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## Advancing Health through Digital Transformation in Europe



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The acceleration of digital health transformation has become a strategic imperative across the European Region. With the COVID-19 pandemic highlighting vulnerabilities in health systems, digital innovation has emerged as a powerful tool to enhance resilience, access and care quality. The World Health Organisation (WHO) and its 53 Member States have embraced digital health as a core component of improving health outcomes and overall well-being. A comprehensive review of studies in the International Journal of Medical Informatics reveals how key areas—governance, digital infrastructure and user engagement—are driving the region's progress and exposing persistent challenges that require coordinated action and sustainable investment.

### Strengthening Governance and Infrastructure

Effective governance underpins all digital health initiatives. A significant number of European countries have developed national digital health strategies, predominantly led and financed by government bodies. These strategies are essential for building coherent systems that align with public health priorities. One critical lesson from the pandemic was the necessity of enhancing Emergency Response Information Management Systems (ERIMS). Improvements in ERIMS allow countries to respond more effectively to health crises by identifying systemic gaps, aligning with international standards and strengthening cross-border coordination.

Despite these advances, challenges remain in implementing robust electronic health records (EHRs). Although many countries have adopted EHRs, widespread interoperability is hindered by limited funding, insufficient technical expertise and incompatible systems. Addressing these barriers requires legislation that supports standardisation and long-term funding frameworks. Investments in EHR infrastructure are vital for achieving integrated, personalised and efficient healthcare delivery. Telehealth services, while expanding rapidly, face their own set of issues, including infrastructure limitations and workforce readiness. Overcoming these systemic obstacles is necessary to embed telehealth into mainstream healthcare services and unlock its full potential.

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### Engaging Users and Standardising Practices

A central focus of digital health is enhancing user engagement through accessible and acceptable tools. Studies on mobile health (mHealth) services highlight their growing role in chronic disease management. In Slovenia, higher usage frequency was associated with increased usability, suggesting that habitual engagement is critical to acceptance. However, psychosocial engagement remained unaffected, pointing to the complex nature of patient behaviour and the need for deeper strategies to foster long-term commitment.

Regional disparities and varying health policy environments have influenced the implementation of mHealth, particularly during the pandemic. Services like teleconsultations and digital appointment systems became vital for the continuity of care. However, issues such as privacy concerns, low digital literacy and security risks remain widespread. These findings emphasise the need for inclusive strategies that address digital divides and support user education. Patient-centred design also plays a key role, with frameworks that integrate patients' perspectives into care pathways proving beneficial. Hybrid EHR models that combine federated and centralised systems have shown promise in facilitating cross-organisational data sharing, though data trust and quality remain major concerns. The successful adoption of these technologies depends on consistent standards and user trust in the digital ecosystem.

### Empowering Professionals and Ensuring Data Quality

Healthcare professionals are pivotal to the success of digital transformation. Research from Finland categorised healthcare workers into different digital competence profiles, underscoring the need for tailored training programmes. Empowering professionals with the skills and confidence to use digital tools can significantly enhance implementation outcomes. Moreover, consistent documentation and the use of standardised nursing languages (SNLs) are critical for the quality of care. Current obstacles, such as inadequate training and fragmented documentation practices, must be addressed through targeted collaboration among clinicians, educators and policymakers.

Data quality within health information systems (HIS) has direct implications for clinical decision-making. An evaluation of over two million patient records in a German hospital revealed that a quarter of the data was unusable due to inaccuracies. This finding demonstrates the importance of

thorough data cleansing processes and robust data governance to ensure accurate clinical and operational insights. Clinical decision support systems (CDSS) offer a promising solution in improving patient safety. One such system reduced anticoagulant medication errors by 42%, showing high levels of acceptance and technical performance. These tools, when integrated effectively, can prevent adverse events and enhance the overall safety and reliability of healthcare delivery.

Europe stands at a pivotal moment in its digital health journey. Progress in governance, infrastructure and professional development has laid the groundwork for a more integrated and responsive health system. Yet, challenges around interoperability, data quality, digital literacy and equitable access continue to hinder widespread implementation. The experiences and evidence shared across Member States offer valuable lessons and models for adaptation. Moving forward, sustained investment, inclusive policy-making and cross-sector collaboration will be essential to harness the full potential of digital health, ultimately transforming care delivery and improving health outcomes across the region.

**Source:** [International Journal of Medical Informatics](#)

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