

# Case study on the Digitalisation of health (eHealth)

## Introduction

The digitalisation of health has been a top priority for the European Union (EU) in recent years, as part of its efforts to improve the efficiency and effectiveness of healthcare systems across the Member States. The EU has launched several initiatives and provided grants and loans through the Recovery and Resilience Facility (RRF) to support Member States in advancing their eHealth<sup>1</sup> systems.

Member States consider the digitalisation of national healthcare systems, as outlined in numerous RRFs, to be a way of providing a long-term opportunity to deliver innovative, accessible, and effective healthcare services to citizens.<sup>2</sup> The concrete amount that each Member State invests in digital transition as part of their NRRPs varies widely. Nevertheless, the RRF requires that Member States allocate at least 20% of their total funding towards the digital transition. "Digitalisation is transforming public health, health systems, and the health information we receive – as well as how we receive and understand it."<sup>3</sup>

## Case study objectives and case selection

In this case study, we focus on five sampled Member States, which have completed their progress in achieving selected milestones and targets (M&Ts) set in their Recovery and Resilience Plans (RRP) in this sector. We seek to answer a range of research questions related to the evaluation criteria of the study on the mid-term evaluation of the RRF. By comparing the experiences of five different Member States, we aim to evaluate the RRF measures related to the digitalisation of health systems, by identifying best practices and lessons learned.

The measures examined for this case study belong to two of the RRF pillars: Digital transformation (pillar 2) focusing specifically on digital public services, and Health, and economic, social and institutional resilience (pillar 5), focusing specifically on healthcare and modernisation of public administration and delivery of public services.

For this case study we have selected five Member States to analyse to what extent they have introduced digital tools in their health systems. The selection criteria are based on the following points:

- Member States with a measure related to eHealth;
- Advanced implementation status<sup>4</sup>;
- CSR country recommendations on the healthcare system.

The Table 1 below provides an overview of the selected measures.

Table 1: Selection of measures covered in the case study

Country	Measure name	Reform / Investment	Milestone / Target	Milestone / Target name
Belgium	eHealth Services and Health Data	Investment	Milestone	Entry into force of the law setting up the Health Data Authority
			Milestone	Design and solution for the subprojects
Croatia	Digital image diagnostics of Clinical Hospital Centre 'KBC Split'	Investment	Milestone	Modernisation of health services in Clinical Hospital Centre KBC Split

<sup>1</sup> There are multiple nomenclatures for 'eHealth', e.g. e-Health, e-health, eHealth. For the purposes of consistency, this case study will employ 'eHealth' throughout, unless the selected measures have employed a different nomenclature.

<sup>2</sup> [https://ec.europa.eu/economy\\_finance/recovery-and-resilience-scoreboard/assets/thematic\\_analysis/2\\_Digital.pdf](https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/assets/thematic_analysis/2_Digital.pdf)

<sup>3</sup> [https://eurohealthnet.eu/wp-content/uploads/publications/2022/220225\\_digital\\_health\\_literacy\\_seminar\\_final\\_event\\_report.pdf](https://eurohealthnet.eu/wp-content/uploads/publications/2022/220225_digital_health_literacy_seminar_final_event_report.pdf)

<sup>4</sup> According to European Commission nomenclature, RRF measures are categorised as follows: Fulfilled (measure positively assessed by the European Commission); Completed (measure claimed as completed by Member State); On track; Delayed; Not completed.

Country	Measure name	Reform / Investment	Milestone / Target	Milestone / Target name
Croatia	eHealth	Reform	Milestone	Improvement and extension of telemedical services
Czechia	eHealth	Reform	Milestone	Definition of interoperability standards in accordance with the European Interoperability Framework for eHealth and definition of rules governing telemedicine
Denmark	Digital solutions in the healthcare sector	Investment	Milestone	Evaluation of patient involvement and widespread use of telemedicine to be made available by the Danish Ministry of Health in close collaboration with Danish Regions
			Target	Develop and make available facilities for telemedicine consultation (KontaktLæge) for multiple platforms
Denmark	Digital strategy	Reform	Milestone	Adoption of a new "Digital Strategy" in the Finance Act 2022 and of the implementation plan
Estonia	Renewal of the eHealth Governance	Reform	Milestone	Approval of the eHealth Governance Framework and its implementation roadmap
Estonia	Strengthening primary health care	Reform	Milestone	Entry into force of the Decree of the Government, which amends the list of health care services of the Estonian Health Insurance Fund on access to specialised medical care

Source: Authors' elaboration based on EC data, 2023.

## Methodology and data collection

To conduct a comprehensive evaluation of the digitalisation of health in the five sampled Member States (Belgium, Croatia, Czechia, Denmark, Estonia), we employ a multi-method approach that includes both desk research and primary data collection.

The first step in our data collection process is to conduct extensive desk research to gather background information on the eHealth systems of the five sampled Member States. We rely on a range of sources, including the Recovery and Resilience Facility (RRF) Scoreboard, EU websites, national governmental websites, and news outlets. These sources provide us with a wealth of information on the policy frameworks, legal frameworks, and investments in eHealth systems across the five Member States.

To gather primary data on the eHealth systems of the five sampled Member States, we employ interviews (Annex 1) and a roundtable discussion. The primary data collection activities of the mid-term evaluation study as a whole (e.g., coordination body survey) will also be analysed to gather further input (if available) on the topic at hand.

To meet the case study objectives outlined above, the case study seeks to answer a number of research questions, included in the table below. Table 2 further links each question to the relevant evaluation question in the mid-term evaluation and describes the main data collection activity used to answer the questions.

*Table 2: Research questions and methodology used*

Criterion	Question	Relevant EQ	Data collection
Effectiveness	To what extent are the measures effective in supporting the digital transition as foreseen by the RRF?	EQ 4.6	Semi-structured interviews
	Have any internal or external factors hindered the implementation of the measures? To what extent?	EQ 5.1	Desk research, semi-structured interviews
	What are the key results linked to the implementation of these measures that have been achieved? Are these measures achieving the expected outputs?	EQ 2.2	Desk research, semi-structured interviews
	What were the key success factors that led to the achievement of the measures' objectives?	EQ 2.2	Desk research, semi-structured interviews

Criterion	Question	Relevant EQ	Data collection
	What barriers/implementation obstacles have been encountered? Were there any unintended consequences or negative outcomes of the measures?	EQ 5.3	Desk research, semi-structured interviews
	How is the financial contribution to the measures channelled and affecting the implementation? (i.e., what are the criteria for distribution.)	EQ 10	Desk research, semi-structured interviews
Relevance	To what extent will the RRP measures on digitalisation of health remain relevant and feasible to implement until 2026?	EQ 23, EQ 23.2	Semi-structured interviews
	How did the measures contribute to the overall digitalisation of health in the Member State?	EQ 4.6	Desk research, semi-structured interviews
	How did the measures involve and engage stakeholders in its design and implementation?	EQ 7	Desk research, semi-structured interviews
	To what extent did the measures respond to the needs of stakeholders (such as patients, healthcare providers, and policymakers) in the Member State?	EQ 7	Desk research, semi-structured interviews
Coherence	To what extent do the measures address the European Semester Country-Specific Recommendations?	EQ 2.3, EQ 14	Desk research
	To what extent do the measures align with and complement relevant EU funds, strategies, policies, initiatives, and priorities? (e.g., EU4Health Programme, Digital Europe Programme)	EQ 6, EQ 14, EQ 16, EQ 22	Desk research
	To what extent do the measures complement existing national or regional strategies and initiatives?	EQ 18	Desk research
	To what extent are the investments coherent with the reforms introduced with the RRP?	EQ 19	Desk research
EU Added Value	Would the reforms/investments on digitalisation of health still have been implemented in the absence of the RRF? Would they have been feasible without the RRF?	EQ 22	Semi-structured interviews
	Is the RRF the right instrument to support the digitalisation of healthcare?	EQ 22	Semi-structured interviews

Source: Authors' elaboration, 2023.

## Contextual information

Healthcare services are a crucial economic sector in Europe, contributing almost 10% of the GDP, 15% of government expenditure, and employing 8.3% of the total EU workforce.<sup>5</sup> The European Commission is committed to establishing a strong European Health Union, and in 2020, all 27 Member States received Country-Specific Recommendations related to health, including eHealth infrastructure. The digitalisation of healthcare falls under the broader policy area of digital public services, which seeks to use technology to provide services to citizens and businesses at all levels. Healthcare systems need reforms and innovative solutions to become more resilient, accessible, and effective in providing quality care to European citizens, especially in the face of enduring health-related issues such as ageing, multi-morbidity, and health workforce shortages. COVID-19 has exposed vulnerabilities in Member States' healthcare systems and highlighted the importance of timely access to health data for research, innovation, and policy-making purposes.

Public spending on health and long-term care is increasing and is expected to continue to rise. Digital technologies offer new opportunities to transform the healthcare sector, empowering citizens to monitor their health status, adapt their lifestyles, support independent living, prevent non-communicable diseases, and bring efficiency to health and care providers and systems. With adequate digital skills, citizens can continue to lead active professional lives as they age, while health professionals and carers can fully benefit from digitally enabled health solutions to monitor and treat patients. The pandemic has demonstrated the potential of innovative telemedicine, remote care, and robotics solutions,

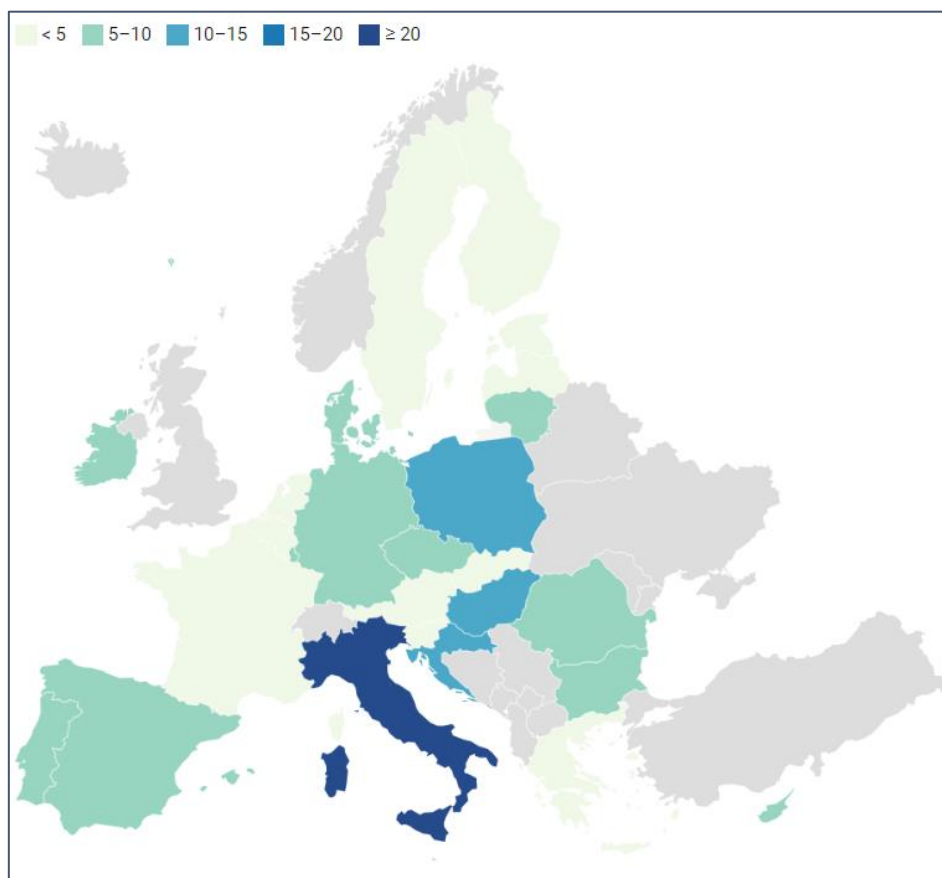
<sup>5</sup> [https://ec.europa.eu/economy\\_finance/recovery-and-resilience-scoreboard/assets/thematic\\_analysis/5\\_Health.pdf](https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/assets/thematic_analysis/5_Health.pdf)

which can protect medical staff and enable patients to receive care remotely at home. These actions would meet the objective laid down in point (f) of Article 4 of the EU4Health Programme.<sup>6,7</sup>

The strategy Shaping Europe's Digital Future<sup>8</sup> outlines the power of data and how it is essential in the health sector. By 2030, the ability for all European citizens to access and control their electronic health records (EHR) across the EU should be greatly improved, with 100% coverage. The European Health Data Space will enhance patient access and control over their health data, as well as the reuse of data for research, policy-making, and regulatory purposes.

To showcase the above, a manual analysis was carried out of all 27 Member States' proposed measures in their RRP<sup>9</sup>. More specifically, digitalisation of health initiatives were researched. It was found that all Member States, except Sweden, had at least one such measure. The below choropleth map (Figure 1) showcases the number of measures for all Member States.

Figure 1: Choropleth map of eHealth measures in all Member States



Source: Authors' elaboration, 2023.

Italy pioneers with a total of 25 proposed eHealth measures, followed by Croatia (14), Hungary (11), and Poland (11).

A total of 161 such measures were identified, which were categorised by the authors based on measure name, as follows in Figure 2:

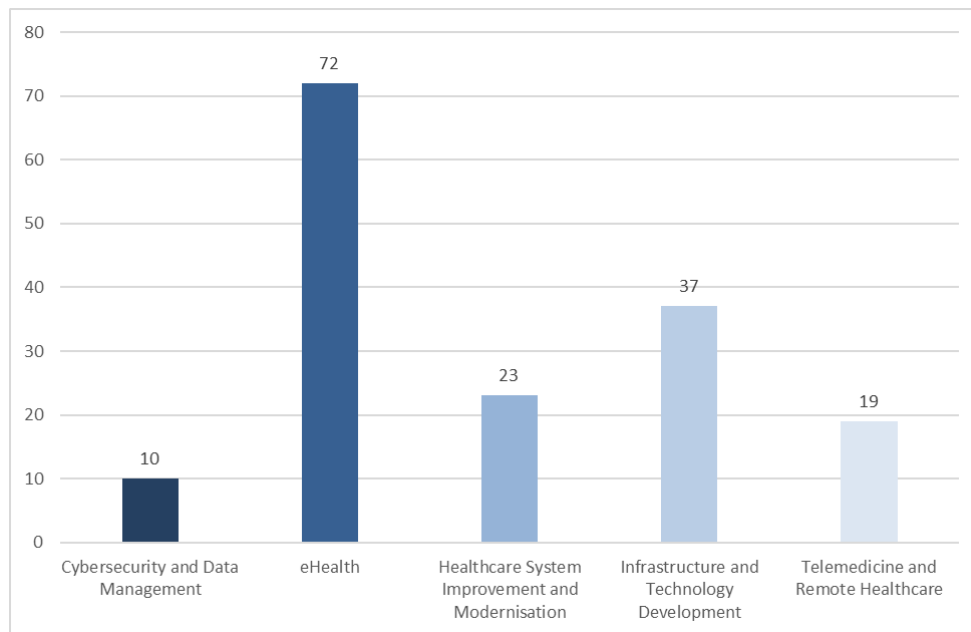
<sup>6</sup> REGULATION (EU) 2021/522 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 March 2021 establishing a Programme for the Union's action in the field of health ('EU4Health Programme') for the period 2021-2027, and repealing Regulation (EU) No 282/2014

<sup>7</sup> The list of actions as presented in Annex 1 of the EU4Health Programme can be found in Annex 3.

<sup>8</sup> [https://commission.europa.eu/system/files/2020-02/communication-shaping-europes-digital-future-feb2020\\_en\\_4.pdf](https://commission.europa.eu/system/files/2020-02/communication-shaping-europes-digital-future-feb2020_en_4.pdf)

<sup>9</sup> Based on FENIX data (cut-off date Q2 2023).

Figure 2: Categorisation of eHealth measures in all Member States



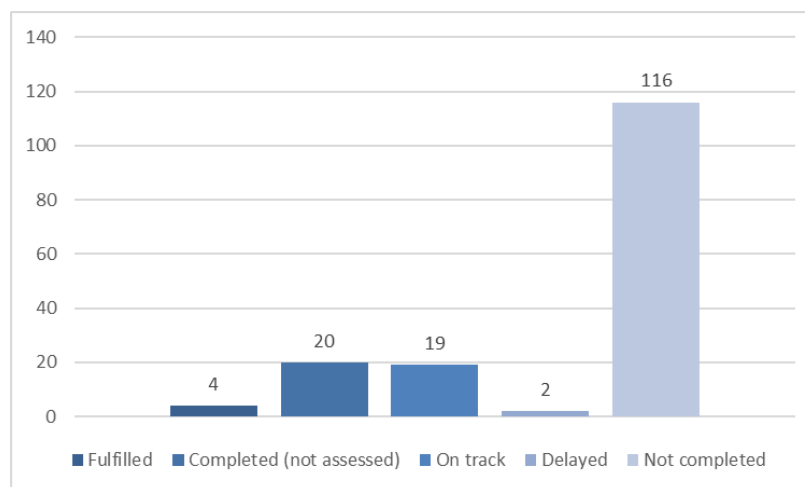
Source: Authors' elaboration, 2023.

The following list provides examples of measures within these categories, which also showcase advancements in the areas of eHealth mentioned above:

- Cybersecurity and Data Management
  - Centres of competence for supporting eGovernment, Cybersecurity and eHealth (CZ)
  - Health data lake (ES)
- eHealth
  - Development of the electronic mother child pass platform including the interfaces to the early aid networks (AT)
  - Digital services and citizen experience (IT)
- Healthcare System Improvement and Modernisation
  - Programme to future-proof hospitals (DE)
  - Sustainability and resilience of a human-centred, comprehensive, integrated healthcare system (LV)
- Infrastructure and Technology Development
  - Digital image diagnostics of Clinical Hospital Centre 'KBC Split' (HR)
  - Improving the 112 national emergency communication system (BG)
- Telemedicine and Remote Healthcare
  - Establishment of Home Health Care & Hospital at Home systems (GR)
  - Remote health monitoring programme for the elderly (HU)

As for the implementation status of all identified measures, the following graph provides an overview, according to the official European Commission categorisation<sup>10</sup> in Figure 3:

Figure 3: Implementation status of eHealth measures in all Member States



Source: Authors' elaboration based on FENIX data, Q1 2023.

## Description of NRRP Measures on eHealth

This section briefly outlines the key features of the measures in each country under the RRF to adopt or strengthen digitalisation of health actions.

The **Belgian** RRP's second pillar 'Digital Transformation' foresees reforms and investments around cybersecurity, public administration, and fibre/5G/new technologies. The goal of component two, is to utilise digital technologies to make the activities of public administrations more efficient both internally and its interactions with citizens and businesses. The eHealth roadmap is a collaborative programme in Belgium aiming to digitalise healthcare. It involves government bodies, healthcare providers, and other stakeholders. Its goals include using health data for various purposes, empowering citizens in their healthcare, providing digital tools for healthcare professionals, and ensuring data privacy. The programme also aligns with European initiatives and considers cross-border healthcare and sustainability aspects. It emphasises stakeholder involvement and collaboration with other EU Member States for a more efficient and connected healthcare system. The budget for the investment is EUR 40 million.

The **Croatian** RRP's fifth pillar 'Health' aims to implement reforms and investments that will enable efficient healthcare at all levels of healthcare provision. As for the digitalisation of health, the pandemic has accelerated the need for modernising the system through the rapid adoption of digital methods and technologies. This includes the implementation of telemedicine and medical robotics, which enable remote consultations and enhance healthcare delivery. The goal is to create a more efficient and accessible healthcare system that can effectively respond to both infectious and non-communicable diseases. The reforms and investments of this pillar amount to an RRF funding of HRK 2,563,703,700 (ca. EUR 34 million). The goal of Croatian eHealth is to improve management capacities through more effective use of data and to encourage innovative solutions in healthcare with the goal of better management of the healthcare system. Overall, there is a diverse range of digitalisation of health measures included in the Croatian plan, which can be roughly categorised to IT systems and platforms, medical devices and modernisation, diagnostic and telemedical services, and medication monitoring.

The **Czech** RRP's first pillar 'Digital Transformation' aims to develop a sustainable and fully functional digital ecosystem that will enhance the competitiveness of businesses, improve the lives of citizens, and reduce state costs. This will involve supporting the adoption of emerging technologies and digital services, as well as accelerating the digitisation of

<sup>10</sup> According to European Commission nomenclature, RRF measures are categorised as follows: Fulfilled (measure positively assessed by the European Commission); Completed (measure claimed as completed by Member State); On track; Delayed; Not completed.

construction management and promoting the use of high-speed internet. The RRP acknowledges the significance of rapid digitalisation and understands that falling behind frontrunners in this domain may result in a competitive disadvantage.<sup>11</sup> The first component within the pillar, 'Digital services for citizens and companies' foresees a financial envelope of CZK 2,857 million within which 'electronic healthcare services' or referred to as 'eHealth' is included. The selected measure 'eHealth' is broken down into two separate projects: (1) Support of projects for innovative technologies in healthcare – telemedicine; and (2) Support for the development of digital transformation in healthcare – interoperability.

The **Danish** RRP's first component 'Strengthening the resilience of the healthcare system' responds to the unforeseen challenges from the COVID-19 pandemic grappling Europe's healthcare systems. Primary and secondary care capacities are strained, supply chains for critical medical products are disrupted, and treating high-risk patients poses new difficulties. To bolster resilience, Denmark's recovery plan provides funding for analysing vaccine effects, implementing digital solutions, improving monitoring systems, and maintaining strategic medical supplies. Amid the COVID-19 pandemic, digital solutions have played a crucial role in connecting citizens and the healthcare system, benefiting vulnerable patient groups. A strategic focus on digitalisation would harness the potential of these technologies to build a resilient and sustainable healthcare system that is more citizen-centric and cohesive. The estimated cost of this component is DKK 244 million (ca. EUR 32,743,946), of which 100% is covered by the Recovery and Resilience Facility.

The **Estonian** RRP's sixth component 'Health and social protection', lies in the fields of healthcare, social protection, and economic resilience. It aims to improve the preparedness and response capacity of the Member State in times of crisis, while also prioritising the well-being and development of children and young people, including education and skills. The overall goal is to enhance the economic, social, and territorial cohesion of the Union by strengthening the resilience of member states, mitigating the social and economic consequences of crises, particularly for women, increasing youth employment, and implementing a youth guarantee program. The reforms and investments in this pillar are divided according to healthcare and social protection priorities. The total RRF funding for this component amounts to EUR 336,3 million.

## Results

The results of the case study are presented by specific evaluation questions under each of the evaluation criteria.

### Effectiveness

To what extent are the measures effective in supporting the digital transition and increasing health resilience as foreseen by the RRF?

#### Summary

The five studied countries have implemented measures to support the digital transition in healthcare and enhance health resilience as outlined in the RRF. These measures include eHealth services, telemedicine solutions, and improvements in healthcare data management. They have generally been effective in achieving their objectives, such as empowering patients, optimising healthcare delivery, and fostering innovation. The cases demonstrate how these measures have positively impacted healthcare systems, including the use of e-consultations and digital tools to improve patient care and access to specialists. Additionally, efforts to strengthen eHealth governance and ensure data security are highlighted as essential for the success of these measures.

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<sup>11</sup> <https://www.planobnovycr.cz/digitalni-transformace-3>

The **Belgian** eHealth Services and Health Data investment is classified as a project contributing 100% to the digitalisation pillar of the RRF<sup>12</sup>, and also aims to use ICT for the further development of healthcare services. The three areas for collaboration with digital service and software providers are:

- Empowering citizens, both in their role as active contributors to their health or healing process.
- Providing efficient digital tools to healthcare providers and institutions to further optimise care and innovate in the healthcare experience.
- Developing the secondary use of health data to support policies, population health management, research, and innovation.

The ten sub-projects that are being implemented as part of the selected measure collectively aim to improve healthcare data management, accessibility, and patient involvement, as well as foster innovation in the healthcare sector.

In **Czechia**, the eHealth measure is effective in combination with cybersecurity measures. In fact, the interoperability aspect is taken into account with the aim to create a secure standardised environment for the exchange of health records nationally and across borders.

In **Croatia**, the successful procurement and deployment of medical and computer equipment, including telemedicine services as part of the Telecordis project contribute to the digital transition in healthcare, particularly in remote areas. KBC Split is introducing digital imaging diagnostics to enhance healthcare, particularly in the areas of disease prevention, treatment, and diagnosis, with a specific focus on cancer.

The **Danish** KontaktLæge app serves as a national telemedicine solution aimed at providing technical support during video consultations between citizens and their general practitioners (GPs), particularly targeting those affiliated with municipalities. It finds application in various municipal settings such as nursing homes, homecare districts, rehabilitation sections, emergency teams, and living-arrangement facilities, with a primary focus on elderly and vulnerable individuals facing social, psychological, or physical challenges. By expanding its accessibility to additional mobile device platforms, it has the potential to reach a broader user base, thereby significantly contributing to the digital transition and enhancing health resilience. The app was especially instrumental during the COVID-19 pandemic, facilitating video consultations to reduce infection risks between citizens and GPs, although it did not address the risk of infection within shared municipal spaces, where employees and citizens frequently interacted. The approach of the patient involvement and use of telemedicine measure proves highly efficient as it empowers patients to take charge of their own health, offering them access to their personal health data and leveraging telemedicine and home monitoring technologies. This not only benefits patients but also enhances the healthcare system as a whole.

In **Estonia**, both measures contribute to supporting the digital transition and increasing health resilience as foreseen by the RRF. The implementation of the measure "Strengthening primary health care" enabled to expand provision and use of e-consultations in primary care and to improve the access to specialised care ensuring continuity of primary care, in particular in remote areas, allowing patients to be advised by a specialist without having to consult them face-to-face. E-consultation service allows a family doctor to send quickly to a specialist comprehensive pre-information on the patient's state of health through digital channels to clarify the diagnosis, to assess the need for further studies and to make better treatment decisions even in more complex cases. The patient sees information related to the e-consultation on the patient portal: referrals to the service in the block "Valid referrals" and answers in the block "Responses to referrals". Through e-consultation, it is possible to enhance the role of GPs in the health care system, to shorten treatment queues and to save time for patients and doctors and to ensure integrated patient care for primary care and specialist care. A person can get information from a GP/nurse more quickly about his health status, treatment and care (i.e. in the response to the referral letter, the person can see what the specialist answered to the questions regarding the person's state of health posed by the GP/nurse, and in some cases the person does not have to see a specialist). The number of e-consultations sent by GPs to specialists (incl. the number of advices given, which includes inviting the patient to specialists' appointment) has increased ca 33% in 2021 compared to 2020, and 26% in 2022 compared to 2021. The increase is related to the fact that e-consultations are generally used more frequently. The smaller the specialty, the harder it is to

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<sup>12</sup> <https://nextgenbelgium.be/fr/projet/num%C3%A9riser-les-soins-de-sant%C3%A9-de-mani%C3%A8re-accessible-et-s%C3%A9curis%C3%A9e>



get to a specialist's appointment (especially in another location/in remote areas), therefore covering the smallest specialties with e-consultations is crucial.

The implementation of the measure "Renewal of the eHealth Governance" supports the development of the new generation health information system (upTIS) in the coming years, ensuring the following:

- Estonian people are more aware of and have better control over their health.
- Innovative solutions ensure the continuity of care, improve clinical procedures and save the valuable time of specialists.
- High quality and accessible health data enables faster and improved decisions, ensures the quality of services and promotes research and development.
- Digital solutions are managed in ways that are transparent, understandable for the users and forward-looking.
- Health-related development processes and legislation are flexible in order to provide state-of-the-art solutions that meet user needs in an ever-evolving world.
- The technical infrastructure supports that the overall health system is secure, up-to-date and sustainable.

#### Have any internal or external factors hindered the implementation of the measures? To what extent?

##### Summary

The implementation of eHealth measures in Belgium has faced obstacles due to a complex governance structure involving multiple decision-makers, leading to delays. In Czechia, challenges include complex public procurement, securing experts, navigating RRF regulations, and pending European standards. However, Denmark and Estonia have experienced no significant hindrances in implementing their measures.

The implementation of the eHealth measure has encountered certain obstacles, primarily rooted in the distribution of competences within the **Belgian** political landscape. This issue arises from the complex structure of eHealth governance, involving nine ministers responsible for health at different levels. This multiplicity of decision-makers often hinders the swift and efficient execution of crucial decisions, leading to delays in achieving desired outcomes. To address these challenges, project leaders are actively working to streamline and expedite the decision-making process. Additionally, the governance structure introduces further complexity, as any changes to project scope exceeding 5% of the budget necessitate consultation with a programme board. This board, comprising representatives from the regions and the federal level, plays a pivotal role in making longer-term decisions. Disagreements at this level can escalate to ministerial involvement, a scenario best avoided due to uncertainty regarding the outcomes.

In **Czechia**, organising public procurement is reported to be a complex task, securing essential experts for state administration poses challenges, navigating the intricacies of the RRF regulations is demanding, and national-level regulations add complexities to project execution. Additionally, the European standards forming the foundation of the interoperability projects are yet to receive official publication, and final implementation specifications remain pending.

As for the **Danish** and **Estonian** measures, neither internal nor external factors have hindered the implementation of the measures.

#### What are the key results linked to the implementation of these measures that have been achieved? Are these measures achieving the expected outputs?

##### Summary

Key results linked to the implementation of eHealth measures in the five studied countries indicate significant progress. In Belgium, the establishment of a Health Data Authority and clear architecture for sub-projects has been

achieved, raising awareness among stakeholders. In Czechia, the release of prioritised use case standards and the publication of telemedicine guidelines represent notable milestones, with further advancements expected through the National Recovery Plan. Croatia's Telecordis project has successfully improved healthcare access and quality in remote areas through telemedicine. In Denmark, telemedicine services like KontaktLæge have been integrated into various healthcare settings, and patient involvement in telemedicine has shown promising results. Estonia's measures have successfully strengthened primary healthcare and renewed eHealth governance, ensuring improved access to specialist care and updated governance frameworks.

In **Belgium**, the entry into force of the law setting up the Health Data Authority<sup>13</sup>, defining in particular the role and the responsibilities of the Authority, was the first key step to the implementation of the eHealth measure. It was adopted on 14 March 2023 and describes the development and validation of the various specifications (called 'Care Set' which may be integrated in the Computerised Patient Records) for their integration of into the providers' software. The key results associated with the implementation of the measure have been noteworthy. A significant achievement has been the establishment of a well-defined architecture and design framework for each sub-project, despite their inherent diversity. This has entailed setting clear objectives and operational methodologies for each individual sub-project. One of the notable advantages of these measures is the heightened awareness among all stakeholders about their collective responsibility to work diligently towards these objectives. It is worth highlighting that while some sub-projects initially possessed only a rudimentary statement of intent, others benefited from the presence of a comprehensive architectural design.

In **Czechia**, as for the interoperability aspect of eHealth, the first iteration of prioritised use case standards, developed in alignment with upcoming European guidelines (refined European Interoperability Framework for eHealth), has been released. The development and adoption of functional and technical specifications for prioritised use cases, including support in HL7 FHIR<sup>14</sup> and in the existing national DASTA standard<sup>15</sup>, is the key fundamental shift. Use cases include: Patient summaries; Electronic medical prescriptions and dispensing information; Laboratory results; Medical Imaging and Reporting; Dismissal Notices. Adherence to these standards is a prerequisite for executing subsequent projects.

These projects are undertaken collaboratively by the Czech Ministry of Health and healthcare service providers. The subsidy application for the interoperability milestone was published by the Ministry of Health in May 2020, and the deadline for submission was end September 2022.<sup>16</sup> The latest date for the completion of the physical implementation of the project is set at 31 May 2026. The interoperability component is divided into two calls<sup>17</sup>: Call 1 (Interoperability I) aims to establish interoperability standards for electronic healthcare and telemedicine. The funding request is for 178 million CZK (excluding VAT) to create common standards and conditions for uniform tools and processes. The priority is to standardise patient summaries, outpatient reports, laboratory orders and results, imaging complement reports and results, and discharge reports. Following this, Call 2 (Interoperability II) will focus on individual healthcare providers. They can access funding if they meet minimum criteria and conditions, such as storing discharge reports in a standard format or being able to exchange relevant information. The specific details, including co-participation requirements and VAT inclusion, are still being adjusted.<sup>18</sup> According to an information page published by the Ministry of Health in June 2022, the Ministry of Health launched a project on the Methodological support of the interoperability reform programme in the healthcare sector.<sup>19</sup> The project aims to support the healthcare sector's interoperability reform programme by providing methodological and consulting services. It involves creating a reform concept and plan, finalising content and communication standards, specifying requirements and budget, designing a test framework, and developing technical standards. The project's outputs will contribute to the implementation of the reform and include a specification of interoperability standards, research on existing standards, and comparative analysis. These outputs are crucial for

<sup>13</sup> [https://etaamb.openjustice.be/fr/loi-du-14-mars-2023\\_n2023041135](https://etaamb.openjustice.be/fr/loi-du-14-mars-2023_n2023041135)

<sup>14</sup> [http://www.hl7.org/implement/standards/product\\_brief.cfm?product\\_id=491](http://www.hl7.org/implement/standards/product_brief.cfm?product_id=491)

<sup>15</sup> In Czechia, data communication in healthcare is provided mainly through the national data standard DASTA.

<sup>16</sup> <https://www.dotacni.info/mv-cr-npo-vyzva-c-3-sluzby-elektronickeho-zdravotnictvi/>

<sup>17</sup> [https://www.zdravotnickydenik.cz/wp-content/uploads/2022/04/prehled-projektu-npo\\_zdroj-mzd.pdf](https://www.zdravotnickydenik.cz/wp-content/uploads/2022/04/prehled-projektu-npo_zdroj-mzd.pdf)

<sup>18</sup> <https://www.mzcr.cz/podle-namestka-pro-it-blahy-rezort-zdravotnictvi-vi-co-chce-ale-chybi-mu-lidi-k-rizeni-ehealth-nabere-dvacet-odborniku/>

<sup>19</sup> <https://ncez.mzcr.cz/cs/pravidladokumentypodklady-interoperabilita-telemedicina/informace>

achieving the reform goals. The public procurement procedure was published on 28 February 2022<sup>20</sup> and was awarded to Deepview Ltd, for a maximum total price of CZK 3,872,000.

As for telemedicine, guidelines governing it have been made public and are guiding a comprehensive initiative by the National Telemedicine Centre. The intention of the reform is to create a trustworthy and transparent framework for the provision of health services at a distance using ICT (telemedicine including mHealth). The project outputs are divided into three main products: Creation of the organisational and legislative framework of telemedicine and mHealth; Creation of methodology and processes for assessment of telemedicine services including mHealth; Telemedicine communication platform and service launch.

In December 2022, the Ministry of Health published a draft amendment to the Act on Health Services<sup>21</sup>, open for comments, which also regulates the rules for the provision of remote health services/telemedicine. The proposal envisages the amendment taking effect from 1 July 2023.<sup>22</sup> Furthermore, the Ministry of Health published, in October 2022, the document on Rules for the development of telemedicine in the Czech Republic.<sup>23</sup> The document proposes binding procedures for the selection and implementation (including evaluation) of telemedicine solutions in the Czech Republic (up to the level of individual projects).

However, the true potential breakthrough is expected with the initiation of the project "Support for innovative technologies in healthcare - telemedicine" as part of the National Recovery Plan. This project holds promise for advancing telemedicine and its integration into the healthcare system under the Ministry's guidance.<sup>24</sup> A member of the telemedicine group announced in 2023 that "the intention of the reform is to create a trustworthy and transparent framework for the provision of remote health services using ICT".<sup>25</sup>

This initiative will involve conducting pilot verifications with multiple providers, encompassing assessment of the telemedicine platform and the meticulous establishment of regulations for nationwide integration. Furthermore, according to a document published by the Czech Medical Journal, the project on telemedicine to be published for financing was planned for May 2022, with a project completion by 2025.<sup>26</sup> According to the minutes of the working group for telemedicine of 15 December 2022<sup>27</sup>, the National Telemedicine Centre of the Olomouc University Hospital (NTMC)<sup>28</sup> will implement the project. Preparations for the project are currently underway and will kick off in autumn 2023. As reported by the project team, the intention of the reform is to create a credible and transparent framework for the provision of telehealth services using ICT. CZK 170 million excluding VAT (i.e., the total of the RRP budget foreseen) is allocated to the project. The Ministry of Health has established a working group for telemedicine since the summer of 2021, which is an expert advisory body of the Ministry of Health, of which the NTMC is part of.<sup>29</sup>

In **Croatia**, the current state of play in implementing the Telecordis project is quite positive. The procurement of necessary medical and computer equipment, including ECG holters, blood pressure holters, spirometers, and 12-channel ECG devices, has been successfully completed. This equipment has been deployed to 40 primary healthcare locations in remote and rural areas, where it was lacking previously. Key results linked to the implementation of the Telecordis project include improved access to diagnostic services, quicker diagnosis, and enhanced healthcare quality in rural areas. The equipment installation has resulted in 356 telemedicine services provided, allowing for the reading and interpretation of diagnostic results. The specialised telemedicine centres staffed with cardiology specialists have contributed to quicker and more precise diagnostic outcomes. The objectives of providing specialised cardiology services at the primary level of

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<sup>20</sup> <https://etendry.cz/detail/771959-metodicka-podpora-programu-reformy-interoperability-ve-zdravotnictvi.html>

<sup>21</sup> Draft law amending Act No. 372/2011 Coll., on health services and conditions of their provision (Health Services Act), as amended, and Act No. 325/2021 Coll., on the electrification of health care

<sup>22</sup> <https://www.zdravotnickydenik.cz/2023/01/pravidla-pro-telemedicinu-a-elektronickou-dokumentaci-ci-dalsi-data-pro-uzis-valek-rozeslal-k-pripominkam-navrh-novely-zakona-o-zdravotnich-sluzbach/>

<sup>23</sup> <https://ncez.mzcr.cz/index.php/cs/milnik-c-3-pravidladokumentypodklady-interoperabilita-telemedicina/pravidla-pro-rozvoj-telemediciny>

<sup>24</sup> <https://www.zdravotnickydenik.cz/2023/01/projekt-ma-priblizit-definovani-uhrad-za-telemedicinu-mely-by-zacit-fungovat-v-lednu-2026/>

<sup>25</sup> <https://www.zdravotnickydenik.cz/2023/01/projekt-ma-priblizit-definovani-uhrad-za-telemedicinu-mely-by-zacit-fungovat-v-lednu-2026/>

<sup>26</sup> [https://www.zdravotnickydenik.cz/wp-content/uploads/2022/04/prehled-projektu-npo\\_zdroj-mzd.pdf](https://www.zdravotnickydenik.cz/wp-content/uploads/2022/04/prehled-projektu-npo_zdroj-mzd.pdf)

<sup>27</sup> <https://ppo.mzcr.cz/upload/files/jednani-ps-tm-15-12-2022-zapis-ps-tm-15-12-2022-63d8bc007f78e.pdf>

<sup>28</sup> <https://ntmc.fnol.cz/>

<sup>29</sup> <https://ncez.mzcr.cz/cs/pravidladokumentypodklady-interoperabilita-telemedicina/informace>

healthcare in remote areas have been achieved to a significant extent. Patients in these areas now have faster access to diagnostic services, reducing the need for travel to distant cities. Additionally, healthcare worker education about telemedicine technologies has increased awareness and acceptance of this mode of healthcare delivery. These measures have largely achieved the expected outputs of improving healthcare access and quality in remote areas through telemedicine.

As for the Teletransfusion project, equipment and system validation were successfully installed at 35 locations within the transfusion units of hospital healthcare institutions, and the system was validated. As for digital imaging diagnostics, a new sophisticated device for magnetic resonance MR 3 Tesla was purchased, which will primarily be used for the diagnosis of children.<sup>30</sup>

The hospital in Split is one of the first to have a 3 Tesla magnetic resonance, and because of this, patients will no longer need to go to other hospitals to have certain tests done. The acquisition of this new device will significantly enhance the accessibility and quality of healthcare services, attracting not only patients from the Dalmatian region but also those from Zagora, the islands, Bosnia and Herzegovina, and even tourists during the summer season. In addressing the efficiency of patient care, the hospital successfully meets the monthly requirements for treating acute cases, namely those requiring immediate attention. The waiting period for regular registration for magnetic resonance imaging currently stands at one year.<sup>31</sup>

Concerning the eHealth reform, the Decision on the adoption of the Telemedicine framework for expanding the range of services in the field of emergency medicine in the Republic of Croatia<sup>32</sup> was published by the Ministry of Health on 27 December 2022. The framework was published on the Ministry of Health's website, its latest version dating to 11 January 2023 at the time of writing.<sup>33</sup> This framework forms part of the national strategies for health development in Croatia. The framework describes diverse options for the organisation of teleconsultation, the architecture of the proposed solution for the remote monitoring system and the connection of relevant information systems, the challenges related to human resources, the working protocols, the financing plan, as well as an action plan. The activities of the action plan can be categorised in several groups: planning and decision-making, legal and regulatory preparation, and project development and implementation. These activities encompass various aspects, including planning, decision-making, legal preparations, procurement, system development, education, and collaboration with relevant stakeholders.

The key results achieved in **Denmark** include the establishment of a steering group for the implementation and dissemination of digital initiatives, the development and availability of telemedicine services such as video consultations, the expansion of video consultations through apps like MinLæge and KontaktLæge, and the modernisation of digital messaging and access to health data. These measures aim to improve treatment quality, enhance access to healthcare services, increase coherence and joint access to health data, and facilitate the delivery of treatment at home.

Specifically for KontaktLæge though, the implementation of the app has not fully achieved its intended goals, which aimed to cover 60 municipalities and 700 GP clinics. Nevertheless, in terms of progress, the app has been successfully integrated into various healthcare settings within the municipalities. Specifically, it is now in use in 43 municipalities, 285 GP clinics, 137 nursing homes, 114 homecare districts, 14 rehabilitation sections, 16 emergency teams, and 32 living arrangement facilities. As of May 2023, there have been a total of 2,714 video consultations conducted through the app. This data illustrates a consistent upward trend, though variations exist among different municipalities. The app was primarily designed to cater to elderly and vulnerable citizens, including those with social, psychological, and physical challenges who require assistance to engage in video consultations with their GP. Through this app, vulnerable citizens are provided with the same opportunity to access GP video consultations as the general population of Denmark. As for the patient involvement in the widespread use of telemedicine, the project's findings indicate substantial potential for scalability,

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<sup>30</sup> <https://www.kbsplit.hr/en/odjel-za-znanstveni-rad/novosti/predstavljene-reforme-i-investicije-nacionalnog-plana-za-oporavak-i-otpornost>

<sup>31</sup> <https://www.glasistre.hr/hrvatska/2023/02/15/kbc-split-bogatiji-za-cetiri-nova-uredaja-vrijedna-vise-od-46-milijuna-eura-846307>

<sup>32</sup>

<https://zdravlje.gov.hr/UserDocImages/2022%20Objave/Odluka%20o%20dono%C5%A1enju%20Telemedicinskog%20okvira%20za%20pro%C5%A1irenje%20opsega%20usluga%20u%20djelatnosti%20hitne%20medicine%20RH.pdf>

<sup>33</sup> <https://zdravstvo.gov.hr/dokumenti/10?page=1&tag=-1&tip2=&Datumod=&Datumdo=&pojam=Telemedicinski>

validating the CID milestone description. Moreover, the project suggests that the treatment should be expanded beyond COVID-19-related health anxiety to encompass all individuals dealing with health anxiety.

As for the patient involvement and widespread use of telemedicine Danish measure, the anticipated goal for patient participation in the project associated with this measure was set at 80 individuals. As of 31 January 2022, a total of 146 patients have actively engaged in diagnostic assessments through video consultations, with an additional 52 patients on standby. Participants completed an online questionnaire assessing their health anxiety levels before undergoing treatment. Utilising their responses, the treatment was customised to suit each patient's specific needs, thereby fostering greater patient empowerment and involvement in their healthcare journey. The preliminary results from the project are highly promising, indicating significant reductions in health-related anxiety, alleviation of physical symptoms such as anxiety and depression, and an overall improvement in the well-being and quality of life for the patients involved. The final evaluation report demonstrates that the project has made substantial strides in advancing telemedicine and patient engagement, aligning with the requirements outlined by the CID.

In **Estonia**, both measures were successfully implemented, and objectives achieved:

The objective of the measure (RRP reform 6.3) "Strengthening primary health care" was to ensure access to general medical care, improve the continuity of treatment and make provision of primary health care more flexible and human-centred. The reform consisted of three sub-measures:

- In order to improve access to specialist care, the use of e-consultation in primary care was extended allowing patients to be advised by a specialist without having to consult them face-to-face. The amendments to the list of health care services of the Estonian Health Insurance Fund entered into force on 1 September 2020.
- The level of support for general practitioners was increased and the funding model for general medical care was modified with an aim to improve access to health care and to make working in primary health centres in remote areas more attractive. The corresponding amendments to the list of health care services of the Estonian Health Insurance Fund entered into force by 1 April 2021.
- The Health Services Organisation Act was amended as regards the management of the list of patients, ensuring continuity of primary care and extending the rights of nurses to prescribe medicines to patients and the amendments entered into force by 1 July 2022.

To address the challenges posed by the COVID-19 outbreak, temporary remote reception services, including video, online, and telephone consultations, were introduced and funded through the Health Insurance Fund's budget. As of September 2020, these services became a permanent part of the funding. Furthermore, starting from the beginning of 2021, distance therapies, such as psychotherapy, physiotherapy, speech therapy, and occupational therapy are included in the list of supported health services.<sup>34</sup>

The objective of the measure (RRP reform 6.4) "Renewal of the eHealth Governance" was to update the governance framework for eHealth with a view to better responding to the needs of the health system and ensure the development of digital solutions to support a sustainable health system in Estonia. The reform consisted of adopting a revised national governance model for information and communication technology of the current health system to provide a forward-looking new eHealth governance model and promote a common understanding among partners of the division of roles and responsibilities in eHealth. The Estonian health ICT governance framework and the implementation roadmap were approved in March 2022.

## What were the key success factors that led to the achievement of the measures' objectives?

### Summary

Key success factors in the implementation of eHealth measures across the five Member States include active stakeholder engagement, ample financial resources from the RRF, flexible budgeting practices, and timely legislative approvals. In Czechia, consistent application of eHealth standards, international collaboration, and participation in

<sup>34</sup> <https://www.tervisekassa.ee/partnerile/raviasutusele/kaugteenuste-arendamine>

relevant projects have played key roles. Croatia's success is attributed to the successful procurement of equipment and healthcare worker education. Denmark's achievements are linked to widespread adoption across healthcare settings and user-friendly app design. Estonia's success involves timely legislative amendments, e-consultation use, and the development of a forward-looking eHealth governance model.

In **Belgium**, several key success factors played a pivotal role in the attainment of the objectives associated with the measure. First, the involvement of diverse stakeholders: a critical factor has been the active engagement of a multitude of stakeholders who are responsive to the prevailing needs. This collaborative approach has facilitated a comprehensive understanding of the objectives and ensured that a wide range of perspectives and expertise have been brought to bear on the implementation process. Second, budgetary assurance: the availability of ample financial resources, made possible by the RRF, has been instrumental in eliminating budget-related concerns. Notably, the flexibility provided by the RRF, which allows unutilised budget allocations to be carried over to subsequent years, has been advantageous compared to the conventional budgeting practices observed in Belgium. In the latter, budgets allocated at the beginning of the year are subject to forfeiture if not utilised, potentially leading to hasty and suboptimal decision-making toward the end of the fiscal year. Thirdly, legislation approval: the approval of legislation, as foreseen by the Belgian RRP, notably the law pertaining to the secondary use of data in March 2023, has been a critical enabler to start the implementation of the milestones of the eHealth Services and Health Data investment. This legislation has provided a clear legal framework for data utilisation and has underpinned the establishment of a dedicated Health Data Agency. This agency plays a pivotal role in steering the secondary use of data, facilitating discussions, and making informed decisions in line with the legislative mandate.

In **Czechia**, the key success factors for the implementation of the eHealth measure are: consistent application of EEHRxF<sup>35</sup>, cooperation with IHE<sup>36</sup>, numerous consultations with foreign experts and study visits abroad, participation in X-eHealth<sup>37</sup> project, experience of the NCPeH<sup>38</sup>.

The **Croatian** Telecordis project's success lies in successful procurement, deployment of equipment, and the education of healthcare workers.

The **Danish** digital strategy<sup>39</sup> aims to make technology and digital solutions an integral part of both the public and private sectors. It particularly mentions the case of telemedicine which would free up resources in the health field. In Denmark, two key success factors played a role in achieving the objectives of the KontaktLæge app measure: multi-area adoption and user-friendly experience. One of the primary success factors has been the adoption of the solution across multiple areas within the municipalities, such as nursing homes and home care districts. This widespread adoption across different healthcare settings has contributed significantly to the measure's success. Another pivotal success factor is the user-friendliness of the app. Municipalities have found the app to be easy to use, which has positively influenced its implementation. The app's stability and intuitiveness have minimised the need for extensive support, further facilitating its successful adoption. Furthermore, the latest version allows selected municipality workers to facilitate video consultations with general practitioners on behalf of citizens without NemID, using their employee signatures. Using the app, vulnerable citizens are offered the same opportunity to use the GP's offer of video consultation as the rest of the Danish citizens. As for the patient involvement and widespread use of telemedicine, patients were not required to obtain a doctor's referral to take part in the project. Instead, they had the option to complete an online questionnaire through a dedicated program webpage, which significantly enhanced patient engagement in the treatment process. These streamlined procedures have not only improved the quality of the assessment process but also reduced time constraints and led to fewer patients falling outside the intended target group.

The measures were necessary to make **Estonian** (primary) health care more accessible, improving the innovativeness, continuity, and flexibility of treatment. The implementation of the measure consisted of preparing and enforcement of

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<sup>35</sup> European electronic health record exchange format

<sup>36</sup> <https://www.ihe.net/>

<sup>37</sup> <https://www.x-ehealth.eu/>

<sup>38</sup> National Contact Point for eHealth

<sup>39</sup> <https://fm.dk/udgivelse/2022/maj/danmarks-digitaliseringsstrategi-sammen-om-den-digitale-udvikling/>

the corresponding amendments to the legislative acts, including the Healthcare Services Organisation Act<sup>40</sup>, for which the amendment came into force in June 2022. The amendments were prepared in time and sufficiently justified to ensure the entry in force. The use of e-consultation in primary care was enabled and the list of specialities was expanded as the result of the measure “Strengthening primary health care”.

In the frame of the measure “Renewal of the eHealth Governance” there was analysed the ICT (information and communication technology) governance model of the current health system in the country with its strengths and weaknesses, and the new forward-looking eHealth governance model, together with an implementation plan, was developed in line with international best practice and the specific needs of the Estonian health system and e-government to ensure all the parties’ common understanding of the division of roles and responsibilities in eHealth.

### What barriers/implementation obstacles have been encountered? Were there any unintended consequences or negative outcomes of the measures?

#### Summary

In general, eHealth implementation can encounter challenges such as adjusting project scopes which might affect timelines. Collaborating with the medical community for standards development may prove demanding, and smaller healthcare facilities may lack financial support. Familiarising healthcare providers with eHealth tools, such as apps, can be an obstacle, especially when adoption is voluntary. Patient involvement in internet-based treatments may vary, offering convenience for some but requiring discipline and comprehension. However, successful implementations without unintended consequences are possible, as seen in Estonia.

In **Belgium**, in the case of a sub-project which aims to enhance citizen empowerment, a noteworthy consideration has emerged. There is a proposal to transition from multiple platforms to a singular, unified platform while phasing out other existing platforms. While this adjustment is not inherently obstructive, it does introduce changes to the project's scope and timeline, necessitating consensus among stakeholders. Consequently, this alteration has the potential to affect the project's pace of development. However, it is to note that, as of now, there have been no unexpected or insurmountable issues that have impeded progress in the implementation of the sub-projects foreseen by Belgium’s measure.

In **Czechia**, establishing comprehensive and robust cooperation with the medical community, along with their active engagement in the standards development process, can prove to be a demanding endeavour that doesn't always yield success. Furthermore, there is a notable absence of financial assistance for smaller primary care facilities.

As for the **Danish** KontaktLæge app, one significant obstacle in the implementation process revolves around the insufficient familiarity with the app. Overcoming this challenge necessitates a heightened level of training and comprehensive introduction, coupled with an improved understanding of the solution. Additionally, ongoing collaboration between general practitioners (GPs) and municipalities is imperative to maximise the solution's full potential in the future. To note, the use of the app is voluntary for municipalities and medical centres, which has also prolonged the implementation and adoption of the app. As for the patient involvement measure, for certain patients, the extensive text within the programme and the discipline needed to engage with an internet-based format may pose as obstacles. However, conversely, the internet-based treatment format offers the advantage of allowing patients to access treatment materials at their convenience, fitting them into their daily routines and accessing them from any location.

In **Estonia**, the implementation of the measures was successful without any unintended consequences or negative outcomes.

### How is the financial contribution to the measures channelled and affecting the implementation?

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<sup>40</sup> <https://www.riigikogu.ee/tegevus/eelnoud/eelnou/1eb45983-df2b-4e3e-9c6d-99d9f6857ea5/Tervishoiuteenuste%20korraldamise%20seaduse%20ja%20teiste%20seaduste%20muutmise%20seadus>



## Summary

Belgium has dedicated EUR 40 million from the RRF to support eHealth development and implementation. Croatia details costs for digital imaging, while Czechia focuses on infrastructure and healthcare providers. Denmark allocates DKK 5 million to key projects with strict financial oversight. Estonia's eHealth is funded differently, with preparations supported by the EU's Structural Reform Support Programme, the SRSP (in the 2021-2027 financial framework known as Technical Support Instrument) and implementation financed from the state budget.

In **Belgium**, the financial contribution to the measure amounts to EUR 40 million, which, in comparison to other projects, is considered relatively modest. The RRF plays a pivotal role in bolstering the financial support for this initiative. Ahead of the RRF, discussions in the government revolved around an allocation of EUR 25 million for the entire eHealth action plan. The infusion of RRF funding significantly contributes to advancing the objectives of this initiative. The utilisation of these financial resources is subject to rigorous scrutiny and accountability in light of the RRF.

In **Croatia**, the cost estimate for Digital image diagnostics investment is the following: Magnetic resonance 3T - HRK 9,200,000 (ca. EUR 1,236,867); neurointerventional digital DSA angiosala - HRK 4,400,000 (ca. EUR 591,545); digital diasopic X-ray device - HRK 1,600,000 (ca. EUR 215,107); endoscopic gastroenterology room - HRK 4,800,000 (ca. EUR 645,322). The maximum grant amount that can be awarded for Digital imaging diagnostics at KBC Split is HRK 20,000,000.00 (ca. EUR 2,670,282).<sup>41</sup> The investments accompanying the eHealth reform amount to HRK 158.024.000 (ca. EUR 21,245,087) (precise breakdown not available).

In **Czechia**, the financial allocation is aimed at two main areas: enhancing the central infrastructure for overseeing and advancing the National Interoperability Framework, and assisting crucial health service providers in implementing solutions for prioritised use cases that align with the stipulations of the National Interoperability Framework for eGovernment. The distribution of funds hinges on the project's alignment with the objectives outlined in the national eHealth strategy and the mandates set by the National Interoperability Framework. The total cost of the reform paid from the RRF is CZK 1423 million (ca. EUR 58,000).

The **Danish** KontaktLæge app and patient involvement in telemedicine were financed by the RRF and awarded 5 million DKK (ca. EUR 670,000) each. The budget and accounts are regularly sent to the Ministry by the implementing organisation MedCom, and adjusted if necessary.

Financial contribution in the framework of the Recovery and Resilience Plan for **Estonia** was not allocated for the two studied measures. Preparations for the implementation of the measure "Renewal of the eHealth" were supported by the SRSP and the implementation of the reform is financed from the state budget.

## Relevance

### To what extent will the RRP measures on digitalisation of health remain relevant and feasible to implement until 2026?

#### Summary

In Belgium, a three-year timeframe remains sufficient for implementing IT-related sub-projects with a focus on educating stakeholders for effective utilisation. Croatia prioritised telemedical services due to the COVID-19 pandemic, while costly investments in innovative technologies pose challenges. Czechia faces tight timelines, procurement uncertainties, and coordination efforts but aligns with national plans. In Denmark, RRP measures continue to be relevant, especially post-COVID, with a strong emphasis on digital solutions in healthcare. Estonia has successfully implemented all eHealth measures.

<sup>41</sup> <https://zdravlje.gov.hr/UserDocsImages/2022%20Slike/Sazetak%20Poziva%20-%20KBC%20Split.pdf>



In **Belgium**, the deadline for the measure was set for the end of 2025. Given that the scope of the measure primarily encompasses IT and related components, a three-year timeframe remains sufficiently long for the effective implementation of the sub-projects. This extended period allows for a focused delivery approach while also accommodating potential delays that may arise during the execution of such complex projects. The concept of "delivery" in this context encompasses not only the development and availability of the digital health applications but also their practical utilisation in the healthcare domain. Achieving the full spectrum of benefits necessitates not only the creation of the applications but also ensuring that all relevant stakeholders actively engage with and employ these digital solutions. Consequently, education and training initiatives form an integral part of these sub-projects, ensuring that users possess the requisite knowledge and skills to effectively utilise the digital tools for healthcare purposes.

**Croatia**, as part of its eHealth measures, prioritised on passing the reform on eHealth, more specifically telemedical services. This may be explained by the COVID-19 pandemic. The remaining measures are aligned with Croatia's CSRs, which are eHealth investments, mostly focusing on innovative technologies in the sector. Their costly implementation may prove a barrier, as the so far completed investment on digital image diagnostics was the first of its kind in the country.

In **Czechia**, the remaining measures to be implemented have a long timeline until deadline. The measures are also aligned with Czechia's CSRs, as well as the national plan, which means that their implementation is expected to not be hindered. Nevertheless, the Ministry of Health reported that the timeline is exceptionally tight, numerous measures encounter procurement-related uncertainties, effective coordination among stakeholders and projects demands considerable effort, and a period for gathering essential feedback before achieving seamless deployment becomes feasible is necessary.

In **Denmark**, only one milestone of the studied investment remains to be completed, which was set a deadline until Q1 2022. Nevertheless, the RRF measures continue to hold relevance, especially in light of the potential of digital solutions within the healthcare sector to provide protection for vulnerable patients and enable efficient patient monitoring and triage. The COVID-19 pandemic has underscored the importance of strategically equipping healthcare professionals and patients with tools that facilitate virtual treatment. The Danish Ministry of the Interior and Health, in collaboration with the Danish Health Data Authority, will further endorse, develop, and expand the utilisation of these new digital solutions. Moreover, the broader Danish healthcare system has increasingly adopted existing digital solutions and introduced new ones in response to the pandemic. The success of this digital transformation hinges on the widespread adoption of digital solutions in healthcare, fostering novel cooperation models and service delivery approaches. Advanced technology also simplifies patient participation in their own treatment, offering easier access to information and enabling more equitable collaboration with healthcare professionals. Consequently, there is a pressing need to advance common digital solutions that support treatment and care across the healthcare system. The anticipated acceleration in treatment pace and technological advancements emphasises the importance of controlling, prioritising, and coordinating these developments to maintain a shared focus on achieving patient and employee-centric goals such as proximity, enhanced quality, and system-wide coherence within the Danish healthcare system. Furthermore, strategic guidance and anchoring are essential to ensure the sustainability of these digital initiatives and to align them with the right long-term priorities, encompassing overarching and coherent infrastructure, the most pertinent focus areas, and more.

In **Estonia**, all eHealth measures have been successfully implemented.

## How did the measures contribute to the overall digitalisation of health in the Member State?

### Summary

In Belgium, several RRF projects address administrative tasks and healthcare efficiency, although not all intended projects made it into the RRF scope. Czechia sees the potential for a significant shift from fragmented paper-based systems to standardised interoperability. In Croatia, eHealth projects enhance digital healthcare access and telemedicine services, especially in remote areas. Denmark's measures transform patient interactions through telemedicine, with apps and electronic questionnaires improving healthcare efficiency. Estonia's measures reduce

treatment queues, enhance patient satisfaction, and incentivise healthcare professionals to work efficiently using ICT solutions.

In **Belgium**, a significant portion of the key projects related to digitalisation falls under the scope of the RRF. These projects encompass various aspects of digital health transformation, including administrative tasks such as facilitating the completion of forms and optimising the distribution of resources among healthcare providers. Additionally, efforts are directed towards addressing organisational aspects to enhance the overall efficiency of healthcare services. Notably, the ten pivotal projects aligned with the digitalisation objectives have been incorporated into the RRF. However, it is worth noting that there were constraints with regard to the timeline for submitting these projects to the European Commission. Consequently, not all intended projects were included within the scope of the RRF.

In **Czechia**, the measure holds the potential to significantly influence progress in the digitalisation of health. It can play a pivotal role in the shift from fragmented and paper-based documentation to a standardised interoperable environment, potentially marking a substantial milestone along this trajectory.

In **Croatia**, the eHealth projects contributed to digitalisation by providing equipment, telemedicine services, and enhancing digital healthcare access in remote areas.

In **Denmark**, the measures have transformed patient interactions with the healthcare system, evolving alongside digitalisation and the emergence of novel digital communication channels. This evolution opens the door to more adaptable interactions with the healthcare system, tailored to individual needs. A notable example of telemedicine's diverse capabilities is the use of electronic questionnaires within apps, enabling patients to respond to health-related queries before or during their treatment journey. Health professionals can incorporate this patient-reported data (PRO) into their treatment assessments. Consequently, patients can avoid unnecessary hospital or general practitioner visits, streamlining the efficiency of healthcare consultations. These patient-reported data (PRO) features are being integrated into the MinLæge/My Doctor app, extending video consultation access to all Danish citizens with their general practitioners and private specialists. The app can automatically initiate questionnaires, perhaps based on age criteria, or clinics can manually trigger them. Depending on the patient's responses, the clinic can determine whether to schedule appointments for vaccinations against conditions like pneumococcus or influenza. Furthermore, the PRO functionality is set to undergo further development, allowing for the creation and implementation of new questionnaires as the need arises. To note, the MinLæge app is a Danish RRP measure still in development.

Both measures significantly contribute to **Estonia's** healthcare digitalisation efforts by reducing treatment queues and appointment durations, minimising direct contact, decreasing the number of empty appointments, enhancing patient satisfaction, and reducing co-payments and time wastage. These measures also ensure healthcare accessibility in remote areas and incentivise healthcare professionals to work more efficiently and optimally through the utilisation of ICT solutions.

## How did the measures involve and engage stakeholders in its design and implementation?

### Summary

In Belgium, stakeholder involvement was integral, though achieving consensus could be challenging. Croatia initiated public consultations for certain milestones. Czechia engaged various bodies, including health providers and insurers, in consultation and implementation. Denmark involved multiple stakeholders to enhance treatment coherence and digital cooperation in healthcare. Estonia collaborated with healthcare associations and government bodies in its planning and governance framework.

In **Belgium**, stakeholder involvement and engagement are integral components of the measure's design and implementation. During the conceptual phase of most sub-projects, initial ideas were formulated, and the process of shaping these was initiated. This shaping process actively involved individuals from various fields and organisations, ensuring a diverse range of perspectives and expertise contributed to the project development. Stakeholders include

interest groups such as healthcare providers, healthcare institutions, industry, and patient groups. The availability of resources and support from the RRF played a crucial role in expediting the realisation of the sub-projects. It enabled the transformation of conceptual ideas into tangible, actionable initiatives. However, it is worth noting that achieving alignment and consensus among all stakeholders in this collaborative process could sometimes be challenging, potentially leading to frustration among the participants.

The implementation body for the **Croatian** Digital image diagnostics is the Ministry of Health and KBC Split (hospital in Split). As for the RRF milestone on Improvement and extension of telemedical services, a public consultation was opened in December 2022 on the draft telemedicine framework for expanding the range of services in the field of emergency medicine in the Republic of Croatia.<sup>42</sup>

In **Czechia**, working groups and governing bodies were involved during the consultation and evaluation processes. In terms of collaboration and stakeholder engagement, the main bearers of individual projects are:

- Ministry of Health
- Providers of health services and organisations of the health department
- Health insurance companies.

The following will also be involved in the implementation of the projects:

- Suppliers of information systems in healthcare
- Regional authorities
- Municipalities
- NÚKIB – National Office for Cyber and Information Security
- Management of basic registers
- State treasury - centre of shared services.

The measure's coordination is carried out by the newly established National Centre for Electronic Health Care<sup>43</sup>.

The **Danish** measures involved and engaged various stakeholders in the design and implementation process. These stakeholders include the Ministry of Health, Danish Regions, Local Government Denmark, the Danish Organisation of General Practitioners, MedCom, municipalities, data consultants, the Danish Health Data Authority, and other relevant organisations. The purpose is to strengthen treatment coherence, quality, and digital cooperation between sectors in the healthcare system. Additionally, strong public-private cooperation in the life science sector will be fostered to develop the future digital healthcare system.

The **Estonian** Hospitals Association, the Estonian Midwives Association, the Estonian Nurses Union, Estonian Psychiatric Association, the Estonian Society of Oncologists, the Estonian Society of Hematology, the Estonian Health Insurance Fund, and the Estonian Family Medicine Association were involved in the preparation of the amendments to the list of health care services of the Estonian Health Insurance Fund. To ensure the creation of a new e-health governance framework and preparing an implementation plan for it the steering committee was formed. In addition to the representatives of the Ministry of Social Affairs, the representatives of the Estonian Health Insurance Fund, the Health and Welfare Information Systems Centre (TEHIK), the National Institute for Health Development, the Health Board, the State Agency of Medicines, the Estonian Hospitals Association, the Estonian Medical Association, the Estonian Family Medicine Association, the Estonian Chamber of Disabled People and the Ministry of Economic Affairs and Communications were also involved into work process as the members of the steering committee.

**To what extent did the measures respond to the needs of stakeholders (such as patients, healthcare providers, and policymakers) in the Member State?**

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<sup>42</sup> <https://www.panora.hr/otvoreno-novo-e-savjetovanje-savjetovanje-o-nacrtu-telemedicinskog-okvira-za-prosirenje-opsega-usluga-u-djelatnosti-hitne-medicine-na-podrucju-republike-hrvatske/>

<sup>43</sup> <https://ncez.mzcr.cz/en>

## Summary

In Belgium, the eHealth measure aims to empower patients and provide digital tools for healthcare providers. Czechia integrated stakeholder needs into its strategy documents and ongoing discussions. Croatia's measures focus on improving healthcare, reducing waiting lists, and enhancing patient care. Denmark's measures, including telemedicine, respond to the needs of patients, healthcare providers, and policymakers by creating a resilient healthcare system. Estonia's eHealth initiatives align with the needs of patients, healthcare providers, and policymakers, aiming to enhance accessibility, reduce costs, and promote a human-centred approach in healthcare.

The **Belgian** eHealth measure aims to empower patients and provide digital tools for healthcare providers.

In **Czechia**, the integration of stakeholders' needs into national strategy documents and extensive discussion has been ongoing. Presently, reform projects are underway to advance towards fulfilling further requirements in the future. The target population groups and economic entities are:

- Citizens of the Czech Republic and professional groups
- Citizens from EU countries using healthcare services in the Czech Republic
- Healthcare providers.

The **Croatian** measures aim to enhance healthcare, improve patient care, reduce waiting lists, and decrease treatment costs. KBC Split aims to enhance healthcare by implementing measures that include building and equipping a hybrid endoscopy room, introducing new diagnostic and therapeutic procedures, and digitising endoscopic procedures. The investment will elevate the quality and accessibility of healthcare for all patient categories, resulting in improved clinical outcomes, especially for paediatric and oncology patients, through earlier and better diagnostics.

The **Danish** measures aim to respond to the needs of stakeholders, including patients, healthcare providers, and policymakers, thereby creating a more resilient healthcare system (cf. CSR). Telemedicine, for instance, enables the provision of treatment and care to patients in their own homes, creating a safe environment. This need has become even more apparent during the COVID-19 pandemic, emphasising the importance of telemedicine solutions for effectively monitoring citizens' health at home. Consequently, there's a growing demand for healthcare services closer to home, including telemedicine and video solutions, aiming to reduce physical visits to hospitals. The progress to achieve telemedicine specifically for patients with chronic obstructive pulmonary disease (COPD) had started in 2018<sup>44</sup>, and is still a priority in the Digital Strategy as five Danish regions with associated municipalities will establish a cross-sector telemedicine service.<sup>45</sup> In 2021, the Danish government, regions, and the National Association of Municipalities agreed on the rollout of telemedicine for citizens with heart failure as well.<sup>46</sup> The KontaktLæge telemedicine solution for instance, promotes physical distancing, limit in-person contact, and free up time for specialised treatments requiring hospital visits. Through the implementation of digital solutions like telemedicine, this measure aims to elevate treatment quality, enable more adaptable and personalised interactions with the healthcare system, enhance healthcare service accessibility, and safeguard vulnerable citizens. In Denmark, all citizens now have access to video consultations with their general practitioners and private specialists through the 'MinLæge' app. Video consultations via the KontaktLæge app can currently be used between municipalities and general practitioners, but not for hospital doctors, specialist doctors and on-call doctors. In April 2023, the Danish Health Data Agency reports that telemedicine home monitoring with specialist doctors will be extended to more patient groups.<sup>47</sup>

In **Estonia**, the implementation of the measures was in line with the needs of patients and healthcare providers as well as policymakers. The goal of the Estonian eHealth governance model is to provide a consistent approach to ensure that decisions regarding ICT are made in line with the health system strategies and objectives and desired value is realised.

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<sup>44</sup> [https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin/governance/materiale\\_moeder](https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin/governance/materiale_moeder)

<sup>45</sup> <https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin/governance>

<sup>46</sup> [https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin/telemedicin\\_hjertesvig](https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin/telemedicin_hjertesvig)

<sup>47</sup> <https://sundhedsdatastyrelsen.dk/da/strategier-og-projekter/telemedicin>

Expanding the possibilities of e-consultation in specialist care allows to avoid direct contacts, using secure ICT solution for provision of appointment service and thereby ensuring continued good quality of health care, such as:

- Human-centred approach in healthcare, based on the principle that people are equal partners in the healthcare system in solving their health problems, and service provision is based on the individual needs of the person.
- Reduction of time and money spent by the patients for travelling to the specialists' appointments.
- Reduction of regional political inequality with the improvement of access to healthcare services in rural areas and the standardisation of treatment quality.
- Healthcare service providers' opportunity to optimise resources and adopt technological solutions that improve the efficiency of the work process.
- Healthcare workers' opportunity to organise their work more flexibly, taking into account the needs and possibilities of a particular patient.
- Supporting the concept of a holistic treatment journey by creating more options for planning the treatment journey.
- Equality of choice in the health services market with other EU Member States.
- Boosting entrepreneurship in Estonia dealing with the development of health technologies.

The primary objectives of the Strengthening primary healthcare initiative were to enhance treatment continuity and quality, increase the accessibility of healthcare, and encourage patients to take more proactive roles in managing their well-being.

## Coherence

### To what extent do the measures address the European Semester Country-Specific Recommendations?

#### Summary

Among the countries studied, Belgium's measures align with its healthcare CSR, while Croatia's investments in eHealth partially address its CSR with a stronger focus on specific healthcare improvements. Czechia's reforms effectively align with its CSR objectives, Denmark's measures focus on improving healthcare resilience without specific eHealth CSRs, and Estonia's actions respond to the CSR by strengthening primary care and improving health system accessibility and resilience.

**Belgium** did not receive any specific eHealth CSRs, however, the following healthcare CSR is put forward:

2020	1.2	2023 – Semester Cycle (May)	Reinforce the overall resilience of the health system and ensure the supply of critical medical products.
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Belgium's RRP focuses on reinforcing the resilience of the health system through modernisation and digitalisation. The measure to digitalise the health sector and health data could, for example, contribute to improving the efficiency of care and the quality of decisions made. The objective of the measure is to make an important contribution to increasing the quality, speed, and agility of healthcare through the digitalisation of healthcare processes by stimulating innovative digital systems and guaranteeing administrative and technical means and the availability of anonymised and secure health data.

**Croatia** received the following CSR in relation to eHealth:

2020	1.2	2023 – Semester Cycle (May)	Enhance the resilience of the health system. Promote balanced geographical distribution of health workers and facilities, closer cooperation between all levels of administration and investments in e-health.
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Of the five selected countries studied, Croatia includes the most investments for eHealth, totalling 10. These investments are varied and include, for example, telemedicine, digital image diagnostics, robotics, and health infrastructure systems. There is a strong alignment with the national CSRs of Croatia on eHealth, but while the projects are essential for specific healthcare improvements, additional projects that directly target workforce distribution and cooperation would be necessary to comprehensively address the main action of enhancing health system resilience.

**Czechia** received the following CSR in relation to eHealth:

2020	1.2	2023 – Semester Cycle (May)	Ensure the resilience of the health system, strengthen the availability of health workers, primary care and the integration of care, and deployment of e-health services.
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Czechia's RRP includes three reforms related to eHealth. All milestones and targets align well with the objectives of the CSR. The former consolidate electronic healthcare infrastructure, extend shared drug recording, define interoperability standards and telemedicine rules, implement new digital health services, and introduce telemedicine services, all contributing to improved accessibility and adaptability to emerging needs. These milestones and targets effectively leverage technology to achieve the main objective.

**Denmark** did not receive any specific eHealth CSRs, however, the following healthcare CSR is put forward:

2020	1.2	2023 – Semester Cycle (May)	Enhance the resilience of the health system, including by ensuring sufficient critical medical products and addressing the shortage of health workers.
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In the case of Denmark, it has not received any CSRs in particular as concerns eHealth. Given the scope of the case study on digital health, measures related to the above-mentioned CSR have not been included in the analysis. Nevertheless, the measures as put forward by Denmark focus on leveraging technology, data, and digital solutions to make the healthcare system more efficient, accessible, and coordinated. These efforts can bolster the health system's resilience by improving its capacity to adapt, respond to challenges, and provide high-quality care to the population.

**Estonia** did not receive any specific eHealth CSRs, however, the following healthcare CSR is put forward:

2020	1.2	2023 – Semester Cycle (May)	Improve the accessibility and resilience of the health system, including by addressing the shortages of health workers, strengthening primary care and ensuring the supply of critical medical products.
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One of Estonia's reforms in the RRP, 'Strengthening primary health care' proposes actions that respond to the above CSR. The actions within the reform aim to improve health system accessibility and resilience by investing in primary health centres, focusing on disease prevention, targeted funding, personalised analysis, and strengthening primary and specialised care. Developing a community-based and integrated healthcare system, promoting digital skills, upgrading health information systems, and implementing legislative changes further enhance the system's responsiveness. Additionally, resource redistribution, support for primary care practice, and nurse empowerment ensure consistent and accessible healthcare services. These actions collectively work towards a more robust and resilient health system.

### To what extent do the measures align with and complement relevant EU funds, strategies, policies, initiatives, and priorities?

<b>Summary</b>			
The research reveals that the Belgian eHealth measure is mostly in line with EU4Health Programme objectives. Croatia's milestones show some alignment with digitalisation actions, emphasising healthcare facilities and telemedicine, but there are gaps in addressing broader digitalisation aspects. Czechia demonstrates strong alignment with digitalisation actions, focusing on infrastructure development and telemedicine. Denmark is committed to digital transformation, with a focus on patient engagement and telemedicine, supported by a new Digital Strategy. Estonia's milestones align well with digital transformation actions, with an emphasis on primary healthcare, digital skills, and regulatory changes to enhance healthcare system sustainability.			

The EU4Health Programme<sup>48</sup> calls for “strengthening the use and re-use of health data for the provision of healthcare and for research and innovation, promoting the uptake of digital tools and services, as well as the digital transformation of healthcare systems, including by supporting the creation of a European health data space.”<sup>49</sup> Annex 2 of this case study provides a list of actions that meet this objective, as written in the Annex 1 of Regulation 2021/522.

The **Belgian** eHealth measure aligns with several objectives of the EU4Health Programme, including digital transformation, telemedicine, citizen empowerment, and the deployment of digital tools. Furthermore, the measure's sub-projects place a strong emphasis on empowering citizens by providing them with greater access and control over their health data. This aligns well with the EU4Health Programme's objective to strengthen citizens' rights and involvement in healthcare decisions. However, the measure could benefit from more explicit mentions of data quality assurance processes, which are crucial for ensuring the reliability and accuracy of healthcare data, as emphasised by the programme. While the measure touches on several facets of digital healthcare, it could further enhance alignment by explicitly addressing activities related to the European health data space. This European initiative is designed to facilitate cross-border data exchange and collaboration, and mentioning how the measure supports preparatory activities for this space would strengthen alignment with the broader programme objectives. In addition to the specific goals of the EU4Health Programme, the Belgian measure also aligns with the European Health Data Space (EHDS), which refers to adhering to common data standards, interoperability requirements, and governance principles. There are weekly meetings dedicated to the subject within the Belgian government.

**Croatia** has included specific milestones and targets to enhance its healthcare services in its RRP. However, upon evaluating these milestones in light of the actions necessary for comprehensive digitalisation, it appears that there is a partial alignment with some key actions, while others may require further attention.

The country's milestones mainly focus on the improvement and modernisation of individual healthcare facilities and services, such as the implementation of the CEZIH IT system, the installation of diagnostic medical devices, and the equipping of operating theatres with robotic surgery capabilities. While these developments signify progress in healthcare technology adoption, they do not directly address crucial actions for digitalisation, such as supporting cross-border data exchange, interoperable health information systems, and cooperation among Member States.

On the other hand, some milestones demonstrate alignment with specific actions outlined for healthcare digitalisation. Notably, the emphasis on telemedicine services, including teletransfusion and telecardiological services, indicates a commitment to promoting digitally driven patient care and technological innovation. Additionally, the country's efforts in improving and extending telemedical services signify support for e-health and the transition to telemedicine, aligning with relevant actions.

In **Czechia**, several milestones and targets have been identified to improve the healthcare infrastructure and services. Evaluating these milestones in relation to the actions required for comprehensive digitalisation reveals a strong alignment with key actions, showcasing the country's commitment to embracing modern healthcare technologies and promoting interoperability.

The milestones highlight the country's dedication to developing a robust electronic healthcare infrastructure, creating interlinked databases, and enhancing digital healthcare services. By completing projects focused on consolidating and improving the digital infrastructure, the country demonstrates its support for action (b) - supporting the deployment, operation, and maintenance of secure and interoperable digital service infrastructure. The extension of Shared Drug Recording (ePrescription) to narcotics and psychotropic substances and the inclusion of electronic vouchers for medical devices further exemplifies progress toward the same action by facilitating data exchange and access to medical information.

Moreover, the country has shown a keen interest in promoting telemedicine services and digital health initiatives. The milestones involving the definition of interoperability standards and rules for telemedicine align with action (d) -

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<sup>48</sup> [https://health.ec.europa.eu/funding/eu4health-programme-2021-2027-vision-healthier-european-union\\_en](https://health.ec.europa.eu/funding/eu4health-programme-2021-2027-vision-healthier-european-union_en)

<sup>49</sup> Article 4(f) of Regulation (EU) 2021/522 of the European Parliament and of the Council of 24 March 2021 establishing a Programme for the Union's action in the field of health ('EU4Health Programme') for the period 2021-2027, and repealing Regulation (EU) No 282/2014.

supporting the optimal use of telemedicine and telehealth. These efforts aim to foster digitally driven organisational innovation, provide patient-centred care, and empower citizens through digital tools.

The targets set by the country reinforce its commitment to digital health services and interoperability. Projects leading to the implementation of new digital health services, connection of health service providers to eHealth services based on interoperability rules, and the operation of an eHealth portal with increased functionality and service catalogue all align with various aspects of actions (b), (d), and (g) - supporting deployment, interoperability of digital tools, and cross-border networking.

Furthermore, the emphasis on introducing new telemedicine services and making them accessible to patients highlights the country's dedication to action (i) - supporting e-health and the transition to telemedicine and at-home administration of medication.

**Denmark** has outlined several milestones and targets that indicate a strong alignment with the actions required for comprehensive digital transformation. The milestones demonstrate a clear commitment to utilising technology to enhance patient care, improve access to healthcare services, and promote data-driven decision-making.

The evaluation of patient involvement and widespread use of telemedicine, in collaboration with the Danish Ministry of Health and Danish Regions, reflects a dedication to action (c) - supporting the digital transformation of healthcare and health systems. By assessing patient engagement and the extensive integration of telemedicine, the country aims to benchmark innovative tools and technologies, such as telemedicine, fostering its adoption to improve healthcare delivery.

Furthermore, the development and availability of facilities for telemedicine consultation (KontaktLæge) across multiple platforms align with action (d) - supporting the optimal use of telemedicine and telehealth. This initiative promotes digitally driven organisational innovation in healthcare facilities, as well as ensuring patient-centred care by offering accessible and flexible telemedical services.

Denmark's adoption of a new "Digital Strategy" in the Finance Act 2022 further underscores its commitment to healthcare digitalisation. The strategy encompasses multiple points related to health, including new technology and citizens' self-reported data, more treatment at home, modernisation of digital messages in the healthcare system, and increased coherence and joint access to health data. These aspects align with various actions, such as (a) - supporting a Union framework and interoperable digital tools for cooperation among Member States, (c) - supporting the digital transformation of healthcare, and (g) - supporting the deployment and interoperability of digital tools and infrastructure.

In **Estonia**, the milestones and targets for healthcare digitalisation demonstrate a considerable alignment with the actions required for comprehensive digital transformation. Additionally, they synergise well with the points included in the milestone aimed at strengthening primary healthcare. These initiatives reflect a robust commitment to utilising technology to enhance patient care, improve access to healthcare services, and promote data-driven decision-making, particularly at the primary healthcare level.

The milestones that focus on developing community-based and integrated healthcare systems resonate with actions (b) and (g), supporting the deployment and interoperability of digital tools and infrastructure. By enhancing accessibility to specialised healthcare services, Estonia takes strides towards action (d), supporting the optimal use of telemedicine and telehealth, which fosters digitally driven organisational innovation.

The goals of promoting digital skills in healthcare and upgrading health information systems align with actions (c) and (g). These initiatives support the digital transformation of healthcare and health systems by facilitating the uptake of innovative tools and technologies such as artificial intelligence and ensuring interoperable health information systems for efficient data exchange.

Moreover, the comprehensive implementation of the reform through regulatory changes complements actions (a), (g), and (j). By establishing appropriate governance structures, supporting the deployment and interoperability of digital tools, and promoting electronic health records, the country enhances healthcare system sustainability and resilience.

In addition to healthcare digitalisation milestones, the activities aimed at strengthening primary healthcare further contribute to a patient-centric approach. Actions such as investing in primary health centres and focusing on disease



prevention and healthier lifestyles align with actions (e) and (f), supporting the development, operation, and maintenance of databases and digital tools for citizens' health data access and control.

Furthermore, resource redistribution and support for primary care practice and enhancing primary care continuity and nurse rights reinforce the importance of patient-centred care. These points complement actions (d) and (f) by promoting telemedicine services, empowering citizens in managing their health data, and supporting the use of digital tools for patient empowerment.

### To what extent do the measures complement existing national or regional strategies and initiatives?

#### Summary

In all of the countries studied, the measures complement various actions put forward by country-level strategies.

The measures outlined in the **Belgian** RRP concerning the digitalisation of health services exhibit a degree of synergy with existing national or regional strategies and initiatives, albeit with some notable considerations. The Belgian government published two action plans around eHealth, spanning from 2019 to 2022 and subsequently from 2023 to 2025. Notably, the latter phase encountered delays due to an intensified focus on addressing the COVID-19 pandemic. For the period of 2023-2025, Belgium is focusing on digital health. The country is witnessing a rise in the development and implementation of health technologies such as apps, wearables, platform technology, and AI-based software across the life sciences value chain and into the patient journey. Ideally, the RRP seeks to prioritise the utilisation of the funding from the RRF to initiate key projects and subsequently construct comprehensive action plans around these initiatives. However, it is imperative to acknowledge that estimating the precise budgetary requirements for these endeavours remains challenging, as the nature and scope of the projects are not yet definitively defined. The allocated budget of EUR 40 million encompasses the aggregate cost projections of all designated projects within the RRP. This allocation affords a certain degree of flexibility, permitting adjustments and reallocations of resources among projects as necessitated by evolving circumstances. The RRP incorporates collaborative efforts from all levels of government, fostering the development of a strategic vision for the evolution of eHealth infrastructure.

The development of eHealth at the national level is driven by two strategies in **Czechia**: the National eHealth Strategy<sup>50</sup> (2016-2020) and the Health 2030 Strategy<sup>51</sup>. For the interoperability aspect of the milestone, the eHealth Strategy aimed to create a national interoperability framework due to the need for standardisation and interoperability of electronic health records. As the Strategy described, progress in the digitalisation of healthcare will be facilitated by the establishment of a solid foundation for interoperability. Similarly, the Health 2030 Strategy set the goal of implementing an interoperable environment for users of common shared electronic services in healthcare. For the telemedicine aspect of the milestone, in the National eHealth Strategy, it fell under the strategic objective of 'Increasing the quality and accessibility of healthcare services'. It aimed to define the technical, data security, and organisational framework for telemedicine. The Health 2030 Strategy foresees telemedicine as a solution in cases patients cannot have physical contact with healthcare workers. Telemedicine is described as a basic building block of eHealth.

The **Croatian** National Health Development Plan for the period from 2021 to 2027<sup>52</sup> is the overarching sectoral planning document, preserving its designated title. It outlines specific objectives, measures, projects, and initiatives set to be executed under the jurisdiction of the Ministry of Health. Its primary objective is the enhancement of the healthcare system and the overall health outcomes of the populace. This plan builds upon the foundation laid out in the National Development Strategy of the Republic of Croatia until 2030<sup>53</sup>. Furthermore, it stays in alignment with National Recovery and Resilience Plan 2021-2026 and the European Commission's Cohesion Policy Guidelines spanning from 2021 to 2027.

<sup>50</sup> <http://ncez.mzcr.cz/en/materials/national-ehealth-strategy-czech-republic-preliminary-translation> , <https://ncez.mzcr.cz/cs/narodni-strategie-elektronickeho-zdravotnictvi/narodni-strategie-elektronickeho-zdravotnictvi>

<sup>51</sup> <https://zdravi2030.mzcr.cz/> , [https://www.khsova.cz/docs/01\\_english/files/health\\_2030.pdf](https://www.khsova.cz/docs/01_english/files/health_2030.pdf)

<sup>52</sup> <https://zdravlje.gov.hr/UserDocImages/2022%20Objave/Nacionalni%20plan%20razvoja%20zdravstva%202021.-2027..pdf>

<sup>53</sup> <https://hrvatska2030.hr/>

The **Danish** Digital Strategy aligns with the Danish Strategy for Life Science (2021)<sup>54</sup> in that it allocates funds in the area for better use of health data. It also aligns with the government's health reform (2022)<sup>55</sup> which aims to promote the use of digital solutions from home. The KontaktLæge app specifically also complements the Danish Digital Health Strategy (2018-2024)<sup>56</sup> where one of the goals is to boost healthcare collaboration for every patient and increase digital cooperation. The Strategy is adopted by all levels of government (national, regional, local). As for patient involvement and widespread use of telemedicine, Denmark's national healthcare authority implemented a telemedicine strategy in 2012, aimed at supporting and promoting telemedicine initiatives that enhance productivity and guide the ongoing modernisation of healthcare services. This strategy, known as the Better Framework for Telemedicine<sup>57</sup> encompasses three key initiatives to establish a more robust foundation for telemedicine: (1) Developing reference architectures and standards, (2) Formulating joint assessment concepts, and (3) Providing an overview of telemedicine technologies and solutions currently in use. In parallel, the regional healthcare authority introduced its own telemedicine strategy in 2012, in collaboration with the Regional eHealth Organisation, referred to as RSI<sup>58</sup>.

The **Estonian** RRP measures align with various governmental initiatives that have received funding from other sources. For instance, the Ministry of Social Affairs and the Estonian eHealth Foundation (TEHIK) collaborated on a project called New Generation Estonian eHealth Information System in 2021.<sup>59</sup> It is funded by the Health Insurance Fund and the European Regional Development Fund (ERF). The project, referred to as upTIS, aims to implement module updates to the state's health information system and hospital information systems. Furthermore, the Estonian reform 'Renewal of the eHealth Governance Framework' was a project<sup>60</sup> of the Ministry of Social Affairs (carried out in the period February 2021 to March 2022). The project was supported by the EU's Directorate-General for Structural Reform Support (DG REFORM), through the EU's Structural Reform Support Programme (SRSP). In addition, the Estonian measures complement the following national development plans:

- National Health Plan (2020-2030)<sup>61</sup>, meeting sub-objective 8 "Person-centred healthcare". It encompasses a comprehensive approach to healthcare transformation. It prioritises empowering individuals within the healthcare system by offering personalised care and fostering awareness, involvement, and responsibility for their health. Additionally, there is a focus on enhancing the capabilities of healthcare professionals through innovative tools and clinical decision support. The development of user-friendly health information systems and services aims to create a more accessible and user-centric healthcare experience. Furthermore, improving information exchange between different healthcare fields and seamlessly integrating health and social roles through technology is a key goal. Data analysis capabilities will be developed to measure the quality and efficiency of healthcare services, ensuring the necessary data quality for analysis. Lastly, the expansion of remote services and e-health infrastructure seeks to improve access to healthcare services while reducing disparities in healthcare delivery.
- eHealth vision for year 2025. Estonian eHealth Strategic Development Plan 2020<sup>62</sup>, meeting all its focus areas. The objectives collectively strive for a holistic transformation of the healthcare system. They emphasise the importance of high-quality health data and efficient data processing, ensuring that information flows seamlessly from its source to various users. The focus is on making healthcare more people-centred, enabling individuals to actively manage their health with personalised data analysis and digital support, fostering growth in health research and development. Additionally, comprehensive case management and cooperation between organisations aim to provide uninterrupted, integrated health services across all stages of care, including prevention and rehabilitation. The objectives also prioritise measuring and analysing healthcare performance at all levels to inform planning and decision-making. Finally, the development of remote services, including

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<sup>54</sup> <https://em.dk/media/14236/agreement-on-a-strategy-for-life-science.pdf>

<sup>55</sup> <https://sum.dk/temaer/sundhedsreformen>

<sup>56</sup> <https://sundhedsdatastyrelsen.dk/da/diverse/download>

<sup>57</sup> <https://www.ft.dk/samling/20111/almdel/suu/bilag/421/1147872/index.htm>

<sup>58</sup> <https://www.regioner.dk/rsi/om-rsi/>

<sup>59</sup> <https://www.tehik.ee/uue-polvkonna-tervise-infosusteeem-uptis>

<sup>60</sup> <https://sm.ee/uptis>

<sup>61</sup> <https://www.sm.ee/rahvastiku-tervise-arengukava-2020-2030>

<sup>62</sup> [https://www.sm.ee/sites/default/files/content-editors/eesmargid\\_ja\\_tegevused/Eesti\\_e\\_tervise\\_strateegia/e-tervise\\_strateegia\\_2020.pdf](https://www.sm.ee/sites/default/files/content-editors/eesmargid_ja_tegevused/Eesti_e_tervise_strateegia/e-tervise_strateegia_2020.pdf)

telehealth and digital care, is seen as a means to improve cost-effectiveness and accessibility in the healthcare system while stimulating innovation and entrepreneurship in the health sector.

- Estonia's Digital Agenda 2030<sup>63</sup>, meeting the sub-objective "Digital Government" and Human-centric digital government. The goals outlined within revolve around creating a human-centric digital government and public services. They emphasise the development of event-based and proactive services for individuals, ensuring that everyone has equal access to digital society and government services. The focus is on designing public services based on user needs, preferences, and fundamental rights. To achieve this, there is an emphasis on high-level practices in service design, development, and management across the public sector. Sustainability is also a priority, with a commitment to keeping vital information systems updated and adequately funded for continued development and operation.

### To what extent are the investments coherent with the reforms introduced with the RRP?

#### Summary

In Croatia, investments align well with the eHealth reform, promoting remote monitoring and data transmission in healthcare. In Denmark, a standalone investment supports digital health initiatives, enhancing healthcare system resilience. Estonia's investment aligns with multiple healthcare reforms, improving healthcare accessibility and integration. Belgium does not have eHealth reforms, though adopted a legislation setting up the Health Data Authority. Czechia does not have eHealth investments.

In **Croatia**, the reform 'eHealth' shall introduce provisions for the establishment of a functional national telemedical framework for the transmission of patient vital parameters from Emergency Health Service (HMS) to Joint Emergency Hospital Service (OHBP) and remote monitoring of outpatient Emergency Health Service (HMS). The project shall deliver: i). Situational analysis; ii) National framework for establishing remote Emergency Health Service (HMS) surveillance and iii) An action plan for the introduction of supervision and a framework for monitoring implementation. Given the limited resources and duration of technical assistance, the teleradiology component shall only be an introductory component at the level of best practice mapping.

This reform is accompanied by five investments. Their alignment with the reform is as follows:

- Telecordis

The Telecordis project aligns with the reform's goal of remote monitoring and supervision. By installing equipment for ECG holter, pressure holter, and 12-channel ECG services in remote and underserved areas, this investment improves access to cardiology services. The connection with telemedical specialist centres enables telecardiology services, facilitating the transmission of vital parameters and patient data for supervision.

- Tele-transfusion

The Teletransfusion project directly contributes to the national telemedical framework's objective of transmitting patient data and enabling remote treatment processes. By connecting hospital transfusion centres and providing telemedical access centres, this investment ensures that patient data from ePrescriptions and eDossiers can be accessed, leading to more efficient treatment in secondary and tertiary healthcare facilities.

- Digital integration of operating theatres and robotic surgery at KBC Split

This investment aligns with the reform's goal by contributing to the digital integration of operating theatres. By implementing robotic surgery and integrating digital systems, it improves the quality of surgical treatment, enhances patient safety, and promotes transparency in treatment. The integration of key health information

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<sup>63</sup> <https://www.mkm.ee/digiriik-ja-uhenduvus/digjuhiskonna-arengukava-2030>

infrastructure resources also supports the national telemedical framework by enabling data transmission and monitoring from these facilities.

- Digitalisation and integration of operating rooms equipped with robotic surgery in Clinical Hospital Centre 'KBC Sestre Milosrdnice'

This investment closely aligns with the reform's goal of introducing robotic surgery and digital integration in operating rooms. Real-time access to patient data during surgeries and the integration of diagnostic and therapeutic devices within the operating room contribute to safer and more effective procedures. This integration also facilitates data transmission to support remote monitoring and supervision.

- Digitalisation and equipping of Clinical Hospital 'KB Merkur' diagnostic units

This investment directly supports the reform's goal of increasing the availability and quality of healthcare for all patients. By equipping diagnostic units with advanced medical equipment, such as ultrasound machines, MRIs, mammography scanners, and CT scans, it enables monitoring and diagnosis. The digital infrastructure allows patient data to be accessed and transmitted to telemedical specialist centres, enhancing the overall telemedical framework.

In **Denmark**, the investment 'Digital solutions in the healthcare sector' is a stand-alone investment, i.e. the RRP does not feature it as part of the reform. Overall, the investment activities align well with the initiatives outlined in Denmark's digital strategy for health (the reform). They share a common goal of leveraging new technology, digital solutions, and health data to enhance the healthcare system's efficiency, quality, and patient experience. The focus on telemedicine and digital health tools in the investment demonstrates a strong alignment with the digital strategy's aim of expanding healthcare services at home and promoting the use of digital solutions for improved healthcare access and delivery. The Danish RRP is set to enhance the resilience of the healthcare system, better equipping it to handle unforeseen crises such as the COVID-19 pandemic. This effort encompasses the establishment of strategic medicine stockpiles to diminish supply chain vulnerabilities. Additionally, Denmark will bolster the digitalisation of its healthcare system, ensuring its readiness for future challenges in the present day.

Within the component 6 "Healthcare and social protection", the **Estonian** Ministry of Social Affairs is responsible for the implementation of the investment "Construction of TERVIKUM", that aims to contribute to improving the access to health care as well the provision of health and social care in an integrated way. The investment is directly related to the measures/ reforms 6.1 "A comprehensive change in the organisation of health care in Estonia" and 6.3 "Strengthening primary health care", but it is also coherent with the reform "Renewal of the eHealth Governance".

The implementation of the investment shall be completed by 31 December 2025 and it supports the development of the health care system and improves its accessibility and resilience by ensuring the continued integration of health and social services, improving their availability on the same infrastructure that meets all the requirements for service provision, and creating attractive jobs for health care professionals at both the county and state level. Providing integrated services on the same infrastructure strengthens patient-centred cooperation between providers of primary care, specialised medical care, active treatment and social services, creating opportunities for the development of innovative services and supporting digital solutions. In the frame of construction of a modern building, the environmental goals are also taken into account with an aim to ensure energy performance of the new building and to optimise the energy consumption during the use of the infrastructure.

Establishment of a new building of a general hospital networked with primary health care and social services is consistent with the ambition to improve the resilience of the Estonian health system, including for coping with crises, and to ensure access to primary care services. Modernisation of the infrastructure increases people' access to high-quality integrated healthcare and makes provision of the services more flexibly and patient-centred, helps to eliminate workforce shortages in the health sector and ensures the continuity of treatment.

**Belgium** has not put forward any reforms related to eHealth, nevertheless, adopted a legislation setting up the Health Data Authority<sup>64</sup> which falls under the studied investment (eHealth Services and Health Data).

**Czechia** has not put forward any investments related to eHealth.

## EU Added Value

Would the reforms/investments on digitalisation of health still have been implemented in the absence of the RRF? Would they have been feasible without the RRF?

### Summary

In Belgium, the RRF was vital for the successful implementation of eHealth investments, aiding with private sector engagement and funding. Without it, project delays would have been likely. Czechia would have depended on other programmes, but the speed and scope of implementation would have been uncertain. Croatia's national eHealth information management system wasn't funded by the RRF, but it aimed to enhance eHealth management nationally. Denmark's KontaktLaege app and telemedicine projects, being relatively small, would have proceeded even without the RRF due to their importance in the country's healthcare system. Estonia's measures didn't rely on RRF funding and were feasible independently.

In **Belgium**, the implementation of the investment for eHealth would have presented considerably greater challenges in the absence of the RRF. The RRF has played a pivotal role in facilitating the approval of budgets and the execution of digital health projects. Without the support of the RRF, the realisation of the sub-projects would likely have faced more significant delays contingent upon the availability of financial resources. One of the primary advantages of the RRF lies in its orientation toward engaging the private sector extensively. This approach has fostered increased collaboration and participation from private industry stakeholders. Furthermore, at the federal level, robust coordination and comprehensive data collection efforts have been undertaken in conjunction with the private sector. This coordination ensures that tangible results are achieved. Prior to the RRF, there existed intentions to undertake a more self-reliant approach. However, the EU's commitment to assisting the industry has led to a mutually beneficial relationship. The industry has become notably more engaged and informed regarding developments at the federal level. This improved collaboration serves to enhance understanding of each other's requirements and objectives.

**Czechia** reported that in the absence of the RRF, it would have relied on support from the operational programmes IROP and ESF. Nevertheless, the scope and speed of implementation by relying on the former is not possible to predict. Without the RRF, the creation of a national competence centre for eHealth would be considerably more difficult.

In **Croatia**, the implementation of the national eHealth information management system was not financed from RRF funds, for example. Nevertheless, the agglomeration of information systems and management processes serve the purpose to enhance eHealth management at the national level.

According to the **Danish** Ministry of Health, the KontaktLaege app specifically is a relatively small project with a small investment, therefore it would still have been implemented in the absence of the RRF. The patient involvement and widespread use of telemedicine project would also have been implemented in the absence of the RRF. Advancing the Danish healthcare system to achieve higher quality, improved geographical equity, and greater cohesion among various entities, specialties, specialists, and segments necessitates continuous investments in digital infrastructure to streamline individual patient journeys. Consequently, digital advancement plays a pivotal role in the ongoing evolution of our healthcare service, establishing it as a unified and seamlessly interconnected network.

In **Estonia**, the implementation of the measures was not financed from the RRF, therefore they would have been feasible in its absence.

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<sup>64</sup> [https://etaamb.openjustice.be/fr/loi-du-14-mars-2023\\_n2023041135](https://etaamb.openjustice.be/fr/loi-du-14-mars-2023_n2023041135)

## Is the RRF the right instrument to support the digitalisation of healthcare?

### Summary

The RRF has proven to be a crucial instrument for supporting the digitalisation of healthcare in Belgium, empowering regions and expediting innovative projects. Czechia and Denmark also view the RRF as the right instrument for this purpose. Estonia did not use the RRF to support healthcare digitalisation.

For **Belgium**, the RRF has proven to be a crucial instrument for supporting the digitalisation of healthcare, and it has been widely perceived as such. Its impact has been significant across various levels of governance. At the regional level, the RRF has provided additional financial resources, enabling regions to have their own budget allocation for digital healthcare initiatives. This represents a notable departure from the pre-RRF scenario, where regions relied on the federal level to secure financing and budgetary support. This newfound autonomy has empowered regions to independently pursue their digital healthcare objectives. At the federal level, the infusion of funds from the RRF has been instrumental in expediting the realisation of innovative ideas and projects. It has facilitated the pursuit of robust solutions that were previously constrained by financial limitations. This shift in focus from financial constraints to addressing the substantive needs, functionalities, and effective utilisation of digital healthcare technologies has been pivotal in achieving meaningful progress. In contrast, the pre-RRF era often saw applications constrained by budgetary restrictions, resulting in suboptimal outcomes.

The **Czech** Ministry of Health deems the RRF as the right instrument to support the digitalisation of healthcare.

For the **Danish** health care, the RRF measure on KontaktLaege has been a small project with a minor investment and has not been an instrument to support a large-scale digitalisation of healthcare. Nevertheless, the RRF measures align with the technology package and will expand upon the previously launched measures, introducing further digital solutions aimed at reinforcing the healthcare system. Moreover, the COVID-19 pandemic has underscored the necessity for strategic endeavours to equip healthcare professionals and patients with virtual treatment-supporting tools.

The digitalisation of healthcare was not supported from the RRF in the frame of the Recovery and Resilience Plan for **Estonia**.

## Annex 1: Stakeholder consultations

Please see below the list of stakeholders that were successfully contacted in light of this case study.

Country	Measure	Organisation	Role
Belgium	eHealth Services and Health Data	FOD Volksgezondheid	Programme Manager e-Gezondheid
Czechia	eHealth (telemedicine) & eHealth (interoperability)	Ministry of Health	Department of IT and electronic health care
Denmark	Digital solutions in the healthcare sector (Patient involvement and widespread use of telemedicine)	Sundhedsata (Health Data Agency)	/
Denmark	Digital solutions in the healthcare sector (Patient involvement and widespread use of telemedicine)	Ministry of the Interior and Health	/
Denmark	Digital solutions in the healthcare sector (Video consultations (KontaktLæge))	Ministry of the Interior and Health	Head of Section
Denmark	Digital solutions in the healthcare sector (Video consultations (KontaktLæge))	MedCom	Consultant
Estonia	Renewal of the eHealth Governance & Strengthening primary health care (upTIS)	Ministry of Social Affairs	Counsellor at Department of Smart Development
Estonia	Renewal of the eHealth Governance	Ministry of Social Affairs	Deputy Secretary General for Innovation
Estonia	Strengthening primary health care (upTIS)	Ministry of Social Affairs	International Technical Advisor

## **Annex 2: Actions meeting the objective laid down in point (f) of Article 4 of the EU4Health Programme**

- (a) Supporting a Union framework and the respective interoperable digital tools for cooperation among Member States and cooperation in networks, including those needed for HTA cooperation;
- (b) Supporting the deployment, operation and maintenance of mature, secure and interoperable digital service infrastructure and data quality assurance processes for the exchange of, access to, and use and reuse of, data; supporting cross-border networking, including through the use and interoperability of electronic health records, registries and other databases; developing appropriate governance structures and interoperable health information systems;
- (c) Supporting the digital transformation of healthcare and health systems, including through benchmarking and capacity building, for the uptake of innovative tools and technologies such as artificial intelligence, and supporting the digital upskilling of healthcare professionals;
- (d) Supporting the optimal use of telemedicine and telehealth, including through satellite communication for remote areas, fostering digitally-driven organisational innovation in healthcare facilities and promoting digital tools to support citizen empowerment and patient-centred care;
- (e) Supporting the development, operation and maintenance of databases and digital tools and their interoperability, including already established projects, where appropriate, with other sensing technologies, such as space-based technologies and artificial intelligence;
- (f) Supporting actions to strengthen citizens' access to and control over their health data;
- (g) Supporting the deployment and interoperability of digital tools and infrastructure within and between Member States and with Union institutions, agencies and bodies;
- (h) Supporting preparatory activities and projects for the European health data space;
- (i) Actions to support eHealth, such as the transition to telemedicine and at-home administration of medication;
- (j) Supporting the establishment of interoperable electronic health records, in line with the European Electronic Health Record Exchange format in order to increase the use of eHealth and improve the sustainability and resilience of healthcare systems.