

Lucia Mokrá

Comenius University Bratislava, Slovakia

lucia.mokra@fses.uniba.sk

ORCID ID: 0000-0003-4883-0145

Digitalisation of the EU Healthcare System: Member States Enabling the European Health Data Space¹

Abstract: This article presents a comprehensive overview of the legislative and policy frameworks adopted at the EU Member State level in healthcare systems and analyses the development of their implementation regarding the 2030 digital targets. The comparative analysis of national strategies for the digitalisation of health services aims to provide information on the existence of the framework for digitalisation of the sector and on the implementation of the e-health record system, and to assess the feasibility of achieving the goal in each Member State and in a cumulative way for the European Union and its Digital Decade Policy Programme. The output of the analysis is an essential contribution to the current process of creating a common European health data space, for which the creation of an e-health information system that is digital and shareable is a prerequisite for interoperability, while ensuring digital inclusion for everyone.

Keywords: digitalisation, health records, access to public services, citizens' rights, policy frameworks, European Health Data Space

Introduction

The European Union, similarly to other international organisations, states and non-state authorities, has been facing challenges connected to the technological development and digitalisation of the 21st century (Kováčiková, 2020). To address the

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digital challenges for a human-centred, sustainable and prosperous digital future, the EU has strategically set its targets and objectives related to digital transformation by 2030 in the Digital Decade Policy Programme (European Commission, 2022).

The programme is based on four pillars, of which one focuses on digitalisation of public services. Within that, three main goals have been set: all key public services will be available online, all citizens will have access to medical records online, and all citizens will have access to digital ID. Regarding the EU-level trajectories of 2024², it is necessary to annually assess development in these concrete areas, focusing on the nationwide availability of online services for citizens to access their electronic health records data and the percentage of individuals that can obtain or make use of their own minimum set of health-related data. According to a Eurobarometer survey on the Digital Decade published in 2023, a significant majority of respondents (76%) expect digital technologies to have a decisive impact on access to and uptake of healthcare services by 2030 (e.g. telemedicine and artificial intelligence in disease diagnosis), even in EU countries where patients are not actually resident. A minority of respondents (13%) think that their country should prioritise citizens' access to their electronic health records between now and 2030 (Eurobarometer, 2023).

While several studies exist assessing the impact of healthcare systems across the Member States, these have mainly focused on the efficiency and effectiveness of the systems and their implementation with the support of European funds. The Commission's assessment, in a case study on the digitalisation of health, provides an overview of initiatives that have been launched and provided with grants and loans through the Recovery and Resilience Facility (European Commission, n.d.a.), but is limited to five Member States.

This article analyses how one of the main objectives of the Digital Decade Policy Programme is addressed, namely the digitalisation of public health services. The core tool analysed is access to, or the creation of, an e-health records system within a national digitalised service system. For this purpose, I analysed in which strategic and policy documents Member States have planned an e-health system, focusing on the creation of an e-health records system, which I considered a strategic digital tool for the effective provision of healthcare, as well as a tool for inclusion and preventing discrimination (Mee et al., 2025). Beyond that, I focus on the implementation of an e-health system, based on the strategic national policy or legal document and its compliance with the ambition of the EU to achieve the Digital Decade programme target of having an e-health records system in all Member States by 2030, which is a precondition for non-discriminatory and effective access to digitalised health services and the creation of health IDs.

2 The paper analyzes data available as of December 31, 2024, as the reference point preceding the adoption of the relevant legislation for the European Health Data Space Regulation.

1. Digitalisation of healthcare

The European Commission presented its vision for a digitally transformed Europe by 2030 in the communication '2030 Digital Compass: The European way for the Digital Decade' (European Commission, 2021), followed by the other two strategic documents: the Digital Targets for 2030 (European Commission, 2022) and the Digital Decade Policy Programme (European Commission, 2023b). The Digital Decade lays down a vision for digital transformation. As detailed in the inter-institutional solemn declaration on digital rights and principles for the digital decade, the following rights are suggested: putting people and their rights at the centre of the digital transformation; supporting solidarity and inclusion; ensuring freedom of choice online; fostering participation in the digital public space; increasing the safety, security and empowerment of individuals; and promoting the sustainability of the digital future. These rights are expected to complement existing rights in the context of digitalisation and are intended to empower citizens in navigating the digital landscape and to provide guidance for EU Member States and other stakeholders (European Commission, 2022).

In the light of the continuously digitalising environment and following the Digital Decade, the Commission adopted the European Declaration on Digital Rights and Principles for the Digital Decade, underlining a human-centred digital transformation (European Commission, 2022). The declaration is anchored in the EU treaties and the EU Charter of Fundamental Rights as well as the case law of the Court of Justice of the EU. It aims to serve as an overarching reference framework for digital transformation in Europe, based on the principle that EU rights and freedoms, as well as European values, should be respected online in the exact same way they are offline. More specifically, the declaration promotes rights and principles relevant for the digital transformation, i.e. putting people and their rights in the centre, fostering solidarity and inclusion, guaranteeing freedom of choice online, promoting participation in the digital public space and ensuring the sustainability of the digital future (Kerikmäe et al., 2019; Mazur & Ramiro Troitiño, 2024; Ramiro Troitiño, 2023). The European Declaration on Digital Rights and Principles offers citizens a bridge to the Union's digital laws and policies, as it indicates the direction of travel of the Union on its journey to digital transformation (Costa, 2023; European Commission, 2022; Outeda, 2024). As outlined in this Declaration, above all, the EU institutions commit to facilitating and supporting seamless, secure and interoperable access across the EU to digital public services designed to meet people's needs in an effective manner, including digital health and care services, notably access to electronic health records (European Commission, 2022, section A7c).

As part of the Digital Decade, Member States are encouraged to ensure that 100% of key public services are online, with 100% access to e-health records and 80% digital ID usage by citizens by 2030 (European Commission, 2022). With pub-

lic services, including health services, increasingly moving to a digital mode, Member States are called on to ensure that nobody is left behind. Additionally, as many argue, digitalisation of healthcare may increase the risk of digital exclusion (Kwiatkowska & Skorzevska-Amberg, 2019). The phenomenon of digital exclusion is generally associated with the lack of skills necessary for using information technologies and can lead to social isolation (Kwiatkowska & Skorzevska-Amberg, 2019). Access to these services is a right of all EU citizens, regardless of age, gender or disability, as specified in the right to non-discrimination in Article 21 of the Charter of Fundamental Rights.

Although the European Commission adopted the Digital Decade programme in 2023, some of the EU Member States adopted their national strategic goals for digitalisation earlier, and an important part of the assessment is whether and to what extent these are compliant with the European strategic policy goals and values adopted later. Overall, the focus of this paper is to provide analytical insight into the EU Member States' obligation to fulfil the goals set in the Digital Decade programme, as well as to ensure that the fundamental principle of the EU law on non-discrimination is applied in healthcare in a way which is compliant with the principles of subsidiarity and proportionality. As Mee et al. (2025) have argued, digital exclusion leads to marginalisation and inequality. According to the UN (UNGA HRC, 2018), digital inclusion can be characterised as a basic human right. Therefore, it is essential to provide safeguards to access healthcare, including e-health systems implementing digitalisation simultaneously to create the European Health Data Space (EHDS), which will benefit all EU citizens, including patients, healthcare professionals, researchers, policymakers and industry players (European Union, 2025). However, I must also underline that the research combines two policies of regulation and implementation in consecutive periods which only partially overlap. Hence the research topic may raise additional questions, such as the use of digital platforms, protection of personal data, governance structure and requirements for network and information systems, which are not addressed or analysed here.

The research uses a tailor-made approach to the specific topic of the nexus of digitalisation in e-health, analysing the EU Member States' approaches to the required digitalisation with the stated 2030 targets, and its application in the area of healthcare, based on the EHDS Regulation adopted in 2025 which foresees full implementation by 2035 (including access by third parties and international organisations). The e-health records system is considered a strategic research point, and can be used as a pilot study for assessment of the preparedness of EU Member States for the full implementation of the EHDS Regulation and the creation of a European Health Union.

2. E-health and digitalisation: The contemporary challenge to a clash of competences?

When analysing e-health policies, we need to clarify the framework of competences for health policy and digitalisation. According to Article 168 of the Treaty on the Functioning of the European Union (TFEU), a ‘high level of human health protection shall be ensured in the definition and implementation of all Union policies and activities’ (European Union, n.d.). Based on the principle of subsidiarity and proportionality, the EU’s role in health policy is therefore complementary to national policies (de la Guardia, 2005; Giovanola, 2023; Hamulák, 2016; Maatsch, 2024). Although the EU treaties do not contain specific provisions on digitalisation, the European Commission can take appropriate action, in close coordination with Member States, under sectoral and horizontal policies to promote innovation, economic growth and the development of the single market (Ayata, 2024; Ferretti, 2022).

An important fact that needs to be outlined before the analysis is that the Digital Decade targets by 2030 are political goals, which became strongly supported by financial resources through the Recovery and Resiliency Facility of the European Union that addressed the impact of the Covid-19 pandemic (European Commission, n.d.b). Given the experience of the pandemic period, and also regarding the lack of Union competences in close coordination of health policies and instruments but especially health information exchange, 2024 was also significant in terms of strengthening cooperation and competences. The Council of the EU and the European Parliament have reached a preliminary agreement on new legislation facilitating the exchange of and access to health data at the EU level (Council of the European Union, 2024).

On 21 January 2025, the Council adopted a new law that makes it easier to exchange and access health data at the EU level. The European Health Data Space Regulation aims to improve individuals’ access to and control over their personal electronic health data, while also enabling certain data to be used for research and innovation purposes for the benefit of patients. It provides for a health-specific data environment that will ensure cross-border access to digital health services and products within the EU. Under the new rules, individuals will have faster and easier access to electronic health data, regardless of whether they are in their home country or another Member State; they will also have greater control over how that data is used. EU countries will be required to set up a digital health authority to implement the new provisions. Currently, the level of digitalisation of health data in the EU varies from one Member State to another, making it more difficult to share data across borders. The new EHDS Regulation requires all electronic health record systems to comply with the specifications of the European electronic health record exchange format, ensuring that they are interoperable at the EU level (Council of the European Union, 2025).

The EU Regulation is phasing its implementation, with several transition periods. While the Commission is obliged to adopt several key implementing acts pro-

viding for the operationalisation of the regulation, EU Member States have already been implementing some of the instruments, such as electronic health records, as they are interlinked with the 2030 digitalisation targets. While the legal obligations of EU Member States in relation to the use of health data in the categories of medical records and genomic data are foreseen as being fully implemented in the EU by 2031, this paper provides an analytical insight into the implementation of e-health records at the EU Member State level, as potential examples of the effective, gradual and structured transition foreseen by the Regulation.

3. The e-health records system in the digital strategies of Member States and its implementation

The initial analysis focused on the existence of a digital strategy or action plan which provides access to public services and particularly to health services. While I can confirm that all 27 Member States do have a digital strategy or action plan in place, only 15 currently have a focused digital strategy in the area of healthcare (Table 1). It is important to add that Denmark also has their Digital Health Strategy 2018–2022, which has contributed to the implementation of an e-health system in practice (Danish Health Data Authority, n.d.).

Table 1. National digital healthcare strategies

Country	National policy framework
Austria	eHealth Strategy Austria
Belgium	Act of 21 August 2008
Bulgaria	National Strategy for E-health and Digitalisation of the Healthcare System 2030
Croatia	National Health Development Plan for the Period 2021–2027
Czech Republic	National e-Health Strategy of the Czech Republic
Germany	Digitalisation Strategy for Health and Care
Hungary	Digital Healthcare Development Strategy
Ireland	Harnessing Digital – The Digital Ireland Framework
Latvia	Digital Health Strategy to 2029
Malta	A National Health System Strategy for Malta 2023–2030
Poland	Strategy of the e-Health Centre for 2023–2027
Portugal	Portuguese e-Health Strategy
Slovenia	e-Health for a Healthier Society
Spain	Digital Health Strategy
Sweden	Draft Roadmap for a National Digital Infrastructure for Healthcare

Source: author's own processing

Reviewing the EU Member States' frameworks, it can be confirmed that most Member States have established a policy framework within the digital strategy for the implementation of an e-health records system. A comprehensive framework which could provide comparable data for the EHDS is not fully in place, however, and the national systems providing online access services for citizens to access their health data vary. This full and universal compliance is considered as the realisation of the e-health principles, which in 2022 was on average 64% in the EU 27; in 2023 it was 79% (European Commission, 2023a; European Commission, 2024).

The Commission's evaluation results for 2023 (considering data up to 31 December 2022) and 2024 (considering data up to 31 December 2023) show that countries are progressing well in facilitating citizens' access to electronic health records. Twenty-two Member States (81%) improved in score in the past year. The top five countries in the EU 27 with the most developed systems are Belgium (100%), Denmark (98%), Estonia (98%), Lithuania (95%) and Poland (90%). The biggest improvement over the previous year was observed for France (+25 points), Portugal (+23 points), Slovakia (+20 points) and Germany (+17 points). Additionally, 17 Member States (63%) made improvements by either providing more categories of health data or providing the available data in a timely manner (European Commission, 2024; Table 2).

Table 2. E-health records system development score by EU Member State

Country	e-health records system		Country	e-health records system	
	2023	2024		2023	2024
Austria	88%	88%	Italy	71%	83%
Belgium	85%	100%	Latvia	79%	85%
Bulgaria	77%	77%	Lithuania	92%	95%
Croatia	86%	86%	Luxembourg	67%	76%
Cyprus	70%	68%	Malta	78%	88%
Czechia	47%	51%	Netherlands	69%	72%
Denmark	96%	98%	Poland	86%	90%
Estonia	89%	98%	Portugal	63%	86%
Finland	90%	83%	Romania	57%	59%
France	54%	79%	Slovakia	42%	66%
Germany	70%	87%	Slovenia	80%	88%
Greece	61%	74%	Spain	83%	85%
Hungary	80%	86%	Sweden	70%	78%
Ireland	0%	11%			

Source: European Union, 2024

Following this evaluation of the policy framework, it is essential that these indications of strategic policy settings are not only implemented but also considered in detail. Since 2023, the Commission has published a Digital Decade status report and country-focused reports about the target of online access to electronic health records for European citizens (Rek, 2024; Rüse, 2014). In the 2024 report, the Commission evaluated the progress made by EU Member States regarding citizens' access to their electronic health records. Methodologically, a composite indicator has been used for this monitoring, incorporating four layers that analyse multiple aspects of access to e-health records: the implementation of electronic access services for citizens, categories of accessible health data, the access technology used (eID or access via portals or apps), coverage (by population and healthcare providers) and equitable access opportunities (European Commission, 2024). Out of all EU Member States, 16 were above the EU average of 64% in 2023; currently, 17 are above the average of 75% in 2024 (Table 3).

Table 3. E-health data by EU Member State (access to electronic results and reports)

Country	Score in health data		Country	Score in health data	
	2023	2024		2023	2024
Austria	87%	87%	Italy	60%	80%
Belgium	52%	100%	Latvia	74%	86%
Bulgaria	48%	48%	Lithuania	87%	92%
Croatia	92%	92%	Luxembourg	48%	51%
Cyprus	92%	83%	Malta	92%	100%
Czechia	38%	43%	Netherlands	21%	23%
Denmark	92%	92%	Poland	58%	60%
Estonia	100%	100%	Portugal	67%	83%
Finland	87%	74%	Romania	38%	37%
France	37%	68%	Slovakia	27%	88%
Germany	69%	69%	Slovenia	100%	87%
Greece	60%	79%	Spain	66%	81%
Hungary	77%	92%	Sweden	69%	91%
Ireland	65%	5%			

Source: European Union, 2024

The European Commission evaluated the performance of the Member States in enabling citizens' access to e-health data, highlighting the role of five so-called 'leader countries' in digitalisation of health data: Belgium, Denmark, Estonia, Lithuania and Poland. While other countries were classified as fast-trackers (scoring between 83 and 88%) or followers (scoring between 66 and 79%), the Commission also highlighted three countries where digitalisation of health data is very low: Romania, the

Czech Republic and Ireland (European Commission, 2024). It should also be added here that while the Czech Republic has a specific strategy for digitalisation in the health sector, neither Romania nor Ireland has such a strategic document. The adoption of a specific document or action plan would reinforce awareness of the need to digitalise access to health information and at the same time enable its effective implementation to achieve the set digitalisation targets by 2030.

Conclusions

This comparative overview highlights the need to enhance the digitalisation of health services across all 27 EU Member States. With the progress of the new EHDS Regulation, effective and harmonised digitalisation of services in the health area as well as e-health records in all Member States are not only the targets by 2030, but also a necessity for the implementation of the exchange of health information, better access to health services and the improvement of the well-being of all EU citizens.

In order to digitalise and meet the objectives of the digital programme, all EU Member States have adopted national digital plans and programmes. However, some of them have also adopted a specific digital health strategy to digitalise health services in more detail and in a more effective way. In the European Commission's assessment, out of the five so-called 'leader countries', four had a specific strategy for digitalisation in health services, including the goal of having an e-health records system in place. Establishing a strategic framework and then implementing effective tools, including sufficient financial resources (European Commission, n.d.b.), are three key factors for successful implementation, not only now but also for achieving the 2030 targets. Considering the progress of EU Member States' e-health records development scores, which increased in the last two years in all countries (see Table 2), we can identify positive development in this area that is compliant with the key parts of the EHDS Regulation, including the first group of priority categories of health data in all EU Member States before March 2029. Furthermore, we can also in later stages verify to what extent Member States are on track with the implementation, ensuring patients have fast and free access to their own electronic health data, are not digitally excluded and that security and privacy protection is in place. The e-health system and access to electronic health records should significantly reduce the administrative burden and allow health professionals to provide effective and patient-centred care.

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