DIGITAL TRANSFORMATION OF THE DANISH HEALTHCARE SECTOR – PERSPECTIVES FROM A UNIVERSITY HOSPITAL

DIGITAL FUTURES:
DIGITAL HEALTH - BETTER CARE FOR MORE PEOPLE – EDINBURGH, MAY 21, 2019

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The Danish Healthcare System

Figure 1
Organisation of the public sector in Denmark

National Level  Regional Level  Local Level

Ministry of Health  5 Regions  98 Municipalities
The Danish Healthcare System

Figure 3
Access structure of the Danish healthcare system

Note: Not all specialist care, such as dental treatment, requires a referral from a general practitioner.
The Danish Healthcare System

Figure 4
The new hospital landscape

Source: Danish Regions
The Danish Healthcare System, financing

Figure 9
Healthcare expenditure as share of GDP in 2013

Figure 10
Organisational chart of the financial structure of the Danish healthcare system

Source: OECD Statistics
Source: The Danish Ministry of Health
Why do Denmark invest so intensively in new hospitals?

New construction in the Danish Healthcare

Number of m²

Challenges up to 2025

Aging population

- In 2025 the number of 0-64-year old citizens will be the same as in 2010.
- But the number of 75-84-year old citizens will increase by 75 pct.
- Less taxpayers and less hands in the healthcare sector

- and there will be more patients with chronic diseases

- From 2013 to 2025 the number of citizens with the most common chronic diseases will increase with 60 pct.
16 projects – number of m² and expected in Decommissioning
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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.
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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
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THE FIVE FOCUS AREAS

1. The patient as an active partner
2. Knowledge on time
3. Prevention
4. Trustworthy and secure data
5. Progress and common building blocks
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FOCUS AREA 1 – THE PATIENT AS AN ACTIVE PARTNER

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.

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
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- 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.

**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.
FOCUS AREA 2 – KNOWLEDGE ON TIME

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.

But 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.
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- 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.

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**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.
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- FOCUS AREA 3 - PREVENTION

**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
- Faster diagnosis and treatment
- A more efficient health system
- A stronger focus on the chronically ill and elderly patients
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- 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.

**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.
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- **FOCUS AREA 3 – TRUSTWORTH AND SECURE DATA**

- Modern and effective legislative framework.

- 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 occurring 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, interconnected patient pathways
- High-quality treatment
- Enhanced patient involvement
- A more efficient health system
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.
FOCUS AREA 5 – PROGRESS AND COMMON BUILDING BLOCKS

An ecosystem of services and components.

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, interconnected patient pathways
- High-quality treatment
- Enhanced patient involvement
- A more efficient health system
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- 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.

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.
Hospital construction site (Feb. 2017)
ICT ecosystem, landscape of technology
ICT Ecosystem, landscape of applications
ICT Ecosystem, Logical datamodel, FHIR mapping
Fast Healthcare Interoperability Resources
Rethinking logistics in the design phase

- Big is beautiful – but it challenges logistics in all areas of hospital operation
  - supplies,
  - medicine
  - sterile goods
  - patient flow, etc

- In the case of the new hospital construction projects in Denmark the central government has made the following requirements:
  - 8% efficiency as a consequence of the new hospitals (operating budget)
  - 2% annual efficiency (operating budget)
  - 30 days clearing guarantee
  - 30 days treatment guarantee
Acute patient logistics

- The Emergency Center at Aarhus University Hospital is a new innovation.
- Patient can stay in EC up to 48 hrs.
- The different specialities are present in EC.
- 76 single patient rooms
- Patients are pre-triaged and are directed/transported to the designated room.
Acute patient logistics

Pre Hospital Journal

Clinical logistics

Electronic patient journal

Visitation module

Acute module

Continuous dataflow

Referral
Visitation
Arrival
Reception
Examination/Treatment
Discharge/Transfer
Shifting focus from verticals to horizontals

EPR

Clinical Logistics

Service Logistics

Just in time medicine

Acute patient flow

Sterile goods flow
The next journey, 2019 - 2022

- Moving from semi-automation to automation
- Autonomation and decision support
- Robotics – software and transportation
- A more flow and process oriented approach

- We have ongoing collaboration with Fraunhofer ISST and IML about Hospital Engineering and Health 4.0.
Thank you
…. for your attention!

The Telegraph
”Aarhus: Denmark’s new culinary capital”

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