AGENDA

1. What is e-health and health it?

2. e-Health in Denmark and Norway
   • Status
   • Governance structure

3. The main initiatives in DK and N

4. Similarities and differences
WHAT IS E-HEALTH AND HEALTH IT?

- **EHR and other IT tools at GP’s office**
- **EHR and clinical solutions in hospitals**
- **EHR and other IT tools in primary care and home based services**

Most important and critical – the interaction

- **Citizen**
- **Hospital**
- **Homecare**

The involvement of ordinary citizens – health care portals etc.

- **Pharmacy**

Pharmacies POS systems etc.

The involvement of patients (tele-medicine etc.)

- **Patients**
WE ALL KNOW THIS SITUATION

Kilde: Læge Henrik Schroll, DAK-e, specialkonsulent Alice Kristensen og chefkonsulent Tove Lehrmann, Region Syddanmark
INTERACTION IS VERY COMPLEX
- THIS IS A VERY SIMPLE EXAMPLE

- Data is pushed between many applications and systems through EDI messages and FTP file transfers
- All relevant receivers do not necessarily receive the updated data
- Copies of the same data exist in several systems (where is the master/most updated data?)
- Shared data repositories are only used in selected areas
- Semantic point-to-point connections based on bi-lateral agreements
- Expensive point-to-point integrations between many IT-systems
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EHEALTH STATUS FOR DENMARK (SEP 2011)

**Municipality sector:**
- All have electronic homecare records and are connected to the Danish health data network.
- 75% uses standardized e-health messaging (MedCom EDIFACT and XML)
- 40% are connected to the national PEM shared data infrastructure

**Primary sector/General Practitioners:**
- All GP’s and most dentist and specialists have electronic health records and are connected to the health network.
- All Pharmacies are connected to the Danish health data network and the national CTR and e-Prescription service
- All GP’s and Pharmacies use standardized e-health messaging (MedCom EDIFACT and XML)
- 20% of all GPs are now connected to the national SMR shared data infrastructure (100% by Q2/2012)

**Hospital sector:**
- All hospitals have electronic health records (4+ different vendor systems)
- All hospitals are connected to the Danish health data network
- All hospitals use some parts of the standardized e-health messaging (MedCom EDIFACT and XML)
- 10% are connected to the national SMR shared data infrastructure (100% by Q2/2012)

**National level:**
- Health care portal (sundhed.dk)
- National e-prescription server (on-line system)
- National repository of summaries of HC treatments (LPR)
- Shared Medicine Record (on-line service)
- Interregional EHR repositories (e-Journal)
EMR Adoption - % of Institutions per Stage

Based on Key Components mapped to EMRAM by HIMSS
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 7</td>
<td>Complete EMR; CCD transactions to share data; Data warehousing feeding outcomes reports, quality assurance, and business intelligence; Data continuity with ED, ambulatory, OP</td>
</tr>
<tr>
<td>Stage 6</td>
<td>Physician documentation interaction with full CDSS (structured templates related to clinical protocols trigger variance &amp; compliance alerts), full R-PACS AND Closed loop medication administration</td>
</tr>
</tbody>
</table>
| Stage 5 | Closed loop medication administration  
**OR**  
full R-PACS |
| Stage 4 | CPOE in at least one clinical service area and/or for medication (i.e. e Prescribing); may have Clinical Decision Support based on clinical protocols |
| Stage 3 | Nursing/clinical documentation (flow sheets); may have CDS for error checking during order entry and/or PACS available outside Radiology |
| Stage 2 | Clinical Data Repository (CDR) / Electronic Patient Record or Clinical Data Warehouse; may have Controlled Medical Vocabulary, Clinical Decision Support (CDS) for rudimentary conflict checking, Document Imaging and health information exchange (HIE) capability |
| Stage 1 | Ancillaries – Lab, Radiology, Pharmacy – All installed OR processing LIS, RIS, PHIS data output online from external service providers |
| Stage 0 | All Three Ancillaries (LIS, RIS, PHIS) Not Installed OR Not processing Lab, Radiology, Pharmacy data output online from external service providers |
E-MESSAGING IN DENMARK

MedCom - The Danish Health Data Network
Messages/Month

- GP’s with EDI: 2120 = 100%
- Specialists with EDI: 790 = 99%
- Hospitals with EDI: 63 = 100%
- Pharmacies with EDI: 250 = 100%
- Doctors on Call: 5 = 100%
- Health Insurance: 5 = 100%
- 120 messages/min

Prescriptions
1567561 = 70%

Disch. Letters
1286713 = 99%

Lab. Reports
1186571 = 99%

Lab. Requests
559348 = 99%

Referrals
330614 = 65%

Reimbursements
20288 = 99%
THE NORWEGIAN EHEALTH STORY - STATUS

- **Municipality sector**
  - 50% of municipalities (covering 85% of population) use EHR systems for elderly care

- **Primary sector/General Practitioners**
  - 95% of GP offices are digitalized (using EHR)

- **Hospital sector**
  - 100% of Hospitals use EHR, RIS/PACS and computerized laboratory systems

- **National level**
  - National Health Networks Established
STEPS IN EHEALTH DEVELOPMENT NORWAY

- Municipality sector
  - Homecare Records
- Primary sector
  - Electronic Health Records
- Hospital sector
  - Patient administration system
  - Ordering systems
- National level
  - Regional HC Networks
  - National HC Network

Timeline:
- 1970
- 1980
- 1990
- 2000
- 2011
STATUS – COMPARED TO DENMARK

- Norway is not a part of EU Comparisons, or EMRAM (until now)
- National work – EPJ monitor (NSEP/NTNU)

- Gp’s
  - Comparable to danish level

- Hospitals
  - Comparable to danish level
  - Less developed on medication

- The main difference areas:
  - Interaction between GP’s and Hospitals (e-messaging)
  - Medication
GOVERNANCE STRUCTURES IN DK INVOLVED IN HC IT

- National Health Care IT (NSI)
  - National “styrelse” with direct reference to the ministry
  - Purpose:
    - Governance of national HC IT solutions and cooperations with regions and municipalities
    - Development and operation of national IT solutions

- Regional Health Care IT (RSI)
  - Interregional organisation, which coordinates and promotes common IT projects between the 5 regions

- Kommunernes Landsforening and KOMBIT
  - Coordinates and promotes shared and common IT-solutions within municipalities

- MedCom
  - Organisation which develops message standards, runs pilot projects and HC network

- Sundhed.dk
  - Co-operation between regions, state and pharmacies
GOVERNANCE STRUCTURES IN N INVOLVED IN HC IT

- Ministry of Health and Care Services
  - National board (e-helse gruppen)
- Directorate of health
  - E-health department
- The Regional Health Authorities
- National ICT
  - Interregional organization, which coordinates and promotes common IT projects between the 4 regional health authorities
- The Municipalities
  - The Norwegian Association of Local and Regional Authorities (KS)
- KITH
  - Standardization organization
- Norwegian Data Protection agency
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DEVELOPMENT INITIATIVES IN DK

- Connection of Shared Medication Record to all homecare systems
- Rolling out a secure SOA infrastructure
  - On-line support of system-system integrations
  - Support of national public key infrastructure
- National Patient Index
  - Provides read access to all relevant system sources
- Consolidation of base registers & reporting repositories
- Interregional picture database
- Interregional shared service EHR repository
Patients have several parallel contacts in the healthcare system. Information about their medication is maintained in multiple systems. Upon change from one actor to another, the information about the patients' medication often becomes incomplete and it is a difficult and cumbersome process to obtain the updated information.
Shared Medication Record (SMR) contains a patient's current and updated medication.

Provides to healthcare professionals a quick, actual electronic overview.

All prescriptions and changes in medication are stored in SMR.

Provides overview for the patient.

Prescriptions are handled by pharmacies through the SMR.

All access to SMR from the actors is done through own it-system (no additional system needs to be accessed).
THE NORWEGIAN EHEALTH STORY – MAJOR CURRENT PROJECTS

- National Electronic messaging program
  - GP- hospitals
  - GP- municipal elderly care
  - Hospitals – municipal elderly care
- National Health Portal
- National e-prescription program
- National core (shared) EHR
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WHAT ARE THE DIFFERENCES?

LET US LOOK AT 4 CASES

- **Electronic messaging – Hospital – GP**
  - Denmark has completed
  - Norway is still struggling - probably finished in 2013

- **E-prescription server**
  - Completed in Denmark in 2007
  - Still a development project in Norway – production in 2 mid ranged municipalities

- **Shared medication record**
  - In Denmark developed as the FMK («fælles medicin kort»). Roll-out to GPs and Hospitals finished in 2012. Home-care area follows in 2012-2013.
  - Norway - ?

- **E-health and the public**
  - Denmark: Sundhed.dk – provides public access to all actors and provides a number of services for the HC professionals too.
  - Norway: Helsenorge.no (very limited content....)
POSSIBLE ROOT CAUSES?

- Norway have established a very high level of information security at all levels:
  - Only messaging with receipt handling are accepted
  - Security levels regarding authentification and access control are very rigid
  - «Registerskræk» (Norwegians seems extremely afraid of storing personal sensitive electronic information)

- Denmark have a tradition of strong central governance (central authorities have central registers) and have made strong national solutions (LPR, FMK, e-Prescription server, Lab results registers, MEDCOM), while Norway have relied on regional governance

- Do Norwegian users have higher demands regarding usability?
  - E-prescription
  - Level of integration - MEDCON module and GP’s EHR.
WHAT IS BEST?

- The Norwegian approach:
  - Defining the optimal solution as a standard, and take what it takes to execute it – usually a very long time and a lot of money

- The Danish approach:
  - Establish pragmatic solutions (step-by-step), political will to adapt legislation, economic incentives for private actors (GPs and Pharmacies) and convince actors through good examples and tackle problems as they arise?

- Trade-offs:
  - The cost of waiting for the perfect and the costs of manually “bridging the gap”
    - versus
  - The cost of possible failures and the costs to prevent failures (eg. secure access), the costs of adopting to shared solutions and the efforts of roll-out

- Time will show - I sincerely hope that someone within 2012 will do some comparative studies on these issues