The Danish Healthcare System

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Healthcare DENMARK is a public-private partnership
Her Royal Highness Crown Princess Mary is patron for Healthcare Denmark

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

• Danish healthcare visitor programs
• Conferences
• Danish delegation visit to other countries
• Communication and press activities
• The Healthcare DENMARK homepage
Agenda

• The Danish Healthcare System
• Danish Healthcare strategies and initiatives
• E-health and Healthcare IT
• Telehealth
• EHR platform at Central Region
• **Capital**: Copenhagen
• **Population**: 5.7 million.
• **Area**: 43,094 km²
• **GDP per capita**: 59,831$
• **Language**: Danish
The Danish Healthcare System

Basic Features

- Universal Coverage
- Free & Equal Access
- Financed by general taxes
- A high degree of decentralization
Organization of the Healthcare System

National Level

Ministry of Health

Regional Level

5 Regions

Local Level

98 Municipalities
Where to go to if you get ill?

- Patient
- General Practitioner
- Specialist
- Dentist
- Private hospitals
- Hospitals
- Emergency ward
Financing Healthcare

- The government
  - Direct tax collection
  - Block grant (75%)
  - Co-financing (20%)
  - Activity based subsidy (5%)

- The regions
- The municipalities

The municipalities receive funding from the government through block grants, activity-based subsidies, and co-financing. The regions also receive funding from the government for health care activities.
Financing Healthcare

Public expenditures on health in general

Total expenditure on health as a share of GDP, 2012 (OECD)
Agenda

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• EHR platform at Central Region
All countries face the same healthcare challenges

**Healthcare challenges**

- **Demographics**
  - Population Pyramid for Canada, 2011

- **Life style**
  - Denmarks initiatives

- **New treatments**
  - Denmarks initiatives

**Denmarks initiatives**

- Early detection of critical diseases, population health initiatives and patient empowerment
  - Early detection of diseases and immediate start of treatment
    - Nationwide screening
    - Fast access to diagnostics
  - Population health and prevention initiatives
  - Primary healthcare clinics
  - E-health, telehealth and patient empowerment
  - Ambient Assisted Living
  - Personalized Medicine

- High quality and effective hospital treatment
  - High quality treatment
  - More outpatient treatment
  - "Just-in-time" coordination and logistics
Danish citizens are happy with their lives and with healthcare services
Outpatient treatment vs. inpatient treatment

Outpatient treatment 2009-2020

Beds 2007-2020
Unique patients vs. bed days (2009 = index 100)
Municipalities and chronic care

- Principle: Keep activity at lowest efficient cost level
- Extensive home care and home nursing
- Prevent acute admissions and take care of patients
- Citizens goal: Returning to and keeping a job
- Empowerment and living an active everyday life
- Rehabilitation
  - Patient education
  - Physical training
  - Diets
  - Tobacco
New initiatives on chronics and early diagnosis

What does the Government want?

- Better treatment in the primary sector (GP’s) and a 20 pct. reduction in emergency admissions for patients with COPD and diabetes.

Initiatives

- A clear treatment plan (diabetes, COPD, arthritis) and more quality of care – more data and more transparency at individual level – GPs and patients

- National initiative for people with lung diseases including early detection and care and treatment via telemedicine for all relevant COPD patients before 2019

- Case management with special trained nurses - offered to vulnerable patients with complex course of treatment in risk of many acute contacts (1 pct. Of patients take up 30 pct. of expenditures).
Ongoing work in the Ministry of Health

The right to fast diagnose and treatment
  • Maximum waiting of 30 days

Cancer Strategy IV
  • Holistic and coherent approach to cancer treatment

Targeted effort for the elderly medical patients
  • New action plan.
  • Focus among other on prevention, treatment and follow-up at home.

Action plan for dementia
  • Denmark as a dementia-friendly country. Individual tailored solutions. Focus on relatives.

Personalised Medicine
National Telehealth by 2019
The Danish eHealth and Telehealth plan

• National EHR and E-health architecture
• International standards
  • HL7
  • Continua Health Alliance
• First fully regional telehealth implementations
• Coordinated strategy:
  • Ministry of Health
  • Danish Regions
  • Danish Municipalities
The eHealth and telehealth strategy will align with the 2013 – 2020 Assisted Living strategy

- Full scale implementation of proven solutions
  - Ceiling lifts
  - Digital rehabilitation
  - Selected robot technology
- Full scale Smart Home implementation
- Smart Home technology for disabled citizens
- Coordinated strategy:
  - Ministry of Health and Prevention
  - Danish Regions
  - Danish Municipalities
16 new hospitals will be the backbone of patient centric healthcare

- Public-private partnerships
- New innovations
- Danish design
- Green technology
Personalised Medicine will increase treatment efficiency and reduce adverse effects:

The Danish National Biobank offers 16+ mio. samples for research.
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A long term focus on health data networks and on e-health provide efficient access to healthcare information

Sundhed.dk  
**E-health Portal**  
2003 -

MedCom  
**Health Data Network**  
1994 -

Who is behind?  
Ministry of Health, Danish Regions, Ministry of Interior, National Association of Local Authorities, National Board of Health, Copenhagen Hospital Corporation, Danish Pharmaceutical Association
SERVICES FOR CITIZENS

• Access to personal health data on treatment
  • E.g. e-Record from hospitals and GPs and Shared Medication Card

• Communication with health care providers
  • E.g. Contact information and e-services like booking, prescription renewals and electronic communication

• General information on health service
  • E.g. quality in health care, patient rights

• Accurate and updated information on health, disease and treatment
  • E.g. medical handbook

• Personal home care/hospital solutions
  • E.g. diabetes and anticoagulant therapy

• Patient to patient dialogue
SERVICES FOR HEALTH CARE PROFESSIONALS

- Access to personal health data on patients
  - E.g. e-Record, laboratory data and Shared Medication Card
- Contact and service information on other health care providers
- General information on health service
  - E.g. waiting lists, quality in health care, health and prevention programs, visitation
- Accurate and updated information on health, disease and treatment
  - E.g. medical handbook, treatment feedback and benchmarking
- Personal home care/hospital solutions
  - E.g. diabetes and anticoagulant therapy
The national EHR today (e-journal)
The Shared Medication Record

Description
- One national database containing updated information about prescription medicine for all patients in Denmark
- Access for all doctors, nurses, dentists, pharmacists at hospitals.
- Viewing access for citizens (own data)

Background
- Reducing number of medication errors
- Better communication regarding medicine between all involved parties
- Improving the quality of the treatment
Data for the National E-health platform is delivered by the regional E-health solutions – e.g. the Systematic eHealth platform

Columna is a full blown eHealth platform consisting of

- The Patient Record
- Patient Administration (ADT)
- Booking
- Order/Result
- Medication Management
- Logistics

Facts about Columna

✓ Columna is used in Central Denmark Region (Denmark’s second largest region with 1.3 million citizens) covering 18 hospitals including University Hospitals
✓ 10,000 different users per day, 25,000 registered users
✓ 6.7 million citizens are registered in Columna, of whom 1.2 million are patients with registered data.
✓ Registration of 2,400 admitted patients and 5,500 outpatients per day.
✓ More than 25,000 medication prescriptions per day.
✓ 40,000 lab results per day. 6,500 per hour in peak.
The National Service Platform

Service users:
- Regions
- Municipalities
- Medical practices
- Government

Service users
- Medical Authorisation
- Civil registration no. (CPR)
- Provider
- Client

Data collection and distribution unit

Business services:
- Shared Medication Record (FMK)
- Treatment relationship
- Follow-up
- Consent
- My log
- Notification
- Notification of birth
- Danish Vaccination Register (DDV)
- Authorisation

NSP services:
- Security Token Service (STS)
- Token exchange

Ministry of Health:
- FMK
- DDV
- Authority
- Registers

Ministry of Economic Affairs and the Interior:
- CPR

Ministry of Ecclesiastical Affairs:
- Register of birth
The National Service Platform – and new services

2014: National Image Index
- Radiology
- Ultrasound
- Telehealth

2015: National Telehealth
- Device data
  - General (e.g. weight)
  - Diagnostic (e.g. ECG)
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Telemedical ulcer assessment: The method
- The nurse photographs the ulcer with her cell phone and mails the image to the doctor.
- The doctor prescribes new treatment or new medication.
- Communication between nurse and doctor is based on a shared web based patient record.

The benefits:
- reduce the number of hospital admissions
- minimise the patients’ transport time
- reduce doctor and nurse time at the hospitals
- improve the skills of the municipal nurses increase patient satisfaction.

National roll-out: 70% of all relevant patients to be included by 2017
Are elderly people able to use Telehealth solutions?

- The Danish Digitalization strategy – electronic mailbox by Nov. 2014
- Patient Empowerment and quality of life
- Integrated Care
Personalised Healthcare – and Telehealth

TeleCare Nord

- All COPD patients in Region North
- Highest number of research projects
- Evidence
- OpenTelehealth – open source platform

The EPITAL project

- Personalised Healthcare
- Call center and new support organisation
- Patient Empowerment
TeleCare North
Home monitoring of COPD patients
TeleCare North

• From a R&D/ pilot program to a full scale demonstration project. First example in Europe.

• Collaboration across sectors, not only around the patient but also with the patient in relation to finding and implementing solutions that meet technical, organizational, legal and economic challenges of deploying full-scale operation.

• Evaluation- and research design, including randomized block design, geared towards gathering evidence of effect.
WHO

TeleCare Nord participants

- 1256 Patients
- The Danish Lung Association
- The municipalities in North Jutland
- The GPs in North Jutland
- The North Denmark Region
- The 4 hospitals in North Jutland
- Aalborg University
HOW

Asynchrony
As simple as possible – based on Open Source
Towards Integrated Care

Local patient related services

- Motivation to participate
- Medical referral
- Patient training
- Monitoring
- Contact to patient
- Monitoring gold 4 patients
- Contact to gold 4 patients
- Rehabilitation
- Yearly COPD control

Regional operating services

- Joined service
- Private vendor
- Public vendor

- Technical preparation of Telekit
- Logistics
- Support
- Server og software operation
- Software support
- Train the trainer
- Solution owner
- Contact / supplier management
- Tendering and procurement
PhD results

Health economic

- Home monitoring offers an health effect measured in qualy-adjusted life year (QALY).
- Home monitoring is more expensive - if offered to all COPD patients
- Home monitoring of patients with server COPD / GOLD 3 offers an effect measured in QALY and a reduces healthcost app. 7000 Dkr. /year.
- Home monitoring of patients who receives municipal nursing and care services offers an effect measured in QALY and reduces cost app. 9000 Dkr. /year
OPEN TELE SIMULATED CONSULTATION

DESIGN FORM

PROCESS FORM

REVIEW & INTERVENE

SEND FORM

SIMPLE, SCALABLE, STANDARDIZED

GO TO HOSPITAL

OPTIONAL VIDEO CONFERENCE

OR PERHAPS...

Posture  Q&A  Data

Time

Posture  Q&A  Data

Database
OpenTelehealth REMOTE PATIENT MONITORING - solution

Generic platform with flexibility to adapt

Medical device class 2
"The Funnel"

1. Self managed
   - Empowerment
   - IT-Support
   - Self treatment
   - Asynchronous TM

2. Support 1
   - Epi Call Center
   - Synchronous TM

3. Support 2
   - Response teams

4. Managed
   - Intensified observation

5. Controlled
   - Intensified observation and care

Reduction of admissions:
- Self managed: 30%
- Support 1: 10-15%
- Support 2: 10%
- Managed: 10%
- Controlled: 10%

Measures:
- Empowerment
- Healthy Lifestyle
- Insight to own health
- Network/Communities
- Increase competences
- Symptom understanding
- Self treatment plan
- IT-based decision support

Activity:
- Measures
- Reduction of admissions

Admission at hospital:
- 25-30%
Medical box – rescue medication

e-health navigator

e-health monitoring devices
CallCenter, Lyngby-Taarbæk, – Summer 2014
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Columna eHealth Platform
Solution Portfolio

- Columna Clinical Information System
- Columna Clinical Logistics
- Columna Service Logistics
- Columna Patient Logistics
- Columna Cura
- Columna Citizen
- Columna Medical Device Integration
Columna eHealth platform
Modularity & Integration
Columna in Central Denmark Region

Fully implemented solution and in 24/7 use

1 Joint solution for somatic and psychiatric patients
10 hospitals in Central Denmark Region
3400+ beds in somatic and psychiatric hospitals
20,000+ different users per day
6.7 million citizens are registered
   (1.7 million are patients with registered data)
2.500+ admitted patients per day
>25,000 medication prescriptions per day
>40,000 lab results per day
6,500 lab results per hour in peak
> 80,000 information exchanges per month with primary health service and citizens to support the continuum of care

HIMMS Level 6
Columna roll-out in the Region

Ambitious plan 10 hospitals in 40 months

Roll-out strategy:
- One standard configuration
- Reuse and small adjustments of clinical content
- Smaller hospitals - full roll-out
- Large hospital stepwise roll-out based on specialties
- Psychiatric and somatic hospital on simultaneous roll-out
Outcomes

- Easy overview of patient information including mobile access
- Increased efficiency
- Higher quality of care
- Tools for effective planning of daily tasks
- Standardized plans of treatment
- Structured clinical documentation, reusable
- Focal point of the interdisciplinary and inter-sectorial cooperation
- Optimized patient flows, logistics and communication
- Optimization of hospital service logistics
- Enhanced patient safety
- High satisfaction among clinicians

Aarhus University Hospital – most efficient in Denmark
The New University Hospital
Involvement in the New University Hospital Skejby (DNU)

Systematic is involved in the development of Healthcare IT solutions to DNU; the main areas are:
- Logistics Optimization in the hospital service areas
- Future Patient in hospital of the future
- The patient dialogue with the hospital

DNU - commissioning
2015 - the first departments
2016 - Emergency Department
2019 - full operation
Facts about the New University Hospital

- Aarhus University Hospital in Skejby today: approx 160,000 sqm
- New buildings: app. 300,000 sqm
- Approx 1.2 million sqm soil
- Plant investment (gross) 1.25bn EURO (2010-level)
- Operating budget (gross) app. 1.25bn EURO
- App. 11,000 employees
- App. 1,000 students
- Annual activity:
  - 100,000 admissions (inpatients)
  - 950,000 outpatient visits
  - 40-50% of the regional hospital activity
  - Up to 38,000 daily transportations