R&I programming to clinical implementation. This includes the alignment of technology roadmaps with healthcare regulation and standardisation efforts, the integration of ethical and societal oversight mechanisms from the earliest research stages, and the establishment of pan-European validation and certification schemes for digital and AI-enabled medical technologies. Such coordination would make it possible for innovations developed in one Member State to be recognised, procured, and deployed seamlessly across others, turning Europe's diversity into a source of resilience rather than fragmentation.

Central to this model is trust, which must be embedded at every layer of the continuum, in the chips that power devices, in the data that flow through them, and in the services that depend on both. Collective governance ensures that trust is not an afterthought but a design principle, supported by transparency, accountability, and continuous stakeholder dialogue. It also reinforces Europe's capacity to define its own standards for digital health, ones that reflect its values of privacy, fairness, and human dignity.

In this vision, healthcare becomes more than an application domain of digital technologies: it becomes a strategic driver of cross-sector innovation. The same semiconductors that enable medical sensing and imaging stimulate advances in mobility, energy management, and secure communication. The AI frameworks developed for clinical decision support inform broader standards for ethical automation. Data spaces initially designed for health research pave the way for interoperable infrastructures across industries.

By interlinking semiconductor research, artificial intelligence, data spaces, and clinical sciences, Europe can construct a resilient and inclusive health ecosystem, one where industrial capability, scientific excellence, and societal trust reinforce one another. This is the essence of the "from chips to healthcare services" vision: a Europe where governance and innovation move together, transforming technological potential into tangible, measurable well-being for every citizen.

7. Turning a vision into actions

Europe stands at a pivotal moment in the transformation of healthcare. The continent's healthcare systems are under mounting pressure from demographic change, chronic disease, and rising costs, while at the same time, technological innovation is accelerating at an unprecedented pace. These two forces, necessity and capability, converge in a single imperative: to translate Europe's digital and industrial strength into accessible, equitable, and sustainable healthcare for its citizens.

The vision of *"From Chips to Healthcare Services"* responds precisely to this imperative. It embodies a holistic and mission-driven approach that connects Europe's excellence in electronics components and systems, and edge-to-cloud computing with its leadership in health research and patient care. The goal is not only to develop advanced technologies, but to ensure that innovation travels across the entire value chain, from the design of a chip to the delivery of a clinical service, from the laboratory to the home, from research insight to improved quality of life.

This whitepaper demonstrates that Europe already has the building blocks to realise this continuum:

- **A robust industrial base**, with world-leading companies in MedTech, semiconductors, photonics, and embedded systems.
- **A trusted regulatory and ethical framework**, centred on the AI Act, the European Health Data Space, and the Medical Device Regulation.
- **A vibrant innovation ecosystem**, connecting research institutions, MedTech industries, and digital-health startups.
- **Public–private partnerships** like the Chips Joint Undertaking and the Innovative Health Initiative, which provide the structure to align industrial, clinical, and research efforts under a shared purpose.

Yet technology alone is not enough. Europe must overcome fragmentation, scale innovation, and reinforce public trust. **Interoperability**, **scalability**, **inclusion**, and **cost efficiency** are not abstract policy goals, they are the practical conditions under which digital healthcare can thrive. Devices, data, and services must communicate securely across borders; pilots must evolve into deployable solutions; citizens must be empowered participants in their own care; and technology must help health systems do more with fewer resources, without compromising fairness or quality.

Like in other digital fields, Europe needs to accelerate in financial schemes that complement the support provided by the Chips JU. Capital ventures in the US are for instance a true accelerator to financially fuel the research teams. On the other hand, Europe is capable of attracting and retaining many biotech, medical researchers motivated by the societal applications in a continent where the benefits of digital health can be applied at scale, for almost every citizen.

But this is not only a business opportunity for Europe's ECS and healthtech industries, it is a

societal mission. The same chips, sensors, and AI systems that drive competitiveness also enable longer, healthier, and more independent lives. They have the power to make prevention more effective, treatment more precise, and care more accessible. The true success of this vision will therefore be measured not in patents or market share, but in healthier citizens, stronger health systems, and renewed solidarity across Europe.

Looking ahead, Europe must carry forward this sense of purpose. The challenges are immense, but so are the opportunities. By aligning industrial policy, research investment, and healthcare reform under a single strategic framework, Europe can turn its technological sovereignty into health sovereignty, ensuring that the next generation of healthcare is designed, built, and trusted in Europe.

In this spirit, the vision "From Chips to Healthcare Services" is more than a research initiative. It is a call to action, to integrate, to collaborate, and to deliver innovation with impact. It invites Europe to transform its scientific and industrial excellence into measurable well-being for every citizen. If life runs on semiconductors, then Europe's responsibility is clear: to ensure that those semiconductors, and the intelligence they enable, run in service of life itself.

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