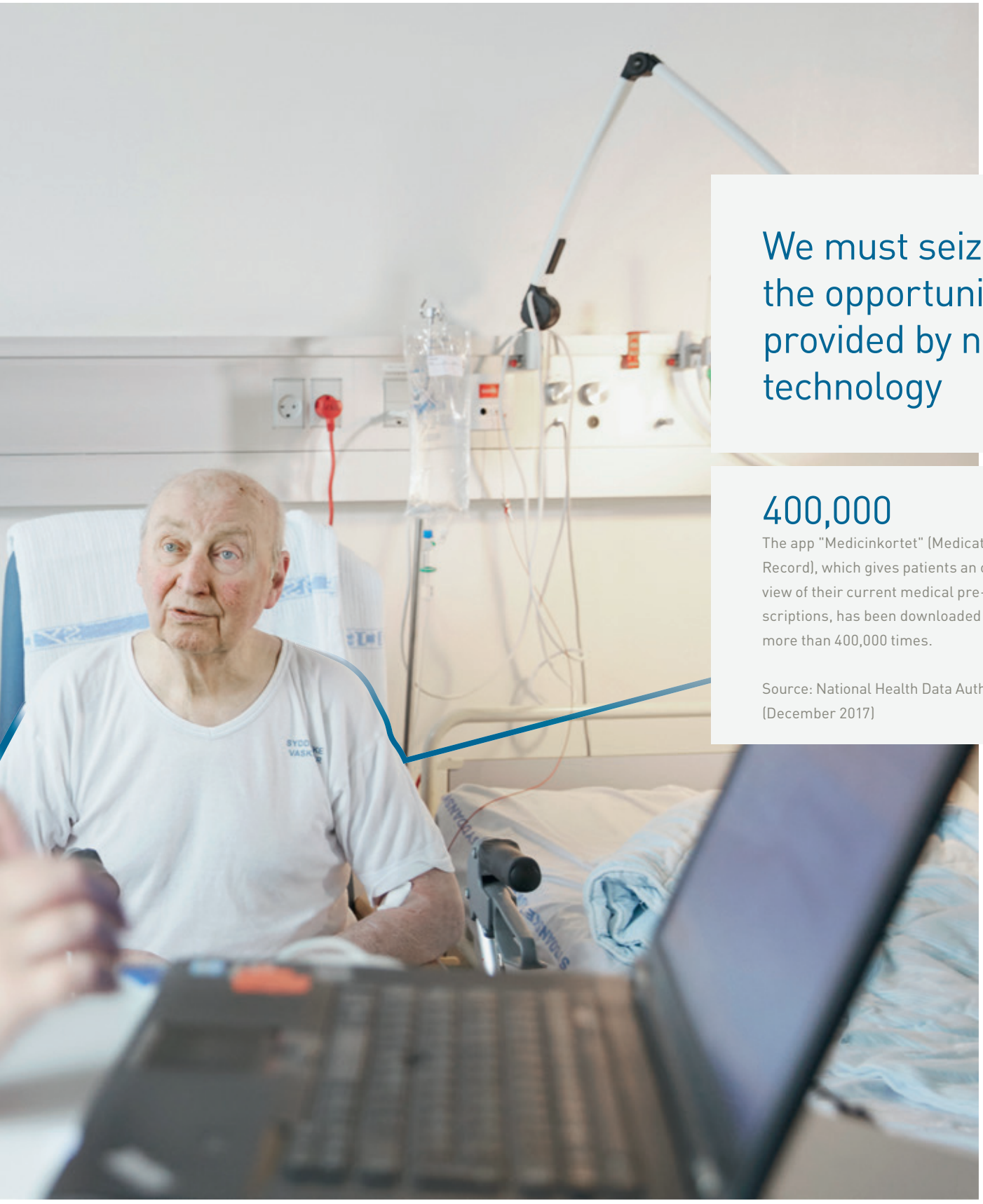
JANUARY 2018

A Coherent and Trustworthy Health Network for All

DIGITAL HEALTH STRATEGY 2018–2022

Denmark is a pioneer, also when it comes to e-health. We are the world leader measured in terms of the vast majority of parameters, such as IT systems at hospitals and GP clinics and digital communication between the segments of the health sector. Outside Denmark, solutions such as the Shared Medication Record (Det Fælles Medicinkort) and the Danish e-Health Portal (sundhed.dk) are highly acclaimed. This is well-deserved. Many digital solutions have been developed and implemented both nationally and locally in Danish regions and municipalities, and we can be proud of them.



We must seize the opportunities provided by new technology

400,000

The app "Medicinkortet" (Medication Record), which gives patients an overview of their current medical prescriptions, has been downloaded more than 400,000 times.

Source: National Health Data Authority (December 2017)

The task is to boost digital healthcare collaboration for every patient

Denmark has a sound foundation on which to continue digitising its health system. We have established digital solutions in Denmark that lead the way internationally. At the same time, it is essential that we work together to continue these developments. The aim is that patients should experience the health system as a coherent and trustworthy health betwork for all that is both inherently digital and inherently personal.

The Digital Health Strategy 2018–2022 arises from the 2018 financial agreements entered into by the Government, the Danish Regions and Local Government Denmark. The strategy must ensure the continued momentum towards a more holistic effort to enable hospitals, municipal health services, the GP's and other public and private participants throughout the health system to cooperate in an integrated network focused around patients. The overall aim of the strategy is to support the healthcare actors in taking responsibility for interconnecting the patient pathways across the individual interactions with the health care sector. Digitisation enables more tasks to be performed close to patients in a personalised and coherent health system, which looks at the person as a whole, not just at the individual diagnosis.

The strategy aims at jointly succeeding in providing cross-sectoral healthcare. Simultaneously, substantial efforts are being implemented locally and within the individual segments, which help achieve the strategy's goals for change. The regions are investing in developing and replacing the electronic health record systems and the municipalities are radically changing the way they use health data by implementing structured electronic care records The Common Language Platform project. The GP's are also in the process of further digitising and upgrading its IT - systems to facilitate GP interaction with patients and provide a better overview. The Digital Health Strategy is built on this and lays the groundwork for a joint digitisation effort for the entire health system. This joint effort and the local efforts are mutually vital to achieving strong digital coherence for patients across the health system.

The strategy defines five focus areas for achieving the objectives of putting patient needs first and making daily workflows easier for healthcare professionals. The strategy must help enhance the coherence of treatment and care for patients and relatives. Accordingly, we will strengthen the common digital foundation for the provision of healthcare across the sector. At the same time, the strategy aims to maintain and reinforce the security of personal health data to enable the safe and secure exchange of relevant data across the health sector.

The strategy sets out a goal of long-term change for each focus area as well as a number of specific large-scale and small-scale efforts, which the parties will jointly imple-

Data and digitisation – two sides of the same coin

This strategy solely involves digitisation and using health data as part of prevention, care and direct treatment. In this context, it may be said that health data is used for primary purposes. Data that is registered and collected during daily workflows is also essential for secondary purposes, i.e. quality development, management and research, etc., in the healthcare area, where a parallel joint public action is being made to ensure transparency of the activity and its quality throughout the health sector. New data-driven technologies enable these two purposes for data use to increasingly supplement one another. As a result, the health system is also taking a strategic approach to, among other things, personalised medicine to strengthen the reciprocity in using health data for treatment and research.

ment during the strategy period. The health sector is already highly digitised. At the same time there is an increasing need to develop technologies and secure the agility and flexibility of the joint actions. Thus the strategy forms a common framework for coordination where the parties agree to continuously prioritise the specific initiatives during the strategy period.

Whereas digitisation supports the general development of the health system, new technology can, however, push the overall framework for the how health services can be provided. The digitisation of the health system must continue to be based on a competitive market with multiple suppliers, which can help drive innovation and new service models. This will help ensure the flexibility and adaptability of the health sys-tem so that it can quickly start using new solutions.

Currently, a patient's medical records are viewable by clinicians across regions in the National Health Record (Sundhedsjournalen). In addition, the Shared Medication Record (Fælles Medicinkort) gives healthcare professionals access to a complete, up-to-date prescription-medicine overview for the patient across the entire health system. These common solutions help lay the groundwork for a more interconnected holistic effort and enhance patient safety and security across hospitals, GPs and municipal health services. We will work to ensure that additional care and treatment information will be exchanged digitally between various local IT systems, so employees can quickly and easily access information about the patient in order to provide care and treatment.

It should fall on the individual patient or relative to carry information about treatment and medical history through the health system. Patients and relatives must be able to rightly expect that the healthcare professionals with whom they interact are familiar with the relevant information – such as medical records, test results, current medication and other practical information – required for treatment and for ensuring peace of mind and an experience of a coherent health system.

Danish Ministry of Health
Danish Ministry of Finance
Danish Regions
Local Government Denmark

Content

5.5 million

Each month, 5.5 million digital messages are sent in the health system (referrals, discharge summaries, etc.).

There is no real alternative to increased digital cooperation

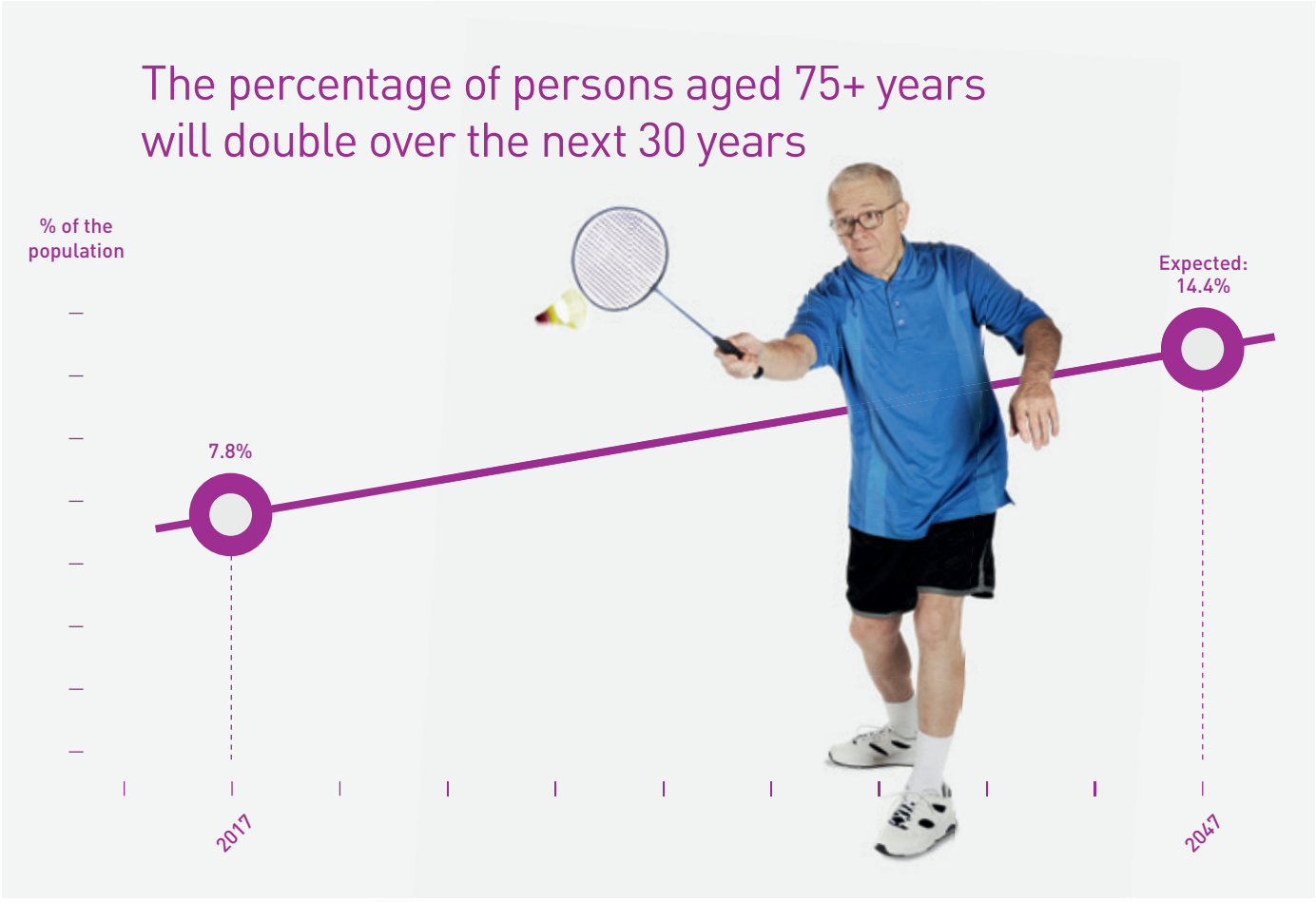
The Danish health service is among the most digitised in the world and workflows at hospitals, GPs and municipal health services are already digitally supported throughout Denmark. This has improved patient treatment and safety, reduced paper-based workflows for employees and made for better utilisation of the health system's resources.

Altogether, the complete digitisation of the most commonly used messages (referrals, discharge letters and laboratory test results), the Shared Medication Record (Fælles Medicinkort) and patient/clinician viewing of information on the Danish e-Health Portal (sundhed.dk) comprise a solid digital foundation on which to build. Digitisation must also help address the health system's challenges in the years ahead.

A primary challenge is to ensure better coherence in treatment. This is not a new issue. On the contrary. But the need for coherence is presently becoming increasingly essential as multimorbidity is rising, putting increasing numbers of patients in contact with multiple segments of the health system. Also, the ambition to develop a more personalised and coherent health system will help ensure that more patients will experience treatment extending across hospitals and other parts of the health care sector.

Over the next thirty years the percentage of people aged 75 or more in Denmark is expected to almost double. At the same time the percentage of people with the most widespread chronic diseases is increasing. It is estimated that by 2030, twice as many people will have to live with Type 2 Diabetes and more than 45% will suffer from chronic obstructive pulmonary disease (COPD). Today, 20% of the Danish population has more than one chronic illness and, specifically for COPD sufferers, approximately two-thirds of the patients have comorbidity. Consequently, the Danish population is becoming increasingly older and comorbidity is increasing. As a result, more people will need to be in contact their with GP, be treated at hospital or receive municipal provisions of care and prevention.

The health system is already undergoing large-scale reorganisations to address this demographic challenge. Treatment is being centralised at fewer, bigger and increasingly specialised hospitals there will be more options to choose from and more tasks will be performed closer to or in the patient's own home where tasks can be performed less intrusively. This is true, for instance, when the home care nurse visits the homes of elderly patients – and can perform more tasks there while in contact with a specialist sitting at the



Source: Statistikbanken.dk (FOLK2 and FRDK117)

hospital. The success of this transformation is critically dependent on the increasingly widespread use of digital solutions in the health sector and the resulting development of new forms of cooperation and models for how health services can be provided.

Digitisation must drive the sustainable development of our health service

New technologies are currently being implemented throughout the health system, and the collection and use of data is sharply growing. New technologies are being developed quickly and entail potentially large gains, including more personalised treatment and digital communication. Some patients are very self-reliant and have the resources to handle more digital interaction with the health system.

These include patients with a well-regulated chronic illness or busy families with young children who need more flexible interaction with their GP. Other patients consider face-to-face encounters crucial for their treatment and they need proactive contact and peace of mind. Digital solutions can prompt patients and health professionals to choose the type of contact that makes the most sense in the specific situation.

Data-driven workflows and artificial intelligence provide brand-new opportunities for actions such as the early detection of critical illness and decision support, enabling an approach whereby treatment not only takes place when the patient walks through the clinic door but more proactively, where the doctor is better able to follow up on agreed interventions. This will enable the health system to interact with the patient earlier in the course of treatment, become more focused and place weight on health rather than treatment.

New technology will also make it easier for patients to take part in their own treatment. Providing the patient with easier access to information enhances the possibility of cooperating on a more equal footing with health professionals regarding his/her own treatment. Also, patients with certain resources will expect the health system to be accessible on digital platforms, apps, health portals, etc., whereas other patients will be challenged by trying to get a general grasp of their situation. Therefore, it must be possible for digitisation to support those who can cope with and want a digitised health system, while simultaneously allotting time for patients, including at-risk elderly citizens, with a greater need for face-to-face interaction.

Digital tools and better access to relevant information will support employees in cooperation and coordination across the →

20% fewer bed-days

within 13 years from 2007 to 2020*

Index 2009 = 100

various segments and entities associated with treatment and care and enhance communication with patients. This presupposes that digital solutions are perceived as helpful – not an unnecessary workflow or meaningless registration that steals time from patients. At the same time, not all health professionals will have the same qualifications for using the new solutions. Therefore, it is crucial to provide adequate training in the use of digital solutions, so that everyone can benefit from the inherent potential of new technology.

E-health involves streamlining routine activities for patients, relatives and employees and making more efficient use of the health system's resources. And it involves establishing better coherence, closer cooperation and higher quality in treatment through new technology.

It is crucial that patients have confidence in the health system to store their health data and information securely, and that each individual's data can only be accessed when this is required for treatment and in accordance with the individual's wish to share or block his/her own health data. Patients should have confidence that health data will only be passed on when it pertains to their treatment and care on the one hand, and trust that what they tell their doctor in confidence will not be disclosed, on the other. At the same time, we face a rising threat from cyber crime where perpetrators seek to gain access to sensitive information such as health data. This makes it necessary to accompany increased digitisation with tighter data security throughout the health sector.

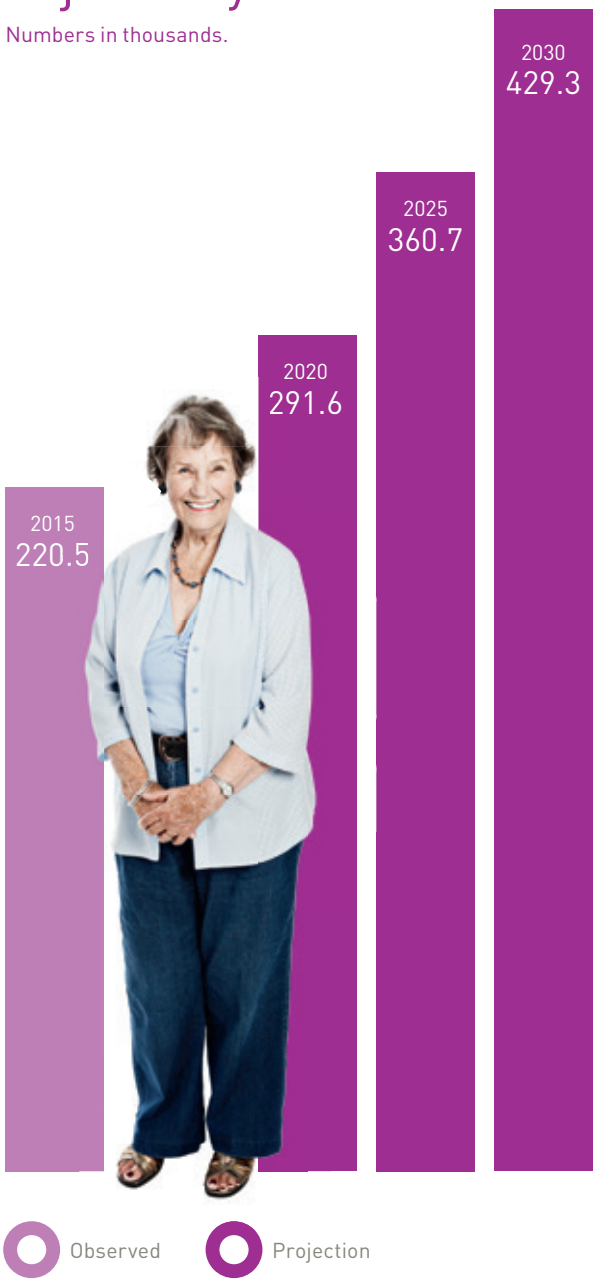
Finally, there is a need to ensure progress in and prioritisation of common digital solutions to support treatment and care across the health system. Also, the expected acceleration of both pace of treatment and the development of new technology will foster a growing need to control, prioritise and coordinate these developments to maintain a common focus on achieving goals of proximity, higher quality and coherence for patients and employees throughout the Danish health system.

Cooperating on the basis of prioritised actions

The actions in this strategy constitute the first step of efforts in the years ahead to achieve a coherent and trustworthy health network for all Danes. Some efforts involve the complete implementation of solutions that are already known to work. Other efforts involve new ideas for solutions which the parties will jointly initiate and learn from. Technologies are developing rapidly and, as new lessons are being learnt, it will be necessary to re-set the priorities of the joint efforts aimed at helping achieve the strategy's objectives for change.

95% more people will have Type 2 Diabetes in just 15 years**

Numbers in thousands.

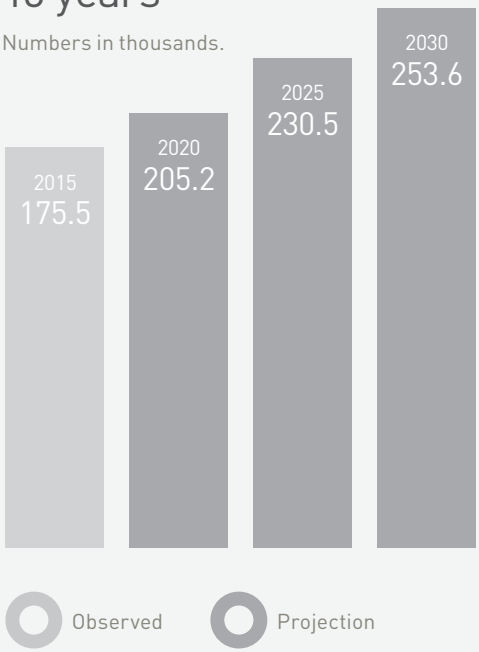


50% increase in outpatient visits from 2007 to 2020*

Index 2009 = 100

45% more COPD sufferers within 15 years**

Numbers in thousands.



*Source: The annual statement of the National Patient Registry (LPR), classified by diagnosis-related groups (DRG), the National Health Data Authority, SSI as well as internal calculations based on "The Danish Regions' Plan for Investments and Hospitals: Screening and Assessment II" (2010).

**Source: National Institute of Public Health (2017): Disease Trends in Denmark.

Because the Danes want it

Source: In a 2015 survey conducted by Trygfonden and Mandag Morgen among Danish respondents, almost two-thirds responded that there is inadequate coherence between the various segments of the health system. In the same survey, respondents cite better coherence as the most important key feature of an improved health system. Only 25% expect cooperation between the hospital and the municipal health service to function satisfactorily to a great or very great degree.

66%

Do not believe that there is sufficient coherence between hospitals, GPs and municipalities in the health system.

COMMON CROSSBAR

National targets: Better coherence, higher quality and greater geographical equality in the provision of health services

In 2017, Denmark's central government, Local Government Denmark and the Danish Regions launched an ambitious political agreement: "National Targets for the Health system". The agreement aims to ensure that all sectors of the health system – hospitals, municipalities and GPs – pursue a clear and common goal of higher quality.

Today, all forces in the health sector are working to achieve the national targets. However, their possibilities of success depend on the elevation of the health sector to a new digital level. This will involve an even greater degree of digital collaboration and the implementation of new technologies to ensure better treatment and coherence in patient pathways.

In continuation of this, this strategy shows which of the eight general national targets can be achieved – to a greater or lesser extent – by means of a stronger application of common national solutions and new technology.

"National Targets for the Health system" is defined by one clear crossbar: better coherence, higher quality and greater geographical equality in the health system. And for the eight targets, which jointly aim to raise the bar to create better coherence, higher quality and greater geographical equality, digitisation is in certain areas an important element – and in other areas a key driver of change.

The development of a health system with better quality, greater geographical equality and greater coherence across entities, areas of specialisation, specialists and other segments requires ongoing investment in digital infrastructure to create flow in the individual patient pathways. Accordingly, digital development is key when it comes to further developing our health service as a single, truly coherent network.

The interaction of this strategy's five focus areas and the eight national targets are specified in the individual chapters.

Better coherence, higher quality and greater geographical equality in the provision of health services

Better, coherent patient pathways

A stronger focus on the chronically ill and the elderly patients

Improved survival rates and patient safety

High-quality treatment

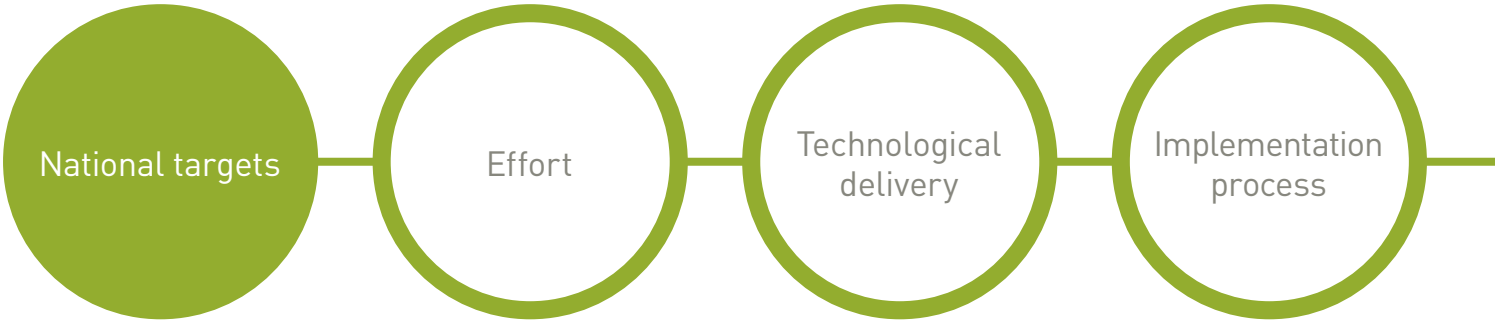
Rapid diagnosis and treatment

Enhanced patient involvement

A greater number of healthy years of life

A more efficient health service

Simple philosophy of change



How do we create sweeping, important changes on a sure footing and as quickly as possible? We follow a simple process model that works, because we are not required to know "everything" at the outset, but we can learn more as we go along in our collective digitisation effort.

Based on an ambition to change, we identify the efforts that will create the greatest possible value and impact in relation to the national targets for the health system. Afterwards, we agree on which technologies are required to effectuate the change. And once the technology has been developed and thoroughly tested, it is made available for implementation throughout the health system. This will engender new opportunities for task performance across the sector and typically be embedded in the health agreements between regions and municipalities, through which the joint efforts to achieve the national targets in the health system will also be carried out.

The final item is impact, including collecting and applying data to optimise and render visible the changes that the actions must help achieve. It all sounds linear and simple. In reality, it is a process requiring a massive effort throughout the system and ongoing prioritisations. In continued efforts to optimise our digital infrastructure and service concepts, we must make room for operation and reality. We take a pragmatic approach to the task. Because change takes time and requires many resources, and sometimes needs and opportunities emerge along the way.

Implementation of the Shared Medication Record (Fælles Medicinkort) is a good example of a joint effort that has successfully moved from idea to genuine change. Everyone involved is familiar with the challenges that arose: from technical integration into all local IT systems to the implementation of new employee workflows. But today, we have actually succeeded in achieving a single up-to-date overview of prescription medicine, providing a brand-new level of patient safety – and marking a crucial step in the patient's experience of an interconnected health system. Change is possible.


Change

Five focus areas

Our ambition to develop a health system which acts as a unified, close and coherent healthcare network for the patient requires the various segments of the health system to cooperate on taking joint initiatives in a number of areas.

As previously mentioned, there are also significant local digitisation efforts, e.g. in in regions and municipalities. The joint and local efforts are mutually interdependent in achieving a digitally coherent healthcare network. However, the strategy involves the vast common task ahead comprising interdisciplinary initiatives.

The patient as an active partner

More people will live longer lives with chronic illness. Therefore, we must support them and their relatives in taking greater ownership of their own illness in their daily lives and enabling them to actively participate in their own treatment. And we must help patients to generally obtain better insight into their own illness and health data, as well as ensure a more flexible interaction with the health system also in their own home.

Patients must experience more coherence

The complexity and speed of treatment will increase due to the rise of comorbidity, the ambition to boost the provision of local health services and the ongoing reorganisation of the hospital structure where hospital services are being centralised at fewer locations. Tasks are being transferred from hospitals to primary care, and shorter hospitalisation and more outpatient treatment means that a higher percentage of treatment and care – in faster transitions – must be provided by local health services. Therefore, we need to provide healthcare employees with easy, secure access to relevant knowledge, so they interact with the patient in the most expedient manner possible. Thus, digitisation must simplify complex patient pathways for employees and

make sense for patients in their interaction with the health system.

Illness must be prevented

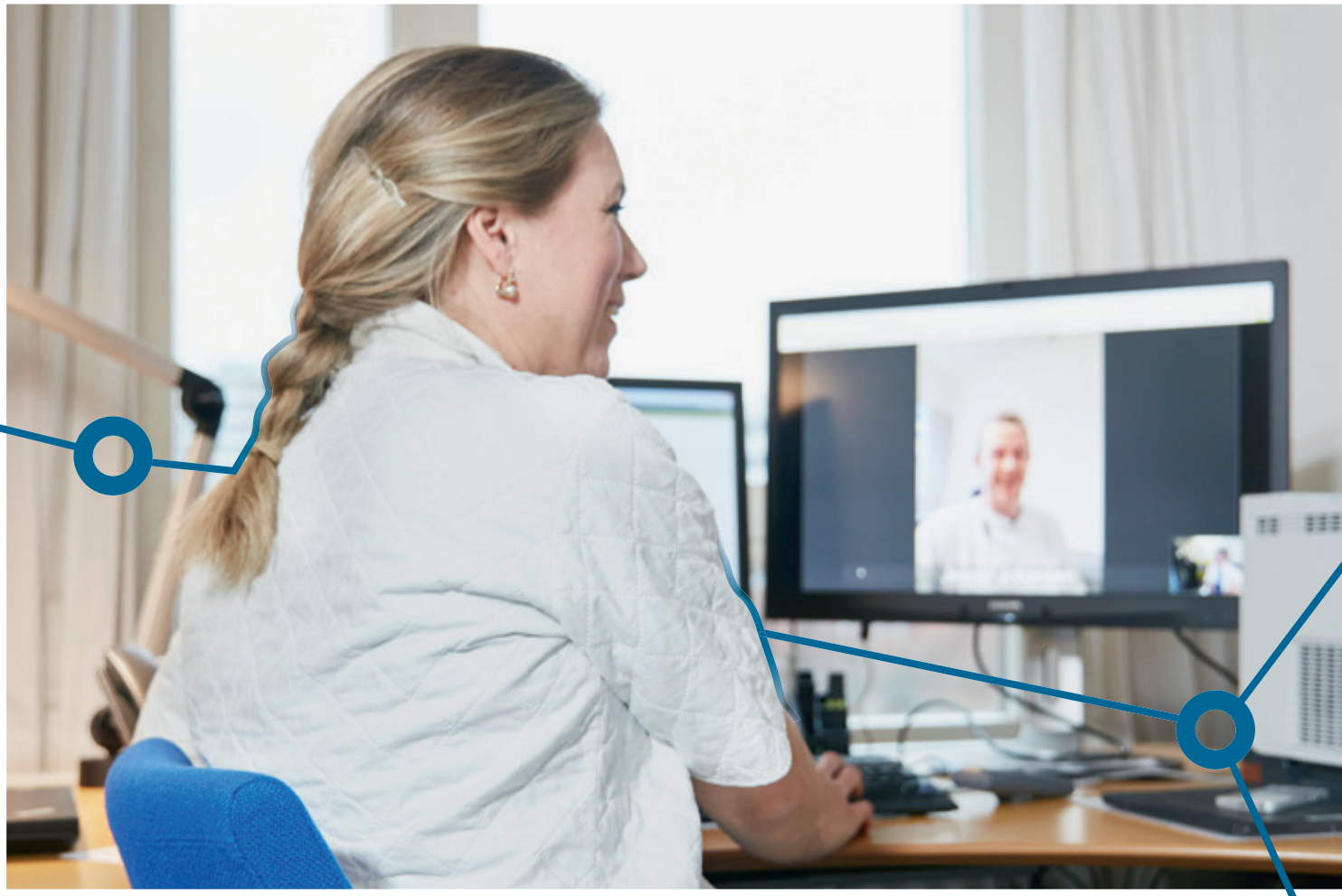
We must shift activity from an emergency response to a scheduled process so patients receive gentler treatment and so that the health system's resources are used in the best possible way. This could be supported by better use of data for early detection of symptoms and deteriorating health and by a more cost-effective division of labour, where tasks can be performed where it makes the most sense and is less intrusive for the patient.

Data security and cyber security must be bolstered

It is a crucial prerequisite for digitisation efforts that patients trust and continue to trust the health system to keep their health data secure. This involves ensuring that the data is only accessible to relevant healthcare professionals when access is required for treatment and that the health sector – due to its essential function for society – is safeguarded against the threat of hacker attacks and cyber crime.

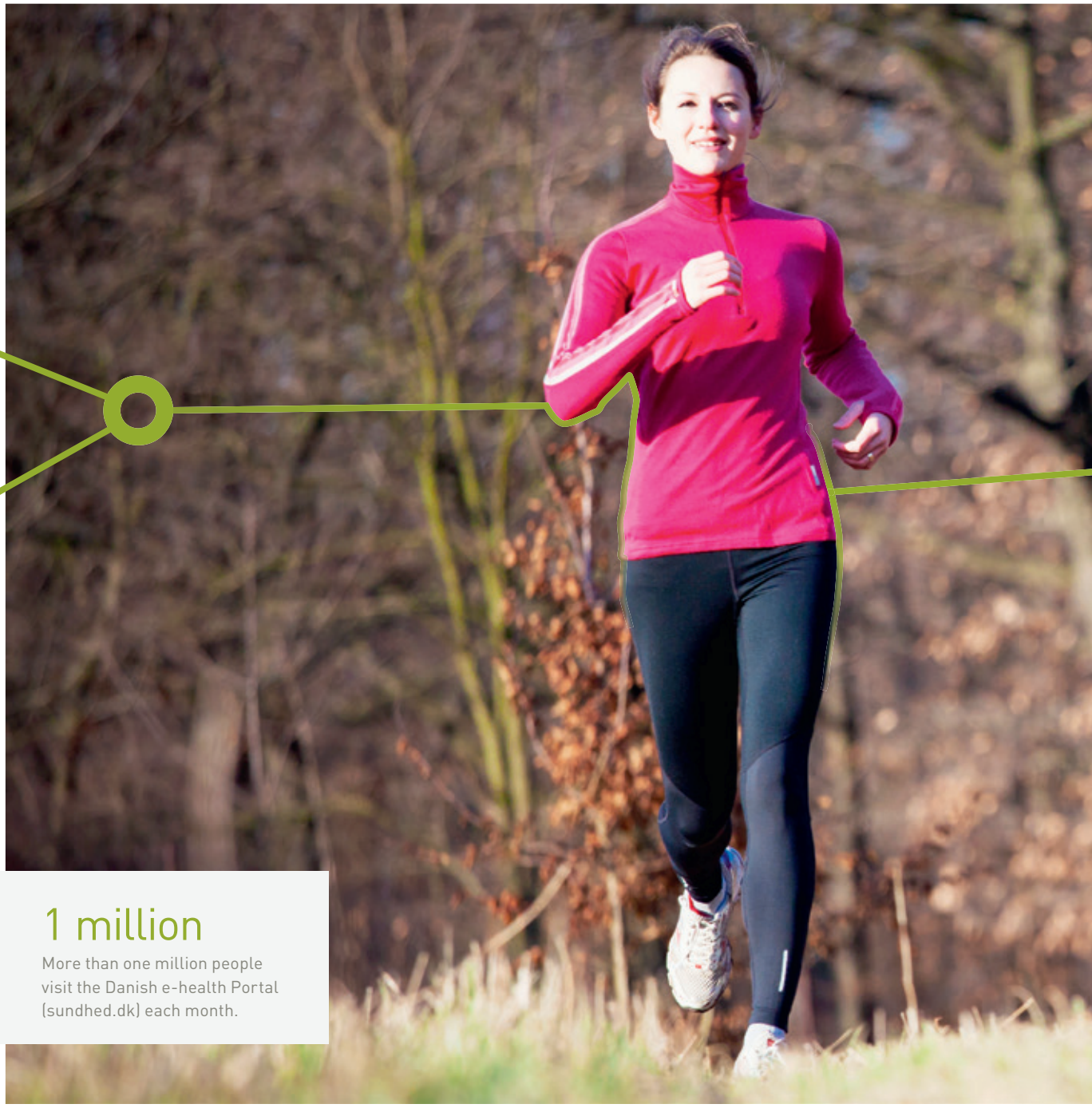
More efficient implementation of common building blocks

We must further develop the digitisation basis to ensure stronger and more flexible actions and make it easier to start using new technologies. This includes testing new ways to roll out common solutions and developing a common IT infrastructure that interconnects segments within the the health system so that this infrastructure will comprise of building blocks that can be flexibly incorporated into local IT solutions. Finally, rapid technological developments mean that we need to ensure the prerequisites for the joint digitisation effort by rethinking collaboration across the health system's segments, also in collaboration with private enterprises, external learning environments, etc.



FOCUS AREA 1

The patient as an active partner



1 million

More than one million people visit the Danish e-health Portal (sundhed.dk) each month.

Digital solutions transform the way services are provided and make it possible for patients to be treated in their own home. An example is digitally supported treatment for people with mental illness and psychological problems. There have been positive experiences in Denmark and abroad with digital support for psychological treatment, including mild anxiety. For this reason, in October 2017, the regions decided to roll out online psychological treatment of anxiety and light to moderate depression as a two-year pilot project throughout Denmark.

Patients should be more involved in their own treatment, so that the health system interacts with the patient on his/her own terms.

It is important to put the needs of the patient first in the treatment situation, as well as to provide more flexible interaction before and after treatment. A disease and treatment process is more than 'the individual appointments' involving direct interaction with healthcare professionals and we must support the patient's options to become involved and meet their own needs throughout their treatment.

FOCUS AREA 1 –
THE PATIENT AS AN ACTIVE PARTNER

Proactive involvement in everyday life - and more self-service

The way in which patients interact with the health system is changing concurrent with digitisation and the development of new digital channels for communication. This gives patients a more flexible interaction with the health system that can consider individual needs to a greater extent.

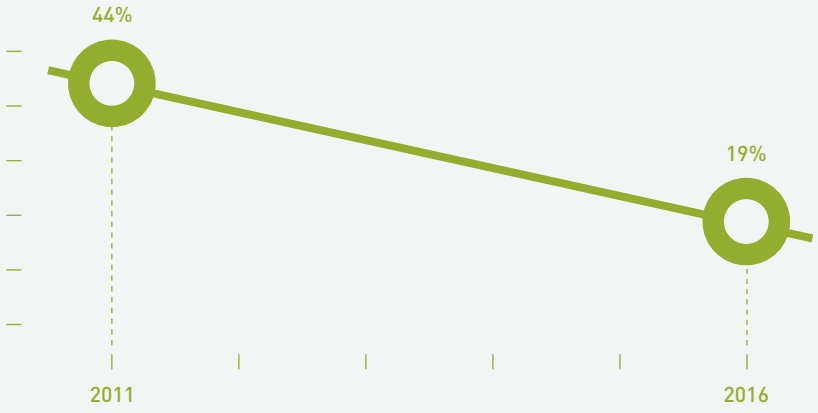
This means a greater amount of interaction with the health system can take place in the patient's own home via telemedicine solutions and video consultations, providing better insight into his/her own health data and more options for self-service, such as booking appointments. Patients should be more involved in their own treatment, such as through patient-reported outcome (PROs) making it possible to systematically incorporate the patient's own knowledge. For instance, this could support an individual assessment of whether consultation is actually needed, instead of summoning all patients to a check-up at the hospital according to the same fixed plan.

Patients who interact with several different parts of the health sector need a better overview of their own illness and treatment plan, which often applies to relatives, as well. In order to provide better options for patients to get involved as active partners in the process, they must be provided with a complete digital overview of the personal health data registered and generated across entities and IT systems. Currently, patients and relatives can view their health record from hospital admittance in the National Health Record (Sundhedsjournalen) on the Danish e-Health Portal (sundhed.dk), but they do not have digital access to their medical records from the GP or the municipalities, and many private vendors of healthcare still do not show patients' medical records in the National Health Record (Sundhedsjournalen). The aim is for patients to be able to see their complete patient pathway, e.g. from knee-replacement surgery performed at the hospital to subsequent rehabilitation at the municipal physiotherapist. This requires common digital standards and extensions to the data and functionality currently available across the health system.

The e-health Portal will continue to serve as a single point of national entry where patients can access their health data provided by the →

The elderly are rapidly becoming experienced online users

In 2011, 44% of persons aged 65 to 89 never used the internet. By 2016, this percentage had decreased to 19%. Thereby, the number of non-users was more than halved in five years.



Source: Statistics Denmark, 2016

hospital, GP and municipal health service. A unified, recognisable graphic style gives users the experience of coherence. In the future, however, users expect a wider diversity of solutions where they can access selected health data, e.g. from municipal care. This can be combined with other relevant data or views can be developed to include additional digital options, such as digitally booking an appointment for an examination or downloading apps as part of a rehabilitation programme.

Users' expectations of the health system will change in the years ahead as patients become more self-reliant and require more flexibility, and as increasing numbers of elderly citizens use digital services in their daily lives. There are users who will benefit from having more digital options when they encounter the health system and who probably already exploit the digital options for monitoring their own personal health . When it is possible to take one's pulse during a run, it is only natural to expect to have the same option when being treated for an illness, and seeing that it is possible to Skype with one's children and grandchildren, it seems only natural to want the same flexible access to one's doctor.

There are still relatively few experiences of using data collected by the patient's own equipment to generate value for prevention and treatment of the patient, such as being able to send blood-pressure measurements or photos of physical marks or symptoms to a GP during an e-consultation. In addition, the areas where apps, medical devices and medication converge are currently shifting. This creates a need for a shared framework and quality requirements, so both patients and healthcare professionals can safely and securely start using devices and apps. It is a matter of defining a specific framework in which devices/equipment can be used for specific tasks and situations.

Efforts

The doctor in your pocket –
A GP app for patients

Ask the patient –
Patient Reported Outcome (PROs)

Digitally supported rehabilitation

A complete presentation of the patient's health data

A guide to health apps

Decision support tools for cancer patients

Digital pregnancy tool

Change

Patients have more options of taking responsibility for managing their own health.
Patients have access to a combined overview of their own patient pathways and data.
Patients will to a greater extent interact with the health system in their own home.

Which national targets are we achieving?

Enhanced patient involvement

A stronger focus on the chronically ill and the elderly patients

High-quality treatment

1.1

The doctor in your pocket – A GP app for patients

GPs currently provide e-consultations and booking of appointments on their websites, but the solutions vary from one doctor to the next and there is great potential for adding on new functionality. A common GP app builds on top of existing solutions in a new digital channel for communicating with one's own doctor so that patients – irrespective of which GP they have – can easily and flexibly access booking, prescription renewal and e-consultation with their GP. The app will be able to generate reminders of medicine and vaccinations and provide functions such as video consultations and the option of sending photos.

Technological delivery

The app must be developed to meet functional needs in communication and cooperation between GPs and patients in an easy-to-grasp, user-friendly manner from a user perspective. Development of the app must be integrated with the GP's medical system and draw on national sources and services, such as security solutions and data from national registries.

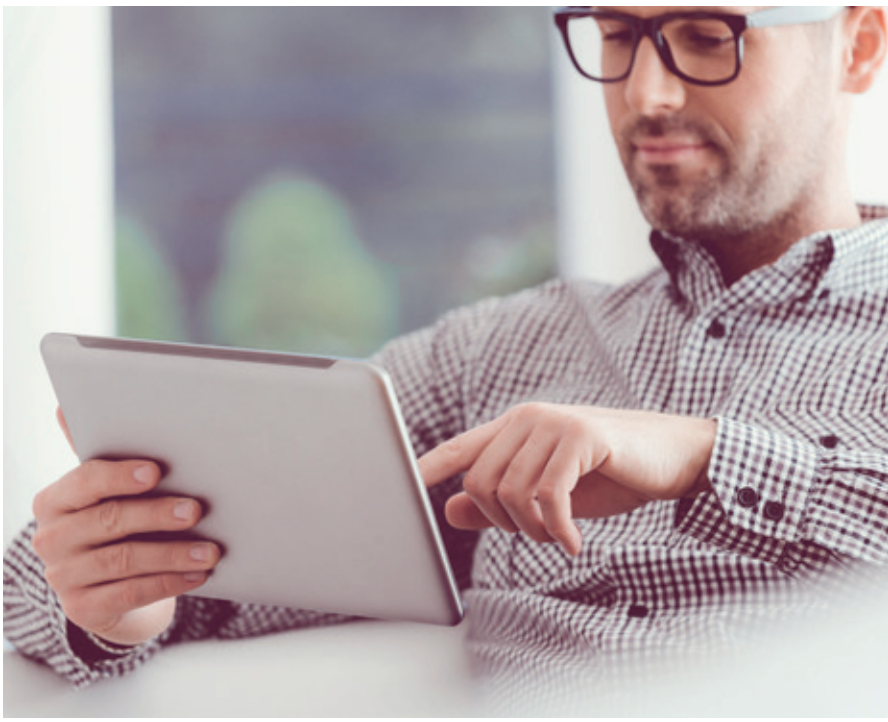
Implementation process

The app is expected to be launched in an initial version with selected functions in 2018. The goal is that it must be widely used by both patients and GPs.

1.2

Ask the patient – Patient Reported Outcome (PROs)

Across the health system a wide range of activities have been launched aimed at spreading Patient Reported Outcome (PROs), which is a general designation for patients' responses to questions about their own state of health. By systematically and actively using PROs in the dialogue with the patient, the health system's actions can be personalised to meet individual needs and support value-based health. The answers can also be used to screen for side effects and need for consultation, so the patient avoids unnecessary check-ups. At the same time PROs create sound new data for research, quality assurance and tasks involving new governance models in the health system. Used correctly PROs are just as essential to the quality of treatment as clinical data. The value of PROs should therefore be conceptually integrated with clinical data.



Technological delivery

Standardised questionnaires will be developed for use across the health care sector. The questionnaires will be collected in a national questionnaire database. A common infrastructure will be built sharing relevant PROs across the health system. A decision will be made no later than in the 2020 financial agreements concerning the possibility of connecting the local IT systems to the national infrastructure in regards to exchanging PROs.

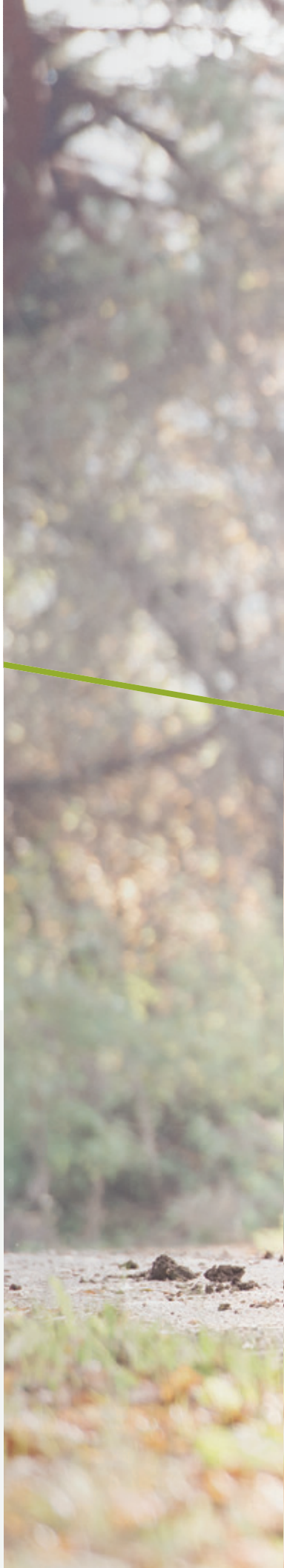
Implementation process

PROs are to be implemented across regions, municipalities and GPs to ensure sufficiently broad use in and across the sector based on the common infrastructure and the standardised questionnaires. The effort is dependent on a local prioritisation of the areas of interest in which to use PROs.

1.3

Digitally supported rehabilitation

Digitally supported rehabilitation gives patients greater flexibility in their everyday lives and the freedom to exercise in places and at times which suit each patient's daily life. Using digital aids in the rehabilitation process makes it possible to combine rehabilitation sessions at a physical provider of rehabilitation services with digitally supported personal exercises, thereby providing more flexible treatment options for each individual and freeing up resources that can target other focus areas.



Technological delivery

Digitally supported training means that patients use digital aids during their rehabilitation process to support physical exercises. An example is attaching sensors to the body during rehabilitation sessions to record the performance of the exercises.

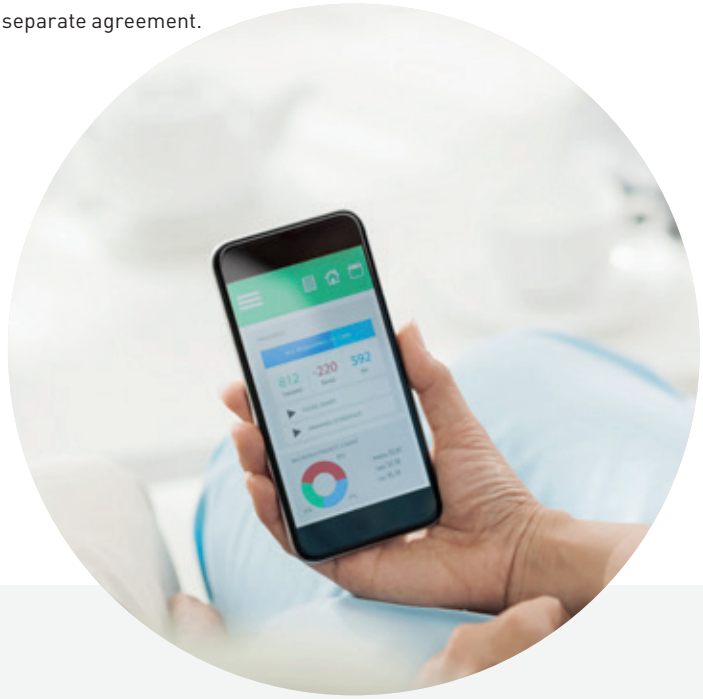
Implementation process

Under the auspices of the Modernisation and Efficiency Programme (MEP), the parties agree that financial gains will be possible by implementing digitally supported rehabilitation, and follow-up on the roll-out of the initiative in the municipalities. Qualifying activities will be initiated to support the roll-out in the municipalities.

1.4

A complete presentation of the patient's health data

Currently, patients can go to the National-Health Record via the Danish e-Health Portal (sundhed.dk) to see their medical records from the hospital, medication records, vaccinations, laboratory results, referrals as well as a log of when this data has been accessed. The National Health Record (Sundhedsjournalen) also serves as a common presentation of patient data for the healthcare professionals in the regions responsible for ensuring cross country coherence in patient treatment. The Danish e-health portal (sundhed.dk) will continue to serve as a single point of entry for patients to view health data and other views can be developed for patients in apps, portals, etc. In order to create a more complete picture of a patient's health data – both for the patient and healthcare professionals – there is also a need to view relevant information received from private hospitals, municipal healthcare providers and GPs. In addition, there must continue to be efforts aimed at increasing the user-friendliness of the views and at improving the access of parents and relatives to data on the Danish e-health portal (sundhed.dk). This initiative is in the idea phase and requires a separate agreement.



Technological delivery

In a new 3.0 version of the Danish e-Health Portal (sundhed.dk) project an analysis of the individual sub-deliveries in the project will be conducted with the aim of implementation within the project period. Some sub-deliveries, such as the access of private hospitals, are already prepared for technical implementation. In relation to the municipalities, an analysis will be conducted to determine which specific data are relevant to present at the Danish e-Health Portal (sundhed.dk), and how they can be presented in a standardised manner.

Implementation process

Medical records from GP systems must be presented on the danish e-Health Portal (sundhed.dk), and an agreement must be entered into with private hospitals concerning the presentation of medical records on an equal footing with medical records from public hospitals' electronic health-record systems. In addition, a model needs to be agreed upon – within the financial agreements – for an investment in presenting relevant health data from the municipalities' electronic care record systems at the Danish e-Health Portal (sundhed.dk).

1.5

A guide to health apps

The rapid development of e-health apps for smartphones and tablets provides patients with new possibilities for collecting or registering information about their own health, such as exercise and sleep, and the apps can provide targeted patient information about a disease. It can be difficult for both patients and healthcare professionals to navigate the wide selection. By having a guide to recommended apps, users and healthcare professionals can get a better overview of which e-health apps provide a valuable, professional supplement to patient treatment, which apps can support better health and which apps meet personal data-security requirements. This initiative is in the idea phase and requires a separate agreement.

Technological delivery

The technical, organisational and legal prerequisites and possibilities must be analysed to establish a comprehensive guide to e-health apps that can viewed by both users and healthcare professionals. The analysis must draw on existing lessons learnt in Denmark and abroad.

Implementation process

The solution singled out in the feasibility study needs to be followed up on and a model for operation and maintenance needs to be worked out, including an ongoing assessment of apps. The communication effort targeting users and healthcare professionals will also be an important element.

1.6

Decision support tools for cancer patients

Under the auspices of Cancer Plan IV, support tools are to be developed and implemented at hospitals in the area of cancer treatment. The tools must support patients with cancer in joint decision-making processes with their doctor about the correct treatment for them based on the patients' personal wishes and needs. It would be beneficial to look at how support tools can be coordinated with the use of PROs.

Technological delivery

Digital support tools will be developed for patients with breast cancer, lung cancer and colorectal cancer.

Implementation process

The tools are to be included in hospital workflows and subsequently evaluated. For example, it would be relevant to look at whether the support tools should be integrated into existing digital systems and tools.

1.7

Digital pregnancy tool

At present, pregnant women receive a paper-based maternity record, which they must bring with them to midwife consultations, doctor's appointments and the maternity ward. This is challenging in terms of ensuring that the relevant information follows the pregnant woman and can be accessed by the healthcare professionals she encounters during the course of the pregnancy.
A digital solution will increase the peace of mind of the pregnant woman, and the digital solutions – logging, secure access, etc., otherwise used in the healthcare area – will also be applicable to the women's maternity records. In addition, a the digital solution for sharing information about pregnant women could be supplemented by solutions for increased involvement of the pregnant women (PROs, etc.), to meet the different needs of pregnant women in the best possible way.
This initiative is in the idea phase and requires a separate agreement.

Technological delivery

A preliminary analysis of possibilities of development, implementation and dissemination of a digital pregnancy tool will be carried out. It is expected that the digital tool is to be used at GPs and at hospitals and can be accessed by the pregnant woman, e.g. via the Danish e-Health Portal (sundhed.dk), as part of prenatal care.

Implementation process

A model for implementation and dissemination of a digital pregnancy tool in local midwife/GP systems, etc., is to be agreed upon.

FOCUS AREA 2

Knowledge on time

Better coherence in patient pathways is an important objective which Local Government Denmark, the Danish Regions and the Danish Ministry of Health are jointly working to achieve on several fronts. Based on the 2018 financial agreements the parties have agreed to launch a process aimed at identifying which frameworks and regulations are currently barriers to coherent patient pathways. This involves technology, culture, and expertise – and securing the legal framework for the sharing of information and data for compatible purposes such as planning and following up on treatment and care. This is important for being able to realise the potential of new technology.

As patient pathways accelerate and cut across the health system, it is essential for patient security and quality of treatment that the right data about the patient is available whenever it is needed.

Many patients and health professionals currently experience patient pathways as disconnected and uncoordinated. Knowledge possessed by one actor is not always exchanged between the relevant employees or is not easily available, but is 'carried around' by the patients and their relatives. Therefore, a greater amount of relevant information for use in treatment and care must be digitally exchanged across hospitals, municipal health services and GPs.

FOCUS AREA 2 –
KNOWLEDGE ON TIME

We must reduce the gap between the entities

The vision is that patients, relatives and employees experience better coordination of patient pathways and an easier workday where key information is close to hand. This must be supported by developing common standards and digital infrastructure which is better at interconnecting local IT systems. Accordingly, digital tools and new technologies must support better coordination, logistics and simpler workflows so that healthcare professionals across the health care sector have easy access to a unified overview of the patient 's information, relevant to their specific task.

Having knowledge on time also entails being able to consult a specialist or to obtain the assistance of a professional interpreter whenever this is needed, and that this can be done efficiently and flexibly from a distance, e.g. via video conferences.

The doctor at the hospital should not spend unnecessary time entering the same master data over and over, the GP should not have to search for messages about follow-up from the hospital in lengthy discharge summaries and municipal nurses should not have to wait in a telephone queue at the patient's GP – and each of them should avoid having to look for contact details about one another. The knowledge available to one entity, such as medical case history, diagnoses, personal considerations and close relatives, must be shared whenever this information is relevant to another entity. It will also give patients and relatives peace of mind that the right information is being shared between the healthcare professionals they interact with.

In the years ahead, many IT systems in regions and municipalities will be replaced. This will lead to more complete digital solutions and a greater volume of structured data. At the same time, it should make it easier to communicate and share data, not just internally, e.g. within the region, but also from one system to another and between sectors. There will be a changeover from a regime where messages are sent between systems to a regime where the same information is shared by and accessed directly from local IT systems. It requires investments in common solutions and standards to link the systems together. It is a significant precondition – also for cooperating across sectors – that all parties contribute to enhanced coherence and share relevant information.
New solutions must be implemented with attention to and investments in employee skill-sets for performing new tasks digitally and in the user-friendliness of the systems to support workflows in the best possible way. But technology alone cannot support the collaboration between hospitals, municipalities and GPs. For example, more and more comorbid patients are being discharged to emergency medical services, available in most municipalities. This requires that information about the patient pathway is available at the time of discharge, that the right advice and expertise is available from the hospital and from the GP, and that specific agreements are entered into concerning division of labour regarding care and health.

In other words, digitisation also requires managerial and organisational development in the methods of collaboration. It is a prerequisite for digital cooperation that all actors cooperate with one another and appreciate and understand each other's tasks and roles in the patient pathway.

Efforts

Better, faster and more secure
digital communication across the sector

A complete overview of a patient's
care and treatment

Digital workflows at GPs and more targeted
communication with other parts of the health care sector

Safer medication at residential care
centres and substance abuse rehab centres

Better overview with structured
care records in municipalities

Change

Complex patient pathways are experienced as being simpler by both patients and healthcare professionals

Patients interact with healthcare professionals who have prior insight into the patient's pathway

Wherever relevant, patients will only have to provide the same information once

Healthcare professionals will spend less time obtaining relevant information about the patients to whom they are providing treatment and care

Healthcare professionals experience digital tools as helpful in performing their core task – and helpful by default for enhancing the coherence

Which national targets are we achieving?

Better, interconnected patient pathways

High-quality treatment

Enhanced patient involvement

Improved survival rates and patient safety

A more efficient health service

2.1

Better, faster and more secure digital communication across the sector

The past 15–20 years have seen a comprehensive digitisation of the most common messages sent across the health system such as referrals and prescriptions. For patients, the coherence of the health system's efforts has been enhanced, e.g. that relevant information about a nursing home resident is sent more swiftly to the region when the resident is hospitalised. In order to support faster, more secure and flexible communication, the initiative aims to upgrade the technical basis for communications so that instead of point-to-point communication, where a message is communicated from one specific sender to one specific recipient, it initiates a transition to online data exchange and to more up-to-date, secure technological platforms.

Technological delivery

Analyses will be carried out and prototypes of new forms of communication will be established and tested laying the groundwork for a decision to migrate the communication systems to online data exchange and more up-to-date platforms, including the National Service Platform as a starting point.

Implementation process

Based on the tests, a decision must be made before the end of 2019 concerning the possible migration to online data exchange and more up-to-date platforms. An agreement to this must be confirmed politically in the 2020 financial agreements. In connection with a possible transition to new technical platforms, ongoing implementation will ensure that all segments of the health care sector can avoid parties will not having to change standards and infrastructure along with this transition.

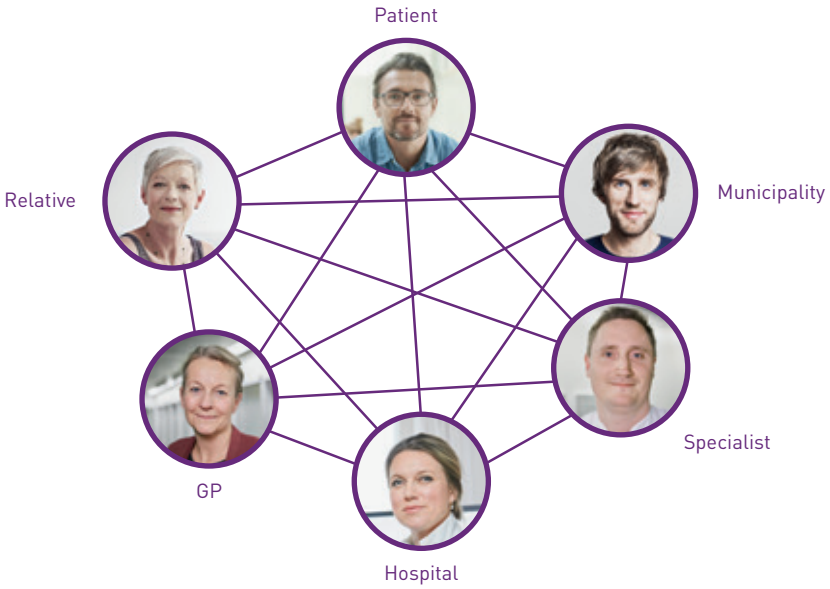
10,000

Every month 10,000 conference calls are held in the health sector through Med-Com's video infrastructure.

2.2

A complete overview of a patient's care and treatment

A unified patient overview is being developed for the sharing of information regarding care and treatment in the national IT infrastructure. This will give patients and relatives a better overview of their own patient pathway and it will be easier for employees across the health system to make a more coherent effort and coordinate various activities. It will also strengthen patient security and safety as the individual patients or relatives will not be responsible for carrying information about treatment to their various contacts with in the health system (GP, specialists, municipal care providers, etc.)



Technological delivery

The solutions will be developed on the basis of wide-range collaboration involving a number of segments including the regions, municipalities, the GP segment, the Danish Ministry of Health and patient organisations. Solutions for a unified patient overview will be developed and tested in the form of new digital services concerning the sharing of appointments, plans and actions, master data and contact details, as well as an analysis of the sharing of common objectives which is expected to be evaluated by mid-2019.

Implementation process

As solutions are developed and tested, the services will be made available for local implementation. Based on lessons learnt from pilot testing, a decision must also be made regarding national implementation of the solutions in local IT systems by 2019 with political confirmation in the 2020 financial agreements.

2.3

Digital workflows at GPs and more targeted communication with other parts of the health care sector

At present, the GP system is largely digitised with electronic health record systems and digital communications with the municipality, hospital and patients As a consequence of. Increasing volumes of information arriving in the doctor's inbox important information can easily be overlooked. Prioritised digital initiatives for GPs have therefore been launched to optimise and facilitate workflows for GPs and their patients. This is intended to free up time and space for other tasks at the clinic and ensure better coherence in the treatment provided.

Technological delivery

A number of new standards and functions need to be developed in the local IT systems used in general practice. These are a quick patient overview, better preparation for consultations through questionnaires, an intelligent inbox, and a better framework for cooperation and communication with the hospital and municipal health services.

Implementation process

The new tools must be implemented by all IT suppliers in general practice, so that all doctors improve communication where mutual dependencies exist, and doctors who wish to work with new digital workflows in the clinic can do so – regardless of which system they have. Better communication will also require modifications in regional and possibly municipal IT systems. To follow up on the realisation of goals and expected benefits, satisfaction surveys will be conducted each year among patients and general practitioners based on dialogue with the user groups for the medical practice systems.

2.4

Safer medication at residential care centres and substance abuse rehab centres

The Shared Medication Record (FMK) is now being used by all hospitals, all GPs and for elderly care in the municipalities. As part of the ongoing work with more correct and safer medication for more patient groups, The Shared Medication Record must also be implemented in substance abuse rehab centres and residential care centres. The work will be done with assistance from MedCom, who will initiate a number of activities to support local dissemination.

Technological delivery

The Shared Medication Record (FMK) must be technically available in all residential care centres and substance abuse rehab centres. This can be done using the existing access via the online version of The Shared Medication Record, or via a new integration to local health record systems.

Implementation process

In order for relevant staff at residential care centres and substance abuse rehab centres to begin using The Shared Medication Record (FMK), it will be necessary to carry out activities of local implementation, such as training, establishing workflows, etc.

2.5

Better overview by having structured care records in municipalities

The Common Language Platform (Fælles Sprog III) is a new common standard and method for registering data in elderly care and municipal health care. The Common Language Platform aims to contribute to better cohesion and greater data re-use in the municipalities' electronic care records. Municipalities can also make procedures easier and support better use of data for the compulsory documentation of home care for patients in line with the Danish Social Services Act, and nursing in line with the Danish Health Act. This is done through the implementation of uniform terms and classifications and harmonised procedures. The electronic structured care records are also expected to have a major impact on data sharing across segments.

Technological delivery

To ensure a more structured recording of municipal health care data, it has been agreed to implement The Common Language Platform in all municipalities before the end of 2018. Further development of The Common Language Platform standard has also been initiated in municipal rehabilitation.

Implementation process

The municipalities are in the process of implementing The Common Language Platform. While some have already completed implementation and begun using it in day-to-day work, others are in the process of training employees in the new method and associated procedures. The municipalities are receiving implementation support from MedCom.

FOCUS AREA 3

Prevention

Technological development is dramatically changing the framework for how health services can be delivered, and allows earlier and more focused efforts.

Digitisation has an inherent force of change. If Denmark is to maintain its leading position in the area of digital health, it will be necessary to work with the very latest digital solutions which can promote a data-supported and population-based approach focusing on health rather than treatment, and thus have a greater emphasis on early detection of disease symptoms and decision support. The health system has to be able to meet patients earlier, in a more targeted way and where they are.

FOCUS AREA 3 –
PREVENTION

It is worth investing in an early and local response

Better prevention covers everything from brand new intelligent technologies to simpler solutions for treatment at home, with new forms of collaboration being more important than the technology itself. One example is digitally supported wound management which is currently occurring in Denmark's municipalities. Patients do not always have to go to hospital for treatment for severe foot ulcers. Instead, a nurse from the local health service – with improved training, and in close cooperation with the specialist at the hospital – can treat and care for the ulcer at the patient's home.

The health system has worked strategically for several years to deploy telemedicine and welfare technologies which have supported workflows for staff and improved care and treatment for patients. Today, the spread of telemedical home monitoring is well underway across the country. This allows follow-up and treatment to be done in the patient's home with home measurements and digital contact with the specialist when necessary. It also means that municipal healthcare personnel can more systematically watch for signs of disease among elderly people at risk. This allows for closer and regular follow-up on the patient's state of health, and the local health service can be quickly mobilised if the patient's condition worsens. Thereby avoiding emergency admissions which are costly and a strain on the patient.

It requires healthcare professionals to have the skills needed to handle the tasks in new ways, and to have a direct line of communication with the specialist, e.g. at the hospital. In the coming years it is therefore important that we ensure progress in the national rollout of telemedicine through knowledge sharing and joint efforts where appropriate.

The health system is also on the threshold of a new level in digital transformation with promising digital solutions such as machine learning and prediction, where data is used as a resource in direct patient treatment and care. If we look ahead, we see a future where prevention, diagnosis and treatment will be more precise using artificial intelligence and big data analysis of large numbers of images, health data and research data, and in the long term data from the patient's own equipment, apps, etc.

Digital tools containing patient data from similar cases and research data must support systematic follow-up for the patient in direct treatment and care in a simple and safe manner. This must contribute to care being organised based on the individual's needs with early detection of symptoms and a more population-based approach to treatment. Instead of treating patients in the order they walk through the door, the doctor should consider his patients as a total population whose health needs to be maximised. Some doctors are quite used to thinking this way but they can be given better tools.

Many of the new technologies still need to be matured, and the precise benefits – and associated risks – have not yet been sufficiently documented. There is great innovative force locally, but also a need for a joint coordination to help regions, municipalities and practitioners get started on the expensive technology investments on a small scale. Specific experience therefore needs to be gathered and shared both nationally and internationally so that preconditions and benefits are documented and thus create a basis for ongoing investments. There will also be a need to create new models for collaboration between the health system, learning environments and private suppliers, which can combine the new technologies with our health data, expertise and security.

Efforts

Digitally supported early detection
in municipal elderly care services

Data-driven technologies for automation,
prediction and decision support

Digital decision support for prescribing medicine

Further spread of telemedical home monitoring

Digitally supported care plans for
patients with chronic illness

Better follow-up on vaccination
and cancer screening programmes

Change

More patients will be offered local and less intrusive management of their illness by the use of digital solutions for home monitoring and sharing their own knowledge.

New technologies and data-supported procedures will help healthcare professionals to focus their efforts so that patients are treated and/or adjustments are made earlier – and ultimately less intrusively.

Which national targets are we achieving?

More healthy years of life

Fast diagnosis and treatment

A more efficient health system

A stronger focus on the chronically ill and elderly patients

3.1

Digitally supported early detection in municipal elderly care

Digitally supported early detection is an element in municipal elderly care services which involves nursing staff systematically and digitally recording and following up on the health status of the elderly. If the elderly person's health is found to be declining, staff can plan future care and intensify their efforts to avoid hospitalising the patient due to dehydration, constipation, bladder infection or other preventable conditions. Care staff find that the method and tools give them a professional boost and greater peace of mind in their work. Digitally supported early detection helps give them an overview of the patient's state of health and systematises detection activities in a way that is useful in their work and for passing knowledge on to other staff.

Technological delivery

The digital tool has already been developed. Some municipalities will need to purchase the solution. Others are already using it. It is also relevant to consider the solution together with PROs.

Implementation process

An analysis has been initiated to identify the dissemination potential for digitally supported early detection. Based on the wider analysis a decision will be made in 2018 on a potential nationwide roll-out of digitally supported early detection in the 2019 financial agreement.

3 . 2

Data-driven technologies for automation, prediction and decision support

New technologies for using data provide opportunities for better treatment and care, e.g. through prediction, decision support and automation. It will also be relevant to look at how artificial intelligence, virtual reality, etc., can support administrative workflows, logistics, teaching and new forms of collaboration in hospitals, municipal health services and in primary care. The health system needs to work closely with private companies and external learning environments behind the technologies to understand and exploit the potential for the benefit of patients and staff.

Technological delivery

There is a need to develop ideas and to test and obtain more knowledge about new technologies in this area in collaboration with healthcare providers, businesses, research environments, educational institutions, etc. Any legal barriers, and ways of handling these, will also be identified.

Implementation process

Implementation and evaluation of pilot projects, where experiences with barriers, applications, concerns, costs and benefits in relation to the new technologies are documented and shared across the health system, creating a better basis for potential decisions on whether to implement a new technology on a large scale.

3.3

Digital decision support for prescribing medication

Currently, there is a risk of errors in administering medication, e.g. if the doctor does not have an overview of a patient's allergies or doesn't know whether a medication interacts with other medications already prescribed. The aim of the initiative is therefore to establish digital decision support tools that will alert the doctor of any issues that need to be considered when prescribing medication for the patient.

Technological delivery

The project involves the purchase of a decision support system and establishment of a central medication allergy (CAVE) register.

Implementation process

The decision support tools must be ready for use in hospitals and in general practice by mid-2020.

3 . 4

Continued roll-out of telemedical home monitoring

Telemedical home monitoring must contribute to close cooperation within the health system, and to the active involvement of patients. Telemedical home monitoring allows patients to perform health measurements at home, while healthcare professionals monitor changes in their health remotely. This gives patients more freedom while actively involving them and giving them greater knowledge of their condition. In addition to improving local treatment for patients, telemedicine can prevent hospitalisation and free up capacity at hospitals. In the years ahead, telemedical home monitoring will be rolled out throughout Denmark for pregnant women with complications and for patients with COPD. In the long run, the aim is for telemedicine to be offered to other relevant target groups where there have been positive experiences. For example, telemedicine is being tested for patients with heart failure and comorbidity.

Technological delivery

All 98 municipalities and 5 regions have joined forces to establish common telemedical solutions for patients with COPD. The telemedical solution for COPD will build on existing national infrastructure and common standards. The telemedical solution for pregnant women with complications will be procured by the regions, based on previous experiences with providing telemedicine to this target group.

Implementation process

Telemedical home monitoring must be offered to everyone in all maternity wards before the end of 2020. Telemedical home monitoring is expected to be relevant to at least 10,000 patients with COPD nationwide. The exact target group depends in part on the solutions chosen locally. The national roll-out in the area of COPD will be completed by the end of 2019.

3.5

Digitally supported care plans for patients with chronic illness

Care plans for patients with COPD, type 2 diabetes and chronic lower back pain will be rolled out in at GP's from 2018. The care plan is the patient's own plan, the content of which is established in cooperation between the patient and the general practitioner. The patient and his or her relatives have digital access to the care plan, which provides knowledge about the illness and an overview of interventions and goals for preventing deterioration and improving life with chronic illness. The care plan can aid the general practitioner in referring the patient to municipal prevention initiatives such as stop smoking courses or telemedical home monitoring.

Technological delivery

Care plans for patients with COPD will be the first plan developed and rolled out in close cooperation between the parties and their IT suppliers, and will be viewable on the Danish e-Health Portal (sundhed.dk) etc. The care plans will be evaluated in 2019 and then improved and further developed in response, e.g. for new disease groups and cross-sector use. Many patients suffer from more than one medical condition. Consideration should therefore be given to whether care plans should be developed in the longer term to support people with comorbidity by ensuring cohesion between various care plans, or development of a single care plan to span disease groups.

Implementation process

COPD care plans will be implemented in 2018, while care plans for type 2 diabetes will kick off during 2018. Care plans for all three illnesses will be developed in 2019 and 2020, and offered to all relevant patients throughout Denmark.

3.6

Better follow-up on vaccination and cancer screening programmes

Many patients in Denmark do not participate fully in the national screening programmes for cancer and the national vaccination programmes. For example, participation in the childhood immunisation programme is insufficient in several areas. This is often because people forget to book a time for a vaccination or examination, and it can be difficult to get an overview of what the health system offers in these areas. The initiative therefore aims to give patients and their general practitioners a better overview of the status of their participation in vaccination and screening programmes, and patients will get better access to knowledge about services offered. This will support better dialogue between the doctor and patient, with the aim of ensuring well-informed decisions regarding participation in vaccination and screening programmes. This initiative is in the idea phase and requires a separate agreement.

Technological delivery

The National Health Data Authority and relevant parties will jointly prepare a model for how the necessary data can be made available for use by patients and physicians in an overview of participation in vaccination and screening programmes.

Implementation process

Access must be provided to the relevant data from the general practitioners' IT systems, and for patients on the Danish e-Health Portal (sundhed.dk) etc.

Jens' story

One patient's complete service journey

Jens has just been diagnosed with COPD and has an appointment with his general practitioner. Jens feels that the doctor is well-prepared and has insight into his new situation. This is because the doctor has received the diagnosis report from the hospital digitally.

Together with the doctor, Jens is given an overview of the actions that need to be taken. Jens can see the simple care plan on the doctor's screen. Jens and the doctor jointly set goals for Jens' health in the plan.

Via the digital portal, Jens shows his wife, Ulla, the exercises and precautions which will be part of his life from now on. She can also read about how Jens can live a healthy life with COPD, which means she will be better able to support him.

Jens has the flu and experiences shortness of breath. He calls an ambulance. At the emergency ward, he has difficulty speaking due to shortness of breath. But the doctor can see in Jens' personal data in the record system that he has been diagnosed with COPD.

In this way the doctor gets a quick patient overview with relevant information about Jens' health. He can see blood pressure, lung function measurements, etc., from Jens' visit to his general practitioner. He can initiate the necessary treatment.

Ulla is at work. But since she is listed as the contact relative in Jens' master data, the nurse in the emergency ward can quickly notify Ulla. She is at the hospital by her husband's side within the hour.

The secretary at Jens' GP's clinic receives a reminder along with the discharge summary that a consultation appointment is needed in one week. She sends Jens a digital message via the clinic's app. Jens responds quickly and a an appointment is recorded in Jens' joint calendar of appointments with the health system.

Following the consultation with his own doctor the municipality is informed that Jens has now been referred to telemedicine. A few days later, the home care nurse therefore visits and helps Jens get started with the home monitoring equipment.

The hospital has discharged Jens with a rehabilitation plan. Jens' doctor suggests that he begins telemedical home monitoring, which can also be used to follow-up on the rehabilitation. They update Jens' care plan.

Each week the municipal physiotherapist at the rehabilitation centre checks whether Jens is doing his exercises correctly and according to the plan. She can contact Jens via a digital messages so he knows he is being looked after.

11

Jens has been given a tablet for his home measurements. He also uses this to view instructions for the rehabilitation exercises agreed in the rehabilitation plan. Via sensors Jens can check that he is doing the exercises correctly.

10

After one year, Jens has to see his own doctor, who can digitally compare Jens' home measurements with similar COPD patients, for a check-up. They agree on new diet and training targets and update Jens' care plan.

12

FOCUS AREA 4

Trustworthy and secure data

The health system currently has a an overall high level of data security. But given the rapid development of digital solutions and data volumes and an increased risk of cybercrime, it is important that data is completely secure all across the health system. All healthcare providers must comply with the necessary and uniform security requirements – now as well as in the future.

FOCUS AREA 4 –
TRUSTWORTHY AND SECURE DATA

We must be on top of security

We have to maintain Danes' confidence in the use of health data. Proper security must remain the cornerstone of the greater sharing and use of data. The basis for this are the principles set out in the ISO 27001 security standard. This is based on data security having to be managed in line with a risk-based approach where each organisation manages their risks and prioritises security resources in response to these risks. The standard is mandatory for all public authorities to follow. There are also new obligations for the entire health sector under the EU's General Data Protection Regulation and the Directive on the security of network and information systems.

Transparency and openness regarding registration and use of patient information stored in the health system's IT systems is therefore crucial. As the opportunities for sharing relevant health data across the health system are exploited, patients must also have a higher degree of control over who can see information in their medical record and they must be able to see who is accessing it.

This is to be achieved in part through more extensive use of the common security solutions that are part of the it-infrastructure in the health sector. This will give patients new opportunities to exercise their right to request that their health information not be shared and automatically ensure that the information can only be accessed by the healthcare professionals who are allowed to do so in connection with treatment. This does not change the fact that it is a punishable offense for healthcare professionals to access information on a patient without a valid reason.

As in the rest of the world, there is also a growing cyber-security threat against Denmark with potential cyber attacks becoming increasingly advanced and involving the risk of greater consequences. When patient treatment is carried out using digital solutions across the health system, there is a risk of potential cybercriminals exploiting the situation if not all players sufficiently meet the necessary, uniform security requirements. All links in the chain have to be equally strong. The parties will therefore jointly strengthen, coordinate and systematise the work on cyber and information security across the health system. This includes the creation of a political cyber forum for the health sector where current cyber security threats and initiatives in this area can be discussed and coordinated.

The technical conditions related to security must also be in place. The security of the central IT infrastructure for the health sector must therefore be upgraded, so it can better withstand hacker attacks and support the transition of the health system's IT systems to mobile platforms. The work must to the widest possible extent be coordinated with similar initiatives in other parts of the public sector, so experience is shared and cross-cutting initiatives can be launched where this is most expedient. It is also very important to strengthen employee awareness, knowledge and behaviour in relation to protecting data and information from unauthorised access, hacker attacks and other security breaches.

Modern and effective legislative framework

Many of the existing rules on access to health data originate from a time where records were kept on paper. Uncertainty therefore often arises in today's digital reality about the statutory basis in digitisation projects. The Danish Parliament have agreed on seven principles for the use of health data and the central government presented a proposal for digitisation-ready legislation in autumn 2017. This has paved the way for further work towards a secure modern legislative framework for digital solutions which takes account of new digital solutions for sharing information between relevant players, and patient security in relation to their data.

Efforts

Patient access to log information from hospitals

Improved digital security – joint initiatives aimed at better cyber and data security across the health care sector

Better patient control of information shared across the health care sector

IT security at the General Practitioner

Modernisation of IT security standards in the health system

Change

Patients continue to have confidence that the health care sector takes good care of their health data

Healthcare professionals work with digital security and patients' sense of assurance

The security level of the digital solutions in the health system is to be increased and will continually match the occurrent need, following a risk-based approach

The entities of the health system work more closely together in relation to cyber and information security

Which national targets are we achieving?

Better, intercon-nected patient pathways

High-quality treatment

Enhanced patient involvement

A more efficient health system

4.1

Patient access to log information from hospitals

At present, patients at hospitals do not have access to information on which healthcare professionals have accessed information in their medical record during hospitalisation. To give patients this opportunity, a way of displaying the log information from the hospitals' electronic health record (EPJ) systems needs to be developed so that patients, e.g. on the Danish e-Health Portal (sundhed.dk), can see which hospital staff have consulted the medical records in the local systems. This improves patient security and discourage unjustified access. It will involve considerable work to show comparable log information in a way that makes sense to the patient and therefore there is a need for further analysis and clarification.

Technological delivery

In preparation for the technical solution, an analysis will be conducted on how data from local electronic health record systems will be imported into a common display format, including which data is to be displayed.

Implementation process

It must be clarified how log information from local electronic health record systems can be displayed in a clear and meaningful way on the Danish e-Health Portal (sundhed.dk) etc. The process for implementing the solution and method of organisation must be decided before the 2019 financial agreement.

4 . 2

Improved digital security – joint initiatives aimed at better cyber and data security across the health care sector

As in the rest of the world, there is a growing cyber-security threat in Denmark with potential cyber attacks becoming increasingly advanced and involving a risk of greater consequences. Each health authority is responsible for implementing initiatives to counter this threat, but to support security in the joint health sector solutions and strengthen cooperation in relation to cyber-security, a number of initiatives will be implemented including monitoring traffic on the central IT infrastructure components and establishing new joint initiatives. The final initiatives will be agreed as part of the work on the 2018–2020 national cyber and information security strategy in which the health sector has been identified as a vital sector for economy and society. The initiative requires a separate agreement.

Technological delivery

The initiatives include a number of technical elements to improve security in the central IT infrastructure in the health sector and the establishment of new joint initiatives in this area.

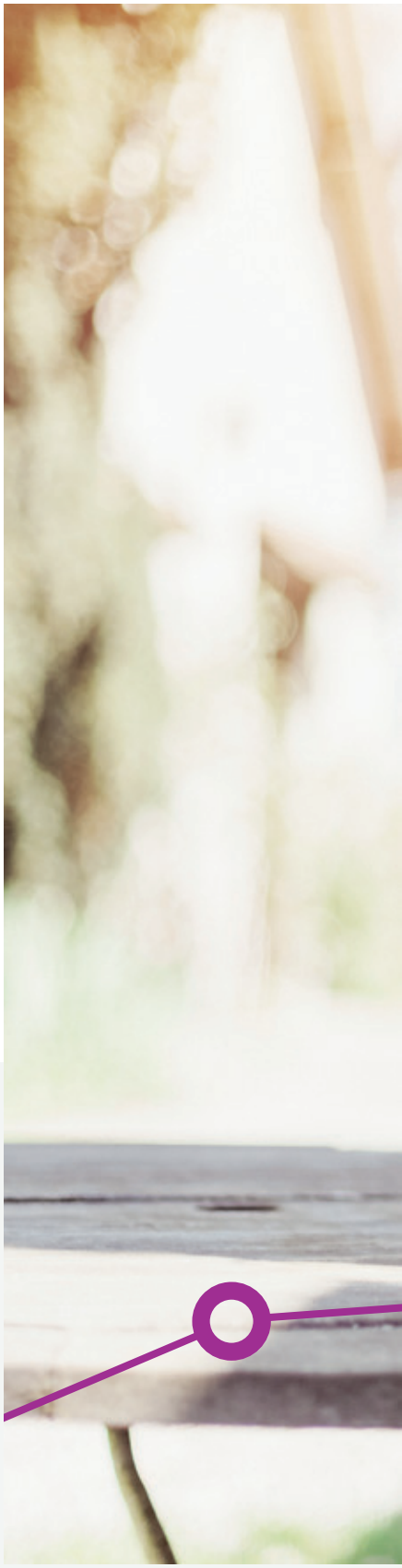
Implementation process

Deadlines for implementing the various initiatives must be agreed in connection with work on the 2018–2020 national cyber and information security strategy.

4 . 3

Better patient control of information shared across the health care sector

To give patients the best possible treatment in the health system it is necessary for healthcare professionals involved in the treatment to be able to share knowledge about the patient. But more data sharing can also create a need among patients to be more in control of their information and the possibility to check that it is not being unduly accessed. It will therefore be explored how patients can be given better opportunities to control access to their data and a better overview of who has had access to their health information, using the technological solutions already established. This initiative is in the idea phase and requires a separate agreement.



Technological delivery

A plan must be prepared for how and to what extent existing national security services can be linked technically to several cross-sector data sources in the health system. The sources will be prioritised in line with their importance and level of use across the sector, but could include the National Health Record (Sundhedsjournalen), the Laboratory Portal (Laboratorieportalen), the Interregional Image Index (Det Interregionale Billedindex), etc. Depending on how extensive the effort is to be there may be a need for minor adjustments to the national security services. The work will, where relevant, be coordinated with initiative 4.1 which is also based on the security services.

Implementation process

Based on the plan, an agreement must be reached on the extent to which the national security solutions need to be integrated into the central data sources.

4.4

IT security at the General Practitioner

General practitioners and other primary care specialists are part of the digital interaction with the rest of the health system. It is therefore vital to improve cyber and information security amongst practitioners, as in the rest of the health system. The security of patients' health data is no stronger than the weakest link. Patients have to be able to trust that the health data registered digitally at their general practitioner is also well protected, and that digital communication with their doctor takes place via the common secure login service (NemID).

Technological delivery

The secure login service (NemID - soon to be MitID) is being deployed to manage patient access to the websites of all healthcare professionals in private practice, for example to see care plans in primary care. In autumn 2017 an analysis was conducted of the security level in general practice and among the IT suppliers, which will be followed up in relation to both technical and organisational measures.

Implementation process

The measures for information security in primary care involve a broader security effort including the organisation of security activities, behaviour, physical conditions and procedures for processing health data and personal information. Therefore, there needs to be greater awareness of cyber and information security in primary care, for example through campaigns for greater awareness of information security among doctors.

4 . 5

Modernisation of IT security standards in the health system

Security in the common IT infrastructure of the health sector is currently based on standards which are not in line with the latest international developments in the area. Nor do the current security models adequately support the fact that patients and healthcare professionals increasingly access health information on mobile platforms, such as apps on smartphones and tablets. It is therefore necessary to completely modernise the security standards and model. In the longer term, it may be possible to do further work with Continua standards and standards for logistics (including GS1) in continuation of the work that has already been done in this area.

Technological delivery

As agreed upon in the 2016–2020 joint public digitisation strategy, a new security standard will be developed to replace the current standard ('den gode webservice') and migration to the new standard will be tested up until the end of 2018. Following the same approach, the potential for using the infrastructure components based on REST/FIHR in the Danish health system will subsequently be analysed. A proposal will be presented to the National Board for Health IT by spring 2018.

Implementation process

This work will make it possible to use the common IT infrastructure for solutions based on modern architecture (microservices) and solutions in line with the latest international healthcare standards (HL7, FHIR) locally. This also covers the integration of mobile devices and equipment such as measuring equipment.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FOCUS AREA 5

Progress and common building blocks

In order to develop a more local, cohesive and effective health system it is necessary to combine digital solutions and build a common digital infrastructure that links IT systems together.

The common IT infrastructure of the health sector needs to be developed so that it functions as a unified 'ecosystem'. This means an open and supplier-independent common network consisting of interdependent services and components linked by common standards and principles. The elements in the ecosystem serve as common building blocks that can be used flexibly locally and across systems, providing a foundation for further digitisation.

FOCUS AREA 5 –
PROGRESS AND COMMON BUILDING BLOCKS

An ecosystem of services and components

With a rising pace of treatment and rapid technological development, the need for more agility and greater flexibility in the development and implementation of digital solutions in the health system is increasing – both locally and nationally. We must therefore continuously tune and develop the collective digitisation efforts across the segments of the health system.

Innovation and the development of new solutions will be driven primarily in the various regions and municipalities based on local needs and desired changes. This will contribute with key experience and new knowledge about the use of technology in the health system and can form the basis for rolling out proven solutions across the country.

But when common solutions need to be implemented nationwide we must ensure faster progress, so solutions quickly benefit patients and employees, irrespective of geography, and are made available in local IT systems more rapidly. Where the common solutions require simultaneous implementation across the segments of the health system there is a need for stronger links, so the benefits can be realised for patients and healthcare staff. There has previously been a focus on the point of all players completing implementation – however it requires an extra effort to be a first mover and gain the first important experiences with the solutions. From a growth and market perspective it is also vital to suppliers that there is a certain volume in the market, as well as predictability and transparency in relation to development requirements in the sector based on common standards.

In order to boost efforts with common solutions, firstly, new models for better implementation and follow-up must be tested during the strategy period. The starting point for the new models is the broad experience previously gained in relation to rolling out new technology in the public sector.

Secondly, efforts to ensure more integrated IT systems in the health system must be better supported and must be more agile. The common infrastructure must be further developed during the strategy period so that it better provides a complete foundation for sharing patient information between the segments of the health system. An overall vision for the national IT infrastructure in the health sector must therefore be formulated to set the direction for efforts in the area in the coming years.

The work on this vision must support that local digitisation efforts are to a greater →

Efforts

Digital welfare solutions distributed to patients

A long-term vision for the common IT infrastructure

Better overview of organisational units
in the health care sector

Establishment of a national substitute -
Civil Registration System solution (e-cpr)

Change

IT solutions that function well in one local area will be rolled out to the benefit of all citizens in Denmark – irrespective of where they live

Healthcare personnel experience that IT solutions meet the core needs of their everyday tasks

The common IT infrastructure is extended to include new services and functions making it easy to further the development of services 'on top' of this common foundation, thereby extending the ecosystem through joint contributions

Which national targets are we achieving?

Better, intercon-
nected patient-
pathways

High-quality
treatment

Enhanced patient
involvement

A more efficient
health system

An ecosystem refers to a complex of systems where loosely connected components – common building blocks – work together and support each other.

The loose coupling allows the various components to continue to develop on their own terms in an open and vendor-independent manner as long as the link to the ecosystem is maintained. The foundation for this is a nationally formulated framework and rules which define the ecosystem.

extent based on the shared infrastructure. The aim is that in the long term new systems can be developed faster locally when the elements of the infrastructure serve as building blocks that can be used flexibly, depending on local needs and requirements. Connections and integrations for common solutions can also be planned better locally. An example of this is the infrastructure established for patient reported outcome (PROs), where each region and municipality is working on initiatives at varying paces. In the long term, the work must lead to the infrastructure more closely resembling a genuine ecosystem based on openness and flexibility, which the segments across the health system can draw on and contribute to in line with common rules of play.

The principles for the work with the common infrastructure arise from the division of responsibility for the IT infrastructure agreed in the health IT agreement in the 2011 financial agreements. This states, among other things, that the parties are jointly responsible for ensuring overall coordination on this area. Where local bodies are responsible for purchasing, developing and operating IT solutions, the central government is responsible for setting standards for cross-sector communication and ensuring a cohesive data and IT architecture.

Implementation across and in depth

In September 2017 there were more than 65 million calls from local IT systems to the National Service Platform (NSP). The number of calls has risen by over 250% since 2013.

COMMON INFRASTRUCTURE:

Principles for work with the new common infrastructure initiatives in the health sector – from the decision to commence to operation

Decision to commence

A new infrastructure initiative is launched following joint prioritisation between all segments, i.e. following a decision of the National Board for Health IT and political confirmation in the annual financial agreements.

Clarification of scope and basis for operation

Standards and architecture: New initiatives must comply with the applicable reference architectures and the National Health Data Authority's catalogue of IT standards, which must be adhered to when developing and using health IT systems in Denmark, pursuant to section 193 (a) of the Danish Health Act.

Legal basis: The statutory basis must be clarified for each specific project including for the collection, storage, processing and disclosure of data.

Links to existing infrastructure: New projects must adhere to the essential principle that existing elements should be reused wherever possible. The National Board for Health IT continues to be responsibile for ensuring overall coordination across projects in relation to digitisation in the health sector agreed in the strategy and the financial agreements.

Realisation of the initiative

Responsibility for realising the initiative will be assigned to a new steering committee or an existing forum such as the MedCom steering committee. The initiative will be followed by the National Board for Health IT.

Maturation and testing

Prior to going live the initiative must be tested and matured to a sufficient level, e.g. according to the TRL scale.

Transition to operation

Operation is transferred to the system management unit at the relevant authority and is included in the Joint Public e-Health Data Administration System (FSI) governance set-up. Financing will typically be arranged through a joint financing model.

5.1

Digital welfare solutions distributed to patients

Digital welfare solutions must quickly and efficiently benefit patients throughout the country. Experience gained from local projects which test and implement digital welfare solutions must be shared more effectively and be used systematically to improve efforts no matter where the patient lives. There must therefore be a thorough review of how the conditions for dissemination can be improved. Based on this review, decisions will be made as to which initiatives are needed to support the dissemination of digital welfare solutions both locally and nationally.

Technological delivery

Based on the thorough review, the parties describe and discuss initiatives that can improve the conditions for the dissemination of digital welfare solutions, such as new common methods for the implementation of common solutions, common standards, methods to ensure better cohesion across initiatives underway or changed incentive structures.

Implementation process

In 2018 the segments will discuss whether initiatives need to be launched on the basis of the review. Responsibility for implementing any activity will be agreed in connection with the political confirmation in the 2019 fiscal agreements.

5 . 2

Long-term vision for the common IT infrastructure

The work of linking healthcare IT systems must be based on secure, robust and scalable common infrastructure which is founded on openness and supplier independency. The infrastructure must also keep up with developments, so that it supports solutions based on new technologies. A long-term vision must therefore be formulated for the development of the common IT infrastructure for the health sector which sets the framework and direction for development of the digital foundation and describes the interfaces to the infrastructure in other sectors. In this way, cohesive and secure digital solutions for patients, their relatives and the health care personnel around them can be created.

Technological delivery

An overall vision for the shared infrastructure will be prepared before the 2019 financial budget agreements. The vision will describe developments in technology, requirements and needs for new functionality, financing, governance, etc.

Implementation process

Based on this vision an agreement must be reached regarding gradual expansion and maturation of the infrastructure during the strategy period to support new solutions and introduce new technologies and standards in the health sector.

5.3

Better overview of organisational units in the health care sector

In line with the increased digitisation in the health sector, the need to ensure unambiguous identification of organisational units across the health sector also increases, for example, so that patients can be precisely informed of the treatment location and employees can more easily locate equipment. The health system's organisation register (SOR), which is ideal for meeting this need, must therefore be prepared during 2018 for wider and increased usage as a replacement for the outdated register for classification of hospital departments ('Sygehus Afdelings Klassifikationen' (SHAK)).

Technological delivery

Preparing the health system's organisation register (SOR) involves a number of technical solutions including development of a new way of accessing SOR so that the register can be queried locally, a technical solution to support the transition from SHAK to SOR, and a solution to allow the regions to maintain their own SOR information directly in their own local IT systems.

Implementation process

The technological consignments are designed to support a local implementation of SOR as efficiently as possible. The existing SHAK system will be gradually phased out as SOR becomes fully implemented.

5.4

Establishment of a national substitute - Civil Registration System (e-CPR) solution

When patients without a Danish civil ID number (cpr) are treated in the health system there is currently a risk of misunderstandings and at worst of errors in treatment as the substitute - civil ID numbers (e-CPR) used to register the patients in the health sector's IT systems are not necessarily unique. This is because each region currently has its own system for issuing e-CPRs, which means that the same number can be assigned to different people. To solve this problem a national e-CPR system will be established and rolled out across the entire health system.

Technological delivery

As part of the initiative a national solution for issuing e-CPR numbers will be established.

Implementation process

The regions must integrate the national e-CPR solution into their own systems or access it via an online solution (website), so that it can be easily accessed by the relevant healthcare staff. In the long term the national e-CPR solution can also be used in primary care, etc.

Summary of efforts

FOCUS AREA 1

The patient as an active partner

1.1 The doctor in your pocket – A GP app for patients

1.2 Ask the patient – Patient Reported Outcome (PROs)

1.3 Digitally supported rehabilitation

1.4* A complete presentation of the patient's health data

1.5* A guide to health apps

1.6 Decision support tools for cancer patients

1.7* Digital pregnancy tool

FOCUS AREA 2

Knowledge on time

2.1 Better, faster and more secure digital communication across the sector

2.2 A complete overview of a patient's care and treatment

2.3 Digital workflows at GPs and more targeted communication with other parts of the health care sector

2.4 Safer medication at residential care centres and substance abuse rehab centres

2.5 Better overview by having structured care records in the municipalities

FOCUS AREA 3

Prevention

3.1 Digitally supported early detection in municipal elderly care

3.2* Data-driven technologies for automation, prediction and decision support

3.3 Digital decision support for prescribing medication

3.4 Continued roll-out of telemedical home monitoring

3.5 Digitally supported care plans for patients with chronic illness

3.6* Better follow-up on vaccination and cancer screening programmes

* Ideas for initiatives requiring a separate agreement.

FOCUS AREA 4

Trustworthy and secure data

4.1 Patient access to log information from hospitals

4.2 Improved digital security – joint initiatives aimed at better cyber and data security across the health care sector

4.3* Better patient control of information shared across the health care sector

4.4 IT security at the General Practitioner

4.5* Modernisation of IT security standards in the health system

FOCUS AREA 5

Progress and common building blocks

5.1 Digital welfare solutions distributed to patients

5.2 Long-term vision for the common IT infrastructure

5.3 Better overview of organisational units in the health care sector

5.4 Establishment of a national substitute - Civil Registration System (e-CPR) solution

FROM IDEA TO EFFORT

Follow-up, ongoing prioritisation and continuing actions

The aim of developing a health system which operates as a trustworthy and coherent healthcare network for all patients will require the allocation of resources and considerable capacity, including for the common and local consignments, as well as embedment in the health agreements between regions and municipalities. Digitisation must be integrated into the overall efforts and follow up on the national targets for the health system.

The strategy is ambitious – and for a health system which is already experiencing great changes, it will be demanding for both management and for project and front-line employees to achieve the consignments described in the strategy. However, the opportunities for achieving the national targets depend on us raising our health system to a new digital level. The parties behind the strategy therefore aim to improve cooperation on the digital initiatives and changes and regularly review the joint efforts.

The strategy has been politically agreed upon between the parties and follow-up is anchored in the National Board for Health IT. The board has over the past many years had good experience with driving and following up on digitisation projects by taking stock of the work with great transparency. The board will continue to pursue this approach to follow up and thereby ensure the overall coordination and prioritisation of digitisation initiatives across the parties in the health sector. The board must therefore be continually informed of progress on the initiatives under the strategy, which is broken down into specific milestones. This is intended to ensure visibility regarding the status of the consignments, and that the board can monitor progress. The parties can thereby also mitigate risks and challenges for the projects consignments together and deal with them as early as possible.

The initiatives in the strategy are a first step towards achieving the strategy's objectives. The National Board for Health IT will therefore annually prioritise the joint efforts with the aim of reviewing the priorities of ongoing initiatives and launching new consignments which will contribute to boost the changes which the strategy sets the direction for. The regular priority review must also address the fact that rapid technological advances are taking place and new opportunities and needs will arise within the health sector which could not be identified at the launch of the strategy. At the same time we will continually learn more about the joint efforts as we develop and test the solutions, and we must draw on dialogue and international experiences with health parties in other countries. The need will therefore arise to change initiatives that are underway or initiate new ones, to boost the changes in the strategy and the national targets for the health system. This can also result from political agreements in the health sector.

Based on an overall annual cycle for the implementation of the strategy, the board therefore agrees on an annual prioritisation of the joint efforts and consignments.

The status of the strategy's initiatives will be published on the National Health Data Authority's website.

The Danish health care sector in brief

Denmark is a small Scandinavian country in northern Europe with a population of 5,7 million and covering an area of 43.094 km2. The capital of Denmark is Copenhagen.

Healthcare in Denmark is based on two main principles:

Free and equal access to public health care. This includes general and specialised practitioner services and all public hospital services. Private co-payment includes dentists and out-of-hospital medicines and aides.

Universal coverage. All residents in Denmark are entitled to public health care benefits in kind financed by general taxes.

The Danish health sector consists of three political and administrative levels: the state (Ministry of Health), the 5 regions and the 98 municipalities.

The Ministry of Health is the principal health authority at state level and is responsible for national health policies and legislation.

The five regions in Denmark are run by elected boards and are the main service providers in the Danish health care system. Their responsibilities include all hospital and psychiatric treatment and parts of the primary health care system including general practitioners (family doctors), private practising specialists and dental services for adults. As a rule, a general practitioner must refer the patient to a hospital for medical examination and treatment unless it is a question of acute illness. However, the vast majority of medical cases are handled by the general practitioner without referral to specialised treatment.

The regions do not collect taxes. Instead, regional health care services are financed through a block grant from the state, a state activity-related subsidy and a municipal contribution.

The 98 municipalities are the local administrative bodies with an average of approx. 57,000 inhabitants. The municipalities are responsible for a number of tasks including social services, primary schools and care for the elderly. In the field of health, the municipalities are responsible for home nursing and homes for elderly citizens with care facilities and associated care staff, public and school health care and rehabilitation.

The municipalities finance approx. 20 per cent of the total expenditure on health care in the regions. The payment consists of an activity-related contribution depending on their citizen's use of hospitals. The purpose of the local contributions is to encourage the municipalities to initiate efficient preventive measures for their citizens with regard to health issues.

The Danish health care system is characterized by extensive digitization. All hospitals, GP's and municipal health care providers keep electronic health records (EHR's) and common IT-standards facilitates electronic communication between providers e.g. are all referrals to medical specialists and psychologist made digitally. Overall coordination within the field of eHealth takes place in the National Board of Health-it created in 2011 and has representatives from the ministry, the regions and the municipalities. The role of the board is to coordinate and follow the overall strategy and development within eHealth, to initiate new national eHealth projects etc.

The Danish health sector in numbers

	Denmark	OECD average
Doctors (pr. 1,000 inhabitants)	3.7	3.4
Number of beds at public hospitals (pr. 1,000 inhabitants)	2.5	4.7
Average length of stay in hospitals	5.5	7.8
Life expectancy	80.8	80.6
Share of GDP spent on health, percentage	10.4	9.0

(OECD 2017)

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DIGITAL HEALTH STRATEGY 2018–2022

MINISTRY OF HEALTH

MINISTRY OF FINANCE

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