# The Norwegian Paradox

ICT success in Healthcare
despite the obstacles!

**Andy Hyde**
**Director of Quality Management and Compliance**
**Diakonhjemmet Hospital**
**Oslo, Norway**

bcs The Chartered Institute for IT

HC 2011
BCS SHOWCASE EVENT

Diakonhjemmet Sykehus

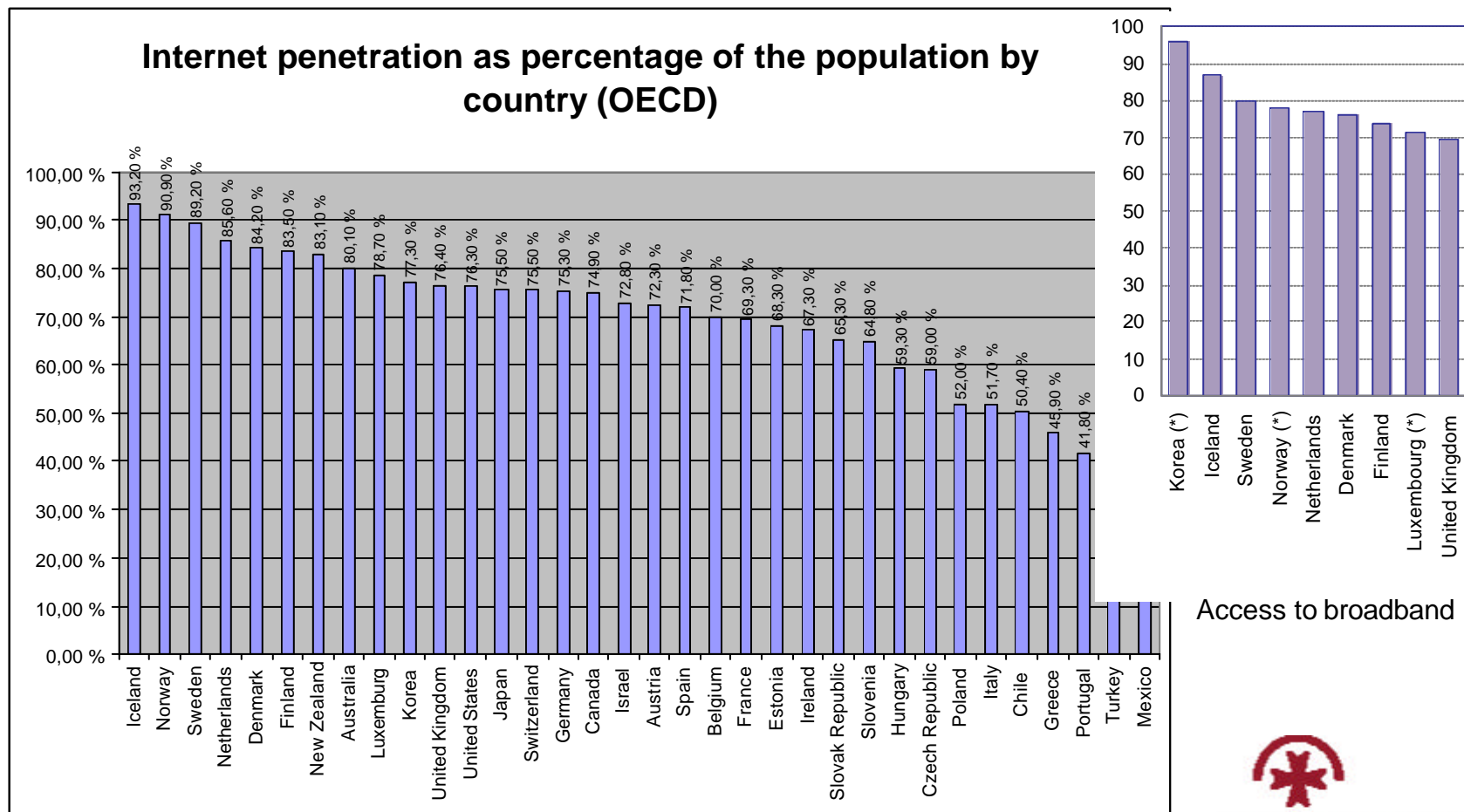6th April 2011. Birmingham

# Presentation overview

- Background

- ICT strategies in Norwegian health care

- ICT implementation in Norwegian healthcare
  - ✧ especially EPR and electronic communication

- The reality of where we are

- Barriers to implementation

- The Paradox

# Diakonhjemmet Hospital

- Founded in 1898
- Local hospital for 3 wards in Oslo, population 120000
- Private, non-profit, foundation based, fully funded from national health service
- Surgery, internal medicine, reumatology, child and adult psychology. All normal support services
- 240 beds

# Background - internet



Internet penetration as percentage of the population by country (OECD)

Access to broadband

Figures for 2009       Source: http://www.internetworldstats.com/stats16.htm

# Background – PC Ownership

**Media Statistics** > Personal computers (per capita) (1998)
by country

VIEW DATA: Totals | Per capita          Definition  Source  Printable version

Bar Graph   Map

Showing values for 1998. Select another time period: 1998

| Rank | Countries | Amount ▼ | Date |
|------|-----------|----------|------|
| # 1 | San Marino: | 678.571 per 1 million people | 1998 |
| # 2 | United States: | 449.513 per 1 million people | 1998 |
| # 3 | Switzerland: | 421.941 per 1 million people | 1998 |
| # 4 | Bermuda: | 419.637 per 1 million people | 1998 |
| # 5 | Norway: | 406.137 per 1 million people | 1998 |
| # 6 | Sweden: | 395.4 per 1 million people | 1998 |
| # 7 | Luxembourg: | 386.779 per 1 million people | 1998 |
| # 8 | Denmark: | 377.287 per 1 million people | 1998 |
| # 9 | Singapore: | 369.615 per 1 million people | 1998 |
| # 10 | Australia: | 368.767 per 1 million people | 1998 |
| # 11 | Finland: | 349.311 per 1 million people | 1998 |
| # 12 | Iceland: | 328.467 per 1 million people | 1998 |
| # 13 | Netherlands: | 324.882 per 1 million people | 1998 |
| # 14 | Canada: | 310.765 per 1 million people | 1998 |
| # 15 | New Zealand: | 288.336 per 1 million people | 1998 |
| # 16 | Germany: | 279.108 per 1 million people | 1998 |
| # 17 | Ireland: | 272.025 per 1 million people | 1998 |
| # 18 | United Kingdom: | 271.352 per 1 million people | 1998 |

**Figures for 1998 to show where Norway was at the time of the first ICT strategy in healthcare**

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# The Health System in Norway

- Hospitals are funded centrally through 4 Regional Health Authorities
  - ✦ Regions: South-East, West, Mid and North

- Primary Health Care is funded by local government
  - ✦ In Oslo by "Bydel" - city wards
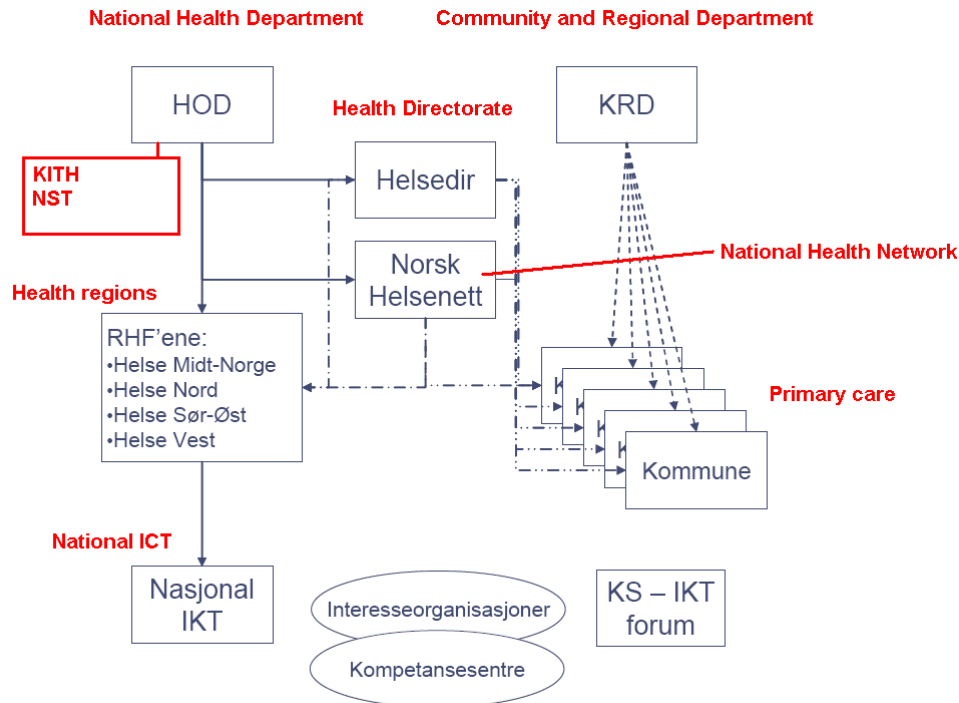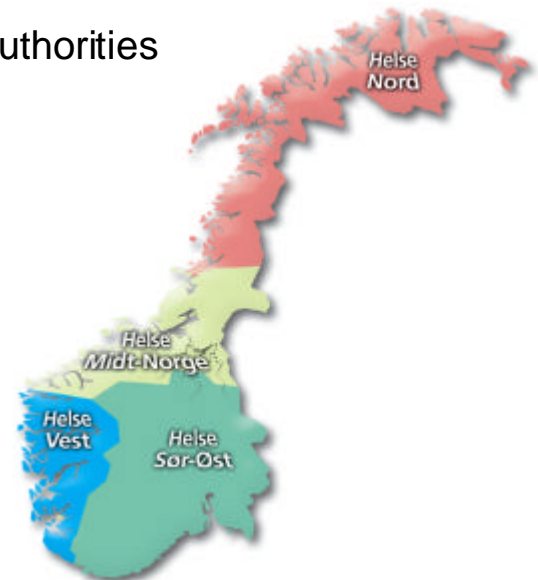
# National Health Strategies

- 1997 – 2000: More Health for every bIT
  - ✧ Network and information exchange
  - ✧ EDI e-mail
  - ✧ Telemedicine
  - ✧ EPR
  - ✧ Public access over Internet
- 2001 – 2003: Si @!
  - ✧ Increase in electronic communication
  - ✧ National Health Network
  - ✧ Telemedicine
  - ✧ Public access over Internet
- 2004 – 2007: S@mspill
  - ✧ Electronic messaging
  - ✧ National Health Network
  - ✧ EPJ
- 2008 – 2013: S@mspill 2.0
  - ✧ Electronic messaging
  - ✧ EPJ
  - ✧ Public access via electronic channels

**We now have a clear goal**

**Today 80% of information is sent on paper and 20% electronically. Within 3 years 80% will be electronic.**

**Director of Health**
**S@mspill 2.0. 2008**

# Objectives for ICT in healthcare

GOALS FOR IT IN HEALTH CARE

- Increase health personnel's competence => better diagnoses and treatment
- Simplify procedures for updating and storage of information => more time for patients
- Better communication between the different tiers => better coordination and interaction
- Promote good information to the patient => more power to the patient
- Maintain adequate information => ensure both safe and effective patient care and a strong policy.

(Health Minister Gudmund Hernes' five main objectives for the use of IT in health care, June 1996.)

# ICT management in healthcare in Norway

- Central "quangos"
  - ✧ NST (National Center for Samhandling og Telemedisin – Tromsø)
    - ▪ *National centre for integrated care and telemedicine – Founded 1993*
  - ✧ KITH - Trondheim
    - ▪ *Competency Centre for IT in Healthcare - Trondheim). Founded 1990*
  - ✧ Norsk Helsenett
    - ▪ *Norwegian Health Network*
  - ✧ National ICT

- ICT investement is different in each region
  - ✧ South-East: Sykehuspartner (Hospital Partner) but contracts are between hospital and supplier
  - ✧ North: Regionally. Contracts regionally

# EPR Vendors

- Three EPR vendors for Hospitals
  - ✧ Now only 2, in reality 1
  - ✧ DIPS, Siemens (Doculive), TietoEnator

- Two vendors for primary care
  - ✧ ProfDoc and WinMed

# Hospitals: implementation of EPR



## Hospitals: Status for implementation of EPR

Legend: Fullført · Påbegynt, men ikke oppgitt år fullført · Påbegynt men ikke fullført

## Health trusts: what is the main type of medical record used?

Legend: Completely EPR, necessary papers scanned · EPR is main record, with paper backup · Planning to phase out paper records
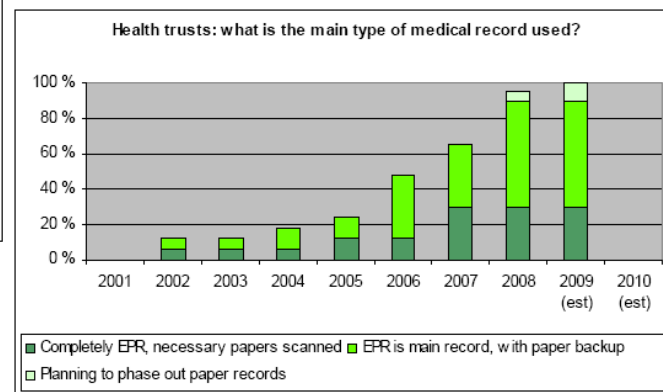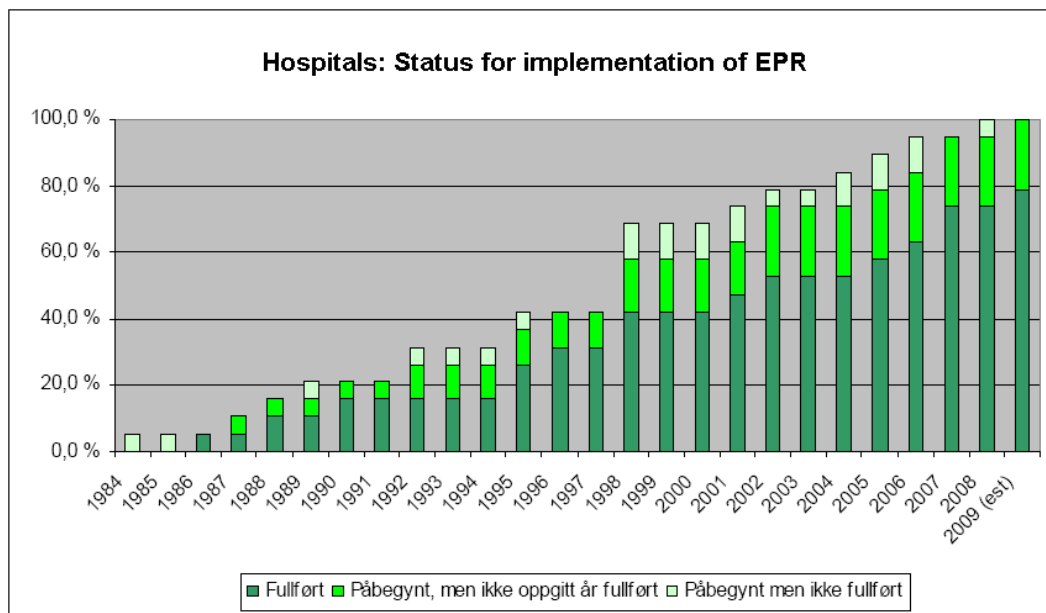
Figure 13: Status for main record type in health enterprises

Source: EPR Monitor 2008: Annual report 2008 - Overview of prevalence and use of ICT in healthcare services

# Primary care: implementation of EPR
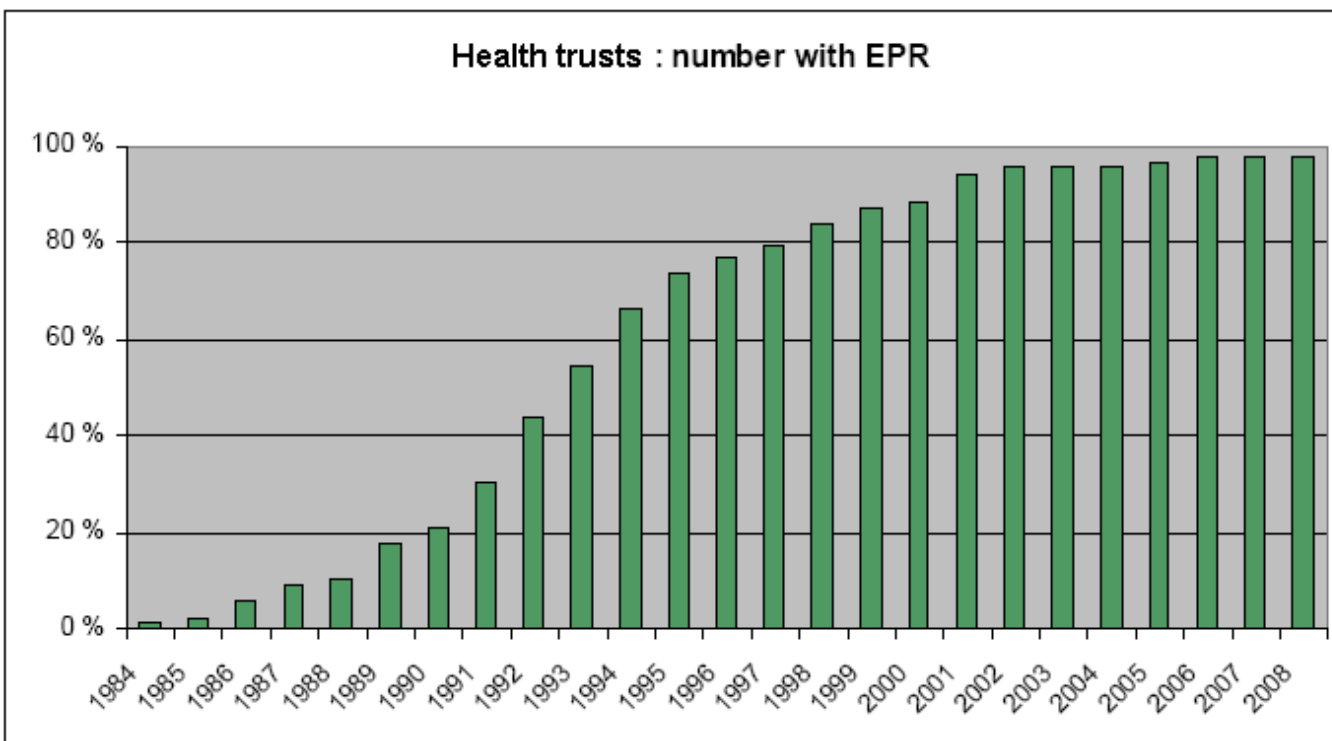
Health trusts : number with EPR

Figure 1: Number of health trusts having implemented EPR

Source: EPR Monitor 2008: Annual report 2008 - Overview of prevalence and use of ICT in healthcare services
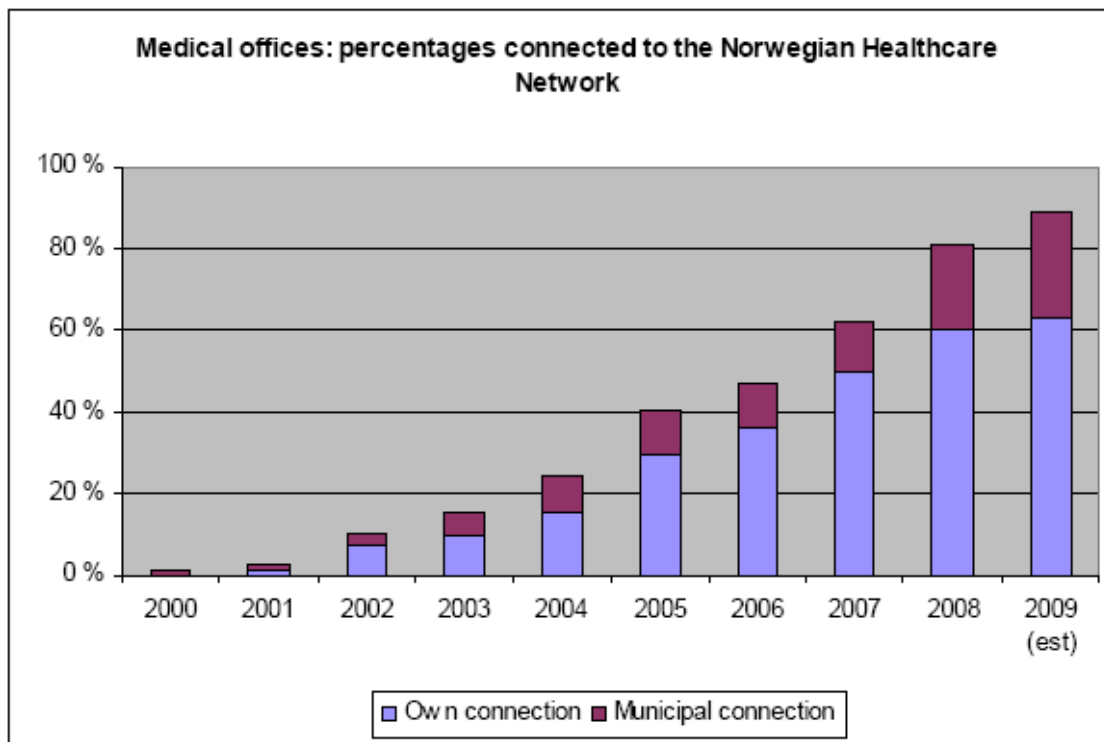
# Norwegian Health Network



Figure 13: Number of medical offices connected to NHN

Source: EPR Monitor 2008: Annual report 2008 - Overview of prevalence and use of ICT in healthcare services

# Use of electronic messaging

**Table 3: Ability to send electronic messages to primary health departments at general medical institutions**

| | All or almost all institutions | Some institutions | No institutions |
|---|---|---|---|
| Epicrisis | 91% | 9% | - |
| X-ray results | 76% | 10% | 14% |
| Lab results (clinical-chemistry) | 82% | 9% | 9% |
| Microbiology results | 55% | 4% | 41% |
| Pathology-/cytology results | 36% | - | 64% |
| Discharge notices | 18% | 14% | 68% |

**Table 2: Ability to receive electronic messages from primary health departments at general medical institutions**

| | All or almost all institutions | Some institutions | No institutions |
|---|---|---|---|
| Referrals | 41% | 18% | 41% |
| X-ray referrals | 27% | 14% | 59% |
| Lab referrals (clinical-chemistry) | 23% | 14% | 63% |
| Microbiology referrals | 14% | - | 86% |
| Pathology-/ cytology referrals | 9% | - | 91% |

**Poor**

**Table 4: Possibility to send different electronic messages to general medical institutions**

| | All or almost all institutions | Some institutions | No institutions |
|---|---|---|---|
| Referral to other enterprises | 5% | 5% | 90% |
| Epicrisis to other enterprises | 9% | 5% | 86% |
| Electronic sick note (NAV) | 5% | - | 95% |
| Prescription of medicines (internally in the company) | 9% | 14% | 77% |
| Prescription to chemist | - | 5% | 95% |

**Very poor**

Possibility to send messages not who does!

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# Legal barriers

- From "More Health for every bIT (1997 – 2000)"
  - ✧ M2.1.1 By the end of 1997 have investigated an appropriate legal and regulatory framework for electronic patient records. See Action Area 5.5: Regulatory Development

- Transfer of information between hospitals
  - ✧ Direct access to information across institutions not allowed.
  - ✧ No message protocol for sending information electronically
  - ✧ LOV 2001-05-18 nr 24: Law concerning health information registers and the treatment of health information (health register law). § 13. Access to health information in the responsible institution
    - ▪ *Paragraph 4: Access to health information in health information registers between organisation **can only be given with the express consent of the patient**. (every time)*

- National Health Register.
  - ✧ Only able to identify individuals after legal changes in April 2009 (NPR bylaw)
    - ▪ *Before this no way to connect individuals across different health care providers*
    - ▪ *Systematic outcome analysis almost impossible*

# Some examples

- In Sept 2008 radiology pictures sent to/from primary care on CDs with radiology results message sent by fax. Radiology pictures must be anonimised so can't be connected to the results message

- Sept 2008 radiology pictures sent from one hospital to another by taxi for emergency operation at a special hospital. Has caused fatality

- Can't send anything electronically between hospitals. Referrals and treatment documents still sent by fax or post

- Lab tests and radiology carried out in the hospital as outpatients are "owned" by the primary care physician and can't be accessed if the patient is hospitalised. They must be retaken

- Information safety regulator after several audits at major hospitals commented that access to EPR was far to broad. They insisted that each health worker should only have access to their patients just when it was needed. Access over this needed to be approved by the clinic directors. This meant they needed to work 24 hours a day!!

- Sept 2008. NAV send patient lists to GPs on diskettes

# Our experience

- Implemented EPR in 1994. Paperless in 2005.
- Now have clinical systems in Labs, Radiology, Operating theatre
  - ✧ Paper based curves. Scanned after use.
- Administrative systems for finance, personnel planning, quality management, building management

- 60% of epicrisis are sent electronically....
  - ✧ but paper sent in parallel because of a lack of receipt notification protocol

- Lab results sent electronically (no paper)

- All other information sent and received on paper
  - ✧ Post sent to wrong address because of "features" lacking in DIPS

- National activity and quality data sent electronically in XML format
  - ✧ Figures published do not match our internal figures

- No support for new initiatives such as patient care pathways, national patient safety initiatives, secure communication with patients
  - ✧ Strategies without tools and framework.

# The Paradox

- Technologically advanced society

- Almost every hospital and GP has an EPR
- Almost all are connected to the National Health Network

- Messages still being sent by CD, fax, paper
- Patients can't book appointments electronically
- Hospitals can't communicate electronically
- Doctors say ICT is far too complicated
- Audits show that EPRs contain lots of incorrect information and are too difficult to use

- Single EPR vendor for hospitals – high risk
- Outdated legal framework
- More focus on individual privacy than effective or safe healthcare

- New strategies before existing plans implemented
- No central coordinating agency or department with more than advisory power
- No political will to find a solution

No way back – No way forward?

That is the Norwegian Paradox