

Healthcare DENMARK

INNOVATING BETTER LIFE



Activity
Productivity in Danish hospitals on the rise

Healthcare expenditure
Learn about the solutions that help cap healthcare expenses

Patient satisfaction
Explore the Danish approach to a coherent healthcare system

A portrait of Her Royal Highness Mary, Crown Princess of Denmark. She is a woman with long, wavy brown hair, looking directly at the camera with a slight smile. She is wearing a light-colored, textured cardigan over a white top. The background is a bright, out-of-focus interior space with a window showing greenery outside.

Her Royal Highness Mary,
Crown Princess of Denmark.
Patron of Healthcare DENMARK

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In Denmark our focus on putting the patient first – combined with efforts to improve efficiency and quality – has resulted in a wide array of innovative solutions. I sincerely believe Danish solutions and expertise can have a positive impact on global health.

The case of Denmark



Throughout the world, governments are facing the same challenge: How can we provide increasingly sophisticated healthcare to a population that lives longer, suffers from an increasing number of chronic illnesses, and expects easy access to treatment?

In Denmark, we have increased public satisfaction with healthcare services and improved productivity and quality in the sector, while successfully keeping health expenditures in check.

How did we accomplish this? Most importantly, we place the patient at the center of attention and design our healthcare sector to support this idea. We combine sophisticated technology and transmission of data with a strong focus on skills and coherent processes. We prioritise design and quality and innovate by involving users and public-private cooperation. Combined, these trademarks lead to cost-efficient and user-friendly care.

In short, our success is the result of a well-functioning public sector supported by innovative companies that provide the technologies, products, and expertise which make it possible. We are not perfect, but we have come far and continue to push forward to tackle modern healthcare challenges intelligently.

Danish healthcare is not exclusively for Danes: Many years of global presence show that our healthcare products and solutions create value internationally. Danish expertise and products are used every day in ambulances, medical clinics, hospitals, and nursing homes across the world.

This magazine presents ideas and solutions that exemplify our results and experiences. The following pages offer a brief insight into the Danish healthcare sector, its structure and ways of working, and just as importantly, the links and collaboration that tie the sector together into one coherent patient pathway.

We hope to inspire you and would like to invite you to Denmark to learn more.

Mariann Fischer Boel

Chairman

Healthcare DENMARK

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Learn more about Healthcare DENMARK and our services.



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In the area of prehospital treatment, Denmark is leading with advanced ambulance equipment, which virtually moves the hospital entrance to the ambulance. The IT and medical equipment in the ambulance and at the hospital are designed to work together and share real time information.

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Denmark is among the EU countries with the highest patient satisfaction and with the lowest GDP spent on healthcare. Learn how Danish hospitals keep the average length of stay low and how hospitals are integrated with other healthcare services to ensure coherent patient treatment.

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Denmark is successfully transforming healthcare to reduce the need for hospitalization and to increase focus on patient empowerment and prevention. A vital element of this is telehealth solutions, which offer healthcare professionals a more frequent interaction with patients at home, and secure a quick and efficient flow of data and health advice.

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Elderly and disabled citizens often value the freedom of living in their own home and to remain as independent as possible. A broad spectrum of technical solutions makes it possible to support living at home while remaining in touch with specialized health professionals.

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A key element in Denmark's healthcare transformation is the investment of more than EUR 5.6 billion in new hospitals and the upgrading of existing facilities. Almost one-third of the current Danish hospital capacity will be modernised to meet future needs. This include inventing new approaches in areas like logistics and patient involvement.



Healthcare DENMARK - An open invitation

Healthcare DENMARK is your gateway to Danish healthcare expertise. Our mission is to communicate knowledge and insight into the specific solutions and stakeholders that have made the Danish healthcare system one of the leading and most efficient in the world. On our website healthcaredenmark.dk, you can find information about Danish companies, organizations, and initiatives.

We would also like to extend a warm welcome and invite you to come experience Danish solutions in practice and meet the people behind. Thanks to our large network, we are able to arrange visits tailored to your specific interests and help plan logistics, such as local transportation and interpretation.

About us

Healthcare DENMARK is a public-private partnership with a national, political mandate to promote Danish healthcare solutions and competencies abroad. The partnership is a framework for linking international partners with efficient Danish solutions and does not represent any individual company or product. Healthcare DENMARK is funded by the following public and private partners: the Ministry of Business and Growth, the Ministry of Health, the Ministry of Foreign Affairs, Danish Regions, Region of Southern Denmark, the Confederation of Danish Industry, the Danish Chamber of Commerce, COWI, Falck, KMD and Systematic.

Healthcare DENMARK is privileged to have as patron, Her Royal Highness Mary, the Crown Princess of Denmark.



Hans Erik Henriksen
CEO
Healthcare DENMARK

The Danish healthcare system

The Danish healthcare system is primarily publicly funded and based on free and equal access to healthcare for all citizens. It is a key priority that patients experience a coherent patient pathway, and to ensure close and efficient collaboration across the health sector.

The National level is where health policy takes its form.

The Ministry of Health draws up guidelines for general planning and operation of healthcare services.

The Regional level consists of the five Danish regions, which are the main service providers in the healthcare system. Their healthcare responsibilities include hospital and psychiatric treatment, and parts of the primary healthcare system such as general practitioners and specialist doctors.

The municipal level provides rehabilitation and general disease prevention as well as home nursing and homes for elderly citizens with care facilities and associated care staff.

Quality of life in Denmark

According to the EU, Denmark ranks among the leading European countries in terms of the population's satisfaction with their lives in general and with healthcare services (Quality of Life in Europe 2012 – ranking among the 27 member states):

Life satisfaction
and happiness: #1

Satisfaction
with health: #2

Access to
healthcare: #2

Health
services: #4

At the doctor's

The general practitioner is the most important gatekeeper in the Danish healthcare system. GPs handle preventive healthcare, treatment, and coordination of services from various health professionals – for example medical specialists and physiotherapists. Danes can freely choose their own GP. On average, Danes are in contact with their GP or an emergency doctor 7.5 times per year. Comprehensive access to digital patient data helps GPs in their work and creates a unique data link between GPs, patients and other parts of the healthcare sector.

The GP as a gatekeeper

In addition to directly treating their patients, GPs in Denmark have a role as gatekeepers, who can refer their patients to other parts of the healthcare system. Upon consultation, patients may be referred to a hospital, to treatment by a medical specialist, or to preventive services such as weight loss or smoking cessation. However, most contacts are concluded at the GP's and only one in ten GP contacts in Denmark result in a referral to another part of the health system.

Comprehensive digital access

GPs keep comprehensive electronic medical records on patients. Data is available through the GP's internal systems and from large parts of the other health services patients have been in contact with previously (e.g. hospital admissions, consultations with medical specialists, laboratory test results, as well as medication records). In addition, GPs can use the Danish e-health portal, sundhed.dk. Through the portal, GPs can extract an array of patient data from hospital records. The system works irrespective of which hospital the patient has been admitted to. As a result, GPs are able to include the patient's complete medical history in their assessment.

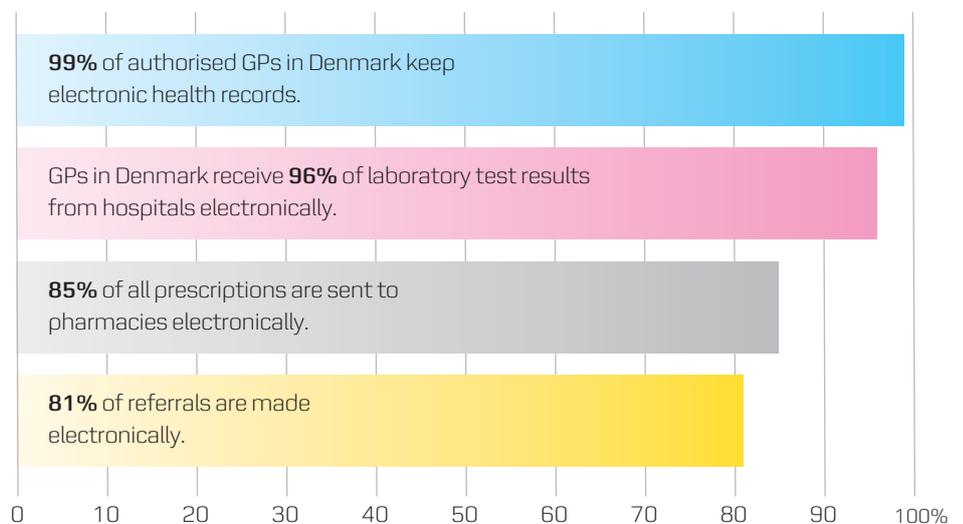
When a patient is admitted to hospital, the various physicians who attend to the patient have electronic access to updated medical records and to results

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The Danish information system is the most efficient in the world, saving doctors an average of 50 minutes a day in administrative work.

Commonwealth Fund
 cited in New York Times, 2010

of all examinations and tests. When the patient is discharged after treatment, an electronic discharge summary is created and sent to the patient's GP.

Sundhed.dk also provides patients with similar digital access to their own



Mr. Andersen's case

health data. The key to this information is the so-called 'NemID' digital signature, which is assigned to all Danish citizens based on a person's unique civil registration number.

Electronic record of medication and electronic prescriptions

Like all other health professionals, the GP has access to the Shared Medication Record, an electronic registry containing all Danish citizens' medicine information. This allows health care professionals anywhere in the sector to see all medication which has been prescribed to the patient by the GP, medical specialist or hospital. The majority of these prescriptions are issued electronically to a central server, making it possible for the patient to pick up their medication from any pharmacy in Denmark. The same principle applies to patient referrals, which are also stored centrally and forwarded electronically from the GP to a specialist doctor, municipality, or hospital.

Summing up

1 Electronic health records and shared databases enable GPs to see most patient data from the rest of the Danish healthcare system. This ensures a high quality of treatment.

2 The GP concludes all treatment for nine out of ten patients, ensuring resource efficiency.



Access to electronic medical records

Sundhed.dk is a public e-health portal that collects and distributes health information and provides access to electronic health records for citizens and health-care professionals. The Danish e-health portal uniquely brings the entire Danish healthcare sector together on the Internet and provides an accessible setting for citizens and professionals to meet and efficiently exchange information.

By serving both citizens and professionals, sundhed.dk enables the two to cooperate on the basis of the same data. This empowers the citizens and gives healthcare professionals tools that continuously improve quality in care.

This means that if Mr. Andersen has pains in his joints, he can prepare himself before a consultation, using information in the e-health portal. If Mr. Andersen is referred for a hospital examination, the physicians, nurses, and other healthcare professionals can access information about the treatment Mr. Andersen has previously received from his GP.

Two weeks after being discharged, Mr. Andersen can access hospital information through the e-health portal. If later, for example, Mr. Andersen is diagnosed with arthritis, through Sundhed.dk, he can read more about this condition and join a patient network. This way, Sundhed.dk helps empower patients and create awareness about their illnesses. Sundhed.dk also provides the basis for active participation in treatment and self-care.

Prehospital treatment

In Denmark, acute calls for an ambulance are answered by a health professional who can help assess the precise need for assistance. If an ambulance is dispatched, the ambulance personnel can commence treatment already during transport to the hospital. Dialogue during transport with medical specialists at the hospital ensures a fast and accurate diagnosis. All test results and observations taken in the ambulance are transferred electronically in real-time to specialized staff at the hospital.

Emergency calls are assessed by specialists

Personnel at the emergency call center are trained to assess emergency calls to ensure that citizens receive the most effective help. The right qualifications ensure the personnel can assess whether an ambulance is required immediately and whether there is a need for other assistance – for example, an emergency physician, paramedics, an ambulance helicopter, or first aid.

Electronic medical record and telehealth in the ambulance

If the patient is picked up by ambulance, the paramedic will keep an electronic ambulance record of all observations, treatment, and medication. Registration and transfer of patient data from the ambulance enables dialogue with specialists at the hospital, ensuring that acute treatment can begin already in the ambulance and that the right hospital staff is ready to continue treatment as soon as the patient arrives.



Specialist support during transit

Ambulance personnel can communicate directly with specialists during transit. For example, they can send electrocardiograms and other readings directly to cardiologists around the country. As a result, it can quickly be evaluated whether a heart patient for example has to be directly transferred to a specialist heart center. Telehealth solutions have been part of the Danish ambulance service since 1999.



Denmark is at the leading edge of eHealth uptake in Europe. I believe other Member States have much to gain from taking inspiration from the Danish eHealth model, rather than re-inventing the wheel.

**John Dalli, European Commissioner
for Health and Consumer Policy**

Mr. Andersen's case



Electronic ambulance record transfers patient data to the hospital

At 10:36 a.m. the emergency call center receives a call from Mr. Andersen, who is experiencing severe chest pain. An ambulance dispatches immediately and arrives at 10:43. Treatment commences in the ambulance, while contact is made with the cardiology department at the local hospital.

Through telehealth communication, the cardiologist diagnoses a blood clot, and Mr. Andersen is therefore taken directly to the cardiology department instead of being taken to the nearest emergency room. At 11:30, Mr. Andersen arrives at the cardiology department, where staff is prepared and ready to conduct a balloon operation. Half an hour later, Mr. Andersen is in the ward after his operation. By 2:00 p.m., he is back in his own clothes, enjoying a cup of coffee. A few days later, Mr. Andersen is discharged with no permanent injury.

Summing up

1 Use of health technology for collaboration between the emergency call center, the ambulance, and the specialists at hospital enables diagnosis and acute treatment already at the prehospital stage.

2 ICT solutions during the pre-hospital stage save lives due to early treatment in the ambulance and a well-planned reception of the patient by the hospital staff. This process is based on patient data being transferred from the ambulance and on efficient communication between a number of healthcare stakeholders.

3 Trained professionals at the emergency call centers and in the ambulances save lives, time, and resources in the rest of the patient pathway.

Prehospital facts in cardiology

Around
20,000
cardiological
teliagnoses
are made in Denmark
every year.

75%
of all patients with
an acute need for
heart treatment
arrive directly at
a heart center.

By using telehealth,
patients requiring acute
treatment at a specialist
cardiology department
are treated, on average,
1 hour
earlier than would
be possible without
telemedicine.

For heart patients,
treatment one hour
earlier means a
10%
relative reduction in
mortality and a
10%
relative reduction
in the risk of developing
heart failure.

Efficient and innovative hospitals

Denmark has the shortest average admission time per patient in the European Union. One significant reason for this is persistent efforts to use a gentler operating technique. Another is the consistent focus on telehealth treatment of patients, who as a result can be discharged for treatment in their own homes. Medical devices are also increasingly integrated in hospital building structures, which support efficient healthcare service. Partnering on this type of projects has given Danish companies great experience in designing simple and useful solutions for hospitals.

Early discharge of patients

In 2000, the average length of stay in Danish hospitals was 6.2 days; in 2010 it dropped to just 4.6 days. As a result Denmark has the shortest average length of stay in hospitals in the EU. Danish hospitals continuously focus on early discharge. This enables patients to return home to well-known surroundings more quickly, and it ensures an appropriate use of resources in the healthcare sector.

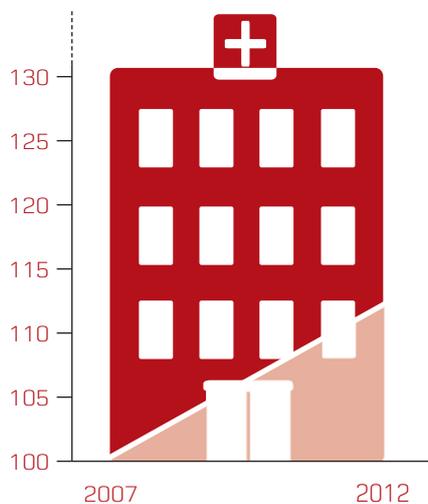
A baby born without complications is discharged after just a few hours. First-time mothers are offered to stay at a patient hotel. Mothers who have given birth before and who experience no complications are discharged. Subsequently, locally based healthcare professionals take over.

Telehealth solutions also make it possible to discharge patients earlier for treatment and monitoring in their own homes – even those with several chronic diagnoses. One of the main reasons for an early discharge is the focus on cohesion in the patient pathway through

close collaboration between hospitals and local healthcare professionals.

Enhanced quality and productivity

Danish hospitals increased their produc-



Productivity in Danish public hospitals rose by 12% from 2007 to 2012.

tivity by 12% from 2007 to 2012. In the same period, activity increased and annual growth rates in health expenditures declined. Persistent efforts to streamline and optimise procedures and improve treatment quality have shortened the length of stays and reduced the number of readmissions. These and other efforts have contributed to the increased productivity in the Danish healthcare sector.

Efficiency has also been improved by enhancing communication – for example, by using information screens at hospitals, which prepare patients for visits to the laboratory. Such initiatives help staff save time and can provide patients with a better treatment experience. Furthermore, Denmark is the first country ever to establish national standards for interoperability of personal health technologies that rely on the guidelines from the Continua Health Alliance.

Efficient logistics at the hospital

One example of efficient logistics in Denmark is the world's first fully automatic sterile center, which was implemented at Gentofte Hospital in 2011. The center sterilises surgical instruments after use and sorts and stores them. Whenever a surgical operation is scheduled, relevant instruments and single-use devices are ordered through the hospital's internal information system. Subsequently, the sterile center seeks out the requested instruments and loads them onto a transport cart for delivery to the opera-

Average length of stay in hospital



Denmark has the shortest average length of stay in hospitals in the EU: 4.6 days in 2010. The average length of stay has dropped from 6.2 days in 2000 to 4.6 days in 2010. During the same period, the percentage of patients that had to be readmitted also dropped by 4.2%.

*Average length of stay.

Source: OECD

ting theatre. Back in the sterile center, robots empty the transport carts and prepare them for use again. In addition to streamlining work processes, the installation positively impacts health and safety at the storage facility as robots now do all the heavy lifting.

A long tradition of health registries and databases

Denmark has a long tradition of thoroughly monitoring and registering when and why citizens are in contact with the healthcare sector. Some databases go back more than 30 years.



Denmark has impressive quality monitoring and improvement initiatives. It has extensive databases on the processes and outcomes of care and a strong agenda to strengthen its information infrastructure; it can also boast many local clinical guidelines, national guidelines and standards developed as part of disease management programmes and pathways

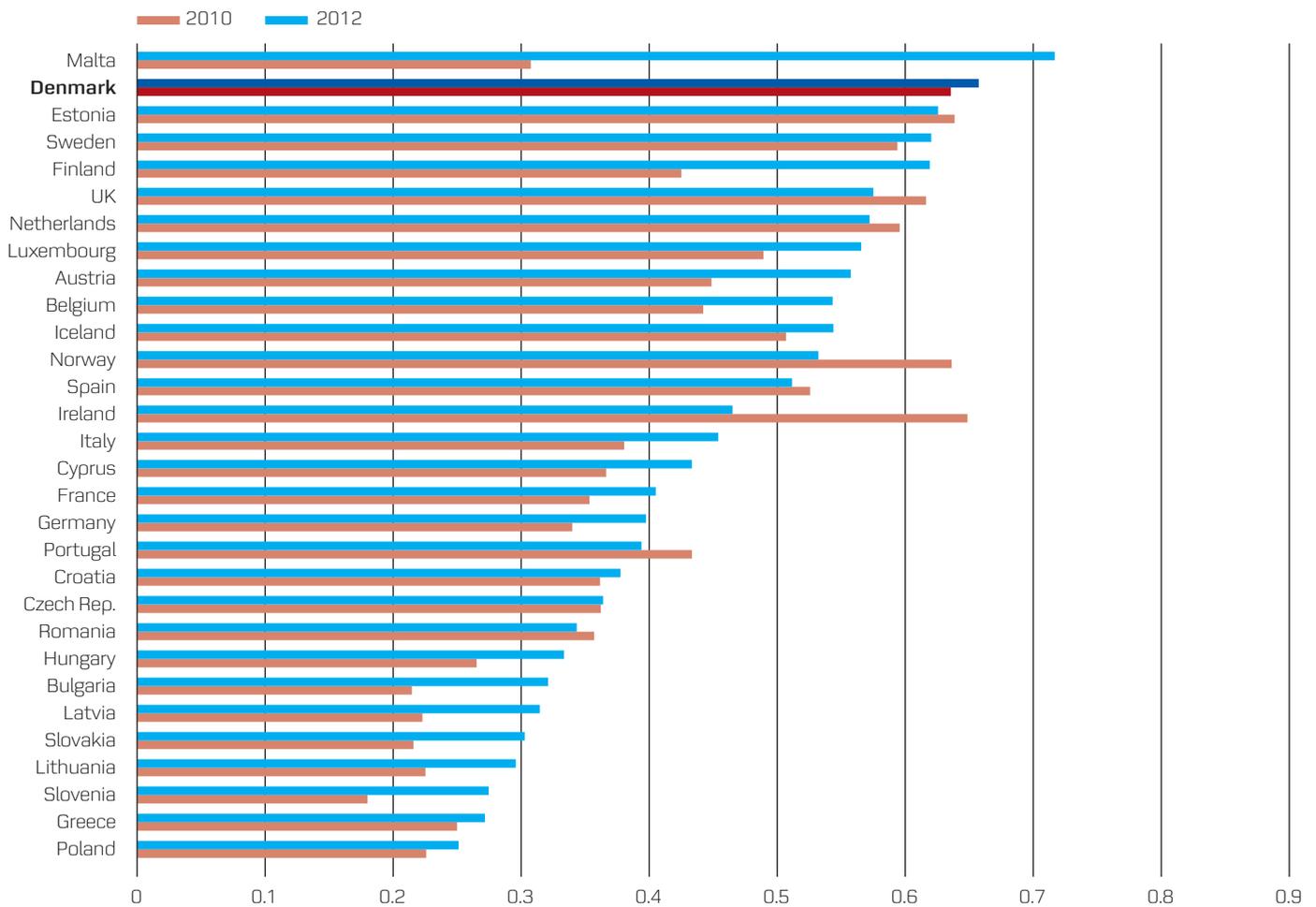
OECD reviews of healthcare quality:
Denmark, 2012

A network of more than 50 national databases has been established containing information on more than 60 different areas of disease and prevention. The use of a unique and personal civil registration number makes it possible to trace patients across various databases, which creates great opportunities for clinical research and development. An excellent example of this is the population-based national biobank. The biobank contains collections of tissue, blood, and other biological samples from humans and constitutes a virtual gold mine of information for research and healthcare.

Denmark on top

The vision for Danish healthcare is to provide coherent clinical pathways, for example, when patients are hospitalised. Digitalization is a key element in achieving this goal by giving healthcare professionals in hospitals access to any patient’s data and test results. According to the EU’s e-health deployment indicator, Denmark is one of the e-health deployment front-runners. The figure below shows the deployment rates across Europe and the general development towards the increased use of e-health solutions.

For many years, the development of e-health in Denmark has been based on the cooperation of all involved parties: the government, the regions, the municipalities, and the system providers. This public-private cooperation has brought innovation and implementation to a level where nearly all basic information from the various sectors has been digitalised and made shareable. In recent years, efforts have been concentrated on integrating and streamlining the way patient data is accessed and shared across the healthcare sector to make all relevant patient data accessible wherever and whenever needed.



Dissemination of e-health at hospitals in the EU(+3).

Source: European Commission & OECD: Benchmarking Information and Communication Technologies in Health Systems, 2013.

Mr. Andersen's case



Central Denmark Region

Common e-health platform across 17 hospitals

In 2010, the Central Denmark Region began implementing one common e-health platform, which supports more than 10,000 users every day in 17 hospitals, including both somatic and psychiatric hospitals. All 17 hospitals can easily share information within and between the hospitals. The system creates a complete overview of patient data with information integrated from different hospital units.

If Mr. Andersen is admitted to the nearest hospital with a fractured hip, and he is later moved to another hospital with a specialist orthopaedic surgery department for hip replacement, physicians from the two hospitals and other specialist groups can see from the common records system what treatment Mr. Andersen has received. Furthermore, different modules of the e-health platform support important functions in every hospital to ensure an efficient workflow, optimal support for hospital personnel, and increased patient safety through standardisation of clinical pathways in treatments. For example, Mr. Andersen's medical record will describe what X-rays and tests are required before the operation and what rehabilitation he should have after the operation. Modules in the e-health platform also include administration of patients, handling of laboratory work, medication administration, along with efficient booking of procedures, hospital resources, and gathering of business intelligence data. This type of flexibility in the e-health platform allows the region to increase coherency and quality of treatment for patients.



Summing up

- 1** High quality healthcare and financial benefits can be achieved if electronic health records are shared across specialist groups, hospitals, and regions.
- 2** Significant human and financial benefits can be achieved by designing buildings and work processes efficiently, with a focus on occupational health and safety.
- 3** Shorter admission times at hospitals cut costs and can be achieved through close co-operation with the rest of the health-care sector and by supporting early discharge to patients own homes.

Treatment at home

Denmark is a global telehealth leader. Telehealth solutions help meet demographic challenges with aging citizens and patients with chronic disorders. An increasing number of solutions are developed and designed to make it possible for patients to be discharged to their own homes, even though they still require treatment, monitoring, and rehabilitation. Many telehealth solutions cut across different parts of the healthcare sector.

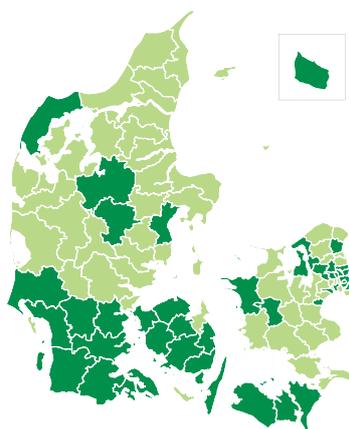
Monitoring from a distance

When telehealth solutions are introduced, focus is primarily on improved quality of life for patients. Numerous patient groups experience significant advantages from being closely monitored while they are in their home. These include patients with ulcers, chronic obstructive pulmonary disease (COPD) patients, and heart patients, who often feel more secure at home and do not have to commute to and from outpatient departments. Telehealth solutions not only benefit the patients in terms of avoiding unnecessary transportation; they are also cost-efficient for society as a whole. An example of both advantages is an ePatch for heart patients. After discharge from the hospi-

tal, the patient wears the patch for one to three days while it measures pulse and ECG. If the pulse is abnormal, the patch stores a 10-second ECG recording. The ePatch then sends the recorded data through a portal to the hospital. Here, a doctor can determine whether or not the heart rate calls for a reaction.

Telemedical ulcer assessment at home

A good example of Danish collaboration across different sectors in the healthcare sector is telemedical ulcer assessment. Municipal home care nurses take a picture of the patient's ulcers – typically, ulcers with complications in diabetes



Over the past years, telemedicine has increased substantially. Several full-scale projects are being implemented nationwide, enabling significantly more patients to be monitored and treated at home. At least 44 of Denmark's 98 municipalities have telemedical ulcer assessment.



The Danes have succeeded in deploying telemedicine, because all relevant stakeholders have been encouraged to join in.

Mobile Healthcare Information and Management Systems Society, 2012

patients or patients with poor blood circulation. The images are saved on a shared ICT system together with a description of the ulcer. Subsequently, on the basis of the images and descriptions of the size, healing, and infection of the ulcer, specialists at the hospital can assess whether the ulcer is getting better or new treatment is required. This effective collaboration, in which municipalities involve experts from hospitals, ensures that patients receive better treatment with both faster and better outcomes.

Rehabilitation at home

Many treatments and operations require subsequent rehabilitation. In this context, telehealth solutions enable patients to carry out rehabilitation exercises when it suits them but still receive professional guidance. One area where telehealth is widespread in Denmark is with COPD patients. After being admitted to a hospital, patients with COPD often need rehabilitative guidance. As a supplement to physical consultations with caregivers, online tools for rehabilitation are increasingly being implemented to prevent readmissions. Online dialogue-based tools provide caregivers in the municipalities with the ability to tailor rehabilitation programmes for their patients. This means that

Mr. Andersen's case

patients can do exercises at home with close guidance from healthcare professionals. The results are available online, and the caregiver can assess the data and adjust the exercises if needed. The municipality of Slagelse has made impressive results with this type of tool. Estimates indicate that 11 readmissions have been avoided in a time period of three months. In Denmark, a readmission costs between EUR 1,750 and EUR 2,000.

Hanne Rode, a specialised nurse in Slagelse says; *“One thing is the economic aspects. But the benefits are just as much linked to the fact that chronic patients can stay in their own home, where they feel safe and they can receive a treatment, which reduces complications. With this system we can train different skills and achieve goals, which empower the citizen. For me, this is the most significant gain.”*

Summing up

- 1** Videoconferencing and home monitoring reduce length of stays in hospitals.
- 2** Image exchange helps optimise cooperation among health professionals and ensures better cohesion in patient pathways.
- 3** Regular training for health professionals working with ICT is necessary.



TeleCare North – telehealth and empowerment

For most COPD patients, it is vital that their lung capacity is monitored regularly over a long period of time. This type of task is both time-consuming and resource demanding, for the patient and for the physician. COPD is therefore an area in which telehealth solutions can add value.

TeleCare North is a cross-sector collaboration to develop telehealth solutions for COPD patients. The partners are the 11 municipalities in Northern Jutland, the North Denmark Region, GPs in Northern Jutland, and Aalborg University. COPD patients are often hospitalised for long periods of time. The objective of the TeleCare North project is to monitor patients closely, adjust their medication and treatment, and thereby avoid hospital admission.

When Mr. Andersen agrees to take part in the project, he receives a small bag to bring home. The bag contains devices which enable him to measure his oxygen saturation, pulse, blood pressure, and weight a couple of times per week. His measurements are transmitted through a small tablet computer to healthcare personnel in his municipality or at the local hospital. Here, healthcare personnel monitor the data and if necessary provide further counselling to Mr. Andersen. By measuring his own health, Mr. Andersen becomes aware of what he can actively do to ease life with COPD – for example, the effects of exercise and the right diet on his oxygen saturation and pulse.

A large-scale project like TeleCare North, in which all stakeholders in the regional healthcare system collaborate across sectors, is unprecedented in Europe, making the project unique.

Supported living

Supporting citizens in remaining self-sufficient and independent is a very important element of Danish care for the elderly and the disabled. It is an ambition to help people as much as possible so they can remain in their own home or alternatively in supported accommodation. Allowing people an independent and empowered life optimizes well-being and result in significant savings for the care sector.

At home as long as possible

Every day rehabilitation is at the core of the Danish efforts to give elderly and disabled citizens a meaningful and independent life. With technological support schemes and empowerment

initiatives, citizens can remain in their own home for as long as possible. As a result of this focus, Denmark was awarded the European Public Sector Award in 2012.

Danish results show that the elderly can often do much more than they might first assume, provided that they receive the necessary support and guidance. Products such as 'paperless' toilets or ergonomic knives can ease daily life. Another example is an integrated ICT platform, which citizens can use to draw the curtains, set the kitchen worktop at the right height, and operate a hoist to get themselves into bed. Similarly, a QR-coded communication system can help people with mild dementia make coffee or operate the washing machine.

Ceiling hoist gives better communication

A number of tasks in elderly care have previously required two helpers to support the citizen – for example, when a



Denmark emerges as an example where good cooperation between government and other key stakeholders such as health professionals has speeded up the integration of personal health systems such as remote patient monitoring systems into healthcare delivery.

**Joint Research Centre,
European Commission, 2012**

person is lifted from one place to another. Using a ceiling hoist to move a person from the bedroom to the bathroom through rails in the ceiling only requires one care helper. This saves resources, but it also means the citizen only needs to keep eye contact with one person when being moved, promoting meaningful interaction and trust between the caregiver and the citizen.

User-friendly technology helps the elderly

A large number of Danish companies develop products and solutions for the elderly and the disabled. As a result new technological solutions are continuously being tested and implemented in the Danish care sector which can help elderly citizens cope on their own, while at same time saving time and resources. Generally, the elderly and disabled in Denmark are very willing to adopt new technology, providing it is easy to use and helps them to be more independent.

The Danish rehab companies are good at including the users in the product development phase.

88%

of Danish rehab companies always or sometimes include users in the product development phase.

The National Board of Social Services database includes around

30,000

different rehab products that are accessible on the Danish market. You can find everything from advanced hoists and hearing aids to ergonomic knives.

Mr. Andersen's case



The reversible bedsheet puts focus on health and safety

Occupational health and safety for health professionals is an important issue when designing and developing new care technologies. One product with a special focus on care personnel is the electric reversible bed sheet. This system helps to deal with heavy and very infirm patients confined to a bed. If, following a hip replacement, Mr. Andersen cannot turn in his bed, the nursing staff can just push a button to turn Mr. Andersen, pull him to the edge of the bed, or sit him up. This means that the nursing staff avoids most of the heavy lifting and that Mr. Andersen experiences being moved calmly and gently. It also speeds up the process.



Summing up

1 Developments in recent years in welfare and health technology provide elderly and disabled citizens with completely new opportunities to live more independently.

2 Investment in support schemes can yield significant financial and human benefits, if they make it possible for people to remain in their own home instead of having to move to a nursing home.

3 The elderly are generally happy to try new technology, as long as it is easily available and clearly improves their quality of life.

Rethinking the hospital

In the next 10 years, Denmark will invest more than EUR 5.6 billion in 16 new hospital projects. These include new greenfield projects as well as expansion of existing capacity. In total, the projects will modernise one-third of the current Danish hospital capacity. The goal is to ensure nationwide access to modern health services and to raise quality levels in the entire healthcare sector. Designing the new hospitals involves a broad collaboration with research institutions and private businesses in the health area.

The process of modernising Denmark's future hospital capacity has a focus on continued specialization and flexibility. The goal is to ensure flexible functions and capacity which can be changed, expanded, or reduced depending on future demand for treatment and care. Therefore, 20% of the costs have been earmarked for procurement and development, and realization of new equipment and new technologies for ongoing implementation.

Building tomorrow's hospitals

The new hospitals are built to provide a better and more cohesive patient flow, improved patient safety, efficiency, and quality. To achieve this, the number of beds at the new hospitals will be reduced by 20% compared with present levels, and outpatient treatment will be expanded by 50% from 2007 to 2020. This requires new technologies and more intelligent solutions to ensure cost-effective health solutions and shorter average length of stays. At the same time, the hospital layout will enhance communication between patients and their families, and the ICT infrastructure will play an important part in developing communication.

Releasing resources for treatment and care

Modernising Denmark's hospital capacity enables dissemination of the newest knowledge, technology, and best practices throughout the country.

Increasing digitalisation ensures efficient operation of core services in hospitals, with new work methodologies, technologies, and organisation. This releases resources for treatment and care, while also providing better health and safety conditions for personnel. For example, the new hospitals will have storage facilities for linen, utensils, medicines which are monitored electronically, enabling a real-time overview of what the hospital has in stock and where relevant devices are located. Inventory control systems will be integrated with procurement systems, which means utensils are always ordered and received in due time. Moreover, there will be a coupling to the electronic patient records, ensuring medication is always included in the patient record. Even laundries will have production data to monitor the amount of linen at both decentralised and central storage facilities.





Cases

Patient involvement in hospital construction

Denmark has a tradition for a high degree of user involvement in the development of new products and solutions. This also applies in the healthcare sector. Patients, families, managers, and employees were all involved in the planning process in the construction of a new psychiatric department at Vejle Hospital. It can be difficult to involve psychiatric patients in this type of process. Therefore, the Region of Southern Denmark has specialised in not only involving but co-creating with even very ill patients. Using anthropological studies from existing hospitals, challenges and improvement potentials were identified. For example, the study showed that the admittance process itself is very important for patients and that patients appreciate being able to move around freely. The process has resulted in clear visions and guidelines for the construction of the new psychiatric hospital.

Intelligent patient bracelets

In order to provide high-quality healthcare, it is important that each patient is at the right place at the right time. The increasing number of patients in the future will generate greater demands on logistics. Today, a lot of time is spent localising inpatients. Very often, this causes considerable waiting time for laboratory staff, physiotherapists and physicians. It can also lead to the deterioration of a patient's condition or, in worst instances, patient death. A future goal is to develop an electronic bracelet for patients with traceability and identification data. The bracelet will also feature staff-to-patient communication through short messages, as well as an option to integrate readings of vital signs. Traceability of patients, goods, and devices entails opportunities to improve patient safety, release personnel resources, and optimize operation efficiency at hospitals.



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