ITHACA
Case study no. 2:
Region Zealand, Denmark

Draft Final Report
June 2018

Acknowledgements

This case study was developed for the ITHACA (Innovation in Health and Care for All) Project supported by Interreg Europe. It was written by Erik Brander, Esther Davidsen and Xenia Lauritsen. The authors express thanks to all the Region Zealand stakeholders who contributed time and presentations to the ITHACA Exchange of Experience Event (EEPE) event in Region Zealand. They also thank the many visiting delegates from the other ITHACA regions for their feedback and comments. These combined contributions have informed and made possible the drafting of this case study.

Contents

1 Introduction

1.1 Background to the Case Study

The Danish Region Zealand hosted the second ITHACA Exchange of Experience and Peer Evaluation (EEPE) event on 12-13 September 2017. The programme included presentations, exchanges amongst participants, workshops, project demonstrations and site visits to key initiatives in the region. The programme was designed to ensure a mutual learning atmosphere, and to show the visiting delegation of experts[1] how the Region of Zealand is working towards the ITHACA project goals of accelerating the scaling up of smart health and care solutions for active and healthy living whilst achieving the triple win of economic growth, more sustainable health and care systems and improved well-being for its citizens. The EEPE concluded with an interactive and structured peer evaluation session with the presence of high-level decision makers from the Region of Zealand.

The Region Zealand EEPE was structured around four pillars that are key to achieving progress on the ITHACA project goals:

- strategic and policy framework;
- eco-system for scaling up smart health and care solutions;
- experience across the innovation cycle (invention, co-creation, market testing, validation and scaling up).

1.2 Methodology

1.2.1 Main information and documentation

This case study is informed by and derives from:

- documentation provided by stakeholders from Region Zealand before and during the EEPE event – including strategy documents, project documentation and promotional materials;
- the information and evidence presented and demonstrated during the event – including PowerPoint presentations;
- peer evaluation feedback from visiting delegates presented during the EEPE's concluding peer evaluation session and in follow-up, written reports.

1.2.2 Preparatory stakeholder meeting

The Region Zealand EEPE event held 12-13 September was organized around a jointly developed story line for the ecosystem, which was co-created by the participants at Region Zealand's first ecosystem stakeholder meeting on 19 June 2017. Representatives from eight key organisations participated in the stakeholder meeting, which was facilitated by a specialist in organisation of such events using the tool of storytelling. Joint, key messages to be

[1] 21 delegates attended the EEPE in Region Zealand. They were from 8 ITHACA regions: Liverpool (UK), Baden-Wurttemberg (Germany), Nouvelle Aquitane (France), Nord Brabant (Netherlands), Friuli Venezia Giulia (Italy), Slovenia, Basque Country (Spain) and Malopolska Region (Poland).

used by presenters during the EEPE event and a systematic, creative approach to the mutual learning aspect were also developed and agreed upon during the stakeholder meeting.

The discussions during the stakeholder meeting uncovered the many common challenges related to cooperation between the different institutional silos involved in care, treatment and rehabilitation, but also revealed the opportunities and potentials for new ways of working together. It was acknowledged that there is a general lack of a systematic and structured knowledge sharing between the stakeholders, which seems to be a limiting factor on cooperation and scaling up of innovative solutions.

The common Region Zealand story line and the agreed mutual learning methodology were used by the eight key stakeholders during the EEPE as a basis for the presentations and discussions. The EEPE was also seen as a learning opportunity for the participating stakeholders to be inspired and acquire knowledge and experience from international experts. It was therefore agreed that the presentations should end up with an open question directed at the visiting delegates. The question should relate to one of the key challenges the individual stakeholders are currently facing. The programme therefore included time for open discussions on the key challenges presented.

The region also consulted with Marielle Swinkels, consultant to the lead partner, and received useful guidance on how to organise the event. An important objective was to find a balance between presentations and discussions on the one hand, and providing a framework conducive to both mutual exchange and social interaction among the participants on the other.

1.3 Structure of the case study

The rest of this report describes the approach adopted and key initiatives undertaken in Region Zealand including policy, identification of the needs for innovation, developing innovative solutions and scaling up solutions for health, care and well-being along with highlighting the expert feedback from the ITHACA delegation.

Section 2 describes the EEPE programme and the place of stay of the participants. Section 3 outlines the policies and strategies in Region Zealand that make up the basis for pursuing the smart health agenda. Section 4 describes the elements of a healthcare ecosystem in the region. Section 5 goes through the various steps of the innovation cycle including how innovation projects are initiated and which projects are in the process and those where solutions have been developed and put to use – all with the aim of improving health, healthcare, care and well-being in the region. Section 6 summarises the assessments from the visiting delegates to Region Zealand's framework and initiatives undertaken.

2 The region and the EEPE programme

2.1 Region Zealand

Region Zealand is one of five regions in Denmark and provides services for 825,893 citizens. With more than 15,000 employees and an annual budget of about EUR 2.3 billion, Region Zealand is the largest workplace in the region. More information on the region and the healthcare system is provided in Annexes 1 and 2.

2.2 EEPE programme

The structure of the EEPE programme was based on presentations of Zealand's policy and institutional settings with open questions, followed by projects examples. In between presentations, physical activities and guided tours were organized in order to create space and time for the delegates to perceive Zealand and our healthcare system with different senses, and to allow them to create bonds amongst themselves.

The programme was as follows:

First day

- **Policy and strategy**
  - Introduction - Policy and strategy context (including role of PFI)
  - ReVUS – Strategy for health innovation in RS
  - Health agreement between Region Zealand and municipalities in the region (Sundhedsaftalen) (2015-2018)
  - Brief feedback to *Policy and strategy*
- **The institutional framework**.
  - Steering Committee for Innovation (SGI) – new super hospitals
  - "One Entrance" ("Én indgang")
  - FIERS (Fund for public-private collaboration – the concept and set-up)
  - Brief feedback to *Institutional framework*
- **Project examples from FIERS to under give examples from the institutional framework pillar: Project examples presented:**
  - Sharing of data for treatment of diabetes (Roche Diabetes Care)

  - Audiological Data Warehouse
    (Danish audio industry)
  - Relabee – Tool for relatives (KMD)
- **Guided Hospital Visit: Slagelse Psychiatric Hospital**
- **General overview of EU projects and selected innovation project (**InnoCan)
- **Hospital visit 2:** Slagelse Care Centre with presentation of project COP life solution
- **"Ecosystem(s)" Existing clusters, partnerships and networks. the delegation was divided into three smaller groups for rotating Café table discussions with the following stakeholders:**
  - Welfare Tech
  - Copenhagen Health Tech Cluster
  - Collaboration with academia

Second day

- **Introduction: The data driven ecosystem**
  - Data-driven innovation
  - Population Health Management
  - Active patient support (aktiv patientstøtte)
  - Bridge to better health
  - Region Zealand's Health Profile
- **Guided tour - Presentation of Living Lab: SOSU Zealand's Centre for Welfare Technology**
- **Large scale innovative projects**
  - Cooperation with the primary sector
  - VIS – Welfare Innovation Sjaelland.
    Collaboration between 13 municipalities
  - Involvement of GPs: Shared Medication Card
- **New Trends in Health Care**
- **Preparation for afternoon feedback session** in five groups
- **Peer evaluation session**

2.3 Liselund – where the EEPE participants stayed and held some of the meetings

With the above objective in mind, the participants stayed and had some of the meetings at a former Danish so-called "folk high school" in Liselund in the neighbourhood of Slagelse in the , which has a strong cultural history on the topic of lifelong learning, i.e. how to be open, learn and exchange ideas and experiences throughout life.

A former headmaster made an after dinner introduction to the philosophy of N.F.S. Grundtvig, the ideas man of the folk high schools, and on the school concept which dates back to the in the 1830s. The cosy living room environment of the school provided a good environment for the visiting delegates to talk and exchange views during the evenings and breaks. The first morning upon arrival was introduced by a morning song session, which is a tradition at folk high schools. Two bicycle rides were included in the programme to give the participants a sense of the physical surroundings of some of the meeting venues, to laugh together and to gather energy between meetings.

3 Strategic and policy context

3.1 Overview of policy and strategies

Region Zealand's health care Innovation policy and strategy is governed by four different policy instruments:

1. Regional Strategy for Healthcare Innovation (2013), originally formulated by the Regional Development department in the region.
2. Regional Growth and Development Strategy - referred to as ReVUS (2015-2018) – synonymous with the region's Smart Specialisation strategy, the target of the ITHACA project. Formulation of this strategy is the responsibility of the Regional Development department of the region.
3. The Innovation system (2016 -) with objectives, strategic priorities and processes for initiating and driving innovation project within healthcare and other areas. Managed by a Steering Group of Innovation representing the entire the region. Primarily developed by the department of Operations, Research and Innovation (ORI) that represents the region in the ITHACA project.
4. The Health Strategy 2015-2018 – is an agreement between Region Zealand and the 17 municipalities of the region. The strategy aims to improve the coherence in the healthcare system, and create better collaboration between the hospitals, the 17 municipalities, the GPs and the citizens in order to ensure more integrated care and move towards more citizen-centred culture and services.

The above elements are described in more detail in the sections below.

3.2 Regional Strategy for Healthcare Innovation

The Regional Strategy for Health Innovation (2013) was formulated by the Regional Development department in the region. It was the region's first framework for healthcare innovation. The strategy described how Region Zealand wanted to work to strengthen innovation and innovation culture in healthcare taking the "Visions for the Hospital Service in Region Zealand 2020" as its point of departure.

The strategy was based on the following four principles:

1. Health innovation based on healthcare needs and demand
2. Strengthening the link between health innovation and research
3. Strengthening cooperation between healthcare and private companies on developing new solutions
4. Promoting innovation culture in health care.

While still providing guidance for healthcare innovation, innovation policy is mostly framed with the ReVUS, the Health Agreement, and the Innovation System described in the subsequent sections.

3.3 Regional Growth and Development Strategy – referred to as ReVUS

The ReVUS is Region of Zealand's SFP action plan for the Regional Operational Programme ERDF. The budget for 2014 - 2020 from ERDF is EUR 110 million of the total national budget of EUR 547 million.

The objectives of the Region Zealand SFP for 2015-18 are:

- Major construction works, such as the hospitals, is to contribute to growth and employment
- Two new clusters are to be set up
- 4% more companies are to introduce new products and services
- Increased export and collaboration with neighbouring regions
- Innovation to increase productivity and ensures growth
- A strengthened digital infrastructure to make it attractive to live and work in all parts of the region.

A sub-objective is to create stronger Public-Private collaboration, including structured knowledge sharing, to help ensure the development and implementation of smart health innovations, and thus contribute to meet the objectives of the ReVUS in terms of growth and development.

A new ReVUS for the period 2019-2022 has been under preparation since late 2017 based on a number of stakeholder workshops and similar events. It was expected to be approved by the Regional Council in the third quarter of 2018.

However, on 24 March 2018 the government decided to implement a fundamental simplification of the existing business promotion system. The number of politically responsible levels is to be reduced to two: one decentralized level with strong local government anchorage and the state. The intention is to create a structure that will help minimize overlapping efforts. The municipalities will continue to be the local focal point for businesses and play a greater role in the business promotion system than today, so that companies and municipalities can develop strong local business promotion efforts in the individual municipality and across municipalities.

A Danish Business Promotion Board will be established, replacing the six regional growth forums and the Danish Growth Council, which will be closed down. As a consequence, the regions are cut off by law from undertaking business development efforts to stimulate growth and job creation the way it is handled today. The latter efforts are those normally described in the ReVUS, which is currently being updated, see above. At the time of writing (mid-June 2018), it is unclear what implication this will have on Region Zealand's future smart specialisation strategy, but it is highly unlikely that there will be a similar policy instrument from the start of 2019. The details are still to be decided upon between the state and regions levels.

3.4 Regional Health Agreement

The Regional Health Agreement ("Sundhedsaftale) 2015-18" is entered into between Region Zealand and the municipalities in the region. It is a key instrument for more integrated care and includes the rules for collaboration. For example, new initiatives to improve the

healthcare system's capacity have to be based on a dialogue between providers, better communication paths; more common documentation and development efforts between the 17 municipalities, dialogue with the GPs, dialogue with the citizens – and support from research institutions and the private sector.

The agreement also includes interventions in the field of Active Ageing and Independent Living with the following objectives:

- Ensuring better collaboration between public and private partners within the health sector
- Providing better access for companies to regional and municipal public service health systems – to increase regional growth
- Providing better access for Danish companies to markets abroad – increased growth
- Ensuring a significantly improved stakeholder network, with structured collaboration
- Educating a competent workforce within the field of health innovation
- Increasing knowledge levels and access to new healthcare solutions from abroad through exchanges between health related ecosystems.

A good example of a partnership activity within the area of Active Aging and Independent Living is joint regional and municipal cooperation on “patient education”, which aims to strengthen patient empowerment. The aim is specifically to ensure that patients with chronic diseases are offered patient education of high quality in order to empower them to self-manage, e.g. medication, physical training and the impact lifestyle has on their health conditions.

3.5 Governance system operated by Steering Group for Innovation

The region’s hospitals are focused on daily operations, but need to be more development oriented through innovation to meet future challenges, which include:

- A growing number of elderly people, persons with multiple deceases and people with chronic diseases, increase in the number of hospitalizations, a need for better treatment and patient experience of health care quality and a necessity to increase cost-efficiency;
- Lack of attention to follow up on innovative ideas from units and their staff;
- Lack of dedicated funding to finance innovation projects based on innovative ideas/solutions
- Lack of support to project owners in undertaking funded innovation projects.

To meet these challenges a regional innovation governance and support system was introduced in early 2016. It is managed by a Steering Group for Innovation (SGI) consisting of the regional CEO and managers of all major regional hospitals and major other organisational units.

The system receives screens and decides on applications for funding of innovation projects submitted by hospitals and central support and administrative units. It is supported by a SGI secretariat that screens, recommends/opposes project applications and assists approved projects throughout the process steps of the so-called DIA model with the three phases shown in the figure below.

Approved radical innovation projects normally receive about EUR 7,000 for the Discovery phase. Subject to a positive outcome of the activities of this phase, they are approved for

funding of the Incubation phase where actual development of the innovative solution takes place. If successful, the project receives funding for the Acceleration Phase.

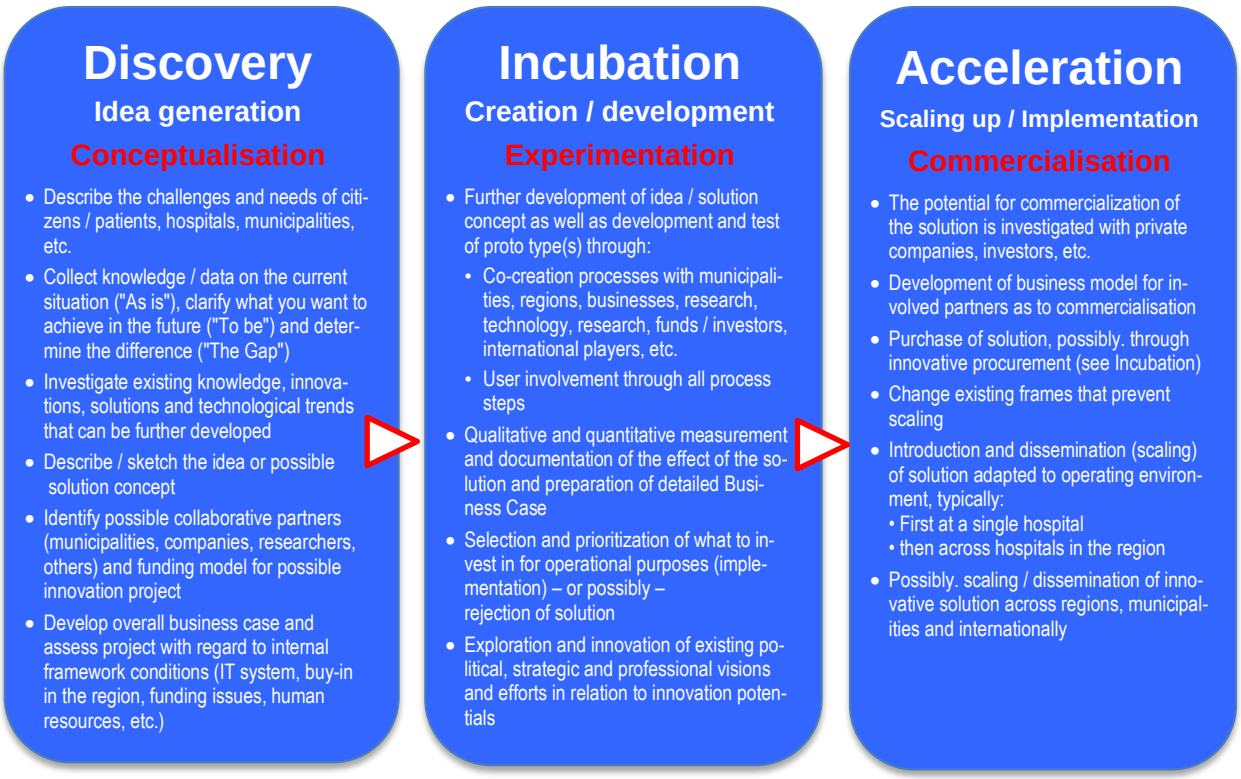


Figure 1: DIA model for innovation projects

The three phases of the DIA model can be used for both large strategic innovation projects across the region and with other collaborators (municipalities, business, research institutions, international partners) as well as decentralized / local innovation initiatives at hospitals and other units in Region Zealand.

4 Ecosystem

4.1 Stakeholder group

The meeting revealed that the regional stakeholders have converging views and interests, but also that their knowledge about each other's projects and activities is generally quite limited. Many of them carry out projects on integrated citizen/patient pathways together with municipalities and general practitioners (GPs) in such diverse fields as back injuries/problems, diabetes, chronic obstructive lung disease (COPD), chronic heart diseases, and schizophrenia.

The ITHACA project aims to build and strengthen the innovation ecosystems in the participating regions in order to inform the development of future smart specialization strategies, and help find ways of developing and scaling up innovative solutions for active and healthy living.

Experience from abroad teaches us that a collaborative and inclusive stakeholder approach to innovation, including all four partners of the quadruple helix innovation system: government, business, academia and the users, form a strong base for producing new ideas and ensuring their implementation in practice.

The healthcare innovation ecosystem in Region Zealand is dominated by a very strong public demand from 6 hospitals and 17 municipalities, strong schools for home-care and nursing skills, a quasi-non-existent business community, and scattered attempts to carry out user involvement when testing and implementing new innovative methods and products. The stakeholder who participated in the first stakeholder meeting in Region Zealand in June 2017 is an example of the participants of the ecosystem, see footnote.[2]

There are several mini-quadruple helix projects ongoing in the Region of Zealand, particularly involving the schools, but no systematic strategy to this effect. The main ecosystem players, apart from the Region Zealand itself, are:

- Welfare Tech.
- Copenhagen Health Tech Cluster
- Absalon, and Roskilde University Centre – research and education in care and nursing.

4.1 Welfare Tech

Welfare Tech is a Danish national cluster and hub for innovation and business development in healthcare, homecare and social services. Welfare Tech is a membership organisation including members from private industry, public organisations, and research and education institutions. Welfare Tech has a broad knowledge about the Danish market through its members and operates as a national entry point for international companies that want to enter the Danish market. Welfare Tech mainly operates in the Danish Region South, but also extends projects and activities into Region Zealand. Health business companies in Region of Zealand are often members of Welfare Tech. A number of joint projects involves partners from Welfare Tech and Region Zealand.

4.2 Copenhagen Health Tech Cluster

The Copenhagen Health Tech Cluster (CHC) is the most recently formed cluster, which mainly operates in the Greater Copenhagen area (the regions of Zealand, the capital and Scania County, Sweden as well as the associated 79 municipalities). CHC aims to connect businesses, municipalities and regions and bring them together to develop and implement digital healthcare solutions with a view to create growth. CHC has a strong focus on the use

[2] The stakeholders included: (1) Copenhagen Health Tech Cluster, (2) Welfare Tech, (3) University College Sjælland (Zealand), (4) FIERS – Fonden til Innovation og Erhvervsfremme i Region Sjælland (English: Fund for Innovation and Business Development in Region Zealand), (5) Helbredsprofilen (English: ”Health Profile” – online support system providing knowledge, experience and tools to help patients with chronic diseases), (6) Broen til bedre sundhed (English: ”The Bridge to Better Health” – a health development programme in Region Zealand), (7) Regional Development Department of Region Zealand (responsible for growth creation through cooperation between institutions within education, research and other forms of knowledge together with industry), (8) PFI of Region Zealand (responsible for supporting operations, research and innovation in the region from analytical, management and administrative perspectives) (9) private sector representatives (responsible for providing the views and needs of the sector).

of health data to develop the solutions of the future, CHC strives to catalyse testing and development of new innovative solutions that can implemented in practice – initially in Denmark and subsequently as a global export.

There is no membership. Events and news are free and accessible to all interested parties, including actors from the Region of Zealand. However, there is so far little cooperation between actors from the Region of Zealand and the CHC.

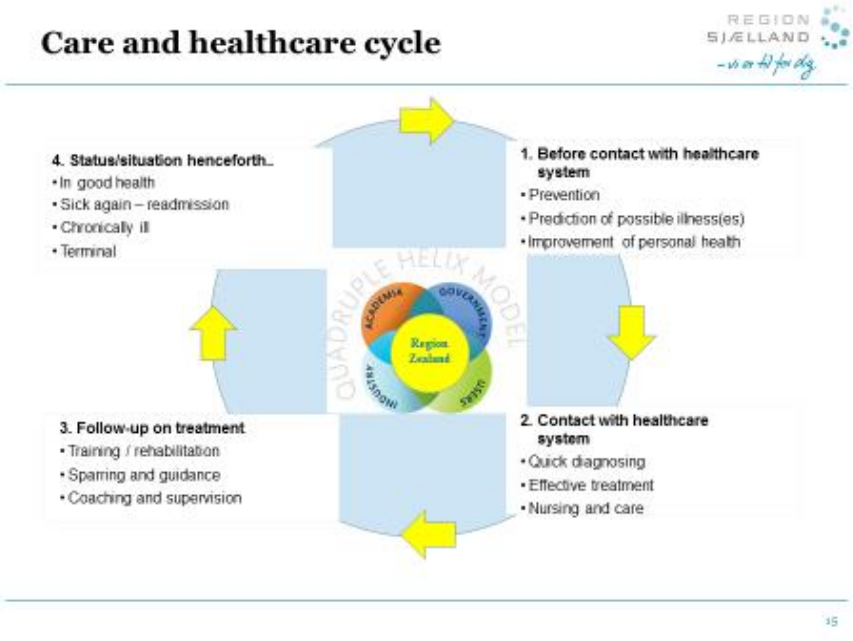
4.3 Research and education

University College Absalon is the regional university college in Region Zealand offering 11 bachelor degree programmes in fields such as nursing, nutrition and health, physiotherapy, occupational therapy, social education and social work. University College Absalon has 8,500 full-time and 2,500 part-time students as well as 650 employees located at seven campuses across the region. University College Absalon is part of several partnership projects with municipalities, the region, research institutions and the business community. Absalon runs a welfare technology centre at its Ringsted location, where students and graduates can learn and use welfare technology products.

Roskilde University Center (RUC) is the local university of the Region of Zealand offering Master degrees and research programmes within the fields of health and IT, health promotion within its people and technology department. The University frequently collaborates on research projects with the Region of Zealand and the 17 municipalities.

5 Interventions and implementation across the innovation cycle

Healthcare innovation in Region Zealand follows the steps in the innovation cycle. In the region, this cycle is translated into the DIA model with the three phases Discovery, Incubation and Acceleration. Further, interventions relate to the steps in the “Care and Healthcare Cycle” shown below:



The challenges in the four phases of the above “Care and Healthcare Cycle” each contain a number of innovation potentials, which can only be exploited in close cooperation between these parties.

5.1 Initiation of innovation projects

Innovation projects are initiated through a number of “channels” in the region. They include:

1. Governance system operated by Steering Group for Innovation (described in Section 3.5)
2. Single point of Entry (One entrance)
3. Virtual app centre
4. FIERS (Foundation for Innovation and Business Promotion in Region Zealand).

Channels 2-4 are described below, while channel 1 was described in Section 3.5 above.

5.1.1 Single point of Entry (One entrance)

The Single Point of Entry (SPE) solution in Region Zealand ensures effective access to the most relevant hospital / department with a view to establish partnerships between companies and the region. One officer receives all requests, and ensures contact with the relevant hospital department or ward, with a view to develop joint projects. The system is supported by a set of standard model project contracts.

5.1.2 Virtual app centre

The region is faced with the following challenges

- Region Zealand is increasingly pressed for resources, while at the same time having to deliver better patient treatment and care in an ever more cost-effective way. mHealth (treatment supported by apps) is seen as a means to meet these challenges.
- mHealth projects are being initiated across the region in an uncoordinated manner without making use of a standard approach to effective prototype development and adherence to regional IT-standards and requirements.
- Financing models for mHealth projects are not institutionalized.

To meet these challenges and shortcomings, a regional Virtual App Centre has been established. It is run by Operations, Research and Innovation (ORI) that provides staff resources. The Steering Group for Innovation (SGI) acts as executive committee. The app centre is designed for efficient prototyping and testing of mHealth apps, bringing together hospitals wards and clinics in Region Zealand, app developing companies as well as other stakeholders together to facilitate a co-creation process.

5.1.3 FIERS

The many challenges that the healthcare system in Denmark and abroad faces is calling for new ways to deal with prevention, treatment, care and follow-up on. This necessitates the development of new innovative solutions in technology, products, processes and organization in all relationships between citizens and healthcare.

FIERS (Foundation for Innovation and Business Promotion in Region Zealand) was estab-

lished by Region Zealand in 2015 as a flexible framework to strengthen the region's cooperation with companies and other external partners on innovation and commercialisation of innovative products and other solutions. FIERS cooperates with companies as well as municipalities and GPs, citizens, patients, interest groups, knowledge institutions, other foundations, etc. on developing solutions for all phases of citizens' contact with the healthcare system.

FIERS' value propositions include:

- *Data Analysis.* FIERS collaborates with Region Zealand to provide health and related citizen / patient data and conducts analyses for the use of companies' innovation activities.
- *Test access / test site*: FIERS also collaborates with the region to access relevant health data, clinicians and patients to facilitate the development and testing of companies' physical as well as intangible products - and other innovative solutions.
- *Project management*. FIERS can assume project management to ensure effective implementation of cooperation projects between Region Zealand and companies. This makes it possible to undertake development projects that would – in some cases – lack an agency that can assume managerial project management.

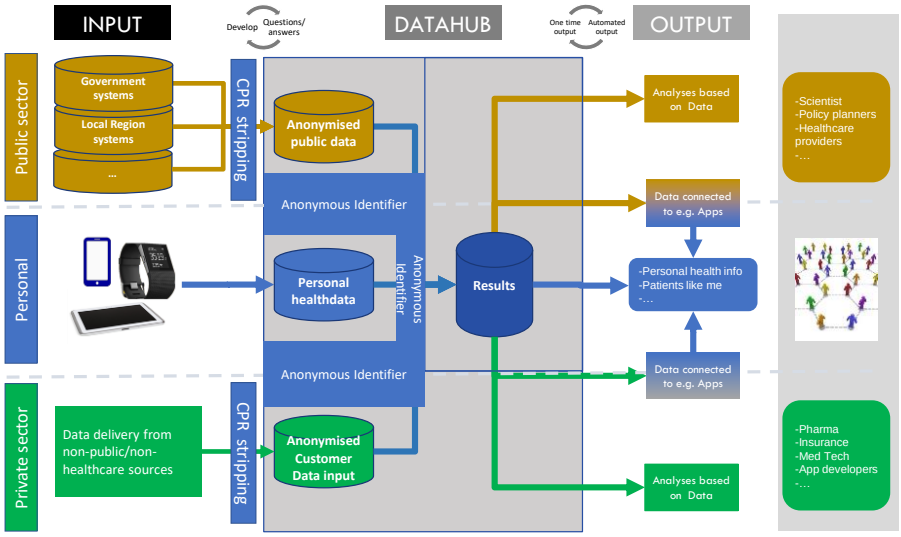
5.2 National innovation projects - under implementeation or concluded

5.2.1 Data-driven innovation

Region Zealand, like the other Danish regions, has collected and collects a wealth of patient data that can be used for a variety of purposes in health innovation. Use of such data has to respect a number of regulations, national as well as the recently adopted GDPR - EU's General Data Protection Regulation. The region is increasingly engaging in using data sets for internal purposes such as incremental innovation and monitoring of hospital performance, but also for innovation projects together with the private sector. Examples include the following projects:

- Sharing of data for treatment of diabetes (together with Roche Diabetes Care)
- Audiological Data Warehouse (together with Danish audio industry)
- “Relabee” – An app-based tool for relatives (together with the Danish IT company KMD)

The structure of data collection and use is illustrated in the below figure.



5.2.2 Population Health Management (name at EEPE – now called PreCare)

A new innovation project PreCare is under implementation. It build on the experience of two other projects within the field of Population Health Management. PreCare is developing preventive solutions for chronically ill and older based on data on state, efforts and results. The goal is to increase their quality of life and prevent worsening, follow-up illnesses and hospitalizations.

In the PreCare project, Region Zealand together with Odsherred Municipality is developing a new person-centered service that offers chronic sick citizens easy access to help 24/7. This will among other things be done through a joint digital specialist clinic, to which both nurses and doctors have been linked as an outbound function from Holbaek Hospital in the region. The service must provide citizens with rapid response in the event of fear or deterioration in their condition and ensure a coordinated effort that will in most cases take place at the citizen's own house. This is expected lead to avoidance of hospitalization in a significant way.

5.2.3 Active patient support

Citizens with chronic diseases such as heart disease, diabetes or COPD – and/or generally with frequent contacts to the healthcare system – is at risk of experiencing impaired quality of life. These citizens are admitted or readmitted to a greater degree than the rest of the population, and therefore need special support. Health data show that 1% of the population (including those with multiple disease) accounts for 29% of the costs of health care in the region.

The objective of the project *Active Patient Support* addressing the above problem is to help increase the individual citizen's quality of life and ability to take care of themselves, and to reduce need for health care services traditionally provided, thereby reducing health care costs in the region.

Active Patient Support is a project tailored to the individual citizen's/patient's needs, henceforth referred to as the citizens to stress the focus on these persons being individual, actively involved citizens rather than perceived as subjects of treatment. The support builds up or enhances citizens' ability to master a life of illness. It starts with an initial dialogue with the citizen. Follow-up support and guidance is provided by telephone. In order to measure the results of the intervention, a control group that does not receive support, has been established. The possibility of targeting support to well-defined and unique citizen/patient-groups based identification of the groups by way of analysis of data from patient records using indicators of past healthcare such as diagnoses, hospital admissions, patient days as well as outpatient consultations and GP visits.

The intervention is based on dialogue where specially trained project nurses form part of a partnership with the citizens to solve their health problems and challenges. The individual citizen's knowledge, experiences and preferences form the framework for the support process. This means that the support dialogues primarily take into account the specific health and social challenges that the citizen finds relevant.

The project is designed to empower the citizen struggling with chronic and complex diseases to better manage their illnesses. This includes an understanding of and ability to understand the complex elements and interaction of the health care system in relation to their own pathway of treatment. In addition, relatives of the citizens, health care staff as well as the health care system – and eventually the regional economy are stakeholders of the project.

5.2.4 Bridge to better health (LOFUS)

There have been several large population studies conducted in Denmark, but not in rural areas. LOFUS has invited 50.000 citizens to participate in the study, nearly half the population of Lolland-Falster.

This study collects a wide range of information and data from citizens: clinical data, biological data, information about participants' life, relations, health and behaviours. LOFUS focuses on households and not just individual participants, this makes it possible to study family patterns of health and disease.

Data from LOFUS are used in research now and in the future. By following a population through time, knowledge about development of disease can be acquired and lifetime research can be conducted.

5.2.5 Region Zealand's Health Profile

Region Zealand experienced a lack of health literacy in their chronically ill citizens and decided to improve communication with this patient group.

The Health Profile is an interactive website with videos, where patients and relatives speak about their personal experiences with specific chronic diseases, healthcare/clinical staff give advice on how to handle certain aspects, and training videos demonstrate how to change a bandage for example.

The Health Profile offers knowledge, experience and tools to help patients as their everyday life changes due to a chronic illness. Information and advice on eating habits, transportation, exercise, assistive devices and more.
The webpage provides information for those who are ill, relatives or those working with people who have a chronic illness. The platform is developed in constant and close contact with patients and their relatives, patient organisations and regional stakeholders. The health profile is also a solution targeted at elderly citizens with chronic diseases to help them better self-manage their health.

The website is free, easy to navigate, gives the user opportunity to choose specifically what they want to watch and is currently available in six languages.

5.3 International projects - projects supported by Interreg

Projects financed from sources outside the region play an increasing role in the region's efforts to engage in innovation activities. Some are supported by national funds that finance innovation projects, often with a view to develop business and thereby contribute to growth and job creation. Others are financed from international sources. Below some projects financed by the EU Interreg programmes are listed.

5.3.1 InnoCan

The InnoCan project is financed by Interreg Deutschland-Denmark. The project aims to make cancer treatment better and more responsive to patients through:

- Faster implementation of new innovative solutions that will make it more gentle to be a cancer patient, such as the C3 device.
- A test centre for innovative cross-border monitoring technology, which will be the gateway for companies with innovative solutions to hospitals.

- Development of more gentle treatment methods - with fewer side effects but with the same effect for five well-defined cancers.
- Developing a common database for the major cancer diseases. Including in-depth analysis of registry data that will support the long-term improvement of treatment quality. Read more under Cancer Registry.

5.3.2 ProVaHealth

The Region of Zealand participates in the ProVaHealth Interreg-Europe project, which facilitates access to health infrastructures for start-ups and SMEs. ProVaHealth involves 14 health Living Labs from the Baltic Sea region and works together with ScanBalt and the European Network of Living Labs. To ensure better access to Living Labs across borders for start-ups and established companies. The project is coordinated by Tallinn Tehnopol.

5.3.3 Demantec

The Region of Zealand is partner in the Demantec project. “Dementia and innovative technologies in nursing homes” is a Danish-German Interreg 5a project implemented over 3 years. The cooperation between four German and six Danish partners and more than 20 network partners will spur the development of eHealth solutions tailored to the needs of those affected by dementia, which can support the processes in nursing homes as the goal of the project. In addition, eHealth solutions must be implemented in future training and care staff work.

5.3.4 ReProUnion

Region Zealand participates in the ReProUnion project financed by Interreg Sweden-Denmark. ReProUnion is a network of 13 clinical and research units within the Capital Region of Denmark, Region Zealand and Scania County in Southern Sweden. ReproUnion’s aims to strengthen the research capacity within infertility as well as establish a common Reproductive Medicine Centre. The Reproductive Medicine Centre is based on a multi-disciplinary concept including research & development, education & career development, treatment & prevention. We call these branches ReproScience, ReproEducation and ReproTreatment.

6 Peer Evaluation Process, Feedback and Recommendations

6.1 Peer Evaluation Process

The Region Zealand EEPE event involved diverse stakeholders from across the region’ ecosystem. It showcased the strategic and policy context, the shape of the ecosystem and the range of interventions and innovations across, and to strengthen, the regional innovation cycle for health, care and well-being. This final section of the case study discusses the findings from the exchange of experience and peer evaluation process and sets out recommendations, for Region Zealand (and particularly the regional ITHACA Stakeholder Group) and for the wider ITHACA partnership, that derive from them.

Visiting delegates to EEPE in Region Zealand acted as an ‘evaluation and feedback team” who observed and provided structured feedback to the hosts about what they saw and learnt at the EEPE. This was delivered at two stages. Firstly, during a verbal peer evaluation feedback session in the final afternoon of the EEPE and, subsequently, in written reports.

Visiting delegates were asked to provide feedback on one of five themes. All themes were covered by the overall delegation. The key themes were:

- Policies, priorities, objectives and aims
- Eco-systems and clusters
- Implementation across the innovation cycle
- Innovation in policy and practice, dissemination and transferability
- Evaluation and impact.

For each theme, delegates' peer evaluation reviews focused on:

- What the host region has done
- Strengths, areas for improvement and gaps
- Good practices - and potential for transferability
- Lessons learnt and their implications
- Recommendations for the host region
- Recommendations for other ITHACA regions.

The final sections of this case study summarise the key comments provided by the delegation. It is structured according to evaluation theme. Recommendations flowing from the peer evaluation - and the EEPE event overall - are flagged up.

6.2 Peer Evaluation Feedback and Recommendations

6.2.1 Theme A: Policies, priorities, objectives and aims

What the host region has done

The region has developed frameworks and strategies that focus on more collaboration between clusters and business and policy and that put the patient in centre. However, innovation can only be considered innovative if you can re-disrupt a system. The team believes that this is the process the region is well into. It has embarked on innovation, but it has not yet disrupted the system significantly. This is logic because it is a difficult process. Our recommendation is about seeing the bigger, holistic picture, because this will help the region to focus and create impact on the things you want to create impact on.

To innovate in the health sector is about not only digital solutions, hospitals and policy. It is about everything we as a human being like and need in our lives. A good example is the last couple of days where the EEPE delegates enjoyed good food, bicycling even though it was raining and enjoyed the green environments. These are the things we need in our lives as human beings. Therefore, the recommendation from the group is: do not forget all the aspects that are also important in the lives of people who are sick or deal with health issues.

Strengths, areas for improvement and gaps

<u>Strengths and regional focus</u>

The region has developed a lot of policies, strategies and an institutional framework to support their implementation. However, the health innovation agenda has very much been focused on health, in particular on the hospital side of it. This also applies to the institutional framework, which is very much linked to the region's competences. The reason is that the drivers of these instruments are from the region itself and that the policies and strategies therefore focus on the responsibilities and focus areas of the region.

Areas for improvement and gaps

There is less in the overall strategies on innovation for homecare, primary care and social care. Initiatives regarding these activity areas were described during the two days of presentation, but they did not seem to be much linked into the strategies presented on the first day. Further, many strategies were presented but it appeared that they may not have been integrated with each other.

There is scope for extending policy and strategy coverage to include both the primary and secondary health care as well as active and healthy ageing. Furthermore, integrating the policies and strategies with each other by aligning objectives have the potential benefits of making the strategic framework more consistent, which in turn will allow for more strategically driven and coherent interventions across the sectors involved.

6.2.2 Theme B: Eco-systems and clusters

What the host region has done

Summary

- The region has a strong wish to undertake innovation as expressed in its strategies. This requires a strong leadership and a well-structured eco-system around innovation.
- Many staff members are working on various aspects of innovation. Good tools for supporting innovation have been developed, especially at the top of the organisation, although this process has only started recently.
- The region has also taken active steps to get innovative solutions to the market, e.g. by using “One entrance” and “FIERS”, which seem to be helpful.
- The region has done a lot to make data available and analyse it. Data and data analysis are used as a marketing tool to motivate people to do research based on the data available.
- There is a high focus on digitalization. Not only of data from the region itself but also private data from citizens are useful.

Strengths, areas for improvement and gaps

Summary

Strengths

- Innovation strategy in place
- Impressive scale and scope of innovation activities
- Well-developed ecosystem
- Well-structured innovation framework
- Leadership by the government
- Tools for supporting innovation, market-testing, route to market (One Entrance, SGI, FIERS)
- Scouting/scanning
- Strong data-base
- Highly digitalized
- Experience in rural health-care.

Areas for improvement (Weaknesses and gaps)

- Strong focus on digital data/technology. Room for focussing more on social and service innovation as well as business model innovation?
- Apparently, there is particularly strong focus on Triple Helix (University-industry-government relationships). Scope for more focus on the "Patient as a partner" in the form of a Quadruple Helix model that also includes civil society as innovation users.
- Innovation is not just about new products, but could also be a new ways of funding innovative solutions and new ways of getting them to the market.
- Narrow focus on health? There is a large scope for also looking at well-being and the lifestyle of people.

Gaps

See above.

Good practices - and potential for transferability

Summary

The delegates noted that they saw many people working on innovation giving a good insight into a series of examples of innovation activities. Particularly interesting initiatives are:

- One entrance (One point of entry)
- FIERS
- Bridge to Better Health is a really good example on how to make rural areas attractive for researchers

6.2.3 Theme C: Implementation across the innovation cycle

What the host region has done

Summary

The innovation ecosystem as described and shown during the EEPE in Region Zealand appears to be very comprehensive. This may be good in one way but may also be considered a weakness. There seems to be limited involvement of patients and citizens in the ecosystem. More emphasis could be placed on these stakeholders in the future.

Strengths, areas for improvement and gaps

Summary

Strengths

- Health agreement between the region and 17 municipalities: an example of a comprehensive approach, which is a very good strategic starting point for cooperation.
- Long visions and planning horizons are used:
  - For the rural health, programme "Bridge to better health": One aim is that the average life of all citizens in the two municipalities covered will be longer. It must at least increase to the national average by 2040)
  - Patient as partner (involvement of citizens and their relatives in development of regional health)
  - Use of medical records data, including Big Data, and analysis of these to be made available for partners in the ecosystem.

  - Living labs, (SOSU) because students and carers are involved

- Use of prediction models and other approaches to identify patients in need of assistance to help these through homecare solutions and prevent them from being hospitalised.

Areas for improvement / Gaps

- There is scope for involving stakeholders of civil society much more in the ecosystem.

Good practices - and potential for transferability

Summary

- "Health profile": a website with videos providing advice to citizens and patients about everyday life, how to cope with illnesses as well as personal experiences told by other patients, relatives and clinical staff (available in six languages including English and German). This website appears to be very useful to potential users. It may be transferred to other countries/regions, depending on language requirements.
- The Fund for public-private collaboration (FIERS) is a good initiative that is piloting different models of cooperation between the region and private companies, including alternative forms of ownership, membership and sharing of data with private innovative companies.
- COPD-LIFE: Exercise Training in Tele-based Rehabilitation for Patients with COPD.
- Living lab:
  - Students/employees
  - Citizens.

Lessons learnt and their implications

Summary

Communication in plain language

The example provided of using plain language when communicating with patients and citizens instead of language they do not understand is good and could be transferred to other countries. (Assuming this refers to the "Health profile")

Planning of prevention using data

Use of the available "gold mine" of data (through prediction models?) to identify those who would gain from prevention interventions would seem to be very meaningful and valuable. It could be considered to go to the real world to ask people about what is going on with respect to COPD or other areas of prevention.

Recommendations for the host region

It is advisable to use the awareness of the citizens by involving them in the region's innovation-related activities. In the Netherlands, for example, there are two ways of doing so: by involving (1) boards of clients that each healthcare provider have established and/or (2) involve the national federation of patient groups and/or associations of patients (patient groups) themselves.

Recommendations for other ITHACA regions

Holland also runs a "rockstart health care" initiative, with a whole model of ownership and membership and access to all those parties around healthcare. It has particular focus on companies, so maybe there is something to learn from the Dutch examples.

6.2.4 Theme D: Innovation in policy and practice, dissemination and transferability

What the host region has done

Summary

Region Zealand has developed great platforms that could and should be used as a springboard or launch pad to finish what would seem to be theoretical work in the field of innovation. The initiatives taken should be scaled through implementation.

The team is somewhat puzzled by the talk of lack of money and resources considering that the country is one of the richest nations on the planet. In contrast, Slovenia gives 260 euros per month and almost nothing else to people who are on social care. This is a laughable amount of money.

The region has organised a very good EEPE. Instead of only focusing on rational healthcare issues, irrational parts such at the cultural dimension such as the concept of Folk High Schools and singing has been included also. This has made us think about what makes us humans. When you are healthy, the value in life comes from enjoyment of life, from things that are sometimes not written down.

Strengths, areas for improvement and gaps

Strengths

- The region has developed a good framework for doing innovation and undertaken a number of good projects. Some projects appear very advanced, other projects are less scientific and less advanced but more engaging.

Areas for improvement and gaps

- The team has been wondering during the EEPE: Where are the patients? ZD can be better at including patients in their innovation cycles. The quote of the day goes to Claus: “we are all patients but some of us are not on the hospital right now”.
- Not only patients were missing. The delegates did see the angle of other users, like doctors, the nurses or the social workers. The issue is about involvement. If clinical professionalisms is not being involved into great innovation ideas, the clinical staff are not going to use it.

Good practices - and potential for transferability

The delegates have seen a number of good projects. Some of these are highlighted below:

- “One entry”: The advantage of this instrument is that you have a simple point of entry to the region for private companies rather than yourselves having to find the relevant organisational unit in the region among a large number of units. Being required to go through this one entry point reduces the power of the companies (if they do not want to play by the rules).
- Copenhagen Health Tech Cluster: Identifies health challenges and needs of the region and municipalities, gives companies knowledge about the market for healthcare solutions, and ensure that companies have the opportunity to develop and test new solutions in collaboration with practice in hospitals and municipalities.
- Health Profile.dk: There is a tendency in society to overcomplicate matters. As a response to this, the website Health Profile.dk provides simple answers and advice to questions from citizens and patients.

- SOSU Zealand's Centre for Welfare Technology: A unit where students, course participants and employees in within the sector for training of healthcare and social assistants are being prepared for the use of welfare technology.

Recommendations for the host region

- Involvement of clinical staff such as doctors, nurses and social workers in the development of innovative solutions. If this is not done to a high degree, there is a risk that the solutions developed will not be understood, appreciated and used/implemented.
- The innovation platform developed by Region Zealand could be better used as a springboard or launch pad to scale, to move from what would seem to be somewhat theoretical work in the field of innovation in some cases to practical solutions to be implemented on a large scale.

6.2.5 Theme E: Evaluation and impact

What the host region has done

Summary

A series of innovation-related policies and strategies have been developed. While this is good, it may also imply a challenge of linking them and aligning their objectives. Some strategies are not clearly linked to health, hence a limited presence of health targets and indicators. This may make it difficult for businesses and stakeholders to know how to involve themselves with a view to contributing towards meeting the region's health objectives.

The region is already very focused on evaluating itself when implementing new policies, strategies and activities. There is a large scope for using the large amount of available data for impact assessment at the strategic level.

Strengths, areas for improvement and gaps

- A number of strategies have been developed. This can be considered a strength but can also be a weakness in some cases. For example, it may be difficult to link them and align objectives between the strategies. It is understood that a new single strategy is to be developed.
- The health agreement (between the region and municipalities in the region) is very interesting. The parties involved tried to use a triple helix approach but the team appreciates that this is complex. Nonetheless, the region and municipalities managed to develop this strategy and agree on funding and procurement related to it. This is an achievement.
- Availability of data is a strength in the region.
- The involvement of GPs (in "Shared Medication Card") is an example of a national policy to monitor and manage prescription of medication that has been implemented at regional level.
- Strong clusters using indicators to assess performance of the stakeholders involved are observed.
- A number of actions already undertaken have a focus on evaluating impacts.

Gaps

- There has been limited focus on prevention – at least in the presentations made during the EEPE

- Some strategies are not linked to health and correspondingly there is a limited presence of health targets/indicators. This may make it difficult for businesses and stakeholders to see, which goals the region wants to focus on and therefore difficult for them to link them to strategy and get access to funding. However, it is understandable that it is difficult to use strategy to achieve this aim.

Areas for improvement (opportunities)

- Use of prediction models to target individuals has been initiated in the region. Once experience has been gained this may be used as a basis for targeting whole population groups through population strategies using the large amount of data available (experience from US). This may also entail moving from a care approach to a health approach.
- One could try to involve more end-user experiences in the development of innovative solutions, although this may be difficult.
- There is scope for using the large amount of available data for impact assessment at the strategic level.
- One may consider a shift from the current focus on disease management to more preventive activities.
- When shifting to a value (outcome) based approach mix a paper performance approach to an outcome approach. The region has a very developed data infrastructure. Data generated from this could support this approach. It takes a lot of time to make this change. Evidence from the US shows that it took 10 years to measure outcome as a basis for a "pay for outcome" approach.

Good practices - and potential for transferability

Among the finding above, some may be considered as best practice:

- The health agreement between the region and 17 municipalities in the region. It is generally a challenge for such parties to enter into such agreement to work towards common goals given their different and complementary responsibilities. They managed to develop this strategy and agree on funding and procurement related to it.
- The involvement of GPs (in "Shared Medication Card") as an example of a national policy to monitor and manage prescription of medication that has been implemented at regional level.

Lessons learnt

Imbedded in the findings under "Good practices - and potential for transferability" above.

Annex 1 Facts about Region Zealand

Overall information

Region Zealand is one of five regions in Denmark and provides services for 825,893 citizens. With more than 15,000 employees and an annual budget of about EUR 2.3 billion, Region Zealand is the largest workplace in the region. It is governed by the Regional Council, which consists of 41 politicians who are directly elected for four years.

The Region is responsible for providing health services such as primary care, psychiatry and hospital services to its citizens. Additionally, health innovation is an important area of action in the region as health innovation provide benefits for citizens and enterprises alike.

Region Zealand has over the past four years invested heavily in new technical infrastructure and organisation of databases on patient treatment, analysis of patient data, and use of the conclusions for the improvement of operations through Lean and similar projects aimed at enhancing effectiveness and efficiency in treatment of patients.

As to demographics, the general trend in the region is that small islands and peripheral municipalities are expected to have significantly higher proportions of older people than the national average in the future (20% higher in 2020). By contrast, the municipalities in and around the urban centres are expected to have lower proportions of elderly. This is not least because many major educational institutions are located in the larger cities of the region.

Region Zealand in numbers:

- Region Zealand has approximately 150,000 hospital patients pr. year (2015);
- In Region Zealand 20% of the overall citizens are elderly (+ 65 years) corresponding to 165,178 citizens (2015);
- 81% of the elderly citizens suffer from 1-3 chronic disease, corresponding to 134,000 citizens (2015);
- About 14 % of the elderly citizen receive some sort of home care (+ 65 years) corresponding to about 23,124 citizens (2015).

Better coordinated patient pathways – a key challenge

Since 2011, Zealand Denmark has worked towards better-coordinated patient pathways between heath providers to reduce the number of unnecessary hospitalization and hospital readmissions of especially elderly patients with chronic diseases.

Patient pathways in the Danish health system have often been criticized for not being coherent, particularly between the primary and secondary care. The lack of coherence and continuity in the patient pathways is often attributed to lack of mutual understanding between health providers, lack of information exchange on patients' health conditions and inadequate communication systems. Various initiatives have been implemented since 2011 at a national and regional level to seek improvements.

Region Zealand has – in collaboration with the 17 municipalities of the region – worked towards implementing solutions that facilitate better patients' pathways (e.g. "The elderly medicalised patient" - "Den ældre medicinske patient" 2011-2015 and "Follow-up follow home solution" – "Følge-Op Ordningen" 2012-current date). This has led to some improvement in the

reduction of hospital readmissions but with the continued challenges that protocols and information pass with difficulty between the different systems of hospitals and municipalities. Information get lost and are one of the main causes for errors in coordinating and preventing against hospital readmissions.

The Region and its municipalities therefore now focus on overall improvement in standardised communication pathways that facilitates understanding and better exchange of information especially with and about patients with chronic diseases.

Annex 2 Healthcare in Denmark

Overall statistics

Healthcare in Denmark is largely financed through local (regional and municipal) taxation with integrated funding and provision of health care at the regional level.

In 2014, the Danish healthcare expenditure amounted to 10.6% of GDP, which is more than the OECD average of 9.0%. Approximately 84% of healthcare expenditure is publicly financed (2015). Life expectancy in Denmark has increased from 77.9 years in 2005 to 80.6 years in 2015. Danish women have a higher life expectancy (82.5 years in 2015) than Danish men do (78.6 years in 2015).

There is one doctor for every 294 persons in Denmark.

Primary care

Most primary care in Denmark is provided by general practitioners who are paid on a combined capitation and fee-for-service basis in a similar way to those in the United Kingdom for example. The regions determine the number and location of general practitioners, and their fees and working conditions are negotiated centrally between the physicians' union and the government. The municipal health services provide health visitors, home nurses, care homes for elderly and school health care.

Secondary care

Hospital care is mainly provided by hospitals owned and run by the regions. This is similar to the model in other Scandinavian countries.

There are few private hospitals, and they account for less than 1% of hospital beds.

Central government

The central government plays a relatively limited role in health care in Denmark. Its main functions are to regulate, coordinate and provide advice and its main responsibilities are to establish goals for national health policy, determining national health legislation, formulating regulation, promoting cooperation between different health care actors, providing guidelines for the health sector, providing health and health care-related information, promoting quality and tackling patient complaints.

The Danish Quality Model, based on the Institute for Quality and Accreditation in Healthcare was introduced in 2005 and run in cooperation between Danish Regions, the Ministry of Health, the Health Protection Agency, Local Government Denmark (LGDK), the Danish Pharmaceutical Association and the Danish Chamber of Commerce.

In April 2015, it was announced by the health minister and the president of the organisation Danish Regions that it was to be abandoned. The argument was that quality work had to be simplified and focused. The time had come to strengthen it by putting the patient at the centre, rather than focusing on compliance with a variety of standards. Accreditation has been justified and useful, but we move on. A number of initiatives have since been taken to this effect.

Local government

The five regions are responsible for hospitals and general practitioners. They are financed mainly through income taxes.

The municipalities have long had responsibilities for nursing homes and care services. Local political accountability to a population with a large proportion of elderly people means that these services get political attention. The level of satisfaction with the health system in 1997 was greater than in other EU countries, including some with larger health care expenditures per capita. In 1988, a law was passed limiting the construction of new nursing homes and nursing homes were converted to single-occupancy rooms. From 1997, all new housing for older people have been required to have at least a bedroom, sitting room, kitchen, and bath.

eHealth

Denmark is one of the world's leading countries in the use of health care technology. Virtually all primary care physicians have electronic medical records with full clinical functionality. Practitioners use Electronic Medical Records (EMR) and Electronic Prescribing to exchange clinical messages (EDI) using the MedCom network. Despite the high adoption levels, the reality is that Denmark for several years has suffered from eHealth system fragmentation, which has led to eHealth's inability to reach full potential in delivering quality healthcare service.

The Regions of South Denmark, Region North and Central Region Demark have implemented modern and coherent EMR's with a number of modules. Larges coherent EMR installation is in the Central Region of Denmark. The system is delivered by the Danish company Systematic. The system is run centrally and used by more than 20,000 users at all 17 hospitals.

In an attempt to unify their fragmented e-health network, the region on the island Zealand (Capital Region and Region of Zealand) have started using a common EMR in 2016 – the Health Platform (supplied by the company Epic. The running in of this IT platform has been faced with a number of teething problems and is still struggling to show its full benefit.