Project number: 101070756
Project name: CONNECTing the dots withIN diGItal HEALTH Innovation Ecosystems
Project acronym: CONNECTINGHEALTH
Call: HORIZON-EIE-2021-CONNECT-01
Type of action: HORIZON Coordination and Support Actions

Deliverable title	Report on the three focus areas
Version number	1
Status	Final
Dissemination level	Public
Due date of deliverable	14/06/2023
Actual submission date	14/06/2023
Project officer	Silvi Serreq
Work package	WP3
Lead partner	ECHAlliance
Partner(s) contributing	PBN, SeAMK, SE
Authors	
Main author name	**Organisation**
Sagarika Gnanaolivu	SE
Nicola Watt	SE
Contributing authors	**Organisation acronym**
Adriana Diaz	ECHAlliance
Robyn Freiheit	ECHAlliance
Ines Lujan	ECHAlliance
Andy Bleaden	ECHAlliance
Klaudia Keringer	PBN
Mika Uitto	SeAMK
Sami Perälä	SeAMK
Reviewers	
Reviewer name	**Organisation acronym**
Karolina Mackiewicz	ECHAlliance

Co-funded by the European Union

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Statement of originality This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

Version Tracker

Date	Version number*	Change
06/10/2022	0.1	Creation of Template
17/10/2022	0.2	Table of content, definition of scope
20/10/2022	0.3	Creation of content
15/10/2022	0.4	Creation of T3.1 draft
08/05/2022	0.5	Content from partner SeAMK -T3.3
31/05/2022	0.6	Content from partner PBN -T3.2
01/06/2023	0.7	Finalising the draft -D3.1
04/06/2023	0.8	Coordinators review
09/06/2023	0.9	Presenting the document to the reviewer
11/06/2023	0.10	Receiving reviewers comments and incorporating them
13/06/2023	0.11	Final internal review pre-submission
14/06/2023	1	Submission

Executive Summary

The CONNECTINGHEALTH project's objective is to foster an interconnected and inclusive innovation ecosystem across Europe and to maximise the value of innovation in the digital health sector, with a long-term and sustainable vision.

The COVID-19 pandemic sparked the growth of digital health technologies across the world. However, there still is a need for greater connections and a supportive innovation ecosystem across Europe instead of countries working in silos.

This report by Scottish Enterprise, Panon Business Network and Seinäjoki University of Applied Sciences aims to be a conversation starter among stakeholders in the digital health innovation ecosystem in Europe and it also aims to create a platform for shared learning of good practices and address barriers faced.

The first focus area by Scottish Enterprise (SE) will look at the 'Health for Wealth' agenda in Scotland and how health and economic outcomes are closely linked in bringing direct and indirect economic benefits to an economy. It also points out the key to a successful health and care innovation ecosystem is where Government, Academia, the Healthcare system and Industry work effectively together comprising the "quadruple helix". This section draws out specific digital health opportunities in Precision Medicine, Personalised Medicine and FemTech in Scotland and Europe.

The second focus area by Panon Business Network (PBN) is 'from Traditional to Digital health industry' and the identification of opportunities for the transition from traditional health care and health ecosystem to a digital health ecosystem. This section draws on 15 good good practices on digital health and rehabilitation across Europe.

The third focus is on 'Supporting Health and Social care stakeholders in promoting and adopting digitalisation and new technologies in health and social care services' by Seinäjoki University of Applied Sciences (SeAMK). The study identifies stakeholder needs in promoting digitalisation in the health and social care sector, based on the experiences from the South Ostrobothnia region of Finland, and has been further expanded to cover experiences from other digital health ecosystems in Europe. A

survey was conducted across Europe which provides insight into current digitalisation support needs, barriers, main future plans and reasons for not adopting digitalisation in health and social care in Europe.

This paper provides an overview on how important digital health technology is to the health care system and to the economy. It highlights key opportunities, good practices and barriers faced in adopting digitization across Europe. It sets the stage to initiate discussion, connect and to build programmes and policies on the lessons learnt across the European health innovation ecosystem.

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List of Abbreviations

Abbreviation	Full terminology
ECHA	European Connected Health Alliance
PBN	Panon Business Network
SE	Scottish Enterprise
SeAMK	Seinäjoki University of Applied Sciences (SeAMK)
DHI	Digital Health and Care Innovation Centre

CENSIS	Centre for Excellences for Sensing, Imaging and Internet of Things
SHIP	Scottish Health & Industry Partnership Group
ILGDD	Industry Leadership Group Digital & Data
NHS	National Health Service
LSS	Life Sciences Scotland
PN	Personalised Nutrition
PM	Precision or Personalised Medicine
ANIA	Accelerated National Innovation Adoption
NSET	Scottish National Strategy for Economic Transformation
EHR	Electronic Health Records
EDIH	European Digital Innovation Hubs

1. Project Information

1.1 CONNECTINGHEALTH Project Overview

The COVID-19 pandemic changed the world and healthcare, demonstrating the potential of new solutions (e.g., the use of digital technologies and data) and the ability of health and care systems to adopt them quickly. While the crisis increased the uptake of digital solutions, it also highlighted disparities and disconnects in the implementation and design of available technologies across Europe and the need to further develop supporting innovation ecosystems.

In addition, European countries (EU, UK and others) face stiff global competition to develop and adopt new healthcare technologies, developed mostly in the US and China to the detriment of the European market and citizens. Therefore, there is a need for collaboration, innovation and investment that capitalizes on the strengths of the European continent.

In the above context, the CONNECTINGHEALTH project has the overall objective of fostering interconnected and inclusive innovation ecosystems across Europe and maximising the value of innovation in the digital health sector, with a long-term and sustainable vision.

CONNECTINGHEALTH Objectives

1. Objective 1: To map the landscape of the digital health ecosystems in Europe and beyond including their stakeholders, resources, initiatives, projects and political frameworks.
2. Objective 2: To explore the current and future opportunities for growth of the digital health sector, and its competitiveness.
3. Objective 3: To engage a wide range of stakeholders from governments, industry, academia and society in the development of the multi-year action plan for the sustainable and thriving digital health sector in Europe.

4. Objective 4: To connect and interconnect the existing regional and thematic digital health ecosystems for better cooperation, learning, exchange of best practices and wider impact.

1.2 CONNECTINGHEALTH WP3 Objectives

The Work Package (WP) 3 objectives can be summarised as follows

- To initiate and foster the discussion about the opportunities for the development of the digital health field in the selected focus areas, that are representative for the innovation ecosystems in Europe and beyond and can be generalised for the sharing and learning
- To identify good practices and success stories for the future of the digital health among the innovation ecosystem
- To share the lessons learned between the innovation ecosystems stakeholders from Europe and beyond
- To mobilise the stakeholders for future cooperative action within the diverse innovative digital health ecosystems.

CONNECTINGHEALTH is a two-year preparatory action funded by Horizon Europe. The project is led by the European Connected Health Alliance (ECHAlliance) and the main partner organisations are Scottish Enterprise (Region: Scotland), Panon Business Network (Region: Western Hungary), and Seinäjoki University of Applied Sciences (SeAMK) (Region: South Ostrobothnia in Finland). Eurosante (Region: Northern France) and Cluster Saúde de Galicia (Region: Galicia) are associated partners.

2. Deliverable Introduction

2.1 Deliverable Introduction

As the objectives of the WP3 where this deliverable belongs are: 1/ to initiate and foster the discussion about the opportunities for the development of the digital health field in the selected focus areas, that are representative for the innovation ecosystems in Europe and beyond and can be generalised for the sharing and learning, 2/ to identify good practices and success stories for the future of the digital health among the innovation ecosystems, 3/ to share the lessons learned between the innovation ecosystems stakeholders from Europe and beyond, 4/ to mobilise the stakeholders for future cooperative action within the diverse innovative digital health ecosystems, this report constitutes an important part of the body of knowledge in this area. By looking at the developments are opportunities around three themes:

1. Health for Wealth
2. From traditional to digital health industry
3. Supporting health and social care stakeholders in promoting and adopting digitalisation and new technologies in health and social care services

This report provides an opportunity to deep-dive into specific themes that are high on the agenda in different regions and countries of Europe. The learnings presented by the CONNECTINGHEALTH partners can be generalised to the other countries.

2.2 Objective and scope

The paper aims to explore the current and future opportunities for growth of the digital health sector, engage a wide range of stakeholders for a sustainable and thriving digital health sector in Europe and finally to connect the existing regional and thematic digital health ecosystems for better cooperation, learning and exchange of best practices. This will feed into the multi-year action plan (D6.1).

When it comes to the scope, the report covers the three areas described above, as well as lessons learned and conclusions.

T3.1 Focus area 1 "Health for Wealth" Lead: SCOTENT Involved partners: All [M1-M12]

This task, led by Scottish Enterprise, initiated the discussion between stakeholders from other European countries and regions around the growth opportunities through the lens of the "Health for Wealth" agenda. It built upon the work conducted in WP2 by focussing on a specific priority area ("Health for Wealth") within a single region. It began with desk research on the Scottish digital health and care landscape and was supplemented by interviews and workshops with key stakeholders across industry, academia, government and the health system as required. It serves as a "conversation starter" for the stakeholders from the other ecosystems across Europe to share their experiences with the topic and identify the opportunities for growth and collaboration.

T3.2 Focus area 2 "From traditional to digital health industry" Lead: PBN Involved partners: All [M1-M12]

This task focuses on the identification of opportunities for growth and cooperation between digital health ecosystems around the discussion on the topic led by the PNB, i.e. the transformation from the traditional to digital health industry. As the link between innovation and economic networks needs to be strengthened, and the job-cutting impact of mass production driven by increasing digitisation and automation needs to be counterbalanced, industrial transformation is a priority for the region. This task undertook field research supported by management interviews among regional economic players, production companies and chambers of commerce to reveal and map future strategies and actions planned to facilitate industrial shift. A collection of business case studies is provided to support this task to serve as guide and good practice alongside other European regions facing the same industrial challenge.

T3.3 Focus area 3 "Supporting health and social care stakeholders in promoting and adopting digitalisation and new technologies in health and social care services" Lead: SeAMK Involved partners: All [M1-M12]

This task aims at exploring how the health and social care stakeholders in the European regions can be supported to promote and adopt digitalisation and new technologies in health and social care services, especially in the times of the reform of the healthcare and social system. It is led by SeAMK and is based on the experience from the South Ostrobothnia region of Finland. A set of co-creation workshops was carried out along with stakeholders and their needs identified in the digitalisation promotion of the health and social care sector. This is compared with the experiences from the other digital health ecosystems from Finland and elsewhere in Europe. Next, the information gathered will be analysed to define and provide a group of recommendations for different stakeholders to improve the adoption of digital solutions.

A synthesis paper following this report will be released later this year highlighting the recommendations and lessons learnt from the three focus areas of SE, PBN and SeAMK.

3. Health for Wealth by Scottish Enterprise (SE)

3.1 Executive Summary

The Health for Wealth report showcases the Scottish health innovation ecosystem, how a wellbeing economy is central to Scottish policy, the opportunities and challenges in digital health and care faced in Scotland.

The report highlights key digital health opportunities in Scotland and the EU in Precision or Personalised Medicine, Personalised Nutrition and FemTech. The report further investigates digital health programmes in these key areas in other European countries and takes a closer look into the link between health policies and economic development policies.

The research for the report was compiled through desk-based research of government publications, academic journals, reports and best practices of health care ecosystems in Scotland and Europe. This was further supplemented with interviews and workshops with key stakeholders.

This report serves as a "conversation starter" for the stakeholders from ecosystems across Europe to identify opportunities for growth and collaboration.

3.2 Introduction to Health for Wealth

"Health for Wealth" is the idea that there is a mutually beneficial relationship between policy and delivery in the areas of the economy and health & care[1].

Health and care policy and delivery can be used to create wealth and improve economic outcomes. Industrial and economic development policy can be used to improve health

It has long been understood that health and economic outcomes are linked; additionally, it has been understood that improving health outcomes, and

[1] Scottish Enterprise, 2021. 2021/22 Business Plan. Referenced fromhttps://www.scottish-enterprise.com/media/4008/se-business_plan_may_2021.pdf

effectiveness and efficiency of healthcare systems can drive economic development and growth.

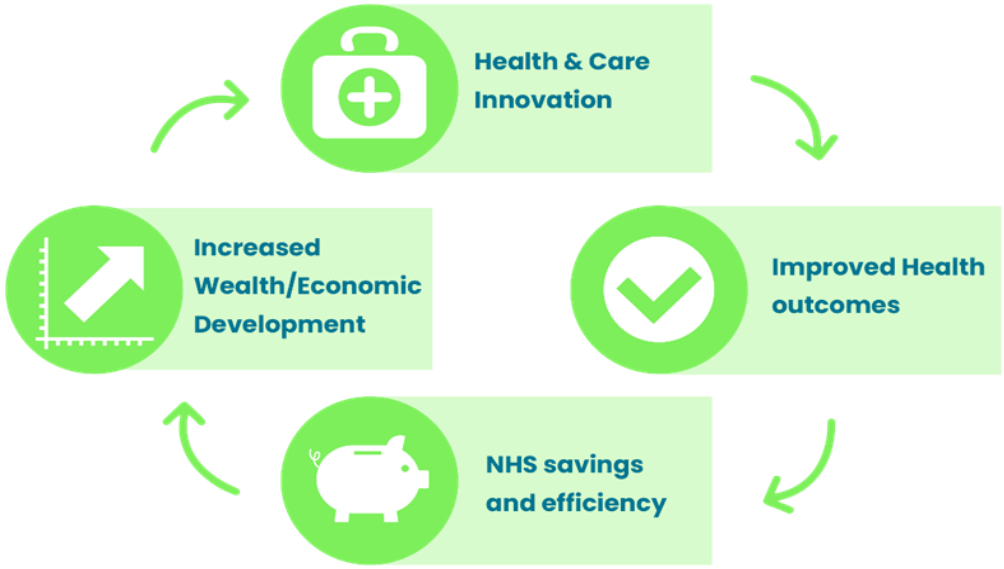

Figure 1: Virtuous Circle of Health Innovation

Economic development of a country can be enhanced by providing new health solutions, processes and paradigm shifts to local and global health and care.

Health innovation and digital technology can improve patient outcomes, reduce waiting times, reduce the burden on hospitals, and allow for patients to be more in control of their health[2] - consequently leading to cost savings for the health system. Digital Health can reduce health inequality, reduce staff absenteeism, increase productivity, efficiency and thus contribute to wider economic development. This results in a virtuous circle of events where one initiative has a beneficial effect on the next.

[2]https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2022/11/care-digital-age-delivery-plan2/documents/care-digital-age-delivery-plan-2022-23/care-digital-age-delivery-plan-2022-23/govscot%3Adocument/care-digital-age-delivery-plan-2022-23.pdf

Scottish Enterprise and the Health for Wealth National Programme

Scottish Enterprise (SE) is Scotland's economic development agency. Scottish Enterprise helps Scottish companies grow and scale with investment, innovation and increase their international competitiveness. Scottish Enterprise works with Government, Industry, local, national and International Governments.

Scottish Enterprise's 2021-22 business plan emphasises the opportunity for Scotland in the Health & Wellbeing economy. The healthcare landscape has changed massively in the last two years with COVID-19 which further emphasised that healthcare and economic development is inextricably linked. As sustainability of health and care systems is a global challenge, Scottish Enterprise recognises the global need for new health and care models more focused on prediction, prevention, personalisation and participation supported by digital technologies and data analytics.

The Health for Wealth opportunity is underpinned by the need and desire to improve the sustainability and effectiveness of health and care systems globally. The Health for Wealth opportunity is to generate wealth (economic development) by providing new solutions to satisfy local and global health and care needs.

The **vision for the Health for Wealth Programme** is: "To make Scotland a world leader in the health & care economy while enabling our citizens to live longer, healthier, lives." The two themes of the programme are:

- Building a world leading health and care innovation ecosystem that optimally links the triple helix of NHS, academia and industry and is optimised by a "once for Scotland" approach within the NHS;
- Fully exploiting the potential of digital technologies and data to transform health and care.

To seize the **Health for Wealth opportunity**, the programme leverages key Scottish strengths including:

- The National Health Service (NHS), a unified health and care system internationally recognised for its expertise and excellence supported by key assets such as extensive longitudinal patient data, and a strong infrastructure for clinical research.
- Leading research and innovation centres in digital health, medical technology, clinical research and AI such as Digital Health & Care Innovation Centre (DHI), Centre for Excellence for sensing, Imaging and Internet of Things (CENSIS), DataLab, Industrial Centre for Artificial Intelligence in Digital Diagnostic (iCAIRD), Precision Medicine Scotland Innovation Centre (PMSIC).
- Significant industry base in key relevant areas made up of digital health companies, businesses involved in precision medicine, large digital sector with transferable technologies.
- In shaping and delivering the Health for Wealth National Programme Scottish Enterprise works closely with several partners. These include NHS Scotland, the Scottish Government, Digital Health & Care Innovation Centre, the Chief Scientist Office, and the Scottish Health & Industry Partnership (SHIP) Group. Collaboration is key to attain the goals of the Health for Wealth Programme.

The Health for Wealth programme believes the future of healthcare needs to be more predictive, preventive, personalised and participatory. Optimising the health and care innovation ecosystem and fully exploiting the opportunities relating to digital health will enable this to be achieved.

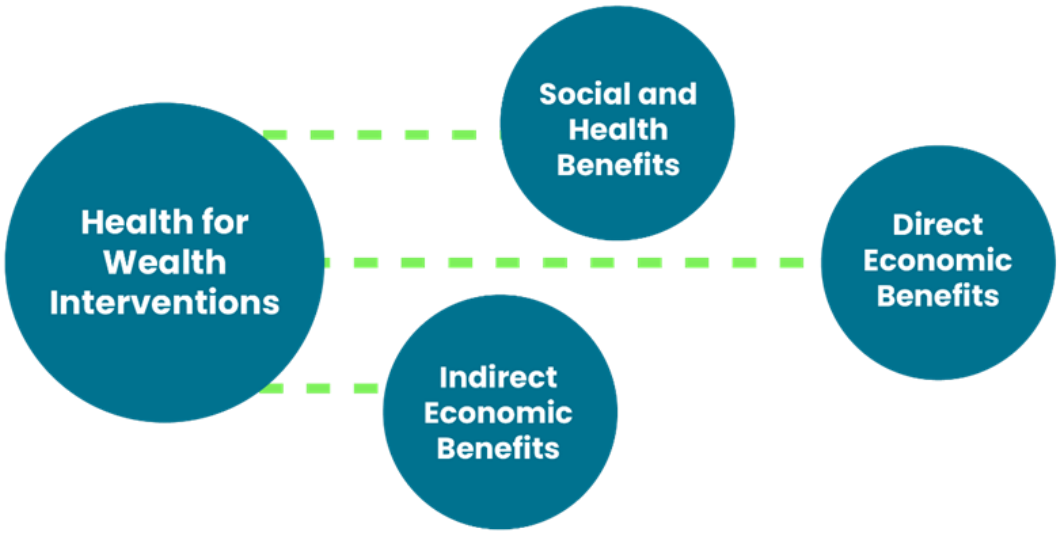

Figure 2: Health for Wealth Interventions

Direct Economic benefits

The programme related activities of SE and partners could result in the direct creation of about 2,000 jobs by the end of the programme in 2025 and the creation of between 350 – 500 additional jobs as a result of inward investment. In addition, jobs will be created to support digital health transformation within the NHS and within the digital technology sectors like communication and hardware. Considering multiplier effects, this suggests total job creation of circa 3000 - 3500 jobs in total over the duration of the programme to 2025.

- The expansion of the life sciences industry with its focus on health will positively impact pharma, medical devices, precision medicine and personalised medicine which will contribute to the life sciences sector's strategic goals of reaching £8 billion turnover by 2025[3].
- Creation of new start-up companies though health innovation will increase private investment.
- Fiscal Savings can be achieved through adoption of more efficient and effective data driven solutions and processes. Scotland will also realise significant quality

[3] Life Sciences Strategy for Scotland 2025 Vision https://www.lifesciencesscotland.com/wp-content/uploads/2017/08/Life-Sciences-Strategy-for-Scotland-2025-VisionFINALlow-res.pdf

improvements in the delivery of health and care, supporting the sustainability of the NHS.

- Increase in Gross Value Added (GVA) with the creation of new jobs.
- The Health for Wealth programme aims to help companies collaborate with the health and care system to develop and test products (test beds), demonstrating adoption as a springboard for international commercialisation.
- Improvement of the health and wellbeing of the Scottish population will increase productivity through the reduction of worklessness and sickness absence and an improvement in social inclusion.

Indirect Economic Benefits

- Reductions of CO_2 emissions will be achieved through less transportation and less wastage[4].
- Benefit to other sectors beyond life sciences: digital, construction or care sectors.

In Scotland as evidenced in Figure 3 below there is a clear link between economic policy and health policy over the years. The role of health innovation, the importance of digital health to the economy and the creation of a wellbeing economy is central to economic development.

[4] Scottish Government, 2021. Digital Health and care strategy. Retrieved from https://www.gov.scot/publications/scotlands-digital-health-care-strategy/pages/11/

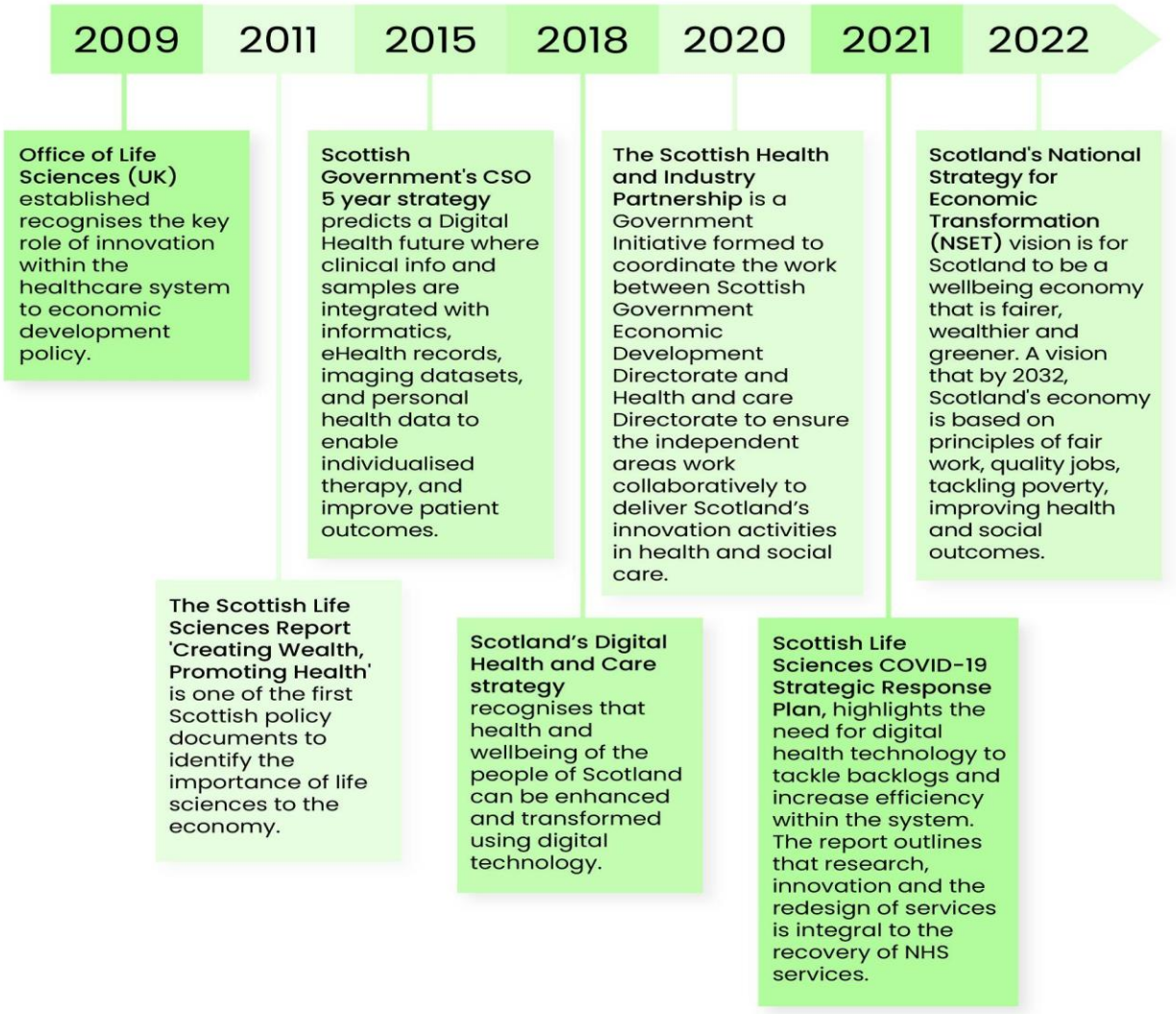

Figure 3: The links between Health Policy and Economic Policy

3.3 Scottish Health Ecosystem

As part of the Health for Wealth theme, SCOTENT are looking into the Scottish Health Innovation Ecosystem as an example to follow within nation borders and abroad in Europe, in addition to better understanding the key components that drive health innovation - further contributing to jobs and gross value added. The health innovation

sector in Scotland benefits from the 'triple helix'[5] partnership between industry, academia and health and care services. In order to fully leverage the potential of digital health, Scotland has working groups and activities with the triple helix approach that can potentially add value to the European context

Investment and time has contributed towards the NHS, industry and academia to work collaboratively to transform health and care. This structure is key to developing a thriving innovation landscape where supportive policies from the Government and where companies and the healthcare system can transition from traditional to digital health.

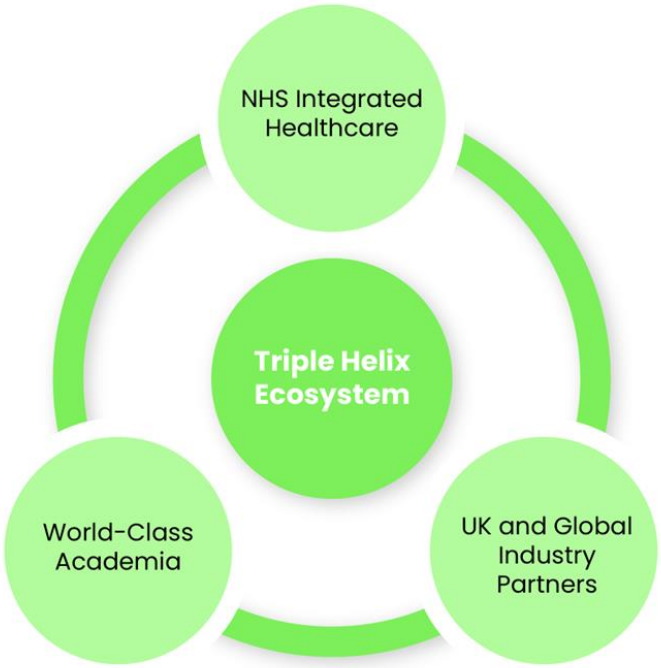

Figure 4: Triple Helix Ecosystem

The main stakeholders of the triple helix are key to Health for Wealth agenda are listed below:

[5] Scottish Government, 2021. The Campbell Report: a roadmap to investment for health innovation, life sciences and healthtech. Retrieved from https://www.gov.scot/publications/campbell-report-roadmap-investment-health-innovation-life-sciences-healthtech-scotland/pages/4/

- **Government:** Supportive policy environment that supports innovation and collaboration.
- **Clinical (NHS & Care System):** NHS Scotland is a public funded healthcare system and is one of the four systems that make up the NHS in the United Kingdom. The Scottish Government Directorate for Health and Social Care has responsibility for health policy, sets national objectives and priorities and signs delivery plans with each NHS Board. The responsibility for running the NHS in Scotland is predominantly devolved from the Scottish Government to the 14 regional Health Boards. The NHS boards plan, commission and deliver services that take care of the health of the residents within their board. Healthcare providers that adopt the latest and most effective and efficient innovations. Work with Industry partners and academia to adopt digital health solutions to improve patient outcomes.
- **Industry:** Industry that invents, commercialises, and exports new healthcare solutions.
- **Academia:** Inform, invent and commercialise new healthcare solutions both alone and in partnership with other elements of the triple helix.

Life Sciences Scotland is the Industry Leadership Group for Scotland. Its members include leaders from across the industry, government ministers, academia, trade bodies, the NHS and enterprise agencies. The aim is to create an environment that supports innovation, creates jobs, and promotes technology which helps deliver the Life Sciences Strategy.

Life Sciences Scotland Industry Leadership Group Digital & Data (ILGDD) subgroup has a focus on identifying data and digital opportunities for industry which are relevant to health and care.

DHI Scotland was started to transform innovative ideas into digital health solutions that help people in Scotland live longer and healthier lives. DHI supports the collaboration between universities, industry and the public sector.

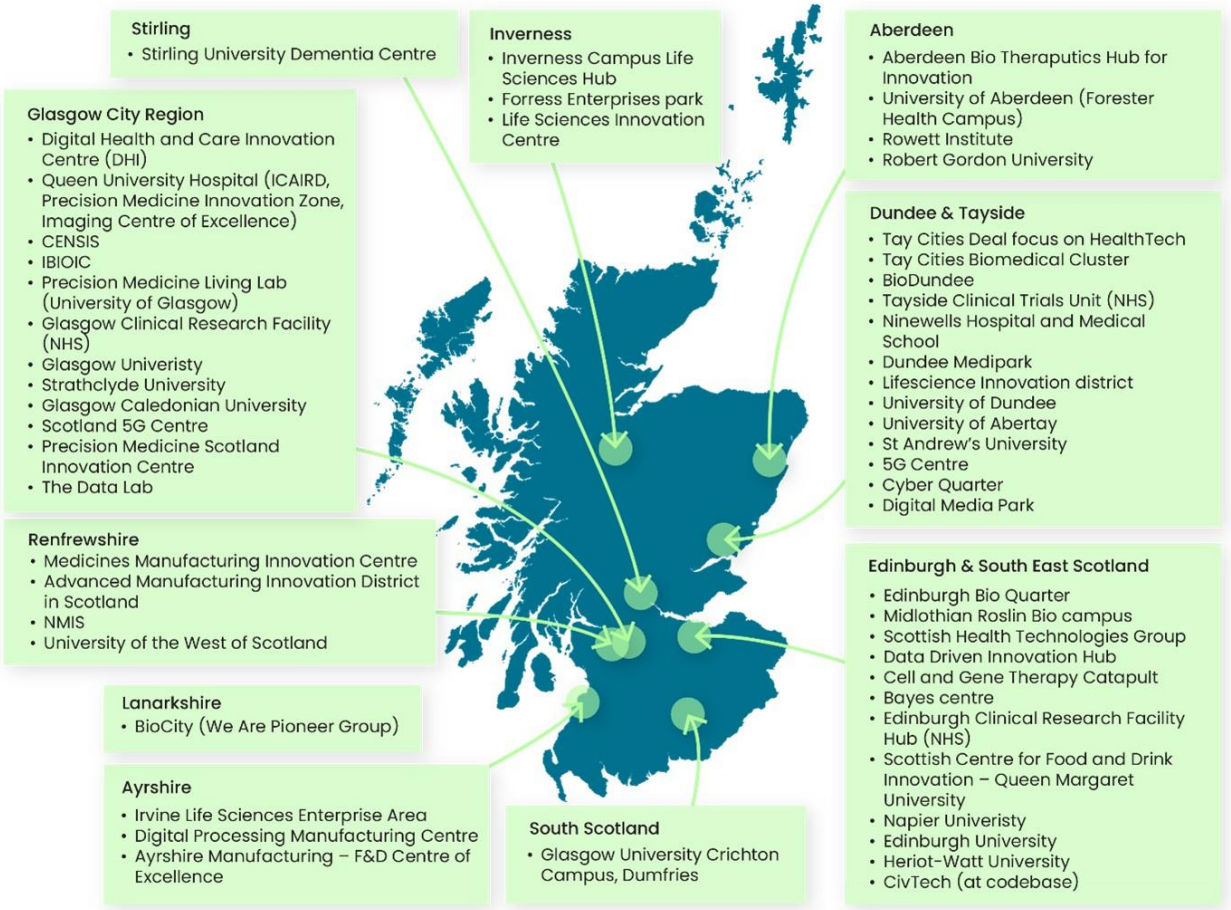

Figure 5: Health Ecosystem in Scotland

To scale innovation across NHS Health Boards: The Accelerated National Innovation Adoption (ANIA) pathway launched in June 2022 and prioritises innovations that improve patient outcomes, improve staff experience and that are financially and environmentally sustainable.

Biorepositories and clinical research facilities: NHS Research Scotland Biorepositories provide researchers with efficient access to a wide range of high-quality and well-characterised tissue from across NHS Scotland for use in research. A network of Clinical Research Facilities within Scotland provides a purpose-built environment for patient-oriented research.

Test Bed Environments: Innovation hubs in the North of Scotland, West of Scotland and Health Innovation South East Scotland help turn ideas and knowledge into products and services, leverage funding, facilitate collaboration, co-design and co-deliver with NHS, Academia and Industry.

Health data: Scotland's Community Healthcare Index (CHI) number and associated years of health and care data are a key competitive advantage in the field. Exploiting it fully could not only help companies test and validate solutions but allow data-based optimisation of health and care delivery and associated outcomes.

IoT network coverage: Almost 100% network coverage in most areas of Scotland. Coupled with the expertise of CENSIS to support secure IoT innovation, Scotland could be an excellent test bed for the development of IoT based solutions.

Data Safe Havens: NHS data safe havens are a secure environment supported by trained staff and an agreed process whereby health data is accessible to enable research while protecting the confidentiality of the data. The data remains under the control of the NHS and complies with legislative and NHS policies.

Skills: The life sciences industry is supplemented annually by 70,000 graduates and a pipeline of 17,000 with digital health expertise. A rich talent pool of health care workers-200,00 health staff and a similar number of social care staff. Over 96,000 people are currently working in digital technology and 7,000 working in digital health and care technology companies[6].

3.4 Specific Digital Health Opportunities in Scotland and Europe

An early exploration of digital health market opportunities was undertaken within the Health for Wealth agenda and in the CONNECTINGHEALTH workshops, and have yielded specific digital health opportunities in Scotland and Europe. Personalised Nutrition, Precision Medicine and FemTech have been identified as key opportunities in the global market, and are forecasted to grow and contribute to the digital health

[6]Scottish Development International. Retrieved from: https://www.sdi.co.uk/business-in-scotland/find-your-industry/health-and-life-sciences-industries/digital-health-and-care

economy overall. These are areas where Government, academia and industry need to come together to realise potential in Scotland and in Europe.

3.4.1 Personalised Nutrition

Personalised Nutrition can be defined in many ways. For this report the project team are defining it as the provision of specific dietary information, services and products focused on an individual's nutritional needs and designed to support their health and wellbeing[7].

Personalised Nutrition delivery may be through a system including apps, tests (DNA and others) and foods that enable an individual to maintain optimal health and contribute to the prevention of non-communicable dietary related diseases.

Developments in digital technologies and testing can improve accessibility and provide the information and knowledge needed to create successful customised nutritional solutions, enabling consumers to be more empowered about maintaining a healthier lifestyle, whether using wearable devices for monitoring weight, height, heart rate, and other data or taking advantage of emerging services such as genetic profiling and gut microbiome testing.

Personalised Nutrition is a rapidly growing global market – anticipated to be worth from US$ 16.6 billion to $25.5 billion by 2027[8]. COVID-19 has also accelerated demand for solutions to manage health and improve immunity from a consumer perspective at a time when advances in mass DNA testing to identify a variety of underlying conditions is becoming more accessible[9].

The personalised nutrition industry is now expanding to offer customers advanced dietary advice, lifestyle, weight loss programmes and products to help avoid long-

[7] Ordovas M Hose et al, 2018. Personalised Nutrition and Health. *BMJ* 2018;361:bmj.k2173. Retrieved from https://www.bmj.com/content/361/bmj.k2173

[8] Euromonitor International, 2020. World Market for Consumer Health.

[9] Cordina Jenny, et al.2021. How Covid-19 has changed the way how US consumers think about healthcare. Mckinsey & company. Retrieved from https://www.mckinsey.com/industries/healthcare/our-insights/how-covid-19-has-changed-the-way-us-consumers-think-about-healthcare

term issues and conditions. Technology and data systems have also evolved to support customisation and with the correct support can be a stimulus for cross-industry collaboration opportunities.

Personalised Nutrition in Scotland

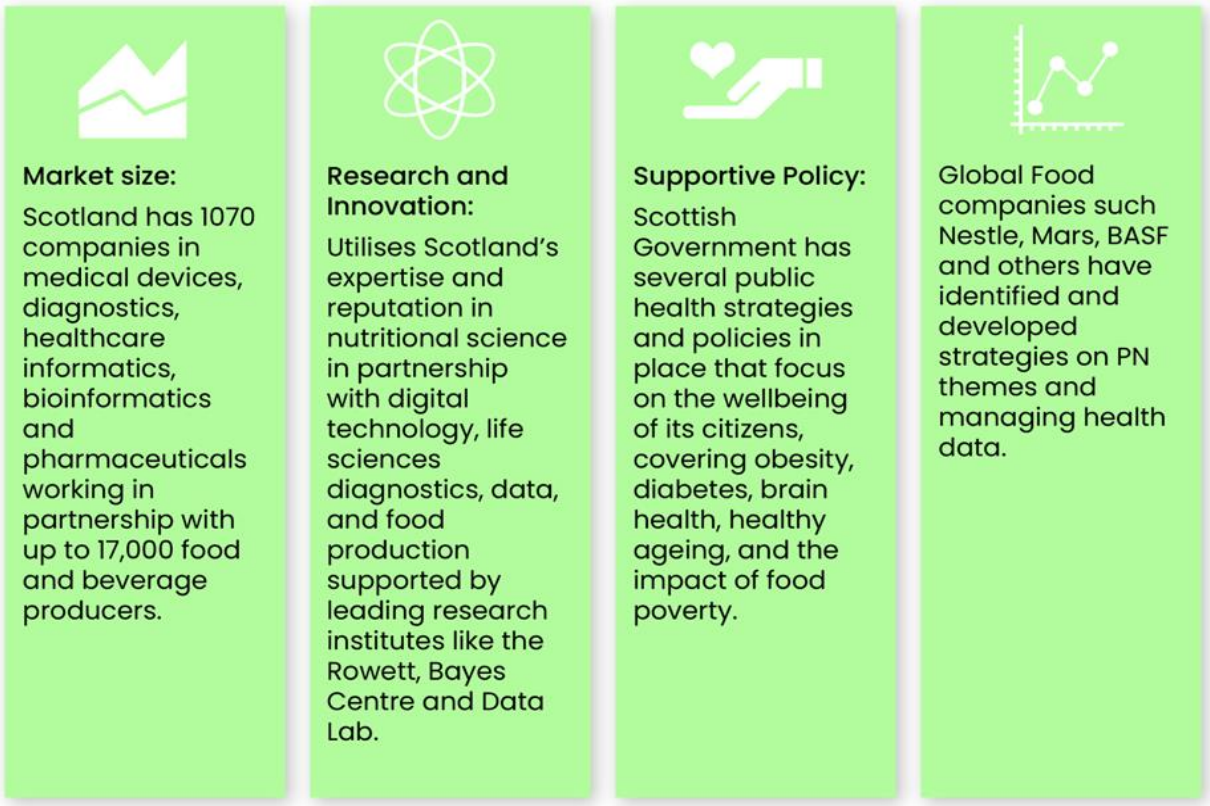

Figure 6: Opportunities in Scotland in Personalised Nutrition

Personalised Nutrition sits within the Programme 'Health for Wealth' as a major opportunity for Scotland contributing to both public health and offering commercial opportunities to businesses operating in digital media, food & beverage production, AI technology, life sciences, supported by a wealth of academic and world-class scientific research.

Within the Health for Wealth programme, personalised nutrition is recognised as a contributor to preventative health.

Scottish Enterprise's response for the need for more preventative health is expected to be rolled out during 2023 in the form of a *prevention through personalisation* project to enable a new and innovative cluster to come together to collaborate on research, innovate and develop products and services as part of the next generation of health solutions, all in response to the recognised growth market around Personalised Nutrition.

Personalised Nutrition in Europe

There are a number of examples of EU-funded projects on personalised nutrition across Europe to overcome health issues such as diabetes and obesity which can be determined by genetic testing and intestinal microbiomes.
The EU funded NUTRISHIELD project aims to create a personalised nutrition platform for young people with information from clinical trials on diabetes, obesity and information on preterm infants. Through the personalised nutrition algorithm via assistive mobile apps NUTRISHIELD provides personalised diet advice and guidance to young people. The project considers how each person responds to nutrients and food types differently based on the phenotype, genome expression, microbiome composition, heath condition as well as their financial capacity.

A four-year personalised nutrition project called Food4Me, funded by the European Commission, started in 2016 looking at the challenges and opportunities in Europe. The research found that personalised nutrition has the potential to reduce healthcare budgets but the cost of personalised nutrition to the population raises the question of affordability. The study highlighted the scope for greater public-private partnership to enhance health in society.

EIT food, Foodvalley NL and Food innovation Hub Europe have joined together to reduce obesity and malnutrition in Europe in a multi-stakeholder personalised nutrition for all challenge.

The Preventomics project uses a biomarker-based system to send personalised advice on dietary and lifestyle habits to prevent diet related diseases. The dietary plan is built on nutrition and lifestyle habits, genotype which is sent using ICT tools. The

dietary advice is in line with the European Food Safety Authority. Preventomics consortium consists of 19 partners from 7 European countries.

The EU funded project called PROTEIN started in 2018 uses personalised nutrition to mitigate, prevent and treat non-communicable diseases. The project uses data on physical activity, dietary patterns and other individual parameters to provide personalised nutrition advice through ICT based systems while ensuring privacy protection.

Additionally, a report on the Future of Food- Personalised Nutrition by Deloitte provides an overview of recent grants and incentives to accelerate the development of personalised nutrition in the EU.

Find below the market size, research and innovation and policies in place in countries in Europe in personalised nutrition.

Spain

Market size: The revenue in the Digital Health market is projected to reach US$1.94 billion in 2023[10]. According to the latest statistics published by the National Statistics Institute, INE, the turnover of the food and beverage industry in Spain amounts to €130.795 billion, which represents 23.3% of the industrial sector, 22.1% of the people employed and 19.2% of the added value. Moreover, the industry encompasses 30,573 companies, i.e. 15.6% of Spanish business[11].

Research & Innovation: Eurecat, is a private technology centre of Catalonia. The centre collaborates with the food industry to integrate food and health, biotechnology, industrial technology and digitization. Eurecat offers companies innovation and technology to respond to innovation in personalised nutrition to target consumers.

[10]Statista. Digital Health in Spain. Referenced from https://www.statista.com/outlook/dmo/digital-health/spain

[11]Invest in Spain. Referenced from: https://www.investinspain.org/content/icex-invest/en/noticias-main/2022/foodtech-spain.html

They help with the product design and formulation of foods to reduce chronic diseases such as cancer, diabetes and obesity.

Supportive Policy: IMDEA Food in Madrid is part of the Madrid Institute of Studies by the Madrid Regional Government and undertakes research into food, nutrition and health and translates the research to benefit the economy and the wellbeing of the people.

IMDEA Food has recognised the high rate of morbidity in Spain caused by chronic diseases and the onset and progress of the diseases can be curbed by nutrition. The institute looks into the science, the business and societal impact of personalised nutrition.

Health4Brain, a new project by IMDEA Food funded by the Spanish Ministry of Science and Innovation is spending US $228,168 on how personalised nutrition can impact cognitive function for the elderly. IMDEA notes that cognitive impairment is estimated to impact 18.5 percent of Spain's over-65 population. Women have significantly higher prevalence rates than men[12].

France

Market size: The revenue in the Digital Health market is projected to reach US$3.13 billion in 2023.[13] In 2018, France's agrifood industries employed 433,579 full time equivalent personnel in 15,479 companies. Those companies generated sales revenue of €198 billion[14]. The French agri-food sector is the second largest after Germany.

Research & Innovation: Eurasante' is a health cluster in Northern France (Hauts-de-France region) and is working to promote the development of the health and nutrition

[12]Nutritionist Insight, 2021. Referenced from: https://www.nutritioninsight.com/news/spain-backs-industry-partnership-on-personalized-nutrition-for-brain-health.html

[13] Statista. Digital Health in France. Referenced from https://www.statista.com/outlook/dmo/digital-health/france

[14]Ministry of Agriculture, 2021. An overview of France's Agrifood indicators Referenced from https://agriculture.gouv.fr/telecharger/126550?token=fedae6bd2159aa507c2a75fa728627e5ce420c588

sector. Eurasante' runs the national competitiveness cluster, Clubster NHL (Nutrition Health Longevity) which looks at the interface of nutrition and health at a national level, bringing together players from the agro-nutrition, biotech-pharma, hospitals, e-health, and healthy aging sectors.

The cluster has a membership of 350 members - companies, care institutions and research organisations to spark innovation, promote finance and business development. Northern France Health and nutrition ecosystem has 1100 companies employing 32,000 people, turnover of €12.5 billion in pharma, medtech and digital health. The research focuses on public health themes such as cancer, cardio-metabolic diseases, neurodegenerative pathologies and chronic bowel diseases.

The French Gut is a national collaboration on gut microbiota. The project will map the microbiota in France and study the link between gut microbiota and chronic diseases and neurodegenerative diseases. The scientific knowledge gained will help personalise nutrition and help promote innovation in diagnostics and therapies.

The Netherlands

Market size: The revenue in the Digital Health market in The Netherlands has reached US$1 billion in 2023. The agri-food sector is one of the main drivers of the Dutch economy. The sector contributes to almost 10% of the country's national income and employment. 30% of the top 40 global food and beverage companies are active in The Netherlands[15].

Research & Innovation: Wageningen University and Research (WUR) are conducting research on the relationship between nutrition and links with obesity and cardiovascular diseases. In the Netherlands, health related problems are often related to unhealthy diets and most of the public health campaigns offer a one size fits all approach.

The Personalised Nutrition & Health consortium is an initiative of TNO and Wageningen University & Research along with companies; Philips, Jumbo, FrieslandCampina,

[15] Dutch Industry. Agri & Food. Referenced from: https://dutchindustry.org/5/

Albron, Maag-Lever-Darm-Stichting (MLDS), PS in foodservice, Noldus Information Technology, SmartWithFood, Marks & Spencer, NIPED, Vital 10, BASF and OME Health. As a public-private partnership the aim is for every individual to be able to make a conscious choice to adopt an eating pattern precisely attuned to their needs.

The collaboration enables researching which technologies are needed to arrive at tailored, scientifically grounded products and services in personalised food and health advice on a large scale. The partners will then use the insights to develop apps with which people can keep a close eye on their health. The consortium has an integrated approach that is unique in the world and involves various disciplines working closely together.

In February 2022, The Wageningen University & Research started working on a new project to develop a DietBot which provides fully automated personalised dietary advice. The digital platform considers the health status, dietary habits and preferences to create a personalised nutritional plan for the person. DietBot works on modular methods to add new functionalities to increase the accuracy of data collection which will result in an AI based diet data gathering solution which then automatically generates healthier options.

Supportive Policy: The Health Council of The Netherlands Dutch dietary guidelines 2015 identifies foods that provide health benefits and reduce the risk of cardiovascular disease or type 2 diabetes[16]. The wheel of five is a recommended dietary pattern that offers Dutch foods with the best possible health benefits.

3.4.2 Precision Medicine

Precision medicine is also called personalised medicine or stratified medicine in parts of the world. In Scotland this is referred to it as Precision Medicine. However in Europe, it's most commonly referred to as Personalised Medicine. Precision Medicine is a new generation of healthcare delivery which signifies a movement away from a one-size-fits-all approach to medical care, tailoring medical diagnosis and treatment to individual characteristics of patients.

[16] Kromhout D et al, 2016. The 2015 Dutch food-based dietary guidelines. Referenced from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5399142/

The forecast for Global precision medicine market across major diseases is £102 billion by 2025[17]. The 4P model predictive, preventative, personalised and participatory medicine aims to reduce the rising costs of healthcare, improve patient outcomes and implement diagnosis and treatment strategies for the patient at the right time[18].
Future Proofing Health, is a Personalised Health index built in partnership with Roche and Copenhagen Institute of Future studies. Countries in Europe are ranked based on the health services, personalised technologies, policy context and health information. Finland is first followed by Sweden then Germany in personalised health rankings in Europe. The United Kingdom is ranked fifth.

Precision Medicine in Scotland

- The Precision Medicine Scotland Innovation Centre (PMSIC) links Scotland's expertise, data assets and delivery infrastructure to accelerate real-world adoption of precision medicine. The Living Laboratory for Precision Medicine brings together academia, industry and NHS with a focus on validation and real-world implementation of precision medicine innovations into healthcare.
- NHS Research Scotland is funded by the CSO and promotes and supports excellence in clinical and translational research. It provides access to the resources you need to successfully trial and validate precision medicine applications, for direct implementation into the NHS, including access to topic specific expertise and specialty research network groups across all therapy areas Scotland-wide.
- With access to extensive clinical data, world-leading researchers and facilities, industry partners and centres of excellence – together with direct links into the regional National Health Service (NHS) for real-world application.

[17] Frost and Sullivan –Global precision medicine growth opportunities, forecast to 2025.
[18] https://academic.oup.com/eurpub/article/32/6/844/6777816

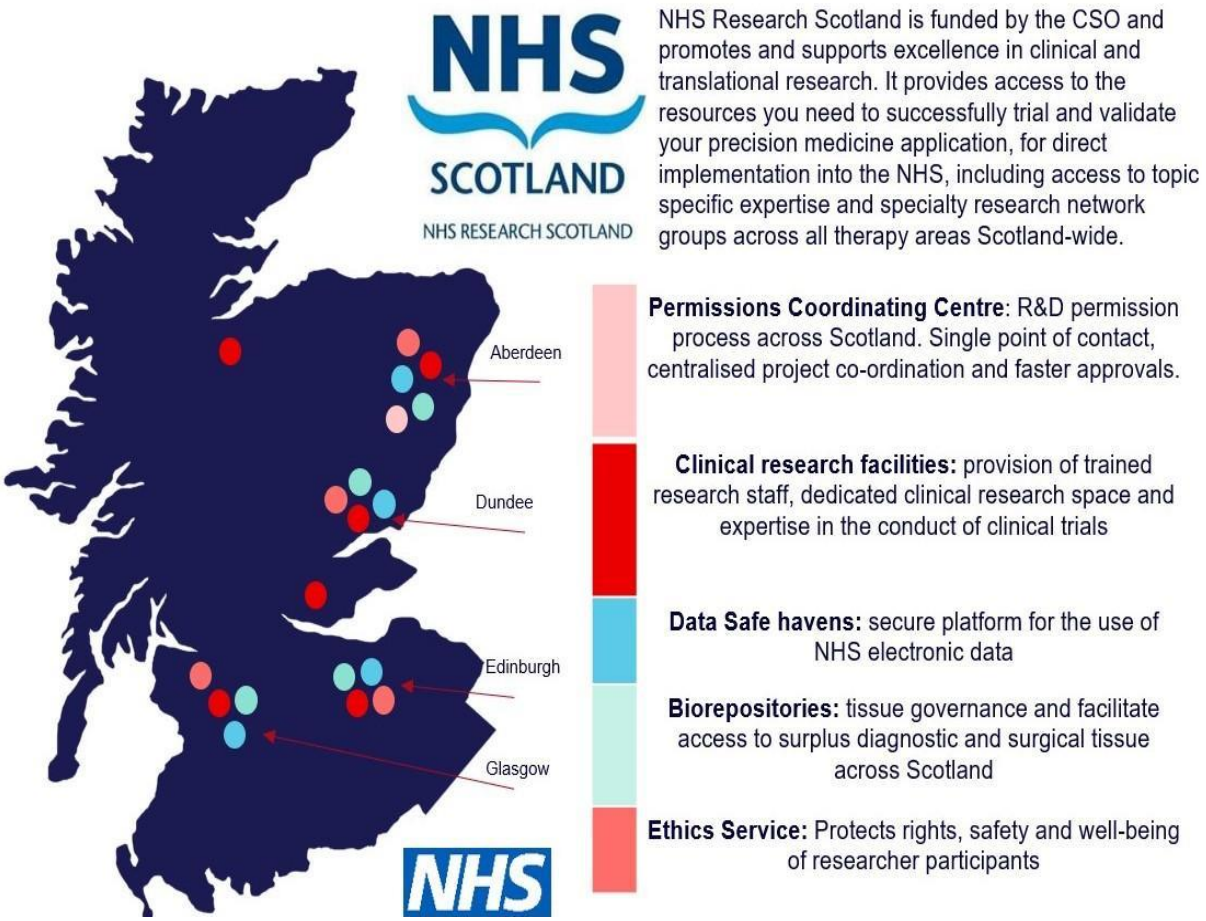

Figure 7: Precision Medicine networks across Scotland

Precision Medicine in Europe

In Europe, the European Commission have been putting in place policies and funding for the implementation of Precision Medicine from 1998[19]. In 2013, In the Commission Staff Working Document, *'Use of '-omics' technologies in the development of personalised medicine'*, noted that health care providers may be able to offer better targeted treatment, avoid medical errors and reduce adverse reactions to medicinal

[19] Beccia et al, 2022. An overview of Personalised Medicine Landscape and Policies in the European Union. European Journal of Public Health. Referenced from https://academic.oup.com/eurpub/article/32/6/844/6777816

products. The Commission considered that the pharmaceutical legislation is flexible enough to address current needs in PM and envisaged to act for the support of advancement in PM by using tools of Horizon 2020 and ongoing revisions of certain legislation.

Find below the opportunities and supportive policies in place in countries in Europe in precision medicine.

Finland

Finland is in the middle of reform, the organisation of public healthcare, social welfare and rescue services is being transformed from municipalities to wellbeing services. Finland strives to be in a leading position for personalised medicine.

Several initiatives including the International Consortium of Personalised Medicine (ICPerMed) have been established to align the vision of personalised medicine among different stakeholders, identify common research themes and to scale up international collaboration.

Opportunities in Finland in Precision Medicine

- Universal Health coverage
- Finland has established a nationwide biobank network, the Finnish Biobank Cooperative - FINBB owned by six largest hospital districts and universities in Finland.
- Findata- Health and Social data Permit Authority make data accessible, easier and secure to use.
- FinGen started in 2017 and is one of the first personalised medicine projects of its type.
- Business Finland (Finnish Government organisation for innovation funding and trade, travel and investment promotion) has a personalised health program aiming to create new business around individualized health platforms.

Supportive Policies: Through its health sector growth strategy, the Finnish Government aims to transform healthcare with the use of new technologies and

scientific research. The National Genome Centre, the Drug Development Centre, the Neurocentre Finland and FINBioBank cooperative will establish operative models and funding in personalised medicine from 2021-23.

Spain

According to the Spanish Association of Bio companies, in 2021, the percentage of launches of personalised medicine products and services increased to 52% in 2021 from 12% in 2020.[20]

Opportunities in Spain:

- The aim of the predictive medicine project in Spain is to record clinical, epidemiological and biological data to the population in Spain which can help build predictive models of disease, address health inequalities, monitor key health indicators and evaluate health policies.
- In Spain, Navarra has been one of leading regions in personalised medicine with projects in genomics, advanced medicine, workforce and infrastructure.

Supportive Policies: The Spanish Government in 2020 launched the Spanish Strategy for Personalised Medicine with funding of €77.3 million which will be coordinated by Carlos III Institute of Health (ISCII). The institute will launch three new programmes on predictive medicine, data science and genomic medicine.

[20] ASEBIO. Referenced from https://www.asebio.com/en/news-events/news/personalised-medicine-increases-its-activity-40-last-year-and-becoming-more

France

In France, scientific and technological innovation is taking place in numerous fields including big data processing, Semantic Web and the Internet of Things, medical devices, and eHealth.

Opportunities in France:

- Genomic Medicine 2025 will use the features of the French health-care system which integrate patient care, training, and research with the government plans in the fields of cancer, neurodegenerative and rare diseases.
- France is positioned as a leader among countries in personalised medicine, with the aim to export its expertise.
- 235, 000 genomes will be sequenced each year in France, primarily for cancer and rare diseases. And then the system will be expanded to cover common diseases[21].
- Hauts-de-France has set up a National Centre for Precision Medicine for Diabetes (PeriDIAB) in Lille[22].

Supportive Policies: In France to ensure fair access to genomic medicine to all patients, France is implementing a national plan-2025 France Genomic Medicine Initiative (PFMG 2025) where precision medicine is introduced to the care pathway within the national framework.

The France Genomic Medicine Plan 2025 fulfills the plans that the commission entrusted by Prime Minister Manuel Valls to Alliance Aviesan in April 2015 to investigate establishing access to genetic diagnosis in France together with a prospective review covering the first ten years. The plan responds to a public health challenge and also encourages the emergence of a national and industrial sector for genomic medicine.

Estonia

[21] Genomic Medicine France 2021. Referenced from https://sante.gouv.fr/IMG/pdf/genomic_medicine_france_2025.pdf

[22]National Centre for Precision Diabetic Medicine. Referenced from https://www.precidiab.org/en/actualite/hauts-de-france-has-set-up-a-national-center-for-precision-medicine-in-the-lille-metropolitan-area-around-the-topic-of-diabetes/

Estonia Genome Project in 2000 was one of the first countries to set up population biobanks for the use of biomarkers along with information on health records and lifestyle habits to improve the public health of the country.

Opportunities in Estonia

- Estonia is commonly known as the most digitally advanced country in the world with interlinked digital health records, patient portal, health insurance data and clinical software interface for health professionals[23]
- Strong interdisciplinary collaboration among healthcare professionals, policymakers and scientific community.
- The Estonian Government has initiated a partnership among key stakeholders to ensure personalised medicine is successfully executed and implemented in healthcare. The partnership connects the Estonian Genome Centre, Department of Computer Science at the University of Tartu, Social Ministry, Health Insurance Fund, Health and Wellbeing Technical Competence Centre, National Institute for Health Development, Clinical Guidelines Committee, the clinical community, and patient interest groups[24].
- A 30 million Euros project in 2023 led by the University of Tartu and Tartu University Hospital is set to establish a personalised medicine research and development centre of international excellence. Apart from clinical trials, the project will look at the impact of personalised medicine services on society, public health and economy[25].

Supportive Policies: The implementation of personalised medicine programme in Estonia was started by the Ministry of Social Affairs in 2016-2020 with the aim to deliver personalised health recommendation to 500,00 Estonian gene donors, target 16,000 women at risk of breast cancer and 200,000 people at the risk of heart disease.

[23] E-Estonia-Referenced from https://e-estonia.com/estonia-a-european-and-global-leader-in-the-digitalisation-of-public-services/

[24] Open Access Government 2018. Persoanlised Medicine In Estonia. Referenced from https://www.openaccessgovernment.org/personalised-medicine-estonia/55550/

[25] Science Business Network 2023, https://sciencebusiness.net/network-updates/university-tartu-received-eu30-million-develop-centre-excellence-personalised

3.4.3 FemTech

Female Health Technology (FemTech) is a subsector of the wider health technology (healthtech) market. FemTech products typically range from digital health software to technology-enabled service providers and they tend to focus on the specific health needs of women.

The article by McKinsey & Company, *The dawn of the FemTech revolution*[26], 2022 discusses the emergence of FemTech which refers to technology and innovation specifically designed for women's health and wellness. The article highlights the potential of FemTech to revolutionise the healthcare industry, given the significant unmet needs in women's health. The article explores the various areas of FemTech, including fertility, pregnancy, menstruation, sexual health and health conditions that affect women disproportionately or differently (such as osteoporosis or cardiovascular disease). The article also highlights the role of female entrepreneurs who are powering FemTech companies. More than 70% of the FemTech companies analysed had at least one female founder compared with a 20% for new companies.

According to Statista, the Global FemTech market was worth $US 51 billion worldwide. The forecast is for the global FemTech market to be $US 103 billion by 2030. FemTech companies are creating wearable wellness technology that integrates with smartphones that offer data-driven approaches for managing women's healthcare and allow women to take control of their care and health-related data. The wearables market's larger tech giants (such as Apple or Fitbit) have also been entering the market with products aimed towards personal women's health and wellness solutions[27].

FemTech in Scotland

[26]https://www.mckinsey.com/industries/healthcare/our-insights/the-dawn-of-the-femtech-revolution

[27] Frost & Sullivan Referenced from: https://insights.frost.com/gl_pr_th_mfernandez_mff7_femtech_may21

Women experiencing menopause are the fastest growing demographic in the workforce across the UK. Major challenges exist around stigma, awareness, and support – particularly in the workplace. Nearly half of menopausal women in the UK feel that menopause symptoms had a major impact on their ability to work[28].

Supportive Policies: Scotland is the first country in the UK to have a Women's Health Plan, which outlines ambitious improvement and change in areas including menopause, heart health, menstrual health including endometriosis, and sexual health[29]. The Scottish Women's Health Plan sets out 66 actions to ensure all women enjoy the best possible healthcare throughout their lives. A key area of priority for the Scottish Women's Health Plan, focuses on menopause.

The Scottish Government's recent Women's Health Plan[30] reaffirms the vast challenges facing those with menopause at work. Specific events in relation to menopause in Scotland are now becoming more commonplace. Women are 75% more likely to use digital health tools than men.

Opportunities in Scotland

- Scotland has several assets that can support the FemTech sector. These assets extend across a number of academic institutions and key companies undertaking R&D and product, process and service development. The assets include innovation support mechanisms, including testing for healthcare solutions, building on research strengths allied to the Health Service. The Data Lab is an example of this, with TDL leading on multi-partner projects such as the Cancer Innovation Challenge alongside other Innovation Centres. A lot of the data and health research and innovation activity can be pivoted to incorporate FemTech – and some activity is directly FemTech related.
- Scotland has specific expertise in wearable devices and sensor-style products and services like the Center for excellence for sensors and Imaging Systems

[28] UK Parliament, Menopause and the workplace, 2022 https://publications.parliament.uk/pa/cm5803/cmselect/cmwomeq/91/report.html#heading-2

[29] NHS Scotland Innovation Fellowships – Chief Scientist Office

[30] Scottish Government, 2021. Womens Health Plan, 2021. Referenced from https://www.gov.scot/publications/womens-health-plan/

(CENSIS). Whilst this is not directly FemTech in many instances, there would be an easy transition from general markets to FemTech focused market opportunities.

- FemTech has the potential to bring social and wellbeing benefits to Scotland. FemTech products help address traditionally overlooked women's physical needs by breaking taboos and developing solutions for example in menstruation, menopause and infertility. It therefore contributes to enhancing the health outcomes for women through better prevention, diagnostics treatment and conditions management, so addressing the gender-health gap. Supporting better health and wellbeing in women, and helping them to manage symptoms of, for example, the menopause and menstruation, then Femtech is likely to mean that fewer working days are lost to sickness absence so impacting on productivity. FemTech products can support women to breastfeed and increase the success rate which delivers health benefits to the mother and baby.

FemTech in Europe

The term FemTech was coined in 2016 when Danish CEO, Ida Tin, used the phrase "FemTech" to legitimise her work and gain investment for the development of a women's health application. Today, FemTech is a growing area with hundreds of companies moving into the market to provide a wide-range of female-centered products and applications[31].

In 2021, Europe's first accelerator programme for FemTech start ups was launched in London. FemTech Lab supports new business by taking the businesses to market and securing investment. Beauhurst in the article FemTech companies closing the gender health gap 2022 has identified top 20 FemTech startups in the UK.

Finding Endometriosis using Machine Learning (FEMale) is a EU Horizon 2020 project that uses machine learning to improve diagnosis, prevention and care in endometriosis. By collecting patient reported data of symptoms of a large random

[31] https://www.sheppardhealthlaw.com/2022/10/articles/digital-health/the-femtech-revolution/#_edn2

sample of people in reproductive age and linking it with registry based information on diagnosis of endometriosis, genetic biomarkers, mental health among other key indicators allows an early diagnosis of endometriosis with pelvic pain. It further allows shared decision making by the patient and healthcare provider and using precision medicine techniques in FemTech.

In July 2021, The European Commission under the Horizon Europe innovation ecosystem programme launched Women TechEU to support deep-tech start-ups led by women. The programme addresses the innovation gender gap and supporting women-led tech start ups at the early and riskiest stage.

Find below the supportive policies and opportunities in countries in Europe in FemTech.

Ireland

Supportive Policies: Women's Health Action Plan 2022-23 sets out women's priorities in Health and looks at key issues that women want to be addressed like faster access to specialist services, reputable sources of health information and enhanced healthcare experiences. It includes voices from women of all ages and women healthcare professionals with the aim to improve health outcomes of women in Ireland. HSE has launched a Women's health page in March 2022 to include information on mental health, pregnancy & birth, breast screening, cervical screening, sexual health and many other aspects of women's health.

Opportunities in Ireland:

- Health Innovation Hub Ireland based in Cork works along with businesses across the health sector to improve patient outcomes. The aim is to develop disruptive women's health solutions with the access to clinical, research and business expertise.
- Health Innovation Hub Ireland is supporting high potential new products, services and start-ups in FemTech. It supports female entrepreneurs and also builds a FemTech ecosystem of experts.

3.5 Conclusion of SE

Scottish Enterprise has identified the clear links between economic policy and health policy under the Health for Wealth theme and demonstrated the importance of health policy to the economic development of a country, bringing about direct and indirect benefits to the economy. These links were further brought out by the COVID-19 crisis and its impact on the global economic market.

The triple helix approach in place in Scotland between the NHS, academia and industry has required time and investment to develop and for this structure to fully leverage the potential of digital health. This model is offered as a potential example of supportive Government policies, input from industry, initiatives from academia and a health system willing to adopt digital health technologies. Various stakeholders representing the triple helix within Europe were engaged during the development of this report and are key to the innovation ecosystem in Europe and towards the multi-year action plan. For too long countries have been working in silos in digital health and there is a need for greater shared learning across key stakeholders.

The challenges faced in the working of a triple helix approach is that it takes time and resources to embed and move from traditional to digital health due to cultural barriers and stretched resources. It requires a phased approach to support the transition.

Workshops and research undertaken under the Health for Wealth agenda identified growing market opportunities in digital health are there to be seized in Personalised Nutrition, Precision or Personalised Medicine and FemTech in Europe. Many European countries are acting on this opportunity through various policies and initiatives but there is more to be done through greater collaboration across Europe. There needs to be further support from stakeholders across the European health ecosystem to move towards preventative health from a reactive approach to health. The opportunities sighted in the report will provide a base from which to explore and co-create the multi-year action plan at a larger scale.

4. From Traditional to Digital Health industry by Panon Business Network (PBN)

4.1 Executive Summary

This report focuses on the identification of opportunities and co-operations for the transition from a traditional health care and health ecosystem to the future vision for digital health ecosystems and digital health industry.

During the work on the report, PBN received a clear idea of some gaps, which made it obvious that the digital transformation in healthcare needs to be further strengthened and is lacking overall funding. As such, one of the main problems in the digital health ecosystem is the lack of funding, as many regions suffer from other disadvantages as well. The job-cutting impact of the mass digitalisation and automatisation needs to be counterbalanced, as well as the schooling and education of both the health care and social care workers needs to be a priority for the region.

In order to complete this study, the CONNECTINGHEALTH project consortium undertook field research with the help of the European and also Canadian Good practices. As a group, the consortium assembled 15 Good Practices in the focus area of rehabilitation as rehabilitation is a major focus of the health sector. Digitalisation and smart devices bring with them a wealth of new opportunities (e.g., exoskeleton, AR, VR solutions).

The traditional system of healthcare has several drawbacks, such as limited access to healthcare services, difficulty in navigating the system, and high cost. Furthermore, from past experience on projects, the lack of digital technology and data-sharing has created an inefficient system that is unable to effectively meet the needs of patients.

In response to these challenges, many healthcare organisations are turning to digital health solutions to improve patient care. Digital health technologies are enabling healthcare providers to improve care coordination, facilitate remote monitoring, and provide better access to healthcare services. Additionally, patient engagement is

becoming more important, as patients are now able to access their medical records, schedule appointments, and receive follow-up care remotely. These technologies are providing healthcare providers with the ability to deliver more personalised and effective care to patients, while also increasing the efficiency and cost-effectiveness of the healthcare system. By shifting to a digital-first approach, healthcare organisations are able to reduce administrative costs, streamline processes, and improve efficiency. The result is a healthcare system that is more cost-effective and better able to meet the needs of patients.

The healthcare industry is undergoing a major transformation from traditional to digital health. The traditional healthcare system has been largely focused on physical visits to medical offices, with limited access to digital technology and data.
However, with the rise of digital technology and the need for improved healthcare outcomes, the industry is transitioning to a digital-first approach. This shift is ushering in a new era of patient-centered care, with greater patient engagement, improved access to healthcare services, data-driven decision-making, and cost savings

Overall, the transition from traditional to digital health is an important step towards improving healthcare outcomes and reducing costs. By leveraging digital health solutions, healthcare organisations can improve patient care, reduce costs, and improve efficiency.Ultimately, this shift from traditional to digital health is revolutionizing the way healthcare is delivered and improving the quality of care for patients.

4.2 Introduction

PBN is the lead of activity T3.2 Focus area 2 “From traditional to digital health industry”, which lasted from M1-M12. This task focuses on the identification of the opportunities for growth and cooperation between digital health ecosystems and the traditional health industry.

As the link between innovation and economic networks needs to be strengthened, and the job-cutting impact of mass production driven by increasing digitisation and

automation needs to be counterbalanced, industrial transformation is a priority for the region.

4.3 Methodology

Rehabilitation is one of the key focus points in the digitalisation area, and it has many opportunities for the future such as: exoskeletons for disadvantaged people, a variety of apps for mental rehabilitation and smart solutions for senior generations to help them feel more secure.

The goal of the activity leader was to collect at least 3 Good Practices/partners from the health industry. The project consortium defined a main category "rehabilitation" and also added the following 5 sub-categories to make the field research deeper and to support the connectivity between the sub-categories.

The five sub-sectors for the rehabilitation category were defined by the project consortium to have more specific insight were:

1. **Sport rehabilitations (especially after injuries)**
2. **Senior rehabilitations**
3. **Rehabilitations after stroke**
4. **Rehabilitation for people with disability**
5. **Mental rehabilitations**

These business cases serve as a support task to guide and make the transition easier to digital health technology. It is important to highlight that other European regions are facing the same industrial challenges. European countries need to support each other and co-operate; Europe needs to gain more attention for available fundings, and good practices and education are crucial points for a successful future.

In total, 15 good practices were collected by the consortium, which was shared in a separate document due to the document length of each good practice. The diversity of the international partnership provided the opportunity to gather good practices from across the European continent, and even from Canada to gain a broad insight

into the cross-sectoral transition between traditional health and the opportunities offered by digitalisation.

As a result it is clear to the whole European region that digitalisation of this crucial sector faces many challenges and needs more relevant funding, opportunities and projects in order to improve for the future.

The timeline of the activity was long enough (nearly 11 months) to gain the knowledge and define the milestones. To guarantee the success of the activity, the project team considered it as a crucial point to involve each and every partner from the consortium, as the consortium are all coming from different countries and different backgrounds. These factors are highly important to provide a see-through and realistic document.

After the online collaborative meetings, taking into consideration the inputs and views of the partners, PBN provided a template for the consortium (see Annex 1). On the shared Google Drive for the project efforts, the activity leader PBN created a specific map for each project partner. The aim of the mapping was that the consortium did not want partners' work to get mixed before the final deadline.

While the good practices were being collected, the consortium continued to co-operate and help each other to make sure the highest quality of the final document, which is the T3.2 Focus area 2: From traditional to digital health industry.

4.4 The importance of health care and rehabilitation sector in Western Hungary[32]

Western Hungary has long been a region with immense potential for growth and development. However, this specific area has been facing challenges due to a lack of investment in infrastructure and digital transformation.

[32] Reference for the chapter: Szombathely2030 development plan.

The healthcare system in Western Hungary has been facing significant challenges in recent years, including a shortage of medical professionals, inadequate funding, and an aging population. These challenges have been further exacerbated by the COVID-19 pandemic. The current state of healthcare in Western Hungary's healthcare system is struggling to meet the needs of its population. Many of the health care and social care workers are choosing to work abroad due to the closeness of the Austrian border. The development plan for Szombathely (called as "Szombathely2030") includes structural changes towards the city's industry system focusing more on digital, smart healthcare instead of only focusing on multinational automotive related industries.

Rehabilitation is an important part of the healthcare system, and the development plan for Western Hungary is making strides to improve the quality of rehabilitation for its patients. In this aspect the project team focused mainly on active rehabilitation, sport rehabilitation, and rehabilitation after stroke, rehabilitation of the senior generation, mental health rehabilitation as well as digitalisation of senior care, and social care. The consortium's aim is the better tracking of patient progress which indicates more satisfied patients, which contributes also for better mental health.

In addition, the natural conditions and hospitals of Western Hungary make it a clear priority. In the study, the project team described in detail that several rehabilitation spas and thermal baths are available for patients in Western Hungary. These spas are visited not only by Hungarian guests but also by foreign patients (mostly European, but also individuals from Asia and North-American). Western Hungary also has several rehabilitation hospitals of international standard. There is a cardiac sanatorium in Sopron, and the University Teaching Hospital of Szombathely is particularly dedicated to post-stroke rehabilitation, not forgetting the high quality rehabilitation facilities offered by the Zalaegerszeg Hospital.

With the help of the Europe-wide good practices, the consortium would like to explore how it's possible to integrate the highest available technology into the rehabilitation sector. By leveraging technology and implementing active rehabilitation programs, improved patient outcomes, reduced healthcare costs, and amore sustainable healthcare system could occur.

Despite these challenges, there are opportunities to create a better, and a more modern healthcare system by leveraging technology in this sector. By implementing these good practices, Hungary is able to create a more sustainable region that attracts investment, fosters innovation, and promotes economic growth.
The rehabilitation of infrastructure is a key component of the plan to revitalise Western Hungary. As one example, Western Hungary is home to several thermal baths that offer a unique opportunity for stroke patients and musculoskeletal diseases to undergo rehabilitation in a relaxing and therapeutic environment. Thermal bath rehabilitation has been gaining popularity as a form of therapy for various medical conditions, including stroke, sport injuries and other health problems. We are trying to focus on these potentials as well, the concept of thermal bath rehabilitation for stroke patients, the economic potential of this therapy, and the challenges and limitations that come with it.

Thermal bath rehabilitation involves using the natural healing properties of thermal water, such as its temperature, mineral content, and buoyancy, to aid in the recovery process of stroke patients.[33] This type of therapy is often used in combination with traditional rehabilitation methods, such as physical and occupational therapy. Hungary has many of these opportunities in a close era such as Bükfürdő, Szentgotthárd.[34]

The benefits of thermal bath therapy rehabilitation are numerous[35]. The warm water can help reduce muscle stiffness and pain, improve circulation, and increase range of motion. Additionally, the mineral content of the water can have a positive effect on the skin and respiratory system. Thermal baths offer rehabilitation opportunities for several injuries and diseases, most of them with a doctor's advice are free of charge (or costs a token amount) with valid National Insurance.

[33] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4049052/
[34] https://termalonline.hu/programajanlo/a-termalfurdozes-elonyeinek-bemutatasa
[35] https://www.healthline.com/health/beauty-skin-care/thermal-water#what-is-thermal-water

It is very important to mention that Western-Hungary is a main region in the heart and cardio sanatoriums' and by this, it is natural that the nation is also focusing on the potential rehabilitation in the cardiac diseases' sector. Szombathely's hospital, named Vas County's Markusovszky University Teaching Hospital offers up-to-date technologies and provides rehabilitation opportunities after stroke. This hospital is a stroke-rehabilitation centre, which proves why PBN thinks this sector of rehabilitation is crucial for the Hungarian region. The other well-known stroke rehabilitation hospital is located in Sopron (approximately 30 minutes from Szombathely), which is also located in Western Hungary, placing itself as close as 15 minutes from the Austrian border. For this reason, Sopron's after stroke rehabilitation opportunities are not only popular in Hungary, but also for Austrian and other Western-European patients. It is crucial to point out that the after-stroke rehabilitation in these hospitals is free of charge, covered by the National Insurance.

Table 1: Summary of Good Practices

The table below describes the short summaries and important information of each good practice. For detailed description, please check the appendix.

Name of the Good Practice	**NUMANA**
Country, City	Canada, Montréal
Title of the Good Practice	Healthy lifestyle & wellbeing habits
Topic(s)	1. Sport rehabilitations 2. Rehabilitation for people with disability 3. Mental rehabilitations
Description	Luci is an app designed with the objective to help you adopt lifestyle habits known for their protective effect on the brain
Link	LUCILAB
Partner, who collected the GP	ECHA

Name of the Good Practice	**My stroke companion**
Country, City	UK, Oxford
Title of the Good Practice	My stroke companion
Topic(s)	Rehabilitation after stroke

Description	My Stroke Companion is a personalised educational package for patients living with stroke. The digital companion aims to reduce health inequalities, by connecting people with personalised health information to help them manage their condition in a way that suits them. The App was co-created and piloted by patient information specialists, Cognitant, in partnership with University College Hospitals London. Hosted on Cognitant's patient engagement platform Healthinote, the APP enables clinicians to create a bespoke information prescription based on a patient's individual needs. Visual and interactive content is individualised by the clinician through the completion of a simple checklist, selecting information relevant to a patient's type of stroke, their medication, symptoms, follow-up tests and local support services available to them. The app was developed in collaboration with patients, clinicians and the patient advisory groups To maximise accessibility, patients can learn about their condition at their preferred setting, speed, and available multilingual.
Link	LINK 1 LINK 2 LINK 3 LINK 4 LINK 5 LINK 6
Partner, who collected the GP	ECHA

Name of the Good Practice	**STROHAB**
Country, City	Dublin, Ireland
Title of the Good Practice	Timing of interventions in eXtended Reality (XR)
Topic(s)	Rehabilitation after stroke
Description	A patient should avail of a minimum of 15 hours of digital therapeutics, at a frequency that enables them to meet their rehabilitation goals, as early as possible, and as long as they are willing or able to participate while showing measurable benefit from the intervention. Heterogeneous and non-standardised physical therapy prescription with digital therapeutics and eXtended Reality (XR). Focus on evidence-based approach to report on improvement in clinically relevant outcomes including activity limitation, participation and quality of life, in the short term (post-acute: 3 months) and long-term (chronic: 6 and/or 12 months).
Link	N.A.

Partner, who collected the GP	ECHA

Name of the Good Practice	**Silver Surfer Call for projects**
Country, City	France, Loos
Title of the Good Practice	A call for projects launched in 2015 to stimulate innovation for healthy aging
Topic(s)	Senior Rehabilitation
Description	A call for projects launched in 2015 to stimulate innovation for healthy aging and to provide innovative solutions for seniors losing their independence. Support for the prototyping and testing of the solutions developed.
Link	LINK
Partner, who collected the GP	ECHA

Name of the Good Practice	**EXOSKELETON**
Country, City	Hungary, and world-wide
Title of the Good Practice	Exoskeleton
Topic(s)	Rehabilitation for people with disability Rehabilitation after stroke

Description	Exoskeleton is a load-bearing and repositioning structure, which encloses the human body. Wearable powered exoskeletons are a new and emerging technology originally developed as robots to enable persons who were completely paralyzed due to spinal cord injury to stand and walk, but more recently developed to provide sensory-guided motorized lower limb assistance to persons with gait impairments. They require the active participation of the user from the perspective of integrating postural control/balance and the locomotion pattern in real life environments whilst simultaneously providing assistance to achieve typical lower limb movement patterns in a task specific manner.
Partner, who collected the GP	PBN

Name of the Good Practice	STEPS Budapest
Country, City	Hungary, Budapest
Title of the Good Practice	STEPS Rehabilitation Centre Budapest
Topic(s)	Rehabilitation for people with disability Rehabilitation after stroke Rehabilitation for sport injuries
Description	The STEPS Centre uses new technologies to enhance patient recovery. Taking into account today's trends, they're looking for possible solutions to optimally integrate robotic devices in therapy. Without forgetting the usefulness of traditional therapy, the power of human interaction.
Link	LINK
Partner, who collected the GP	PBN

Name of the Good Practice	Brain o mix
Country, City	UK, Oxford
Title of the Good Practice	Brain o mix
Topic(s)	Rehabilitation after stroke Mental rehabilitation
Description	e-Stroke is a CE-marked collection of tools that use AI algorithms to support doctors by providing real-time interpretation of brain scans and patients to get the right treatment at the right time.
Link	LINK 1 LINK 2
Partner, who collected the GP	PBN

Name of the Good Practice	ISRAA
Country, City	Italy, Treviso
Title of the Good Practice	Social co-housing and helping the elderly generation
Topic(s)	Senior rehabilitation Rehabilitation for people with disabilities
Description	I.S.R.A.A. is an Italian public senior care provider, whose aim is to promote the highest quality of care and quality of life of older people living in their private homes, in nursing homes, in daily care centres or in smart cohousing venues. They support age-friendly environments by providing innovative knowledge and care to remain independent as much as possible despite their functional, cognitive, and social limitations.
Link	LINK 1 LINK 2
Partner, who collected the GP	PBN

Name of the Good Practice	**mPower Health & Connected Communities**
Country, City	UK
Title of the Good Practice	mPower
Topic(s)	Senior Rehabilitation

Description	mPower is a five-year project supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB), and led by NHS National Services Scotland. The project is a cross-border collaboration to support older people (age 65+) living with long-term conditions across Scotland, the Republic of Ireland, and Northern Ireland. Supported by the International Engagement Team, Programme Management Services (PgMS) colleagues collaborated with 10 other partners across multiple countries, sectors, services, and communities to enable people to take steps to live well, safely and independently in their own homes by self-managing their health and care in the community.
Link	LINK
Partner, who collected the GP	SCOTENT

Name of the Good Practice	**Big Health Sleepio**
Country, City	UK
Title of the Good Practice	Sleepio (Sleep) and Daylight (anxiety) digital therapies
Topic(s)	Mental Rehabilitation
Description	Sleepio is a clinically evidenced sleep improvement programme that is fully automated and highly personalised, using cognitive behavioural techniques to help improve poor sleep and anxiety. Daylight and Sleepio are now available to the entire Scottish Population given the partnership with the Scottish Government.
Link	LINK
Partner, who collected the GP	SCOTENT

Name of the Good Practice	**Pogo Digital Healthcare**

Country, City	UK
Title of the Good Practice	My tailored talks
Topic(s)	Rehabilitation after stroke
Description	Design and Delivery of Innovative software solutions for the healthcare sector. Innovative software Products -Tailored Talks and My Tailored Talks help clinicians to improve shared decision making and communication with patients, family members and carers after surgery stc (stroke, neurology,covid, long covid). This mobile application enables patients to receive the right information (in the form of a Tailored Talk) at the right time, forming part of an end-to-end pathway for patients with long covid and stroke.Patients are onboarded to the app by their GP, and will be prompted to answer a series of questions on their symptoms. Based on their responses to these questions, they will be offered bespoke content through the Tailored Talks platform, ensuring they are given relevant guidance to help manage their symptoms. Patients are also able to request a call back from Chest, Heart and Stroke Scotland.
Link	LINK
Partner, who collected the GP	SCOTENT

Name of the Good Practice	**Rise Nutrition**
Country, City	UK
Title of the Good Practice	Fuel to Rise Automation
Topic(s)	Sport rehabilitation

Description	Data driven nutrition to fuel performance. Rise Nutrition takes the guesswork out of fuelling your body and replaces it with cutting edge analytics to optimize athletic performance. The current business model focuses on supporting elite sports. Scheduling nutritional needs around training and performance capitalization. Their system is designed to ensure maximum performance or endurance as and when required based on the customer's programme across three themes: Dietary Analysis, Regimen Suggestions, Accountability & Monitoring.
Link	LINK
Partner, who collected the GP	SCOTENT

Name of the Good Practice	RehabWall
Country, City	Finland
Title of the Good Practice	RehabWall, a virtual reality exercise tool for multi-personal rehabilitation
Topic(s)	Sport rehabilitation Rehabilitation after stroke
Description	RehabWall is intended as a tool for multi-professional rehabilitation. The exercises have been created in collaboration with health professionals. The product utilizes Virtual Reality glasses, a balance board, a touch screen, and a motion sensor. Exercises designed for physiotherapy and occupational therapy help users strengthen their functional abilities. A health professional can monitor the customer's progress in these exercises in great detail.
Link	LINK 1 LINK 2
Partner, who collected the GP	SeAMK

Name of the Good Practice	Mentalhub.fi
Country, City	Finland
Title of the Good Practice	Mentalhub.fi
Topic(s)	Mental rehabilitation
Description	MentalHub.fi is a collection of mental health resources, including symptom scales and self-help programs that anyone can access
Link	LINK 3

Partner, who collected the GP	SeAMK

Name of the Good Practice	**HouseMate**
Country, City	Ireland
Title of the Good Practice	HouseMate
Topic(s)	Rehabilitation for people with disability
Description	HouseMate enables people with disabilities to access their smartphone and control their environment. Disabled people have great accessibility challenges in their everyday life and may require assistance with everyday tasks regarding their home-environment. HouseMate enables disabled people to independently control their smartphone and use it to operate appliances in home and work environments.
Link	LINK 1 LINK 2
Partner, who collected the GP	SeAMK

Name of the Good Practice	**Leeloo AAC App**
Country, City	Finland
Title of the Good Practice	Leeloo AAC App
Topic(s)	Rehabilitation for people with disability
Description	Leeloo is an app that helps non-verbal children communicate with their carers, teachers and friends. Leeloo is developed with the augmentative and alternative communication (AAC) and picture exchange communication system (PECS) principles.

Link	LINK 1 LINK 2 LINK 3
Partner, who collected the GP	SeAMK

Conclusion of the Good Practices

The collection of the Good Practices justifies that in recent years, rehabilitation apps have become increasingly popular to aid in the recovery process for those with physical injuries, disabilities, and mental health conditions. Most of the Good Practices that were collected are based on web or mobile apps, and these are mainly focusing on 3 key groups:

1. Mental health rehabilitation
2. Rehabilitation after stroke
3. Rehabilitation for disadvantaged people.

These apps offer a convenient and cost-effective way for individuals to access rehabilitation programs from the comfort of their own homes. However, the success rates of these apps vary greatly depending on the specific group they are targeting. The success rates are limited for APPs for the older generation, due to their limited knowledge about the smart-solutions and digitalisations.

Physical rehabilitation apps are designed to help individuals recover from injuries or disabilities that affect their mobility and physical function. These apps typically offer a range of exercises and activities that target specific areas of the body and aim to improve strength, flexibility, and range of motion. However, robotics (e.g. exoskeleton) are also a crucial factor for the rehabilitation sector. In this initiative, the project team found many robotics-based solutions, which are available for people with disabilities and could also be relevant for certain patients after having a stroke.

Overall, the consortium can say that the examined countries are currently exploring the interest of the people, and if governments, experts and involved specialists realise the need and the opportunities, they start to co-operate and develop a related platform or APP. Most of the countries reflected in the good practices (see Appendix)

realised the need of education for the silver generation and are trying to find support and funding to educate this generation in order to provide the best possible solutions for them as well.

4.5 Conclusion of PBN

The transition from traditional to digital health transmission has been a long-standing issue in the healthcare industry. The limitations of traditional healthcare delivery systems have been exposed by the COVID-19 pandemic and the pandemic has highlighted the need for healthcare systems to be more flexible and adaptable to changing circumstances.While digital health technologies have the potential to revolutionise healthcare delivery, there are still significant funding and support issues that have impeded their widespread adoption.

In this study, the consortium wanted to reflect on the fact that there is an urgent need for funding the digitalisation in the healthcare system and to support the transition towards a digital future. An important issue learned is that disadvantaged regions need more attention and support for the implementation of the digital health system and make the transmission easier.

One of the key challenges of the transition to digital health transmission is the lack of funding for the development and implementation of digital health technologies. Many healthcare organisations struggle to secure the necessary resources to invest in new digital health technologies. Additionally, there is a shortage of funding for training healthcare professionals in the use of digital health technologies. This lack of education can lead to a reluctance among healthcare professionals to adopt new technologies, which can hinder the transition to digital health transmission. Furthermore, there is insufficient support for the integration of digital health technologies into existing healthcare systems.

Through international cooperations and projects, such as CONNECTINGHEALTH, and by means of collaborative experiences amidst consortium, experts, and stakeholders, ideas and suggestions can come together to be shared which ideally makes future cooperations easier. The fact that the project team was able to collect a wide range

of successful and completed Good Practices acts as a step to help move forward towards the digitalisation era of the health industry.

5. Supporting Health and Social care stakeholders in promoting and adopting digitalisation and new technologies in health and social care services by Seinäjoki University of Applied Sciences (SeAMK)

5.1 Executive Summary

The aim of this report by Seinäjoki University of Applied Sciences (SeAMK) was to identify the stakeholder needs in promoting digitalisation in the health and social care sector, based on the experiences from the South Ostrobothnia region of Finland, and to expand and compare the results with the experiences from other digital health ecosystems in Europe. This was done by translating and conducting a survey for European digital health ecosystem representatives and comparing the results with the findings of an original study conducted in South Ostrobothnia, Finland, on social and healthcare professionals/organisations.

The report emphasised the importance of tailoring digital solutions to the unique needs of organisations and involving employees in the procurement process to ensure successful implementation. Reasons cited for slow adoption of digitalisation included financial constraints, technology and data security concerns, organisational and cultural factors, and operational challenges as reasons for the slow adoption of digitalisation. To overcome these barriers, the report suggested investing in digital health, providing training, supporting employees, prioritizing data security and interoperability, improving leadership, and fostering a culture that values digital solutions. Future plans to promote digitalisation included engaging stakeholders, improving telehealth and remote care, adopting robotics and AI-driven solutions, and implementing digitalisation strategies. In order to achieve these plans, it was recommended that efforts should have focused on improving digital skills, promoting user-friendly technologies, adopting relevant technologies, and developing coordinated strategies.

5.2 Stakeholder needs in digitalisation promotion

Digitalisation has swept through the social and health care sectors all around the globe, enabling new key possibilities for example in communication, data management and access to services. Adopting digital solutions has been seen as a great possibility to reduce costs and improve the quality of services in social and health care. Although some organisations have been able to adopt the new technologies and digital approaches with minimal difficulties, others have encountered notable barriers, challenges, and uncertainties. For example, when asked about barriers and uncertainties in adopting digital health software and platform solutions in a CONNECTINGHEALTH workshop, the project's participating stakeholders mentioned topics such as regulation, resources, integration, purchasing procedures, lack of links, inequality, attitudes, safety and reliability issues and usefulness of the technologies (Figure 8).

Figure 8: Barriers to adopting digital softwares and platform solutions

It is clear that these challenges are real and affect how digital solutions are adopted into health and social care organisations throughout Europe and beyond. However, the prevalence and magnitude of these challenges in adopting digitalisation may differ between different organisations, regions and even countries. To ensure that

organisations can effectively and efficiently use digital technologies and achieve their goals, their digitalisation support needs need to be identified.

Identifying needs in digitalisation promotion

In 2021, SeAMK approached this issue and completed a survey study on digital services and digitalisation support needs in South Ostrobothnia, Finland. A total of 124 social and health care professionals/organisations from public-, private- and third sector replied. Now, as a partner in the Horizon EU project "CONNECTINGHEALTH", the aim was to compare the experiences with other digital health ecosystems in Europe in order to provide recommendations on how to support digitalisation of stakeholders in health care. For this task, SeAMK conducted an online survey (Webropol) for representatives of digital health ecosystems in Europe in the spring of 2023 and compared the findings to the original study from South Ostrobothnia. A total of 16 representatives of digital health ecosystems from 11 European countries replied. The survey included four main themes, which were translated from the original Finnish survey study:

1. Digitalisation support needs
2. Barriers in adopting digitalisation
3. Main reasons for not adopting digital solutions
4. Main future plans regarding digitalisation

5.3 Findings

Digitalisation support needs

In the first part of the survey, the project partners asked the digital health ecosystem representatives about the significance of various digitalisation support needs for social and healthcare organisations in their area. The most significant support need identified was information on impact and effectiveness (94% perceived as significant or very significant), followed by information on cost-effectiveness (88%), support for planning new services (88%), information on the future of services (88%) and information on legislation (88%). The lowest need for support was for service design (69%) and information on risks, harms and security threats (69%). The European digital

health ecosystems rated all but one support need (information on risks, harms and security threats) as more significant than the sample from the previous study from South Ostrobothnia, Finland (Figure 9).

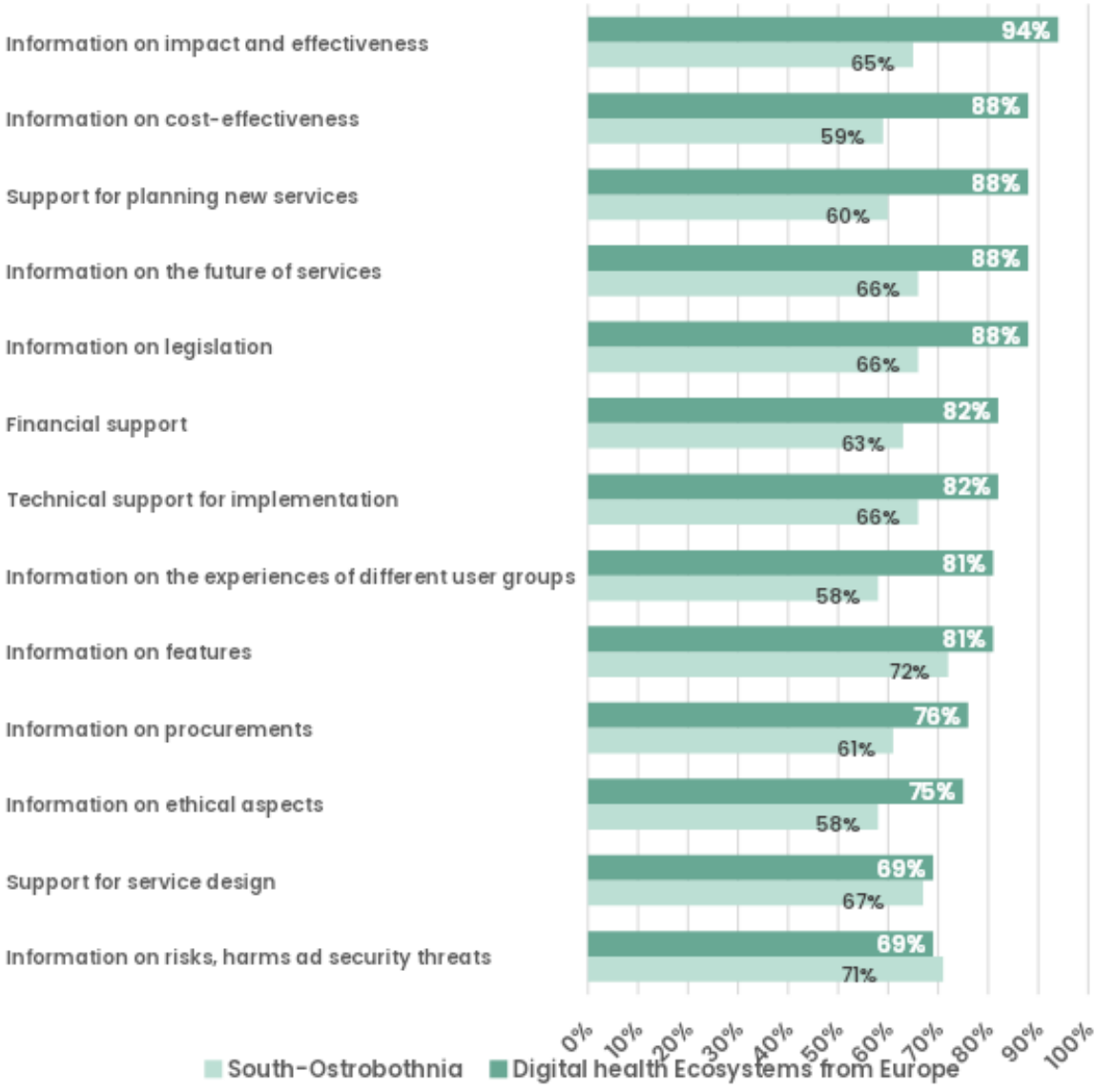

Figure 9: "Significant" or "Very significant" digitalisation support needs

Barriers in adopting digitalisation

In the next section of the survey, the project team asked representatives of the digital health ecosystem to identify the importance of the listed barriers to digitization for social and health organisations in their area. 88% of the participants rated suitability of digital services for organisation needs as `significant´ or `very significant´ barrier of digitalisation. This was followed by lacking sufficient workforce (75%) and competences of organisations (69%). In contrast, the least significant barriers for digitalisation were difficulties in finding the right experts (32%) and cost of staff training (32%). The Finnish participants from the original South Ostrobothnia study were more concerned about the costs of staff training, finding the right experts and acquisition of technologies than the digital health ecosystem representatives from Europe (Figure 10).

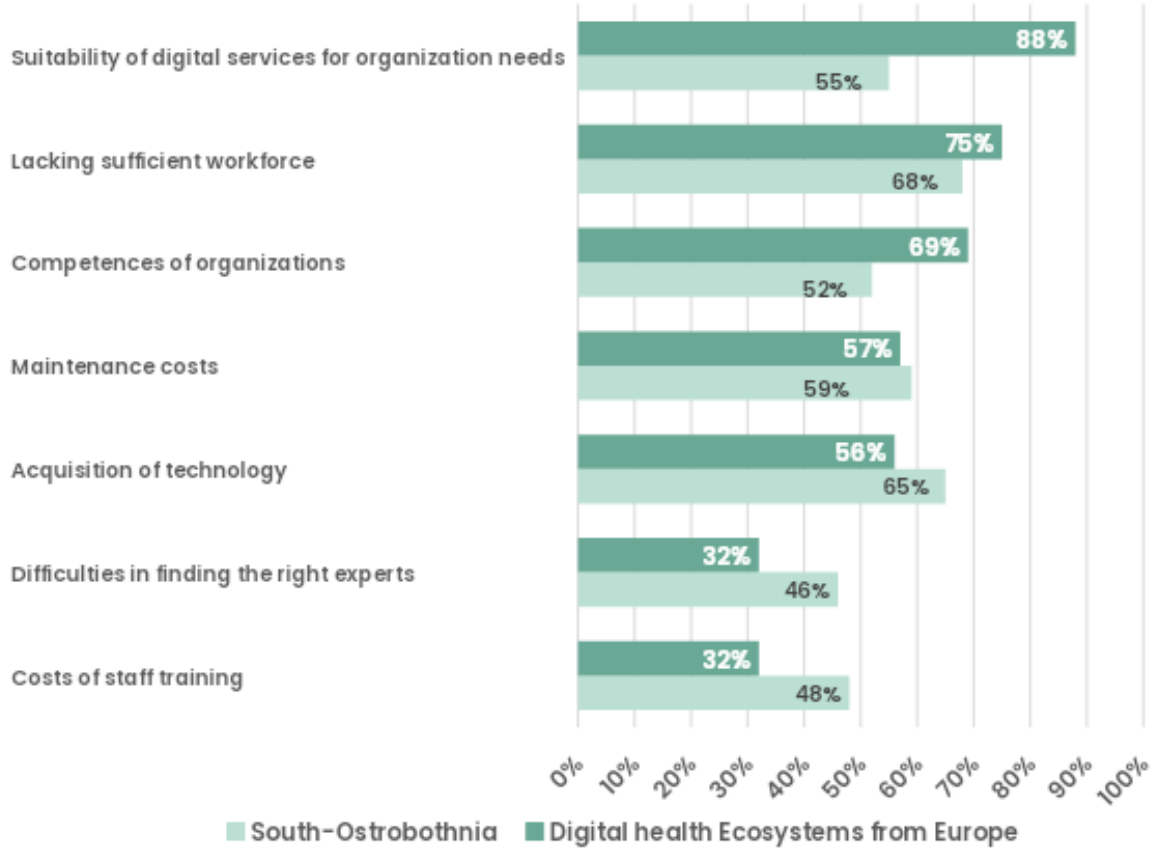

Figure 10: "Significant" or "Very significant" barriers of digitalisation

Reasons for not adopting digital solutions

In the third section of the survey, the digital health ecosystem representatives were asked to reflect on what were the main reasons for not adopting digital solutions in social & health care organisations in their area. After analysing, thematizing and synthesizing the findings from both surveys, four themes emerged (Figure 11).

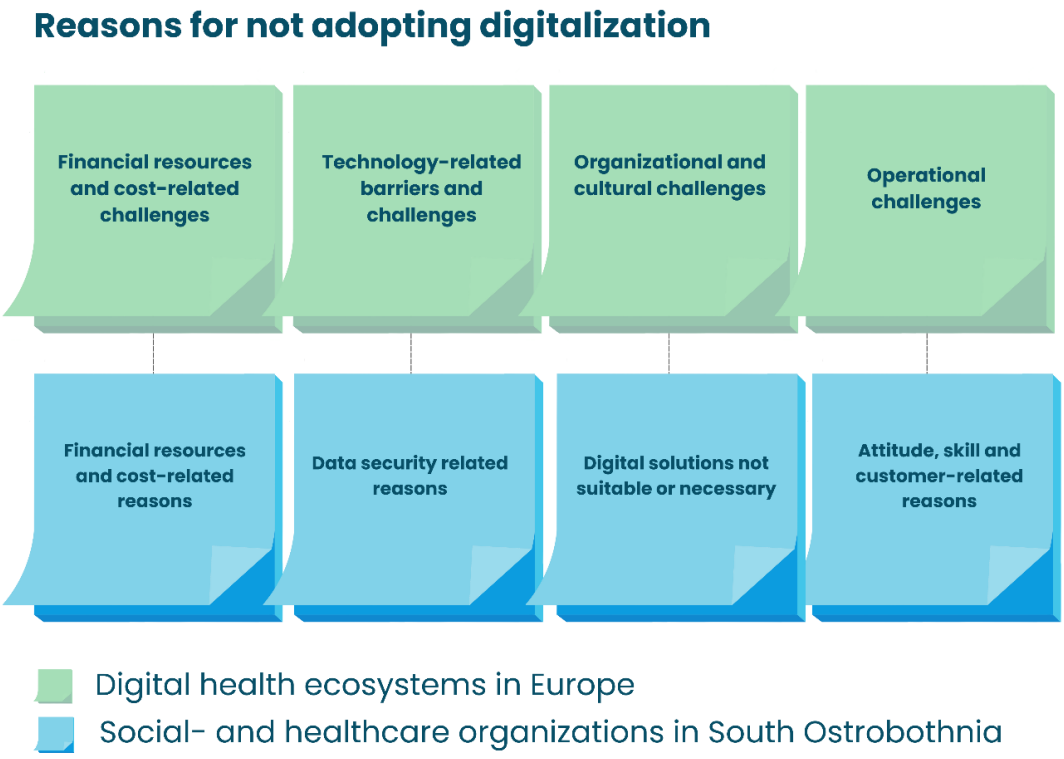

Figure 11: Reasons for not adopting digitalisation

- **Financial resources and cost-related reasons**

Participants from both the European digital health ecosystems and the organisations from South Ostrobothnia identified financial resources and cost-related reasons as significant reasons for not adopting digital solutions. Organisations are currently faced with financial constraints that limit their possibilities in investing in digital health solutions and are forced to focus on other important matters, hindering the adoption of digital solutions.

- **Technology- and data security related reasons**

Technology-related barriers and challenges in adopting digital solutions in healthcare were raised by the European digital health ecosystem participants. These included the lack of experience, digital literacy, time, implementation support, infrastructure, interoperability, and user-centred design, as well as negative attitudes, capacity issues, and differing perspectives between suppliers and public implementers. Findings from social and healthcare organisations in South Ostrobothnia extended this list by identifying data security-related issues regarding the use of technology.

- **Organisational and cultural reasons**

The European digital health ecosystem representatives identified organisational and cultural challenges as reasons for not adopting digitalisation. These reasons included lack of leadership, vision, quality of management, stakeholder dialogue, awareness, understanding benefits of digital solutions and consideration of the paradigm shift required. Additionally, local authorities not looking at best practice models, not seeing the value of nutrition in patient outcomes, and putting more expectations on the care staff were identified as key reasons for not adopting digital solutions. The findings from South Ostrobothnia also added to the list the challenge of digital solutions not always being suitable or even necessary for the organisations in different sectors or their heterogeneous target groups with different background characteristics.

- **Operational reasons**

Representatives from the European digital health ecosystems also identified operational challenges as a reason for not adopting digitalisation in healthcare. These challenges included insufficient time, the need to hurry processes, challenges in benchmarking good practices from elsewhere, and challenges in identifying key challenges and prioritizing efforts. In the South Ostrobothnia study, poor attitudes, insufficient skills, and customer-related factors were also identified as adding to the operational challenges in the field.

Views on the main future plans

In the fourth (and last) section of the survey, the digital health ecosystem representatives were asked to reflect what they see as main future plans regarding

digitalisation for social- and healthcare organisations. After analysing, thematizing and synthesizing the findings from both surveys, following themes emerged (Figure 12).

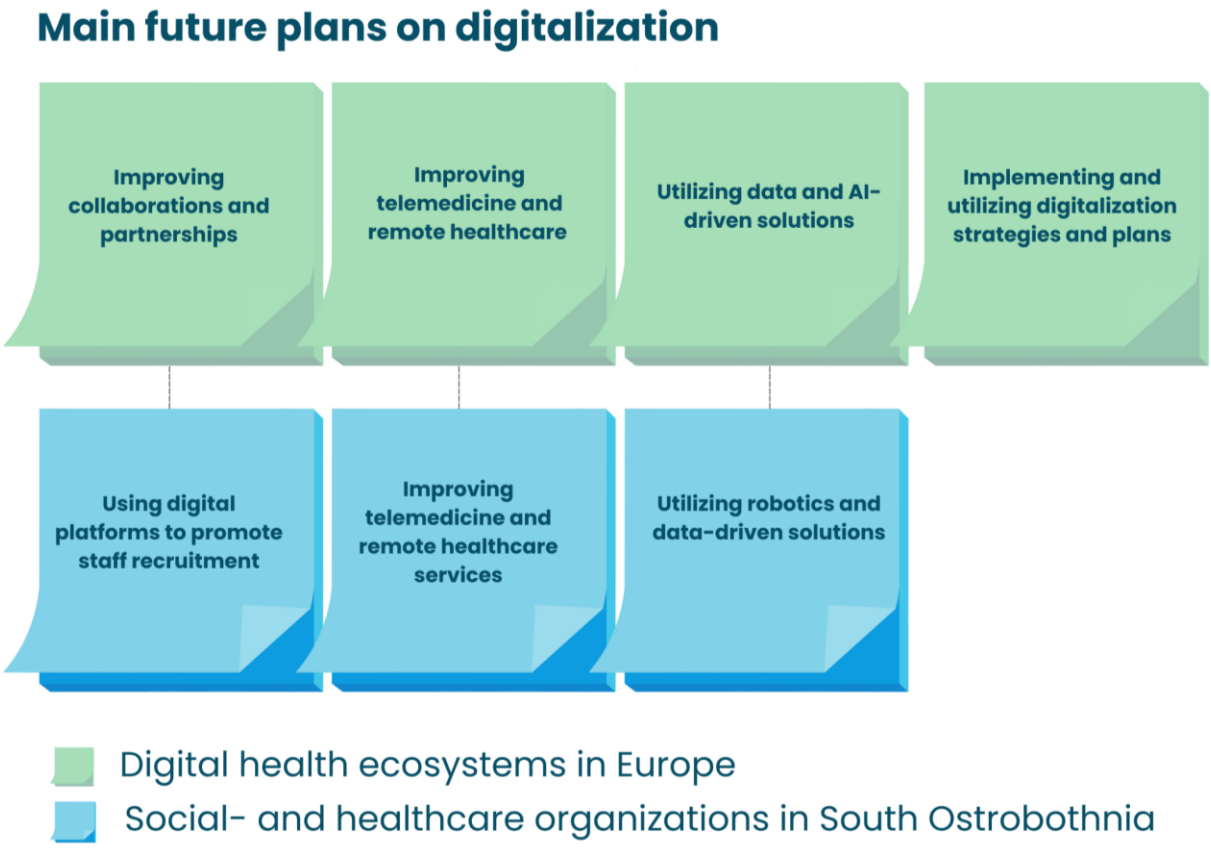

Figure 12: Main future plans on digitalisation

- **Improving stakeholder engagement and cooperation**

The digital health ecosystem representatives identified improving stakeholder engagement through collaborations and partnerships as a relevant future plan for promoting digitalisation in their area. Some of the issues raised included building innovation through international and multidisciplinary partnerships, fostering collaboration between public and private sectors, and establishing coordination and steering groups. For social and healthcare organisations in South Ostrobothnia, the main future plan for digitalisation and stakeholder engagement was the use of digital platforms to reach potential workforce and improve recruitment processes in a sector that currently lacks sufficient staff.

- **Improving telemedicine and remote healthcare**

The digital health ecosystem representatives also identified the improvement of telemedicine and remote healthcare services as a key future plan in digitalisation of social and health care. The importance of these services had been highlighted by the COVID-19 pandemic, resulting in more remote services that still were seen as necessary to expand. Promoting remote healthcare also included improving digital skills of the workforce and promoting user-friendly technology development. The organisations from South Ostrobothnia especially emphasised the need to develop intuitive digital booking systems and online communication methods.

- **Adopting robotics and data and AI-driven solutions**

The importance of data and AI-driven solutions was identified by the digital health ecosystems as key future plans. Technologies, such as electronic health records, AI and big data analytics were seen as significant future possibilities in reducing errors and improving healthcare outcomes while maintaining data security. The social and healthcare organisations from South Ostrobothnia also identified adopting medical robotics and home security technologies as relevant future plans.

- **Implementing and utilizing digitalisation strategies and plans**

The only future plan that was identified exclusively by the digital health ecosystem representatives was the implementation and utilization of digitalisation strategies and plans as a key strategy for social and healthcare organisations in their area. Some countries had already established national digital health strategies, while others were still in the process of developing them. In relation to strategies and plans, concrete actions, stakeholder coordination, and setting common success criteria were seen as important factors in facilitating effective collaboration in the future to improve digitalisation.

5.4 Conclusion of SeAMK

Overall, social and healthcare organisations and digital health ecosystem representatives identified similar challenges related to digitalisation, but with different

emphasis, depending on the organisation and context. For example, the digital health ecosystem representatives identified more overall and large-scale issues, such as strategies, whereas the organisations from South Ostrobothnia focused more on the implications of digitalisation in practice and emphasised matters such as data privacy issues more than the ecosystem representatives. In Finland, data protection and GPRS issues receive a lot of attention, even to the point of making it difficult to pilot new solutions. Based on the views of the ecosystem representatives, this is not as much the case in other European countries. In conclusion, this task provided a thorough view on current digitalisation support needs, barriers, main future plans and reasons for not adopting digitalisation in social and healthcare in Europe.

The sample size of the survey conducted on digital health ecosystem representatives included input from 16 different digital health ecosystems from 11 European countries. Because of their important role as connectors of ecosystem organisations, they were seen as representative of the views of social and healthcare organisation across their region. This approach turned out to be successful: the ecosystem representatives provided high quality input to the survey. Input from the ecosystems was well complimented by findings from the original study from South Ostrobothnia, that had 127 social and health care professionals/organisations as the participants.

The digitalisation support needs findings indicated that in order for digitalisation to be successful in the industry, organisations want to and need to better understand the benefits and potential of implementing digital solutions and understand its financial implications. Organisations may additionally require assistance in identifying and developing new digital solutions and in understanding digitalisation's role in the future of the industry and how legal and regulatory matters are to be taken into consideration.

Interestingly, regarding barriers of digitalisation, implementation-related barriers (such as staff training costs, finding the right experts, acquisition of technology, and maintenance costs) were seen as less significant than capacity and suitability-related barriers (such as suitability of digital services for organisational needs, lacking sufficient workforce, and competences of organisations) by the European digital

health ecosystem representatives. This highlights the importance of ensuring that digital solutions are tailored to the unique needs of each organisation, rather than implementing one-size-fits-all solutions that neither fit the organisation's needs nor are effective. To avoid these pitfalls, it's important to listen to the staff and involve them in the procurement process when planning the roll-out of new digital solutions. Additionally, there seems to be a need for organisations to improve their overall digital health competencies to fully leverage the potential of digitalisation.

Reasons for not adopting digitalisation in this report included financial reasons, technology and data security related reasons, organisational and cultural reasons as well as operational reasons. The high perceived cost of implementing digital health solutions and strict budgets seem to hinder the adoption of digitalisation in social and health care. Additionally, data security issues, poor useability, low skills and lacking infrastructure to adopt digital solutions can cause challenges that need to be tackled. Furthermore, poor management, not understanding the benefits of digitalisation and challenges in identifying the key challenges and prioritizing efforts can test the resilience of organisations in the digitalizing world. These findings emphasize the need to invest in digital health, provide training and support for the social and healthcare staff, prioritize data security and interoperability, improve leadership and create cultures that value digital solutions.

Several future plans were identified to promote digitalisation in the social and healthcare sector. These included improving stakeholder engagement and cooperation, improving telemedicine and remote healthcare, adopting robotics and data and AI-driven solutions, and implementing and utilizing digitalisation strategies and plans. To ensure these future plans can become a reality, efforts should be made to improve digital skills of the workers, promote user friendly technologies, adopt robotics, data-driven solutions and other technologies as applicable and to develop digital health strategies and coordination to ensure the implementation and effective collaboration in digital health.

6. Conclusion and next steps

The report highlights the importance of digital health technologies in revolutionising the way healthcare is delivered in Europe. It evidenced the need to increase efficiency, quality and cost savings in the healthcare system. The COVID-19 crisis has brought out the limitations of the traditional healthcare system and showed how economic policy and health care policy is so inextricably linked. Countries in Europe are striving for a more predictive, preventative, personalised and participatory health care system with the aim to reduce rising costs, improve patient outcomes and improve sustainability.

The report has highlighted key opportunities in precision medicine, personalised nutrition and femtech. It also looked at the innovative programmes and policies in place across Europe. The report additionally featured success stories in digital health and good practices in the rehabilitation sector across the continent.

The report also looked at the key challenges faced in Europe in adopting digitalisation. Some of the key barriers included the lack of funding, the lack of education to roll out digital health programmes, data privacy, data silos, lack of interoperability, lack of sufficient workforce, lack of personalisation of digital products to organisations needs and reluctance of healthcare professionals to use digital technologies.

This report serves as a conversation starter for stakeholders in the innovation ecosystem domain to learn from each other and mobilise efforts into a connected health ecosystem.

The next step is to identify, collect and evaluate key lessons from the three focus areas of this report and apply it to the European context. Finally, this report aims to aid the European Commission, partners, businesses and other stakeholders in developing digital health programmes and policies in Europe and beyond.

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Appendix 1 : PBN Good Practices

1. Author contact information *mandatory field	
Name of the Organisation	NUMANA
Your organisation *mandatory field	
Country	CANADA
Region	Québec
City	Montréal

2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No	
If not, who are the other organisations in charge of the good practice?	LUCILAB (the digital solution)	
Location of the organisation in charge:	*Country*	CANADA
	Region	Québec
	City	Montréal
3. Good practice general information *mandatory field		
Title of the practice	Healthy lifestyle & wellbeing habits	
Topic (Please select the relevant topic)	1. Sport rehabilitations (specially after injuries) 2. Rehabilitation for people with disability 3. Mental rehabilitations	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	Luci is an app designed with the objective to help you adopt lifestyle habits known for their protective effect on the brain.

Detailed information on the practice (max. 1000 characters)	*Please see:* https://lucilab.ca/en/app/
Resources needed *not mandatory field!	*The team:* https://lucilab.ca/en/team/ The funding is around 8 million CDN$
Timescale (start and end date)	Started in 2020 end date 2024
Key achievements (evidence of success)	Changing your lifestyle is a long-term commitment that requires the right support. LUCI's team knowledge and great listening skills allows to guide the individual throughout his or her's change process. Over 1000 users so far.
Keywords to your good practice	Digital prevention prescription, platform

1. Author contact information *mandatory field		
Name of the Organisation	Cognitant Group Ltd	
Your organisation *mandatory field		
Country	UK	
Region	Oxfordshire	
City	Oxford	

2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	Yes, Cognitant led the work with NHS's hyper-acute stroke unit (HASU) at University College London Hospitals (UCLH) as advisors.	
Location of the organisation in charge:	*Country*	UK
	Region	London
	City	London
3. Good practice general information *mandatory field		

Title of the practice	My stroke companion – a personalised digital support for stroke survivors
Topic **(Please select the relevant topic)**	1. Sport rehabilitations (specially after injuries) 2. Senior rehabilitations 3. **Rehabilitations after stroke** ✓ 4. Rehabilitation for people with disability 5. Mental rehabilitations

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	My Stroke Companion is a personalised educational package for patients living with stroke. The digital companion aims to reduce health inequalities, by connecting people with personalised health information to help them manage their condition in a way that suits them. My Stroke Companion was co-created and piloted by patient information specialists, Cognitant, in partnership with University College Hospitals London. Hosted on Cognitant's patient engagement platform Healthinote, the companion enables clinicians to create a bespoke billioninformation prescription based on a patient's individual needs. Visual and interactive content is individualised by the clinician through the completion of a simple checklist, selecting information relevant to a patient's type of stroke, their medication, symptoms, follow-up tests and local support services available to them. My Stroke Companion was developed in collaboration with patients, clinicians and the patient advisory groups The Stroke Association, Headway and Different Strokes. To maximise accessibility, patients can learn about their condition at their preferred setting, speed, and language, including Urdu, Punjabi, Polish and Nepalese, which are the most widely spoken languages in the UK after English.
Detailed information on the practice **(max. 1000 characters)**	Please provide information on the practice itself. In particular: • What is the problem addressed and the context which triggered the introduction of the practice? • How does the practice reach its objectives and how it is implemented? • Who are the main stakeholders and beneficiaries of the practice? ***What is the problem addressed and the context which triggered the introduction of the practice?*** Globally, stroke is one of the most common causes of death. In 2019, 6.6 million people die from cerebrovascular disease worldwide, and more than 100,000 strokes were recorded each year in the UK. That is around one stroke every five minutes, making it the fourth biggest

killer in the UK [1]. The economic impact of this is vast, burdening health care services as well as other sectors in society. Costs of stroke have been recently estimated in the UK at around £26 billion per year [2].

There are approximately 1.3 million stroke survivors in the UK and many more family members living with the sudden, unplanned and life-changing consequences of stroke [3]. Despite significant global progress in prevention, treatment and rehabilitation of stroke, patients and their families often face challenges navigating life after a stroke, in part due to a paucity of accessible information. Cognitant's 'My Stroke Companion' serves as a digital support package (DSP) that supports the population, clinicians and healthcare systems to reduce the challenges presented and generate better care outcomes.

The hyper-acute stroke unit (HASU) at University College London Hospitals (UCLH) sought to **improve the support given to stroke survivors**, with the aim of empowering patients, their families and carers **with information pertinent** to what happened when the stroke occurred, as well as what to expect throughout their rehabilitation and how to manage their health and reduce the risk of secondary stroke in the future.

Currently, most patients have access to general information about strokes that are non-specific, non-local, not tailored to their specific concerns, their ethnicity or social background and not from a trusted source. Recognising the complexity of strokes due to the different types and causes, the wide range of treatments and rehabilitation available, and the diverse patient demographic, UCLH were hoping to provide health information in a personalised way that fills the gap in available information.

UCLH also hoped to deliver efficiency savings through the provision of information that could be consumed virtually in the comfort of a patient's home rather than in the clinic setting, increasing medication adherence, and reducing unexpected hospitalization following discharge.

How does the practice reach its objectives and how it is implemented?

Cognitant worked in partnership with UCLH to develop a digital support package called 'My Stroke Companion'. The digital support package is live on the Healthinote platform, containing tailored

	information bespoke to each stroke survivor discharged from the UCLH HASU. My Stroke Companion meets the following objectives: 1 - To improve the support given to stroke survivors, with the aim of empowering patients, their families and carers with information pertinent to them: 'My Stroke Companion' enables clinicians to create a bespoke and personalised information prescription based on a patient's individual needs. It is personalised by clinicians through the completion of a simple checklist on Healthinote, selecting information relevant to their patient. This includes the type of stroke they have had, rehab or treatments recommended, medicines prescribed, conditions relating to stroke, follow-up tests and contact details of their stroke team. When submitted, the checklist automatically populates a cover letter (which can be reviewed/checked and input into the patient's electronic health record). The clinician can then send this via email, SMS, or present a QR code to their patient. 2 – To provide the personalised information in a way that it can be consumed virtually in the comfort of a patient's home: The patient can access 'My Stroke Companion' with their unique information prescription content via the Healthinote platform, on smartphones, tablets or desktop. The companion can be used to ensure that patients and their support networks have access to relevant and reliable information outside of the hospital setting. 3 – to support health equity through culturally and linguistically adapted content Patients can learn about their conditions from trusted sources that are culturally adapted and translated to support the UK population in a more equitable way. Patients can consume the information at their preferred setting, speed, and language, including Hindi, Bengali, Polish, Turkish and Gujarati. 4 – to demonstrate appropriate engagement with key information, to support patient's knowledge pertinent to appropriate self-management Information prescriptions have been issued by clinicians to patients over a 2-month period, and patients were able to share with family

members and carers as appropriate. During that period, 127 users accessed 'My Stroke Companion' 233 times (showing an engagement rate of 1.8 visits per user). Users viewed over 6 pages each, spending nearly 14 minutes navigating around 'My Stroke Companion' and engaging with key content relevant to their stroke and care plan. Independent evaluation completed by Candesic demonstrated that 'My Stoke Companion' has been deemed to be acceptable by patients and family members and fills a gap in the market.

Who are the main stakeholders and beneficiaries of the practice?

Stroke patients and their families and caregivers benefit from 'My Stroke Companion's' provision of information that can be consumed virtually in the comfort of their own home rather than in the clinic setting, improving their understanding for better self-management.

Clinicians benefit from the ability to seamlessly provide health information in a personalised way that fills the gap in available information and acts as an adjunct to the consultation, hence saving their time in explaining information which is critical improving patient outcome.

The NHS benefit from improvements in consultation efficiency and improved health outcomes thanks to improved patient understanding of their health and treatment, leading to better self-management, increased medication adherence, and reduced unexpected hospitalisation following discharge. The fact that the information can be consumed outside of the hospital setting, supports a model of virtual care.

References

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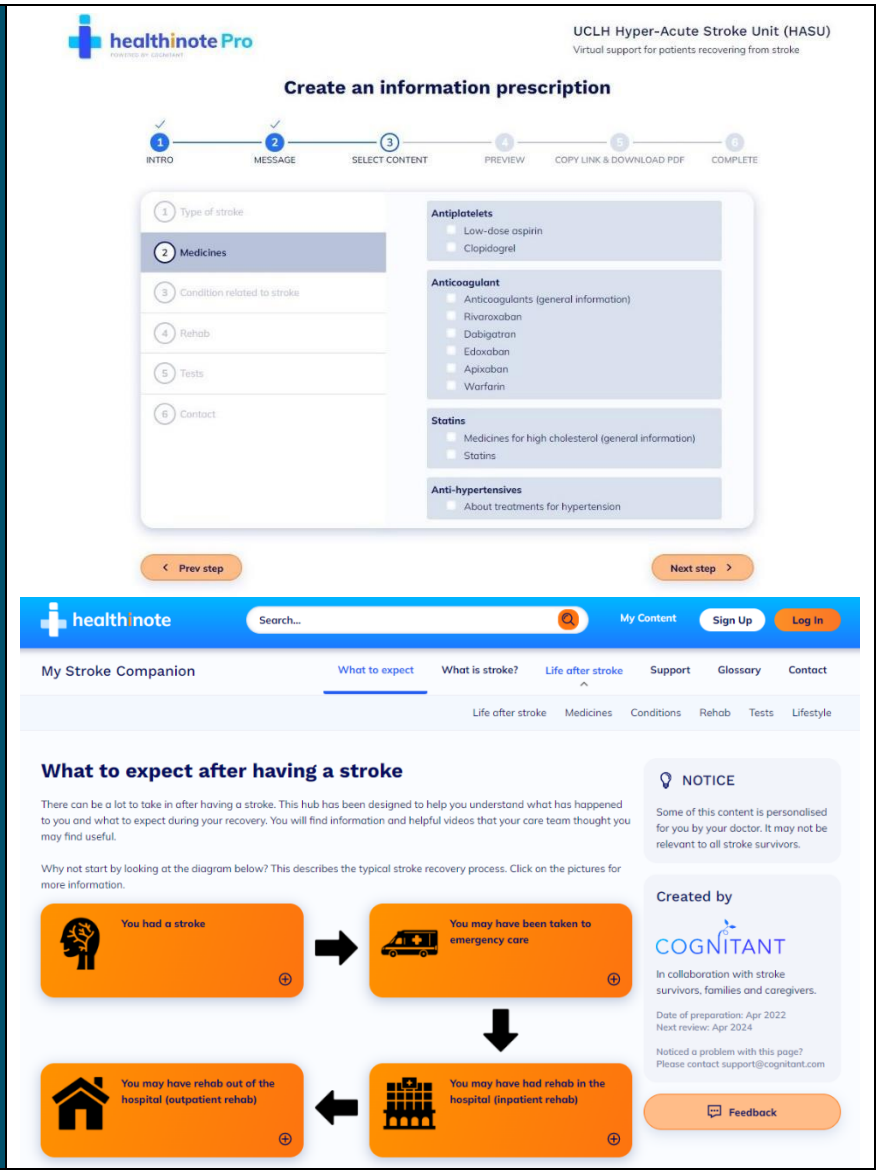
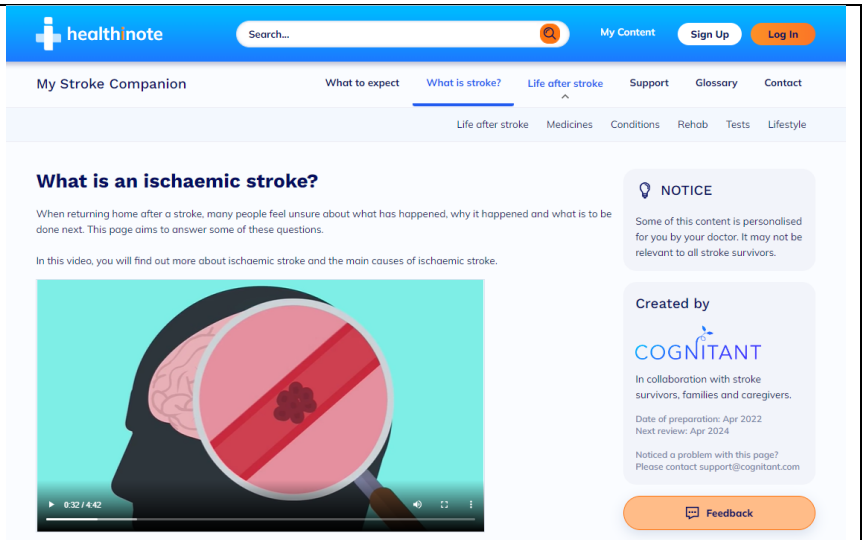
[2] Stroke Association. Current, future and avoidable costs of stroke in the UK. Available at: https://www.stroke.org.uk/sites/default/files/costs_of_stroke_in_the_uk_report_- executive_summary_part_2.pdf. Assessed July 2002

[3] Stroke Association, Stroke Statistics, stroke.org.uk/what-is-stroke/stroke-statistics

Resources needed *not mandatory field!	Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.
Timescale (start and end date)	My Stroke Companion launched in December 2022, marking the start of a year-long trial ending in December 2023
Key achievements (evidence of success)	Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results). Results of the trial so far have been very positive. Information prescriptions have been issued by clinicians to patients over a 2-month period, and patients were able to share with family members and carers as appropriate. During that period, 127 users have accessed 'My Stroke Companion' 233 times (showing an engagement rate of 1.8 visits per user). Users viewed over 6 pages each, spending nearly 14 minutes navigating around 'My Stroke Companion' and engaging with key content relevant to their stroke and care plan. Independent evaluation completed by Candesic demonstrated that 'My Stoke Companion' has been deemed to be acceptable by patients and family members and fills a gap in the market. A user (patient) of My Stroke Companion said that it is "A useful central repository of information that is great as it stopped (us) having to google lots of things and trying to figure it all out"
Further information: *Link to further information on the case study can be found*	Case Studies Archive - Cognitant Digital Health Building Better Healthcare Health Tech Digital SR Times Health Tech World

Visual presentation:
Image (2000px wide recommended) and/or video



	
Keywords to your good practice	*e.g.: wearable robotics, platform, health care robotics, software developments etc.* stroke, stroke patient, patient education, stroke education, patient recovery, health equity, patient centricity, patient empowerment, patient cocreation
Optional part	
Challenges and lessons learned	[300 characters] Please specify any challenges encountered/lessons learned during the implementation of the practice. A number of necessary improvements are being developed to ensure the tool is integrated easily into the stroke pathway: • Prescribing of the hub (personalising the hub via an online tool and providing a link to each patient in their discharge summary) requires integration with the clinical system to streamline the process • A more efficient way of recording the information prescription into the patient health record is required to ensure the full MDT have access to what information the patient has received, to ensure coordination of care and continuity in education • Future improvements should include the ability to update the personalisation as a patient progresses through the pathway and their recovery, ensuring information is always up to date (reminders)
Further information	Any other relevant information about your good practice, which could be useful for others

The design approach:

The project started with a 6-week intensive discovery phase to understand the unmet needs of stroke survivors and their caregivers and family members. Desk research was conducted to understand the current information landscape and to identify gaps in the current information base. Clinicians, patients and their family members were also consulted throughout the design phase via focus groups, 1:1 interviews and surveys to ensure that the resource was built on a solid evidence-base of lived experience and helped to meet information needs.

The co-creation process concluded the following needs for 'My Stroke Companion':

- Minimalist, easy-to-use layout to cater for people who may have pre-existing or acquired reading or learning difficulties
- Personalised information, relating to:
    - type of stroke and post-stroke symptoms
    - what to expect following discharge
    - rehabilitation and guidance on healthy lifestyles
    - medication and tests that patients may undergo (such as MRI)
    - local support groups and hospital contact information

A 3-month development period followed to develop the personalised, interactive 'companion' of information tailored to each person's stroke and their medication and rehabilitation plan. These include explainer videos and visual content to help users fully understand and memorise information. Links to further support organisations and contact details of the medical teams are also provided to help meet additional patient queries and advice around lifestyle changes (such as quitting smoking).

Plans for future development:

Following a successful pilot, UCLH with Cognitant plan to expand My Stroke Companion to cover additional topics such as TIAs, personalised risk factors for further stroke, more holistic support such as returning to work, applying for benefits and managing personal relationships.

	Future improvements also include updating personalization as patient progresses through recovery, and adding features such as reminders and push notifications. The Phase 2 project will be set across a 12-month period, 500 patients will be recruited including 300 patients from UCLH and 50 patients from four new regions. Participant consultation, formal user testing, the ongoing collection engagement metrics, and an openness to improve, will enable us to iteratively develop a solution that is acceptable to stroke survivors and those supporting them.

1. Author contact information *mandatory field	
Name of the Organisation	STROHAB, University College Dublin
Your organisation *mandatory field	
Country	Ireland
Region	Dublin 4
City	Dublin

2. Organisation in charge of the good practice *mandatory field	
3. Good practice general information *mandatory field	
Title of the practice	Timing of interventions in eXtended Reality (XR)
Topic **(Please select the relevant topic)**	1. Rehabilitations after stroke

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	A patient should avail of minimum of 15 hours of digital therapeutics, at a frequency that enables them to meet their rehabilitation goals, as early as possible, and as long as they are willing or able to participate while showing measurable benefit from the intervention.
Detailed information on the practice **(max. 1000 characters)**	Please provide information on the practice itself. In particular: • What is the problem addressed and the context which triggered the introduction of the practice? Heterogeneous and non-standardised physical therapy prescription with digital therapeutics and eXtended Reality (XR). • How does the practice reach its objectives and how it is implemented?

	Focus on evidence-based approach to report on improvement in clinically relevant outcomes including activity limitation, participation and quality of life, in the short term (post-acute: 3 months) and long-term (chronic: 6 and/or 12 months). • Who are the main stakeholders and beneficiaries of the practice? Healthcare providers, prescribers, physicians, allied therapists and private health insurance.
Resources needed *not mandatory field!	Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.
Timescale (start and end date)	From development through to the product lifecycle.
Key achievements (evidence of success)	Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results). For a statistically significant efficacious improvement in motor performance.
Further information: *Link to further information on the case study can be found*	1. Laver KE, Lange B, George S, Deutsch JE, Saposnik G, Crotty M. Virtual reality for stroke rehabilitation. Cochrane database of systematic reviews. 2017(11). 2. Turner-Stokes L, Pick A, Nair A, Disler PB, Wade DT. Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. Cochrane Database Syst Rev. 2015;2015(12):CD004170. Published 2015 Dec 22. doi:10.1002/14651858.CD004170.pub3
Visual presentation: *Image (2000px wide recommended) and/or video*	
Keywords to your good practice	Stroke rehabilitation, stroke, extended reality, virtual reality, augmented reality, digital therapeutics.

5. Good practice general information *mandatory field	
Title of the practice	***Aphasia-friendly communication***

Topic **(Please select the relevant topic)**	2. Rehabilitations after stroke 3. Rehabilitation for people with disability.

6. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	A patient should be dynamically assessed, stratified and be served with aphasia-friendly content, at a capacity that enables them to engage meaningfully with digital interfaces, to maximise the benefits of interventions or educational material provided, with regards to receptive and expressive language and communication.
Detailed information on the practice **(max. 1000 characters)**	Please provide information on the practice itself. In particular: • What is the problem addressed and the context which triggered the introduction of the practice? Aphasia is a language disorder after a stroke that affects your ability to communicate. 1 in 3 patients are affected after a stroke. Aphasia interferes and causes difficulty for patients with reading, writing, spelling, comprehension and expression or the ability to speak. How does the practice reach its objectives and how it is implemented? By following guiding principles and design recommendations from the medical literature and iterative assessment of impact on comprehension for people with aphasia. • *Who are the main stakeholders and beneficiaries of the practice?* *Digital Health Providers, Healthcare providers, prescribers, physician, allied therapists and private health insurance.*
Resources needed *not mandatory field!	Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.
Timescale (start and end date)	From development through to product lifecycle.
Key achievements (evidence of success)	*Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* To maximise outcome measures for usability, acceptability, self-management, engagement, adherence and persistence of digital health solutions**.**
Further information: *Link to further information on the case study can be found*	Rose T, Worrall L, McKenna K. The effectiveness of aphasia-friendly principles for printed health education materials for people with aphasia following stroke. Aphasiology. 2003 Jan 1;17(10):947-63. Rose, T.A., Worrall, L.E., Hickson, L.M. and Hoffmann, T.C., 2012. Guiding principles for printed education materials: Design preferences of people

	with aphasia. *International Journal of Speech-Language Pathology*, *14*(1), pp.11-23. Rose TA, Worrall LE, Hickson LM, Hoffmann TC. Exploring the use of graphics in written health information for people with aphasia. Aphasiology. 2011 Dec 1;25(12):1579-99. Association UK S. Making information accessible for people with aphasia Accessible Information Guidelines [Internet]. 2012 Jul. Available from: https://www.stroke.org.uk/sites/default/files/accessible_information_guidelines.pdf1_.pdf
Visual presentation: *Image (2000px wide recommended) and/or video*	
Keywords to your good practice	Stroke, aphasia, user interface, user experience, accessibility, disability, language difficulties, digital health.

1. Author contact information *mandatory field	
Name of the Organisation	Eurasanté
Your organisation *mandatory field	
Country	France
Region	Hauts-de-France
City	Loos

2. Organisation in charge of the good practice *mandatory field	
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	Eurasanté
3. Good practice general information *mandatory field	

Title of the practice	Silver Surfer Call for projects
Topic **(Please select the relevant topic)**	Senior rehabilitations

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	A call for projects launched in 2015 to stimulate innovation for healthy ageing and to provide innovative solutions for seniors losing their independence. Support for the prototyping and testing of the solutions developed.
Detailed information on the practice **(max. 1000 characters)**	The Hauts-de-France region currently has 920,000 seniors (65 years and older), or 13% of the regional population. With an estimated growth rate of 1.4%/year, by 2050 the region will be home to 1.6 million senior people, i.e. 25% of the population of the territory. A key challenge in the Silver Economy industry is to develop adequate products. Through the Silver Surfer calls, we contribute to bridging the gap between the needs of older people and the innovations developed by companies, start-ups and health professionals, by giving them the chance to experiment and co-construct their products with end-users. At the same time, the developed products and services contribute to improving the life of older adults. They can access innovations that they contributed to develop and that enable them to stay autonomous or live longer at home. The partners of the last edition are: - The Hauts-de-France Region, - the Nord Department, - the European Metropolis of Lille, - Carsat Hauts-de-France (pension funds) - Bpifrance
Resources needed *not mandatory field!	
Timescale (start and end date)	Every year since 2015
Key achievements (evidence of success)	Key figures for the 8 editions of Silver Surfer: • +170 applications received • 45 proofs of concept funded for an amount of €360,000 • 27 final winners supported in the development of their product or service • 28 thematics related to the challenges of aging
Further information: *Link to further information on the case study can be found*	https://www.eurasante.com/appel-a-projet/silver-surfer

Visual presentation: *Image (2000px wide recommended) and/or videeo*	SILVER SURFER https://www.youtube.com/watch?v=5nrFO8thSc0
Keywords to your good practice	*e.g.: silver economy, call for projects, testing, experimentation*

1. Author contact information *mandatory field	
Name of the Organisation	PBN
Your organisation *mandatory field	
Country	Hungary
Region	Western Hungary, Vas County
City	Szombathely

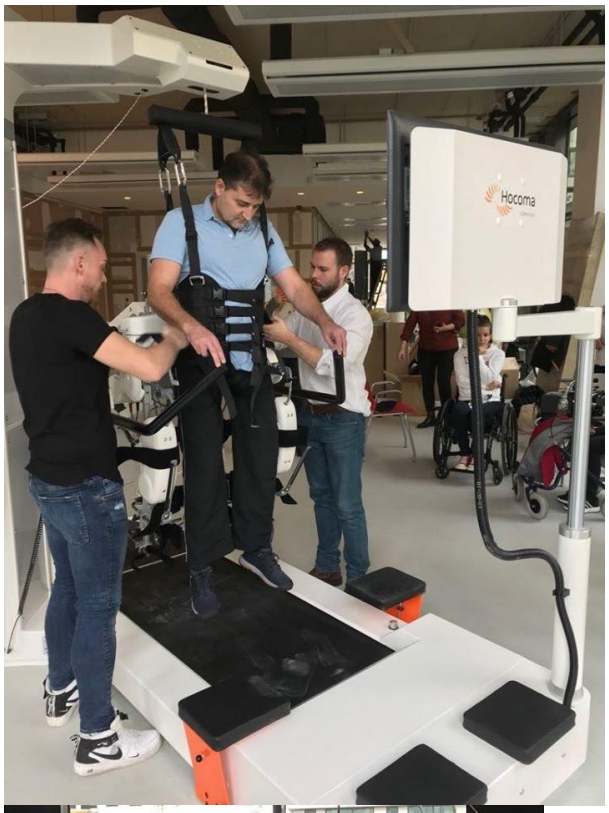
2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No	
If not, who are the other organisations in charge of the good practice?	Steps Rehabilitation Center, Budapest	
Location of the organisation in charge:	*Country*	Hungary
	Region	Budapest
	City	Budapest (District IX.)

3. Good practice general information *mandatory field	
Title of the practice	Steps Rehabilitation Center in Budapest
Topic **(Please select the relevant topic)**	1. **Sport rehabilitations (specially after injuries)** 2. Senior rehabilitations 3. Rehabilitations after stroke 4. **Rehabilitation for people with disability** 5. Mental rehabilitations

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	The STEPS Centre uses new technologies to enhance patient recovery.Taking into account today's trends, they'ree looking for possible solutions to optimally integrate robotic devices in therapy.Without forgetting the usefulness of traditional therapy,the power of human interaction.
Detailed information on the practice **(max. 1000 characters)**	A robot-assisted rehabilitation programme is a form of care that requires the collaborative work of multiple health professions. With the help of appropriately trained professionals, the goal of robot-assisted neurorehabilitation is to identify new ways of combining neuroscience with rehabilitation to make a patient's daily life easier. Major groups of neurorehabilitation diseases include stroke, cerebral palsy, spinal cord injuries, multiple sclerosis, traumatic brain injuries, degenerative brain diseases, individuals with severe brain injury, amputees, musculoskeletal disabilities and other neuromuscular conditions.The need for rehabilitation is essential for people with disabilities/limitations. This is where the advances in robot-assisted therapies made possible by the latest technology fit in. Robot therapy devices available at the STEPS Rehabilitation Centre: 1. Lokomat PRO 3D 2. Andago 3. Armeo Senso 4. Armeo Spring 5. Tyrmotion Amadeo 6. Tyrmotion Station Pablo 7. Tyrmotion Timo
Resources needed *not mandatory field!	No information about the development costs, staff is approximately 7 qualified persons

Timescale (start and end date)	No information
Key achievements (evidence of success)	Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).
Further information: *Link to further information on the case study can be found*	https://stepsbudapest.com/

Visual presentation:
Image (2000px wide recommended) and/or video



Keywords to your good practice	wearable robotics, health care robotics, rehabilitation robotics center.
Optional part	
Further information	https://stepsbudapest.com/

1. Author contact information *mandatory field	
Name of the Organisation	PBN
Your organisation *mandatory field	
Country	Hungary
Region	Western Hungary, Vas county

City	Szombathely

2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No	
If not, who are the other organisations in charge of the good practice?	Brainomix	
Location of the organisation in charge:	*Country*	United Kingdom
	Region	Oxfordshire
	City	Oxford
3. Good practice general information *mandatory field		
Title of the practice	Brainomix -eStroke software	
Topic (Please select the relevant topic)	1. Sport rehabilitations (specially after injuries) 2. Senior rehabilitations **3. Rehabilitations after stroke** 4. Rehabilitation for people with disability **5. Mental rehabilitations**	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	e-Stroke is a CE-marked collection of tools that use AI algorithms to support doctors by providing real-time interpretation of brain scans and patients to get the right treatment in the right time.

Detailed information on the practice **(max. 1000 characters)**	The platform provides real-time interpretation of brain scans to specialist and non-specialists, in order to guide treatment and transfer decisions for stroke patients, allowing more patients to get the right treatment at the right time.It includes a mobile app that doctors can use to share brain scans securely with specialists at other hospitals, for example if a second opinion is sought. A study presented at the World Stroke Congress last year showed that implementation of e-Stroke reduced door-in-door-out (DIDO) times by more than an hour,and tripled the number of stroke patients achieving functional independence. Expansion of the Good Practice: The platform is already deployed in many hospitals across the UK, in Europe,Asia USA.The tool – which is backed by funding from the EU – will be deployed across all 28 stroke centres in Hungary as part of a national push to improve the care of stroke patients.It follows an earlier EU grant that funded the installation of e-Stroke in 10 hospitals in and around the Hungarian city of Pécs.
Timescale (start and end date)	2022-ongoing project
Key achievements (evidence of success)	A study presented at the 13th World Stroke Congress found that the implementation of e-Stroke reduced door-in-door-out (DIDO) times by >1 hour, and tripled the number of stroke patients achieving functional independence.
Further information: *Link to further information on the case study can be found*	https://pharmaphorum.com/news/hungary-will-deploy-brainomix-ai-stroke-software-nationwide https://www.brainomix.com/stroke/
Visual presentation: *Image (2000px wide recommended) and/or video*	https://vimeo.com/569491934 https://vimeo.com/639165909 https://vimeo.com/651583144
Keywords to your good practice	software developments, stroke awareness, raising awareness, stroke prevention

1. **Author contact information** *mandatory field	
Name of the Organisation	PBN
Your organisation *mandatory field	

Country	*Hungary*
Region	*Vas*
City	*Szombathely*

2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No	
If not, who are the other organisations in charge of the good practice?	ISRAA	
Location of the organisation in charge:	*Country*	*Treviso*
	Region	*Italy*
	City	*Treviso*
3. Good practice general information *mandatory field		
Title of the practice	Social co-housing and helping the elderly generation	
Topic (Please select the relevant topic)	1. Sport rehabilitations (specially after injuries) **2. Senior rehabilitations** 3. Rehabilitations after stroke **4. Rehabilitation for people with disability** 5. Mental rehabilitations	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	I.S.R.A.A. is an Italian public senior care provider,whose aim is to promote the highest quality of care and quality of life of older people living in their private homes, in nursing homes, in daily care centers or in smart cohousing venues. They support age-friendly environments

	by providing innovative knowledge and care to remain independent as much as possible despite of their functional, cognitive and social limitations.
Detailed information on the practice **(max. 1000 characters)**	I.S.R.A.A. is an Italian public senior care provider,whose aim is to promote the highest quality of care and quality of life of older people living in their private homes, in nursing homes, in daily care centers or in smart cohousing venues. They support age-friendly environments by providing innovative knowledge and care to remain independent as much as possible despite of their functional, cognitive and social limitations. The phenomenon mainly concerns nursing homes but has important impacts in all the transitions of older people between different social and health care services.ISRAA intends to call together companies, research centres and experts in the phenomenon so that they can devise the best proposals for solutions, also working on that throughout regional, national and EU funding dedicated to health.The objective of the Treviso Ecosystem regarding housing is to promote capacity-building around the momentum that is pushing senior housing and Age-Friendly Environments at the top of the European agenda in recent years. Technological innovation applied to prevention, treatment and reduction of social isolation is a priority for policies to develop services for the elderly.
Resources needed *not mandatory field!	ISRAA works with specialists, psychologist, economist and researchers. They receive RDF, EU projects, but we do not have detailed financial resources and staff resources information.
Timescale (start and end date)	Ongoing
Key achievements (evidence of success)	Since 2012 ISRAA has been working for the promotion of healthy lifestyles and the transformation of the ageing process in close collaboration with the University of Padua, of which it is a partner in a Master's degree in longevity psychology. Several European, national and regional projects in the field of active ageing have been carried out in the course of this perspective. They are currently working on extending their buildings, and possibly 2 more block of houses will be served for ISRAA in order to provide co-housing opportunities to senior people.
Further information: *Link to further information on the case study can be found*	https://echalliance.com/ecosystem/italy-treviso-health-and-social-care-innovation-ecosystem/ https://www.israa.it/

Visual presentation: *Image (2000px wide recommended) and/or video*	

Keywords to your good practice	social co-housing, rehabilitation, senior care provider, smart senior care

1. Author contact information *mandatory field	
Name of the Organisation	Scottish Enterprise
Your organisation *mandatory field	
Country	United Kingdom
Region	Scotland
City	

2. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No	
If not, who are the other organisations in charge of the good practice?	mPower NHS National Services Scotland -lead partner	
Location of the organisation in charge:	*Country*	UK
	Region	*Scotland*
	City	
3. Good practice general information *mandatory field		
Title of the practice	mPower Health & Connected Communities	
Topic **(Please select the relevant topic)**	1. Sport rehabilitations (specially after injuries) 2. **Senior rehabilitations** 3. Rehabilitations after stroke 4. Rehabilitation for people with disability 5. Mental rehabilitations	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	mPower is a five-year project supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB), and led by NHS National Services Scotland. The project is a cross-border collaboration to support older people (age 65+) living with long-term conditions across Scotland, the Republic of Ireland, and Northern Ireland. Supported by the International Engagement Team, Programme Management Services (PgMS) colleagues collaborated with 10 other partners across multiple countries, sectors, services, and communities to enable people to take steps to live well, safely and independently in their own homes by self-managing their health and care in the community.
Detailed information on the practice (max. 1000 characters)	The project started in 2017 and ran until May 2022. mPower worked with communities to enable people to take the steps needed to live well, safely and independently in their homes by self-managing their own health and care in the community. Community Navigators were employed to work with people referred from health and care services to develop wellbeing plans connecting them to activities in their community as well as connecting them to technology to enhance support for health and wellbeing. Throughout the project older people learnt to embrace digital technology to enhance their lives, specifically to improve their health and wellbeing: helped support and develop the necessary skills; removing barriers and helped build their confidence. The project introduced a range of both health and citizen technology to vastly improve people's life, whether that's through facilitating better self-management of their long-term condition, such as using apps like My Diabetes My Way or fully using devices like an ECHO or KOMP, everyone who has given these new things a try has benefited. https://mpowerhealth.eu/wp-content/uploads/2022/07/mPower-impact-brochure-FINAL-FINAL-FINAL-1.pdf
Resources needed *not mandatory field!	
Timescale (start and end date)	2017-2022
Key achievements (evidence of success)	Specifically, beneficiaries highlighted feeling decreased social isolation, decreased loneliness, increased feelings of empowerment

	and confidence, increased digital literacy and a facilitation of self-management behaviours. https://mpowerhealth.eu/case-studies/ https://mpowerhealth.eu/wp-content/uploads/2022/07/Evaluation-of-the-mPower-Project-2017-2022-Full-Report.pdf
Visual presentation: *Image (2000px wide recommended) and/or video*	https://mpowerhealth.eu/wp-content/uploads/2022/07/mPower_FILM-1_mPowers-Person-Centred-Approach.mp4
Keywords to your good practice	Digital technology, ehealth, embracing technology, cross border shared learning, connecting and enabling communities, self-management, connecting people and solutions
Optional part	

1. Author contact information *mandatory field	
Name of the Organisation	Scottish Enterprise
Your organisation *mandatory field	
Country	UK
Region	Scotland
City	

2. Organisation in charge of the good practice *mandatory field	
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	No

If not, who are the other organisations in charge of the good practice?	Pogo Digital Healthcare	
***Location of the organisation in charge*:**	*Country*	UK
	Region	Scotland
	City	Edinburgh
3. Good practice general information *mandatory field		
Title of the practice	Pogo Digital Healthcare -My Tailored Talks	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	Design and Delivery of Innovative software solutions for the healthcare sector
Detailed information on the practice (max. 1000 characters)	Innovative software Products -Tailored Talks and My Tailored Talks help clinicians to improve shared decision making and communication with patients, family members and carers after surgery and even long covid. This mobile application enables patients to receive the right information (in the form of a Tailored Talk) at the right time, forming part of an end-to-end pathway for patients with long covid and stroke. Patients are onboarded to the app by their GP, and will be prompted to answer a series of questions on their symptoms. Based on their responses to these questions, they will be offered bespoke content through the Tailored Talks platform, ensuring they are given relevant guidance to help manage their symptoms. Patients are also able to request a call back from Chest, Heart and Stroke Scotland.
Timescale (start and end date)	Started in 2017
Key achievements (evidence of success)	Pogo Digital Healthcare and Chest Heart and Stroke Scotland (CHSS) have been collaborating since 2020 when Tailored Talks came into being. Clinicians responding to calls to the CHSS advice line have been providing patients with Tailored Talks since 2021. More recently, CHSS has been a key partner in the development of MyTailoredTalks, our long-term condition management app. As the first 3rd sector organisation to take part in an integrated care

	pathway with National Health Service (NHS) primary care, CHSS has contributed content on long covid to MyTailoredTalks, and provides up to 12 weeks of care and support to people living with long covid. NHS Lothian in Scotland partnered with Pogo Digital Healthcare on the creation of Tailored Talks, our personalised information sharing platform.
Visual presentation: *Image (2000px wide recommended) and/or video*	https://youtu.be/MGQ0XUi37tI
Keywords to your good practice	App, Tailored Talks, personalised medical information, platform
Optional part	
Further information	Pogo Digital Healthcare

1. Author contact information *mandatory field	
Name of the Organisation	Scottish Enterprise
Your organisation *mandatory field	
Country	UK
Region	Scotland

2. Organisation in charge of the good practice *mandatory field	
Is your organisation the main institution in charge of this good practice?* (GP related to the	No

traditional or digital health industry developments)		
If not, who are the other organisations in charge of the good practice?	Rise Nutrition	
Location of the organisation in charge:	*Country*	UK
	Region	Scotland
	City	Edinburgh
3. Good practice general information *mandatory field		
Title of the practice	Rise Nutrition Fuel to Rise Automation	
Topic **(Please select the relevant topic)**	1. **Sport rehabilitations (especially after injuries)** 2. Senior rehabilitations 3. Rehabilitations after stroke 4. Rehabilitation for people with disability 5. Mental rehabilitations	

4. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	*Data driven nutrition to fuel performance.* Rise Nutrition takes the guesswork out of fueling your body and replaces it with cutting edge analytics to optimize athletic performance. The current business model focuses on supporting elite sports. Scheduling nutritional needs around training and performance capitalization. Their system is designed to ensure maximum performance or endurance as and when required based on the customer's programme across three themes: Dietary Analysis, Regimen Suggestions, Accountability & Monitoring.

Detailed information on the practice **(max. 1000 characters)**	• Rise Nutrition is a sports technology company with a social justice mission. We are a team of nutrition researchers and data scientists who understand that nourishing populations is a complex problem. • The platform gives players and coaches an easy way to connect, help athletes reach their performance goals, and save time for dietitians who want to work closely with more athletes. • Nutrition is an essential component of sports and athletic training. The amount, ratio, and timing of fuel for athletes can be the difference of seconds and inches at game time. The Fuel to Rise proprietary database of sport and position-specific requirements gives coaches, athletic trainers, and dietitians the data needed to support the precise needs of each individual competitor. • The Fuel to Rise platform saves time for sports dietitians, allowing them to serve more athletes, and provides a resource to programs with few or no nutrition support staff.
Further information: *Link to further information on the case study can be found*	https://risenutrition.org/
Visual presentation: *Image (2000px wide recommended) and/or video*	
Keywords to your good practice	Machine learning algorithms, mobile app, web dashboard, tailored athlete support, personalised nutrition

1. **Author contact information** *mandatory field	
Name of the Organisation	Seinäjoki University of Applied Sciences
Your organisation *mandatory field	
Country	Finland
Region	South Ostrobothnia
City	Seinäjoki

RehabWall

1. **Organisation in charge of the good practice** *mandatory field

Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	-	
If not, who are the other organisations in charge of the good practice?	CSE Entertainment Oy - A Finnish exergame company	
Location of the organisation in charge:	*Country*	Finland
	Region	Kainuu
	City	Kajaani
2. Good practice general information *mandatory field		
Title of the practice	RehabWall, a virtual reality exercise tool for multi-personal rehabilitation	
Topic (Please select the relevant topic)	**1. Sport rehabilitations (specially after injuries)** 2. Senior rehabilitations **3. Rehabilitations after stroke** 4. Rehabilitation for people with disability 5. Mental rehabilitations	

3. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	"RehabWall is intended as a tool for multi-professional rehabilitation.The exercises have been created in collaboration with health professionals. The product utilizes Virtual Reality glasses, a balance board, a touch screen and a motion sensor. Exercises designed for physiotherapy and occupational therapy help users strengthen their functional abilities. A health professional can monitor the customer's progress in these exercises in great detail."
Detailed information on the practice (max. 1000 characters)	*Please provide information on the practice itself. In particular:* • *What is the problem addressed and the context which triggered the introduction of the practice?* This good practice is an easy to use Virtual Reality tool to bring efficiency into e.g. neurological rehabilitation and occupational therapy. • *How does the practice reach its objectives and how it is implemented?* RehabWall is equipped with VR-glasses, a balance board, a touch screen and a motion sensor. It is suitable for improving and restoring sensory and cognitive abilities and a wide range of motor skills, as well as cognitive and hand function rehabilitation • *Who are the main stakeholders and beneficiaries of the practice?*

	Main stakeholders and beneficiaries of the practise include private and public physiotherapy, occupational therapy and other health care providers in Finland and worldwide.
Resources needed *not mandatory field!	*Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* This good practice is a tool developed by a private company. When the device has been purchased, it is easy to use and ready to go. Assist of a healthcare professional might be needed for the "player", depending on the individual. However it can be also used by a rehabilitation patient without the assistance of others. The device can be either rented or purchased and it has been used in many healthcare settings in Finland.
Timescale (start and end date)	Ongoing
Key achievements (evidence of success)	Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results). RehabWall can be identified as a good practice in combining Virtual Reality and gamification with multidisciplinary rehabilitation.
Further information: *Link to further information on the case study can be found*	www.cse.fitness
Visual presentation: *Image (2000px wide recommended) and/or video*	https://youtu.be/d63U38r5uSI
Keywords to your good practice	Virtual reality, gamification, neurological therapy, occupational therapy.

Mentalhub.fi - Mental health Self-help programs

4. Organisation in charge of the good practice *mandatory field	
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	-

If not, who are the other organisations in charge of the good practice?	Mielenterveystalo.fi / Mentalhub.fi	
Location of the organisation in charge:	*Country*	Finland
	Region	Whole country
	City	Whole country
5. Good practice general information *mandatory field		
Title of the practice		
Topic (Please select the relevant topic)	6. Sport rehabilitations (specially after injuries) 7. Senior rehabilitations 8. Rehabilitations after stroke 9. Rehabilitation for people with disability **10. Mental rehabilitations**	

6. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	MentalHub.fi is a collection of mental health resources, including symptom scales and self-help programs that anyone can access
Detailed information on the practice (max. 1000 characters)	*Please provide information on the practice itself. In particular:* • *What is the problem addressed and the context which triggered the introduction of the practice?* Prevalence of mental health issues in Finland is increasing and resources are lacking to provide necessary visits to mental health professionals. • *How does the practice reach its objectives and how it is implemented?* MentalHub.fi offers free information and self-help mental health resources that anyone can access via internet browser. • *Who are the main stakeholders and beneficiaries of the practice?* Mental health professionals, people suffering from mental health issues, hospitals etc.
Resources needed *not mandatory field!	*Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* MentalHub.fi is maintained by Helsinki University Hospital (HUS) and is running on public financing.
Timescale (start and end date)	2009 - ongoing
Key achievements (evidence of success)	*Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).*

	MentalHub.fi has been able to provide free-of-charge evidence-based mental health prevention, rehabilitation and promotion self-care programs that are accessible to everyone regardless of socioeconomic background. Factual evidence on its effectiveness is not available.
Further information: *Link to further information on the case study can be found*	Mielenterveystalo.fi Mentalhub.fi
Visual presentation: *Image (2000px wide recommended) and/or video*	https://www.youtube.com/watch?v=3kNpmmb4r8A
Keywords to your good practice	Mental health, self-help, online programs

HouseMate

7. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	-	
If not, who are the other organisations in charge of the good practice?	Unique Perspectives Limited	
Location of the organisation in charge:	*Country*	Ireland
	Region	Callan
	City	Kilkenny
8. Good practice general information *mandatory field		
Title of the practice		
Topic (Please select the relevant topic)	11. Sport rehabilitations (specially after injuries) 12. Senior rehabilitations 13. Rehabilitations after stroke **14. Rehabilitation for people with disability** 15. Mental rehabilitations	

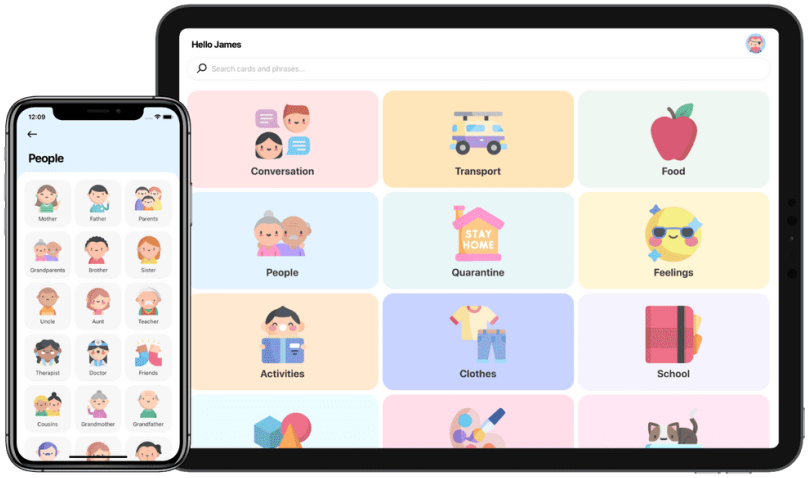
9. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	HouseMate enables people with disabilities to access their smartphone and control their environment

Detailed information on the practice **(max. 1000 characters)**	*Please provide information on the practice itself. In particular:* • *What is the problem addressed and the context which triggered the introduction of the practice?* Disabled people have great accessibility challenges in their everyday life and may require assistance with everyday tasks regarding their home-environment. • *How does the practice reach its objectives and how it is implemented?* HouseMate enables disabled people to independently control their smart phone and use it to operate appliances in home and work environments • *Who are the main stakeholders and beneficiaries of the practice?* People with disabilities, occupational therapists, physiotherapists, care homes etc.
Resources needed *not mandatory field!	*Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* Only installation and educational resources needed to implement.
Timescale (start and end date)	Ongoing
Key achievements (evidence of success)	*Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* "HouseMate has become the leading system in Finnish environmental control business and most of end-users have HouseMate.
Further information: *Link to further information on the case study can be found*	https://housemate.ie/
Visual presentation: *Image (2000px wide recommended) and/or video*	https://www.youtube.com/watch?v=7JPFnWMqzbc
Keywords to your good practice	People with disabilities, rehabilitation, environmental control

Leeloo AAC App

10. Organisation in charge of the good practice *mandatory field		
Is your organisation the main institution in charge of this good practice?* (GP related to the traditional or digital health industry developments)	-	
If not, who are the other organisations in charge of the good practice?	Dream Oriented Ltd	
Location of the organisation in charge:	*Country*	Finland
	Region	Whole country
	City	Whole country
11. Good practice general information *mandatory field		
Title of the practice	Autism speech app for nonverbal children	
Topic (Please select the relevant topic)	16. Sport rehabilitations (specially after injuries) 17. Senior rehabilitations 18. Rehabilitations after stroke **19. Rehabilitation for people with disability** 20. Mental rehabilitations	

12. The Good Practice *mandatory field	
Short summary of the practice (max. 200 characters)	"Leeloo is an app that helps non-verbal children communicate with their carers, teachers and friends. Leeloo is developed with the augmentative and alternative communication (AAC) and picture exchange communication system (PECS) principles."
Detailed information on the practice (max. 1000 characters)	*Please provide information on the practice itself. In particular:* • *What is the problem addressed and the context which triggered the introduction of the practice?* Nonverbal children need assistive technology in autism treatment and autism therapy to help communicate with others. • *How does the practice reach its objectives and how it is implemented?* Leeloo is an app that works on mobile devices and can be downloaded for IOS and Android. • *Who are the main stakeholders and beneficiaries of the practice?* Non-verbal children, people on the autism spectrum, occupational therapists etc.

Resources needed *not mandatory field!	*Please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* Leeloo is an app that works on mobile devices and can be downloaded for IOS and Android. It is free for download but offers in-app purchases.
Timescale (start and end date)	Ongoing
Key achievements (evidence of success)	*Why is this practice considered good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* Leeloo app has been accepted to the UNICEF App Catalogue and it has been granted the following badges: Mobility friendly, vision friendly, cognitive friendly & hearing friendly.
Further information: *Link to further information on the case study can be found*	https://play.google.com/store/apps/dev?id=7991951050276003777 https://assistivecards.com/leeloo/
Visual presentation: *Image (2000px wide recommended) and/or video*	https://www.youtube.com/watch?v=vqWiZ2eHl28 
Keywords to your good practice	Autism, communication, occupational therapy, verbal communication

Appendix 2: List of Consultees for the Health for Wealth report by SE

NHS Scotland - International Engagement Team

NHS Scotland - Policy Team

Digital Health and care Innovation Centre (DHI)

Scottish Development International - contacted field office staff in Scotland, Ireland, France, Spain and the Nordics

Cluster Saúde de Galicia (CSG)

Scottish Enterprise Health & Wellbeing Team

Scottish Enterprise -Digital Economy Team

Personalised Nutrition Cluster Scotland

Precision Medicine Scotland Innovation Centre

Healthy Ageing Innovation Cluster Scotland (HAIC)

Scottish Digital Mental Health Innovation Cluster

Scotland Europa

Panon Business Network

Seinäjoki University of Applied Sciences