Assessment Report

Translation, Innovation & Technology Transfer in Ageing Network in the context of the COVID-19 pandemic

October, 2022

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A. Executive Summary

Background:

The COVID-19 pandemic has massively disrupted and stressed the healthcare systems exacerbating the shortcomings of the public and private healthcare sectors. Nonetheless, this unique situation has also served as a catapult for accelerating the transformation needed putting many significant changes far faster than they would have done in the pre-pandemic operating environment. Each European region has dealt with the breakthrough using the strengthns of their ecosystem to maintain and reinforce the services focus on the care of the eldest. The current challenge is how to use the experience gained to underpin these services and prepare them for the future situation, promoting the resilience and the lessons learned as a response to the pandemic challenges.

It is interesting at this moment to consider the data in perspective. Just to provide an approximation we use an example of data of the distribution of COVID-19 cases by age group and clinical situation. The data pertain to cases reported in Spain between 10 May and 20 July 2020. (Data source: Spanish Ministry of Health report).
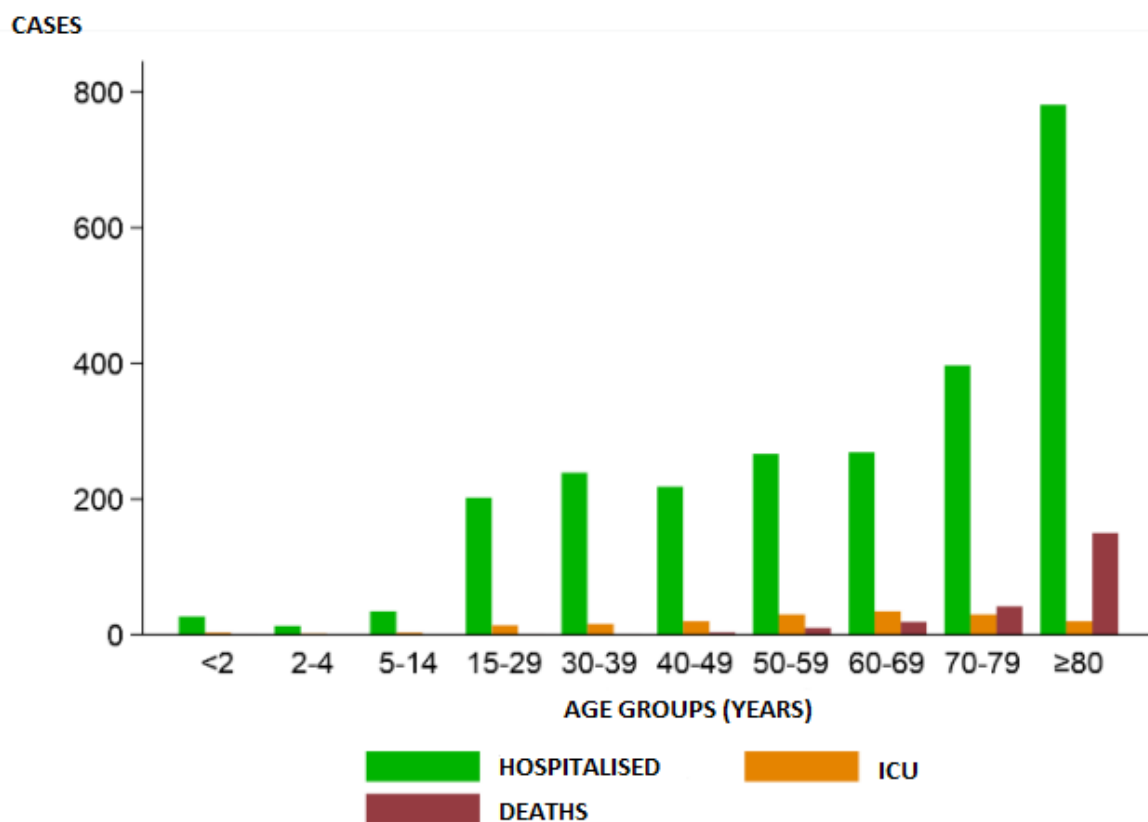
The statistics are overwhelming, the aged groups most affected throughout this situation are clear, so how the experience gained is used to improve the Active and Healthy Ageing (AHA) ecosystem is key to determining future responses to similar situations. Without forgetting those measures that will already be part of the post-pandemic ecosystem. Indeed, aging populations and more prevalent chronic diseases increased the demand for care during the pandemic generating the need of unsustainable resources in the time, but the success in the outcomes differ widely between the solutions implemented. The abrupt adoption of solutions based on analytics solutions, even as new technologies have changed many industries and the perception of the population regarding its need.

In the current situation, Europe is preparing to rebound from the events of the past year, but it is necessary to collaborate within each ecosystem and between the regions. In order to take full advantage of the experience gained, each region is obligated to carry out a deep reflection of the lesson learned including the mistakes to avoid in future situations and share this knowledge to create synergies and boost the implementation of effective solutions.

On 21 June 2020, the NextGenerationEU programme was approved by The European Council, the largest economic stimulus instrument ever funded by the European Union, in response to the unprecedented crisis caused by the coronavirus.

The aim of these funds is to achieve that Europe post-COVID-19 becomes greener, more digital and more resilient to the changes and challenges of the future. Moreover, it must manage this in a joint and coordinated manner, building on the knowledge gained in this crisis and seeking to learn from the experiences for better governance with these recovery funds.

Member States have submitted National Recovery and Resilience Plans defining action programmes with the objective of enhancing growth potential, job creation and economic and social resilience, as well as accelerating the green and digital transitions. This post-pandemic analysis and learning will also help in the successful implementation of these plans.

The COVID-19 crisis forced each region to develop answers in several areas creating a mixed impact on each region. Among the wide range of perspectives and considerations, three main targets are underlined in this proposal as drivers of the change: Public-Private partnerships; Improvement in data management, analysis, and technology; and the use of new models, resources, and organizations.

Taking into account the thematic areas in which the TITTAN partnership has shown strengthens an experience, we pre-identified three areas affected by these drivers of change:

i. Inside-Out Technological Innovation → Healthcare Delivery pathways

With the outbreak of the pandemic, healthcare delivery pathways had to refocus on meeting the following guidelines:

- Implementing strategies to reduce the number of patients in health centres and increase the physical and temporal space between them

- Attention to patients with suspected COVID19 in separate circuits from the rest of the users, considering that they should be cared for in separate areas

- Clinical care of the patient shall be carried out following the criteria of the primary care team, ideally by telephone or similar

- Cancellation or delay of non-urgent surgery and medical tests.

We will be reviewing the different solutions in each region to deal with this difficult situation: at a time of increased demand for care from those affected, combined with greater restrictions on movement and a high number of medical staff on sick leave. Technology and innovation were key factors to overcoming all these major historical challenges.

ii. Outside-In Technological Innovation → Active and Healthy Ageing Ecosystems

As mentioned above, the elderly population was the most affected by the disease, with a higher mortality rate and greater symptomatology, although we must not forget the negative effects on their emotional and mental health.

The confinement and not being able to follow their routines, as well as the fear of death, uncertainty, anxiety... too many adverse circumstances that had a negative impact on their health. In addition to all this, there was the fear of being alone in a hospital, the major difficulty with the use of new technologies, and the impossibility of face-to-face   assistance.
We are going to examine which solutions have contributed in each region to mitigate all these effects, to improve the remote monitoring of their chronic diseases, the new and more accessible solutions for those inexperienced with technology, support and empowerment initiatives, etc. In conclusion, solutions that have been developed within the health system to improve the AHA area.

iii. Patient Empowerment → Patient Empowerment

Thanks to the global digital transformation, health systems around the world have implemented Telehealth, which emerged as a measure and one of the only solutions to guarantee the safety of the patient and the health professional. It would be interesting to see patient satisfaction regarding telehealth during the pandemic, since it could be related to adherence, and this, in turn, to a more autonomous patient.

The use of devices or digital technology for healthcare has experienced a very large increase with the pandemic, although there is still a gap for their correct usability that could not be addressed due to the urgency of the moment.

These types of initiatives and technological solutions have contributed to improving the self-care and empowerment of chronic patients, with a special focus on the importance of prevention.

Patients are more aware of the changes in their condition, in most cases taking their own measures at home, and therefore remain alert to any complication of their pathologies.

However, isolation, loneliness during hospital stays, and the powerlessness of people living alone mean that solutions have to be implemented to address all of these circumstances.
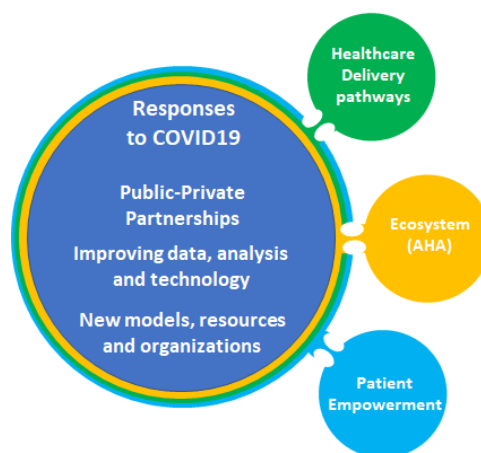
Drivers of the change of relevance in the context of COVID-19 Pandemic:

a) Public-Private partnership: The current situation has been the origin of the building of several bridges of collaboration between different sectors, underpinning the fast adoption of innovative responses. The follow-up in the population through the mobile-phone application shed-light about the way that the virus infected the groups of population. Beyond the applications that track citizens (Radar COVID in Spain; PassCOVID.gal only for the Region of Galicia - Spain), topics as the use of personal big data, have been seen as a potentially powerful tool in fighting the pandemic. For example, in contact tracing, that is, revealing the places a patient who has tested positive has visited in recent days in addition to the people the user has been in contact with (thus identifying specific people at risk). Several initiatives were launched along Europe to support the collaboration in order to create synergies that would result in the development of these previously unthinkable solutions – but with which application did the citizens felt secure most? How did the government use this information?

These solutions were helped by the wide type of regional initiatives announced to mobilize cohesion within the ecosystem and flexibly the respond to the rapidly

emerging needs in the most exposed sectors, such as healthcare, SMEs and markets. Examples vary from a specific call to support the R&D&I of COVID19 in the Basque Country, to support for the immediate manufacture of means for protection against COVID-19 in Galicia besides two specific calls to support the R&D&I as well.

Multidisciplinary collaborations were needed to deliver fast and accurate these solutions. In fact, the cooperation would have never occurred without the supporting framework created by country or regional call addressed to support these projects. Without any doubts, these efforts to allocate resources acted such as a waterfall of aids boosting the process of implement solutions. Nonetheless, the success of the measures considered must also be analyzed because there is always the potential for improvement. The aim is to gather and exchange practices, and contributions driver of the change making the reflection whether these aids were a success or if the regions considered the enough indicators to measure it.

b) Improving data, analysis, and technology: The breakthrough of COVID19 has needed the implementation of remote solutions more quickly than in the normal scenario within the healthcare systems – public and private-. Phone calls, emails and telehealth consultations were some of the ways that the practitioners used to reply to the patient's concerns. In fact, these new services -among others- were used to cope with the population's exponential demand for healthcare, which led to the use of telemedicine as an alternative - still to be improved - that helped to alleviate the emergency. Telehealth / Telecare was always considered a suitable solution for ensuring the sustainability of the healthcare systems and dozens of applications were already launched in Europe to get access to physicians and other specialists.

Examples of all these developments are numerous:

- In Scotland, the use of the Near Me application, which allows video consultations, was expanded from 330 consultations per week to almost 17,000.

- The TELEA telemonitoring system of the Galician Health Service, was adapted during the Covid-19 crisis to facilitate the follow-up of patients' cases at home and social and health residences, as well as to carry out controls after hospital discharge in complex patients.

- In Lombardy, in collaboration with the University of Milan (UNIMI) they carried out the creation and implementation of two telemedicine platforms: COD 19 y COD 20.

- In Saxony, they have developed CCS, a videoconsultation platform which provides support and assitance for patients and doctors which is what differentiates this solution and gives it value added.

- In the Basque Country, they launched a Videoconsultation Piloting project that led to the implementation of a video consultation tool that was integrated into their management system in order to have access to patient data.

Yet, to have full access to their methodologies and self-empowerment digital tools for patients are challenging for elderly people. Scalable, affordable, flexible digital

infrastructure in the core of the systems could dramatically accelerate their rollout. Healthcare system could take noteworthy steps to close the gap. Regions need to set clear digital strategies and investment plans to build resiliency and deliver efficiencies enabling solutions that allow managing subsequent waves of the pandemic or future pandemics.

In this regard we would like to highlight the great work that was done in Scotland to address this problem of the digital gap. "Digital Approaches to Care Homes" was an initiative led by the Scottish Government and implemented with Connecting Scotland (a Scottish voluntary organisation), in partnership with other public bodies. Thanks to this project, it was possible not only to provide devices and connect 75% of care homes, but also to train a large number of older people in digital skills.

At the same time, overstressed healthcare systems are fighting against a data rain - produced each day- directly related to its activity. The comprehensive analysis of this information shapes the knowledge about how the efforts are been implemented and the success of them. Overcome this challenge and ensure reliable, comparable clinical research results and coherent segmentation premises has an impact beyond the healthcare system – considering both insights the clinical and social care- because it also impacts the support of COVID-19 research supported by several regional or national initiatives. The capacity to foresee the needs increase the efficiency and effectiveness of the healthcare system boosting agile decisions. Several innovations were developed, but not all of them were implemented homogeneously, and it should be ensured because some of these changes will resonate beyond the current situation. Care pathways, roles, sites, and services could need reconsideration for the future.

Before implementing technological solutions to address COVID-19, it was imperative that these solutions were integrated into a comprehensive strategy. Within this framework, it was necessary to implement legal and organisational measures that met many requirements: they should be realistic, proportional, effective, based on scientific criteria, and last but not least within the legal framework.

Health-related data have a high value and therefore a high level of protection, therefore it is necessary to prevent third parties who use or access this information from exceeding its use or process, creating situations of abuse. The moment of uncertainty caused by the emergency situation could be favourable to this type of abuse or situations of loss of liberties, discrimination or other damage to the personal rights of citizens.

Due to the urgency to provide working solutions, it is good to analyse now if these applications have been detected as potential threats to privacy in their implementation.

c) New models, resources, and organizations: At least two situations have characterized the response of older non-COVID19 patients to the stress suffered by healthcare systems regarding their treatments. On one hand, some patients did not go to the hospital with symptoms because they were afraid of get infected, while others were unable to keep appointments because clinics were closed, they could not travel due to the lockdown and the probes needed were delayed. On the other hand, for

those that had the luck to be treated in the hospital the uncertainty and disempowerment were common, being unable to take family or friends with them.

Despite the negative impact of the pandemic, some tools were developed to maintain the patient empowerment establishing successful relationships and patient involvement in their treatment in the COVID-19 era.

An example of a project to strengthen patient empowerment was the collaboration with the network of Galician pharmacies that maintained the proximity with the population and helped them a lot in that hard moment, especially to the elderly, by providing reliable information, medicines at home, Covid tests, face masks, etc.

Another example is the Basque Country initiative "Paziente Bizia-Paciente Activo" (Active Patient), a programme of education in self-care and self-management of citizens' health and well-being, which played a very important role during the pandemic.

Particularly, the younger generations have maintained a good relationship with their clinicians, without loose too many empowerments, because they use more mail and mobile health (mhealth) tools like apps, and they are willing to try new solutions. These promising results with telemedicine are applicable to the less vulnerable patients. On the other hand, there are still option to improve the situation in the case of elders.

Despite the negative impact of the pandemic and the effect that the situation has created on patient empowerment, there is still hope for maintaining and developing solutions therefore experiences and lessons learned in the regions can be an inspiration of good practices.

Rationale:

The main goal of this document is to identify the situation of the region in relation to the three thematic areas addressed by TITTAN Covid-19 project and to identify valuable experiences and good practices, to be presented to the other partners, as well as to all interested stakeholders and parties.

Expected Outcome:

The result of this activity will be an Assessment Report, which will be shared with the rest of the partners and local stakeholders involved in each region.

The good practices identified in the Assessment Report had been explained in more detail in the framework of the PAVEEx ("Pro-Active and Valued Exchange of Experiences") Workshops:

- Workshop March 2022, organised by the Scottish partner (DHI) https://youtu.be/gdgAfPgJORM
- Workshop May 2022, organised by the Saxony partner (HS):

https://youtu.be/D6WtOFv4YaU

- Workshop June 2022, organised by the Basque Country partner (BIOEF):

https://youtu.be/AvJi6yRgqac

Finally, at the High-level event of the project, the partners presented the conclusions and lessons learnt during this time, as well as they examined in depth the strategies and some good practices presented by the regions:

- Final Conference Sept 2022, organised by Galician Health and Knowledge Agency (Lead): https://www.youtube.com/watch?v=eY9XXLfSjqA&t=11503s

We will publish and disseminate this report on the project website and on our social networks in order to make it accessible to all those interested in the topics studied.

B. General overview of the regions involved in TITTAN COVID-19 project

Partner name
ACIS, Axencia Galega de Coñecemento en Saúde. Galician Health Knowledge Agency.
Region name
Galicia
Country
Spain
Number of inhabitants in the region
2.695.645 inhabitants
Percentage of population over 65 years
25,75%
Please indicate the policy instrument which has been addressed by TITTAN and the main features of this policy instrument.
2014 – 2020 ERDF Operational Programme of the Region of Galicia. The ERDF Operational Program of Galicia was approved in March 2015, aligning with Europe 2020 targets and the Regional Specialization Strategy. The area of health and especially the field of Active Ageing and Healthy living are among the highest priorities for the region. The Galician OP is divided in 10 Thematic Objectives (TOs). TO1 aims to foster Research and innovation development in the region. Galicia aims to become a lead region in Southern Europe that offers knowledge intensive products and services linked to a healthy lifestyle model. Under this framework the Galician Regional Health Government is aware of the challenges ahead. Galician senior population (more than 65 years old) reached the 25% of the total population in 2015. Besides, a considerable part of Galician people live in rural areas and the management of healthcare services are most expensive. Innovation seems the only solution to overcome current health challenges. Since 2011, Galicia collaborates with other European regions in the development of European and participating actively in some of the most important initiatives developed at EU level (KIC, EIPonAHA, etc). Long term collaborations and exchange of good practices can be a very powerful measure to incorporate successful strategies implemented by other European regions in Galicia. The final goal is to increase the quality of life of our patients, guaranteeing a sustainable healthcare system through the incorporation of innovative policies. The Galician Regional Government supports different programmes and plans through the ERDF Operational, some being of the thematic areas addressed by the TITTAN project. In particular, the regional plan "Innovasaúde" for the innovation of the health sector, and the regional plan "Hospital 2050" for the innovation in the hospital environment, contain measures for fostering Pre-commercial Procurement (PCP) and Public Procurement of Innovative Solutions (PPI) practices. At the same time, «Innovasaúde» aims to create a safe, fast and intelligent patient-centred healthcare system, thanks to digitalisation and the introduction of telehealth practices. Finally, the regional programme "PRIS" must be for the valorisation of research results generated in the Galician health system.

Are the main objectives addressed by the policy instrument involved in TITTAN, linked to the regional innovation strategy for smart specialisation (RIS3)? If yes, please indicate how.

Yes, Innovation and technology are undoubtedly two of the main pillars underpinning the RIS3 2014-2020 Galicia Smart Specialisation Strategy.

More specifically, TO1 of the Galician ERDF OP aims to foster research and innovation development in the region. All investments related to the TO1 will be related with the already approved Galician RIS3 strategy. The RIS3 strategy is consequently subjected to the OP.

The RIS3 has been defined around 3 big Challenges. Challenge 3 involves the promotion of New Healthy lifestyle model based on Active Ageing of Population.

To achieve this challenge, support will be given to initiatives aimed at the creation of an autochthonous technology-based business sector boosted by the driving force of the SERGAS on both the supply and demand side of knowledge.

Likewise, efforts will be made to consolidate Galicia's image as a reference region in the development of pioneering initiatives associated with the management of an ageing and dispersed demographic structure.

With regard to the new RIS3 2021-2027 of Galicia, its objectives 1 y 2 are also totally aligned with the main goals of TITTAN:

Objective 1: Achieve a more open and integrated ecosystem: Consolidating an advanced, integrated, organised and specialisation-aligned R&I offer, capable of responding to the challenges of digitalisation and sustainability.

Objective 2: Balance excellence and market applicability: To increase the number of innovative companies, making it easier for smaller companies to incorporate innovation in the different stages of their production process through individual and/or collaborative projects.

Which actions of the following are considered the key areas in the Health and Well-being Sector in your region? How they have evolved in the last 5 years? Please select at least three:
- **Prevention, screening and early diagnosis** (1. Health literacy, patient empowerment, ethics and adherence; 2. Personal health management; 3. Prevention, early diagnosis of functional and cognitive decline; other, please specify).
- **Care and cure** (1. Protocols, education and training programmes for health workforce, comprehensive case management, multi-morbidity, poly-pharmacy, frailty and remote monitoring; 2. Multi-morbidity and R&D; 3. Capacity building and repeatability of successful integrated care systems; other, please specify).
- **Active ageing & independent living** (1. Assisted daily living for older people with cognitive impairment; 2. Extending active and independent living through Open and Personalised solutions; 3. Innovation improving social inclusion of older people; Other, please specify).

1. Prevention, screening and early diagnosis
- **1.1 Health literacy, patient empowerment, ethics and adherence** are considered as key areas for the Health Sector in the region.
  Several plans are being implemented in order to tackle this challenge, as for example: *e-saúde, Escola de pacientes, paciente experto 2.0, and EMPATTICS (EMpowering PAtients for a BeTTer Information and improvement of the Communication Systems,* with the aim of implementing ICT technologies to support

patient empowerment and improve adherence The most relevant projects in this field will be further explained through the good practices reported below.

Regarding with this, we should highlight the Strategy for the Humanisation of Healthcare implemented in Galicia in 2019:

Its strategic axis 1 is based on the Empowerment of citizens. The Strategy proposes a series of measures dedicated to promoting among patients, carers and citizens in general, knowledge about health and health education that facilitates their autonomy and decision-making capacity.

Within this framework of prevention and early diagnosis, ACIS and SERGAS recently joined the innovative TARTAGLIA project. Its aim is to consolidate a nationwide federated network to accelerate the application of artificial intelligence in the Spanish healthcare system.

This project will include actions to strengthen prevention and health promotion (cancer, neurological diseases and cardiometabolic diseases) and to increase health crisis response capabilities.

2. Care and cure:

- **2.1 Protocols, education and training programmes for health workforce, comprehensive care management, multi-morbidity, poly-pharmacy, frailty and remote monitoring** are considered also as essentials areas for the Health Sector in the region. One of the main goals to reach is to provide patients with useful and friendly tools for managing their diseases while being at home. This challenge was tackled through the plan Innovasaúde, funded with 45 M€ of ERDF funds, which was launched from the Public Health System of Galicia to get a safe, fast, intelligent and patient centred Health System. One of the projects developed within Innovasaúde was *Digital home.* The system to be developed will be provided with a bidirectional channel to connect healthcare service with patients, so they would receive reminders of self-practices during the following-up of their disease (pressure, temperature, weight, pulse, glucose, etc.) so that a monitoring service could revise and check the saty of the patients.

  We cannot forget to emphasize in this field the innovative tools we have created, thanks to these projects, that have transformed the Galician healthcare system. An example is TELEA, a tele-assistance platform for monitoring different patients in the healthcare system.

  TELEA was selected by the European Commission in the call launched in December 2020 as one of the six best practices to be transferred among the EU countries that are part of CIRCE.

  ACIS and SERGAS have been selected to take part in this new European project, Joint Action Transfer of Best Practices in Primary Care (CIRCE), aimed at the transfer and implementation of best practices in Primary Care.

3. Active Ageing & Independent living:

- **3.1. Extending active and independent living through Open and Personalised solutions** are considered as key areas for the Health Sector in the region. In recognising the hard work developed during the last years by the Public Health System of Galicia, the region has been recently awarded with the "four stars" category in the EIP on AHA, as a reference site in terms of Active Ageing.

  Along in this same line, a great project has been implemented by the Spanish Ministry of Health, Código 100, which was managed from the Public Health System of

Galicia in order to response to demographic change. The plan was funded by Operational R&D&I Plan Technological Funds 2014-2020 (80% ERDF) and it was structured in three lines of action:

○ Innovative therapies, devices, services and protocols.
○ Patient empowerment.
○ Training Health Professionals.

Moreover, the Public Health Authority is working in several plans to achieve the independent living for elderly people through innovative solutions. Please find below some examples:

- Referral hospitals provide elderly population with medication directly at home. The project was launched in 2000 and there are currently 9.200 citizens taking part in the programme.
- In-house socio-sanitary services are being provided to elderly population through interactive television and *MiAvizor pilot* (monitoring the daily activity of senior citizens at home).
- Home hospitalisation plan (HADO Strategy 2019-2023) one of the strategic lines of the Galician Health Service providing patients with expert, safe and efficient hospital care at home.
- The Post-COVID 19 Mental Health Plan (2020-2024), which prioritises the implementation of projects aimed at reducing the impact of COVID 19 on people's mental health and emotional wellbeing. In this area, it is vitally important to provide care for the elderly and people in socio-health centres, as well as tele-assistance as a tool to reinforce face-to-face consultations, the support of health professionals on the front line of action against COVID-19, and the strengthening of suicide prevention programmes".

As previously reported, the RIS 3 Strategy of Galicia was approved in 2014 and defined around 3 big Challenges, being the third challenge, the promotion of a New Healthy lifestyle model based on Active Ageing. The approval of the RIS3 was a turning point for the Health Sector in the region and allowed the development of the two major innovation plans from 2012-2015, Hospital 2050 and Innovasaúde, which were implemented with the following purposes:

• Hospital 2050, the Hospital of the future: safe, sustainable, efficient and innovative green building.
• Innovasaúde: safe, fast, intelligent and patient-centred health system.

Lastly, regarding with this area we must underline the participation of our region in the european project Regions4PerMed. This project involves several European regions and aims to achieve a fast and deep uptake of personalised health.

To achieve this, it should focus on the following measures:

- use characterization of individuals' phenotypes and genotypes (e.g., molecular profiling, medical imaging and lifestyle data) to tailor the right therapeutic strategy to the right person at the right time
- develop a system that uses data and technology to provide personalised care and focusing the system on more preventive and predictive ways of working.

Are the leading companies in the Health Sector of your region specialized in the key areas which have been formerly indicated?

Hospital 2050 and Innovasaúde were the two major innovation plans developed in Galicia, which received 90 M€ of ERDF funding from 2012 to 2015 to implement 23 large-scale projects articulated around the hospital of the future and a new structural and functional design of the hospitals.

These plans caused a high impact in the SMEs of the region, the impact was specially notable for IT companies which developed innovative and specialized solutions for giving answers to the challenges proposed by the Galician Public Health Sector.

These companies have now a very useful background for having worked with the Public Health System of Galicia in Hospital 2050 and Innovasaúde through mechanisms of Public Procurement of Innovation Procedures.

They have increased their specialization in the field of health and are in position to develop solutions, which address directly the needs of the Health System.

The companies in the sector and other companies that created products to address these new needs and problems in these areas had to make a great effort during the Covid-19 crisis. On their way they were boosted by initiatives such as Connect-19 promoted by the Regional Ministry of Economy, Employment and Industry, through the Galician Innovation Agency. Through this programme, twenty innovative or technology-based Galician companies will work on the development of innovative solutions that can contribute to reducing the socio-economic impact of the pandemic.

Innovations ranged from an app to monitor malnutrition in Covid-19 patients, to a kit for early detection of the disease, to the development of textiles to combat bacteria and viruses, to the multiple companies that will develop different hygiene and protection items.

Is there a close cooperation between the companies, the universities and research centers related to the Health Sector and the public administration in your region?

Yes, being a region of 2.149 million of inhabitants as well as having a Public Health System which is common to all the region allows Galicia to establish strong partnerships and collaborations between the main stakeholders of the region.

In order to continue working on the strengthening of health knowledge and innovation ecosystem in Galicia, a new public agency was launched in January, 2016. The Health Knowledge Agency, ACIS.

ACIS manages the health knowledge of the entire Galician Public Health System around 4 strategic areas:

- Training for healthcare professionals.
- Health research.
- Innovation from an open approach, not only for results to be transferred from the laboratory to hospital beds and also to the market, but also for them to generate economic returns that result in public health.
- Assessing technologies to ensure that the most innovative ones are applied in accordance with top security criteria.

In addition, some initiatives have been developed to foster this cooperation. One of these

initiatives that managed to bring the needs of the public health sector closer to companies and to enable companies to be more successful in their innovative healthcare solutions was the first living lab that was created in the Hospital of Ourense.

The project is part of a Pilot Action of the TITTAN project and aims to test this model before creating a network of living labs integrated in the Galician Health system.

The aim of the Ourense Living Lab in regard to ageing is to have an innovative structure which combines different stakeholders in order to test and develop user-driven products for elderly people and elderly care in real life contexts.

As a result, six collaborative agreements between the Galician Health Service and the respective companies have been signed in order for the companies to carry out the testing of their innovative solutions together with the staff of the Ourense living lab in the facilities of the Ourense Hospital.

Some of the projects to be tested are:
- the HomeworksRehab project, in which virtual reality will be used for the rehabilitation of patients with brain damage
- Minerva initiative for neurological imaging to help diagnose stroke and Alzheimer's
- and a virtual assistant that facilitates greater independence and more active ageing of patients with neurodegenerative diseases

Please indicate the relevant stakeholders from private sector (big companies, cluster, etc.) related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

All the relevant stakeholders from private sector related to the Health Sector in the region are represented by the following Clusters, which are actively involved in the TITTAN project.

- **Biotechnology Cluster of Galicia, BIOGA:** non-profit business association that brings together the organizations integrated in the Life Sciences value chain based in Galicia. The cluster, was initially founded by 3 companies in 2010 and has, since then, increased its number of partners to more than 45. BIOGA comprises partners from different institutions, most of them are companies, and more specifically SMEs. Some of them are spin-offs from universities, but also some big companies. In addition to the industrial representatives, some Public Research Organizations such as the University of Santiago and Biomedical Foundations are also part of BIOGA.
- **Health Cluster of Galicia:** non-profit association whose main objective is the business dynamization of Galicia, contributing to the economic and social development of the region, through cooperation among all institutions and public and private companies related to the health system, by performing innovative projects. The cluster consists currently of 38 partners (companies, research centres, universities).
- **Food Cluster of Galicia, CLUSAGA:** The food industry is one of the strategic sectors in Galicia, both due to its dimension, and its economic and social significance. In this area, Clusaga articulates an organizes the structure of the Galician food industry, in a broad sense, integrating businesses, as well as innovation and research bodies and other organizations, in cooperation processes, making it possible to reap benefits from the implementation of actions and collaborative projects and reaching a critical mass, strengthening the international competitiveness and visibility of the sector. The cluster consists currently of more than 70 partners (companies, research centres, universities).

Please indicate the relevant stakeholders from research centers and universities related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

The three public Universities of Galicia, as well as the main research centres of the region are involved in the project through the participation of the Biomedical Foundations and Clusters. The universities and the Public Health System develop their activity research in the field of health under the umbrella of the three Biomedical Institutes of Galicia (IDIS, IIS and INIBIC), which are managed by the three biomedical Foundations of Galicia, which are actively involved in TITTAN.

The main goal of the Biomedical Foundations is to promote research, training, scientific development and innovation in the health sector. To achieve this, the three Biomedical Foundations use innovation as a tool for transferring research results to society.

- **Biomedical Foundation Ramón Domínguez- Health Research Institute of Santiago de Compostela (IDIS)- University of Santiago de Compostela.**
- **Biomedical Foundation Galicia Sur- Health Research Institute of Vigo (IIS)- University of Vigo.**
- **Biomedical Foundation Profesor Novoa Santos- Health Research Institute of A Coruña (INIBIC)- University of A Coruña.**

Please indicate the relevant stakeholders from public administration related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

- **Innovation Agency of Galicia, GAIN:** regional agency in charge of implementing the Galician RIS3 strategy as well as managing the ERDF funds. GAIN is actively involved in TITTAN.
- **Public Health System of Galicia, SERGAS and the Regional Ministry of Health:** both actively involved in TITTAN through the role of ACIS in the project.

Please indicate the 3 innovative projects/interventions with higher transformational impact in the Health Sector which have been developed in the last 5 years in your region.

1. Hospital 2050: is a healthcare innovation plan focused on the development of technologies capable of creating the hospital of the future: safe, sustainable, efficient and innovative green building.
 Activated through an innovative public procurement process co-financed with ERDF funds, it ended in 2015 with the result of 9 projects.

2. Innovasaúde: is a healthcare innovation plan focused on developing advanced solutions for current and future healthcare needs. Activated through an innovative public procurement process co-financed with ERDF funds, it ended in 2015 with the result of 14 projects.

Thanks to digitalisation and the introduction of telehealth practices, its aim is to create a safe, fast and intelligent patient-centred healthcare system.

3. Código100: is an innovation plan focused on ageing, one of the top priorities of the Galicia region. This plan had a budget of €13 million co-financed by funds from Spain's Multi-regional Operational Programme 2014-2020.

Thanks to this project, around fifteen procurement contracts have been executed using Public Procurement of Innovation.

The Code 100 Healthcare Innovation Plan has been selected for the list of nominees in the

category for the Procura + 2020 Innovation Acquisition Award.

To which of the three thematic areas addressed by TITTAN do you think you can contribute most?

As per the previous experience of the region in terms of Public Procurement of Innovation, we think the region of Galicia will contribute most to the first thematic area addressed by TITTAN, the area related to foster the Outside-IN Innovation.

In fact, the Health Public Service of Galicia has been recognised in the 1st European Innovation Public Procurement Awards launched in 2021. This body won the first prize in the Innovation Procurement Strategy Award category, which recognises long-term strategies that foster innovation procurement, solutions and sustainable practices.

The Galician Health Service, through the Galician Health Knowledge Agency, presented the application entitled "The Galician Innovation Journey in Search of PPI Solutions for Active and Healthy Ageing", with the acronym "INNO-AHA SERGAS".

The candidacy shows the commitment of the Regional Ministry of Health and the Galician Health Service since 2012 to innovative public procurement and its achievements during this time.

Following the previous experience gained by the fulfillment of innovation-procurement-based projects (i.e. Código100, InnovaSaúde or Hospital 2050) that led meaningful advances for clinicians and the overall Galician Public Health System. The Galician Health System envisages to contine and spread the application of the innovation procurement tools with projects encompassing different areas with a high impact in health and society, such as antimicrobial resistance (Innova MicroLab) or promoting an effective interconnection between research initiatives and healthcare activities (INNOVATRIAL).

Innovative services and solutions supported by innovation procurement tools have shown broad and relevant applications, such as screening, diagnosis or treatment of prevalent diseases like rheumatic, neurodegenerative and cancer pathologies or deployment in pharmacogenomics, in actual healthcare settings.

In addition, the candidacy includes the recognition of Galicia as one of the European reference regions in the development, adoption and scaling up of innovative practices for active and healthy ageing (EIP on AHA Reference Site with 4 stars).

In the same thematic area, SERGAS and ACIS have recently joined the PROCURE4HEALTH project. The objective of this project is to create a community of buyers and stakeholders in Public Procurement of Innovative solutions (PPI) and to empower all actors involved in PPI through this network, focusing mainly on public buyers. The project will also allow to analyze the current barriers and needs of buyers in order to, in a later phase, create and share tools to facilitate PPI for all the actors involved.

Which of the three thematic areas addressed by TITTAN are you more interested in learning about?

We are really interested in learning more about new strategies and policies to raise citizen´s awareness about the use of innovations in the field of health, which are strictly aligned with the strategy of the Health Public Service of Galicia.

What are the main strengths, weaknesses, opportunities and threats which are currently being faced by the Health Sector in your region? (Please, indicate maximum 4 in each field)

Strengths	Weaknesses
- Strong and high quality Public Health System. - Innovation selected as one of the priorities in the Strategy of SERGAS. - High quality of life and raw materials (healthy food) in the region. - High coordination among the main stakeholders. - Health Public Service of Galicia: winner of the first prize in the category called Innovation Procurement Strategy Award of the European Innovation Council, providing prestige and solvency.	- High number of small companies without innovative/research capacity in the region. - Lack of specialized investors. - Fragmented private sector. - Lack of investment in R&D. - Lack of health professional profiles with knowledge about innovative processes.
Opportunities	**Threats**
- Recent creation of ACIS as the chief element of health knowledge and innovation. - Room for developing new products and services: Labsaude, the first living labs integrated in the Galician Health system. - RIS 3 strategy oriented to health. - Exception IT infrastructure and homogeneous Electronic Medical Records. - Existence of two clusters which revitalise the health innovation sector: Biotechnology Cluster of Galicia, BIOGA and Health Cluster of Galicia. - Further growth in the biotech sector as a result of the pandemic	- The ageing trend. - Financial crisis not resolved. - Core structure not yet consolidated and depending on political changes. - The ageing of the population is a major cost for the system, which means that this money cannot be spent on technological improvements.

Partner name
BIOEF, Basque Foundation for Health Research and Innovation
Region name
Basque Country
Country
Spain
Number of inhabitants in the region
2,177,654 inhabitants
Percentage of population over 65 years
21% (458.396; 8.9% men (193.550), 12.18% women (264.846)
Please indicate the policy instrument which has been addressed by TITTAN and the main features of this policy instrument.
At the beginning of the project TITTAN – 2016-2020- the policy instrument addressed was the ERDF Operational Program of the Basque Country 2014-2020. However, it was the RIS3´s Bioscience-Health the policy instrument impacted at the end of the project. Regarding the new TITTAN-COVID19 project the instrument selected was the new version of the "Research and Innovation for Strategy in Health 2020" (RISH 2020). ERDF Operational Program of the Basque Country – 2014-2020 2014 – 2020 ERDF Operational Program (OP) of the Basque Country. The ERDF Operational Program 2014-2020 of the Basque Country is the document in which the strategy and thematic objectives of intervention are set up in the region. It addressed finance activities by the ERDF for the new programming period 2014-2020, and the financial arrangements set for these objectives. The ERDF Programme put special focus on the thematic objectives addressed to promote the smart specialization strategy in Europe 2020: R+D+I (OT1), TICs (OT2), SMEs (OT3) and Low Economy and Carbon (OT4). The measures addressed through the TITTAN project are as follows: - Thematic objective 1 (R+D+I), where there is a specific mention on boosting the R+D+I on ageing and health by promoting the technological convergence to fill gap markets on ageing, health and others (page 12 of the document). - Thematic objective 3 (to improve the competitiveness of the SMEs), to which creating new services, products for ageing population, and health, is one of its main issues (page 15 of the document). RIS3-Euskadi The Basque Country (BC) in its latest OP, which cofounds its Bask Regional Innovation Strategy (RIS3 Euskadi, hereafter "RIS3"), introduced different modifications to align R&D&I investments to RIS3 priorities (Advanced Manufacturing, Energy and Biosciences-Health). The Research and Innovation for Health Strategy 2020 (RIHS 2020), leaded by the Ministry of Health of the Basque Government, helps to reach the goals set up in the RIS3´s Bioscience-Health priority. During TITTAN-COVID19 project 2020-2021 RIHS 2020 The RIHS 2020 is the Basque Public Health System's (BPHS´) contribution to RIS3 in order to

develop the Biosciences-Health priority. The Ministry of Health leads the dynamization of the priority and BIOEF carries out the Technical Secretary functions while it is also involved as an agent.

Indeed, RIS3´s Bioscience-Health priority and RIHS 2020 assume the opportunity to take advantage of the helper effect of the BPHS for complement the scientific-technological and business capacities of the Basque Country as a booster of health, improving the performance of the health system itself, and the generation of wealth. To that end, it promotes the collaboration of the Health System with the business ecosystem and Basque scientific-technological agents. Liokewise, the RIHS 2020 includes, within the Impact chapter, the development of Open innovation programs, such as Innosasun program. This program facilitates interaction between Public Health System and companies from the Biosciences-Health sector of RIS3. In fact, the whole Health System participates in the Innosasun program, while it is coordinated by BIOEF. Innosasun acts by offering personalized support to companies and scientific-technological agents in the development of products and services with potential application in health, turning the health system into a reference partner.

Are the main objectives addressed by the policy instrument involved in TITTAN, linked to the regional innovation strategy for smart specialisation (RIS3)?   If yes, please indicate how.

TITTAN project 2016-2020

Yes, the Basque Country Smart Specialization puts the emphasis and priorities on: Advanced manufacturing, Energy, Biosciences / Health.

The smart specialization approach aims to bring together resources and knowledge from different fields, technologies and disciplines to develop activities that cover the whole value chain of R&D&I.

Moreover, the Basque Country opts for innovation as a key element for improving the competitiveness of its economy, the public sector must assume an exemplary leadership role with respect to innovation, through the improvement of public services, guidance for citizen and operational efficiency to meet the following needs:

   • To adapt the functioning of public administration to the parameters of an advanced democracy.
   • To ensure efficient services and quality care to citizens.
   • To consolidate and update the development of eGovernment.
   • To adapt its organizational structure and professional profiles.
   • To involve citizens in the design, management and evaluation of policies.

Furthermore, the RIHS 2020 is the Basque Public Health System's contributes to RIS3 in order to develop the Biosciences-Health priority.

During the TITTAN-COVID19 2020-2021

Yes, not only should the above comments be considered, but it is a specific priority Bioscience-Health in RIS3 Euskadi. Furthermore, RIHS2020 also supports the development of medical devices such as the R&D&I projects carried out to fight against COVID19 with the Innosasun program.

Which actions of the following are considered the key areas in the Health and Well-being Sector in your region? How they have evolved in the last 5 years? Please select at least three:

   • **Prevention, screening and early diagnosis** (1. Health literacy, patient empowerment, ethics and adherence; 2. Personal health management; 3. Prevention, early diagnosis

of functional and cognitive decline; other, please specify).

- **Care and cure** (1. Protocols, education and training programmes for health workforce, comprehensive case management, multi-morbidity, poly-pharmacy, frailty and remote monitoring; 2. Multi-morbidity and R&D; 3. Capacity building and repeatability of successful integrated care systems; other, please specify).
- **Active ageing & independent living** (1. Assisted daily living for older people with cognitive impairment; 2. Extending active and independent living through Open and Personalised solutions; 3. Innovation improving social inclusion of older people; Other, please specify).

During the development of the TITTAN project 2016-2020
- Prevention, screening and early diagnosis
- Personal health management
- Capacity building and replicability of successful integrated care system
- Extending active and independent living through Open and Personalized solutions.

The Basque Country healthcare model aims to enhanced patient centered and seamless care by improving coordination and continuity of care between care levels and adapting provided care to patient needs. In this way, the structural integration of both primary and secondary care organizations of each specific area into one single integrated care organization (ICO) is a priority in the healthcare plan. This plan was launched at the beginning of 2012 and finished in January of 2016 resulting in 13 ICOs. The creation of the ICOs has allowed the merging of governance bodies and, in consequence, the coordination between healthcare professionals of distinct care levels has been improved.

Integrated Intervention Plans for population groups identified according to their risk has been deployed in the Basque Health Service. They include clinical pathways that involve all levels of care, disciplines and actions needed to implement the best clinical practice for:
- Multimorbid patients
- Patients with Diabetes Mellitus
- Patients with Congestive Heart Failure (CHF)
- Patients with Chronic Obstructive Pulmonary Disease (COPD)

The integrated intervention plans has been joint to the incorporation of new innovations, such as the creation of new roles ("liaison nurse" in hospitals and "case manager/advanced skills nurse" in health centers), implementation of telemonitoring services, and deployment of structured programmes boosting patient empowerment.

In the Basque Country, prevention, screening and early diagnosis has been a key area in the Public Basque Health Service (Osakidetza). Great efforts have been done in the last years and several programs for early diagnosis have been deployed: screening for early detection of breast cancer, screening for early detection of colon cancer, heel test for newborns etc. Currently, special emphasis is being made in the development and up-scaling of new programs and strategies to boost personal health management and patient empowerment, and improve adherence to treatment:

 • Educational programs in self-care for patients, caregivers, and citizens (School of Patients, Active Patient) and new models of community interventions through the "local health networks"

 • Information and training for citizens in drug therapies, including chronic diseases and ageing (iBOTiKA)

 • Improve pharmacotherapeutic care by strengthening communication among professionals

for a better use of medicines and reach better health outcomes of patients with Diabetes II and polypharmacy.

 • Optimize safety and effectiveness of drugs in people cared by home care services.

The new programs respond to the priorities of Basque Country Health Plan (2013-2020) formulated by the Basque Government and the strategic guidelines 2013-2016 of the Health Service, Osakidetza.

Moreover, integrated communication systems to unify and share clinical information have been developed:

 • Electronic health record (EHR- Osabide Global), e-prescription (Presbide), intranets and other communication mechanisms (videoconferences). These have been scaled up to all services and extended to nursing homes to facilitate the communication between health professionals and ensure shared clinical information. It will cover over 50% nursing homes places in December 2016.

 • Interoperability of social and health information systems, using a tool (InterRAI-CA) to share the diagnosis and care plans. This is being piloted and 70 licenses have been bought.

A risk stratification tool was created in 2010 to identify patients with different levels of complexity according to the risk of using healthcare services in the near future. Three stratification processes have been done and currently work is being carried out to improve the tool (data collection, social indicator, feasibility).

Another key area in the Basque Country is the "Extending active and independent living through Open and Personalized solutions". The Digital Agenda 2015 fosters Living labs structures as Ergolab, to create more usable digital services for the elderly; the University of Deusto evaluating ICT solutions in real environments laboratory or Living Labs, and through interdisciplinary platforms (Deusto Ageing and Wellbeing Interdisciplinary Research Platform). Telemonitoring services for chronic heart failure (CHF) and Chronic Obstructive pulmonary disease (COPD) has been deployed in Osakidetza and currently covering 210 CHF and 170 COPD patients.

During the TITTAN 2020-2021

It is worthy to underline that during the last five years the regional efforts on the Health and Wellbeing were leaded by the Scientific and Technological innovation Program (STIP) and the RIS3 Euskadi 2014-2020 as it was previously detailed.

As it was mentioned above the strategic priorities identified of the smart specialization RIS3 for the Basque Country were 1) Advance Manufacturing, 2) Energy and 3) Bioscience-Health. The way to contribute to the goals included in the RIS3 by the Basque Public Health System is underpinned in the RIHS.

During this period, the application of Bioscience-Health priority reinforced the development of the health sector, based on the existence of a powerful and efficient public network with research and innovation capacity capable of drawing new developments. Indeed, the Biosciences-health priority worked to generate wealth in Euskadi developing a sector of high added value that also benefits the health of people through:

• Strengthen the health system as support for the business sector and tractor new scientific-technological developments

• Consolidate value chains around healthcare products (including medical devices), new therapies and treatments, and health promotion.

The development of this sector is based on public-private collaboration, entrepreneurship, and open innovation. As result of this regional effort and specifically according to the RIHS, the

following matter were addressed during this period:

    • Prevention, screening and early diagnosis 1. Health literacy, patient empowerment, ethics and adherence; 2. Personal health management; 3. Prevention, early diagnosis of functional and cognitive decline; Other, please specify.

     • Care and cure 1. Protocols, education and training programmes for health workforce, (comprehensive case management, multimorbidity, polypharmacy, frailty and remote monitoring); 2. Multimorbidity and R&D; 3. Capacity building and replicability of successful integrated care systems; Other, please specify.

   • Active ageing & independent living 1. Assisted daily living for older people with cognitive impairment; 2. Extending active and independent living through Open and Personalized solutions; 3. Innovation improving social inclusion of older people.

Are the leading companies in the Health Sector of your region specialized in the key areas which have been formerly indicated?

TITTAN project 2016-2020

Yes

In the Basque Country, the health sector is heterogeneous in nature, since it includes both biotechnology based companies such as medical equipment, medical devices, ICT and bioinformatics, suppliers or manufacturers of prostheses and implants companies. Many of these companies are grouped in the Basque Biocluster-Basque Association of Bioscience.

Moreover, traditional pharmaceutical companies, Faes Farma and Bial, have joined in recent years new business groups (Progenika Group now integrated into the Grifols Group, Noray BG Group, BTI, Praxis Group) that have grown at more rhythm and have an international presence. Young startups, in a process of generating new businesses, are emerging. Mostly, the bioregion is made up of a variety of small firms, characterized by their youth, their long maturation periods (and the associated financial requirements), the existence of highly qualified and gender parity, intensive activity in R + D, and the inherent international vision.

On the other hand, the region ongoing efforts towards person centred care have led to applied research in neuroscience (Achucarro, CIC Biogune, Progenika), interoperability (Ibermatica, Everis), domestic robotics (Tecnalia and IK4), rehabilitation technologies (Tecnalia) and innovative functional food (Tecnalia).

MONDRAGON Corporation (MONDRAGON) is the first industrial cooperative created in 1956 in the Basque Country and is the foremost Basque business group and the tenth largest in Spain. MONDRAGON corporation created MONDRAGON Health, which belongs to MONDRAGON Promotion Centre, with the aim of leading Health Sector development and fostering the generation of comprehensive solutions through inter-cooperation. MONDRAGON Health wishes to contribute to transform the local business fabric and create wealth and added-value employment. An important aspect of MONDRAGON Health's work is seeking opportunities for business and joint collaboration with companies–corporate group companies and others–and with local governments, health administrations, etc.

MONDRAGON corporation has participated in the creation of 280 SMEs which employ over 80,000 people. Moreover, MONDRAGON serves as an inspiration to the growing number of social entrepreneurs. Through local government R&D programmes the SMEs they create collaborate with technology centres such as TECNALIA and IK4 and large enterprises such as INDRA.

The University of Deusto is working in the implementation of enabling technologies for older people (or at risk of frailty, for example Sunfrail project) through serious games based on ICT

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sensors (Kineage), or in a cognitive rehabilitation programme designed for individuals with psychosis and/or schizophrenia as well (REHACOP programme).

The University of the Basque Country UPV/EHU is working in joint projects regarding optimal physical exercise programs to avoid or reverse frailty and developing specific technology for physical rehabilitation of the upper limbs.

The Basque Health Service (Osakidetza) has developed integrated ICT tools such as EHR (Osabide) and the Nursing Care Program (Osanaia) with local companies as Ibermatica and Bilbomatica.

Health research linked to the healthcare system is carried out in the Basque Health Service (Osakidetza) managed by the Basque Foundation for Health Innovation and Research (BIOEF), as well as in the Institutes of Health Research (IHR) Biodonostia and Biocruces, Kronikgune and Osatek.

TITTAN project 2020-2021

Yes,

In relation to the above information the Basque Bioscience-Health ecosystem has been strengthened during the period. Indeed, according to the last data of 2021, the biosciences and health sector in the Basque Autonomous Community is made up of more than 150 companies, 90% of which are SMEs, employing more than 8,085 people and representing 1.9% of the GDP in the Basque Country. With a total turnover of more than 1,668 million euros in 2020, R&D expenditure in that year was more than 140 million euros. The biosciences sector has a growing business presence in the Basque Country, and has a great opportunity for growth in a market that will grow internationally.

The strong commitment to the development of the biosciences sector has driven the Basque Health Cluster, which coordinates, manages and promotes the common interests of the companies in the sector, in collaboration with the local administration and other organizations in the field of biosciences, promoting business cooperation as a basis for the competitive development of its companies and their internationalization, and contributing to the development and positioning of the Basque Country's bio sector. The Basque Health Cluster currently has more than 90 associated companies. This cluster includes companies associated with the sub-sector Pharmaceutical the 12,5%, Biotechnological 20,3%, Medical Device 21,7%, Care Services 5,92%, Digital Health 15,13%, Services 24,3%. Regarding the R&D&I centers, the Basque Public Health Systema also added the HRI Bioaraba for boosting the cooperation in the Araba

Is there a close cooperation between the companies, the universities and research centers related to the Health Sector and the public administration in your region?

TITTAN project 2016-2020

Yes, there is a close cooperation. There are several initiatives in which different organizations are working together closely as the LifeKIC initiative for the EIT HEALTH KIC, Reference Site in the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) and the definition of the RIS3 strategy.

TITTAN project 2020-2021

Yes, the European Commission has given the Basque Country the highest possible rating, four stars, and the "Seal of Excellence" as a Reference Site for their outstanding work fostering regional innovation and active and healthy ageing, enhancing the quality of life or ageing

population, improving the provision of healthcare and social care services, and fostering economic growth and a competitiveness increase in the region. This award is the result of the fruitful connections boosted in the ecosystem during the last years. This result is due to the STIP, RIS3 and RIHS strategies which boost the networking around the Bioscience-Health priorities.

Please indicate the relevant stakeholders from private sector (big companies, cluster, etc.) related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

During the project we maintained the Basque Health Cluster informed of the activities carried out, so the companies of the health sector were also informed and invited to be involved during the project.
These are:
  • Tecnalia
  • IK4
  • MONDRAGON corporation (MONDRAGON Health)
  • Progenika Biopharma
  • Noray bioscence group
  • Praxis Pharmaceutical
  • FAES FARMA
  • BIAL
  • BTI Biotechnology Institute
  • Deusto Foundation
    • Basque BioCluster (Abyntek Biopharma, AJL Ophtalmic, Bial Industrial Farmacéutica, Biobide, Bioftalmik, Biofungitek, Biokilab, Biolan Microbiosensores, Laboratorios Biotalde, Brainco, Biopharma, BTI Biotechnology Institute, Dynakin, Faes Farma, Histocell , Idoki, Ikerlat Polymers, IMG Pharma Biotech Ingeclima, Inkoa Sistemas, Innoprot, Laboratorios Bromatológicos Araba, Laboratorium Sanitatis, Midatech, Biogune, Noray Bioinformatics, One Way Liver Genomics, Praxis Pharmaceutical, Progenika Biopharma, Proteomika, Vacunek)
  • Tecnalia, IK4, MONDRAGON corporation and Deusto Foundation are actively involved in the project.

Please indicate the relevant stakeholders from research centers and universities related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

During this period the stakeholder involved were:

  • Kronikgune
  • CIC Biogune
  • CIC Biomagune
  • CIC Nanogune
  • Achucarro-Basque Center for Neuroscience
  • Basque Center on Cognition Brain and Language
  • BCA-Basque Center for Applied Mathematics
  • BIOFISIKA-Basque Center for BIOFISIKA
  • Ikerbasque-Basque Foundation for Science
  • Matia Institute of Geronlogy

- University of the Basque Country UPV/EHU
- University of Deusto
- University of Mondragon
- Institutes of Health Research (IHR) Bioaraba, Biocruces-Bizkaia and Biodonostia.
- OSATEK
- Basque Culinary Center
- CITA Alzheimer
- Adinberri

Kronikgune, Matia Institute of Geronlogy, University of the Basque Country, University of Deusto, University of Mondragon are actively involved in the project.

Please indicate the relevant stakeholders from public administration related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

- The Basque Department of Health
- The Basque Department of Economic Development and Competitiveness
- The Basque Department of Treasury and Finance
- Basque Health Service (Osakidetza)
- BIOEF
- SPRI-Basque Business Development Agency
- Ikerbasque-Basque Foundation for Science
- Innobasque-Basque Innovation Agency
- Deputations of Araba, Bizkaia and Gipuzkoa.
- BIOEF, The Basque Department of Health, the Basque Department of Treasury and Finance and the Basque Health Service are involved in the project.

Please indicate the 3 innovative projects/interventions with higher transformational impact in the Health Sector which have been developed in the last 5 years in your region.

1.   eHealth Strategy:

The Basque Department of Health, through Osakidetza, has deployed an ICT strategy to support integrated care dealing with ageing, chronicity and dependency. The final objective is the creation of a unified system that integrates all different clinical information, with the aim of promoting continuity of care under the same process between the different integrated care organisations (ICOs) avoiding fragmented care. In addition to this, an e-Health strategy, Osarean, has been implemented providing non-face to face care focused on prevention, monitoring and health advice.

The Basque Department of Employment and Social Policies has deployed a telecare service covering more than 35.000 people connected via "panic button" and phone, with a central call centre and mobile teams (Beti-on). Operators can activate services entrusted to the eHealth Centre, such as telemonitoring or emergency department.

The most relevant health ICT tools deployed are Risk Stratification System, unified Electronic health Record (EHR), Osanaia (a tool for nurse´s management), e-Prescription (Presbide), multi-channel communication services (OSAREAN Customer Relations Management, CRM, platform), Personal Health Folder (PHF) and other tools that increase coordination among healthcare professionals and social care workers. Health professionals from any centre or care level can communicate and share information through the EHR and the electronic prescription.

Osabide Global, the unified EHR, is a single electronic medical records´ program providing comprehensive patient focused information. All Osakidetza centers have deployed the EHR (including hospitals and primary care centers). The tool contains all health-related information on a patient, facilitating service delivery and enabling the provision of new forms of healthcare such as videoconference between primary and specialized healthcare. With its patient centered approach, it has significantly contributed to the care continuum, and allowed to overcome the previously existing barriers between different areas and levels of care.

Osabide Global interoperates permanently and very intensively with hospital healthcare information systems (HIS). For each patient, doctors can see all stored data, as next appointments, fact sheets and recommendations, informed consent forms, social history, pending tasks, reports etc. Different clinical data and diagnostic tests or health records are also accessible in Osabide Global.

Osanaia is a tool created for the management of nursing care, allowing to set and manage personalized nursing care plans, customized to each patient needs. It integrates information from primary, specialized care and mental health.

The e-Prescription service, Presbide, is provided by a unique system in both care sectors, and covers all health centers, hospitals and community pharmacies. This system has been integrated as a module within the EHR systems (Osabide).

OSAREAN Multichannel Services Centre (MSC) supports the e-health call center, run by nurses on a 24X7 basis and manages several e-health services:

   • Health advice, managing through a protocol supported algorithm, mild health problems that can be treated at home or referring patients to an appropriate health professional or emergency service.

    • Chronic care, performing activities embedded in integral clinical pathways, such as symptoms follow up, adherence reinforcement calls, health education or others.

   • Telehealth integration, gathering the information provided by all telemonitoring devices and sensors that measure patients´ clinical parameters at home, facilitating patient follow up, care adherence and enhancing patient-professional communication.

   • Prevention programs, such as stop smoking program, monitoring sedentary lifestyles etc and health related questionnaires completed by patients in the PHF.

    • Personal Health Folder (PHF) system permits, via personalized web access, patients examining and downloading their clinical reports and information. Patients can introduce health data. This information is recorded into their EHR, via the CRM for further evaluation and health status monitoring by professionals.

   • Administrative procedures such as appointments and some documents can be performed on line.

2. Holistic view of the need to approach ageing and innovation by all agents:

Several strategies has been defined to deal with ageing and innovation in the Basque Country:

   • The Health Plan for the Basque Country (2013-2020), the strategic guidelines (2013-2016) of the Basque Department of Health and the strategic Social and Health Care guidelines for Basque Country (2013-2016) establish as a priority ageing, chronicity and dependency.

   • The Basque Country Strategy on Ageing (2015-2020) has been defined by the Department of Employment and Social Policies (Basque Government). The strategy is focused on adaptation to an ageing society (new governance model), anticipation and prevention for ageing better and friendly environments and participation in the construction of welfare

society.

• The Plan for Science, Technology and Innovation "PCTI Euskadi 2020" has been developed by the Basque Government to create the conditions to improve the level of efficiency of science, technology and innovation system. The Plan aims to deepen the results orientation of the system, adapting the different types of research activity and their position in the value chain of the innovation to this objective. This Plan aims to apply more innovation to research, increasing cooperation between the science world and the business world to guide the activity of R+D+I towards results which can meet business demands and help address the major challenges facing the Basque Country, thus contributing to job creation and to economic and social wealth.

• The Health research and innovation strategy 2020 of the Basque Department of Health comprises the guidelines to follow in order to ensure the healthcare system becomes as essential pillar in the RIS3 strategy and establish as objective: increase the impact of activities R + D + i aimed at improving health citizenship and contribution to the generation wealth; improve the integration of research and innovative activities the care work care and teaching; stimulate the realization of research and innovation by the health care professionals and advance in the involvement of patients and citizenship; Improve funding for research and innovation in health, with both internal and external resources.

Education related to health is a priority for the three universities of the Basque Country (University of the Basque Country UPV/EHU, University of Deusto and University of Mondragon). New qualifications related to Health have been created: Physiotherapy degree (University of the Basque Country) and Biomedical engineering degree (University of Mondragon). Moreover, several masters are running: "Healthy Ageing and Quality of life" by the University of the Basque Country UPV/EHU, "Health Management", and "General Health Psychology and Clinical Neuropsychology" by the University of Deusto. The University of Deusto, furthermore, is running the DIRS-COFUND project, one of which focus areas is Health and Wellbeing. Mondragon University runs courses for middle range managers to ensure the vision of integration and chronicity. The University of the Basque Country has launched EUSKAMPUS together with TECNALIA and DIPC (Donostia International Physics Center), based on the International Campus of Excellence Programme. EUSKAMPUS constitutes a community of ten education, research and transfer clusters that shape the three main specialization areas one of them being healthy ageing and quality of life.

Moreover, an infrastructure for innovative knowledge transfer within and across sectors has been established in the Basque Country. Associations of private companies, non-profit organization and public sector include Basque Biocluster (biosciences sector) and Gaia (electronics, information technology and telecommunications). InnovaNet (Euskadi+innova) supports training and actions related to innovation in companies.

The Basque Foundation for Health Innovation and Research (BIOEF) has implemented Innosasun program, that "de facto" converts the healthcare services in a real testing lab or living lab for SMEs innovations, providing support through capabilities, knowledge and its extensive collaborative.

Osakidetza has created Integrasarea, a network to ensure continuity of patient-centered care and actions carried out in different health organizations. It includes actors from health organizations, citizens and industry. It aims to disseminate management tools, guidelines and best practices to ensure continuity of care and promote collaborative learning.

Basque Country participates in national and international networks: EUNEHTA, EUPHA, EHMA, INAHTA, HTAi, WHO Global Network of Age friendly Cities and Communities, Covenant on

Demographic Change, AFE-INNOVNET, and WeDO Network.

All these activities and strategies are reflected by the Active Ageing index results that place Basque Country in the 7th place of 28 European countries analyzed. This index measures the extent to which older people can realize their full potential in terms of employment, participation in social and cultural life and independent living. It also measures the extent to which the environment they live in enables seniors to lead an active life. It consists of 22 indicators grouped into four dimensions: employment, social participation, independent and secure life, and capacity for healthy aging. The Basque Country ranks in the second position compared to the EU-28, only after Sweden in the fourth dimension. This dimension measures if the environment facilitates active aging. It accounts for 20% of the overall score and includes aspects such as life expectancy, life expectancy in health, mental health, the use of information and communication technologies, social connectivity and level of education.

3. Bioscience -Health priority in RIS3 Strategy

The RIS3 strategy is a dynamic process in which various actors are involved, making up the four parts of the innovation 'helix': public authorities, the business community, academia and knowledge, and civil society.

Therefore, the design and monitoring of its implementation will be done collaboratively through the development of each of its priority areas, by:

   • A participatory process, called Entrepreneur Discovery Spaces, to flesh out the priorities in science, technology and innovation in the Basque Country, taking as its starting point the current situation.

    • The promotion of pilot projects generated from a real need or challenge detected in the Basque socio-economic fabric or from an opportunity for the country, which will be used as a test to validate and/or specify a priority, a new approach or a new way of doing new politics.

On the deployment of the strategy RIS3 in Bioscience Health a pilot group has been created. The pilot group is formed by actors from different sectors: research (CIC Biogune, Cic biomagune), industries (IK4, Tecnalia, Basque Biocluster, Euskampus), the Basque Health Service (Osakidetza) with the technical support of Ikerbasque (Basque Foundation for Science), BIOEF and Spri (Basque business development agency) and a directive commission (The Health Department, The Education, Language policy and Culture Department, The Economic Development and Competitiveness department and The Treasury and Finance Department) and Innobasque (Basque Innovation Agency) as technical secretariat.

The pilot group has worked in identify:

   • Priority areas: Rare Diseases, Personalized Medicine, Digital Health-devices, Analytics/Big Data

   • Strategic initiatives: Innosasun, Innovative Public Procurement, Baliosasun, EIP-AHA.

For each priority area, a working group has been established. The working group is formed by skilled persons in each area. These working groups have to assess the impact on the health sector of its area, assess the technological, scientific-and business skills in the Basque Country in relation to the area and evaluate the global trends to explain the need or opportunity of this priority area, developing a living document and later implement a plan of action in each priority area.

To which of the three thematic areas addressed by TITTAN do you think you can contribute most?

We can contribute to the three thematic areas
Which of the three thematic areas addressed by TITTAN are you more interested in learning about?
We are interested in learning about the three thematic areas

What are the main strengths, weaknesses, opportunities and threats which are currently being faced by the Health Sector in your region? (Please, indicate maximum 4 in each field)

Strengths	Weaknesses
• The Basque Health Service is public, based on the principles of universality, solidarity, equity, efficiency, quality and citizen participation. Chronicity and integrated care driving to a new organizational model are considered a priority. Strong shared leadership addressing the coming tackles. • Health Sector is a strategic priority. It is reflected in the different strategies lines (PCTI, RIS3...) and in the new qualifications in health that have been launched in the last years in the Basque Universities. • Small size of the region which enables the interdisciplinary and intersectorial collaboration (ecosystems) and favors the changes with the early adopter culture of the Basque Country. • Industrial and technological sector highly developed.	• Dispersion of activity, lack of focus and small critical mass (few actors and try to reach a lot) and low investment in R + D+i compared to other countries and incapacity to transform research to products and services. • Limited communication between the different actors. There is a wide gap between the health system and social health workers (psychology, physiotherapy). • Industrial sector in the health area is weak, is asleep and must be activated. Moreover, there is a lack of health professional profiles in the productive and technological sector. • Health system capacity is underused and limited culture in R+ D+ i in health.
Opportunities	**Threats**
• Ageing as an economic opportunity (silver economy). It is an emerging area being an opportunity for the Basque industrial sector and for the new network of entrepreneurs. • European framework that supports innovation, research and ageing and the scaling up of good practices. • Need for restructuring the healthcare system to respond to changes, new professionals competences and roles are being consolidated in the system. New approaches in	• Economic crisis. Political instability and risk that decision-makers do not support R + D + i. • Not having focus, dispersion of activities and not be able to provide feedback activities. • International competitors that are ahead of us and are more developed. • The ageing population which is a major expense for the system and the generational change that may cause

interprofessional and collaborative work are emerging. • Economic crisis. Sociocultural level of citizenship.	the absence of leaders.

Partner name
FRRB, Fondazione Regionale per la Ricerca Biomedica
Region name
Lombardia
Country
Italy
Number of inhabitants in the region
9.965.046 (Year 2021)
Percentage of population over 65 years
2.308.169 (23.0%)
Please indicate the policy instrument which has been addressed by TITTAN and the main features of this policy instrument.
2014 – 2020 ERDF Operational Programme of Lombardy Region. The ERDF Operational Programme of the Region of Lombardy is the regional policy instrument that lays out the implementation of ERDF funds. The actions of the TITTAN project can be related to the Axis I "Strengthening research, technological development and innovation", with a focus on the following areas: promotion of new markets for innovation – support to PCP and PPI actions; support to projects concerning the regional innovation strategy for smart specialization (RIS3) – of which one of the specific work programmes is "active ageing"; support to actions enabling the regional stakeholders to participate in innovation platforms, such as clusters, as well as to participate in European programmes for research and innovation. The Operational Programme could benefit from the expertise of other European regions, particularly with regard to the transfer of transnational research results to businesses, and to the policies and projects about telehealth and its application in the public healthcare of S3s.
Are the main objectives addressed by the policy instrument involved in TITTAN, linked to the regional innovation strategy for smart specialisation (RIS3)?
YES The "Smart Specialisation Strategy" (S3) of Lombardy Region outlines the strategy of integrated and sustainable development that the region intends to pursue. Lombardy' RIS3 helps build connections of ideas, finance and trade with similar activities becoming a long term strategic framework. The identified challenge is to support, to accelerate the transformation of traditional and/or mature industries in emerging industries. Lombardy S3 includes a number of priorities, and among them there is "industry of health".
Which actions of the following are considered the key areas in the Health and Wellbeing Sector in your region? How they have evolved in the last 5 years? Please select at least three:
• **Prevention, screening and early diagnosis:** ➢ Health literacy, patient empowerment, ethics and adherence; ➢ Personal health management; ➢ Prevention, early diagnosis of functional and cognitive decline;

- ➢ Other, please specify
- **Care and cure**
- ➢ Protocols, education and training programmes for health workforce, (comprehensive case management, multimorbidity, polypharmacy, frailty and remote monitoring);
- ➢ Multimorbidity and R&D;
- ➢ Capacity building and replicability of successful integrated care systems;
- ➢ Other, please specify.
- **Active ageing & independent living**
1. Assisted daily living for older people with cognitive impairment;
2. Extending active and independent living through Open and Personalised solutions;
3. Innovation improving social inclusion of older people;

- **Prevention, screening and early diagnosis:**
Personal health management;

- **Care and cure**
Multimorbidity and R&D;

- **Active ageing & independent living**
Extending active and independent living through Open and Personalised solutions;

Are the leading companies in the Health Sector of your region specialized in the key areas which have been formerly indicated?

Yes. There are a number of companies, regional organisations and public hospitals involved in the areas that can be identified, but mostly they are working within two important clusters: "Lombardy Life Sciences Cluster" and the "Lombardy Cluster Technologies for Living Environments". Clusters promote the interaction between the multidisciplinary research system, the pharmaceutical-biomedical industries and the public institutions in the health sector, providing an important input to research and innovation in the country.

Is there a close cooperation between the companies, the universities and research centres related to the Health Sector and the public administration in your region?

Yes. The clusters support a high-level interaction between the different actors in the healthcare sector.
In addition, Lombardy is the Region that invests the most in Italy in Life Sciences and it is the first in Italy for the number of companies in the life sciences sector and, together with Cataluña, Baden-Württemberg and Île de France, and one of the first regions in Europe for pharmaceutical production.

Please indicate the relevant stakeholders from private sector (big companies, cluster, etc) related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

- Lombardy Cluster for Life Science, Finlombarda S.p.A., Lombardy Cluster Technologies for Living Environments.
Both clusters are involved in TITTAN activities.

Please indicate the relevant stakeholders from Research Centres and universities related to the Health Sector in the region, and which of them are actively involved in the TITTAN

project.
• Don Gnocchi Foundation • Monzino Hospital, • ASST Giovanni XXIII hospital • University of Milan
Please indicate the relevant stakeholders from public administration related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.
• Directorate-General for Healthcare • Directorate-General Research, Innovation, University, Export and Internationalization;
Please indicate the 3 innovative projects/interventions with higher transformational impact in the Health Sector which have been developed in the last 5 years in your region.
1. Pre Commercial Procurement initiatives in the health sector. 2. Open Innovation platform. 3. Regional Healthcare reform with the law 22/2021.
To which of the three thematic areas addressed by TITTAN do you think you can contribute most?
After meeting with the stakeholders, we think we can provide insights form the Lombardy Region on all the thematic Areas encompassed by TITTAN.
Which of the three thematic areas addressed by TITTAN are you more interested in learning about?
With regard to TITTAN, Lombardy Region through FRRB could learn more about citizen´s awareness regarding the use of new technologies for improving quality of life.

What are the main strengths, weaknesses, opportunities and threats which are currently being faced by the Health Sector in your region? (Please, indicate maximum 4 in each field)

Strengths	Weaknesses
• The Lombardy healthcare system is a leader in **innovative medical** and **surgical technology**, **advanced medical training** and **research**. • High quality healthcare, with some of the most important hospitals in Italy, • Capacity to take care of high number of patients from other regions and abroad. The high proportion of patients from other regions – about 10% and up to 50% in some specialties, such as oncology and cardiology – proves the attractiveness of the LHS.	• The main weakness of the Lombardy System is the difficulty to manage the high number of elderly people (over 65), which represents a continuous challenge for the regional health care structure. The demographic situation requires a deep focus and monitoring (qualitative and quantitative) of their health status. • Also, the high density of the population (approx. 10 million people live in Lombardy) is one of the leading

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• Relevance of **biotechnology sector** (Of all the Italian companies that operate in biotechnology, 35% reside in Lombardy, and the region accounts for 73% of national investments in biotechnology Research & Development. These 78 companies employ 11,555 people and generate annual revenues of € 2.4 billion) and relevance of the pharmaceutical sector. About 60% of the productive **pharmaceutical enterprises** operating in the country are located in Lombardy. In addition, there are internationally-recognised universities hosting medical-scientific disciplines, sufficient to make the region one of the best international biomedical and biotechnology research centres in existence, particularly in the fields of genomics and nanotechnologies.	causes of the massive impact of covid 19 on the regional territory.
Opportunities • The regional Health System reform of 2016 tried to tackle the main threats. In particular, statistics suggest that in 2030 Lombardy will have a population of about 3 million of elderly people, with more than 1 million people being over 80. The 2016 reform aimed to implement a new paradigm: from "to cure" to "to take care". • A recent reform (2022) is aimed at strengthening the territorial healthcare systems, with healthcare structures closer to the population.	**Threats** • The main threats come from the demography and epidemiology of Lombardy region.

Partner name
HEALTHY SAXONY - Verein zur Förderung der Gesundheitswirtschaft e.V.
Region name
Saxony
Country
Germany
Number of inhabitants in the region
4.078.000 inhabitants (January 2018)
Percentage of population over 65 years
26,5 % (2019)
Please indicate the policy instrument which has been addressed by TITTAN and the main features of this policy instrument.
ERDF The ERDF Operational Programme of the Free State of Saxony is the regional policy instrument that manages ERDF funds. It is about to be approved by the Saxonian government in spring 2022 as a result of detailed consideration regarding regional challenges as well as overall investment priorities. Extensive parts of this programme align with priorities of the Europa 2020 smart specialization strategy as well as the Saxon Strategy for Innovation, e.g. to foster research, development and innovations, reduce CO_2-Emissions, the adjustment to climatic changes as well as the preservation of the environment and many more. The improvement of healthcare through more resourceful and innovative technology-based measures is among the top priorities of the region. The rate of population under the age 20 decreased from 24% in 1990 to 17,6 % in 2019 while the rate of senior population (age 65 or higher) increased during the same period from 16% to 26,5 %. It is expected that the amount of senior population will be increased up to the rate of 33% by 2025 while the rate of the younger population will hardly increase. Furthermore a remarkable amount of the Saxonian population lives in rural areas where medical and healthcare provision are far less dense than in urban regions. Only by fostering and implementing technology-based innovations, Saxony can tackle the distinctive demographic and healthcare challenges mentioned above.
Are the main objectives addressed by the policy instrument involved in TITTAN, linked to the regional innovation strategy for smart specialisation (RIS3)? If yes, please indicate how.
The regional innovation strategy for smart specialisation (RIS3) is the result of a strategy development process that is based on comprehensive analyses and intensive participation of numerous stakeholders like, for instance, health economics and biotechnology. Health is a key driving force of economic growth. Lifetime health and well-being for all, high-quality and economically sustainable health and care systems, and opportunities for new jobs and growth, are the challenges; overcoming them is the aim of promoting research and innovation. The term health industry has a cross-industry character and includes the

development, manufacture and marketing of goods and services that are used in the broadest sense of the preservation and restoration of health.

Some parts of the healthcare industry include highly innovative, research-oriented fields. These arise both in the life sciences and medical technology (new diagnostic and treatment approaches, pharmaceutical products, medical equipment, medical computer science), in the field of knowledge-intensive services (medical and nursing care), and increasingly outside the traditional health care system, at the interface between other disciplines of knowledge, for example engineering and information technology. So, for example, winning over an ageing population to support the testing and structuring of alternative care facilities becomes increasingly important.

Consequently, the understanding of health, disease, disability, development and (active) ageing and their improvement through innovative scalable and effective products, strategies, interventions and services are to be supported. These include e-health measures, measures for telematic, interdisciplinary networking and Ambient Assisted Living (AAL).

The Free State of Saxony will strengthen the willingness and ability to create healthcare innovation and improve the conditions for it – for instance via the foundation of institutions like Organic Electronics Saxony, Silicon Saxony and HEALTHY SAXONY. This also supports a more patient-oriented society and market research (Open Innovation, User Innovation) to increase the marketability of innovations in health and nutrition.

In Saxony, more than 30 university and non-university research institutions are active in the field of life sciences. The institutions are working together as partners, to jointly promote medical / therapy and molecular bioengineering interdisciplinary research and translate it into applications. Major research clusters with international reputation in the field of regenerative medicine / therapy are located in Saxony: CRTD (Dresden) and IZI (Leipzig), SaxoCell (Dresden/Leipzig), EKFZ (Dresden).

Which actions of the following are considered the key areas in the Health and Wellbeing Sector in your region? How they have evolved in the last 5 years? Please select at least three:

- **Prevention, screening and early diagnosis** (1. Health literacy, patient empowerment, ethics and adherence; 2. Personal health management; 3. Prevention, early diagnosis of functional and cognitive decline; Other, please specify).
- **Care and cure** (1. Protocols, education and training programmes for health workforce, (comprehensive case management, multimorbidity, polypharmacy, frailty and remote monitoring); 2. Multimorbidity and R&D; 3. Capacity building and replicability of successful integrated care systems; Other, please specify).
- **Active ageing & independent living** (1. Assisted daily living for older people with cognitive impairment; 2. Extending active and independet living through Open and Personalised solutions; 3. Innovation improving social inclusion of older people; Other, please specify).

- Prevention, screening and early diagnosis
  - Patient empowerment, prevention and early diagnosis of functional and cognitive decline: Else-Kröner-Fresenius Centre of Digital Health, establishing an inpatient living lab within a university medical centre
  - Prevention, early diagnosis of functional and cognitive decline: ERDF-cofunded project TeleNeps, diagnosing psycho-traumarelated long-term conditions in a stage as early as possible. ERDF-cofunded project VR, diagnosing and treating mental conditions using virtual reality
  - Early diagnosis of functional and cognitive decline: SOS-Net, Tessa and TNS-Net ehealth-based acute stroke treatment networks connecting virtually all Saxon

hospitals to the three major stroke units at the two university medical centres Dresden and Leipzig as well as to the Chemnitz hospital

Constant implementation, extension and improvement of the existing structures during the last years. Ehealth provides new means and tools for facilitating collaboration across all sectors.

- Care and cure
  - Capacity building: implement care networks for inpatient and outpatient care, especially in rural areas: KOMPASS Leipzig, CCS Gesundheitsregion Ostsachsen (Health Region of Eastern Saxony)
  - capacity building: Horizon2020 project SHAPES, creating a pan-European digital services exchange ecosystem for smart and healthy ageing
  - case management: ERDF-cofunded project NEFAH, providing clinically approved neurofeedback treatment for children in home settings to prevent chronification as well as allow for local treatment instead of travelling repeatedly to the respective centres
- Active ageing & independent living

  - Assisted daily living for older people with cognitive impairment: Quartiers- und Generationengenossenschaft
  - European smart ageing projects SHAPES and GATEKEEPER

Especially in the field of active and healthy ageing there is strong innovative power throughout the SME landscape, the networking and cluster institutions as well as the research institutes and universities in Saxony. New care and case management models, sensors and ehealth applications are being developed and tested.

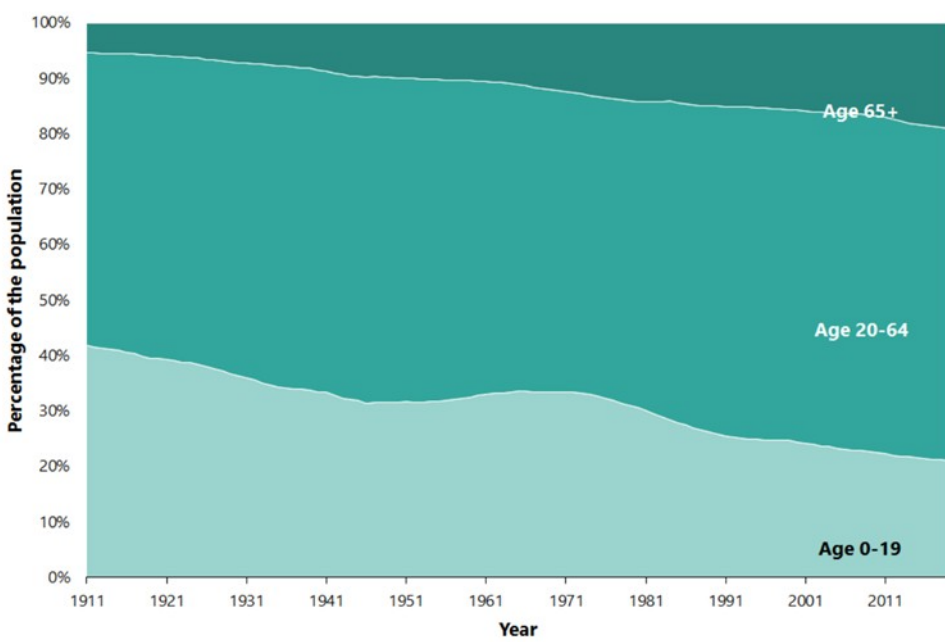| **Are the leading companies in the Health Sector of your region specialized in the key areas which have been formerly indicated?** |
|---|
| There are no leading companies in the health sector in Saxony as such, there is a conglomerate of excellent research institutions, university medical centres, innovative hospitals, associations, many biotechnology and medical technology companies with high innovative power. The largest actors specialize in the key areas mentioned above, with special focus on networking (Carus Consilium Saxony) as well as health and care (Dresden University Medical Centre, Leipzig University Medical Centre, Chemnitz municipal hospital). |
| **Is there a close cooperation between the companies, the universities and research centres related to the Health Sector and the public administration in your region?** |
| Yes, implemented in a private association: HEALTHY SAXONY e.V., which also provides the connection to the Saxon State Ministry for Social Affairs |
| **Please indicate the relevant stakeholders from private sector (big companies, cluster, etc) related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.** |
| - Biosaxony e.V.: is the cluster of biotechnology and life sciences industries in the Free State of Saxony. It stimulates innovation, supports initiatives in the interest of small |

and medium enterprises, and passes on technical knowhow in R&D and market oriented transfer projects. It is included into TITTAN via membership in HEALTHY SAXONY.
- Silicon Saxony e. V. is Europe's most successful trade association for the micro- and nanoelectronic, smart system, application and energy system industries, connecting 300 manufacturers, suppliers, research institutes, universities and public institutions in a network.
- Organic Electronics was founded on October 6th 2008 by seven companies and three research institutes from the organic sector in order to strengthen the organic center in Saxony and global.
- VTI represents the textile industry in Saxony which is highly innovative and has a strong impact on the healthcare sector. They are involved into TITTAN through membership in HEALTHY SAXONY.

Please indicate the relevant stakeholders from research centres and universities related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

- Technical University Dresden: it is one of eleven German "Excellence Universities". The Faculty of Business and Economics, through its Chair of "Systems Development", supports Regional Government about the implementation of ehealth initiatives.
- University Medical Hospitals Dresden and Leipzig (both members of HEALTHY SAXONY)
- Fraunhofer institute IZI Leipzig, member of Healthy Saxony
- Fraunhofer institutes (MOEZ, ENAS ...), not actively involved.

Please indicate the relevant stakeholders from public administration related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

State of Saxony – Saxon State Ministry for Social Affairs and Consumer Protection: it is the main public authority at regional level, in charge of designing and implementing health policies. It is in charge of managing the policy instrument. (involved via LOI and close cooperation through HEALTHY SAXONY)

Please indicate the 3 innovative projects/interventions with higher transformational impact in the Health Sector which have been developed in the last 5 years in your region.

1. smart and healthy ageing project SHAPES
2. Telemedical stroke networks (SOS-NET, TESSA, TMS-Net) Parkinson treatment network PANOS
3. Else-Kröner-Fresenius centre for Digital Health

To which of the three thematic areas addressed by TITTAN do you think you can contribute most?

Areas 1 and 2

Which of the three thematic areas addressed by TITTAN are you more interested in learning about?

Area 2 and 3

What are the main strengths, weaknesses, opportunities and threats which are currently being faced by the Health Sector in your region? (Please, indicate maximum 4 in each field)

Strengths	Weaknesses
• Saxon research institutes provide remarkable expertise in the fields of widespread diseases, regenerative medicine, cancer treatment and IT supported biotechnology. • The region has a wealth of powerful small businesses and strong research and education institutions.	• Funding critical • No venture capital culture • Startup scene still growing
Opportunities	Threats
• HEALTHY SAXONY shares this responsibility with the Saxon Ministry of Social Affairs. • Public/private cooperation and technology transfer for developing new products and services. • It represents an ideal benchmark, since it comprises both high income and low income districts already dealing with issues related to ageing populations and various connecting factors for lifelong support.	• Saxony is the state most affected in Germany by the demographic change and also the most rapidly ageing region in Germany.

Partner name
DHI, Digital Health & Care Innovation Centre
Region name
Scotland
Country
United Kingdom
Number of inhabitants in the region
5,463,3000 (Estimate as of 30 June 2019) Source: RGAR 19: Population (nrscotland.gov.uk)
Percentage of population over 65 years
19% (estimate mid 2019) Source: RGAR 19: Population (nrscotland.gov.uk) **See figure below:**
Please indicate the policy instrument which has been addressed by TITTAN and the main features of this policy instrument.
The Scottish European Regional Development Fund (ERDF) Operational Programme (OP) 2014 – 2020 sets a number of priorities including: - Innovation in Support of Growth and Jobs - Promoting business investment in innovation and research, and

- developing links and synergies between enterprises, R&D Centres and higher education sectors

Innovation is a key driver of production growth, and Scotland has a strong base of innovation which it can build on.   As the Economic Strategy for Scotland makes clear, improvements in innovation enabled businesses to become more competitive, grow more quickly, enter new markets and become more resilient to change.

The Scottish Government is supporting ambitious collaborations between business, academic and others to capitalise on Scotland's world class research through a dedicated innovation policy (case study 3.1.2) and significant investment in a network of Innovation Centres (see case study 3.2.2).   There are currently eight Innovation Centres in Scotland, including the Digital Health & Care Institute (DHI), one of the TITTAN network partners.

DHI plays a hub role in the Scottish health and care ecosystem and has a main focus on aging as a potential domain for innovation.

Planning to support international collaboration by piloting Innovation and Investment Hubs at key global locations, and this project could be an enabler for its development.

Through the Policy Instrument and the economic strategy, Scotland has committed to investing business research and innovation, as well as investing in the promotion of products and services.   There is also a commitment to developing open innovation in a number of key sectors.

In addition to supporting innovation activity in Scotland, the Scottish Government is also

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Are the main objectives addressed by the policy instrument involved in TITTAN, linked to the regional innovation strategy for smart specialization (RIS3)?   If yes, please indicate how.

Yes. Although not exactly the same format as other EU regions' RIS3, Scotland has adopted an approach to Smart Specialisation at the European level and the Scottish Government's economic strategy – with a priority in Life Sciences – operates as part of this approach.

Having a regional innovation smart specialisation strategy/approach agreed with the Commission is a pre-condition for 2014-2020 ERDF innovation activity. More information is available on pages 4-6 of the Scottish ERDF Operational Programme in the Smart Growth section.

A Scottish Government blog states that:

'In Scotland, our approach has been not to draft a separate strategy document but to draw together the elements of our strategic framework which are linked to Smart Specialisation and to engage in furthering our Smart Specialisation Strategy as an integral part of our domestic agenda.

We are also working closely with EU partners to share learning and experience on this, to accelerate demonstration of how this can lead to enhanced delivery and promote more efficient and effective use of public investment.'

Which actions of the following are considered the key areas in the Health and Wellbeing Sector in your region? How they have evolved in the last 5 years? Please select at least three:

- **Prevention, screening and early diagnosis** (1. Health literacy, patient empowerment, ethics and adherence; 2. Personal health management; 3. Prevention, early diagnosis of functional and cognitive decline; Other, please specify).
- **Care and cure** (1. Protocols, education and training programmes for health workforce, (comprehensive case management, multimorbidity, polypharmacy, frailty and remote

monitoring); 2. Multimorbidity and R&D; 3. Capacity building and replicability of successful integrated care systems; Other, please specify).

- **Active ageing & independent living** (1. Assisted daily living for older people with cognitive impairment; 2. Extending active and independent living through Open and Personalised solutions; 3. Innovation improving social inclusion of older people; Other, please specify)

1. **Health literacy, patient empowerment, ethics and adherence**

Scotland's key area:

Person-centred Health and Care:

'Ensuring what matters most to people is at the heart of how services are designed, delivered and improved'

High quality, person-centred healthcare is at the heart of the Scottish Government healthcare strategy for Scotland. The 'Healthcare Quality Strategy for Scotland' (2010) sets a strategic vision for the NHS in Scotland which embraces 3 key 'person-centred' principles which strive to ensure that:

- *'the NHS listens to peoples' views, gather information about their perceptions and personal experience of care and use that information to further improve care*
- *the NHS builds on the values of the people working in and with NHSScotland and their commitment to providing the best possible care and advice compassionately and reliably by making the right thing easier to do for every person, every time*
- *the NHS is making measurable improvement in the aspects of quality of care that patients, their families and carers and those providing healthcare services see as really important'*

As part of this policy commitment, a number of key initiatives have recently been developed, including:

- **Must do with me**

Practical improvements to person-centred care are promoted and supported through five key '*Must Do With Me'* areas:

1. What matters to you?
2. Who matters to you?
3. What information do you need?
4. Nothing about me without me
5. Personalised contact

'Together these five "Must Do With Me" areas are designed to ensure that all of the interactions between people using services and the staff delivering them are characterised by listening, dignity, compassion and respect.'

- **Care Quality Improvement Programmes**

The Scottish Government healthcare quality strategy is committed to delivering the highest quality of care, striving to ensure that services and care delivery are continuously improved.

This is achieved in practice by a multi-faceted care quality implementation strategy, which seeks to ensure that care is delivered according to clinical excellence and evidence-based best practice; that quality improvement is an intrinsic part of NHSScotland processes as well as key

performance targets.

Care and cure (Protocols, education and training programmes for health workforce):

● **Clinical excellence and evidence-based best practice:**
The Knowledge Network and 'Evidence into Practice'
The Knowledge Network platform is the national knowledge management platform for health and social care delivered by the Knowledge Services Group of NHS Education for Scotland (NES). It provides high quality knowledge support for delivery of health and social care.
The Knowledge Network provides:

- **A wealth of 12 million information and learning resources from more than 100 quality assured health and social care providers.** This includes collections of articles, books and journals, guidelines, policy documents, resources for patients and service users, evaluated websites and e-learning courses.
- **A personal webspace:** allows users to choose collections of resources defined for different workforce groups and topics. 'My Resource Space' also allows users to save and organize personal collections of resources using tagging. People Connect provides a social directory.
- **Online community tools:** help groups of health and social services staff and partners to create their own community websites and collaborative workspaces to share information and learning resources as well as personal knowledge and experience. Community websites provide tools including wikis, blogs, discussion forums, tagging and personal profiles.

'Evidence into Practice', is part of The Knowledge Network and is designed to help clinicians find, share and apply evidence to practice to deliver the best quality patient care. It provides a targeted clinical evidence search which includes guidelines, pathways, evidence summaries and systematic reviews.

● **Healthcare Improvement Scotland:**
Healthcare Improvement Scotland is the national healthcare improvement organisation for Scotland and part of NHSScotland. Healthcare Improvement Scotland's mission is to encourage and support continuous improvement in healthcare practice.
The organisation work with staff who provide care in hospitals, GP practices, clinics, NHS Boards and with patients, carers, the community and the public. In particular, Healthcare Improvement Scotland provides quality improvement support to healthcare providers.
Care of older people: Healthcare Improvement Scotland measures NHS boards against a range of standards, best practice statements and other national documents relevant to the care of older people in acute hospitals. Healthcare Improvement Scotland inspections focus on the three national quality ambitions for NHSScotland, which ensure that the care provided to patients is *person-centred, safe and effective*.
The inspections are designed to ensure that older people are being treated with compassion, dignity and respect while they are in an acute hospital.
Improvement Hub (ihub): In response to the integration of health and social care services across Scotland which became effective as of the 1st of April 2016, Healthcare

Improvement Scotland has worked with a range of partners to create a new improvement resource, called the Improvement Hub (or ihub). This resource is designed to support Health and Social Care Partnerships and NHS boards to improve the quality of health and social care services.

- **Care Quality Improvement Programmes:**

Care quality improvement is also enacted in practice via targeted care quality improvement programmes. Recent improvement programmes include:

The Scottish Patient Safety Programme:

This is a national initiative launched in 2008 to reduce avoidable harm in NHSScotland and transform the safety of acute care for patients. The programme is led by Healthcare Improvement Scotland and is delivered in partnership with 15 NHS boards across Scotland. It aims to improve the safety and reliability of healthcare and reduce harm, whenever care is delivered. From an initial focus on acute hospitals, the programe has now been expanded to include safety improvement programmes for Acute Adult care, Maternity and Children care, Mental Health and Primary Care (SPSP, 2014).

2. **Assisted daily living for older people with cognitive impairment**
   Scotland's key area :

Healthcare Improvement Scotland has been leading a national programme of work with NHS boards to improve older people's acute care in NHSScotland since April 2012. This programme called the *'Improving Care for Older People in Acute Care'* workstream focuses on 2 key areas:

- **care co-ordination**: focused on identification and immediate management of frailty
- **cognitive Impairment:** focused on identification and immediate management of delirium.
- **The 'Frailty work-stream'** aims to identify frail patients on admission to acute care, so that those patients receive timely comprehensive geriatric assessment and input from a specialist team on the day of admission. Evidence shows that timely assessment on admission improves outcomes for geriatric patients (Graham et al., 2011).
- **The 'Delirium work-stream'**:
  Older people and people with dementia, severe illness or a hip fracture are more at risk of delirium. Healthcare Improvement Scotland has developed a 'care bundle' for identifying and caring for people with delirium and it is being piloted with NHS boards in Scotland.

Impact of the programme:

Data from individual boards shows some patients outcomes improvements, including:-
- *'reduced mean length of stay from 22 days to 8 days in NHS Grampian*
- *a 50% decrease in the average number of falls per month in two wards between January 2013 and January 2015 in NHS Greater Glasgow and Clyde*
- *frailty screening in three wards in the surgical directorate at the Royal Infirmary of Edinburgh resulted in decreases in length of stay, falls and the number of complaints.'*

3. **Extending active and independent living through open and personalised solutions**

Scotland's key areas:

Anticipatory care planning: developing a national approach to anticipatory care planning to enable people living with long term conditions to live in their community and avoid hospital admissions

Pathways for high resource individuals – identify and test pathways of care that enable people at risk of becoming high resources users of health and care, and help them to spend more time in the community than hospital.

Place, home and housing: planning of housing and related services to provide people with a home environment that supports greater Independence and improved health and well-being.

Independent-Living Vision & Collaborative:

In 2013, the Scottish Government, the Convention of Scottish Local Authorities, the disabled people's Scottish Independent Living Coalition, and NHS Scotland jointly issued a 'Shared Vision for Independent Living in Scotland'.

The statement set out a vision supporting independent-living in the community for people with disabilities, including 'the rights to practical assistance and support to participate in society and live an ordinary life'.

Active and Independent Living Improvement Programme (AILIP) is an Allied Health Professions-led national improvement programme. In May 2015, the Scottish Government announced a £3 million, three year fund to enable active and independent living for people recovering from illness or injury. It aims to develop innovative ways to help people with illness, disability or injury to lead healthy lives and stay in their own homes.

Are the leading companies in the Health Sector of your region specialized in the key areas which have been formerly indicated?

There are a range of companies specialising in the key areas which were indicated in the previous section In Scotland.

These companies range from small to medium sized enterprises to Multi National Corporations, who may not be active in the specific key areas, but are active in the healthcare across Scotland as a whole and therefore impact on the key areas.

SMEs:
- Mydex
- TIYGA
- CM2000
- Albyn Housing
- Commuicare 247

MNCs:
- Oracle Systems
- Virgin Media
- Vodaphone
- Hitachi
- Capita
- Pfizer
- Medtronic
- GSK
- British Telecom
- Hewlett Packard Enterprises

- CISCO
- Dimension Data
- Orion Health

Is there a close cooperation between the companies, the universities and research centres related to the Health Sector and the public administration in your region?

Scotland has a strong ties linking industry, academia and research centres and this is actively encouraged by the Scottish Government.

This can be evidenced by the number of networks and organisations that are in place to help promote innovation and strengthen these existing links.

One of the key examples is the Network of 7 Innovation Centres which was created in 2012 by the Scottish Funding Council in Partnership with Scottish Enterprise and Highlands and Islands Enterprise to Support transformational collaboration between universities and industry. The Centres aim to enhance innovation and entrepreneurship across Scotland, and have the full backing from industry. They will draw on the wealth of research expertise to Work on problems and opportunities which have been identified by industry, as well as supporting skills and training, and increasing collaborative working.

The Digital Health and Care Innovation Centre is one of the 7 innovation centres:

http://www.innovationcentres.scot/who-we-are/

Other examples include:

Scottish Enterprise

Scottish Enterprise is Scotland's main economic development agency and non-departmental public body of the Scottish Government. They Work with the public and private sectors to identify and exploit the best opportunities for delivery of a significant and lasting effect on the Scottish economy.

http://www.scottish-enterprise.com/

Highlands and Islands Enterprise Integrates economic and community development, covering the Highlands and Islands of Scotland, which makes over half of Scotland's land mass. They are the Scottish Government's economic and development agency with the aim to generate sustainable economic growth across the Highlands and Islands.

www.hie.co.uk

Interface was established in 2005, and is a knowledge connection for business and acts as a central hub connecting organisations from a wide variety of national and international industries to Scotland.

http://www.interface-online.org.uk/about-us

NHS Research Scotland promote and support excellence in clinical and translational research in Scotland so that patients can benefit from new and better treatments. Formed through a Partnership of the Scottish NHS Boards and the Chief Scientist Office of the Scottish Government, they aim to ensure that NHS Scotland provides the best environment for supporting research.

http://www.nhsresearchscotland.org.uk/working-with-us

InnoScot Health - work in partnership with NHS Scotland and healthcare professionals to develop and commercialise products to improve patient care. They are the only organisations set up to Work alongside NHS Scotland to carry out commercialisation activities.

https://innoscot.com/

Knowledge Transfer Partnerships - The scheme helps businesses to innovate and grow by enabling new skills, knowledge and expertise and apply these to strategically important projects, through linking them with a University and a KTP associate.

https://connect.innovateuk.org/web/ktp

Additionally, each University in Scotland has a Department/team which is dedicated to establishing and enhancing the relationships between the universities in Scotland and the industry base.

Please indicate the relevant stakeholders from private sector (big companies, cluster, etc) related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

Scottish Enterprise, are a non-departmental public body of the Scottish Government, and work collaboratively across the public and private sectors in Scotland to deliver significant and lasting benefits for the Scottish economy.

As active stakeholders and members of the regional steering group, Scottish Enterprise represent the private sector.

Please indicate the relevant stakeholders from research centres and universities related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

There are a number of key stakeholders across Scotland from research centres and universities which are active in the health and care sector in Scotland. There are 19 higher education establishments in Scotland, and DHI, the lead regional partner for Scotland for TITTAN, is engaged with them all to different degrees.

The **University of Strathclyde** is represented on the Steering Group and is taking a key role in the Project, including the preparation of this regional assessment report.

Strathclyde are ranked 7th in the UK for spin-out Company creation, and research is in the top 20 of the UK.

http://www.strath.ac.uk/

The University of Strathclyde is also hosting the only Computer Science-led Digital Health research group in Scotland: https://dhawg.cis.strath.ac.uk/

The College Development Network have recently joined the Regional Steering Group and lead on innovation, creating CPD opportunities and sharing best practices across Scotland's colleges Network.

IRISS - The Institute for Research and Innovation in Social Services is a charitable company with a mission to: promote positive outcomes for the people who use Scotland's social services by enhancing the capacity and capability of the social services workforce to access and make use of knowledge and research for service innovation and improvement.   DHI are involved with IRISS at present, but to date they have not been engaged with the TITTAN project.

http://www.iriss.org.uk/

Please indicate the relevant stakeholders from public administration related to the Health Sector in the region, and which of them are actively involved in the TITTAN project.

The public administration in Scotland in relation to the health and care sectors is a collaboration of a Number of organisations, headed up by the Scottish Government and the NHS.

The Scottish Government - The devolved government for Scotland has a range of responsibilities which include: health, education, justice, rural affairs, housing and the environment. Some powers are reserved to the UK government and include: immigration, the constitution, foreign policy and defence.

The Scottish Government are actively involved in the TITTAN regional steering group through the Innovation Team and Health Innovation Partnerships, which are part of the Scottish Government's health and social directorate.

http://www.gov.scot/

NHS

NHS Lothian: is one of 14 territorial NHS health boards in Scotland.

NHS National Services Scotland - NSS supports customers to deliver their services more efficiently and effectively by offering shared services on a national scale using best-in-class systems and standards. Their aim is to help our customers save money and free up resources so they can be re-invested into essential services. They also provide consultancy and support to help public bodies join up health and social care. NSS are engaged with TITTAN project and are active members of the regional steering group.

https://nhsnss.org/

SCTT - The Scottish Centre for Telehealth and Telecare supports the development and expansion of technology enabled health and care services in Scotland. This involves working across boundaries with industry, academia, local authorities, NHS Boards and third and independent sectors to develop recognised models for redesigning health and care services. SCTT are actively involved with the TITTAN project and have participate in the Regional Steering Group.

http://sctt.org.uk/

NHS Research Scotland (NRS) aims to support and promote excellence in clinical research in NHS Scotland, that will make a positive difference to patients health within Scotland, the UK and internationally.   We are in the process of engaging NRS with the TITTAN project.

http://www.nhsresearchscotland.org.uk/working-with-us

Please indicate the 3 innovative projects/interventions with higher transformational impact in the Health Sector which have been developed in the last 5 years in your region.

1. **Scottish Innovation Centre Network:**
The Digital Health & Care Innovation Centre is one of 7 Innovation Centres, which have had a transformational impact over the past 5 years - increase in innovations in health and care, through working with key strategic partners throughout Scotland.   The programme was reviewed and a a formal report was published in 2016 - Independent Review of Innovation Centres Programme (sfc.ac.uk)

2. My Diabetes My Way (MDMW) - using data for diabetes. A self-management system for diabetes, which is NHS Scotland's patient and carer information portal for diabetes. It contains validated educational materials, video and interactive tools supporting patient education and self-management, and allows patients across Scotland direct Access to their diabetes data via a novel electronic personal health record. The system is unique in that it offers Access to an entire national population, and provides information from many diabetes related sources, and has the potential to connect to any medical report in the UK and beyond.

MDMW are currently working with DHI to develop algorithms to interpret lifestyle

wearable data and analyse blood glucose results, this will enable improved self management and allow patients to have a more useful with dialogue with clinicians. The existing website portal will be relaunched as part of this activity and is being co-designed with users.

3. Scottish Patient Safety Programme: is a unique initiative that aims to improve the safety and reliability of healthcare and reduce harm, whenever care is delivered. Currently the work-streams focus on: acute hospitals, acute adult care, Healthcare Associated Infections, Maternity and children, medicines, Mental and health and primary care.

To which of the three thematic areas addressed by TITTAN do you think you can contribute most?

Although Scotland has very strong expertise in all 3 of the thematic areas, it has a particularly strong record in the thematic area 1 'Outside to Inside Technological transfer' and hence we propose to focus our contribution to the TITTAN network on this specific domain.

Which of the three thematic areas addressed by TITTAN are you more interested in learning about?

Thematic area 2 – Inside-Out technological innovation

What are the main strengths, weaknesses, opportunities and threats which are currently being faced by the Health Sector in your region? (Please, indicate maximum 4 in each field)

Strengths	Weaknesses
● The Scottish Government Policy Support & financial commitment to a High quality NHS / Care Quality. A strong policy commitment to eHealth (i.e. eHealth Directorate within Scottish Government), extensive and robust eHealth infrastructure built over the last 20 years, high expertise in using new technologies and digital health services (eHealth / telehealth / telecare) ● Highly skilled, trained and dedicated NHS workforce ● Good-quality data (e.g. ISD), information and evidence ● Very strong track record of European and international cooperation. NHS24, for example, is very visible in Europe and leads one of the Action Groups in the European Innovation Partnership (EIP) on Active and Healthy Ageing. Scotland has also recently been awarded '4 star references cite' status at the European level.	● Entrenched health inequalities which remain difficult to resolve despite concerted efforts to address these issues ● Care coordination not always optimal ● Change management / technology and service innovation can be slow and protracted ● Lack of evidence to support new technologies and ways of working

Opportunities	Threats
● Integration of health and social care ● World-class universities, medical schools and research and development centres ● Strong support for innovation and digital technologies both within and outwith the NHS	● Brexit impact on economy and NHS staff recruitment and retention ● Political uncertainty around Scotland's Status within the UK / Europe ● Financial constraints as consequences of the above

C. Thematic Area 1. Healthcare Delivery pathways

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Title of the good practice
1. COVID19 Pandemic – experience from a frontline hospital (Lombardy)
Name of the organisation in charge (Please indicate whether it is a public administration, an Educational and Research Institution, Industry or Community)
ASST Papa Giovanni XXIII di Bergamo (Public Hospital and Assistance Centre - Public health authority of the Lombardy Region)
Summary of the good practice (3.000 characters)

The Good Practice implemented by ASST Papa Giovanni XXIII during the acute phase of the emergency (February – April 2020) was illustrated by the Health Director – Dr. Pezzoli.

➢ **Establishment of a Crisis Unit**. The Unit, coordinated by the Health Director and composed of the Medical Directorate, the Health and Social Professions Directorate, the Risk Manager, the Bed Manager, the Emergency Room Manager and the Directors of the Operational Units involved, carried out assessments during the acute phase of the emergency (on the beds and intensive care units, on urgent surgical operations, on the sanitisation of environments, on logistics and on the organisation of the staff employed (doctors and nurses).

➢ **Support from military contingents during the acute phase.** The Hospital of Bergamo was supported by military contingents of the Italian Army, foreign military contingents and volunteers (for example the Russian Army, Emergency etc.) for sanitization operations of the environments and for support to the care of COVID patients. increase

➢ **Recruitment.** In order to deal with the emergency, doctors, biologists and nurses were mainly hired on temporary contracts. In addition, the ASST recruited pneumologists and infectious diseases specialists.

➢ **Rules of access to the hospital**. The ASST decided to change the pre-pandemic protocols from the very beginning of the emergency. After receiving initial indications from the Lombardy Region and the Ministry of Health, a new internal protocol was introduced. In particular, Access Rules were modified by including screening procedures (swabs) at the hospital admission. In general, admissions for both time-dependent illnesses, ordinary outpatient activities have decreased and emergency room admissions for trauma and injuries have dramatically decreased.

Telemedicine Platform. A platform called **'Fenix Televisita'** was used to support telemedicine services, both during and after the acute phase of the pandemics, guaranteeing data confidentiality, traceability, document archiving, medical consultation reports, validation with a digital signature. This platform allowed to send dematerialised prescriptions and it was accessible from all devices [PC, tablet, smartphone] in web app mode. The service was already in use before the pandemic for Medically Assisted Procreation.

➢ **Medical Centre at Bergamo Exhibition Centre (Fiera di Bergamo).** The Medical Centre was built with the installation of a TRIAGE emergency room area. There were 142 beds, all equipped with medical oxygen source and vacuum suction, including 24 with

intensive and sub-intensive care equipment. Laboratory activities were carried out at the ASST Papa Giovanni XXIII with a system of transporting biological samples according to the urgency. The first patient was admitted on 6 April 2020, the last discharged on 23 May 2020 with an average hospital stay of 21 days with a total of 120 patients transited at the Fair. Out of the 120 patients, 28 underwent intensive and sub-intensive care. Lastly, a total of 277 workers (hospitals, volunteers, Civil Defence and the military of the Russian Federation) worked in various capacities.

How much funding has been mobilised for its implementation?

For the creation of the "Fenix Televisita" platform and the integration with the Single Booking Centre of the Hospital (CUP), the ASST Papa Giovanni XXIII spent € 57,828.00. For the installation of workstations and tools (PCs, monitors, webcams and audio speakers), € 29,700.00 was spent (including 5-year rental fee for PCs and monitors and purchase of webcams and audio speakers).

With regard to IT assistance and maintenance, the ASST pays an annual fee [from July 2021 (6 MONTHS) € 8,519.00 have been spent].

What is the original geographical coverage of this good practice? (Local, regional, national…) Has this good practice been adopted in other regions around the country or beyond?

➢ During the emergency phase, ASST Papa Giovanni XXIII did not cover a specific territory (City of Bergamo or neighbouring areas) but continued to welcome patients from the entire province of Bergamo (which can count 1,200,000 inhabitants) and from other Lombard provinces.

Evidence of success:

The above-mentioned procedures, promptly adopted, allowed a coordinated and effective management of the common areas and hospital wards, of the entrances as well as the possibility of assisting patients remotely, in safety, through digital informatics tools.

Resources needed:

N.A.

Further information

Website: https://www.asst-pg23.it/
Contact person: Dr. Fabio Pezzoli (Health Director of ASST Papa Giovanni XXIII).

Title of the good practice
2. Urgent patients; Hubs for time dependent diseases (Lombardy)
Name of the organisation in charge (Please indicate whether it is a public administration, an Educational and Research Institution, Industry or Community)
IRCCS Centro Cardiologico Monzino (Scientific Institute for Health Research, Hospitalization and Health Care – IRCCS. Private Hospital)
Summary of the good practice (3.000 characters)

The Good Practice implemented by IRCCS Centro Cardiologico Monzino (CCM) during the acute phase of the emergency (February 2020 - May 2020) was illustrated by the Clinical Area Director - Dr. Pepi. The practice mentioned concerns the coordination of hubs for time-dependent cardiovascular diseases, created for the treatment of specific pathologies and proved essential to guarantee continuity of care to patients who could not wait for treatment until the end of the pandemic phase.

Hub system. The Hub system was introduced by Lombardy Region on **8 March 2020 (with DGR 2906)** to deal with the pandemic emergency from its earliest stages. This reorganisation involved the conversion of some Lombardy hospitals into **Hubs dedicated exclusively to Time Dependent Diseases**, while other hospitals on the territory were reorganised **to treat Covid patients** (and therefore non-Hubs).

Characteristics of a Hub Centre for Cardiac Surgery and Cardiology. The 4 Hub centres for cardiac surgery in Lombardy had to provide for the activation of preferential paths for non-Covid emergencies, access, and hospitalisation thanks to the presence of several teams (of which at least one is active 24/7) and dedicated operating theatres that are always active.

Centro Cardiologico Monzino (CCM) acted as the coordinator of the 4 Cardiac Surgery Hub Centres in terms of emergencies and admissions. In addition, it had the role of Hub in terms of **vascular surgery and cardiological emergencies**: cases of acute myocardial infarction (infarction network), electrophysiological emergencies (pacemaker, severe arrhythmias, defibrillators), cases of structural heart disease that could not be postponed.

➢ **Taking charge of and transporting patients from non-hub hospitals**. From the beginning of the emergency, decisions on which patient to transport, treat and operate at the Hub were taken quickly but in compliance with a specific protocol. As soon as the hospital transmitted the clinical and diagnostic data (coronarography, CT scan, echocardiography, etc.) of the urgent patient via a telematic system, the team of cardiac surgeons at the Hub immediately examined the data. In case of acceptance, the patient was transferred to the Hub managed by **Areu (Regional Emergency Agency)** by ambulance or helicopter in the case of distant hospitals; the patient thus became a "**New administrative and hospital case**" in 100% charge of the destination Hub. On the contrary, if problems were detected, the team of the Hub was asked to report in a file on the decision of non-acceptance, taken in agreement with the hospital of origin. All diagnostic activities were finally carried out at the Hub, both because of the difficulty of performing examinations at the SPOKE site and because of the difficulties encountered in transmitting diagnostic data from the hospital of origin.

➢ **Collaboration with other Cardiac Surgery Hubs**. The cardiac surgeons of the Cardiology Centre, in collaboration with their colleagues at the other Cardiac Surgery Hub Centres, have created a shared priority list of emergencies to be carried out (in a logic of full collaboration) and in total agreement with the Regional Guidelines. The same was done for urgent vascular surgery cases, while urgent cardiology cases were always handled by the CCM

teams.

➢ **Transfer of medical/nursing teams to hub centres**. At an early stage, the Hub Centres were faced with the <u>problem of insufficient teams of cardiac surgeons in their departments</u>. They therefore decided to establish <u>direct contacts</u> with non-Hub ordinary hospitals with patients under treatment (but with the imminent closure of cardiac surgery wards due to the reorganisation of intensive care beds). As soon as a request for relocation of patients with an urgent need for immediate hospitalisation or with completed pre-hospitalisation (waiting to be operated on in a few days) arrived, the Hub and the hospital immediately activated (if the CCM did not have the availability of its own teams or if the spoke centre requested it) to <u>transport the respective team of cardiac surgeons to the Hub structure</u>, together with the patient under treatment.

➢ **Access Rules to the CCM**. All patients had to be <u>Covid negative</u> (the CCM was among the first to have rapid swabs available). At the Monzino, <u>chest CT scans</u> were used almost routinely <u>to detect suspected pneumonia</u> and to check the status of patients to be admitted for COVID infection. The Cardiology Centre, in parallel with the rules of distancing, refitted its Emergency Department with special waiting areas by using the Aula Magna and university spaces. However, it should be pointed out that in both the first and second surges (for the first months of the first pandemic, access was reserved to urgent cases only), many patients scheduled for surgery and check-ups did not show up at the Monzino for fear of being infected with the virus and, as a result, many appointments were postponed.

How much funding has been mobilised for its implementation?

N.A.

What is the original geographical coverage of this good practice? (Local, regional, national…) Has this good practice been adopted in other regions around the country or beyond?

➢ During the emergency phase, the CCM coordinated cardiovascular emergencies throughout Lombardy, also being the hub for cardiac surgery (4 centres in Lombardy) and vascular surgery (4 centres) and the above-mentioned cardiological emergencies on behalf of the Lombardy Region.
In the two pandemic surgess the CCM treated:
- Cardiac surgery and vascular surgery: 198.
- Interventional cardiology (ICP): 338.
- Arithmology: 395.
As far as general aspects are concerned, the closing down of activities for patients for a few months and the consequent impossibility for patients from other regions to arrive in Lombardy (at first because of rules requiring them not to leave their own region, and then for logistical reasons) had a significant impact on the number of admissions of patients from other regions (usually over 20% of the patients treated).

➢ Moreover, although not a COVID HUB, specific wards were set up for those patients who were discovered to be COVID positive after having been admitted in an emergency, or coming from the Emergency Department, which in the meantime was overwhelmed by the additional activities of the many COVID Centres). The commitment of medical and paramedical staff was therefore focused on both the cardiovascular emergencies and COVID patients.

Evidence of success:

The Procedures described, adopted in a timely manner, enabled coordinated and effective management of transports from other hospitals and admissions of patients to a dedicated Hub.
Resources needed:
N.A.
Further information
Website: https://www.cardiologicomonzino.it/it/; https://www.cardiologicomonzino.it/en/   **Contact person**: Dr. Mauro Pepi (Clinical Area Director of IRCCS Centro Cardiologico Monzino).

Title of the good practice
3. Back to normality: remote follow up activities and recovery plan for care services (Lombardy)

Name of the organisation in charge (Please indicate whether it is a public administration, an Educational and Research Institution, Industry or Community)
ASST Spedali Civili di Brescia (Public Hospital and Assistance Centre - Public health authority of Lombardy Region)

Summary of the good practice (3.000 characters)
The Good Practice implemented by ASST Spedali Civili in the subsequent phase of the emergency (May - October 2020) was divided into two distinct areas: Outpatient Area (Dr. Lodetti and Dr. Guarinoni) and Hospitalization and Care Area (Dr. Rosati). Outpatient Area: ➢ **Recovery of performances.** Upon indication by the Regional Authority, the activities provided were those requested with urgent commitments (U - with priority within 72 hours and B - with priority within 10 days). In May 2020, the lists for new appointments were therefore scaled up in time. With the first re-openings, a mapping of new areas in other hospital's premises was carried out. Outpatient activities were thus re-activated, even for less urgent appointments (marked D with priority within 30 days and P - with priority within 120 days) and for screening activities. The Territorial Centres dedicated exclusively to COVID patients were also discontinued. Finally, the appointments' diaries were reviewed to re-arrange the appointments according to the new social distancing rules. Comparison between Total no. of services in 2019 [1,509,193] and Total no. of services in 2021 [1,302,085]. ➢ **Follow Up Systems**. In order to avoid the interruption of the therapeutic and care pathways for the chronic patients, Telereferral examinations were introduced (telephone contact, request for the transmission of clinical documentation to the patient, remote evaluation of the patient's state of health). The Follow up system being used and then integrated with the ambulatory area was **Fenix Amb** (outpatient management software). In order to monitor the **post-Covid sequences**, an experimental project was launched through the **D97 regional exemption** (exemption from payment of hospital fees for patients tested positive for the virus), with the start-up of a follow-up course at specific ambulatories. The D97 exemption was then replaced by the **national CV2123 exemption** for the monitoring of Covid patients who were discharged from hospital. Admission and Treatment Area ➢ **Recovery of Health care services**. In the emergency phase and afterwards, there was a decrease in admissions in the surgical area while admissions in the medical area increased. To reduce the waiting times for scheduled surgeries, Lombardy Region decided to adopt an incentive-based method of compensation for medical-nursing personnel in the event of additional surgical sessions being scheduled (beyond the hours institutionally due), by extending the hours and the number of days of the operating theatre, which were previously only activated for emergencies.

How much funding has been mobilised for its implementation?
The number of doctors who took part in the reduction of waiting times in the "incentivised mode" was 50, each of them contributing with a different "amount of working hours".

What is the original geographical coverage of this good practice? (Local, regional, national…) Has this good practice been adopted in other regions around the country or beyond?
➢   During the post-emergency phase, ASST Spedali Civili did not cover a specific territory or city but continued to receive patients from the entire province of Brescia, from other Lombardy provinces and from outside the Lombardy Region, as the follow-up monitoring activities "trespassed" outside the province.
Evidence of success:
The reported Procedures have allowed efficient management of the reopening of regular hospital activities, services and remote monitoring tools for Covid patients (and other categories) in a consolidated manner.
Resources needed:
N.A.
Further information
Website: https://www.asst-spedalicivili.it/servizi/notizie/notizie_homepage.aspx **Contact persons:** Dr. Paolo Lodetti and Dr. Milena Guarinoni for Outpatient Area of ASST Spedali Civili di Brescia (U.O.C. Specialistica Aziendale). Dr. Cristina Rosati for Admission and Treatment Area of ASST Spedali Civili di Brescia (U.O.C. Epidemiologico, Accreditamento e Flussi Sanitari).

| Title of the good practice |
|---|
| 4. Health telemonitoring platform TELEA (Galicia) |
| **Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)** |
| Galician Health Service (SERGAS) and Galician Health Ministry (Consellería de Sanidade) |
| **Summary of the best practice (3.000 characters)** |

TELEA is the Galician Health Service's home telecare platform for monitoring and contact between chronic patients and health professionals.

It is a multipatient, multiprofessional and multipathology platform which was adapted during the pandemic in order to monitor the most stable cases and free up beds for the most serious ones.

Initially this platform was conceived as a tool that allowed chronic patients at the primary care level to be monitored to avoid their worsening. This telemonitoring system has been improving the relationship between patients and Sergas professionals for years, facilitating the monitoring on their health status, in an agile, efficient way and without the need to travel. Since 2015, when its implementation began, Telea has registered more than 977,000 patient data and currently monitors more than 20,000 patients suffering from one of the 16 pathologies registered in the Telea profiles. This has contributed to an early and rapid detection of any alteration of the registered parameters.

The patient can easily access the platform from home using their mobile phone. When they start the tool they can see in the calendar the actions that have to be taken each day and the measures that have to be taken every hour, all you need to do is to record the data of your measurements.

These data are evaluated by healthcare professionals in a central Control Unit (CCU) for patient tracking which have coloured alerts that allow them to detect in a very visual way the most serious and urgent cases because they are outside the established parameters.
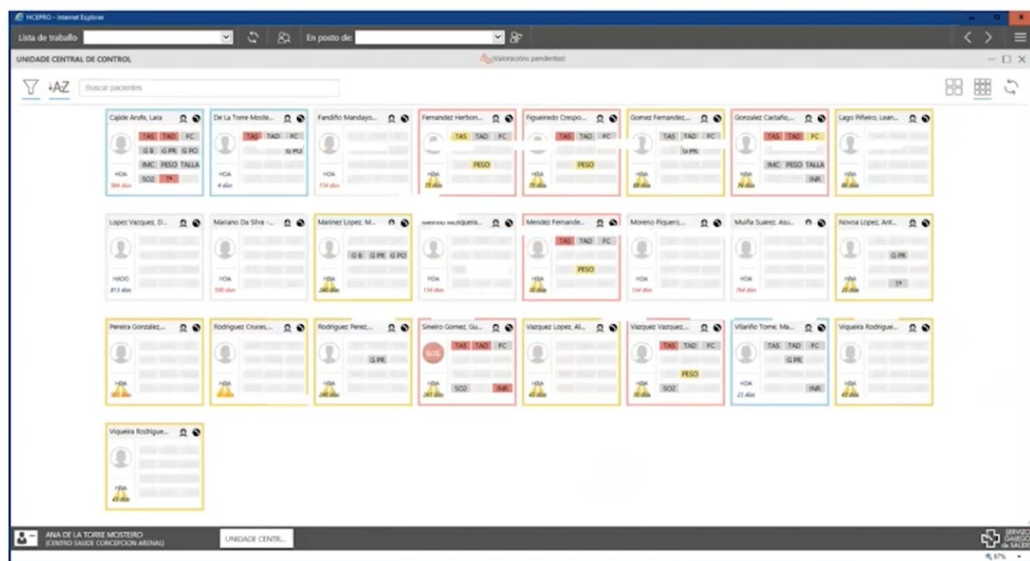
These are the clinical variables that we can introduce in TELEA: blood pressure, weight, blood glucosa, O2 saturation, steps, heart rate, body mass index, INR and temperature. Two of them have been very decisive for the follow-up of COVID patients: O2 saturation
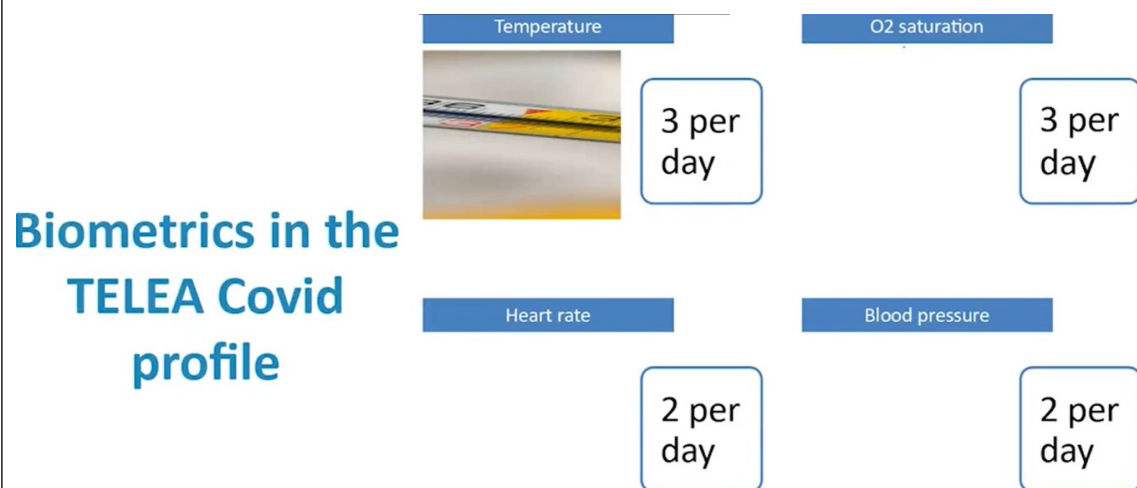
and temperature.

In addicion TELEA allows to the patients to complete clinical questionnaries to help in its better follow-up and finally the have enabled communication channels by mail, phone call or videoconference.

During the management of the pandemic caused by covid-19, in addition to the patients who were already telemonitored, active cases and their close contacts were also added and offered an electronic communication channel.

The application of Telea in the pandemic required the design of a profile for Covid with the inclusion of the following criteria:

- The access of technological resources.
- Knowledge of telemonitoring tools or having a caregiver who can give the supported.
- Diagnostic confirmation of Covid-19 without hospital admission criteria.
- Adequate social and functional support that meets the home requirements for isolation

These are the biometrics in the TELEA CoviD profile:

Biometrics in the TELEA Covid profile

Temperature	3 per day
O2 saturation	3 per day
Heart rate	2 per day
Blood pressure	2 per day

Specific questionnaires were also designed for the Covil profile: one related to respiratory diseases, another to chronic diseases and a third one to mobility or daily habits.

How much funding has been mobilised for its implementation?

This is a Public Procurement of Innovative Technology within the framework of the Innova Saúde project of the Galician Health Service (SERGAS) financed with ERDF Funds. The Innova Saúde project has a total budget of €45 million.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

The original geographical coverage of TELEA is all the Galician region.

This good practice was shared in 2020 in the framework of a Twinning between Galicia & Baja Silesia (Poland) within the European Innovation Partnership on Active and Healthy Ageing EIP on AHA.

TELEA was selected by the European Commission in the call launched in December 2020 as one of the six best practices to be transferred among the EU countries that are part of CIRCE.

ACIS and SERGAS have been selected to take part in this new European project, Joint Action Transfer of Best Practices in Primary Care (CIRCE), aimed at the transfer and implementation of best practices in Primary Care.

Evidence of success:

The growing usage data of this platform over the last few years gives us an idea that its use has become widespread and successful.
Since 2020, the number of patients monitored has risen from 500 to 20,000.
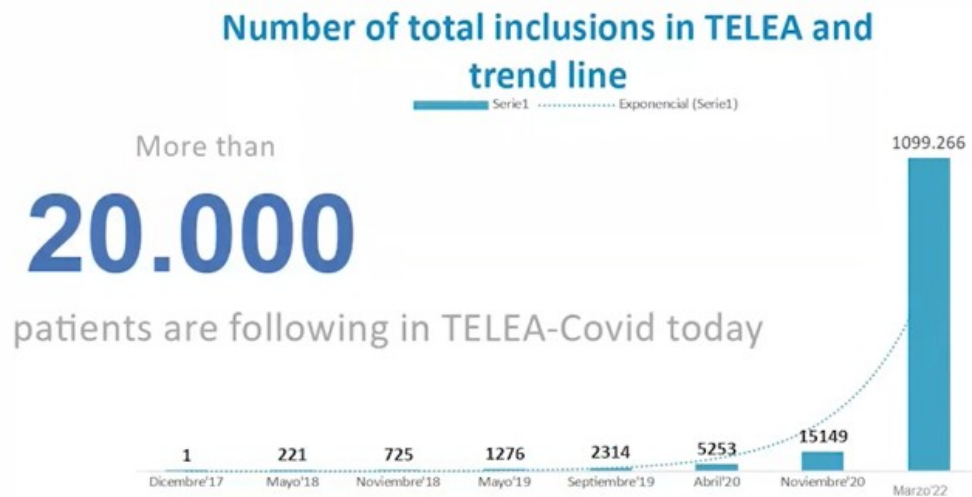
Regarding user satisfaction, we have launched telematic surveys to patients and have obtained more than 80% of responses.
From these responses we can conclude that:
- 88% think that TELEA is a good monitoring system during the COVID period.
- 92% think that TELEA provides a better quality of life.

Resources needed:

In this case, the platform was already operational when Covid broke in. The technicians only had to adapt the new Covid profile to the specific needs and new requirements described above.
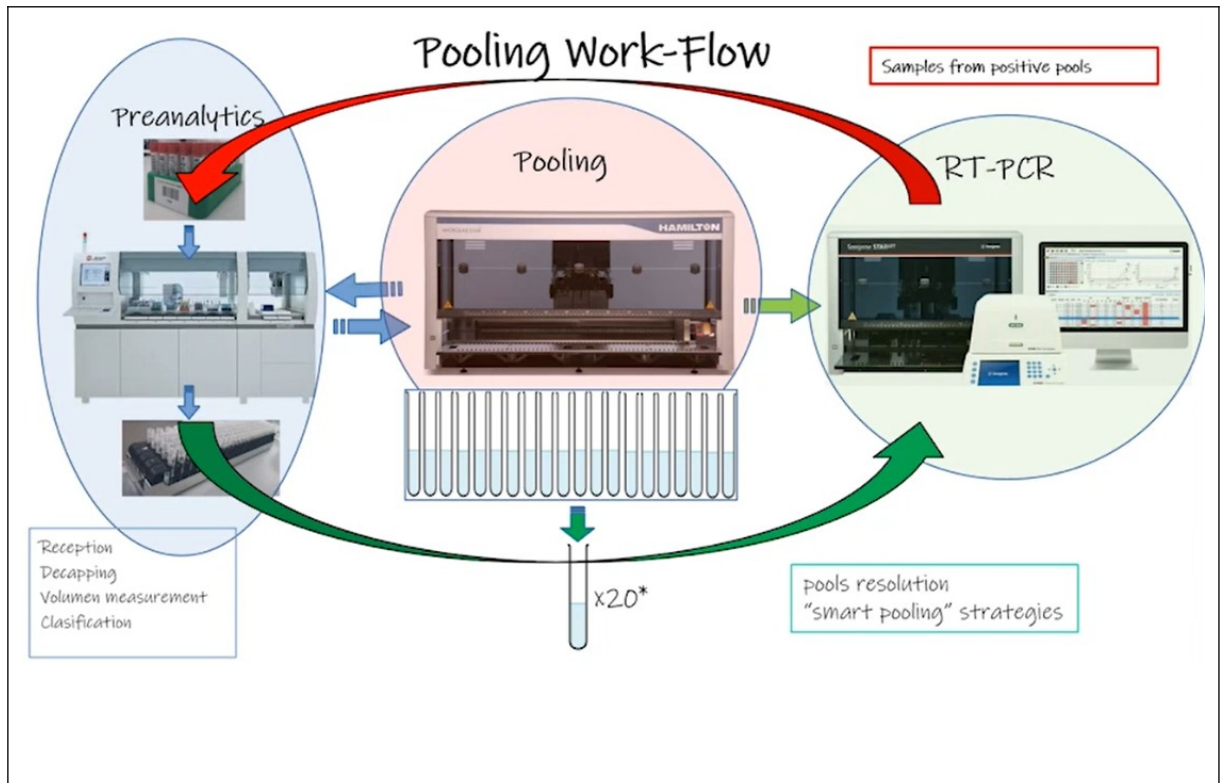
Further information

Website: https://www.sergas.es/Hospital-2050---Innova-Saude/IS-TELEA?idioma=es
Contact person: Alfonso Alonso, Deputy Director of the Healthcare Assistance Directorate of SERGAS

Title of the good practice
5. Pooling system for performing PCRs (Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Galician Health Service (SERGAS)
Summary of the best practice (3.000 characters)

In 2020, for the first time in Spain, the management of the Vigo Health Area implemented the pooling technique, which allows samples from several citizens to be analysed in a unique test, multiplying its evaluation capacity.

The specific objectives of this project were:

-to identify infected individuals in healthy populations (asymptomatic carriers) in a rapid and inexpensive manner

-to classify populations according to their prevalence - low (1%) or high prevalence (5%).

It consists of joining the samples of 20 different people and processing them together, as if they were those of a single individual. If the result of processing the resulting sample is negative, it is concluded that each of the original samples is also negative, thus saving the time and capacity that would be involved in the individual study of each of the original samples.

If the overall result is positive, the samples have to be separated for reprocessing: either by dividing the pooled sample into smaller fractions or by testing each of them individually.

This technique was not only used to detect positives but also in a preventive way, achieving infection-free   zones.

This system is a highly efficient diagnostic tool to monitor and control virus circulation in strategic areas. That is, instead of wait for workers with symptoms to appear, a proactive action is taken to search for and identify asymptomatic workers, in order to control outbreaks of the disease as soon as possible and to guarantee strategic areas free of circulating   virus.

It is therefore very effective for testing groups of people in large workplaces, such as healthcare workers, users and workers in socio-sanitray centers and reisdences, as well as groups   in   industrial   areas.

During the implantation of this system the first step was the need of having a self-sampling method for getting samples. They had to change the nasopharyngeal swab (the initial way of collecting samples) to saliva. Moreover they had to design a new type of tube to collect a sample and a smartphone application for recording in the robotic infrastructure used for the process. This register ensures the privacy of the participants and the traceability of the samples.

The infrastructure consisted of several robots in which the process and the pooling work flow was carried out. The geometryof the robotic track conditioned the way of working.

Another limitation is the decrease in analytical sensitivity associated with this type of processing.

This decrease can lead to an increase in the false negative rate compared to single processing techniques.

But the advantages are a lot:

-save time and reagents detecting negative (detects outbreaks started)

-you can perfom serial analisis and include more targets besides the coronavirus (the last

two moths they worked with flu and with other virus)

Finally, if the result is negative, a message is sent immediately to the mobile phone. If the presence of a virus is detected, the protocol standardised by the SERGAS is initiated.

How much funding has been mobilised for its implementation?

The initiative was carried out by a research project in which the Galician Health Service and the Galicia Sur Biomedical Institute participated.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

The SERGAS is organised into 7 health areas. These are organisational instruments, without legal personality, that configure the peripheral bodies that manage the Galician Public Health System and integrate all the care centres of the Galician Health Service in their territorial area.
The original geographical coverage of the Pooling system is the Vigo Health area of SERGAS, but from this laboratory it was possible to carry out analyses for the whole Galician region.

Evidence of success:

Thanks to this technique in the Vigo area it has been able to realise about 2 million PCRS.
The laboratory had the capacity to analyse almost 100,000 PCRs per month.
In this activity, priority was given to the fortnightly screening of the nearly 7,000 workers in the Vigo Health Area (14,000 per month) and the fortnightly screening of the 15,000 workers in the Galician socio-sanitary residences (30,000 per month). And the rest (56,000) will be used in the screening of groups in the industrial sectors.
This system contained 700 outbreaks in companies, residences, hospitals and other groups in the Vigo area and throughout Galicia, by detecting the first contagions at an early stage.

Resources needed:

The laboratory is located at the Álvaro Cunqueiro Hospital in Vigo, which allows all the robotic equipment for this procedure to be integrated into a single device.
This project also involves the participation of the School of Engineering of the University of Vigo.
The system is made up of different equipment:

> A pre-analytical module that decapping, classifies and registers the sample input.
> 2 pipetting robots that group 20 samples in the same tube.
> 2 extraction equipment that prepare the sample and perform PCR
> 3 thermocycler modules that provide the final result of the pool.

Pooling Work-Flow

Further information
Website: https://www.iisgaliciasur.es/pooling-informacion-para-entidades/ https://pooling.iisgaliciasur.es/   **Contact person:** Benito Regueiro, Head of the Microbiology Service of the Vigo health area of SERGAS

Title of the good practice
6. PRACTICUM DIRECT: Pandemic Simulator(Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Galician Public Health System (SERGAS): Pontevedra Health Area
Summary of the best practice (3.000 characters)
It is a simulator for managerial reasoning in pandemic situations, which aids in healthcare decision making. Based on neuroscience and cognitive psychology, incorporating doubt into managerial decision making to guide the brain towards knowledge integration Its aim is to boost management and research knowledge by improving the reliability of services and reducing variability. The need for assistance and support in decision-making has been identified at the micro-management, mesomanagement and macro-management levels. The national health system (management teams at different levels within the health organisation) will take decisions in a pandemic on the basis of the results-based guide that results from pooling all the decisions taken in similar situations in all the hospitals, services and categories in the regions, country and other countries. By combining epidemiological models with artificial intelligence techniques and methods based on neuroscience and cognitive psychology, we incorporate all decisions that have been made in care centres (hospitals and primary care) and social-healthcare centres to provide a decision-making SIMULATOR. Based on the contingency plans, a predictive model of the evolution (e.g. infection rate, admissions linked to decision making and the COVID 19 wave, consumption of Noradrenaline, Antibiotics, corticoids, etc.) is been developed. The project has 3 phases: modelling, validation and testing and implementation. The project is currently in the first phase. Different regional managers have been interviewed on the basis of a questionnaire designed for this project. The results are currently being analysed and algorithms are being developed to enable the development of a decision-making simulator based on previous experience.
How much funding has been mobilised for its implementation?
The project is supported by Innovation Agency of Galicia, GAIN with 270,000 euros for its development.
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
The coverage is regional at the moment but depending on success it could be implemented at other organisational levels and regions. There are simulators for clinical decision making, validated by the European Board of Medical Asessors, but no for decision making in health management. Therefore, it

represents a great opportunity to lead the training of managers in the health area and to be a benchmark.

Evidence of success:

The results of initial part are currently being analysed and algorithms are being developed to enable the development of a decision-making simulator based on previous experience.

Resources needed:

- A team made up of health professionals, expert team
- Data scientist team, ffor the development of the model for decision making.
- Access to aggregated databases (not clinical data), on the evolution of the pandemic (also available in SERGAS)

Further information

Website:https://www.researchgate.net/project/PRACTICUM-DIRECT-Simulator-for-Decision-Making-during-Pandemics-PRACTICUM-DIRECT-Simulador-de-toma-de-decisiones-en-pandemias
Contact persons: Modesto Martínez Pillado, Head of section quality unit
Pontevedra Health Area modesto.martinez.pillado@sergas.es
Olga Solas, Galicia South Institute for Health Research (IISGS)

Title of the good practice
7. XIDE: Integrated Demand management in team(Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Directorate General for Health Planning and Reform, Galician Health Ministry (Consellería de Sanidade)
Summary of the best practice (3.000 characters)

XIDE is a project wich attempts to obtain maximum efficiency by choosing the most suitable professional to meet the citizen's demand. It is not a way of triage rather it is the process of finding the best way to meet the patient's demand.
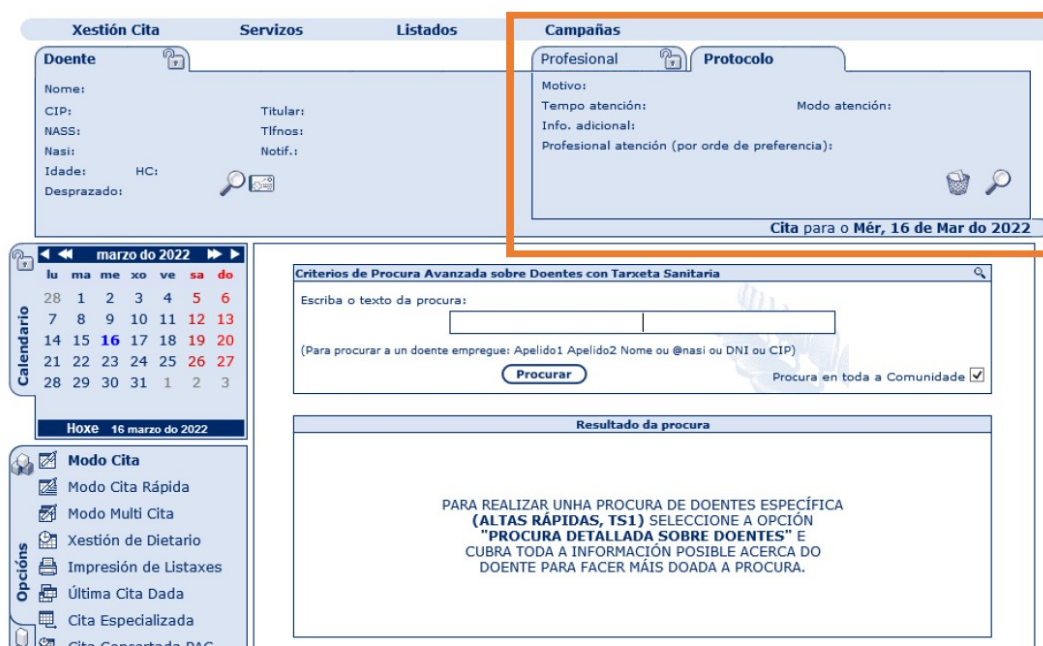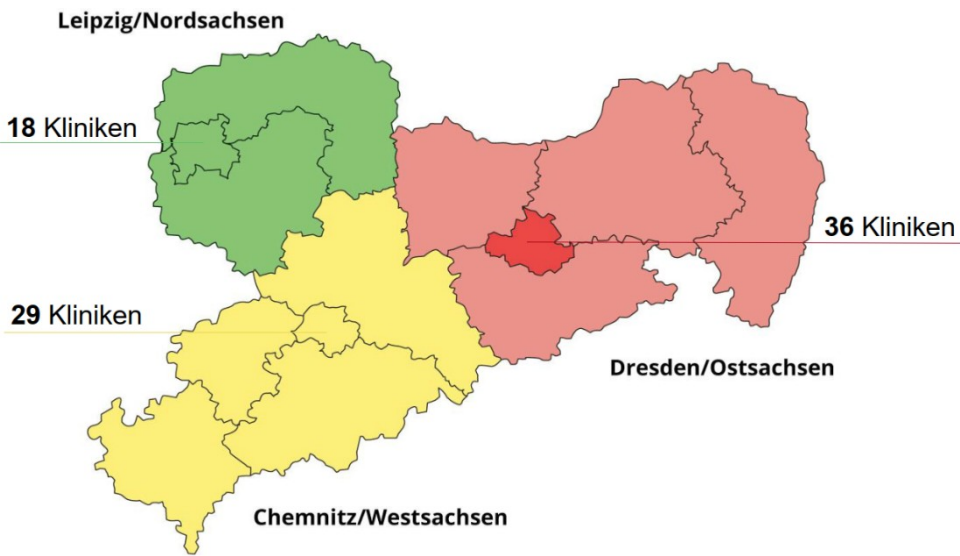

It is a is an innovative technological tool designed to optimise the management of appointments on demand in primary care, through which all professionals of the primary care team participate in an interdisciplinary way and within their competency to respond in a given time to a reason for consultation (expressed by a citizen).

The objectives of the project are as follows:
- Encourage the promotion of professional competence
- Increasing the quality of care in time-dependent processes.
- Efficient organisation of professional staffing
- To guarantee that all people who need on-site care receive it in time and form.

For its creation a working group was created that defined the reasons for consultation and designed the citation proposals, which are continuously being continuous revision. It integrates more than 1000 reasons for consultation in both the adult and paediatric versions. Once the user has been identified, efforts are made to determine the reason for the consultation through standard, non-invasive questions. If the patient does not wish to express their reason for consultation, XIDE guaranteedly assigns him/her aregular telephone appointment with the doctor to express their reason to him/her.

As a result of the process, the system provides an appointment that the tool will decide if it is a priority and if it is a face-to-face appointment, and also decides the professional who will best meet the user's demand.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

The coverage is regional at the moment but depending on success it could be implemented at other organisational levels and regions.

Evidence of success:

XIDE is fully integrated into the primary care management system tool, allowing all processes to be more efficient.

It started in November 2021, and since then it has been implemented in 61 Health Centres distributed throughout all the provinces of Galicia, benefiting 30% of the population of the entire community (787,817 inhabitants).

In total, 274,870 entries have been made to make an appointment on demand through XIDE.

Resources needed:

To develop the XIDE project, the Regional Ministry of Health set up a working group made up of more than 70 professionals from all categories of primary care (doctors, nurses, pharmacists, midwives, social work, dentists, dental hygienists, physiotherapists, paediatricians, administrative staff).

Further information

More info: https://www.youtube.com/watch?v=WlYxJykvdT8
Contact:
Francisco Jesús Represas Carrera: Head of Service - Directorate-General for Health Planning and Reform of Xunta Galicia
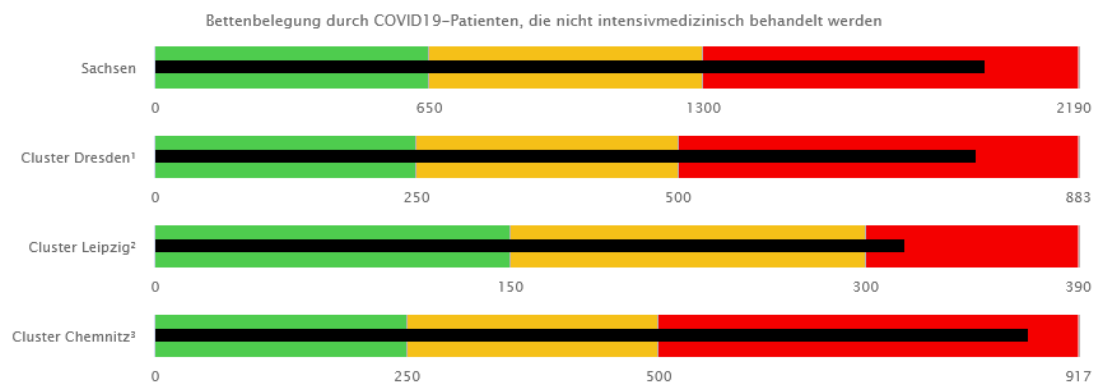planificacion.reforma.sanitaria@sergas.es

Title of the good practice
8. Regional hospital clustering (Saxony)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Dresden University Hospital Carl Gustav Carus for eastern Saxony, Leipzig University Hospital for northwest Saxony

Summary of the best practice (3.000 characters)
Usually, there is no overarching organizational structure of German hospitals, aside from the general structure of ownership where there are private corporations (Helios, Sana etc.) and semi-public structures like Caritas. During the Covid-19 situation there was a major change in the system. Saxon hospitals were organized into three groups or clusters. The aim is to combine capacities in order to avoid triage situations when single hospitals reach their capacity limit. These three clusters are: 1) Cluster Dresden 2) Cluster Leipzig 3) Cluster Chemnitz   In the Dresden and Chemnitz hospital clusters, the critical level is 500 hospital beds each in the normal wards and 170 intensive care beds each. The critical load value in the Leipzig hospital cluster is 300 beds in the normal wards and 80 beds in the intensive care units. A dashboard-like overview was developed to inform the clusters about the current status of the capacities (see figures below). This is updated three times a day The value at the right end of the diagram bar indicates the current total bed capacity for COVID-19 patients who do not currently require intensive care or intensive medical treatment. As soon as the need arises,

these beds will be increased. The current daily bed occupancy can be read from the black bar.

Bed occupancy by COVID-19 patients receiving intensive care treatment:

Bettenbelegung durch COVID19–Patienten, die intensivmedizinisch behandelt werden
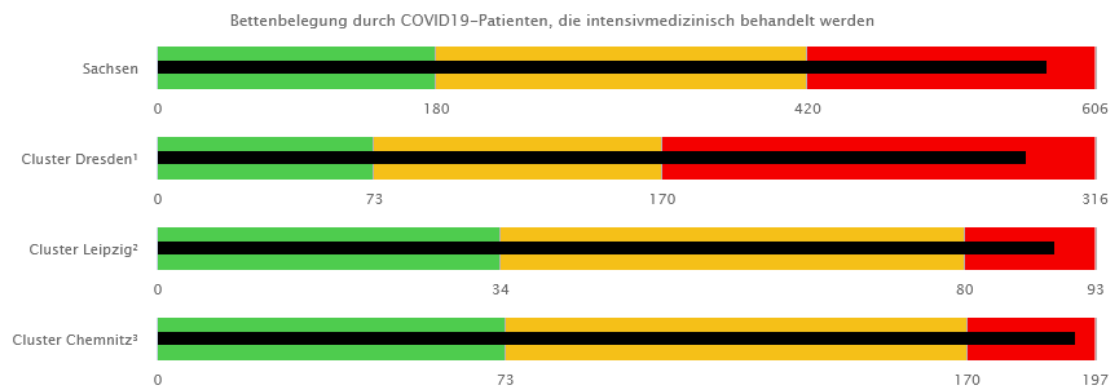
Bed occupancy by COVID-19 patients not receiving intensive care treatment:

Bettenbelegung durch COVID19–Patienten, die nicht intensivmedizinisch behandelt werden

Within these three clusters, a governance structure was set up in order to allow an optimal flow of information and decisionmaking, especially when capacity limits are reached and reallocations become necessary. Meetings of these decision-making bodies occur usually daily, sometimes more than once a day.

Within the cluster, the crisis unit consisted of the Central Hospital Dispatch Center, the Hospital Operations Center, and the Corona Medical Board. The Central Hospital Dispatch Center was established in March 2020 and operated 24/7. It is responsible for centralized management of bed capacity within the cluster. Furthermore, the control center coordinates the distribution of COVID-19 patients according to medical urgency and admission capacity. In addition, it distributes centrally procured supplies and is available for medical consultation. During the peak of the pandemic, the Central Hospital Dispatch Center received an average of 120 calls per day, for a total of 34,239 calls.

When a cluster reaches its capacity, the three hospital control centers must coordinate with each other. Then the patients are transferred to hospitals in another cluster. If the three clusters reach their capacities the patients need to be transferred beyond the state Saxony to other federal states. In order to coordinate the following Clover-leaf Scheme. There was no overload situation in the Saxon hospitals, accordingly the pandemic situation was well handeled.

How much funding has been mobilised for its implementation?	
Individual staff cost for each of the participating institutions	
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?	
Originally regional coverage. GP has been adopted throughout several other German regions	
Evidence of success:	
No overcrowding, no triage, hospitals cooperated	
Resources needed:	
265,000 € staff costs per year (1 FTE 24/7)	
Further information	
Website: N.A. **Contact**: Dr. Robin Weidemann, UKD	

Title of the good practice
9. National Covid patient reallocation scheme (Saxony)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
The Federal Ministry of Health
Summary of the best practice (3.000 characters)
The cloverleaf concept was developed in spring 2020 in context of the Corona pandemic in cooperation between federal and state governments. The concept coordinates / regulates the nationwide relocation of Covid-19 patients who are requiring intensive care. COVID-19 incidences increased exponentially, so did the number of severely ill patients who require intensive medical care. Since capacities in the area of inpatient care of intensive care patients are limited and cannot be increased as needed due to the required material and the necessary qualification of the staff, it became necessary to develop a system that balances regional overloads of intensive care units and prevents triage. The cloverleaf-concept is used when intensive care units in certain hospitals in Germany are overloaded and the coordination of distribution of affected patients to other cities or even other states becomes necessary. This should enable all patients to receive a comparably high, comprehensive level of treatment in accordance with current medical standards. Within this concept Germany is divided into five parts, like a five-leaved clover. These parts are: North, East, South, South-West and West. There are stakeholder of the operational and strategic management. *Operational management:* One leaf includes one to five states. Regionally relevant part consists of (East): Thuringia, Saxony, Saxony-Anhalt, Brandenburg and Berlin. Within the leaf one state is nominated as single point of contact (called SPoC). The SPoCs function as regional coordinating authorities with the GMLZ and a specialist group (COVRIIN) of the RKI. The GMLZ is a special part of the Federal Ministry of the Interior and Community, which deals with civil protection and disaster assistance. The specialist group (COVRIIN) is division of Intensive Care Medicine, Infectious Diseases and Emergency Medicine. The stakeholders of the operational management are responsible for the implementation of the concept. In order to this purpose regular conferences within one leaf are hold (cloverleaf-conference). *Strategic management:* The stakeholders of the strategic management are responsible for the evaluation of the national situation. It consists of representatives of the SPoCs and the COVRIIN specialist group, of representatives of different ministries (for instance the Ministry of the Interior or Ministry of Health). This committee meets regularly for overall strategic control and in conjunction with the cloverleaf-conference.

The hospital utilization is assessed using three levels, like a traffic light scheme.

Green: The green level describes the normal situation in hospitals. The patients are transferred to other clinics if capacities have been exceeded.

Yellow: Because of increasing hospital occupancy, the planning level yellow is reached. The states monitor occupancy to avoid local or regional hospital overcrowding. Within the yellow level, the reallocation within the Clusters of Saxony is used.

Red: If there are signs of an overload situation, the planning level red is reached. If an overload situation occurs in a cloverleaf, the predefined SPoCs alert the operational committee. The patients can be transferred regionally or nationally. If the states within one leaf still have capacity, the patients are transferred regionally. If the capacities in one leaf are exceeded the patients are transfe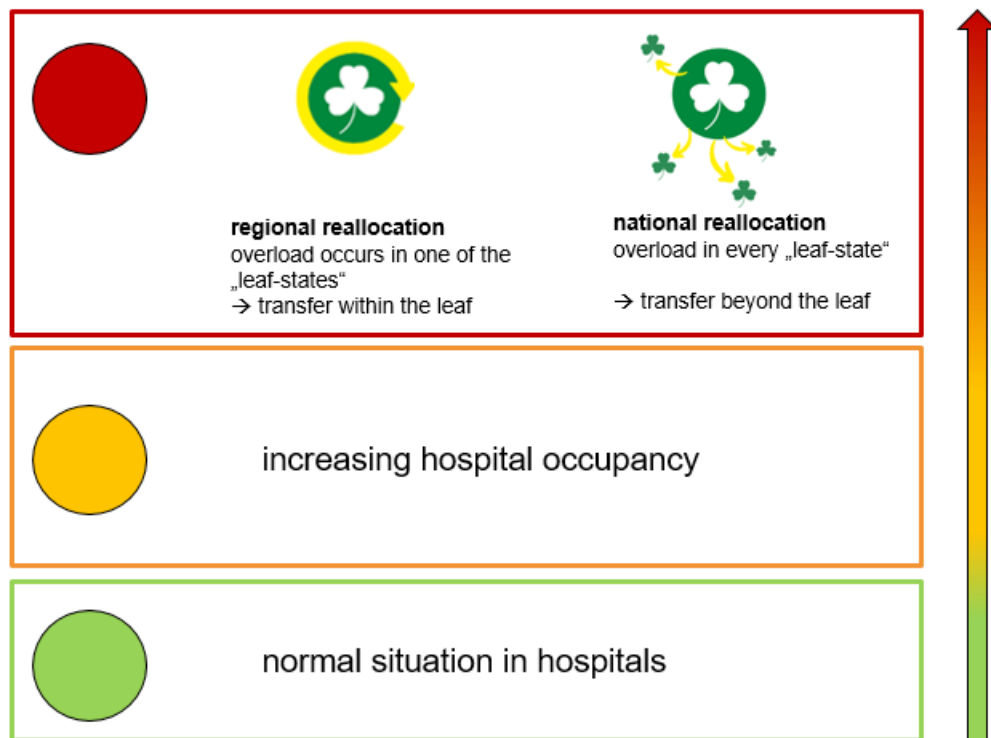rred nationally. The fact that patients may not be transferred to the nearest hospital despite a free place is part of the transfer strategy. It is based directly on the epidemiological situation at regional, state and national level and also takes into account the development forecast. If the occupancy rate in a region is very high and foreseeable to remain so, patients are transferred to more distant hospitals, even if individual places in closer hospitals should still be free. This is also done to prevent overcrowding and counteract triaging.

The SPoC describes the patients to be transferred according to an agreed protocol, which is the basis for the requested SPoC to search for a clinic. Strategic relocations take place over longer distances (approx. 400 to 1,000 km) or over a longer period of time (approx. six to twelve hours). The patient's condition must be able to withstand this higher burden. Which patients are transferred is decided on the base of various criteria. These include, for example, health and physical criteria.

Health condition: An important criterion for the transfer of a patient is the health condition. Patients should not show any deterioration in their respiratory status in the last 24 hours. The person to be transferred should be intubated and tracheotomised, i.e. artificially ventilated. In addition, the patient's circulation should have been stable for at least 24 hours.

Physical condition: In addition to the health aspect, the physical condition of the sick person is also a transfer factor. Among other things, the responsible physicians take into account body size and weight.

regional reallocation
overload occurs in one of the „leaf-states"
→ transfer within the leaf

national reallocation
overload in every „leaf-state"

→ transfer beyond the leaf

increasing hospital occupancy

normal situation in hospitals

The means of transport must also be selected individually. Intensive care transports require special intensive care transports. Especially for ill patients and, in the Cloverleaf, a frequent case when long distances have to be covered. Depending on the patient's situation, the route and the weather conditions, the means of transport must be selected appropriately. Not only airborne transport makes sense. Under certain circumstances, it may also make medical or tactical sense (for example, because of the weather) to resort to ground-bounded means of transport.

The SPoC of the East cloverleaf activated the cloverleaf concept in December 2020. At this time the patients were transferred regionally.

In November 2021, the Single Points of Contact (SPOC) of the South and East cloverleaves activated the cloverleaf concept in November 2021, due to high regional congestion. Since then, strategic transfers over greater distances for capacity balancing took place throughout Germany. In the fourth wave, 34 patients were flown out from Saxony into other states.

How much funding has been mobilised for its implementation?

N.A.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

National. Originally regional coverage. GP has been adopted throughout several other German regions

Evidence of success:

No overcrowding, no triage, hospitals/states cooperated
Resources needed:
N.A,
Further information
Website: https://www.bbk.bund.de/DE/Infothek/Fokusthemen/Corona-Pandemie/Kleeblattkonzept/Was-ist-Kleeblattkonzept/was-ist-kleeblattkonzept_node.html#vt-sprg-4 **Contact person**:

Title of the good practice
10. Hospital based vaccination campaigns (Saxony)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Dresden University Hospital Carl Gustav Carus, Leipzig University Hospital
Summary of the best practice (3.000 characters)
Saxony is the federal state with the lowest vaccination rate in Germany. Many citizens do not get vaccinated for various reasons. This situation is particularly problematic for nursing staff. The government has now reacted to this by making vaccination mandatory in the nursing sector. The hospital-based vaccination campaigns were introduced as early as March 2021. There were two reasons for this. 1) On the one hand, many physicians declared themselves willing to vaccinate in addition to their daily work. Despite the high effort. 2) On the other hand, not to waste any vaccine Hospitals collected leftover vaccine doses. Structures were created to collect left-overs to prevent expiration. The respective hospitals organized the appointment and vaccination process. Since it was primarily hospital staff who were able to participate in the vaccination campaigns first, care was taken to ensure that appointments were compatible with working hours. There was a strong contribution from internal staff, often performing flash-mob like actions during break times with extreme efficiency. Later on, external people, such as relatives, suppliers or networking partners, also had the opportunity to be vaccinated as part of these campaigns. This inside-out structure proved to be very efficient. Also the appointments for the second dose and boosting were organized in this way. Unfortunately, it does not change much regarding the vaccination rate within the population. However, the vaccination campaigns were able to ensure access to the vaccine for many people who were willing to be vaccinated and would have had to wait a long time for their vaccination appointment due to prioritization. In addition, left-overs were prevented from expiring and having to be disposed of. Unfortunately it does not change much regarding the vaccination rate within the population hospitals has their own campaigns not to waste any vaccine.
How much funding has been mobilised for its implementation?
Approx 75 TEUR per centre staff cost only, not including cost for vaccine itself Individual staff cost for each of the participating institutions
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
Local, but widely spread adoption
Originally regional coverage. GP has been adopted throughout several other German regions

Evidence of success:	
Rather high vaccination rate within participating hospitals	
Resources needed:	
Approx 75 TEUR per centre staff cost only, not including cost for vaccine itself Individual staff cost for each of the participating institutions	
Further information	
Website: n.a. **Contact**: Dr. Robin Weidemann, UKD	

Title of the good practice
11. Multidrug-resistant bacterial and fungal superinfections in SARS-CoV-2 critically ill patients. Pharmacokinetic-pharmacodynamic analysis to optimize antibiotic treatment (Basque Country)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Bioaraba, Clinical Microbiology, Vitoria-Gasteiz, Spain; Osakidetza Basque Health Service, Araba University Hospital, Microbiology Service, Vitoria-Gasteiz, Spain. - Gasteiz (Spain). - Vitoria-Gasteiz (Spain). Public health organization.
Summary of the best practice (3.000 characters)
Several studies from different countries have shown the risk of COVID-19 patients of suffering bacterial and fungal superinfections. At the beginning of the pandemic (between March 4 and March 31) in the Intensive Care Units (ICU) of the OSI Araba, 12.5% of COVID-19 patients suffered a superinfection by *Pseudomonas aeruginosa, Enterococcus faecium, Haemophilus influenza*e or methicillin-resistant *Staphylococcus aureus*. These superinfections, often due to resistant microorganisms, increase the morbidity and mortality of these patients. In this context, it is essential to evaluate whether empirical treatments with broad-spectrum antibiotics have developed changes in nosocomial colonization and / or infection in patients admitted to the ICU, and to monitor the appearance of multidrug-resistant strains in response to antibiotic pressure. Our objective is to follow the resistance trend of bacteria and fungi to antimicrobials after the COVID-19 pandemic, and to evaluate, by pharmacokinetic / pharmacodynamic (PK/PD) analysis the adequacy of the antimicrobial dosing used to treat COVID-19 patients admitted to the ICU with bacterial and fungal superinfections. This strategy is very useful to optimize the dosage regimens and to improve the morbidity and mortality of the patients, which allows for the design of the antibiotic policy in the ICU considering the current pandemic situation.
How much funding has been mobilised for its implementation?
38.335 €
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
Regional. Yes.
Evidence of success:
This activity has shown the great genetic diversity of the microorganisms that circulate within the same hospital unit, even considering patients with similar characteristics. Likewise, it corroborates the wide distribution of resistance genes, virulence and mobile genetic elements. We have shown an increase in multidrug resistance (MDR) phenotypes among the different bacterial populations, mainly in the genes encoding Extended spectrum beta-lactamases (ESBLs), with the consequent risk of resistance dissemination and loss of therapeutic options.   For future studies, it would be interesting to be able to determine whether these resistance genes, especially those encoding ESBLs, and virulence genes are located in isolated mobile elements.

Resources needed:
Next-generation sequencing (NGS), *Illumina* semiconductor.
Further information
Website: **Contact persons**:   Marina Fernández Torres: MARINA.FERNANDEZTORRES@osakidetza.eus   Alicia Rodriguez: alicia.rodriguez@ehu.eus   Andrés Canut: ANDRES.CANUTBLASCO@osakidetza.eus

Title of the good practice
12. Prediction of clinical deterioration in patients admitted due to COVID19 (Basque Country)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Osakidetza Basque Health Service, Research Unit, Galdakao-Usansolo University Hospital

Summary of the best practice (3.000 characters)
During the breakthrough of the COVID19 pandemic a great number of software tools were launched to guide decisions and to predict clinical deterioration in COVID-19 patients. These tools require to be tested in the real scenario to check the feasibility of being considered in the clinical daily routine after an assessment with real data of the patients. COVID19-Osakidetza is a prospective cohort study recruiting COVID-19 patients. This good practice is about the process of how performing a collection of information to establish a baseline of sociodemographic characteristics, comorbidities and associated medications, vital signs, treatment received and lab test results of COVID-19 patients from baseline to discharge. This information also included the following information, requirement of the intensive ventilatory support or invasive mechanical ventilation, and/or admission to a critical care unit and/or death during hospitalization. Considering all of them a curated model was able to predict the need of external ventilation of the patients. Based on the development of a Catboost model 1568 patients were included in the derivation cohort and 956 in the (external) validation cohort. The model was able to find that the strongest predictors of clinical deterioration were arterial blood oxygen pressure, followed by age, levels of several markers of inflammation (procalcitonin, LDH, CRP) and alterations in blood count and coagulation, among other. The main goal of the model was the ability to predict progression to a score of 5 or higher on the WHO Clinical Progression Scale before patients required mechanical ventilation. This good practice underlines not only the importance of systemic data collection but also the impact of a clinical validation of this type of computer models using the information included in the electronic health report. The process allowed the discovery of useful information for screening COVID19 patients to predict their evolution. However, this requires enough patients and a validation process in different cohorts. The process demonstrated in this experience is useful to show the stepwise approach and to underline the importance of the need of a validation in different population cohorts before applying it in the clinic.

How much funding has been mobilised for its implementation?
A total Budget of 131.500,00€ for performing the practice.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
Regional. No yet.

Evidence of success:
The good practice represents a way to validate a machine-learning based prediction model with excellent performance properties to be implemented in electronic health report (EHR).

Not only the goal is to predict progression to a score of 5 or higher on the WHO Clinical Progression Scale prior to patients requiring mechanical ventilation, but also how to perform the process to find and validate these outcomes. Future steps are required, such as an externally validation of the model in other settings and in a cohort from a different time and to apply the algorithm in clinical practice. Nevertheless, the procedure explained tackle the steps required to reach the success in the development of a machine learning model for the patient classification to predict their prognosis.

Resources needed:

The access to the EHR is essential to get the information which is used to train the machine-learning models. This requires of a close collaboration between several Departments in a healthcare system. In addition, expert research in machine learning and computer sciences should be involved in order to develop a robust model with enough capacity to identify and predict prognosis in the patients.

Further information: https://www.nature.com/articles/s41598-022-12247-9

Website:https://www.kronikgune.org/grupo-de-investigacion-en-servicios-de-salud-y-enfermedades-cronicas-del-hospital-de-galdakao/
Contact person: Susana García Gutierrez, SUSANA.GARCIAGUTIERREZ@osakidetza.eus

Title of the good practice
13. Near Me (Scotland)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Scottish Government
Summary of the best practice (3.000 characters)

Near Me is a video consulting service that enables people to attend health appointments remotely from home or wherever is convenient. The service witnessed a £1.6 million '12 week scale up' by Scotland's TEC programme in 2020 and is now being rolled out across a variety of public services. The service is already widely used across NHS Scotland for primary and secondary health and care appointments, with around 20,000 consultations every week as of 2021.

It is built on the 'Attend Anywhere' platform aiming to reduce travel across rural Scotland. According to a survey conducted with patients for the 'Evaluation of the Attend Anywhere / Near Me video consulting service in Scotland, 2019-20', the average one-way distance they would have travelled to a clinic was 51 miles (82 km).

Near Me is an exemplar of healthcare delivery pathway innovation. It gives patients the option to receive healthcare wherever is most convenient for them and accommodates a wide range of circumstances. During and before COVID-19, it particularly benefitted the ageing population by reducing their exposure to infection and eliminating the stress and difficulties of travelling to an appointment.

Difficulties Encountered
- Managing the capacity of the platform as the demand for remote consultations increased rapidly throughout the COVID-19 pandemic.
- Encouraging the adoption of remote consultations by clinicians. Before COVID-19, local staff saw the benefit of travelling to patients to gather more social information during their visits, Near Me was considered a rare need.
- Overcoming the assumption that the ageing population and disabled patients would be unable to adapt to a digital service.
-

Potential for learning or transfer
- Making educational resources for the implementation of Near Me available, enabled its rapid scale up in a time of crisis.
- Establishing a technical support team was key to the adoption and success of the service.
- Connection of 'Champion' clinicians with their peers to share tips on the best use of Near Me relative to their specific field and circumstances extended the reach of the service.

Despite the wide-ranging positive impact of Near Me there are still barriers for some patients:
- Poor or no access to an internet connection
- No access to private space where they can use Near Me to speak confidentially with

clinicians
- Low digital skills

To extend the positive impact of the service, the team is confronting the digital divide and finding solutions to the lack of private spaces by working with organisations such as Connecting Scotland, Libraries, Community Centres or Village Halls that can provide safe spaces and technical support.

How much funding has been mobilised for its implementation?

Capacity for the underlying video consulting platform (Attend Anywhere) was increased a cost of £1.2 million p.a. (1.4 million Euros)

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

Scotland – Nationally - Though the pre-Covid use of Near Me covered most health boards in Scotland, usage was around 1100 consultations per month. This peaked at around 90k per month and currently sits around 50k. The system is in use throughout Scotland.

Evidence of success:

Between March and June 2020, consultations increased from 330 per week to almost 17,000. Near Me has:
- · Reduced exposure to infectious diseases
- · Reduced travel to appointments: time, cost, convenience
- · Reduced time away from work, school or home
- · Made it easier to attend if the patient usually needed someone to take them to appointments
- · Enabled patients to have someone with them for support at their appointment (joining the consultation either with them or from another location)
- · Decreased the environmental impact of travel

Evaluation Summary Report 2020

Resources needed:

- Team of 6 people working remotely from home
- Supported by technical team of 12 people
- Network of Near Me leads in every health board across Scotland
- Three different service models were used on the platform; Hub-home, Dyadic hub-spoke and Triadic hub-spoke.

Further information

Website: https://www.nearme.scot/

Contact person: kara.mackenzie@dhi-scotland.com

Title of the good practice
14. NHS Scotland National Decision Support Programme & COVID19 Decision Support (Scotland)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Digital Health and Care Innovation Centre – Research Organization

Summary of the best practice (3.000 characters)

The National Decision Support Programme for the Scottish Government, led and managed by DHI in partnership with NHS Greater Glasgow and Clyde, NHS Lanarkshire, NHS Lothian and Healthcare Improvement Scotland responded to the COVID-19 pandemic with the development of several decision support solutions for healthcare professionals:

1. Guideline apps for:
   - Delivery of local COVID -19 guidance in NHS Greater Glasgow and Clyde, NHS Lanarkshire, NHS Lothian – released at different times between April and December 2020 providing up-to-date guidelines and information support for clinicians delivering healthcare to patients with suspected COVID 10. The first COVID-19 guidance app (for NHS Lothian) was released in just 1 week.
   - Delivery of national guidance from the Scottish Intercollegiate Guidelines Network (SIGN) within Healthcare Improvement Scotland for primary care assessment of COVID 19 (released 08/20) and for management of Long COVID (09/21).
2. A patient app to support self-management of Long COVID. This includes a symptom diary which enables the patient to track changes in their Long COVID symptoms. They can generate a report showing how their symptoms have changed over time and share this report with healthcare professionals (Released 12/21).
3. All applications were built within DHI's existing Right Decision Service platform which enables rapid development of tools using publication-ready predefined templates and functionality, without requiring any programming skills.

The Long COVID professional and patient-facing apps were developed using a co-design approach, engaging closely with professional and patient groups and working through successive iterations of prototypes, alpha and beta versions.

Difficulties encountered

A further application, 'RESTORE2', a tool for early detection of deterioration in care home residents with suspected or confirmed COVID-19 was developed for integration with care home assessment records. The partner organisation responsible for the care home assessment record system development had initial concerns that they might hold some legal liability for the medical device. It was clarified that this was not the case, but the delay in integration meant that the project proceeded without RESTORE2 being implemented. However, the RESTORE2 tool is fully developed and UK CA marked for future use and integration.

Potential for transfer or learning

- Provide clarity on the need and benefit of person specific support and of medical device responsibilities at the outset of development.
- Collaborate closely with knowledge managers in health boards and with clinicians who have a strong sense of ownership over the service.
- As part of the co-design approach, work through iterations of wireframes and prototypes during consultation with user groups to focus and enhance the discussion.
- Partnership with Healthcare Improvement Scotland as the national body for evidence and guidance products in NHS Scotland was key to giving credibility and authority to the national COVID tools.

How much funding has been mobilised for its implementation?

Circa £20k (23k Euros) for knowledge management time and app hosting and maintenance.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

National use of SIGN apps across NHS Scotland; use of local COVID guideline apps in NHS Lanarkshire, NHS Greater Glasgow and Clyde and NHS Lothian.
DHI is sharing learning about the decision support technology model and implementation approach with NHS England as they embark on their decision support programme.

Evidence of success:

- 500-1000 users per month per app.
- Safer, more timely and consistent patient care, reducing unwarranted variation and consequent patient harm. For these reasons, the tools received excellent feedback from clinicians.

Resources needed:

- 'Right Decision Service' technology infrastructure and knowledge management expertise to design knowledge architecture and populate apps.
- Clinician and patient time to collaborate with knowledge managers.

Further information

Website: Covid-19 Decision Support | Digital Health & Care Innovation Centre (dhi-scotland.com)
Contact person: kara.mackenzie@dhi-scotland.com

Title of the good practice
15. Test and Protect (Scotland)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Public Health Scotland, led by Digital Health and Care Innovation Centre

Summary of the best practice (3.000 characters)

Prior to the COVID-19 pandemic, virus testing, result notification and contact tracing in Scotland was managed regionally by local National Health Service (NHS) health boards, using a system reliant on paper, spreadsheets and phone calls.

As the pandemic took hold, the Digital Health & Care Innovation Centre (DHI), raised a concern that this regional approach would quickly reach its capacity. This led to the creation of a project owned by Public Health Scotland and led by DHI, to develop new, digital systems for test result notification and contact tracing.

For the development of the test result notification system, DHI brought together 15 stakeholders from the digital innovation and public health fields for two workshops to create a vision and roadmap. Within 41 days a new test result notification system was implemented across 14 health boards in Scotland, transacting millions of records every month.

With an unprecedented rise in cases, it was identified that an entirely new approach to contact tracing would also be needed. Using the same co-creative approach, the team at DHI designed a digital system where citizens were empowered to 'self contact trace'. It was the first ever co-managed healthcare system in Scotland to be deployed at scale, representing a significant breakthrough in healthcare.

Difficulties encountered

Clinicians involved in the project were concerned about their duty of care in ensuring citizens had seen their result, which posed a challenge for developers. The solution was to send a link to results via text which, upon entering their surname and DOB, would send a read receipt back to the clinical team. Phone calls were used as a follow-up method where citizens, particularly older groups, had not seen their results. This upheld ethical standards and addressed privacy concerns, while being scalable for millions of people.

Potential for learning or transfer

Establishing knowledge transfer mechanisms
- Positions key individuals to understand both the problem/need and the possible solution

Using participatory design methods
- Brings together the right stakeholders to ensure that the solution will work for all users
- Gets buy-in from stakeholders; addressing concerns through iteration

Continuous investment into new delivery methods
- Pre-pandemic development of data exchange infrastructures allowed the team to move quickly

Organisational culture predicated on trust
- The project was led by junior-level professionals, who were trusted and empowered in their roles by senior managers, thanks to their credibility and integrity as individual

How much funding has been mobilised for its implementation?

£500k (580k Euros) was deployed for the development of the digital self-service tools and test results service. Further funding was mobilised for the broader test and protect programme (value to TBC).
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
National - Scotland
Evidence of success:
- The result of these digital innovations was the successful contact tracing of millions of citizens, saving countless lives   - Pressure on NHS systems and staff was relieved and significantly greater impact from funds and resources was leveraged   - Government restrictions could be lifted, minimising the negative effects on citizens particularly felt by older groups who had to isolate due to their vulnerability   - A new precedent for activating citizens to co-manage their routine healthcare has been set, which will have a long term impact on healthy ageing
Resources needed:
£500k (580K Euros) was deployed for the development of the digital self-service tools and test results service. Further funding was mobilised for the broader test and protect programme (value to TBC).
Further information
Website: **Contact**: kara.mackenzie@dhi-scotland.com

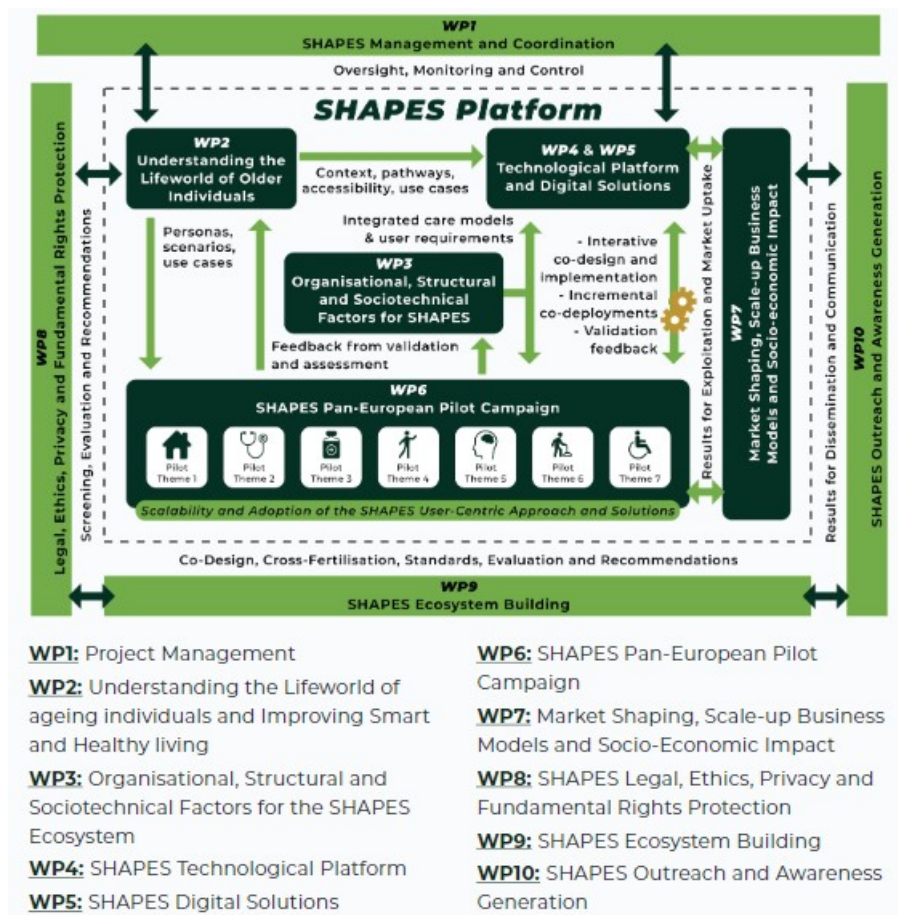# D. Thematic Area 2. Active and Healthy Ageing Ecosystems

Title of the good practice
1. SHAPES digital services for active and healthy ageing (Saxony)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
National University of Ireland, Maynooth
Summary of the best practice (3.000 characters)

At the same time that the European population is ageing, life expectancy is increasing. European Union citizens can remain productive and active far beyond the standard age of retirement. Sustaining longer and healthy lives requires solutions that prevent or minimise risks of injury, f railty and long-term chronic diseases.

The SHAPES Innovation Action (IA) intends to build, pilot and deploy a large-scale, EU-standardised open platform. The integration of a broad range of technological, organisational, clinical, educationaland societal solutions seeks to facilitate long-term healthy and active ageing and the maintenance of a high-quality standard of life. Mediated by technology, in-home and local community environments interact with health and care (H&C) networks contributing to the reduction of H&C costs, hospitalisations and institutional care.

SHAPES Integrated Care Platform is an open platform based on four factors: home, behaviour, market and governance. Mediated by technology, in-home and local community environments interact with health and care networks contributing to the reduction of health and care costs, hospitalisations and institutional care. Big data analytics and artificial intelligence analyse information pertaining to health, environment and lifestyle and individual needs, create user profiles and deliver personalised digital technologies.

SHAPES Digital Technologies cover a wide spectrum of areas including IoT and Big data Platforms, online communication and accessibility tools, cognitive stimulation and rehabilitation, conversational assistants and chatbots, solutions based on robotics, health and

wellbeing platforms, solutions to ensure security, COVID-19 responses tools as well as solutions in the area of data analytics, such as predictive systems and wellbeing assessment tools.

The SHAPES Project brings together leading research groups, companies and experts from across Europe. The consortium is industry driven and addresses the whole value chain required for the success of the SHAPES Project.

The SHAPES Project is structured in ten thematic work packages (WPs), each subdivided into specif ic Tasks. The figure provides a graphical summary of the structure of the Project and of the relevant topics addressed by the different WPs and by the whole project.

SHAPES Large-scale Piloting campaign engages more than 2000 older individuals in 15 pilot sites in 10 EU Member States, including 6 Reference Sites of the European Innovation Partnership (EIP) on Active and Healthy Ageing (AHA), and involves hundreds of key stakeholders to bring forth solutions to improve the health, wellbeing, independence and autonomy of older individuals, while enhancing the long-term sustainability of health and care systems in Europe.

WP1: Project Management

WP2: Understanding the Lifeworld of ageing individuals and Improving Smart and Healthy living

WP3: Organisational, Structural and Sociotechnical Factors for the SHAPES Ecosystem

WP4: SHAPES Technological Platform

WP5: SHAPES Digital Solutions

WP6: SHAPES Pan-European Pilot Campaign

WP7: Market Shaping, Scale-up Business Models and Socio-Economic Impact

WP8: SHAPES Legal, Ethics, Privacy and Fundamental Rights Protection

WP9: SHAPES Ecosystem Building

WP10: SHAPES Outreach and Awareness Generation

LEGEND
● SHAPES Partner
● SHAPES Partner and Pilot Site

Different pilot themes: Pilot theme 1 is the pilot project in Saxony and is a demonstration for providing an environment for older individuals that contributes to a more independent, better and healthier living at home as well as keeping them integrated in an active and social life. The target group consists of older people (+65 years) living independently and displaying signs of reduced physical and/or cognitive capabilities and/or functions (physical and/or cognitive), but willing to maintain autonomy, independence and healthy living at home. The aim is to reduce fear by increasing competent usage of digital solutions that solve specific problems of the target group.

How much funding has been mobilised for its implementation?
21 Mio. EUR total estimated budget is 20.7m€ of which 18.7m€ is the requested EC contribution

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
The SHAPES pilots will be done in 13 pilot sites in nine countries including Cyprus, Czech Republic, Germany, Greece, Ireland, Italy, Portugal, Spain and the UK (Northern Ireland). The table below provides additional information regarding the names/ types of the pilot sites and the types of care or key themes. For more detail see D3.1 Ecological Organisational Models of Health and Care Systems for Ageing

| Types of pilot sites			
Country	**Name of pilot site**	**Type of pilot site**	**Type of care/ key themes**
Cyprus	University of Nicosia Research	Research organization	Challenges to modern life from a wide range of perspectives, including

	Foundation (UNRF); University of Nicosia Medical School (UNIC)		technological and scientific advances, modern culture and thought
Czechia	University Hospital Olomouc (UHO)	Teaching hospital	Chronically ill patients with heart diseases, palliative care, anticoagulation treatment General healthcare to older people, people with chronic and cardiovascular illnesses general complex and specialised medical care
Czechia	Czech National eHealth Centre	Health centre associated with UHO	Innovations in healthcare in the region development and scaling up of eHealth infrastructure, services and applications
Germany	Health Region Cologne Bonn (HRCB); Oberbergischer Kreis	Regional area District	Resource for regional development digital health / health development corporate health management medicine technology care in rural areas healthy ageing regional development
Germany	Federal State of Saxony (Sachsen)	Federal State	General medical care provision
Greece	5th YPE	Regional health authority	Active Ageing and Independent Living Safe and secure traveling despite existing health problems Prevention/ Screening Empowering older people who are socially isolated
Greece	LLM Care (Long Lasting Memories Care) Health and Social	Multi-agency partnership comprised of academic/ research organisations, health/tech providers, regional policymakers, and civil society organizations	Care and rehabilitation services for older people
Ireland	Centre of Gerontology and Rehabilitation at St. Finbarr's Hospital	Hospital	Rehabilitation following a stroke Rehabilitation for people aged 65+ years old Physiotherapy Occupational therapy and physiotherapy for people who are 65+, who have had a fall or are at risk of falling
Italy	WeCareMore Centre for Research and Innovation of AIAS Bologna onlus	Regional Centre for Assistive Technology	consultancy services and partnerships to bodies in the public and private sectors focussing on "the use of digital technologies in the health and social care sector" (AIAS)
Portugal	Porto4Ageing	Multi-agency partnership comprised of academic/ research organisations, health/tech providers, regional policymakers, and civil society organizations	Active ageing and Independent Living Care and Cure Prevention, screening and Early Diagnosis Focus on driving structural change regarding health and care provision in the Porto Metropolitan Area
Portugal	USIDEC	University for adults	Provision of education to older adults

			aged 55 years or older	Attempts to tackle loneliness among older adults
Spain	El Salvador	Residential care facility	care for older people who are retired often people with dementia	
Spain	Clinica Humana	Private clinic	Care for people with chronic illnesses, degenerative diseases such as dementia and Parkinson's Disease, cancer Often people with multiple co-morbidities Physical rehabilitation Palliative care	
Northern Ireland/ United Kingdom	Northern Health and Social Care Trust	Health and social care trust	Provision of health and social care Acute services Psychiatric inpatient care (Holywell Hospital) Acute mental healthcare (Ross Thompson Unit in Causeway Hospital)	

Evidence of success:

The pilot campaign has not yet started, so we don't have any evidence of success, which will be derived from the evaluation toolkit as outlined in "D6.1 SHAPES Pan-European Pilot Campaign Plan". The toolkit includes the following evaluation methods:
- MAFEIP to model population health and cost effectiveness
- MAST to provide evidence-based arguments for the negotiation of new services
- MOMENTUM and MAPS for the assessment of the success and sustainability at the end of the pilot

NASS to identify risks and avoid failure during use case development regarding patient groups and digital tools

Resources needed:

The SHAPES project is in the process of building a platform hosting a suite of digital solutions which will be tested as part of the pilot campaign. These include:
- Digital solutions for an intelligent living and care environment
- Application suite for healthy ageing
- Robotics and assistive technologies
- Decision support, risk assessment and prediction services
- Solutions for health and care service providers
- Lifestyle management and wellbeing assessment
- Solutions security assessment as a service
- Covid-19 response digital solutions

A detailed overview of the suite of technologies piloted in SHAPES can be found in "D5.2 – SHAPES Digital Solutions"

Further information

Website: https://shapes2020.eu/
Contact: shapesinfo@mu.ie

Title of the good practice
2. Co-Creation for designing innovative solutions in home and social care (HoCare2.0) (Saxony)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Central Transdanubian Regional Innovation Agency Nonprofit Ltd.; Hungary
Summary of the best practice (3.000 characters)
HoCare2.0 initiative brought together 11 partners (Germany, Czech Republic, Hungary, Poland, Italy and Slovenia) varying from public service providers, through national healthcare services to business support organizations. Each Project Partner has specific knowledge and expertise that ensures high-quality outputs. The ultimate goal of the whole partnership is to deliver a systematic change in territorial innovation ecosystems and shift them towards Open Innovation2.0. The aim of the project HoCare2.0 is to provide customer-centered home care (health and social care) by using the principles of co-creation. The co-creation approach refers to a product or service design process in which feedback from consumers plays a central role from beginning to end. It is a way in which businesses allow consumers to submit ideas, designs or content. HoCare2.0 connects representatives of Quadruple Helix (QH) so they work together on the final product or service for home care. QH means Industry– Entrepreneurs and SMEs who are producing home care products and devices, Public administration, Institutions that provide healthcare or healthcare-related services, Citizens in need of home care products or services, Academia – researchers, universities with innovations related to home care Within the project a network of co-creation labs, one per territory, is created. The purpose of this Network is to connect Quadruple helix actors to develop innovative products and services and to raise awareness and knowledge for home health and social care. With the help of co-creation Labs members needs to be addressed in each territory are identified. Furthermore SME and POLICY Tools are developed and designed. To share a high-quality knowledge HoCare2.0 develops a knowledge pack that serves as a core education tool for the individual, institutional and stakeholder knowledge advancement about adapting of co-creation approaches and using previously developed tools. Partners also organize trainings for SMEs and providers of public services during open conferences, roadshows that are going to take place in different countries during the project duration. Therefore, trainings ensure constant awareness and knowledge building in Central Europe territories.
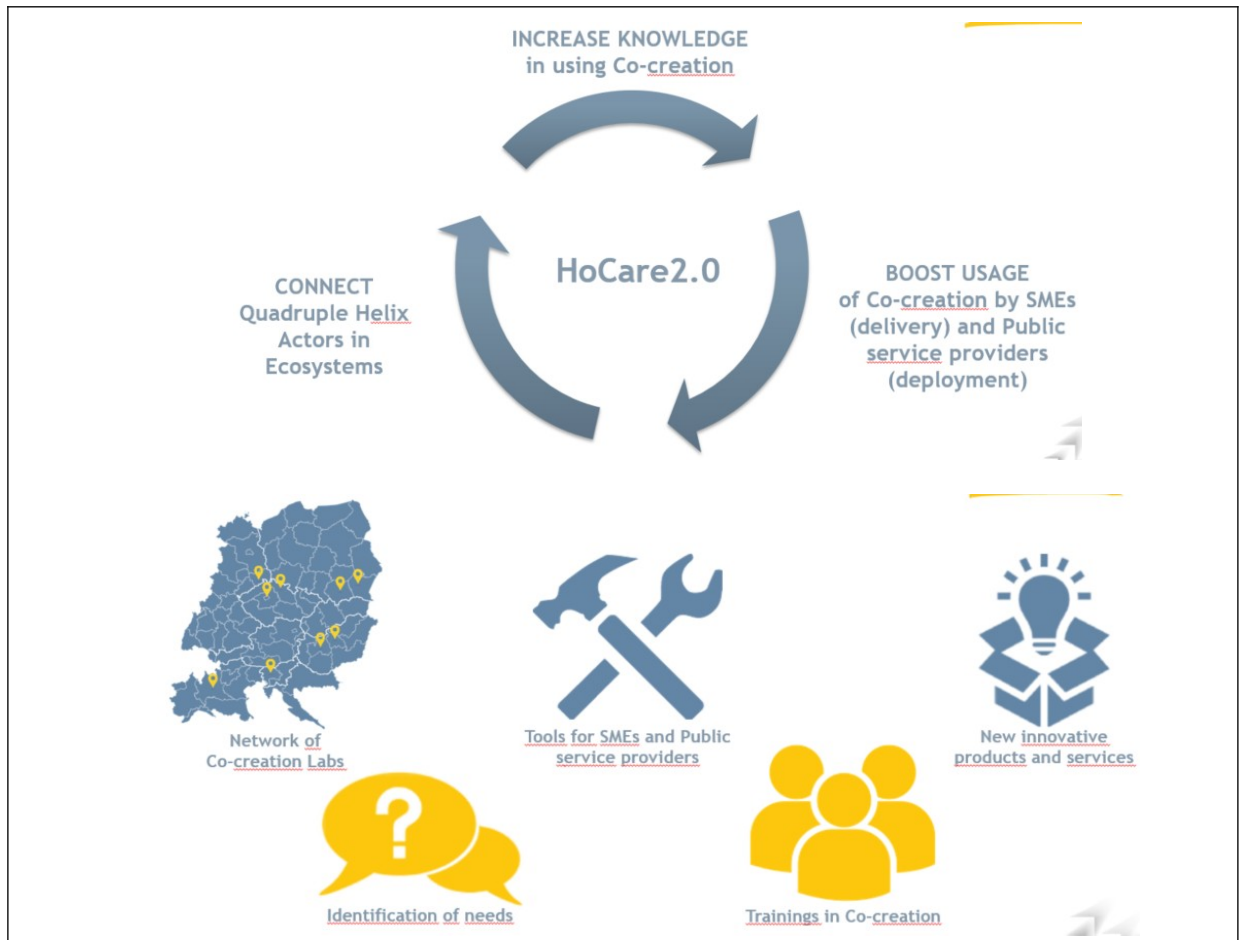
In total, 18 institutions in all territories demonstrate the usability and impact of developed tools at the delivery of innovative health of social home care solutions by co-creation involving elderly care recipients and their family members. Pilots also provide important examples of good practice in Central Europe. Twelve SMEs and six Providers of public health and social care services participate in pilot developing and testing.

There are two pilots in Germany.

- The Digital Therapy Companion

The aim of the project was the further development of the existing browser-based application, already used for cancer oral therapy as mobile app for other chronical diseases.

- Intelligent audio analysis
- Video consultation with assistance

How much funding has been mobilised for its implementation?

1.9 Mio. EUR

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

The three best practices were tested and implemented regionally. The Digital therapy Companion is already being sold throughout Germany. The video consultation with assistance was used by a regional care provider and is transferable to other service providers in the outpatient and inpatient healthcare sector. In the future, it is planned to replicate and thus scale the solution in other regions within Saxony.

Evidence of success:
1) The Digital Therapy Companion: A digital medical product for optimal therapy support of cancer patients with direct connection to the treating practice. 2) Intelligent audio analysis: The development of the solution is not yet finalized. Success can only be estimated after market launch. 3) Video consultation with assistance: The solution is available for use in other healthcare facilities and can therefore be considered a success. Overall, almost all innovative solutions have been successfully launched at the various Piot sites in Europe.
Resources needed:
• - Co-creation know-how • - Partners to implement the pilots: SME, public service provider • - Representatives of the Quadruple Helix to co-create the solutions (including time and human resources) - Availability of financial resources on the part of the partners to develop the solutions
Further information
Website: https://www.carusconsilium.de/de/projekte/demographie-und-flaechendeckende-versorgungskonzepte/hocare-2.0 https://www.interreg-central.eu/Content.Node/HoCare2.0.html **Contact Person**: Ákos Szépvölgyi, szepvol@kdriu.hu

Title of the good practice
3. Strategy of Covid-19 vaccination (Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Directorate-General for Public Health, Galician Health Ministry (Consellería de Sanidade)
Summary of the best practice (3.000 characters)

Galicia's vaccination strategy can be considered a reference as it has been the leading Spanish region in terms of vaccination, with a great success in terms of coverage, especially in the elderly population.

The success of the strategy was based on 4 fundamental axes which are described in the presentation:

1.-The staff training:

It was necessary to train specific teams of nurses, who were self-trained at the beginning of the whole process in the preparation of the vaccines, adverse reactions, the interviews that had to be done…

2.-The support of technological innovations for appointments (use of QR codes), for data recording and other tasks, providing vaccination with technological advances that have been key to systematising the process.

An example was the process used for communicating the vaccination appointments:

The citizens receive an SMS with a QR code and a link to the geolocation of the exact location of the vaccination. The date and time of the vaccination appointment is indicated in the same text message.

The QR allows a unique identification of the patient and a perfect traceability of the patient and the vaccine. If the citizen arrives without the code, there is an information point at the vaccination point where the QR code is generated.

3.- An organisation and logistics in which every detail was measured in order to organise a good delivery and registration of the doses.

The vaccines are delivered in an hermetic box or a refrigerator. It is checked that all the vials that were requested for the population scheduled for that day have arrived.

In each box there are two data loggers, which are devices that measure the temperature of the vaccines during their transport.

It is introduced in the computer as a USB and it shows a graph with these temperatures to verify that the vaccines are in perfect condition to be administered.

Another application was developed, where only the vaccine was registered, 1the vaccine that was available at that moment was already preloaded, the batch, you simply had to check that it was the right person and make a small clip to register, so it was a very agile way and in this waywe were able to speed up the process.

In addition, this vaccination registry application could also provide an option for the personto receive an SMS and be able to download the digital COVID certificate directly from the Sergas mobile application.

4.- and a transparency in the communication of all the information that contributed to involve the citizens.

Finally the strategy had to be changed a little to adapt it to the pediatric populationin order to make this vaccine more attractive to them. The nurses and the people who were there dressed up as superheroes and made a metaphor, an association with the COVID vaccine, as if it gave them superpowers. Once they had completed their vaccination, they were given a superhero card.


What is the original geographical coverage of this best practice? (Local, regional,

national...)Has this good practice been adopted in other regions around the country or beyond?
It is a strategy only implemented in the Galician health system.
Evidence of success:
Galicia's vaccination strategy can be considered a reference as it has been the leading Spanish region in terms of vaccination, with a great success in terms of coverage, especially in the elderly population. In terms of the population aged 12 and over, who have a complete vaccination schedule, we have 95.5 coverage compared to 92.5 in Spain. Also 62.7 in the paediatric population compared to 41.3 in Spain. We had more than 100 vacination points set up at the same time,including large areas and Health Centres. The maximum that was administered was more than 50,000 vaccines in one day and the vaccination points worked from Monday to Sunday, mornings and afternoons. We should add to this, the different possibilities given to people who could not attend the initial appointment and, above all, the great involvement of all the staff. But also for elderly or dependent people, a home vaccination campaign was carried out.
Resources needed:
In each of the health areas (7 areas) there was a general coordinator who provided services and with whom the body in charge of the general organisation had weekly or almost daily communication. Regarding recruitment and training of personnel, specific staff had to be recruited and trained for this process. In addition, to organise the queues and to organise the correct access to the vaccination point, assistance was provided by professionals from Civil Protection and security. For the vaccination points, large areas such as congress and exhibition centres and health centres were used.
Further information
Website:https://www.sergas.es/Saude-publica/PGV?idioma=es https://coronavirus.sergas.gal/Contidos/Informacion-vacinacion-COVID **Contact person**: Susana Mirás Carballal , susana.miras.carballal@sergas.es Head of the Communicable Diseases Control Service

Title of the good practice
4. Care and Support Plan for health professionals (Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
General Directorate of Human Resources, Galician Health Service (SERGAS)
Summary of the best practice (3.000 characters)
The SERGAS launched this comprehensive plan in 2021 in order to to prevent possible emotional and health problems in the staff and therefore ensure the quality of the health service.   The aim of the initiative was to minimise the impact of the pandemic on the health and wellbeing of healthcare workers, who were suffering from the emotional impact of their daily work and from facing such a new and uncertain situation.   The plan, with a great communicative commitment to ensure its success and dissemination, focused on organising campaigns and activities that were structured around 3 central pillars: -*Active Listening Plan*: Improving internal communication and listening channels.   -*Recognition Plan*: strengthening their daily work with permanent recognition actions.   -*Psychological Accompaniment Plan*: with measures aimed at psychological support and care.   Within the first Plan, we highlight the Healthy Teams Programme and the Management Transformation Programme, in which 130 ICU professionals and 140 managers were trained respectively. In both experiences we listened to what we learned during the pandemic and learned how to optimise processes with all this new knowledge.   In the second area, the most popular initiative among professionals and the general public was the opening of different channels to express the public's gratitude for the heroic work carried out during the pandemic. Letters of gratitude were written, 8500 posters were distributed, 211 e-mails were collected, 4,200 post-its in 70 ballot boxes, 14,300 messages on 100 panels, 243 children's drawings... a great task of communication and compilation that helped the staff to feel recognised and comforted in a very visual, close and therapeutic way.
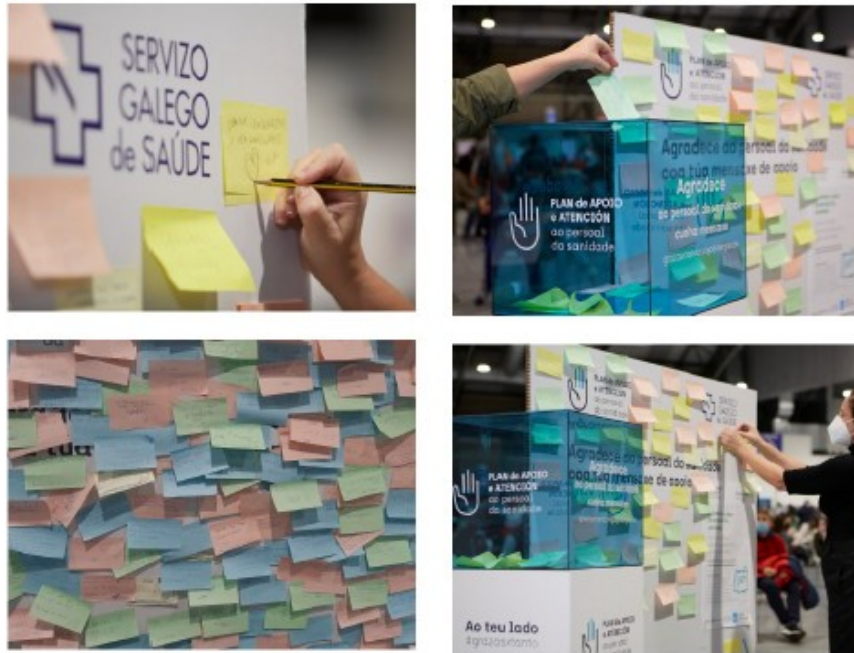
Finally, as part of the Psychological Support Plan, the Cycle of Conferences and the programme "Take Care of Yourself to Take Care of others" was a great success, with more than 300 interventions by mental health professionals.

A very important communication strategy was designed, accompanied by a graphic campaign of the project with ballot boxes, panels, graphics, images for the computers and similars supports or materials. We also created a newsletter with information, several e-mail boxes for each programme with the names of the initiatives. In addition, a great work was done to coordinate and manage the information content in order to reach all the

professionals.
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
It is a strategy only implemented in the Galician health system.
Evidence of success:
Create channels for expressing the gratitude of the citizens was one of the actions that has been mostly appreciated by the staff. 5000 post-its, al most 15000 messages, multiple ways were offered to communicate this public feeling, which meant a very continuous reinforcement of their day-to-day work against the Covid. Furthermore, we are also very satisfied with this initiative because it was very well received by the citizens and it was also a way for them to express all the sentiments that have arisen with this crisis, to approach and to feel more present and connected with their "heroes". The rest of the activities that were organised have had a great follow-up and impact but we would like to mention the Cycle of Conferences with 37.000 views and the self-care courses with 15.223 Participants registered.
Resources needed:
For the Recognition Plan we set up different supports such as urns, panels, e-mails, drawings, graphic material all created with the corporate image of the project. There was also a commemorative video now in the month of March 2022thanking all the professionals for all the work they have done. With regard to the *Psychological Accompaniment Plan* teams were created in each health area where there was a psychiatrist of reference and clinical psychologists. In order to give the Conferences were also held with a leading professional in the self-care and emotional wellbeing sector.
Further information
Website: https://coronavirus.sergas.gal/Contidos/Saude-laboral-PRL?idioma=es **Contact person**: Nuria de Castro-Acuña Iglesias, nuria.decastro.iglesias@sergas.es Head of Prevention of Occupational Risks Service

Title of the good practice
5. Emergency telemedicine: COD 19 and COD 20 systems (Lombardy)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
ASST Fatebenefratelli Sacco (Public Hospital and Assistance Centre - Public health authority of the Lombardy Region) and Università degli Studi di Milano (Public research university).
Summary of the best practice (3.000 characters)

The creation and use of the two telemedicine platforms (COD 19 and COD 20 – Acronym: "Cure Ospedalieri Domiciliari") by ASST Fatebenefratelli Sacco (ASST FBF-Sacco), which is the most important hospital dedicated to infectious diseases in Northern Italy, in collaboration with the University of Milan (UNIMI) during the three phases of the emergency (March 2020 - May 2021), were illustrated by Dr. Foppiani and Dr. Ziyangirova (under the support of Professor Zuccotti of the University).

Initial situation. In the first phase of the emergency, the main problem was the large number of COVID patients to be followed up in hospital. There was therefore a need to discharge the patients in less serious conditions, who could be followed and monitored remotely at home.

Piattaforma di sorveglianza pazienti COVID19

COD19 - Centro Operativo Dimessi COVID19

UNIVERSITÀ DEGLI STUDI DI MILANO

Sistema Socio Sanitario
Regione Lombardia
ASST Fatebenefratelli Sacco

Source: https://www.cod19.it/

COD 19. The COD 19 Platform represented a Telemonitoring system to cope with the high number of people affected by COVID 19 in the wards of Sacco Hospital in Milan. Its creation included the involvement of postgraduates from UNIMI, infectivologists and doctors working in the various facilities of ASST FBF Sacco hospital.

The monitoring system was developed in the following phases:
   • Patient Lists. From the earliest stages of the pandemic, infectivologists provided COD 19 operators with lists of hospital discharged patients, for whom a remote monitoring was necessary (for evolution of the disease and/or for those who had long-term post-disease effects).
     • Establishment of the first operative unit. To ensure an immediate response, the operators (Postgraduates) initially started by using phone calls and an Excel sheet with patients' contact details and up-to-date information on their health status. In the first two weeks (February 2020), approximately 1000 COVID patients were monitored.
      • Creation and development of COD 19. After a month (March 2020), UNIMI commissioned a digitised system to Link-Up, a small IT company, which developed a first prototype of a digital platform to better manage the information gathered from the monitoring activities.
   • Functioning of COD 19. The use of the data collected allowed effective communication of the patients' health status to different stakeholders [infectivologists, GPs (general

practitioners), ATS Milano (Metropolitan health authority)]. COD 19 was also useful for other types of pathologies not related to the virus.

COD 20. The aim of COD 20 is to give a more central role to the tele-visit system.

COD 20 acts as a platform for:

• Telemedicine. It works thanks to different Hospital Devices for different pathologies which are connected directly with the platform, transferring data into it.

• Tele-visit. The specialist can carry out check-ups and modulate drug therapy remotely.

• Teleconsultation. Several specialists follow the same patient.

• Health Tele cooperation. The specialist in the hospital communicates with a caregiver who follows the patient in presence (or with nurses/specialists who go to the patient's home).

• Functioning of COD 20. The platform is an open software, offered for free use by UNIMI. The platform is equipped with an electronic folder that allows files to be exchanged between general practitioners and specialists. The patient can upload reports and clinical documentation into the Folder.

• Functioning of a Tele-visit. When the specialist sets a date, the system automatically sends a text message and an email confirming the visit to the patient. At the same time, the platform transfers the data and the reports to the patient (in the Electronic Health Record of Lombardy Region).

How much funding has been mobilised for its implementation?

In terms of costs, Link-Up developed both platforms with the financial support of large companies, as sponsors for the fight against COVID. Actually, UNIMI did not pay for their creation. The only costs were for the VoIP services integrated into the platform (calls to patients) and the contracts of the postgraduates. An agreement between UNIMI, ASST FBF-Sacco and ATS Milano has been signed to regulate the reporting of each patient taken on. These platforms are therefore extremely advantageous for any hospital.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

• COD 19. During the emergency phases of the pandemic, the use of COD 19 for patient monitoring was effective for a densely populated context such as the city of Milan and its hospitals. In addition to ASST FBF Sacco, COD 19 also operated in the first wave for Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico and for ASST Grande Ospedale Metropolitano Niguarda. In the second wave, ASST Santi Paolo e Carlo and ATS Città Metropolitana di Milano were added. Swabs centres sent the data to the ATS, and in turn which then processed and sent them to COD 19. During the second wave the platform handled as many as 400 reports per day. In July 2021, activity slowed down as the numbers were better managed due to the vaccination campaign and better management of hospital wards. The platform became fully operational again during the most recent surge in infections (December 2021) and it tracked a total of more than 48.000 patients since the start of the pandemic.

• COD 20. In the Metropolitan Area, COD 20 is fully active for ASST FBF Sacco, while it is being activated for Fondazione IRCCS Cà Granda - Ospedale Maggiore Policlinico, Fondazione IRCCS Istituto Nazionale dei Tumori and ASST Grande Ospedale Metropolitano Niguarda. In Lombardy, COD 20 is operational for the ASST of Valtellina and Alto Lario, in the

province of Sondrio.

There are currently 680 specialists operating with 72 outpatient clinics using COD 20 for ASST FBF-Sacco in Milan. The Platform also has a further 103 specialists with 17 outpatient clinics for ASST Valtellina in Sondrio.

Evidence of success:

The implementation of COD 19 and COD 20 has enabled coordinated management of remote medical examinations in safety for both doctors and patients.

• Future developments. A UNIMI project, called GSA (University Grand Challenges), involves 13 departments and aims to understand how telemedicine from different perspectives (economic, health and legal). Another project to be developed for paediatric cardiology will involve the use of cardiology devices to be installed in paediatric family clinics so that paediatricians can send the tracing of the pathology detected immediately to the platform and the hospital. The University Centre for Telemedicine (UCT) will be set up within UNIMI and will be the reference point for the entire COD 20 project in the coming years (a virtual medicine centre).

Resources needed:

N.A.

Further information

Website:COD 19: https://www.cod19.it ; https://www.asst-fbf-sacco.it/news/info/cod19-oltre-10000-pazienti-presi-in-carico-dal-centro-operativo-dimessi
COD 20: https://www.cod20.it/ ; https://lastatalenews.unimi.it/cod20-piattaforma-tecnologica-statale-per-virtual-hospital
Contact people: Prof. Gian Vincenzo Zuccotti (Director/Chief Pediatrics and Pediatric Emergency Room – ASST Fatebenefratelli Sacco and Professor of General and Specialty Pediatrics – Università degli Studi di Milano), Dr. Andrea Foppiani (PhD of Food, Nutrition and Environmental Sciences – Università degli Studi di Milano) and Dr. Irina Ziyangirova (Project Manager COD 20 - ASST Fatebenefratelli Sacco)

Title of the good practice
6. A new practice of active ageing: Adapted physical activity (APA) before and during the pandemic (Lombardy)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Fondazione Istituto Sacra Famiglia ONLUS (Non-profit organisation – Private healthcare/hospital, habilitation/rehabilitation centre in residential, home-based and outpatient settings).
Summary of the best practice (3.000 characters)
The practice "Adapted Physical Activity" (APA), implemented through the project "Salute in Movimento" (Health in Motion) was illustrated by Prof. Pregliasco, former Health Director and consultant of the Foundation Sacra Famiglia and Dr. Ghezzi, Head of the Service. Fondazione Istituto Sacra Famiglia ONLUS was founded in 1896 and is based in Cesano Boscone (Milan Metropolitan Area) but it also has branches in Lombardy, Piedmont and Liguria. Its mission is to manage social, health and welfare services organised in chain, dedicated to assisting the elderly and disabled (in its Nursing home for the elderly (RSA) or in Disabled health care residence (RSD)). There is also a hospital, Casa di Cura Ambrosiana, connected to the Fondazione, which offers a series of diversified in-patient and out-patient services for the frail elderly. There are also various outpatient and home care services in the area. "Salute in Movimento" (Health in Motion) is a service that carries out a series of personalised functional assessments of disabled and elderly people with different degrees of chronicity, with the aim of improving the physical and psychological conditions of the Institute's patients and monitoring the results.   Source: https://www.sacrafamiglia.org/anziani/attivita-fisica-adattata-apa/ • APA, Adapted Physical Activity or 'Attività Fisica Adattata'. Adapted Physical Activity is a practice implemented, since 2002, within the above-mentioned Service to elderly people. The objective of APA is to educate to movement in a socialising way, i.e. involving elderly people to participate in bi-weekly sessions (collective or single for a duration for a total of 150 hours per week, as recommended by the WHO Guidelines) organised by Kinesiologists and Professional Educators in gyms. The idea at the basis of this practice, is that movement is considered as an element of prevention, habilitation and maintenance of good psychophysical conditions. In addition, APA has proved to be necessary for patients with chronic degenerative problems (arthrosis, polymyalgia rheumatica, osteoporosis) or with

acute illnesses and comorbidities that seriously affect independence.

APA eligibility and admission process involve a series of steps: The eligibility of each new Assisted is ascertained by a medical examination and then by a visit from a kinesiologist who carries out assessments of the patient's physical performance. The patient's posture and functionality are then assessed through a series of tests. Once the eligibility process has been completed, further periodic evaluations of APA developments are carried out every 3 months and the data collected is uploaded into a software for processing. The data helps understand the outcomes of the implemented activities.

The isolation experienced during the various waves prevented the maintenance of an active lifestyle of the elderly subjects. In particular, the restrictions and fear of the SARS COV 2 virus hindered normal daily activities (walking, taking the stairs, etc.) and the socialising activities experienced through APA.

The staff remotely administered adapted exercises and movement routines ("Health Pills") both individually and collectively (via WhatsApp groups and other messaging apps). Technological tools also enabled remote lessons (via video calls) with physical exercises explained and applied.

For the frail elderly, caregivers were trained to work remotely and online with the operators of the Institute. This made it possible to follow patients with dementia through functional work and cognitive stimulation (through guided conversations to stimulate memory, orientation and attention span), which slowed down the progression of chronic degenerative pathologies.

For elderly people inside Nursing homes, on the other hand, a number of APAs were activated for specific separate and isolated groups; operators and kinesiologists could only access these groups with protective equipment and adequate spacing (to avoid contagion).

How much funding has been mobilised for its implementation?

As far as "Salute in Movimento" is concerned, the services are not provided under an accreditation scheme with the National or Regional Health Service but are framed as private services (paying a fee to access the full range of services provided, including Adapted Physical Activity).

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

APA was implemented not only at the headquarters of the Fondazione Istituto Sacra Famiglia (involving its own territory) but also at some of the other 12 branches in the Lombardy region, involving around 70 users.

At the Cesano Boscone site, about 200 patients were taken into care and benefited from the Adapted Activity.

Evidence of success:

The Good Practice implemented by the Fondazione Istituto Sacra Famiglia ONLUS, activated before the emergence of the COVID 19 Pandemic and continued during the various waves, allowed an efficient and virtuous path of active ageing in terms of movement intended as an element of prevention, habilitation and maintenance of good psycho-physical conditions. Since the implementation of the first lock down measures and restriction, the practitioners

found an increase of behavioural disorders, depression and self-isolation among the patients who were used to take part in the adapted practice. As much as APA appears to be more effective in presence, the pandemic allowed the experimental use of digital tools to communicate and to give continuity to activities. A number of older people, more familiar with digital tools, responded well to these new modes. Many others, on the other hand, required the help of relatives or caregivers, making the new tools complementary but not substitutive.

Resources needed:

N.A.

Further information

Website:
https://www.sacrafamiglia.org/anziani/attivita-fisica-adattata-apa/   ;
https://www.sacrafamiglia.org/en/home-sacra/

Contact people: Prof. Fabrizio Pregliasco (Former Health Director and current Scientific Advisor – Fondazione Istituto Sacra Famiglia ONLUS) and Dr. Iride Ghezzi (Head of Service Salute in Movimento – Fondazione Istituto Sacra Famiglia ONLUS).

Title of the good practice
7. Digital Approaches to Care Homes (Scotland)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Scottish Government – Digital Health and Care Division – Public Health Administration

Summary of the best practice (3.000 characters)
During the initial response to the COVID-19 pandemic the devastating impact on care homes and the experience of staff and residents became apparent. Residents could not receive visitors or external clinicians because of imposed lockdowns and interaction between residents was also limited. From a human rights perspective, it was important to ensure 'quality of life' while protecting residents from a deadly virus. The solution was a digital alternative to in-person socialisation and healthcare. A national programme was launched in November 2020. Digital Approaches to Care Homes was led by Scottish Government delivered with Connecting Scotland, in collaboration with COSLA, Care Inspectorate, Coalition of Care Providers Scotland, Scottish Social Services Council and Scottish Care. There were 3 pillars of delivery outlined in the 'The Action Plan for Digital Approaches in Care Homes':   - Digital Foundations - Ensuring that the connectivity and devices could support digital technologies. Identifying needs and developing approaches for data gathering that supports better individual care planning and the provision of services, supports and activities.   - Digital Services - Improving access for residents to integrated health and care services. Supporting the emotional and physical wellbeing of residents and staff.   - Digital Leadership and Skills – Developing digital skills and confidence of residents and staff.   Difficulties encountered   - Ensuring all 1400 care homes in Scotland had access to the internet and devices to use with residents. Care homes can vary in size from 4 beds to 150 so every care home had different capabilities, resources and requirements. A self-evaluation form was used to understand the needs of each care home.   - Digital training for busy and overstretched care home staff was delivered in shorter, bitesized modules to provide flexibility around existing care duties.   - Co-design and collaboration happened asynchronously so that care home staff could contribute at a time that worked for them.

How much funding has been mobilised for its implementation?
£1.5 Million (1.75m Euros)

| What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or |

beyond?
Scotland – National There was an initial pilot undertaken in six Aberdeenshire care homes to identify the most appropriate devices to distribute and to identify the associated staff digital learning needs. An external evaluation was embedded in the programme and there was an ongoing capture of what worked and what didn't. Some resources were developed as a result: Resources for Care Homes	TEC Scotland and Digital Compendium	TEC Scotland Collaboration with Barclays Digital Eagles was initiated in January 2022, forming a continuation of the initial training provided by the TEC Social Care Team and the Connecting Scotland Digital Champions training team.

Evidence of success:
Sector uptake of internet connection and devices was 75% of all Scottish Care homes (1,056 homes). The program helped many care home residents in Scotland maintain a level of social interaction during COVID-19 and tragically, the service was used to facilitate the last goodbyes between residents and their family and friends. Without a rapidly developed digital alternative to face-face contact the negative psychological impact of the pandemic would have been intensified. <img>
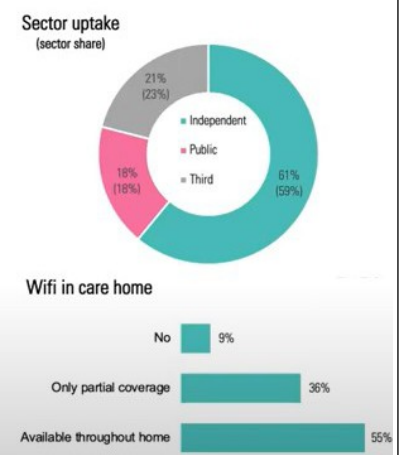
Resources needed:
Through a partnership with Connected Scotland 1,961 iPad devices were delivered to 1,056 care homes despite a surge in demand for devices during the pandemic. Every care home that required one was provided with a MiFi dongle and a data package for 4G connection. (746 MiFi devices).

Further information
Website: **Contact**: kara.mackenzie@dhi-scotland.com

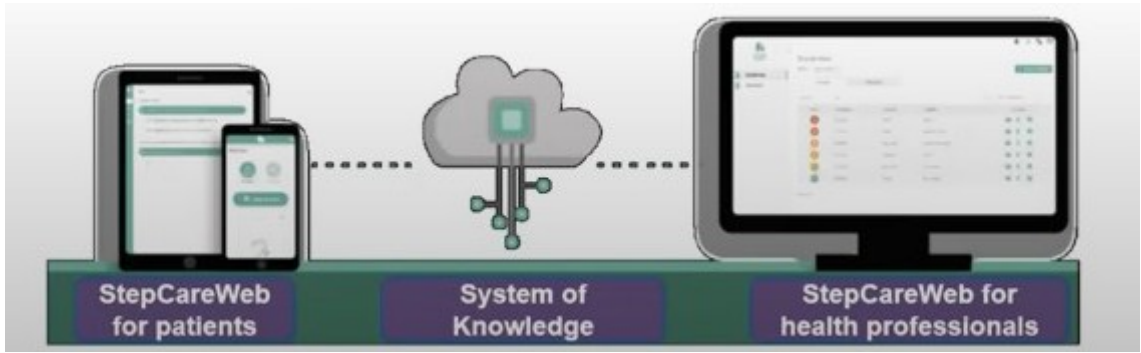| **Title of the good practice** |
| --- |
| 8. Clinical validation study of the stepcare e-health system to optimise COVID-19 patient monitoring and facilitate home hospitalisation and isolation. A pilot study (Basque Country) |
| **Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)** |
| Naru (Medtech industry) |
| **Summary of the best practice (3.000 characters)** |
| StepCare is a medical software device, developed by the SME Naru Intellifence, to **optimise the remote monitoring** of adult patients without cognitive impairment diagnosed with COVID-19 or with symptoms compatible with COVID-19. Is intended for cases where the patient's symptomatology is mild, or when the hospital system cannot offer it (due to lack of resources or security), **and home isolation is recommended.** StepCare allows patients to extend the time during which they can **follow their disease progression from home.** The system **detects and prioritizes patients, based on the severity** of their symptoms, allowing healthcare staff to act quickly and appropriately, without the need to increase resources.

This good practice was supported by Innosasun Program and Medtech Initiative, two support mechanisms for the business sector, created by the Ministry for Health of the Basque Government, to articulate the interaction with the Basque Public Health System (BPHS) and related agents, responding to their needs in terms of innovation.
INNOSASUN and Medtech initiative offered to Naru Intelligence the Basque Public Health System framework– specifically the Biodonostia Health Research Institute and the Healthcare System, Osakidetza- to perform a clinical validation. This allowed the company to demonstrate **that their medical device works in a real scenario, safely and effectively, and due to this study their software medical device was granted the CE mark.**
StepCare is a good example of how INNOSASUN and Medtech boost the development of a software tool (StepCare) that helps in the fight against the COVID19, which **achieved the market faster**, complying with all the requirements applicable. |
| **How much funding has been mobilised for its implementation?** |
| Pending implementation. |
| **What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?** |

The good practice has a regional coverage. At the moment of filling this document no one has implemented the same practice.
Evidence of success:

After performing the clinical validation
    •   It is concluded that StepCare is a **clinically safe, reliable and efficient** system.
    •   The results point to a **reduction in the workload** of the staff of the Primary Care and Home Hospitalization services and the **optimization of patient care and follow-up**, providing the clinical staff with the necessary information to anticipate a worsening of the patient, which has supposed an improvement with respect to the procedures habitually used.

Resources needed:
28.998,85 € for clinical validation
Further information
Website: https://www.biodonostia.org/biodonostia-apoya-la-validacion-clinica-de-stepcare-un-sistema-de-inteligencia-artificial-para-optimizar-el-seguimiento-de-pacientes-con-covid-19/ **Contact person**: lmendoza@bioef.eus , scardoso@bioef.eus

Title of the good practice
9. The Basque Public Health System Programmes which articulate the interaction with the business sector, INNOSASUN and MEDTECH (Basque Country)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Basque Foundation for Health Innovation and Research (BIOEF)
Summary of the best practice (3.000 characters)

The Basque Health Service, Osakidetza, has around two million potential patients and more than 30,000 professionals, which makes it a strategic partner in terms of testing for companies
in the development of their healthcare technologies.

Innosasun and **Medtech** are two support mechanisms for the business sector to articulate interaction with the Basque Public Health System (BPHS) and related agents, responding to their needs in terms of innovation.

In 2014, the Ministry for Health of the Basque Government created **Innosasun Program** to support companies and thirds parties in the development and validation of health technologies. Innosasun aims to turn the BPHS into a preferential partner, putting its capacities and know-how at the service of socio-economic development.

The **main activities** carried out in the frame of Innosasun are: 1) counselling and guidance to companies and other agents about specifications or requirements of their health technologies, so that they can fit better the needs of health professionals and patients and, ultimately, the market; and 2) preclinical and, above all, clinical studies for the development and validation of health technologies. In this sense, Innosasun offers the healthcare system as a test bench or living lab in a real environment, for demonstration, validation and/or cost effectiveness studies of medical devices and technologies.

In 2018, the Ministry for Health of the Basque Government created **Medtech Innitiative** to economically support the collaboration of the BPHS **with companies** in the frame of Innosasun for the development and validation of health technologies that improve health outcomes and generate value. This initiative allowed to overcome one of the main limitations for third parties, especially SMEs, in their way to market, which is the lack of budget for expensive but, at the same time, mandatory clinical studies.

Some examples of the technologies that were tested thanks to these collaborations can be seen in the image, and are: 3D printed medical device systems, e-health solutions, in vitro analysis solutions, robotic solutions, obviously medicines and others.

During the pandemic, both supporting tools of the Ministry for Health, Innosasun and Medtech, have been very valuable. The BPHC has collaborated and supported the development and validation of 11 health technologies, including **SARS-CoV-2** diagnostic systems and **Covid-19** patient treatments, from 11 different companies.

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How much funding has been mobilised for its implementation?
Since 2014, for the implementation of Innosasun, funding for technical staff has been mobilised. In more detail, two people full-time at BIOEF. In the case of Medtech, a budget of **8,2 M €** has been mobilised since 2018 divided as follows: 1 M€ in 2018, 1.3 M€ in 2019, 1.5 M€ in 2020, 1.7 M€ in 2021 and 2.7 M€ in 2022.
What is the original geographical coverage of this best practice? (Local, regional, national...) Has this good practice been adopted in other regions around the country or beyond?
The good practice has a regional coverage. At the moment of filling this document no one has implemented the same practice.
Evidence of success:
The capacities of both programmes have also been used to fight the pandemic. During 2020 and 2021, **eleven out of 49 companies** that accessed Medtech collaborated with the Basque Public Health System in projects focused on development of **SARS-CoV-2** diagnostic systems and **Covid-19** patient treatment. Two diagnostic test have been granted the CE mark thanks to the clinical validations carried out and the other 9 technologies have accelerated their way to market thanks to advances in their development or validation.
Resources needed:
1.350.000 € / year, 3 people and the specific call.
Further information
Website: https://www.bioef.org/es/actividad/necesitas-al-sistema-sanitario/programa-innosasun/ https://www.bioef.org/wp-content/uploads/2020/06/Resumen-Medtech-2018-2020-vFINAL-17.06.2020.pdf   **Contact Persons:** lmendoza@bioef.eus , scardoso@bioef.eus

E. Thematic Area 3. Patient Empowerment

Title of the good practice
1.Best practices in community pharmacies during the pandemic (Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Official Pharmacists´ College of Galicia
Summary of the best practice (3.000 characters)

The Galician government's collaboration agreements with the pharmacy network helped during the pandemic, with so much uncertainty and insecurity, providing proximity to the population.

The good practices of pharmacies that most helped in this time of crisis and insecurity were:

1)The delivery of medicines and health products to the home due to the state of alert for the following groups:

- People in a situation of dependency and/or functional autonomy loss who lack a family, social or professional support network

- Persons living alone who are susceptible to complications from possible SARS CoV 2 infection

2)The distribution of free face masks through the agreement with the Xunta. The total of beneficiaries were 717.723.

3) Protocol for detection of SARS CoV 2 virus through self collection ofsaliva samples in the pharmacy office. Thanks to a web tool and a great logistical and distribution effort, it was possible to send them to the reference laboratory and have the results within 24 hours.

4)The issuing of COVID 19 certificates of vaccination, diagnostic tests and recovery.

5)And lastly, Protocol for the performance of rapid self diagnostic for COVID 19 detection sample collection, processing and communication of results from the pharmacy office.

6)Preferential care for people over 75 years old in pharmacies: Fragile,vulnerable and lonely patients, which greatly helped this group, which suffered so much in the pandemic.

7)Campaigns aimed at the population in relation to COVID 19 to promote preventive measures, participation in vaccination and fostering collective responsibility.

In addition to all this collaboration in all pharmacies, all citizens were provided with verified and accessible information at a time of great uncertainty.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

It is a practice of regional coverage but easily transferable to other regions.

Evidence of success:

The numbers reflect the great work that was carried out: more than 195,000 samples collected for PCR screening with more than 3,700 positives detected, more than 140,000 self-tests provided and more than 1,100,000 Covid certificates issued.
And most importantly, the proximity and security that these professionals provided to the population, especially the elderly, in a time of such insecurity and uncertainty.

Resources needed:

The actions, agreements and accords signed in different areas were undertaken by nearly 3 850 community pharmacists who practice in the1.380 pharmacies in Galicia.

Further information

Website: https://www.cofc.es/

Contact person: Héctor Castro Bernardino, President of the Official Pharmacists´ College of A Coruña

hcastrobe@cofc.es

Title of the good practice
2.Management of security equipment in times of covid 19 (Galicia)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
General Directorate of Economic Resources, Galician Health Service (SERGAS)
Summary of the best practice (3.000 characters)
During the pandemic, this good practice attempted to solve the problems, never before experienced, in relation to health safety equipment.

During the pandemic, this good practice attempted to solve the problems, never before experienced, in relation to health safety equipment.

The great demand for health protection material, together with the shortage and blockage in the supply of this material, posed a great challenge for all the regions. The 5 fundamental elements that SERGAS had to face this great challenge, in a context never seen before, were the following:

* Having an Integrated Logistics System with placement at the final point of consumption, which allowed staff to relieve them of logistical tasks and to focus on patient care.

The SERGAS logistics platform reaches and offers its service to any health centre and primary care centre, despite how far away or poorly communicated it may b. 72% of Galician Health Service orders have been automated.

* The availability of LOGAS, an innovative tool that provides a Single Management System for Procurement and Purchasing.

LOGAS allows us to access the stocks, consumption and supply characteristics of all the Health Areas. having a unique catalogue of products and services.

* Design of differentiated circuits for the management of Protective Material for Covid-19 and a extraordinary circuit for donations, to accelerate their distribution and avoid bottlenecks of this

type of material.

*Single Centralised Purchasing, essential for guaranteeing supply, which has made it possible to reduce delivery times and also to relieve the health centres of work.

*Continuous Monitoring of Procedures, allowed us to analyse daily in order to implement corrective measures.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
It is a practice of regional coverage but easily transferable to other regions.
Evidence of success:
Thanks to this complex and comprehensive system, supported by new and innovative technologies, which simplifies processes and tasks, it was possible to manage more than

11,000 orders per day, which were directed to all the consumption units in the different health areas, both in large centres and in smaller and more isolated ones.

Resources needed:	
Having a Logistics Platform (PLG) with a high productivity, unique storage facility for the entire SERGAS was a key element. This platform has been awarded with the prize for the best logistics project in 2018 by the Spanish Logistics Centre. It was also important to have Kanban type storage and RFID cabinets in the consumption units (CUs)	
Further information	
Website: https://www.sergas.es/A-nosa-organizacion/A-Direccion-Xeral-de-Recursos-Economicos?idioma=es Contact: Martín Cribeiro González Head of Procurement Service. General Directorate of Economic Resources at SERGAS Martin.Cribeiro.Gonzalez@sergas.es	

Title of the good practice
3.Osasun Eskola (Basque Country)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Osakidetza

Summary of the best practice (3.000 characters)

Osasun Eskola is the health school of Osakidetza and the Department of Health of the Basque Government. It works on literacy and health education with the aim of improving people's empowerment. It provides information in simple, easy-to-understand language, in a pleasant and attractive format, with a reassuring and motivating message that gives people confidence in their own abilities. In addition, simple tools for self-management are offered. It provides a holistic view of the person and their care, including a view of self-care, care provided, and care received.

During the pandemic, informative content on different topics is created or adapted.

- Information related to Covid-19, signs and symptoms, confinement and isolation measures, recommendations, frequently asked questions, and so on.

- Information on healthy habits adapted to both confinement and subsequent de-escalation or recovery of the previous situation. Food, physical activity, rest and sleep, leisure, information management, bereavement, etc. are discussed.

- Emotional health. The aim is to improve knowledge and management of states of health and emotional discomfort and also to improve the early detection of states of illness or mental disorder, secondary to the increase in stressors linked to the pandemic. Information is developed on emotions; difference between states of health, discomfort and disorder; self-assessment tool for symptoms of depression and anxiety; tools to improve self-care and techniques to solve problems or manage worries; grief process; relaxation audios, educational videos, downloadable pdfs... The web content has received more than 80,000 visits since its publication on 02/2021. The validated self-administered scales to assess the intensity of symptoms of anxiety disorder and depression are offered in digital format. After filling out both, you receive a personalized recommendation. At this moment more than 3500 forms have been filled in (each form includes both scales).

- Pregnancy, childbirth and postpartum. Secondary to the cessation of the group activity, in this case the maternal preparation carried out by the midwives, the need is detected to transfer information on reproductive health through a channel other than face-to-face. The web content on reproductive health was developed with 6 sections covering pregnancy, childbirth, postpartum, newborn, breastfeeding and educational and informative material. The content is completed with 16 educational videos. People from all the organizations have collaborated, which favors knowledge, consensus and the unification of the message

regardless of the issuing agent and means that it is prescribed or recommended from the pregnancy or pediatric follow-up consultation itself. Acceptance is very good, considering the number of births/year in our community. In less than a year it has received around 50,000 visits.

How much funding has been mobilised for its implementation?

Only videos and audios (16 on reproductive health and 6 on emotional health) are contracted.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

Our website lacks user profile activation. We do not know the real scope of the initiatives. We only know the location of the device during browsing, which provides superficial information. We have identified connections from Latin America, Europe and also from Spain and, of course, from our autonomous community.

Evidence of success:

There is no evidence beyond the monitoring of utilization data or informal feedback from various health care stakeholders and users.

Resources needed:

Osasun Eskola currently has 2 nurses and occasional collaborations with professionals from the organisation.

Further information

Website:
https://www.osakidetza.euskadi.eus/osasun-eskola-portada/-/tu-portal-de-salud-y-vida-sana/
Contact person: osasuneskola@osakidetza.eus

Title of the good practice
4. Piloting of video consultations. Framework.(Basque Country)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
OSAKIDETZA. Basque Health Service

Summary of the best practice (3.000 characters)
Evidence about patient outcomes, cost effectiveness, safety, technical issues, impact of video consultations on healthcare delivery, and quality of consultations is mixed and mainly from small studies. The few randomized trials that have been conducted focus on the use of video consultations in hospital outpatient clinics for patients with chronic conditions. They generally report that video consultations led to high satisfaction among patients and clinicians; no difference was seen in disease progression or service use; A non-randomized trial comparing video with telephone and face-to-face consultations in UK primary care reported no difference in terms of consultation length, content, and quality compared with telephone consultations. However, both forms of remote consultations were seen as less "information rich" than face-to-face consultations, and technical problems were common. In addition, we could not find meaningful evidence to inform clinicians on when to use phone or video consultation. After the small studied was conducted these are the learnings and the next steps: **It is considered a useful tool but in specific and defined processes**, defining beforehand and clearly with the patient in which moments of the follow-up process it can, should and will be used.   **It brings the value of verbal communication and image to the telephone consultation**, which can lead to verify that both the professional and the patient-family are satisfied with what is proposed.   **Complemented with face-to-face consultations**, it will be a good alternative to telephone consultations.   **From a technical point of view, it is easy to use**, but it needs to be improved from the point of view of the management of a primary care agenda.   **It is not yet validated for use in acute pathology**, unless progress is made in triage processes for health emergency situations.   **The scaling of this project will continue during 2022 and 2023.**   Twenty-one professionals were selected for the study and materials were prepared to assist them and their patients.

After one month of use, both groups were surveyed to assess their usability and effectiveness.

How much funding has been mobilised for its implementation?

A corporative contract with Zoom platform

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

It began as local attempts to avoid covid impact and soon it became a corporative project.

Evidence of success:

The good experience taken by 21 professionals with more than 150 videocalls give us the track to begin with the deployment of this tool.
In the surveys we can highlight that the patients did not find it complicated to connect, it was useful for patients with chronic problems and that they stated that compared to phone calls, the video call offered them a plus.
In addition, more than 66% of them confirmed that they saw video calls as a necessary element in the future of the system.
More than 80% of the professionals would continue to use it.
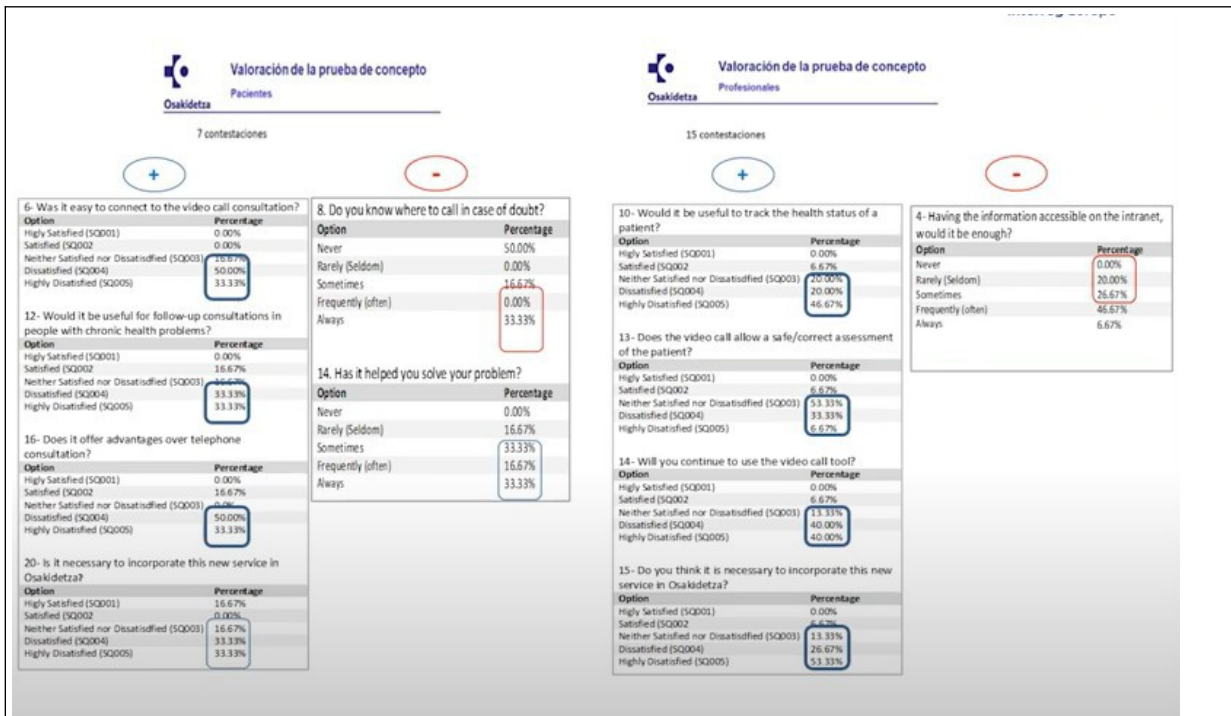
Resources needed:
Zoom platform tuned for the corporate EHR

Further information

Website:

Contact: Joseba Igor Zabala Rementeria. Head of integrated care and chronicity Service in the Basque Health Service (Osakidetza). josebaigor.zabalarementeria@osakidetza.eus

Title of the good practice
5. eHealth Call Centre. (Basque Country)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Osakidetza. Emergencies.
Summary of the best practice (3.000 characters)
On 9 June 2010, the Health Council began to operate with 10 nursing professionals. The opening hours were from Monday to Sunday from 8am to 10pm. Initially it was a health care service for citizens, but over the years it has become a reference service in health care, education and empowerment of citizens. It currently has 23 consolidated nursing posts and a 24x7 continuous timetable. Its location in the Osakidetza Emergency Department makes it a high-resolution service for urgent/emergency situations, as it can send an ambulance, doctor or nurse to the home. It can also make appointments with the Primary Care Referral Teams. Among all the functions it performs is the attention to health demand, both in calls received from the specific Council telephone (900 20 30 50) and calls received on the specific telephones of the 3 Osakidetza Emergency Coordination Centres, performing a triage to assign a level of urgency to the call and monitoring chronic patients both telemonitored (COPD and CHF) and not telemonitored (Pluripathological and Palliative). Another programme that has considerably increased the activity of Consejo Sanitario is the Telecare Service (elderly or frail people). It also collaborates in different Research Projects, such as suicide prevention.
When the pandemic arrived and because the health advice service became the reference telephone number for the public (as well as continuing with its usual activity), it needed to be resized, with up to 50 nursing staff to cope with the sharp increase in calls and sick leave of the usual staff. In addition, 10 new nursing posts had to be set up in the Emergency Coordination Centre and new call referral circuits had to be established from 112 to alleviate the flood of calls that the emergency telephone also received, and which did not have emergency criteria and therefore needed to be dealt with at a more appropriate level. Likewise, referral circuits to Primary Care and Continuous Care Points were established.
These new circuits, together with the continuous change of protocols and procedures, obliged the nursing staff to be constantly updated. The fact that we work with a computer tool shared with Osakidetza Emergencias and 112 means that nursing is very responsive and helps to channel activity in such a way that each person is attended to at the most appropriate level of care to resolve their problem. In addition, having a fully integrated Clinical History also makes it easier for professionals to be informed and make appropriate and safe decisions.
Once the pandemic activity has stabilized, the Suicide Prevention Programme has begun in coordination with 112 and the specific suicide prevention telephone number at national level (024). In addition, follow-up calls are made for 30 days to people who have attempted to take their own lives and have gone to hospital emergency rooms for this reason.
How much funding has been mobilized for its implementation?
In this case the budget has increased due to the increase in the number of nursing staff. The staffing needs are adapted according to the activity and the increase in programmes and new projects.

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond? / (Local, regional, national...) Has this good practice been adopted in other regions around the country or beyond?

The Health Council has received visits from several European Regions.

At a national level, communities such as La Rioja, Cantabria and Navarra have set up health advice adapted to their characteristics and their professionals have come to train with "Consejo de Enfermería".

Evidence of success:

-Growth of nursing staff.
24x7 working hours.
-Increasing activity data:
2017: 173,047 calls received
2018: 186.779
2019: 192.173
2020: 359.418
2021: 244.934

Increased activity in monitoring chronic patients and calls received from Telecare.

Consolidation of corporate programmes (multi-pathology, palliative care, suicide prevention, telemonitoring).

Resources needed:

NA.

Further information

Website: https://www.osakidetza.euskadi.eus/servicios-on-line/-/consejo-sanitario/
Contact Person: Raquel Roca. raquel.rocacastro@osakidetza.eus

Title of the good practice
6. Teleconsultation and Videocalls (Basque Country)

Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Osakidetza - Basque Health Service Basque Government Department of Health

Summary of the best practice (3.000 characters)

In 2021, Osakidetza launched the possibility of attending medical and nursing consultations in Videocall mode, piloting a new Teleconsultation utility directly integrated into the patient's Medical History platform (Osabide Global) and directly using the corporate videoconferencing solution (Zoom) that was implemented in the organisation in 2020.

Osakidetza introduced telephone consultations some time ago. The reasons why it opted for this type of consultation are various and quite obvious. We can talk about avoiding absences from work. In this way, the patient does not need to waste the time spent in physically going to the medical centre for an uncomplicated consultation. We can also talk about the savings in terms of travel, not only in time, but also in petrol, money and pollution. Patients can resolve their doubts quickly, safely and with all the guarantees of the criteria of a specialist doctor in the field in question.

We can also say that telephone consultation is a good measure to avoid contagion. Indeed, the pandemic has shown this to be the case.So why implement Video Call as a new alternative for conducting consultations?

Firstly, the Videocall provides video, which reduces the coldness in the professional-patient relationship. In addition, sometimes, the professional requires video to be able to make a more exhaustive diagnosis. For example, in psychiatry or dermatology consultations it can be of vital importance. Let's not forget that we can also apply video-calling in rehabilitation, where it is important that the physiotherapist can show the exercises to the patient or even see if the patient performs the exercises correctly.

Secondly, Osakidetza wants to go further. Although, in a first phase, it has opted to make video calls for consultations and it is the professional who proposes it, the points identified where we will be able to apply them will be many more. By way of example, the following:

- ✓ **At the patient's request:** Via multi-channel appointment or via call to the health centre, the patient will be able to request video-call with their doctor or nurse of the quota, just as they can now select phone call.
- ✓ **HDOM:** Travel can be avoided, in cases where it is sufficient for the professional to consult by video.
- ✓ **On-the-spot video call: It** could be applicable to implement a mechanism whereby the patient requests an on-the-spot video consultation in front of a pool of professionals (Emergency, Health Council, Health Centre).
- ✓ **Group Video Call/Webinars: The** use of webinars could be applied to give training to groups of patients on a specific date/time (courses on childbirth, healthy living, smoking cessation, etc...).
- ✓ **Multidisciplinary video call: In** this case, the health professional can share the invitation with other professionals.

In March, a PoC (Proof of Concept) was launched with 21 professionals from the network, including both doctors and nurses, and from the primary and specialised areas. The aim was

to receive feedback from both professionals and patients in order to measure satisfaction with the service and to be able to grow from there.

The proof of concept did not require a complete development, but a fairly basic one. Adaptations were made in Osabide Global and Osabide Global Primaria, so that professionals could access Osakidetza's Zoom platform via the clinical stations to make video calls. In the same way, the patient received an invitation to connect to the Osakidetza Zoom platform via SMS and/or email.

The proof of concept was conducted from March to June 2021. To evaluate the results, a survey was enabled and filled in by Professionals and Patients, and both the results and the feedback shown by the participants were very positive.

When the patient called or made a face-to-face request for a video-call appointment, because he or she was told to do so by the doctor, the administrative staff, when looking for the appointment, has to enter a special code for video calls.

At this point the system reminds that it is mandatory introduce your telephone and email details in order to be able to send links to connect and the appointment details.

On the day of the appointment, the professional will only have to access his or her agenda where he or she will already see the video call appointment.

When openihe/she open the patient's history, an icon will appear at the top of the screen to open the access to Zoom.
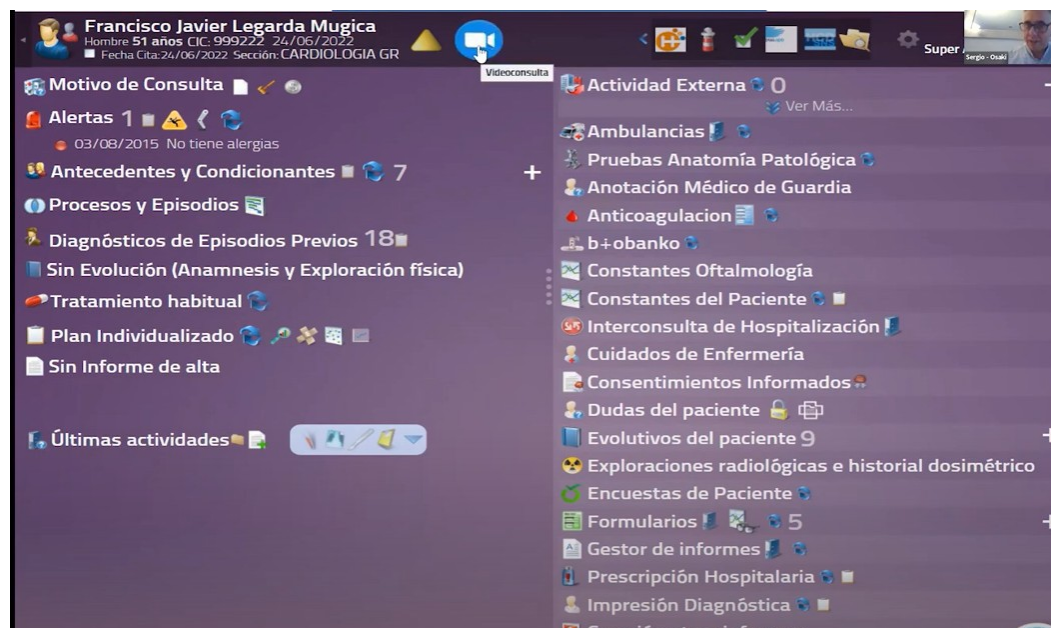
How much funding has been mobilised for its implementation?
The developments have been financed directly through the maintenance budget of the applications related to the Patient Health Record.
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond? /
The original coverage of the Videocalls pilot was initially reduced to 25 clinicians (doctors and nurses from Primary Care and Specialised Care), belonging to 9 Service Organisations.

This year the intention is to open the piloting of the VideoCall solution within the Specialised Care area for all Service Organisations, including the Mental Health Network.
Evidence of success:
The Osakidetza Healthcare Directorate, through the Healthcare Integration and Chronicity Service (SIAC), has drawn up a report with the results of the evaluation survey carried out in June 2021 for the piloting of the VideoCalls solution. Likewise, the EIPD - Data Protection Impact Assessment (EIPD) report has been drawn up to guarantee the use of VideoCalls, both for the user-patients and for the Osakidetza professionals who take part in them.
Resources needed:
• Integration API between the ZOOM corporate videoconferencing solution and the Osakidetza (Osabide Global) corporate medical records application. • Technological infrastructure Communications • Zoom licences (new modules/plugins) • CAU - Citizenship (Chair configuration)
Further information
Website: http://www.osakidetza.euskadi.eus/ **Contact person**: SERGIO.RESINOSANTAMARIA@osakidetza.eus

Title of the good practice
7. Paziente Bizia-Active Patient Programme online (Basque Country)

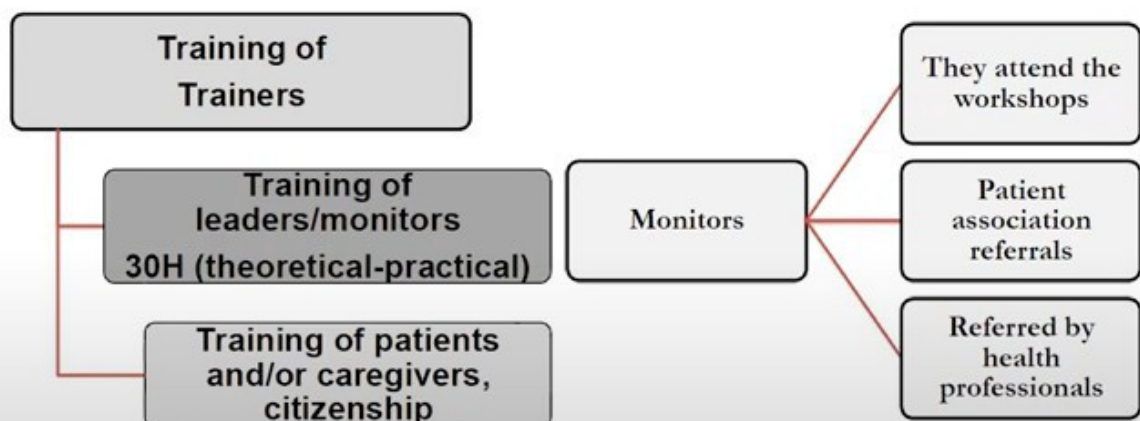| Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community) |
|---|
| Osakidetza (Directorate for Health Care/Subdirectorate for the Coordination of Primary Care) |

Summary of the best practice (3.000 characters)
In 2010, "Paziente Bizia-Paciente Activo", a peer-led self-care and self-management education programme based on the Stanford University methodology, was introduced. Later, in 2013, our own methodology was developed. Objective: To increase the empowerment of people living with chronic illnesses and/or carers, through training workshops on self-care and self-management of the illness, seeking to enable them to better understand their illness, take responsibility for their health and participate in shared decision-making with healthcare professionals. In 2018, the need was identified to reach people who, due to time constraints, travel, lack of anonymity, etc., do not have access to the face-to-face format. Therefore, a pilot project was proposed with 200 users. Favourable results were obtained in 2020 which, together with the Covid-19 pandemic situation, led to the definitive implementation, targeting a wider population. The whole process is based on anonymity, easy and convenient access to the content developed, with no timetables. The methodology is based on reading content, interaction with group members about problems, achievements, difficult emotions, action plans, and learning self-care and self-management skills. People with basic technological skills can participate (mini-guide offer access to the platform). In addition, there are 6 sessions/6 weeks, in which there are two facilitators with whom users interact. It is a continuous cascade training, first the monitors are trained for 30 hours of theoretical and practical. These monitors, who will then teach the workshops, are recruited from among people who attend the workshops or who come from associations or health professionals.

How much funding has been mobilised for its implementation?

135

| NA. |
| --- |
| **What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?** |
| Regional |
| **Evidence of success:** |
| The methodology has been implemented in two types of format:

 Face-to-face format, group sessions, 12/15 people, weekly frequency (7/8 sessions). These sessions cover basic knowledge about the disease, healthy lifestyle habits, emotional management, sexuality, symptom management, and skills such as establishing action plans, problem solving, communication techniques, stress management and shared decision-making. In response to the pandemic, in March 2020 it was decided to move to a videoconference platform, maintaining content, duration and frequency.

 Asynchronous format - no set completion time -: a total of 505 participants of whom 76.6% completed the training.

 Among respondents with an average age of 45 years, 75% consider anonymity to be an advantage. Seventy-five percent feel more able to control their illness. Regarding the experience; 1) the assessment of the classroom content 4/5, 2) the assessment of the facilitators 4.1/5, 3) the general satisfaction with the course and materials 4/5, 4) the general assessment of the platform 4/5.

 Regarding the videoconference format, a survey was carried out on 167 participants, 89% completed the training with an average age of 59 years, there is a general satisfaction and organization, 9/10. The workshop will help to better control the disease 8.4/10. It has increased my confidence 8/10. It was highlighted how the online environment of the platform was useful and satisfactory for the agents involved, centralised access in real time at any point, without infrastructure and travel. In addition, it was noted that: 19) it gave continuity to the programme while maintaining its clinical effectiveness, 2) allowing heterogeneity in the groups, and 3) it favours the relationship between monitors/participants and 4) The new offer and evaluation studies will generate new knowledge that will allow us to advance in the best way to achieve greater involvement of people in the management of their health.

 It has collaborated in European projects such as C3Cloud, HOPE, Jadecare, Gateekeeper... and has won several national awards. |
| **Resources needed:** |
| Two full staff for developing the content of the courses. |
| **Further information** |
| **Website**: https://www.osakidetza.euskadi.eus/pacienteactivo/

 Contact person: lourdes.ochoaderetanagarcia@osakidetza.eus / pacienteactivo@osakidetza.eus |

Title of the good practice
8. Video consultation / Video consultation with assistance (Saxony)
Name of the organisation in charge **(Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)**
Carus Consilium Sachsen GmbH, University Hospital Dresden, MedicalSyn GmbH, cultus gGmbH
Summary of the best practice (3.000 characters)

The advantages of virtual meetings were highlighted even before the corona pandemic. As the majority of the elderly in Saxony is living in rural environments, the opportunity of digital consultations with doctors / experts becomes necessary. Not least because it greatly relieves the burden on elders with mobility restrictions. It furthermore increases the service quality of the clinic, while the time per medical consultation and patient time spent per doctor visit decreases. Dresden University Hospital offered a system of video consultation for the internal clinics in April 2020, devolped by Carus Consilium Sachsen GmbH (CCS) and MedicalSyn GmbH. Currently the video consultation is provided to all physicians at the University Hospital. The aim is to develop an intersectoral networked telemedicine-based video consultation at Dresden University Hospital in order to maintain and increase access and efficiency to both diagnostic and accompanying care structures. Diagnostics and therapy are to be networked with approaches of individualized medicine. The application range of the presented intersectoral scenario is to be used from diagnostics to clinical monitoring. CCS is responsible for the patients support. In this process the CCS is responsible for providing support/care to the patient prior to the actual medical appointment. Tasks include processing appointment requests, appointment coordination, confirmation and sending access data. CCS is also available for any technical questions.
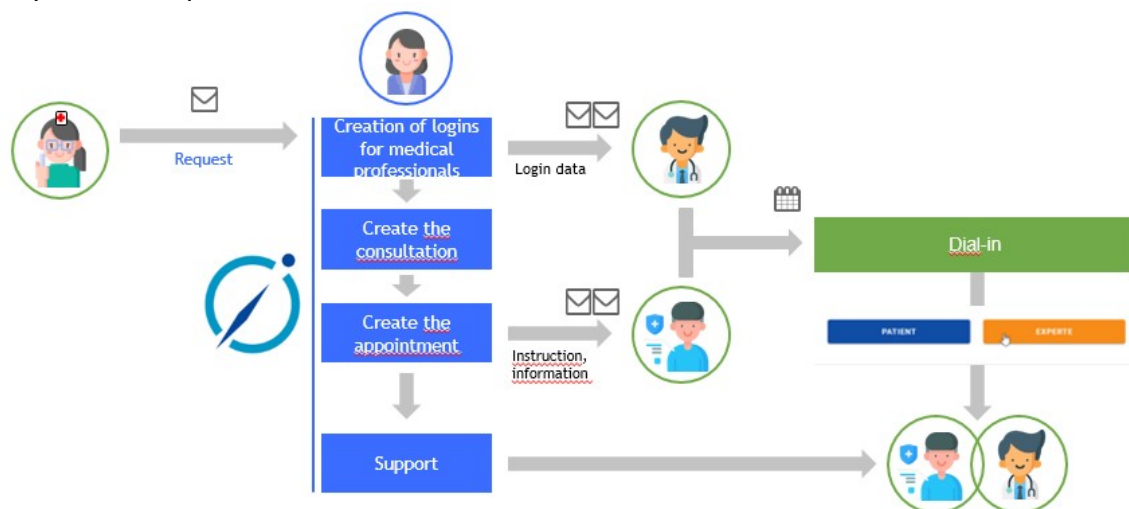
Customary solutions on the market, unlike the proposed CCS solution, are basically designed for the point-to-point connection between patients and a practice workstation and are generally overburdened with the complex IT infrastructures in hospitals. Integration into existing calendar solutions is not possible, nor is file transfer into a hospital information system with its correspondingly high security requirements. An upstream communication process (appointment management) which includes briefing of

the patient, technical support, processing of a checklist for the preparation of the video consultation, is only provided for in the CCS solution. The Video consultation can be used in a variety of ways and can be a support or relief in a wide range of cases. For the doctors as well as for the patients. Within the Hocare2.0 the "Video consultation with assistance" was developed, together with a regional public service provider for outpatient and inpatient care and the university hospital (cultus gGmbh). The aim of the project was to offer customer-oriented solutions in the field of home care. The service gives care recipients the opportunity to attend their doctor's appointment in the form of a virtual consultation. They are supported by an assistant who is responsible for preparing, accompanying and following up the video consultation.

How much funding has been mobilised for its implementation?

Approx. 50,000 €within HoCare2.0, excluding production costs of the software at MedicalSyn

What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

Local, for the clinics of the University Hospital Dresden. Many requests by Saxon hospitals. The service is independent of the geographical location, can be integrated in other hospitals in Saxony and Germany/Europe/worldwide.
Also the video consultation with assistance could be used throughout Saxony / Germany for both inpatient and outpatient facilities.

Evidence of success:

UKD: used by 19 clinics in 41 consultations by 131 users
Within the HoCare2.0 project, a statement was published by the regional public service provider. This document confirms a successfully implemented solution. This is transferable to other institutions as well.

Resources needed:

For the development of the video consultation, personnel, time and financial resources are necessary.

Experience shows that for further development the co-creation approach should be followed and Quadruple Helix partners should be involved.

For pilot activities in HoCare2.0:
- Representatives of the Quadruple Helix to co-create the solutions (including time, human and financial resources)
- Knowledge about Co-Creation
- Public service provider to implement the solution
- Financial and personal ressources on side of public service provider

Further information

Website:
Contact person: info@carusconsilium.de
videosprechstunde@ukdd.de

Title of the good practice
9. DYNAMIC-SCOT COPD (Scotland)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
NHS Greater Glasgow and Clyde – Public Administration
Summary of the best practice (3.000 characters)

Funded to scale up by the Scottish Government between May 2020 and August 2021, in response to the COVID19 pandemic, the DYNAMIC-SCOT COPD project aimed to reduce hospital admissions of patients with significant lung disease; thereby reducing their chances of COVID-19 infection and decrease the pressure on NHS staff and resources.

Chronic Obstructive Pulmonary Disease (COPD) is a group of lung conditions that cause breathing difficulties. It is to become the 3rd leading cause of death worldwide by 2030 and mainly affects middle-aged and older adults.

The COPD Digital Service is a cutting edge co-management platform that enables patients to better manage their condition at home and proactively treat exacerbations before they result in hospitalisation. It makes use of detailed clinical summary and event data, patient-clinician messaging and patient-reorted outcome data visualisations aggregated with patient wearables and remote-monitoring therapy.
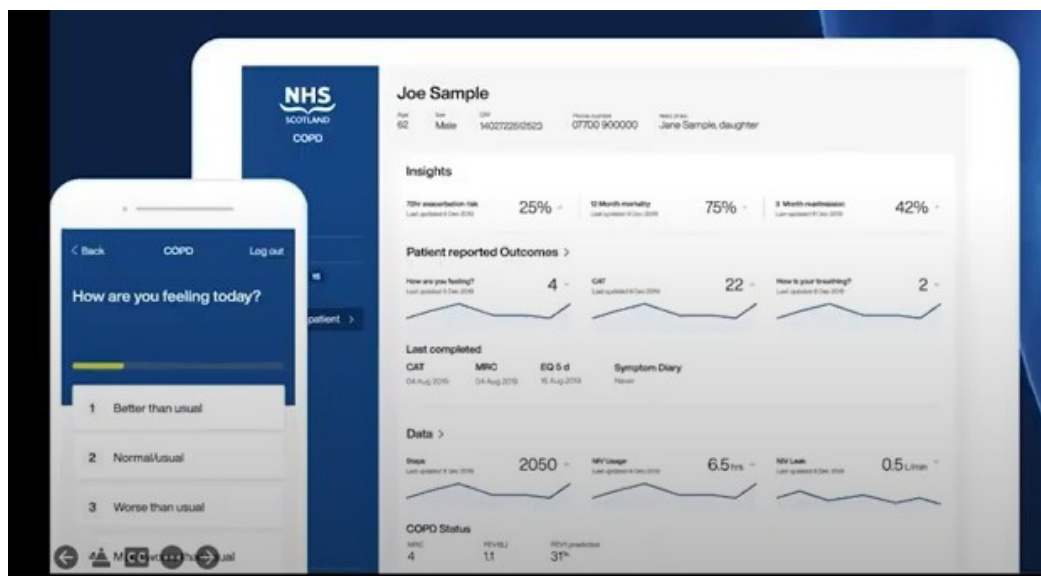
The project was built on an NHS Greater Glasgow & Clyde (NHSGGC) and STORM ID RECEIVER clinical trial having sustained patient engagement and a reduction in clinical events the COPD service was scaled across NHSGGC prioritising those patients who would benefit the most.

How much funding has been mobilised for its implementation?
£185,964.48 Awarded to NHSGGC
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?

Originally in NHS Greater Glasgow and Clyde, and later scaled to cover the NHS Lothian Region.

Evidence of success:

There is planed scale up across regions in England after the success of the initial scale-ups covering the Greater Glasgow and Clyde and Lothian regions, the 2 largest health boards in Scotland. The platform can be reutilized for other chronic diseases, or in the future, for patients who have multiple chronic conditions that need co-managed.

Initial data from the key implementation and effectiveness evaluations, conducting for DYNAMIC-SCOT by NHSGGC respiratory innovation team, shows that annual admission rates for COPD dropped by 42% and annual bed date rates by 88%.

Difficulties encountered

The platform had to meet the requirements of a diverse range of users from clinicians to patients. Equally, the requirements of the clinicians needed to be balanced with technical feasibility and development costs. This was achieved through close collaboration between clinicians, academics and industry partners with a defined problem statement and shared set of goals.

Potential for learning or transfer

Collaboration with stakeholders was critical to the success of the project to:

- Understand the requirements of patients to improve engagement and enable them to manage their condition.
- Demonstrate the benefits of the platform to clinicians and ensure cohesion with their clinical workflow.
- Provide technology providers with sufficient insight to build a platform that is fit for purpose. Equally, allow them to challenge back and shape "the ask."
- Prioritize the essential features that will accrue the most benefit the fastest, create a roadmap for future additions that are not critical.

Resources needed:

- £185,964.48 was awarded to NHSGGC
- A portfolio based approach and previous technological infrastructure investment and development was critical for a rapid response to the challenges presented by the COVID-19 pandemic

Further information

Website:
Contact person: kara.mackenzie@dhi-scotland.com

Title of the good practice
10. Connecting Scotland (Scotland)
Name of the organisation in charge (Please indicate whether it is a Public administration, an Educational and Research Institution, Industry or Community)
Scottish Government
Summary of the best practice (3.000 characters)

Connecting Scotland was set up in March 2020 in response to the Covid-19 pandemic and provides a national, human-centred approach to reducing the rates of digital exclusion due to low income. It is a collaboration between public, private and third sector organisations, with Scottish Council for Voluntary Organisations and Scottish Government working together as the leads.

The programme provides devices, data, and support to those facing highest risk of digital exclusion, and further impacted by the Covid-19 pandemic and subsequent lockdowns. It utilises a 'Digital Champion' model: staff and volunteers across Scotland who have trusted relationships with end recipients are trained to provide holistic ongoing support in the digital space, focused on building foundation and essential digital skills, confidence and digital understanding.

Phase 1 (Apr – Jul 2020)

The first phase of Connecting Scotland included several pilot projects plus the main programme which targeted 9,000 households who were clinically vulnerable to coronavirus (for example, with someone shielding).

Phase 2 - families and care leavers, older and disabled people, Care homes

Phase 3 - employability

Phase 3 - fast track

A 'fast track' process was established to enable organisations to apply for a small number of devices (up to 10) to meet immediate need for digitally excluded people who may not have fit the criteria of previous rounds or who were newly identified.

Difficulties encountered

    Distributing devices
    Instead of being delivered directly to the individuals risking errors, devices were shipped to the organisation that applied for them who then matched the serial numbers with correct recipients.

    Relying on frontline staff and volunteers for training and support
    At the start of the COVID-19 pandemic many staff were willing to volunteer extra time over and above their day job to support recipients with their new devices and digital skills. A more sustainable model is needed going forward to ensure that everyone can continue to access digital skills support, without added pressure on frontline staff.

Potential for learning or transfer

- The most effective way to find individuals in need was through organisations, cha-

rities and local authorities that were already working with them. Applications for devices were made by the organisation to avoid excessive paperwork and to avoid placing the burden of applying on an individual • Strong and open relationships with partners was key for quickly resolving any challenges that arose • A pilot was run to test assumptions and theory. It revealed a lot about what worked and what didn't through feedback and interviews with participants
How much funding has been mobilised for its implementation?
£48 Million (55.5m Euros)
What is the original geographical coverage of this best practice? (Local, regional, national...)Has this good practice been adopted in other regions around the country or beyond?
National - Scotland
Evidence of success:
• 4,244 digital champions have been trained to offer support • 60,000 households online • 68% of respondents in the phase 1 follow-on survey said that they were confident or fairly confident internet users, and 86% of respondents said that their digital skills had improved since becoming involved in Connecting Scotland • 86% of respondents reported an improvement in their ability to stay in touch with each other • 83% of respondents reported an improvement in being able to find interests • 74% reported an improvement in their mental health
Resources needed:
• Scottish Government project team (6 staff) • SCVO project team (6 staff) • User researchers (SG staff) evaluating the work (3-4 staff) • Technical and logistical support from suppliers Vodafone (connectivity) and XMA (devices)
Further information
Website: **Contact person**: kara.mackenzie@dhi-scotland.com

Title of the good practice
11. Organisation and Patients engagement Women's Health Association (Lombardy)
Name of the organisation in charge (Please indicate whether it is a public administration, an Educational and Research Institution, Industry or Community)
Salute Donna ONLUS - Association of Patients and Volunteers registered in the Single National Register of the Third Sector with the goal of carrying out activities of general interest and voluntary work towards third parties.
Summary of the good practice (3.000 characters)

Anna Mancuso, President of **Salute Donna ONLUS Association**, presented some best practices related to patient engagement. Salute Donna ONLUS is a patient association founded in 1995 and based at the Fondazione IRCCS Istituto Nazionale dei Tumori in Milan. Being an association composed of oncology patients working as volunteers, its mission is to protect cancer patients, develop research projects and implement activities that originate from the real needs of patients undergoing treatment.

Ordinary activities of Salute Donna ONLUS. The activities related to the involvement of patients, many of whom are volunteers of the Association, are:

a) **Primary prevention activities**. Salute Donna ONLUS organizes dissemination events on healthy lifestyles in line with the **European Code Against Cancer,** mostly in schools and for diverse audiences. Volunteers of the Association play the role of **testimonials,** in order to raise awareness on the importance of research and specific treatments for oncological diseases.

b) **Fundraising for research projects.** The research projects – in coordination with Fondazione IRCCS Istituto Nazionale dei Tumori- aim to tackle both social issues (correct lifestyles, nutrition, damage and pollution caused by smoking etc.) and health issues.

c) **Organization of scientific conferences**. The Association periodically organizes conferences aimed at providing information on various oncological diseases. The volunteers are in charge of the organization of the meetings.

Political-Institutional Advocacy Activities of Salute Donna ONLUS. The project "**La salute: un bene da difendere, un diritto da promuovere**" ("Health: an asset to defend, a right to promote") was created in 2014 and brings together as many as **45 patient associations at national level**, under the coordination of Salute Donna ONLUS. As part of this initiative, Salute donna advocates for the rights and the demands of cancer and oncology patients before state institutions and policy forums (**Political-Institutional Advocacy activities**).

Source: https://www.salutedonnaonlus.it/wp-content/uploads/public/ASD-Guida-Coronavirus-Web-OK.pdf

Activities during Covid 19 pandemic. At the beginning of the pandemic, Salute Donna ONLUS took action to assist and support patients through the following initiatives:

1. **"The Hour of Health" Facebook Live**. During this hour, medical professionals, well-known members of the Parliament, and researchers were involved and interviewed to provide information on Covid 19 virus, Anti-Covid 19 vaccine campaign, and how to access hospitals. The live broadcast, initially under the name "Good Morning Health", started a few days after with the first restrictions were imposed at national level, with a frequency of once per week.

2. Activation of a **Question/Answer Forum on the Association's Facebook Page**. Starting March 12, 2020, patients and families were able to ask questions and get answers from a team composed of infectivologists, oncologists, haematologists, psychologists, and specialists.

3. **Launch of a survey of Italian oncology and Onco-haematology patients during the pandemic**. During the pandemic, Salute Donna ONLUS launched "**Health: an asset to defend, a right to promote**" project, involving 45 patient associations participating in the project. Within this project, Salute Donna ONLUS initiated a data collection, both online and via paper forms, distributed within hospital outpatient clinics. A total of **774 patients nationwide participated**. The survey was conducted following two strands: the management of **diagnosis, treatment and follow-up activities**, what **inconveniences**, **concerns** patients experienced, and the needs of people living with cancer. The results provided insight into the inconveniences patients experienced during the restrictions. It was found that the suspension of services in hospitals caused great concern; also, the fear of contracting the virus at hospital facilities severely impacted the patients. Based on the findings, new care initiatives have been implemented (e.g., many logistics companies have taken steps to manage medication administration at home). On the service management side, it emerged that, despite enormous difficulties, hospital services for cancer patients in northern Italy ensured some continuity (or suspended to a limited extent) of care, although it was the area of the country most affected.

➢ **Initiatives toward the elderly population.** The association has also been targeting the elderly population affected by cancer for many years, providing information services on healthy lifestyles, prevention, nutrition, and physical activity. During the pandemic,

the association's volunteers provided real support to the elderly by assisting them to book medical appointments online and helped to write and distribute a **booklet on the Anti-Covid19 vaccination campaign** in hospital outpatient clinics.
How much funding has been mobilised for its implementation?
Fundraising takes place through the "**5 per Mille**", a system that allows taxpayers to give the 5% of their taxes to a third-sector association. Some companies, either pharmaceutical or organic food companies, support Salute Donna ONLUS to develop research projects.
What is the original geographical coverage of this good practice? (Local, regional, national…) Has this good practice been adopted in other regions around the country or beyond?
Salute Donna ONLUS has branches in various regions of Italy. To date there are 27 branches in 8 regions with a total of **400 volunteers** throughout Italy.   In Lombardy, the association actively works within the main hospitals for oncological diseases, including the Fondazione IRCCS Istituto Nazionale dei Tumori in Milan.
Evidence of success
The activities implemented by Salute Donna ONLUS, prior to the emergence from COVID 19, enabled the improvement of the conditions of cancer patients being treated in hospitals in terms of care, support, and awareness. All the above-described activities show an example **of real and active patient involvement.**   During the pandemic, the Association acted to support cancer patients in distress, to provide them with continuity of care and clear information about Covid 19. It also helped raise the awareness of health care institutions to create policies specific for cancer patients during the covid 19 emergency.
Resources needed
N.A.
Further information
Website: https://www.salutedonnaonlus.it/   **Contact Person:** Anna Maria Mancuso (President of **Salute Donna ONLUS Association**).

Title of the good practice
12.Redesigning Volunteer Intervention Practices in Oncology and Volunteering 3.0. (Lombardy)
Name of the organisation in charge (Please indicate whether it is a public administration, an Educational and Research Institution, Industry or Community)
Lega Italiana per la Lotta ai Tumori (LILT) - Milan Monza Brianza Provincial Association Aps - (Public body on a membership basis, non-profit, based in Rome and supervised by the Ministry of Health).
Summary of the good practice (3.000 characters)

Immacolata Di Carlo, Head of the Volunteer Sector of Lega Italiana per la Lotta contro i Tumori (LILT), the Italian League for the Fight against Tumors, - **Milan-Monza Brianza section** (active since 1948), illustrated a number of good practices related to volunteer intervention practices for cancer patients. The mission of LILT consists in the following acitivites: Primary Prevention, Early Diagnosis, Assistance to cancer patients and their families, Promotion and Support of initiatives, studies and research in the field of oncology, Collection of public and private economic support for the enhancement of the fight against cancer

Among the activities of LILT volunteers:
- **Assistance to adult and paediatric patients and their families**. LILT provides, to cancer patients with socioeconomic hardship, **financial subsidies** through a year-round social service operation, takes care of **food package delivery**, provides support for the payment of utility bills (internet, electricity and gas) and organizes services of **accompaniment to treatment at hospitals** (about 13,000 admissions per year). In addition, LILT provides health care equipment on loan for free use (wheelchairs, decubitus beds, etc.), cultural mediation services involving the profession staff, and legal advice in the field of oncology.
- **Care Services - "At Home, Away from Home" Network**. LILT provides foster homes free of charge (5 "Houses of the Heart") for paediatric patients (children and young people up to 25 years old), located near the Fondazione IRCCS Istituto Nazionale dei Tumori in Milan, for patients and family members coming from other Italian regions (N.B. In Italy, the phenomenon of health migration between regions is quite common).
- **Technical information and assistance to patients in hospitals**. LILT volunteers are qualified to support patients with information for **orientation to hospital wards** and **encourage the patient** to have a helpful and supportive relationship with them.

LILT Volunteers. LILT volunteers are selected through the *Minnesota Multiphasic Personality Inventory Test* (MMPI) – (a test used in clinical and forensic settings to investigate personality traits and behavioural characteristics), interviewed by psychologists

and trained on an ongoing basis (Internship and annual training courses and periodic supervision and refresher meetings with psychologists). They are aged between 20 and 70, and they must ensure their availability at least for one or two half-days each week. The Volunteer Sector is responsible for the day-to-day management of LILT volunteers from the moment they join the association until the end of their activity. The sector coordinates volunteer groups, each of them led by a group leader, who represents the main contact for LILT. The number of volunteers to date is **697**.

Patient engagement activities before the pandemic. In the previous years before Pandemic, LILT implemented various activities that involved cancer patients and former patients. Among those carried out in hospitals there were:

- "**Animation Group**" in which volunteers organized and managed moments of entertainment and gathering with patients (board games, happy hours, Christmas concerts and other recreational occupations).
- "**ArtLab**" an art workshop held in the indoor spaces of the Fondazione IRCCS Istituto Nazionale dei Tumori, where all patients, former patients and family members could do a variety of activities (paintings, yoga, postural movement) in order to regain their well-being and quality of life.

Patient engagement activities during the pandemic. At the beginning of the Sars Cov 2 pandemic and the first Lockdown in 2020, the way of operating, managing service delivery and volunteering changed. While home care services could continue thanks to the intervention of LILT workers, active volunteering in hospitals has come to a halt, leading to serious inconvenience for patients undergoing treatment (especially in hospices for palliative care).

Following the first reopening (June 2020), activities involving active involvement gradually resumed. Among them, courses previously delivered by professionals, supported by volunteers, moved to "**Spazio Parentesi**", the first Academy in Italy dedicated exclusively to training and informing cancer patients and former patients; the preparation of the premises and the idea were designed in collaboration with the **European School of Oncology (ESO)** and **Europa Uomo**. Multidisciplinary teams working in Spazio Parentesi have organized and delivered the following courses:

- "**Corpo e Mente ArtLab**". Art Workshop in hybrid mode (presence + online classes). Online classes were most appreciated as they reduced travel and stress for patients undergoing Chemotherapy and Radiotherapy (very disabling therapies for patients).
- **"Mi prendo Cura di me".** Training course on motor activity, good eating habits, and psychological and motivational support.
- "**I Corretti Stili di Vita**". Pathway for everyone (including healthy people), focusing on primary prevention and healthy lifestyle.

Volunteering 3.0 project. Following the sudden lack of volunteers in contact with patients,

LILT Volunteer Area needed to reorganize the reception and support of patients. The project started with a survey, aimed at identifying patients' and hospitals' needs, in order to prioritize the most pressing ones (facing the pandemic and the absence of LILT volunteers to support them).

The main needs that emerged from the survey are the following 3:

- **Information and guidance services**. This request was followed by the decision to install Information Totems at the entrance of the **Fondazione IRCCS Istituto Nazionale dei Tumori** and the **Fondazione IRCCS Istituto Neurologico Carlo Besta** on an experimental basis. The Totems enabled patients to access information about wards, hospices, support services, accompaniment to care, and helplines and listening services (Psychologists or volunteers).

Source: https://www.legatumori.mi.it/resta-informato-post/news/i-totem-di-volontariato-3-0-una-nuova-forma-di-aiuto-per-tutti/

- **Information about cancer patients' rights**. A socio-legal web page was created, thanks to the collaboration of four lawyers (former LILT volunteers). The "**Socio-Legal Support**" page was (still is) on the LILT Milan-Monza Brianza website. The patient or family member could then address a socio-legal inquiry via a Form to be filled out sent through the system to the Volunteer Area managers (and in turn they would forward it to the Social Workers or the four lawyers).
- **Implementation of volunteer home activities**. Analysis revealed a need on the part of patients for someone to help them at home with a whole range of practical tasks (shopping, paying utilities, accompanying them to the doctor, helping with other tasks). **Additional volunteers were recruited** for this activity and the skills of those already present were updated.

The project lasted for one year (December 2020-December 2021), and at the end of it, all proposals implemented were incorporated into the ordinary functions of LILT. A new project is planned in 2022, "Volunteering 4.0", which will also expand to other Italian regions (Veneto, Tuscany and Lazio).

How much funding has been mobilised for its implementation?
Being a third-sector entity, LILT can benefit from donations, through the tax form "5 per mille", a system that allows taxpayers to give the 5% of their taxes to a third-sector association. In addition, it participates in regional funding calls for projects, it leads **fundraising** campaigns with companies through **sponsorships and corporate welfare projects dedicated to prevention** (such as seminars or the mobile clinic for visits to companies). Other sources of funding are open **awareness campaigns/events** and **bequests in wills** from individuals to LILT.
What is the original geographical coverage of this good practice? (Local, regional, national…) Has this good practice been adopted in other regions around the country or beyond?
LILT is divided into **106 sections** throughout Italy (or provincial associations). Each section implements its own projects **based on the context and needs of patients in that specific territory**. All Good Practices and projects described above were designed by the section present in the Milan Metropolitan Area and the province of Monza-Brianza (LILT Associazione Provinciale Milano-Monza Brianza) which are the most densely populated geographical areas in Italy.
Evidence of success
The good practices implemented by LILT described above (both before and during the pandemic) were made possible through the active employment of LILT volunteers. They were instrumental in that their voluntary actions had positive effects for a specific group of patients (cancer patients), both in treatment and in the post-therapy period. In fact, this approach has enabled patients to enjoy real human-relational support that alleviates stress and fears toward illness and treatment (Concept of Humanization of Care). Although the period of the first Lockdown in 2020 brought serious inconvenience to patients, LILT was able to reorganize its initiatives with the help of new digital tools and remote delivery modes, rethinking and reorganizing spaces and redefining the role of volunteers in this new scenario.
Resources needed
N.A.
Further information
Website: https://www.legatumori.mi.it/   **Contact People:** Immacolata Di Carlo (Head of the Volunteer Sector of LILT), Luisa Bruzzolo (LILT Milan Operations Director).