THEMATIC PAPER

Working together to deliver better digital healthcare

While people, goods and viruses move across borders with ease, health data still remain trapped within national borders or stuck behind legal, administrative or technical barriers, such as patient data managing systems of individual healthcare providers. With people's mobility increasing and a growing demand for better and more tailored services due to health-related and other socioeconomic challenges, interoperable eHealth solutions are being slowly but increasingly developed and deployed within and across borders in Europe. The COVID-19 crisis has placed an unprecedented pressure to speed up these efforts, calling for the necessary paradigm shift, a general mindset of innovative, networked, aligned and global thinking to improve healthcare by means of information and communications technology.

KEY POLICY MESSAGES

- Good governance and leadership are crucial in bringing together stakeholders and linking the different digital healthcare policies under one pan-European umbrella. The integration of digital healthcare policies under wider strategic regional development objectives allows for a cross-sectoral and more integrated approach and better use of resources.

- International and national networks, initiatives and commitments, and territorial cooperation mechanisms are crucial for the facilitation of digital innovation. They make it possible to address joint challenges, scale up best practices from the field and create a common market for digital healthcare across borders.

- Openness and co-creation through cross-border innovation ecosystems can bring together valuable perspectives from different types of healthcare users, providers, researchers, entrepreneurs, non-governmental organisations and the public sector to identify healthcare-related challenges and develop common digital solutions to tackle them.

- Data are a prerequisite for cross-border digital healthcare solutions and need to be made more accessible across borders and to relevant stakeholders. Data sharing across borders enables EU citizens to receive informed and tailored healthcare, especially when they are unable to otherwise communicate their medical history or underlying conditions. Data re-use helps with treatment and research of infectious diseases (such as COVID-19) and complex chronic conditions (such as cancer). Healthcare organisations can benefit from data re-use in many ways; these involve public health, personalised medicine, organisation and management, as well as research, development and innovation.

- Citizens need to be able to choose the stakeholders with whom they want to share data within and across borders. Citizens should be able to manage consent on their own with the help of easy-to-use applications and an integrated infrastructure. In turn, third parties should be able to request access to data for re-use purposes, and citizens should get feedback on the actual use of their data. Incentivisation schemes for citizens to agree on data re-use should be developed, on the grounds that this would be a contribution to social, public and community-based objectives. Underlying conditions of cybersecurity, data protection and patient-consent-based movement of data need to be in place to ensure trust and buy-in from end users.

- Obtaining the full benefits of health data sharing and re-use is reliant on the adoption of common data storage, privacy, security and interoperability mechanisms. Technical, semantic, organisational and legal interoperability are the foundation and prerequisites for cross-border, cross-institution, cross-platform and cross-service data sharing, and unlocking the power of digital technologies and innovation.

- Joint procurement of digital healthcare solutions and innovation helps buyers to pool relevant expertise and the necessary purchasing power across borders, incentivising development as well as deployment of innovative healthcare solutions on a wider scale and in an economically viable way. Joint procurement brings about economies of scale and enables digital innovation to have a bigger impact, as it can be deployed by several procurers; therefore, it also ensures increased interoperability and reduced administrative costs.

- Strategic alignment of national health policies with the EU priority areas will boost the joint transformation efforts and increase access to the new funding opportunities that are becoming available through EU4Health, Digital Europe, Horizon Europe, the Recovery and Resilience Facility, the European Regional Development Fund, the European Social Fund Plus and InvestEU programmes from as early as 2021.

1.
Introduction

The situation for the implementation of digital healthcare in terms of legislation, the availability of information and communications technology (ICT) infrastructure, data, services and skills is very **different within and between countries in Europe**. Uneven development of citizen-centric digital healthcare (eHealth) solutions in the EU27 and European Free Trade Association countries and the United Kingdom remains a major obstacle in providing European citizens with adequate **access to healthcare regardless of where they live**. Although the European Commission and the EU Member States have been actively working on digitally driven, patient-centred, multistakeholder, cross-silo and cross-border healthcare solutions since the adoption of the rules in 2011 (Directive 2011/24/EU), they have underestimated the difficulties of deploying an EU-wide eHealth system, which has seen **little exchange of information to date** (ECA, 2019).

Much of this **challenge lies in the complexity of healthcare** – organisation, management, clinical practice, sharing of information (including highly sensitive personal information), research, education and professional development are **mostly independent and built around multiple self-adjusting and interacting systems**. And the complexity proliferates when the cross-border dimension is added. Furthermore, all initiatives, programmes and projects aiming to change a healthcare system are similarly complex.

The ongoing health crisis caused by the coronavirus disease (COVID-19) outbreak has further accentuated many of these crucial shortcomings and highlighted the urgency of building resilience by future-proofing and harmonising the myriad of health systems. In addition to the fight against the COVID-19 pandemic, the roadmap for the next programming period foresees increased investments towards **the paradigm shift centralising the role of the patient, overcoming legal and organisational barriers, enabling access to healthcare regardless of the country, supporting cross-organisation and territorial cooperation for care provision, data sharing and interoperability, healthcare system administration, creation of new institutions, adoption and procurement of new technologies and solutions, research and development, digital skills, cybersecurity and public health in general** (European Commission, 2021a).

Why is it important?

CITIZENS
PEDRO

Pedro, Spanish, is visiting his friend Manuel in Vienna. Unfortunately, as he walks down the street, Pedro slips then hits his head on the ground and loses consciousness.

He's led to a nearby hospital to get an urgent life-saving operation. Since Pedro's Electronic Health Record is accessible in Austria, all previous operations, allergies and intolerances are available. Pedro is safely operated and can join his friend Manuel for a nice cup of coffee.

MEDICAL PROFESSIONALS
ELENA

Elena is a Bulgarian doctor who examines many expat patients. When Jean consults her with a persisting very high blood pressure, she can easily access his Electronic Health Record and medical history. This saves her time to enter information in her system about his age, weight, intolerances and allergies.

She can also see how Jean reacted previously to medication when he was treated for his high blood pressure. This makes Elena's life easier, since she can quickly diagnose Jean and prescribe him the best medication, to which he would react positively.

PUBLIC ADMINISTRATORS
GIUSEPPE

Giuseppe works in an Italian hospital which is regularly referred patiens from other EU Member States. Having the ability to receive and read the Electronic Health Record of his foreign patients makes it easy for him to know what relevant tests have been performed recently and avoid repeating them. It also saves the patient from unnecessary intrusive testing and lowers the costs for the hospital.

Source: European Commission, 2019
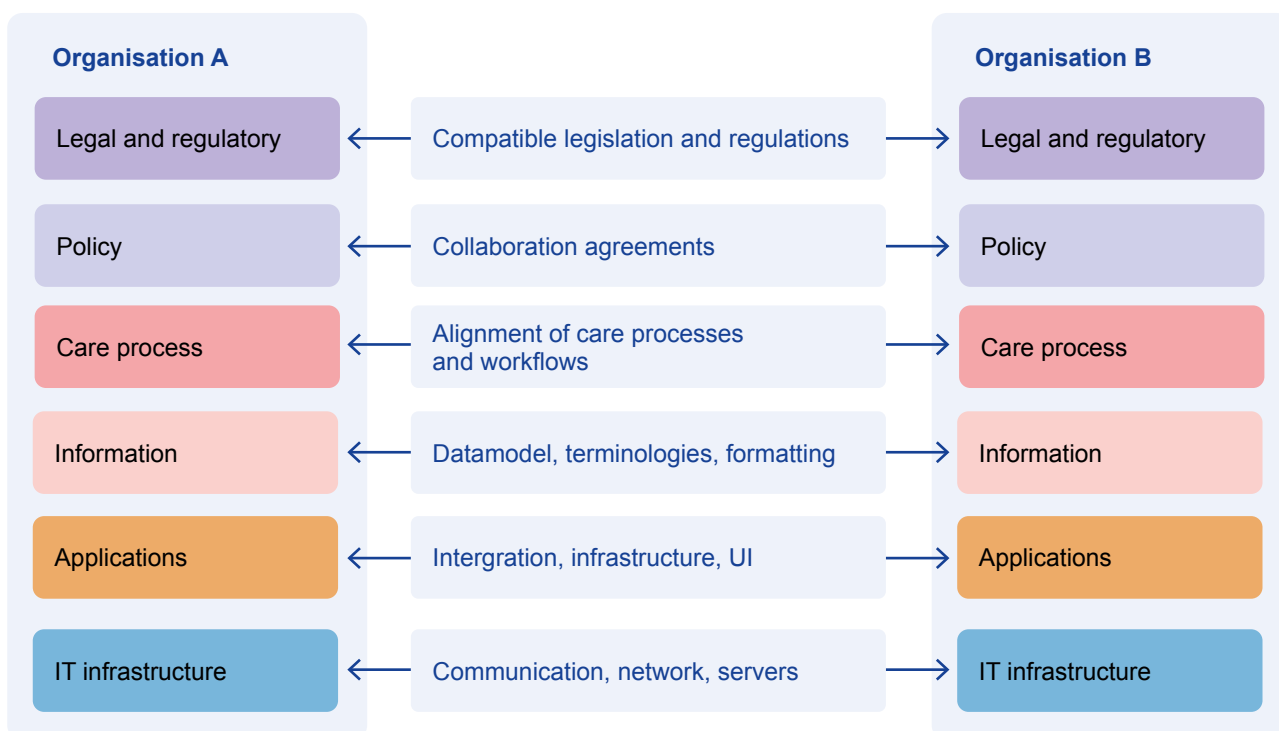
2.
Data and interoperability

Safe, efficient and sustainable healthcare systems are highly dependent on data. Data can support clinical decision making; allow for healthcare system planning, supervision and improvement, research and development, and the creation of a thriving and competitive market for digital health solutions; and provide information to empower patients to engage actively in their healthcare and wellness management. Such data includes formally structured data in electronic health records (EHRs): medical images, laboratory reports, drug prescriptions, claims and reimbursement data, patient-reported outcomes and other data management tools used in healthcare systems. It also includes data generated outside the healthcare setting, such as data from wellness devices including fitness trackers and other data originating from a wide range of settings (European Commission, 2021b).

To support the movement of data and the digitalisation of health and care within and across borders of the EU, the European Commission published a communication (2018) and put forward three objectives:

1. give citizens better access to their health data anywhere in the EU;

2. connect and share health data for research, faster diagnosis and better health outcomes;

3. use digital services for citizen empowerment and person-centred care.

A foundation for success across these objectives lies in ensuring **interoperability between the different healthcare-related infrastructures and information technology systems** (Figure 1).

Figure 1
Necessary alignments between different levels of interoperability

Organisation A		Organisation B
Legal and regulatory	← Compatible legislation and regulations →	Legal and regulatory
Policy	← Collaboration agreements →	Policy
Care process	← Alignment of care processes and workflows →	Care process
Information	← Datamodel, terminologies, formatting →	Information
Applications	← Intergration, infrastructure, UI →	Applications
IT infrastructure	← Communication, network, servers →	IT infrastructure

UI, user interface.
Source: European Commission, 2015

In broad terms, interoperability in eHealth means the ability of two or more eHealth systems (e.g. electronic health records, registries, and information technology or digital tools) to use and exchange both computer-interpretable data and human-understandable data and knowledge (eHGI, 2012) within a compatible and supportive legal, regulatory and policy framework (European Commission, 2015).

Although several compatible interoperability frameworks have been deployed, such as the Connecting Europe Facility (CEF) building blocks (European Commission, 2021c), refined eHealth European interoperability framework (ReEIF) (European Commission, 2015), minimal interoperability mechanisms (MIMs) (OASC, 2021) and eHealth digital service infrastructure (eHDSI), establishing interoperability remains a difficult challenge. Healthcare services within and between countries are operated in a **complex regulatory setting**, with a myriad of laws and guidelines dictating how services are provided. The way in which data are handled has to fit into that system. In addition to the legal fragmentation, there is a high **level of complexity in the practical aspects** of the exchange of information between healthcare providers and patients.

For example, even though the majority of the EU Member States are using EHRs, many of them are not doing it systematically or have more than one EHR system in place, which often creates issues with data flow within a Member State, not to mention between countries. In addition, many of the systems are often still not fully General Data Protection Regulation (GDPR) compliant. In the cross-border setting, this will often lead to a **lack of technical interoperability between record systems, as well as operational interoperability** for allied issues such as patient identification, healthcare professional authentication, language-related semantics and data privacy (European Commission, 2021b).

Health is an especially peculiar sector, given the nature and sensitivity of the data. For the flow of data to be unlocked, citizens must be in control of their data, trust data handlers and **know who is using their data and what is happening to the data. Secure access to health data is paramount for continuity of care for citizens as they move around the EU.**

In this regard, the adoption of the GDPR (Regulation (EU) 2016/679) in 2016 is a particularly important achievement. The GDPR recognises data concerning health as a special category of data and provides a definition of health data for data protection purposes. Though the innovative principles introduced by the GDPR (privacy by design and the prohibition of discriminatory profiling) remain relevant and applicable to health data, specific safeguards for personal health data and for a definitive interpretation of the rules that allows the effective and comprehensive protection of such data have now been addressed by the GDPR. Processes that foster innovation and better-quality healthcare, such as clinical trials or mobile health, need robust data protection safeguards to maintain the trust and confidence of individuals in the rules designed to protect their data (EDPS, 2021).

To ensure interoperability across the eHealth domain, it is important that health data are findable, accessible, interoperable and reusable (FAIR). Currently, based on the EU data strategy, the EU is building common data spaces, including for the health sector. This common **European Health Data Space** (European Commission, 2020a) supports the mapping and 'FAIR-ification' of existing health data registries and other data sources, and will promote better exchange of and access to different types of health data (EHRs, genomics data, data from patient registries, etc.), not only **to support healthcare delivery (primary use of data) but also for health research and health policy-making purposes (secondary use of data).**

To facilitate the mobility of patients seeking cross-border care, the European Commission is building an EU-wide **eHDSI**, commonly also known as **MyHealth@EU.** The EU Member States will be able to connect their health systems to the eHDSI through a national contact point adhering to the interoperability guidelines of the European Commission, allowing health data to be exchanged across borders, with the initial focus on electronic prescriptions and electronic patient summaries (European Commission, 2021d). In the long term, medical images, lab results and hospital discharge reports will also be available across the EU, with the full EHRs to follow later on. The **X-eHealth project**, launched in 2020, aims to develop the foundation for a common framework for this (X-eHealth, 2020).

EXAMPLE 2

Cross-border exchange of electronic prescriptions and patient summaries

You are on holiday or a business trip in Croatia, Czechia, Luxembourg, Malta or Portugal and need to see a doctor and want them to have access to your essential health data through a patient summary. You are in Croatia, Estonia, Finland or Portugal and you have to get medicines that were prescribed to you in your home country. These two eHealth cross-border services are currently interoperable between these countries (March 2021).

The cross-border patient summaries provide information on important health-related issues such as allergies, current medication, previous illnesses and surgeries. They are part of a larger collection of health data called an electronic health record. A digital patient summary is meant to provide doctors with essential information in their own language concerning the patient, for when the patient comes from another EU country and there may be a language barrier. The cross-border electronic prescriptions (ePrescriptions) are useful, for example, for travellers who have forgotten to take their medicines with them, or who are staying abroad for a longer period. It also makes it possible to get medicines with specific storage needs dispensed at the travel destination. These include medicines that need cold storage.

To operate the electronic cross-border exchange of patient summaries or ePrescriptions under the European eHealth digital service infrastructure programme, patients' relevant personal administrative and health-related data are processed by two parties: the healthcare professional who is consulting in the country of visit and who will receive the patient summary or ePrescription, and the health agency in its role as national contact point for eHealth that is facilitating the exchange through the secure gateway that it provides for this purpose. These exchanges can only take place with the explicit consent of the patient.

In addition to the 7 Member States where these services are currently implemented, 18 other Member States have made a commitment to developing similar services that connect their national eHealth systems to the common EU information and communications technology infrastructure. This was initially planned to be finalised by 2022; however, there have been some problems and delays, and the pan-European roll out has been postponed until 2025.

In some Member States, the use of ePrescriptions and patient summaries has been a common practice for many years. In others, however, pilots have only recently started. Reduced availability of eHealth services at national level is one of the main challenges associated with the deployment of the EU-wide eHealth infrastructure, together with lack of interoperability between the services and legal obstacles associated with the secure handling of sensitive, personal information. In addition, some Member States do not participate at all or only participate in some of the services of the EU-wide eHealth digital service infrastructure.
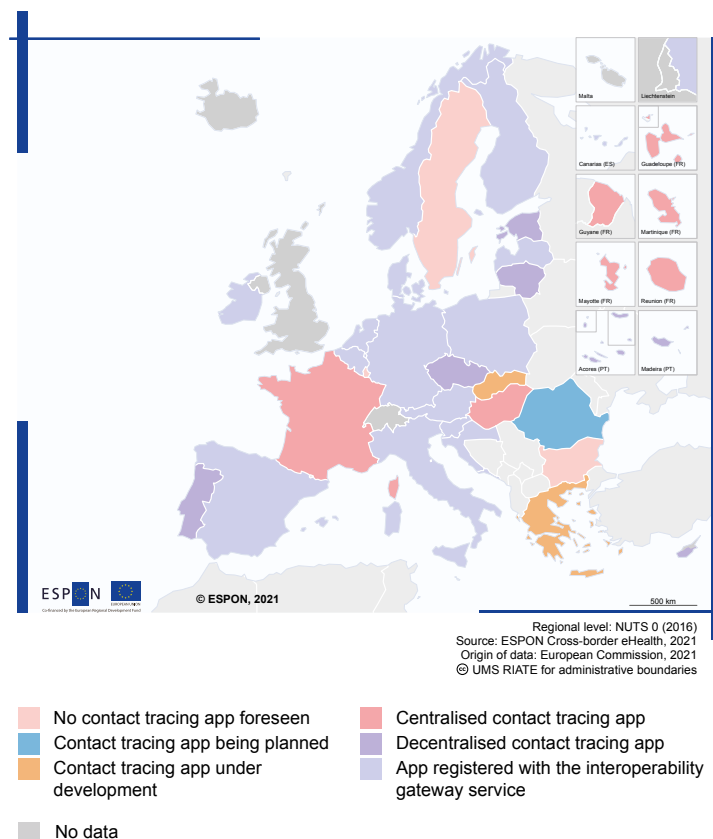
EXAMPLE 3

Leveraging data to fight the COVID-19 pandemic

Tracing and warning apps are designed to help to prevent the spread of COVID-19. To trace or warn potential contacts across the borders, these apps need to be able to communicate with each other. In other words, they need to be interoperable.

The European Commission has set up an EU-wide system – a 'gateway' – ensuring that apps work seamlessly across borders to warn, prevent and trace contacts, while keeping in line with data security laws and EU fundamental rights such as privacy and data security. Therefore, users will only need to install one app, and when they travel to another participating European country they will still benefit from contact tracing and receiving alerts, be it in their home country or abroad.

By October 2020, 20 apps in 13 Member States were developed based on decentralised systems that can be interoperable through the gateway service (Map 1). Altogether, these apps were downloaded by around 30 million people by October 2020, which corresponds to two thirds of all app downloads in the EU in the same period.

Map 1
Mobile contact-tracing apps

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Regional level: NUTS 0 (2016)
Source: ESPON Cross-border eHealth, 2021
Origin of data: European Commission, 2021
Ⓜ UMS RIATE for administrative boundaries

- No contact tracing app foreseen
- Contact tracing app being planned
- Contact tracing app under development
- No data
- Centralised contact tracing app
- Decentralised contact tracing app
- App registered with the interoperability gateway service

Sharing research data for disease prevention, personalised treatment and clinically impactful research
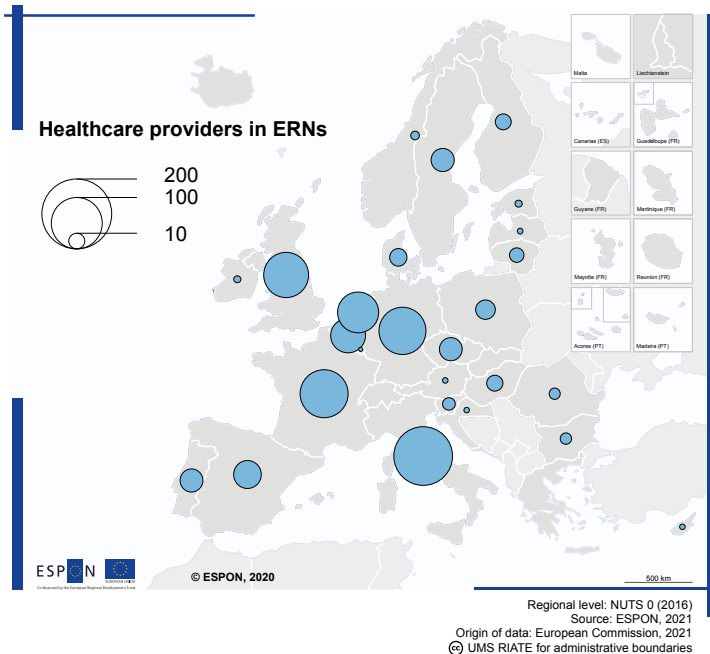
Sharing data on rare diseases and genomic data is essential to unlock the benefits of pooling expertise and using genomics for research and healthcare.

Assembling and sharing data from large, international studies offers particular value for general research in genomics, health and disease, from detailed study of the genetic factors driving different forms of cancer to understanding how genetics may influence the risk of common diseases or why people react differently to infectious diseases such as coronavirus disease 2019. It also allows health professionals in Europe and around the world to identify and share what they have learned about new and extremely rare genetic conditions that affect only a handful of people in the world.

Sharing data and expertise related to rare diseases is coordinated through European reference networks (ERNs). ERNs are virtual networks involving healthcare providers across Europe. They aim to tackle complex or rare diseases and conditions that require highly specialised treatment and concentration of knowledge and resources (Map 2).

Sharing genomic data is coordinated through the 1+ Million Genomes initiative, which is a voluntary commitment by Member States to cooperate on genome data. To meet the target of having over 1 million genomes sequenced by the end of 2022, the signatories of the 1+ Million Genomes initiative adopted the '1+MG roadmap 2020–2022' in 2020. The roadmap was established to provide a clear prospect of tangible outcomes over the course of the next few years.
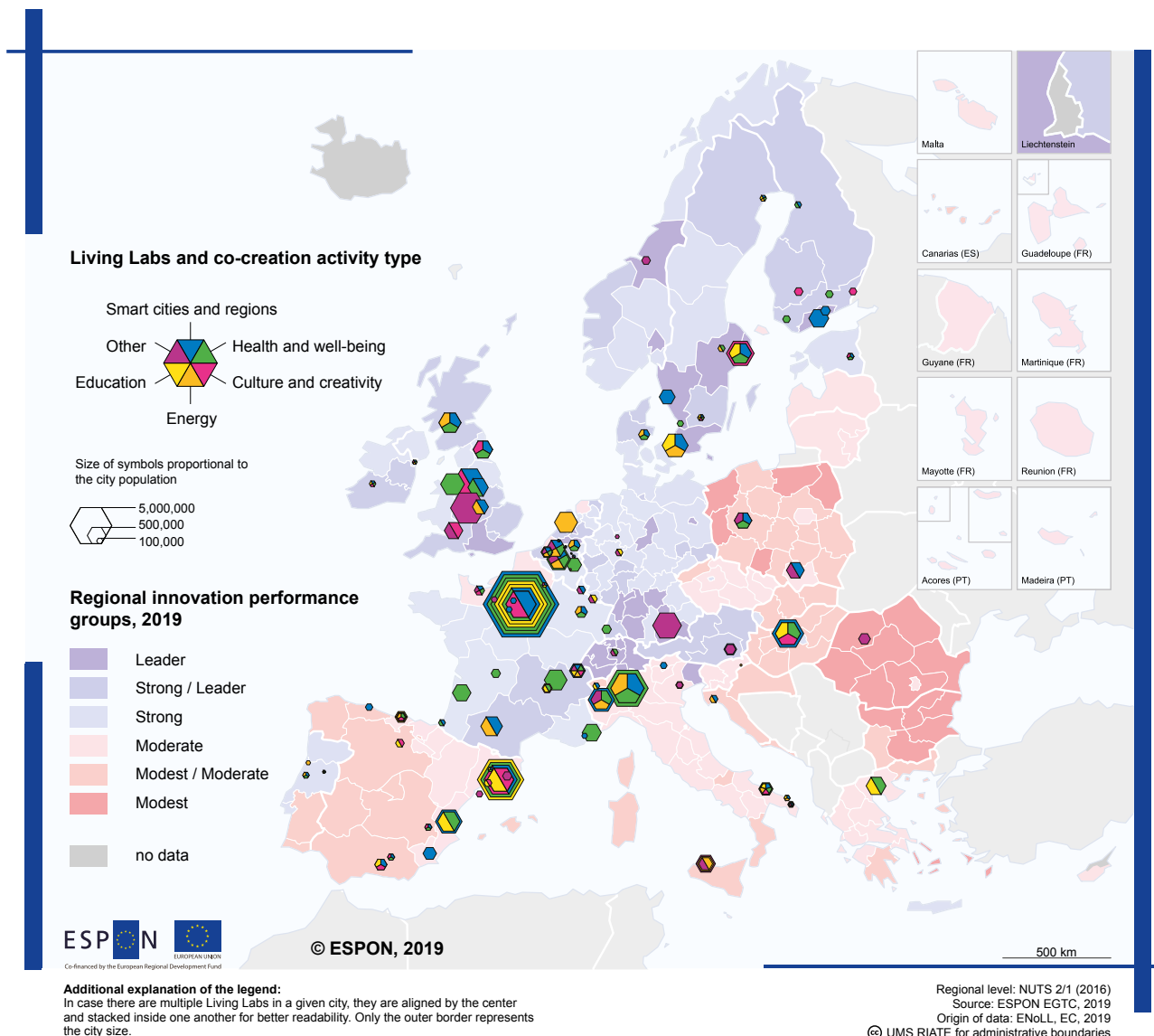
Map 2
Healthcare providers in ERNs

Regional level: NUTS 0 (2016)
Source: ESPON, 2021
Origin of data: European Commission, 2021
© UMS RIATE for administrative boundaries

3.
Open innovation ecosystems

Digital technologies such as artificial intelligence, 5G, the internet of things, supercomputing and robotics offer new opportunities to transform the way we receive and provide health and care services, benefiting people, healthcare systems and the economy. To drive this digital innovation, it is paramount to build the necessary supporting ecosystems, which help bring together the multidisciplinary viewpoints of traditional silos of **healthcare providers, the public sector, industry, enterprises, research organisations, civil society, citizens and patients**. Open innovation ecosystems offer an environment that promotes teamwork, collaboration, and sharing of expertise and ideas, and provide the necessary infrastructure

for research and development, testing and piloting in the market. In addition, they provide other innovation services, such as financing advice, training and skills development, that are needed for a successful digital transformation.

Here, **territorial cooperation is important for both the development and the uptake** of processes, market-ready solutions and services that have a high added value and a high probability of success in terms of adoption and scalability. Territorial cooperation will help to pool expertise and resources, delegate roles, bridge the digital divide between savvy and laggard regions, and create the necessary

Map 3
Open innovation ecosystems with a cross-border and transnational perspective on eHealth

Living Labs and co-creation activity type

Smart cities and regions
Other — Health and well-being
Education — Culture and creativity
Energy

Size of symbols proportional to the city population
5,000,000
500,000
100,000

Regional innovation performance groups, 2019

- Leader
- Strong / Leader
- Strong
- Moderate
- Modest / Moderate
- Modest
- no data

© ESPON, 2019

500 km

Additional explanation of the legend:
In case there are multiple Living Labs in a given city, they are aligned by the center and stacked inside one another for better readability. Only the outer border represents the city size.

Regional level: NUTS 2/1 (2016)
Source: ESPON EGTC, 2019
Origin of data: ENoLL, EC, 2019
UMS RIATE for administrative boundaries

digital single market for small and medium-sized enterprises (SMEs) and other companies that would otherwise suffer from territory-induced barriers to operate, grow and succeed.

In Europe, this type of infrastructure is taking shape most visibly under the EU initiatives to develop the network of **European digital innovation hubs, innovation partnerships and living labs**, which will contribute signifi-

cantly to shaping Europe's digital future, including in the healthcare sector (Map 3).

Most of these innovation ecosystems are concentrated in regions with strong innovation performance in Belgium, Denmark, Finland, Sweden and the United Kingdom, as well as in regions with moderate or even modest innovation capacity in Italy and Spain (Map 3).

EXAMPLE 5

OuluHealth – health innovation ecosystem in northern Finland

The OuluHealth ecosystem is a Digital Innovation Hub and a Living Lab that has active partnerships with researchers, business networks, and regional, national and international networks and alliances. On the EU level, OuluHealth is a member of the European Connected Health Alliance, EU Cooperation in Science and Technology Action network, European Network for the Joint Evaluation of Connected Health Technologies and Digital Health Society Task Forces, which are building EU-level strategies and proposing actions (action plan 2018) in digital health.

Oulu's evidence for status as a reference site is largely based on the OuluHealth ecosystem and its OuluHealth Labs operation. OuluHealth is an active member of the Nordic reference site collaboration with the European Innovation Partnership on Active and Healthy Ageing. Furthermore, OuluHealth has applied to host the EU mHealth Hub, and the bid has passed the first evaluation stage. By building a network of Nordic collaborators, OuluHealth aims to strengthen cooperation at both the strategic and operational levels. A good example of this is the network of Nordic Test Beds. A long period of collaboration

with Nordic partners generated the Nordic proof-testing collaboration network, of which OuluHealth is a member. These active interactions with European innovation networks ensure the formation of strong strategic partnerships and rapid and broad implementation of novel solutions and action models in innovation ecosystems.

On the regional level, OuluHealth has strong collaborations with Allied ICT Finland, which brings together several domain-specific Digital Innovation Hubs, such as Super IoT, PrintoCent, Arctic Drone Labs and 5G Test Network Finland, and services such as Analytics+ in Finland. OuluHealth is one of the five innovation ecosystems of the Oulu Innovation Alliance, which is a regional strategic collaboration model with committed stakeholders. The collaboration model has proven to be an excellent ecosystem model for public–private–people partnership cooperation at the regional, national and international levels. The Oulu Innovation Alliance's other fourecosystems are Agile Commercialisation, ICT and Digitalisation, Industry 2026, and Northern City with Attractive Opportunities (European Commission, 2021c).

4.
Innovation procurement

According to the Statistical Office of the European Union (Eurostat) (2020), healthcare expenditure amounted to 10 % of gross domestic product in the EU in 2018. A significant portion of the healthcare sector's expenditure is used for procuring eHealth services and products; therefore, it plays an important role in shaping the relevant supply and demand market. If some of this **purchasing power is combined through partnerships across borders** and used strategically to procure innovative solutions, the healthcare sector can invert the current tendency of the specifications for digital-oriented solutions to be dictated only by the large players in the private sector, and can put itself in the **driving seat of digital innovation.**

Hence, to successfully engage in procuring innovative digital solutions, healthcare providers must **make use of networking and cooperation.** Healthcare providers are natural candidates for jointly procuring digital innovation, not only because they currently face common needs, but also because they can **pool expertise and the necessary purchasing power** to facilitate procurement, and attract innovators, in particular high-tech start-ups and innovative SMEs. In addition, joint and collective procurement arrangements introduce clear benefits, as **they bring about economies of scale. This enables digital innovation to have a bigger impact, as it can be deployed by several procurers, thus also ensuring increased interoperability and reducing administrative costs.**

To procure digital solutions, healthcare providers should determine whether these solutions already exist on the market or innovation is necessary. By using the modernised EU public procurement directive (Directive 2014/24/EU), for example, healthcare providers can make optimal use of collective purchasing arrangements to **respond to unmet needs**, creating greater benefits for patients **regardless of where they live** and improving the public service experience beyond merely satisfying primary needs. Healthcare providers must increasingly consider **'how to buy'**, **as opposed to 'what to buy'**. This opens up the discussion about whether or not the procurement of a digital innovation will lead to higher quality and efficiency and deliver the expected eHealth solution or service as well as wider social benefits as set out in the relevant policies.

The EU's research and innovation programmes seventh framework programme, the competitiveness and innovation framework programme and Horizon 2020 have been supporting this type of networking and territorial cooperation by funding projects in which groups of procurers from different countries around Europe are jointly implementing pre-commercial procurement (PCP) or public procurement of innovative solutions (PPI), and coordination and networking projects that prepare the ground for future PCP or PPI.

Healthcare providers are natural candidates for jointly procuring digital innovation. This is exemplified by the fact that the majority of EU-funded PCP and PPI projects have been related to the health sector, and all of them include an international dimension.

Altogether, the EU has supported 13 PCP, 3 PPI and 5 combined PCP and PPI projects on digital healthcare with EUR 61.1 million (total investment of EUR 82.7 million), which have benefited over 200 procurers across the EU and beyond. Some 38 % of the of the procurers were public bodies (excluding research organisations and higher education establishments), 18 % were university hospitals, 17 % were other research organisations, 16 % were for-profit organisations and 11 % were other types of organisations.
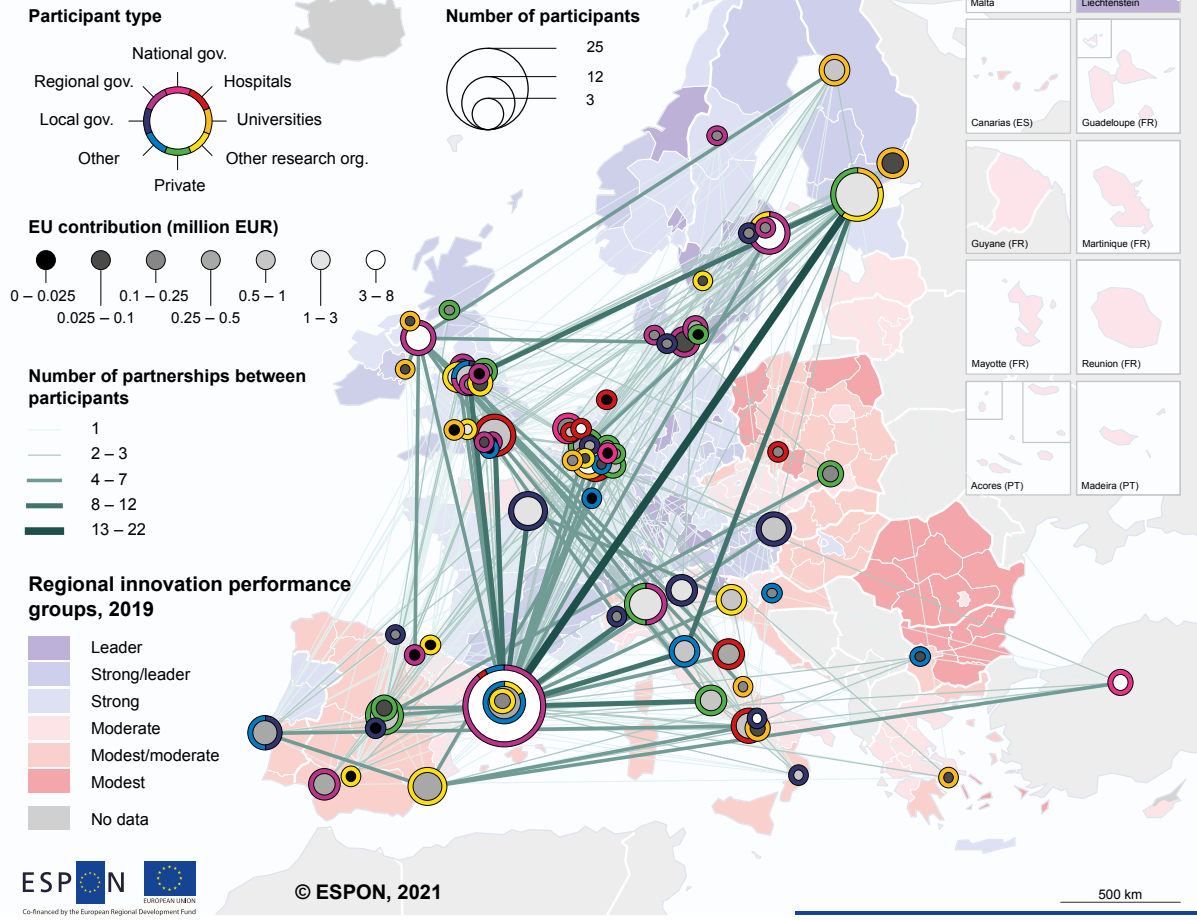
Most active joint PCP and PPI procurers have been organisations located in regions with strong innovation performance in Belgium, Denmark, Finland, Sweden and the United Kingdom, and in regions with moderate or even modest innovation capacity in Italy and Spain. These procurers have managed to implement most projects, absorbed the majority of the available EU funding and established international procurement networks that will hopefully remain effective and grow for years to come (Map 4).

Together with boosting territorial cooperation, these public procurement tools haven proven to enhance the **cost efficiency** of digital products and services by considering life-cycle costs over the long term and boosting performance. Studies have shown that innovation procurement leads, on average, to cost savings of 20 % on public procurement expenditure (which constitutes about one fifth of gross domestic product in Europe, or around EUR 2.4 trillion a year). Savings may also occur because of **reduced staff requirements** resulting from digitalisation, thereby making **healthcare providers more resilient and sustainable.** They also open a route-to-market for new economic operators (especially SMEs), helping operators to bring products to the market stimulate enterprise growth.

Map 4
EU-funded projects implementing pre-commercial procurements or public procurement of innovative solutions in the healthcare sector

Participation intensity and network dynamics in EU funded joint cross-border PCP and PPI projects in digital healthcare, 2013–2020

Participant type

National gov.
Regional gov.   Hospitals
Local gov.   Universities
Other   Other research org.
Private

Number of participants

25
12
3

EU contribution (million EUR)

0 – 0.025   0.1 – 0.25   0.5 – 1   3 – 8
0.025 – 0.1   0.25 – 0.5   1 – 3

Number of partnerships between participants

1
2 – 3
4 – 7
8 – 12
13 – 22

Regional innovation performance groups, 2019

Leader
Strong/leader
Strong
Moderate
Modest/moderate
Modest
No data

Malta   Liechtenstein
Canarias (ES)   Guadeloupe (FR)
Guyane (FR)   Martinique (FR)
Mayotte (FR)   Reunion (FR)
Acores (PT)   Madeira (PT)

© ESPON, 2021

500 km

EXAMPLE 6

Addressing societal and governmental needs through transnational joint procurement: The SILVER project – independent living of the elderly

Improving cost-effectiveness in the homecare sector means increasing the number of elderly people living a higher-quality life independently at home with the same amount of care staff.

The financial sustainability of health and care systems, the increase in public expenditure on long-term care due to ageing, the increasing pressure on public budgets, and the growing demands from older people for care products and services were challenges that seven public procurers from seven countries decided to tackle together by forming a transnational joint procurement group.

The group of SILVER contracting authorities (formed by Eindhoven (Netherlands), Odense (Denmark), Oulu (Finland), Stockport (United Kingdom), Vantaa (Finland), Västerås (Sweden), and the region of South Denmark) launched a pre-commercial procurement to address that specific challenge in 2013. This competition-like procurement method enables public sector bodies to engage with innovative businesses and other interested organisations in development projects, so that they can arrive at innovative solutions that address specific public-sector challenges and needs.

The SILVER challenge's main goal was to stimulate market players to develop new, innovative robotic solutions that target assisting the elderly and those caring for them with personal activities of daily living. These robotic solutions should be able to take over all or part of the work of caregivers. Once they have introduced the new solutions, 2–4 years after the end of the pre-commercial procurement, it should be possible to care for 10 % more people with the same number of care staff. As a result, 70% participating contractors are successfully commercialising their solutions. A few hundred of the robotics solutions resulting from the SILVER project have already been sold and deployed in the SILVER countries and beyond. Moreover, the SILVER project has triggered the creation of new start-ups and helped existing start-ups to grow their business.

The SILVER project officially ended on 31 August 2016. However, given its success, the seven public procurers from the five participating EU countries have considered that the work is not yet complete. Plans are being developed by the parties to continue working with Robot Care Systems to support them in the future development of the Lean Elderly Assistant.

5.
ETC programmes

As part of the EU cohesion policy, for 30 years the European Territorial Cooperation (Interreg), has played a significant role in facilitating cooperation between European regions through project funding. It provides a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States. More concretely, Interreg aims to enhance regions' capacity to find shared solutions to common challenges **in a wide range of fields, including healthcare.**

The ESPON - European Territorial Observatory Network analysis shows that Interreg's role in eHealth has been steadily growing in Europe over the last 17 years. The Interreg projects on eHealth have ranged from knowledge exchange and capacity building to joint emergency management and the development of new services according to the projects listed in the KEEP database (keep.eu, 2021). The cooperation on eHealth under Interreg started during the 2004–2006 programming period with the implementation of two pioneering transnational and two cross-border projects. Total investment in these projects amounted to EUR 5.4 million, with the EU contributing EUR 2.7 million. These first initiatives concentrated on the Baltic Sea Region and the Germany–Netherlands border (Map 5).
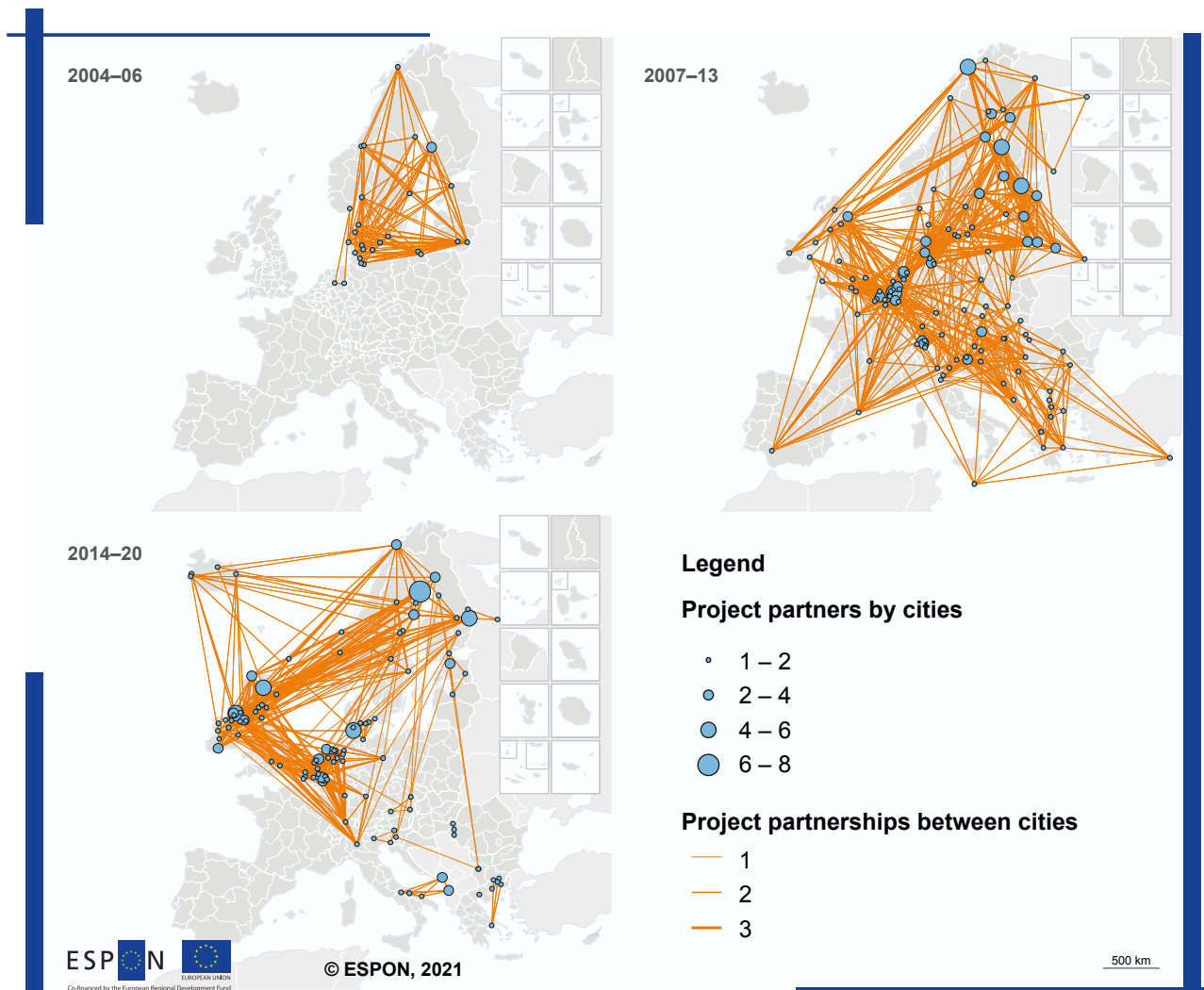
The 2007–2013 programming period brought about an increased need for and a wider interest in territorial cooperation on eHealth. Relevant projects were initiated in all EU and European Free Trade Association countries except Portugal and Iceland. Here, a total of 9 cross-border, 11 transnational, 3 interregional and 2 neighbourhood partnership projects were conducted, amounting to

EUR 52.6 million, with the EU covering 47 % of the expenses. **Most active collaboration took place around northern and western Europe; some also took place in Austria, Italy, Slovenia, Switzerland, and central and south-eastern regions** (Map 5).

Despite the 2014–20 programming period showing an increase in investments, fewer countries were participating in eHealth-related cooperation under Interreg. With a total investment of EUR 62.9 million, 2 neighbourhood, 10 cross-border, 17 transnational and 1 interregional project (ESPON eHealth) were conducted. These were mainly initiated and driven by stakeholders located in northern and western Europe (Map 5). However, some most recent projects may be missing from the database. **In addition to Interreg programmes, more cooperation has been instigated under larger programmes and initiatives.**

Map 5
The evolution of Interreg programmes investing in eHealth

Legend

Project partners by cities

- 1 – 2
- 2 – 4
- 4 – 6
- 6 – 8

Project partnerships between cities

- 1
- 2
- 3

500 km

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Regional level: LAU2 (2011)
Source: ESPON, 2021
Origin of data: keep.eu, 2021
UMS RIATE for administrative boundaries

EXAMPLE 7

The future of digital health in the EU (ESPON eHealth)

Stemming from the activities of the Urban Partnership of Digital Transition, the Ministry of Finance (Estonia), Oulu (Finland), Sofia (Bulgaria) and the Association of Municipalities and Towns (Slovenia) asked ESPON to support them in their policy processes with an analysis on the roll out of eHealth in the four countries.

The study examined how digital health solutions and policies in stakeholders' territories foster the development of data-driven healthcare and digital health services, identified existing and potential opportunities and challenges to cross-border movement of health data and prescriptions, and proposed relevant policy recommendations.

In particular, the study examined how eHealth solutions can be developed and promoted in the evolving landscapes of technology, territorial governance and cross-border cooperation in the stakeholders' territories.

The analysis identified best practices and legal, public policy and other challenges, and opportunities for digitalisation in the health sector. Results of the projects were used by stakeholders as an input for implementing their ongoing and planned eHealth policy developments and reforms.

The total budget for the project was EUR 0.27 million, and it was financed through the ESPON 2020 cooperation programme (ESPON, 2018).

EXAMPLE 8

Welfare Technology Test Labs (VälTel): Collaboration brought smart solutions for rural healthcare in Sweden and Norway

Faced with a widely dispersed and ageing population, leaders in the healthcare sector in Jämtland Härjedalen, Sweden, and Trøndelag, Norway, turned to local businesses to develop and test new welfare technology. The VälTel project, implemented between 2016 and 2019, led to innovative developments in local healthcare services and created a valuable cross-border, cross-sector collaboration with many benefits for public health (European Commission, 2020b).

Dozens of innovations were tested across three broad issues: mobile and decentralised health solutions, safe homes and providing emergency support in sparsely populated areas. They include the evaluation of internet of things sensors to monitor disease-related parameters and lifestyle factors in home care, and developing a mobile X-ray device in a custom-made car to deliver services for frail elderly patients living in remote areas. Both these innovations have been taken up by local authorities following a successful testing phase. The project also tested commercially available Global Positioning System watches to evaluate their potential in safeguarding dementia patients. The trial of a pocket-sized ultrasound device that can detect suspected heart failure and refer patients for specialist care has been discussed in a number of scientific publications (European Commission, 2020b).

Other tests included digital bed guards, the use of robots for drug distribution and the creation of a virtual primary care emergency room, which allows a single general practitioner to serve multiple remote care centres through internet of things devices and cameras. Although not all tests were successful, they have all been educational for both the public sector and industry (European Commission, 2020b).

The consortium reported a number of indirect effects stemming from the project, such as the establishment of the eHealth centre in Östersund, Sweden, and an innovation clinic at Levanger Hospital in Norway. In addition, a formal agreement has been signed between the research and development units of Jämtland Härjedalen in Sweden and Nord Trøndelag Hospital Trust in Norway on collaboration in research, education, development and innovation in healthcare (European Commission, 2020b).

Total investment for the project Welfare Technology Test Labs was EUR 3 million, with the EU's European Regional Development Fund contribution of EUR 0.9 million through the Interreg Sweden–Norway operational programme for the 2014–20 programming period (European Commission, 2020b).

6.
Policy recommendations

APPOINT DIGITAL LEADERS AND ADD THE NECESSARY SKILLS. Appoint digital leaders to develop and oversee the implementation of digital policies across agencies that deal with healthcare provision, and engage with stakeholders and networks within and across borders. Add new roles, such as chief digital officer and chief data officer, and establish cross-disciplinary units that also coordinate the development of digital healthcare.

Increase access to healthcare by improving healthcare providers' digital literacy. Build knowledge and expertise and standardise certified online training programmes.

COMMIT POLITICALLY AND FINANCIALLY. Explicit political commitment by governments in the EU to adopting eHealth that is applicable across the Union is required. This commitment needs to be backed by sustainable co-funding for the implementation of joint digital healthcare programmes and actions for capacity building and evaluation that are aligned with transnational and national strategies and financing possibilities (EU4Health, Digital Europe, Horizon Europe, the Recovery and Resilience Facility, the European Regional Development Fund, the European Social Fund Plus and InvestEU) for healthcare and wider digitalisation objectives.

PROMOTE MULTILEVEL APPROACHES. Policy-makers, experts and stakeholders need to work closely with their counterparts within and across borders. They must seek out expertise and knowledge stored in competence centres and ecosystems and act within the framework of wider digital innovation policies. Efforts made at hospital, regional or national level alone will not be sufficient, and more consolidated and collective actions at international, national and regional levels are essential. Digital healthcare can be facilitated holistically only through system-wide strategies on multiple scales, integrated both horizontally and vertically.

INTERCONNECT eHEALTH WITH OTHER CROSS-SECTOR AND CROSS-BORDER POLICY THEMES. Link healthcare in a cross-thematic manner under the umbrella of digitalisation. By cross-fertilising policy themes that usually work separately, value-adding combinations can be identified that allow the better integration of cross-border policies by using digital development as a bridge.

Create financial instruments that mobilise investment towards digital integration. Simplify procedures and engage in extensive training and capacity building to allow the different EU funds (and financial instruments) available to healthcare providers to be deployed more effectively in a coordinated fashion through multifunded, place-based integrated development strategies that have a digital focus.

Align digital innovation policies with healthcare development policies by establishing a professionalised, specialised cross-sectoral and cross-border agency, or expert authority.

BUILD INNOVATION ECOSYSTEMS AND COMPETENCE CENTRES. Invest in the creation or reinforcement of digital innovation competence centres and ecosystems that support the local, regional, national, cross-border and transnational development of digital healthcare, such as digital innovation hubs, living labs and reference networks. Engage with a diverse set of stakeholders: healthcare providers, public sector, industry, enterprises, research organisations, civil society, citizens and patients. Provide the necessary expertise, infrastructure, support and advice for research and development, testing and piloting. Support platforms that connect the different stakeholders and ease their collaborative work, as well as oversee the management of open innovation projects, to ensure the sustainability of the effort.

NETWORK. Uplift genuine collaboration and co-development by the various stakeholders in the transformation of healthcare by supporting their networks through funding that encourages collaborative innovation. Bring local stakeholders directly into contact with their cross-border and transnational counterparts. Inspire them by involving them in study visits, workshops and meet-ups.

Work together with other stakeholders involved in healthcare provision to strengthen networks and markets within healthcare systems, foster and facilitate digital innovation roll-out, pool expertise, delegate and achieve more efficient use of public resources.

FOCUS ON PATIENTS AND FRONTLINE CARE PROVIDERS, ENGAGE WITH THEM AND EMPOWER THEM. Raise awareness on cross-border healthcare rights and promote citizen engagements with EHRs. Co-develop healthcare strategies and action plans from the bottom up, rooted in what citizens and frontline healthcare providers aspire to have, ensuring that their voices are well represented. Engage with the end users and health and care providers from the outset, not just after specific applications suddenly appear, to secure community buy-in and make healthcare transformation feel like a natural transformation rather than change imposed from on high.

Recognise the value of the data as a public good. Promote the participation of citizens in data collection and data sharing for analysis processes for the fight against diseases that require cross-border responses, such as COVID-19, or in areas that would benefit from a cross-border response (e.g. rare diseases and genome research).

ENFORCE DATA PROTECTION LEGISLATION. A fully GDPR-compliant national legislation, coordinated across Member States, that protects the privacy of health-related data held in electronic formats and addresses the individual rights of patients and their interaction with health records is necessary to safeguard citizens within and across borders. In particular, appropriate national legislation should, as a minimum, address access and ownership of patient data stored in health records, define who can access it, allow patients to restrict access if they wish, address amendments and deletions of data and ensure that patients are informed about the related risks.

Utilise new technologies to create new models of data sharing and citizen engagement. Adopt a human-centric approach to personal data such as the MyData approach.

INTEGRATE DIGITALLY, DRIVEN BY DATA, EMPHASISE (FUTURE) INTEROPERABILITY AND STANDARDISATION. A systematic approach to the adoption of eHealth standards for data exchange and interoperability needs to be taken, and a national body in each Member State must be clearly identified to govern this process. Member States are recommended to adopt the CEF building blocks, ReEIF, eHDSI and MIMs to introduce a quality management system for interoperability testing, a set of appropriate testing tools, and quality label and certification processes.

Future-proof tech deployments in the healthcare sector to ensure that they do not fall into lock-ins of potentially problematic data and technology silos and become obsolete or isolated. Healthcare providers need to ensure that their systems and data models are interoperable, by default, with new solutions and solutions that have not yet been thought of.

HIGHLIGHT SUCCESS STORIES AND SCALE UP FROM PILOTS TO GLOBAL MARKET. Scale up successful cross-border digital healthcare pilot activities that contribute to the roll out of an EU-wide digital single market through knowledge exchange and prioritised funding. Promote successful pilots in healthcare networks, in conferences and through journalists. Ensure that success is recognised and that benefits are widely shared to enable further development and spin-off projects, so that more healthcare providers can get involved.

PROMOTE JOINT PROCUREMENT. Capitalise on the procurement tools, such as PCP and PPI, to materialise EU-wide digital healthcare development. Learn and develop ways to design requests for proposals for eHealth solutions and services that are CEF-, MIM-, ReEIF- and eHDSI-compliant. Agree on a (limited) list of open standards and technical specifications with which procured digital solutions should comply. Consider data key assets both as inputs and as outputs of a solution or system. The goal must be to optimise procurement itself, that is, ensuring employees are better trained, to deploy more financial resources and offer incentives for innovative behaviour.

Capitalise on the opportunity to receive, free of charge, technical and legal assistance from the European Assistance for Innovation Procurement initiative, which supports public procurers across Europe in developing and implementing innovation procurement. This support includes assistance in PCP and PPI from local lawyers.

ESTABLISH MONITORING FRAMEWORKS. A systematic approach to the monitoring and evaluation of national and regional healthcare digitalisation efforts with EU-wide objectives needs to be implemented, taking into account the changing focus and goals of digital healthcare policies over time and the socio-contextual characteristics of each Member State.

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