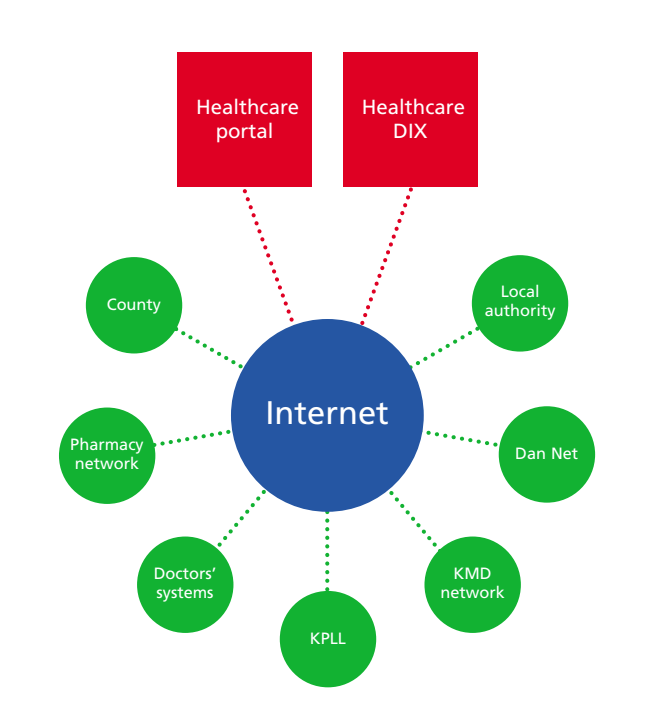
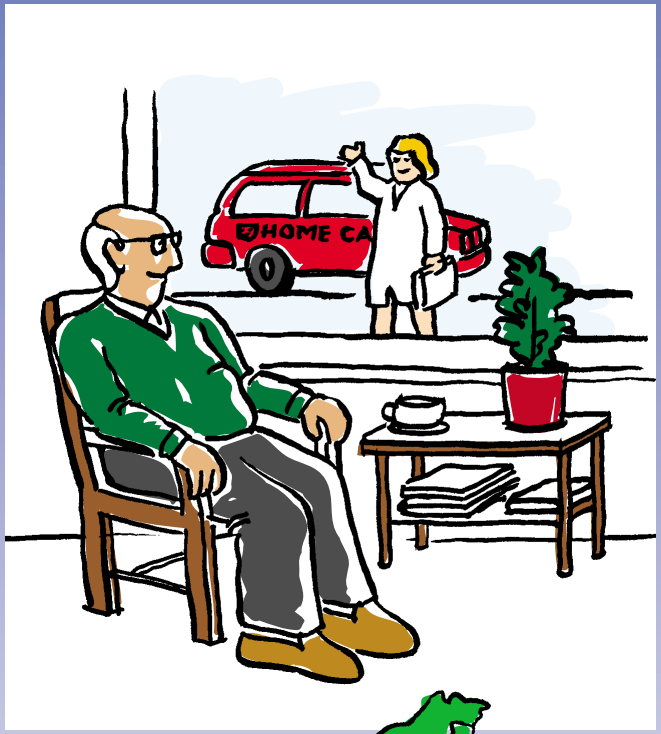
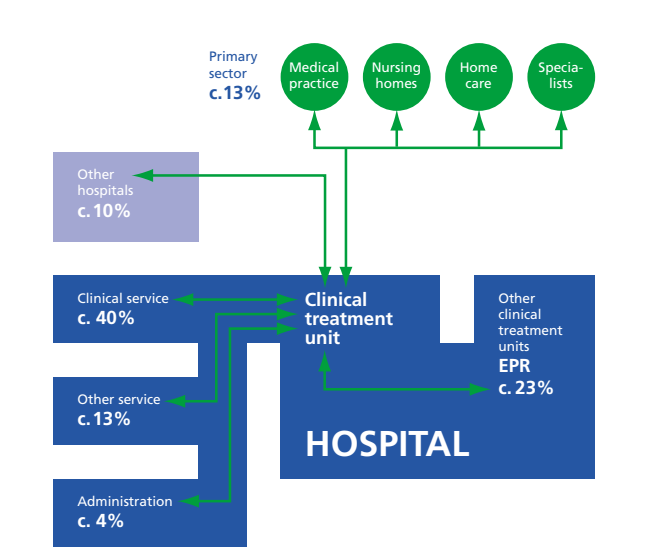
# MedCom IV
## Status, plans and projects




- Internet strategy
- Local authorities and healthcare communication
- Hospitals and healthcare communication
- International activities

# Contents



# Aims of MedCom

**MedCom aims to contribute to the development, testing, dissemination and quality assurance of electronic communication and information in the healthcare sector with a view to supporting coherent treatment, nursing and care.**

# Introduction

## Healthcare communication on the move

Communication is a key word in a healthcare sector, which reflects specialisation and division of labour between a large number of specialists and specialist groups across sectors. Quality and efficiency in patient treatment are entirely dependent on rapid, reliable and error-free exchange of information between all parties concerned with the patient.

It was therefore natural for the healthcare sector at the end of the eighties to start examining the options for using data communication. It started with a few enthusiasts, who could see the sense in transferring standard messages electronically. The idea quickly caught on, and the use of electronic communication developed in both breadth and depth – more and more users joined in, and the potential applications were extended to include new types of messages.

### One healthcare data network, several regional networks

The small, dispersed projects were soon brought together in actual regional healthcare data networks, the project organisation MedCom was founded back in 1994, both to control development and to ensure communication across the regions. The idea was to develop joint national communication standards for the most important forms of messages and to make the regional healthcare data networks building-blocks in a national healthcare data network. Coordination, development and exchange of experience became important tasks for MedCom in the efforts made to promote IT communication in the healthcare sector.

A particular dimension of the development work throughout the period has been interaction with private business. At first the market for the IT solution in this area was virtually non-existent. A market of this kind has been built up alongside the development of the healthcare data network under close and constructive co-operation between users, suppliers and MedCom.

### From the doctor to the whole healthcare sector

In the first phase of development, the general practitioner was the pivotal point in communication, which primarily passed between medical practices, hospitals, laboratories and pharmacies. Then the local authorities also joined in and became an important partner in cooperation, in home care and other areas.

Messages in the form of prescriptions, laboratory results, X-ray results, discharge letters etc. were exchanged in steadily increasing numbers between more and more users. By the end of the nineties, the healthcare data network was already forwarding around a million messages a month. The figure is now twice that level.

Alongside all this development, there has been intensive work on the consolidation and quality assurance of communication. There has also been considerable positive experience of the significant work involved in carrying out organisational changes under the impact of the new informational technology. Only if organisational changes are made can the improved communication really prove effective.

### New perspectives

The dentists, physiotherapists and occupational therapists are relatively new users of the healthcare data network. Promising trials are underway with telemedicine, and the Internet has come into the picture. The expansion and development of the Internet has made it appropriate to look at the opportunities to use Internet technology to meet some of the communication needs of the healthcare sector.

And this is where one of the principal focal areas of MedCom IV has been. The Internet opens up completely new opportunities both in relation to the patient and in dialogue with healthcare professionals. It is important to gather experience with this communication through a large number of practical projects. At the same time, MedCom IV has been concerned with the expansion and quality assurance of EDI communication, as well as the development and implementation of communication to and from electronic patient records.

# History

## It started in the eighties

The history of the healthcare data network goes back to the end of the 1980s, when interest in electronic communication between the various parties in the healthcare sector grew. Local projects were launched on the initiative of the Association of County Councils, at the hospitals in Vejle and Silkeborg and elsewhere. The projects, together with the DSI report *EDB over (sektor) grænser (Computing Across (Sector) Boundaries)* helped to draw attention to the need for cross-sector communication from 1991 on.

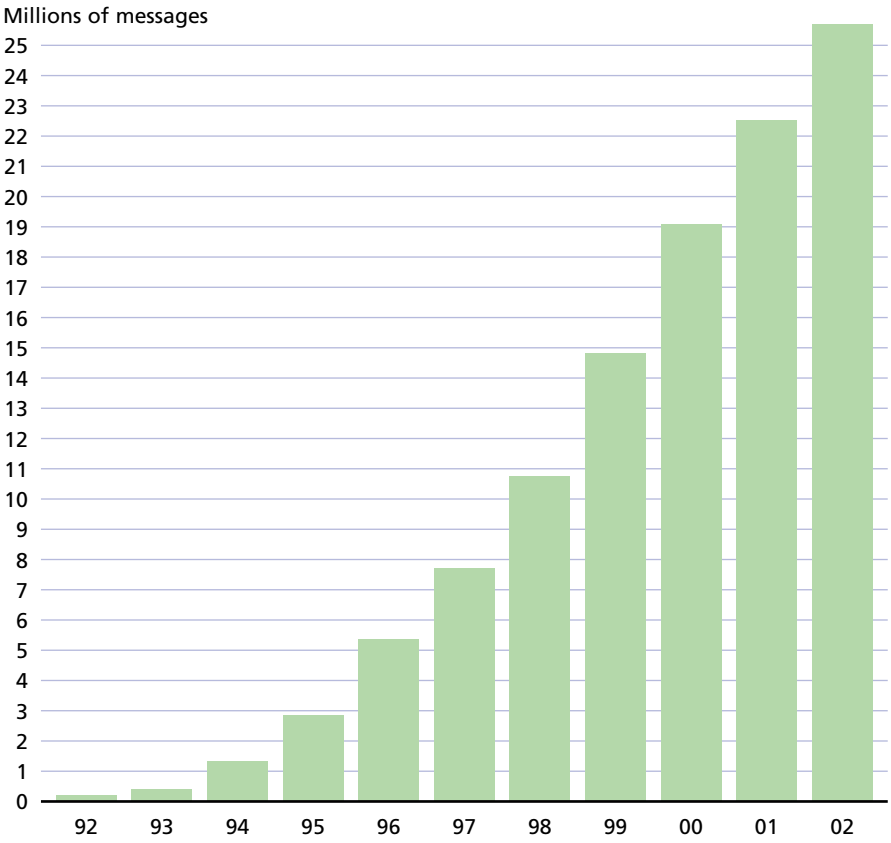
Alongside these projects, a trial involving communication between 10 pharmacies and 11 medical practices was held on Amager in 1989-90. The trial was pioneering in EDI communication in Denmark, and the same technological platform has been used for communication right up to the present day.

## The first regional projects

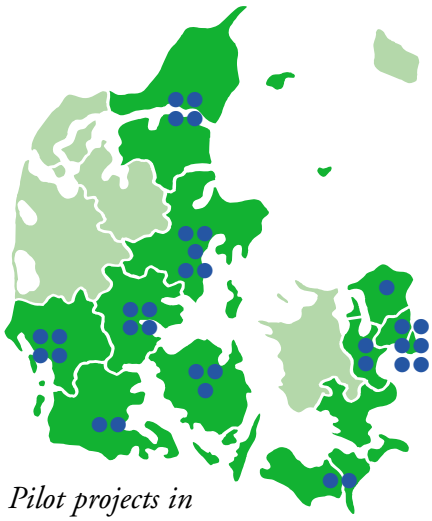
Three large regional EDI projects started in 1992:

- FynCom in Funen County
- The Odder project in Århus County
- KPLL in Copenhagen

All three projects were based on the technology used in the "Amager trial".




*The spread and use of the healthcare data network has developed appreciably over the last ten years. Today, 2.3 million messages a month are communicated.*



*Pilot projects in Medcom I*

## MedCom I: 1994-1996

To counteract the tendency for the counties each to "re-invent the wheel", Funen County in 1992 submitted a proposal to organise a joint nation-wide project bringing together national government, the counties, private companies and healthcare organisations under the name of: "MedCom – The Danish Healthcare Data Network".

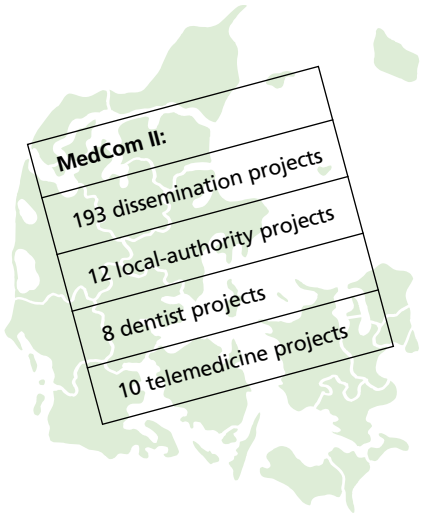
The purpose of MedCom was to develop nation-wide standards for the most common communication flows between medical practices, hospitals and pharmacies: referrals and discharge letters, laboratory results, X-ray letters, prescriptions and hospital billing, totalling over 30 million messages a year.

The development projects ran from 1994 to 1996 as 25 pilot projects spread across the whole country, which together involved the majority of the suppliers of IT to hospitals and medical practices. However, the dissemination of the standards went slowly. A decision was therefore made to carry out a second project – MedCom II.

## MedCom II: 1997-2000

The primary purpose of MedCom II was to ensure rapid and large-scale dissemination of the standards developed under the MedCom I project. The local-authority healthcare sector was brought into the project together with the area of dentistry and telemedicine. Internet technology also started to be used.

Following the implementation of MedCom II, EDI communication between hospitals, medical practices and pharmacies became everyday reality in all Danish counties, and 1.3 million messages a month were exchanged. Altogether more than 2000 medical practices, pharmacies, hospitals and laboratories were connected to the healthcare data network at the end of 1999, and between a third and a half of all standardised communication between the parties in the healthcare sector was exchanged electronically.




## MedCom III: 2000-2001

As communication in MedCom II came into use on a large scale, it became clear that fundamental quality assurance of the EDI communication was necessary, as the standards were used differently by the various suppliers.

At the same time, a decision was taken to launch four smaller project lines: the Hospital Area, Telemedicine/Internet, Local-Authority Communication and International Projects.


## MedCom today

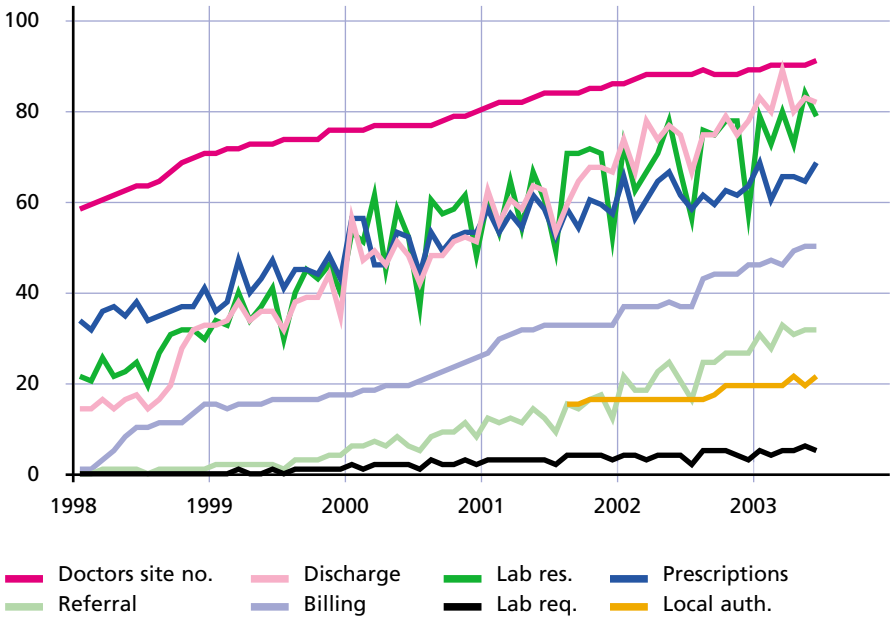
Electronic EDI communication has now overtaken daily, paper-based communication in the primary healthcare sector. By far the majority of doctors, hospitals, laboratories and pharmacies use electronic communication instead of writing letters – and this is the most common form of communication in the major areas of the primary healthcare sector.

| Spread | Number | % |
|---|---|---|
| General practitioners | 1939 | 88% |
| Specialists | 444 | 57% |
| Pharmacies | 331 | 100% |
| Hospitals | 64 | 100% |
| Local authorities | 24 | 26% |
| **Gains** | **Saving** | |
| Medical practice | 50 min./day | |
| Telephone follow-up to hospitals | 66% | |
| Per message | DKK 25 | |
| **Total electronic communication:** | | |
| 2.3 million messages a month. 70% of all communication in the primary healthcare sector. | | |

*MedCom III reflected a consolidation of the healthcare data network throughout the country and four project lines – Hospital, Local Authority, Telemedicine/Internet and International Projects – which each separately covered a group of regions.*

## MedCom status

Percentage of possible messages

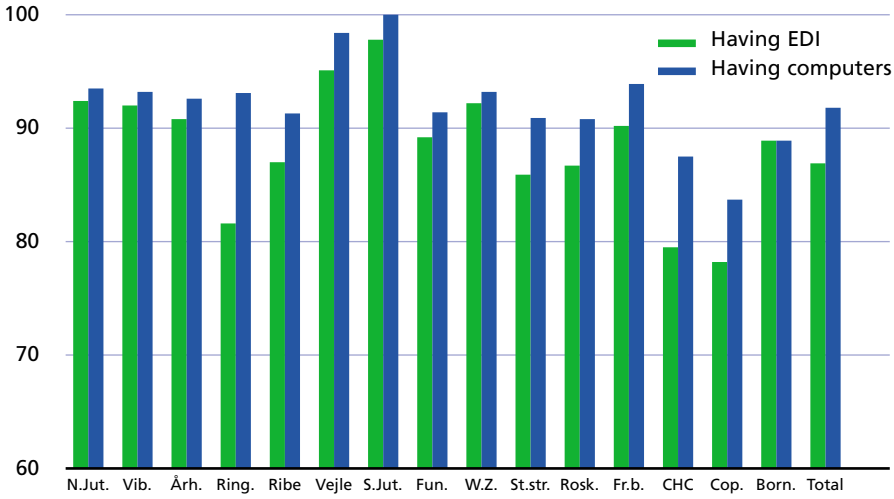



*The "Doctors site number" curve shows the proportion of doctors who use EDI communication, while the "Local authorities" curve shows the proportion of local authorities connected to the healthcare data network. The other curves show how large a proportion of discharge letters, laboratory requests, laboratory results, prescriptions, referrals and bills from general practice to the National Health Insurance Scheme proceed electronically.*

*Only in laboratory requesting and communication with the local-authority health visiting service is there still a need for further development and dissemination projects.*

## Medical practices, 1 April 2003

Percentage of all GPs




*The columns show for each county how high a proportion of medical practices have computers and EDI. It can be seen that most GPs have both, but there is a small group who do not have either computers or EDI. A small group have computers, but do not use EDI communication.*

## MedCom IV: 2002-2005

A substantial part of the work in MedCom III consisted in establishing the basis for the subsequent MedCom projects in two important areas, the introduction of Internet-based communication in the healthcare sector and re-use of MedCom's standards in the hospital area.

## The MedCom steering group

- Vagn Nielsen, Head of Department, Ministry of the Interior and Health (Chairman)
- Leif Vestergaard Pedersen, County Health Director, Århus County (Deputy Chairman)
- Karin Meinicke Andersen, Head of IT, Danish Pharmaceutical Association
- Lene Bilslev-Jensen, Head of Section, Ministry of Finance, The Digital Taskforce
- Steen Christophersen, Vice President IT, H:S Informatik
- Leif Hagerup, Chief of Section, Association of County Councils
- Morten Hein, Head of Section, Ministry of Social Affairs
- Henrik Bjerregaard Jensen, Centre Manager, MedCom
- Ralf Klitgaard Jensen, Chief of Section, National Association of Local Authorities
- Anders Kristian Jørgensen, Vice President, Dan Net A/S
- Arne Kverneland, Chief of Section, Nat. Board of Health
- Peder Larsen, Deputy Director, Funen County, Healthcare Secretariat
- Jørn Jan Nielsen, Deputy Chief of Section, Copenhagen Local Authority, Healthcare Directorate

The MedCom IV project is therefore building on previous MedCom projects and consists of four project lines:

1. **The Internet Strategy**, the purpose of which is to introduce a nation-wide, Internet-based healthcare data network and achieve large-scale use of web lookup, telemedicine and other Internet-based forms of communication in the healthcare sector.
2. **The Local-Authority projects**, the purpose of which is to achieve large-scale use of MedCom's standards for communication between hospitals and local-authority home care covering 75% of all Danish local authorities.
3. **The XML-EPR Communication project**, the purpose of which is to achieve large-scale nation-wide use of all relevant MedCom messages for communication internally in hospitals and between hospitals.
4. **MedCom's SUP project**, the purpose of which is to achieve Internet access to PAS and EPR patient records both within a county and across county boundaries.

## Commentary

### An important driving force

**The Minister of the Interior and Health, Lars Løkke Rasmussen**

"The Danish Government actively supports the MedCom co-operation, because it continues to constitute an important driving force in the development and expansion of electronic communication across the health service," says Lars Løkke Rasmussen, the Minister of the Interior and Health.

"In a specialised health service, ensuring that staff have rapid and secure access to all relevant clinical information on patients is a great challenge. It is essential that healthcare staff are able to communicate effectively across the boundaries of institutions, units and sectors.

The projects underway in MedCom IV focus in particular on communication in the hospital sector and communication between local authorities and hospitals, as well as GPs. In addition, the establishment of the new Internet-based healthcare data network is opening the door for new nationwide forms of communication, including secure web-mail, videoconferencing and lookup, for example in X-ray systems.

I anticipate that the communication projects will lead to increased quality and coherence in patient progressions and provide the basis for improved information and service to patients. I also anticipate that the projects will act as catalysts for changes in old routines and procedures in the health service, so that the resources can be used in the best possible way."

## All general medical practices are now joining

A number of new IT opportunities for general practitioners were introduced in the new agreement between the Association of County Councils and the GPs, which came into effect on 1 April 2003.

By 1 January 2004 all doctors who have received a computer billing fee in January 2003 must be able to communicate according to all the MedCom approved standards as they existed in October 2002. They must follow the standards for prescriptions, billing, discharge summaries and laboratory results in their communication, and – to the extent that it is safe and practical to do so – referrals and laboratory requests as well.

All doctors who did not receive a computer billing fee in January 2003 must join by 1 January 2005. In addition, provision is made to offer patients e-mail consultation and give results to patients by e-mail, as well as appointments and prescription renewal on the Internet.

## Specialists join in EDI

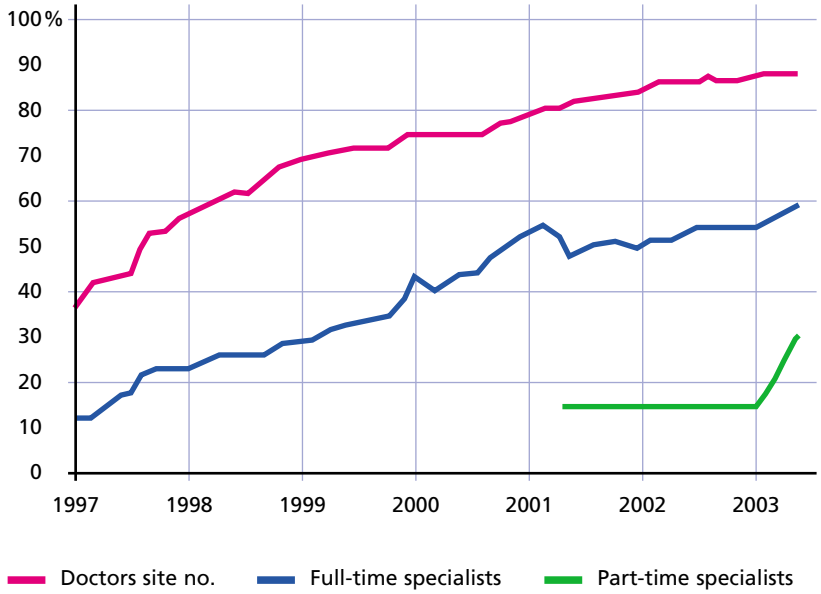
The new agreement between the Association of County Councils and the Danish Association of Medical Specialists makes it possible to offer grants enabling specialists in private practice to acquire IT and establish facilities for EDI communication and Internet access.

The grant is DKK 15,000 for full-time practitioners, DKK 20,000 for part-time practitioners, and a grant of DKK 5,000 is paid for the establishment of EDI communication alone. To qualify for a grant, it is necessary to purchase a doctors' system capable of handling all MedCom messages with the exception of MEDREQ. It is also a requirement that the specialist's practice is connected to the healthcare data network and that he or she uses all relevant messages in the communication that currently takes place in the county concerned.

The grant scheme started on 1 January 2003, and in the first few months of the year alone 86 new specialist practices started using EDI, three times as many as in the whole of 2002.

## Dissemination

Proportion of GPs and specialists in the healthcare data network




## Perspective

## MedCom certifies communication

Error-free communication of EDI messages in the healthcare data network is entirely dependent on both the sender and the recipient using standards and syntax correctly. This makes demands on the computer systems at both ends of the communication.

Previously the standards for the individual messages were tried out in pilot projects county by county and supplier by supplier, and the systems were gradually adapted. It was a process that was time-consuming and demanded considerable resources for all parties involved.

As part of the quality assurance of communication, users and technical staff have developed and introduced "Good EDI Letters", with MedCom as the intermediary. Thus the documentation of the standards has been made very precise, and it is to a large extent possible to carry out the adaptation of sender and recipient systems before the EDI message is put to use.

MedCom offers all systems houses and counties testing and certification of the sending and receiving of each individual EDI type. If the systems house or county complies with the standard for the type of letter concerned, MedCom issues a certificate of approval. The approval is published on the MedCom website.

Only systems that have undergone testing and approval may use the MedCom stamp of approval. Counties, Copenhagen Hospital Corporation (CHC) and national laboratories have undertaken only to use and communicate with systems and messages approved by MedCom.

# The Internet strategy

Within the health service, the Internet today is used for lookup in referral information and clinical guidelines. Use of the Internet is, however, limited by the lack of security in the open Internet. If the Internet is to supplement or be an alternative to the VANS-based healthcare data network, it will need to be possible to pass on the structured EDI messages via Internet technology, and for the messages to be integrated into the computer systems that take part in the communication. Expanded use of Internet technology makes fundamental demands with regard to security, infrastructure, certification, user administration and so on.

## The Infrastructure project

The aim of this project is to establish a nation-wide secure IP-based network for communication between the parties in the health service. The basic idea is to build up the network by linking together existing secure intranets in counties, local authorities and other organisations.

The first phase in establishment is to carry out a pilot project involving the construction of a prototype, by which the relevant forms of communication can be tested in daily operation between the participants in the project.

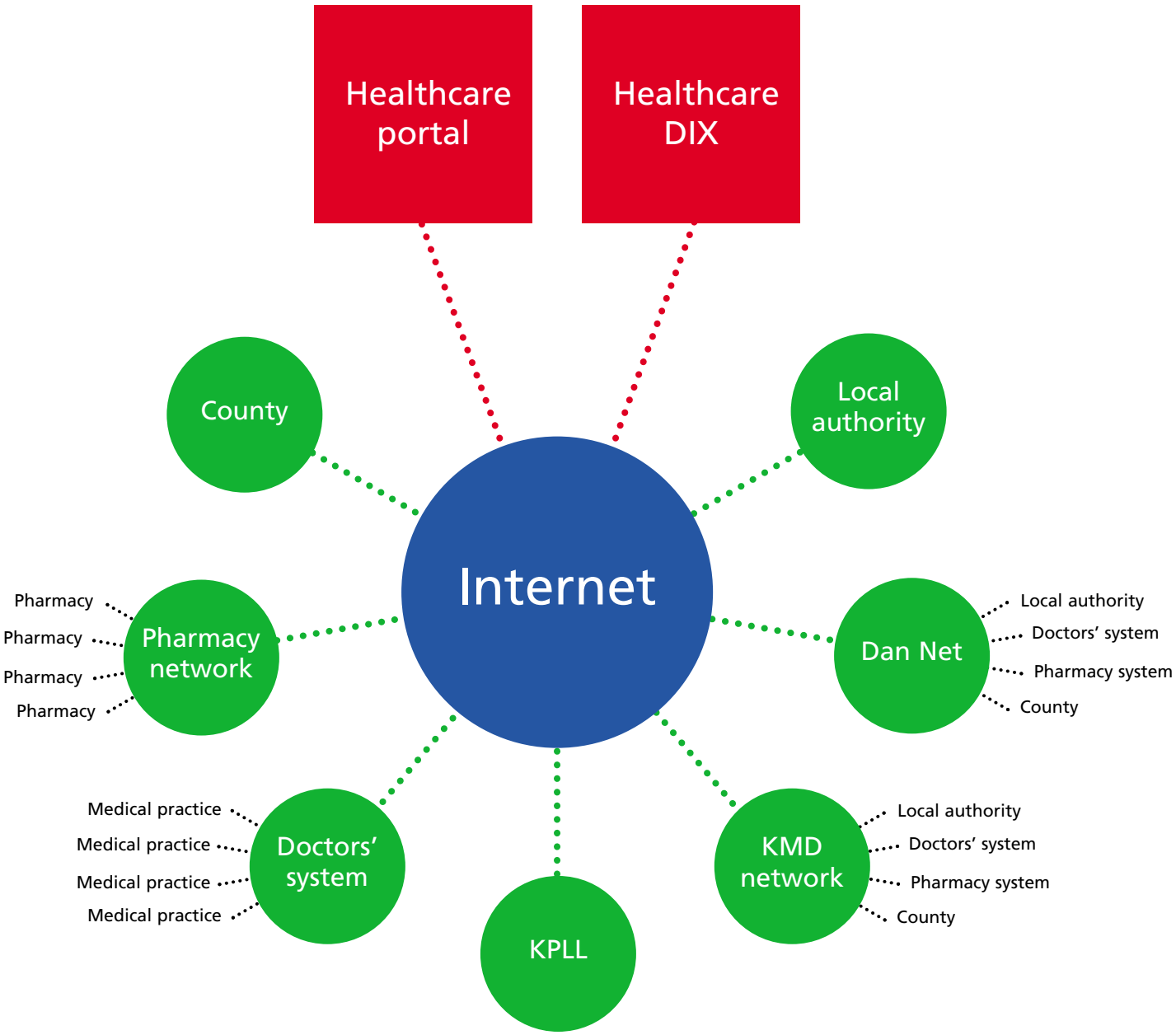
With a healthcare internet, the way is cleared for communication options that were not available in the traditional

### The Primary Group

The purpose of the Primary Group is to monitor and carry out MedCom projects under the Internet strategy and in the area of local authorities. In addition, it fulfils tasks in relation to problem-solving and enhancement in conjunction with the EDI communication already in existence. The Group consists of project leaders and other key individuals from counties, CHC, local authorities and other organisations in the healthcare sector.

- Birte Elgaard Andersen, Copenhagen County
- Karin Meinicke Andersen, Danish Pharmaceutical Association
- Karin Argir, Capio Diagnostik
- Lone Behnfeld, South Jutland County
- Karin Bisgaard, West Zealand County,
- Bente Christensen, Vejle County
- Ib Thyge Christensen, Frederiksborg County
- Anne Danborg, Skovbo Local Authority
- Kjeld Erbs, Århus County
- Ronnie Eriksson, Association of County Councils
- Anne-Marie Falch, North Jutland County
- Lene Meyer Grosen, Frederiksborg County
- Jens Grønlund, Viborg County
- Susanne Larsen Grøntoft, CHC
- Merete Halkjær, Copenhagen Local Authority
- Finn Roth Hansen, West Zealand County
- Jan Stokkebro Hansen, Copenhagen County
- Niels Hornum, KPLL
- Rose-Marie Jensen, Bornholm County
- Lisbeth Jørgensen, Funen County
- Tine Korsholm, Ringkjøbing County
- Tove Lehrmann, Funen County
- Søren Lorentzen, Frederiksborg County
- Niels Munk-Jensen, FAPS
- Birgit Nielsen, Storstrøm County
- Claus Nielsen, National Association of Local Authorities
- Lisbeth Nielsen, Association of County Councils
- Tove Charlotte Nielsen, Vejle County
- Helle Stockfleth Olsen, Statens Serum Institut
- Jens Parker, PLO
- Peter Pedersen, CHC
- Susanne Duedal Pedersen, National Board of Health
- Jens Henning Rasmussen, Roskilde County
- Henning Voss, Centre for Healthcare Telematics
- Kim L. Østerbye, Ribe County

- Karin Demkjær, MedCom
- Lars Hulbæk, MedCom
- Gitte Henriksen, MedCom
- Henrik Bjerregaard Jensen, MedCom
- Ib Johansen, MedCom
- Dorthe Skou Lassen, MedCom
- Jens Rahbek Nørgaard, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom




VANS-based network. It will be possible, for example, to put the pull principle into practice, so that it is the recipient of information who actively retrieves the information he needs from the information supplier's system. At the same time, images, sound, graphics etc. become part of the forms of information that are easily accessible.

Finally, Internet technology opens the door to the circle of users in the healthcare internet being expanded to include all parties involved, not least the patients.

## Timetable for technical pilot project

| | 2002 | | | | 2003 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 09 | 10 | 11 | 12 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| **Infrastructure project** | | | | | | | | | | | | | | | | |
| VPN connections | ■ | ■ | ■ | | | | | | | | | | | | | |
| EDI via MIME (mail) | | | ■ | ■ | ■ | | | | | | | | | | | |
| Web lookup | | | ■ | ■ | ■ | | | | | | | | | | | |
| Evaluation of phase 1 | | | | | ■ | ■ | | | | | | | | | | |
| Web-mail | | | | | | | ■ | ■ | ■ | ■ | | | | | | |
| Videoconferencing | | | | | | | ■ | ■ | ■ | ■ | | | | | | |
| **Communication project** | | | | | | | | | | | | | | | | |
| 4 working groups | | ■ | ■ | ■ | | | | | | | | | | | | |
| System development | | | | | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| Spearhead dissemination | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

*Use of the new infrastructure is ensured through spearhead projects in 2003, with subsequent dissemination projects in 2004 and 2005.*

## The Infrastructure Group

The purpose of the Infrastructure Group is to ensure that MedCom's infrastructure projects are implemented. The Group is temporary and consists of project leaders and network managers from organisations that have decided to establish VPN connections to the healthcare data network under the pilot project. The temporary Infrastructure Group will be replaced by a permanent group when the project is ready for daily operation.

- Karin Meinicke Andersen, Danish Pharmaceutical Association
- Orla Antonsen, Viborg Hospital
- Allan Bech, Copenhagen County
- Martin Bech, UNI-C
- Flemming Engstrøm, Copenhagen Local Authority
- Jørgen Granborg, A-Data ApS
- Jens Grønlund, Viborg County
- Jan Stokkebro Hansen, Copenhagen County
- Peter Illum Hansen, Funen County
- Lars Hillerup, Vejle County
- Niels Hornum, KPLL
- Erik Jacobsen, Datagruppen MultiMed ApS
- Henrik Thuren Jensen, Profdoc A/S, Darwin
- Lisbeth Jørgensen, FynCom
- Børge Knudsen, Ribe County
- Ib Lucht, UNI-C
- Bo Nielsen, bo soft A/S
- Tove Charlotte Nielsen, Vejle County
- Jens Parker, Lægehuset
- Morten Pedersen, Datapharm A/S
- Peter Pedersen, CHC
- Morten Pedersen, Association of County Councils
- Palle Runer, DataPharm A/S
- Ole Sprøgel, Dan Net
- Jan Staack, CHC
- Lise Wormstrup, KMD A/S
- Kim Østerbye, Ribe County
- Lars Hulbæk, MedCom
- Henrik Bjerregaard Jensen, MedCom
- Jens Rahbek Nørgaard, MedCom
- Claus Duedal Pedersen, MedCom

## VPN contacts

- Karin Meinicke Andersen, Danish Pharmaceutical Association
- Hans Elmquist, West Zealand County
- Susanne Enevoldsen, Ringkjøbing County
- Flemming Engstrøm, Copenhagen Local Authority
- Jørgen Granborg, A-Data ApS
- Jens Grønlund, Viborg County
- Helge Hansen, South Jutland County
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- Niels Hornum, KPLL
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- Carsten Lind, Frederiksborg County
- Claus Lohfeld, Århus County
- Kenneth Mogensen, Storstrøm County
- Bo Nielsen, bo soft A/S
- John Møller Nielsen, Eterra Danmark A/S
- Tove Charlotte Nielsen, Vejle County
- Hans Birger Olsen, Bornholm County
- Allan Pedersen, Viborg County
- Jens Henning Rasmussen, Roskilde County
- Palle Runer, DataPharm A/S
- Lennart Sorth, UNI-C
- Ole Sprøgel, Dan Net A/S
- Jan Staack, CHC
- Aksel Worm, Copenhagen Local Authority
- Lise Wormstrup, KMD A/S
- Kim L. Østerbye, Ribe County

## Commentary

### MedCom and the Healthcare Portal

**Kristian Ebbensgaard, Chairman of the Association of County Councils**

"MedCom plays a key role in the communication between hospitals and GPs. The counties have taken an active part in the co-operation, which has nurtured electronic communication without equal in the rest of Europe," says Kristian Ebbensgaard, county chief executive and chairman of the Association of County Councils.

"The Association of County Councils has taken the initiative for the joint public healthcare portal. We owe our ability to implement such an ambitious project partly to the standardisation and infrastructure created within MedCom.

With MedCom IV, MedCom is now moving into the hospitals and seriously making a start on Internet technology. The primary local authorities are also on the way to becoming active participants in MedCom.

A proper foundation for effective communication throughout the Danish health service has been created."

## Perspective

### The Internet strategy and the Healthcare Portal

The MedCom standards, which are used at present in the healthcare data network, can be directly re-used for data exchange via the Public Healthcare Portal, which is being developed on the initiative of the Association of County Councils.

Today, more than 40 types of letter based on MedCom standards have been established. The MedCom standards are based on consensus among healthcare professionals on content and application. On this basis, documentation and test messages have been prepared, sender systems have been approved in the testing of content and syntax, and in a similar way recipient systems have been approved through the testing of reception and presentation.

By linking together existing secure intranets, MedCom has established the healthcare internet, known as HealthcareDIX (SundhedsDIX), via VPN connections to VPN nodes. Operation is user-financed, and 13 counties, CHC, Copenhagen Local Authority, two doctors' systems, KPLL and Dan Net are currently taking part in the network. The work on the healthcare internet consists here and now in the development of a series of Web-based services, which are made available to the parties connected to the network.

HealthcareDIX is therefore ideally suited to fulfilling the communication needs the Public Healthcare Portal has to meet.

# Web lookup of laboratory data

The idea in the "Lookup of Laboratory Data via the Web" project is to give healthcare professionals Internet access to patient data stored in another county, hospital or laboratory database. It will typically be relevant in situations where the healthcare professional has to treat a patient without having any knowledge of the patient's data, for example in the case of emergency hospital admissions. Quick and easy access to relevant patient data in those cases will boost both quality and efficiency in patient treatment.

Provision for Web lookup will generally be useful where it was not "known" that patient data would be needed. This applies for example in the treatment of free-choice patients and patients

who are being treated in another county, because they need a national or regional function.

Previous projects have shown that great gains can be made for both the patient and the health service by ensuring access to laboratory results and ECGs.

The reasons why this solution has not been put into practice already are both technological and organisational in nature. It is not until the closed healthcare internet is established that there is a genuinely realistic prospect of carrying out a project aimed at massive dissemination of lookup in laboratory data via the Web.

The overall aims of the project are:

- to assure the patient that all relevant information can always be accessed in connection with treatment and investigation
- to make sure that relevant results are always available to the attending healthcare professional, across county and organisational boundaries
- to minimise the number of duplicate investigations and in that way prevent the patient being subjected to unnecessary investigations
- to establish a supplement to the existing EDI communication and create the possibility of improving diagnoses and the planning of treatment

The objective of the project is that the counties and laboratories taking part have Internet-based access to relevant data for external users developed and implemented and to provide access to the service via the closed healthcare internet.

The establishment of lookup provision in laboratory systems is to be seen in the context of the forthcoming Public Healthcare Portal. If the Healthcare Portal is seriously to be the Web entry port to the health service, it is essential that services are developed that make it appropriate and attractive for healthcare professionals to use the portal. A huge expansion of lookup solutions to laboratory data, which can be made available via the portal, will contribute to making the portal a natural tool for healthcare parties to employ.

In relation to the national IT strategy, Web access to laboratory data will support the development of various telemedicine services.

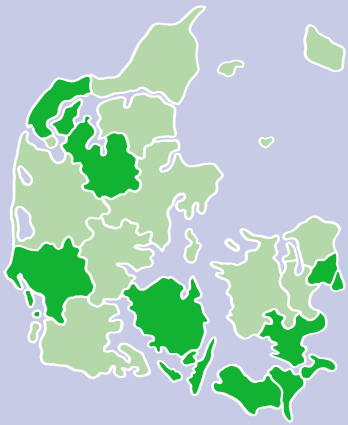
## Timetable for Web lookup of laboratory data

| | 2002 | | | | 2003 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 09 | 10 | 11 | 12 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| **Communication project** | | | | | | | | | | | | | | | | |
| Project preparation | | ■ | ■ | ■ | | | | | | | | | | | | |
| Co-operation agreements | | | | | ■ | | | | | | | | | | | |
| System development | | | | | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| Spearhead dissemination | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

## Project Group

- Anni Christensen, Department of Clinical Biochemistry, Esbjerg Varde Central Hospital
- Marianne Ebbell, Central Laboratory, Næstved Central Hospital
- Lone Espensen, Department of Clinical Immunology, Odense University Hospital
- Niels Hornum, KPLL
- Michael Johansen, B-DATA
- Lisbeth Jørgensen, Funen County
- Kate Kusk, Viborg County
- Dorthe Skou Lassen, Funen County
- Ise Mortensen, Clinical Biochemistry Section, Hillerød Hospital (observer)
- Lisbeth Ramsvatn, Institute of Pathology, Hillerød Hospital (observer)
- Maja Stephansen, Storstrøm County
- Kim Østerbye, Ribe County

- Lars Hulbæk, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom



# Web requesting of tests for clinical biochemistry and clinical immunology

The project on the requesting of analyses in departments of clinical biochemistry and immunology will mean saying goodbye to pre-printed request forms. The departments will be able to receive electronic requests which the doctors have filled in via a standard Web browser.

With the WebReq program, all doctors can send an electronic request in MEDREQ format as a normal EDI file to Clinical Biochemistry and Immunology. WebReq enables the connected doctors' systems to have laboratory-specific information stored in a central place, so that they are free to record and maintain this information in the local doctors' system. This provides a number of benefits:

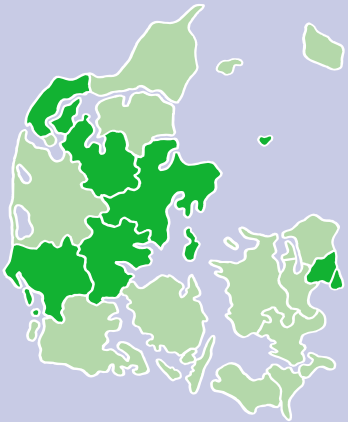
- Same procedure in the laboratory for both EDI and Web requesting
- No further investments in comparison with EDI requesting
- Same interface regardless of laboratory
- Freedom of choice between EDI and Web requesting
- Not dependent on choice of laboratory and laboratory system
- Can easily be used by all doctors' systems without major programming effort
- Provision for changes in laboratory systems and doctors' systems without involving all users
- Easy access for doctors to set up their own profiles and their own tests
- Provision for easy re-ordering of previous tests
- Provision for printing out PTB (sampling forms)

## Project Group

All departments of clinical biochemistry and laboratories as well as all suppliers of doctors' systems are invited to take part in the project. A WebReq project group with the following participants has been set up to monitor and implement the project:

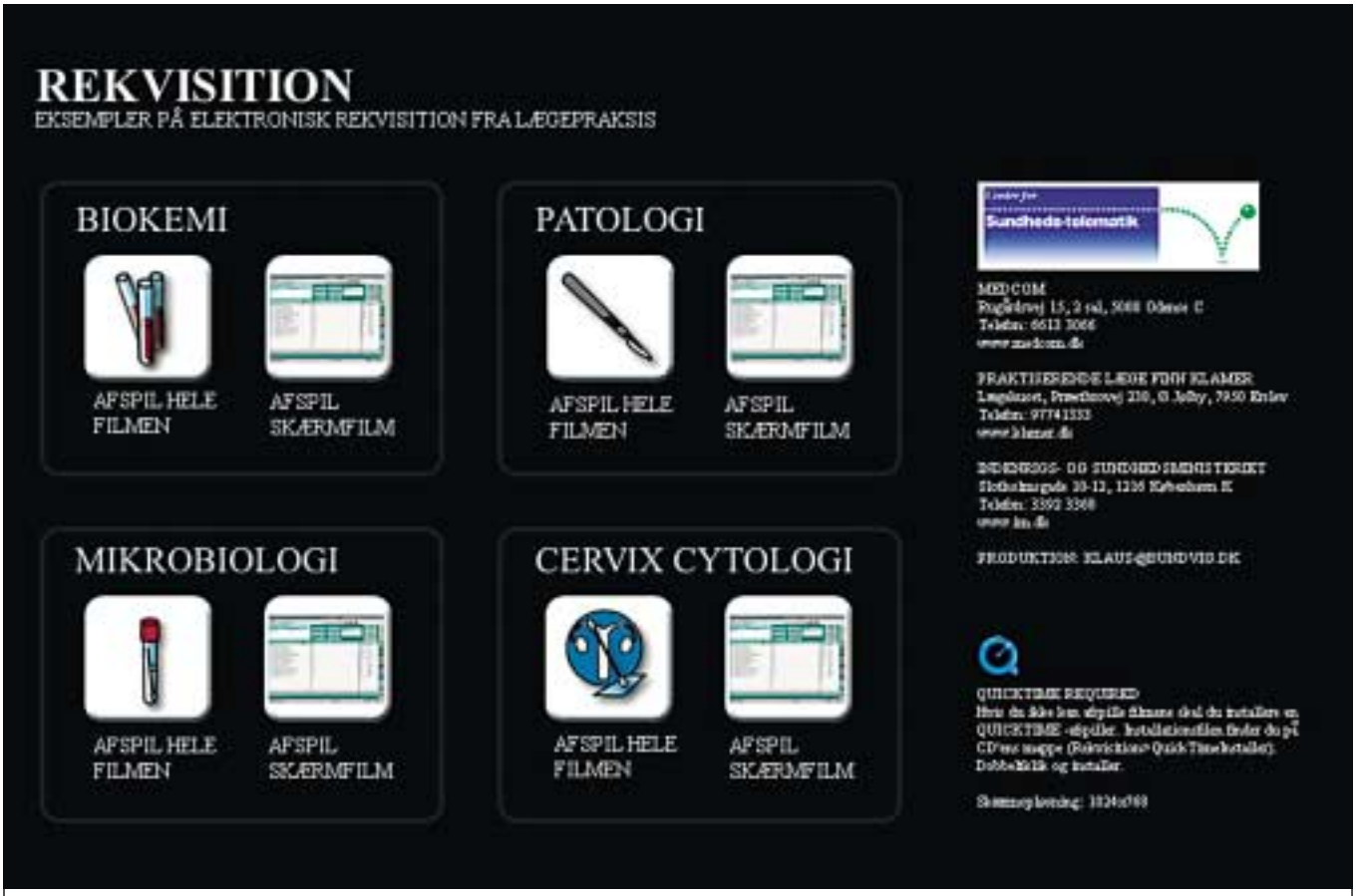
- Dorthe Black, KPLL
- Niels Jørgensen Christensen, Aarhus County Hospital
- Kjeld Erbs, Århus County
- Lotte Estrup, KPLL
- Finn Roth Hansen, West Zealand County (observer)
- Rita Henriksen, Esbjerg Central Hospital
- Niels Hornum, KPLL
- Bodil Jacobsen, Vejle Hospital
- Erik Jacobsen, Datagruppen Multimed
- Lisbeth Jørgensen, Funen County (observer)
- Margit Kisbye, Funen Svendborg Hospital (observer)
- Kate Kusk, Viborg County
- Birgit Juhl Madsen, Vejle Hospital
- Tove Charlotte Nielsen, Vejle County
- Dora Simonsen, Viborg Hospital
- Tom Valbjørn, KPLL
- Kim Østerbye, Ribe County

- Karin Demkjær, MedCom
- Gitte Henriksen, MedCom
- Ib Johansen, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom



The doctor obtains access to the system using a normal Web browser via VPN/SSL and later via the healthcare internet. Users have to log onto the system with an access code (external number) and a password. In WebReq, the doctor can parameter-transfer necessary patient data and relevant practice information, including default laboratory choices, so that a WebReq call can be built into the individual doctors' system as a fixed routine and consequently minimise the number of manual registrations.

The procedure for requesting using WebReq is quite straightforward. When a request is filled in, it is approved, and a standard PTB form is completed. Alternatively, one of the laboratory's




## Instruction film on laboratory request

The introduction of electronic laboratory requesting necessitates incorporating a number of new procedures into medical practices. To show how an efficient and practical procedure in relation to electronic requesting proceeds, MedCom has prepared a number of instruction videos that review the various requesting procedures and the associated taking and labelling of samples.

The videos can be downloaded from the MedCom website, www.medcom.dk. They have also been issued on a CD, available free of charge from MedCom.

pre-printed forms is used. The samples are taken, and the request is sent off in normal MEDREQ-EDI format to the recipient laboratory.

The doctor receives a report back from the laboratory as MEDRPT in the traditional way, but the request can also be sent as a copy to the requester with the aim of being able to read the requested analyses into the local doctors' system.

## Timetable for Web requesting

| | 2003 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| Project description | ■ | | | | | | | | | | | |
| Co-operation agreements | | ■ | ■ | | | | | | | | | |
| WebReq module ready | | | ■ | | | | | | | | | |
| Meetings with suppliers | | ■ | ■ | | | | | | | | | |
| Testing of systems | | | ■ | ■ | ■ | | | | | | | |
| Pilot operation | | | | ■ | ■ | ■ | ■ | ■ | | | | |
| Pilot operation completed | | | | | | ■ | ■ | ■ | | | | |
| Fine-tuning of software, if necessary | | | | | | ■ | | | | | | |
| Dissemination | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ |

# Web lookup of X-rays images and descriptions

The "Lookup of X-ray Images and Descriptions via the Internet" project aims to provide healthcare professionals with direct access to central patient information stored in the X-ray system of another county or hospital. It is very relevant in connection with emergency admissions, treatment of free-choice patients and national and regional patients or in the preparation of the treatment of a new patient. The healthcare professional can obtain the information quickly via Web lookup, so that the patient's treatment is efficient and of the highest quality.

Web lookup also makes it possible to establish different telemedicine services, such as asking an expert for a second opinion. As the shortage of experts in the area of radiology increases, telemedicine solutions of this type will steadily gain ground.

Finally the lookup solution will be useful for GPs when they have to inform patients about their illness and treatment, as X-rays often encourage dialogue with the patient. Access for doctors to X-rays additionally supports the upgrading of skills among both GPs and specialists.

The reasons why this solution does not already exist are both technological and organisational in nature. It is only with the establishment of the closed healthcare internet that it is genuinely realistic to carry out a project that disseminates a lookup solution of both X-ray descriptions and various types of images stored in digital form.

The overall aims of the project are:

- to assure patients that all relevant information can always be accessed for treatment and investigation
- to make sure that relevant X-ray descriptions and images are always available to the attending healthcare professional, across county and organisational boundaries
- to minimise the number of duplicate investigations and in that way prevent the patient being subjected to unnecessary investigations
- to establish a supplement to the existing EDI communication and create the possibility of improving diagnoses and the planning of treatment

The objective of the project is that the counties and laboratories taking part have Internet-based access to relevant data for external users developed and implemented and to provide access to the service via the closed healthcare internet. The establishment of lookup provision in laboratory systems is to be seen in the context of the forthcoming Public Healthcare Portal. Massive dissemination of lookup solutions to image diagnostic data, which can be made available via the portal, will contribute to giving the portal the healthcare content that makes it a natural tool for healthcare parties to employ.

## Project Group

- Dan Gedebjerg, Esbjerg Varde Central Hospital (observer)
- Finn Roth Hansen, West Zealand County
- Bjarne Hjorth, Odense University Hospital
- Lisbeth Jørgensen, Funen County
- John Kiil, West Zealand Hospital
- Lillian Kofoed, Kalundborg Hospital
- Tove Charlotte Nielsen, Vejle County (observer)
- Marianne Richelsen, Hillerød Hospital
- Kim Østerbye, Ribe County (observer)

- Lars Hulbæk, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom

## Timetable for Web lookup of X-ray data

| | 2002 | | | | 2003 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 09 | 10 | 11 | 12 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| **Communication project** | | | | | | | | | | | | | | | | |
| Project preparation | | | | | | | | | | | | | | | | |
| Co-operation agreements | | | | | | | | | | | | | | | | |
| System development | | | | | | | | | | | | | | | | |
| Spearhead dissemination | | | | | | | | | | | | | | | | |

# Teledermatology network

This project, which is concerned with establishing a nation-wide "teledermatology network", is based on MedCom's TeleMed project from 1999. During the course of three months of operation, MedCom tested the sending of digital skin images to supplement the traditional co-operation and pattern of referral between medical practices and dermatology specialists.

Experience from this project showed that it is possible to make gains in the form of:

- Easily available specialist support
- Improved patient service, fewer visits to doctors, no extra transport, waiting time and absence for the patient
- Improvement in the quality of treatment
- Regular continuing training of the doctor
- Simpler check-up/follow-up treatment in general practice
- Support of the patient's free choice of specialist

The overall objectives of the teledermatology project are to:

- Replace/supplement general referrals to skin specialists with telemedicine consultations
- Ensure patients have of equal and quick access to specialist assessments of skin images through their own doctor
- Support continuing training of GPs through communication with skin specialists
- Establish nation-wide provision for telemedicine skin image consultation

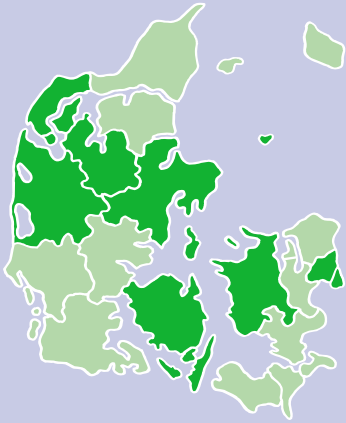
In relation to the future national IT strategy for the health service, the establishment of a teledermatology network will be the first step towards putting into effect the recommendations made in the Ministry of Health's telemedicine report from 2001.

The establishment of teledermatology is to be viewed in the context of the future Public Healthcare Portal. Via the Healthcare Portal, GPs can obtain an overview of providers of teledermatology consultation, and guidance and recommendations in connection with teledermatology should also be available here. In the longer term, a teledermatology network can be supplemented by a national skin image database of particularly interesting and/or typical skin ailments, as known from Erlangen University in Germany.

## Project Group

- Birte Elgaard Andersen, Copenhagen County
- Kjeld Erbs, Århus County
- Jens Grønlund, Viborg County
- Bo Gundtofte, Roskilde County (observer)
- Finn Roth Hansen, West Zealand County
- Lisbeth Jørgensen, Funen County
- Tonny Karlsmark, Bispebjerg Hospital
- Finn Klamer, Øster Jølby, Mors
- Tine Korsholm, Ringkjøbing County
- Ove Kristensen, West Zealand
- Søren Lorentzen, Frederiksborg County (observer)
- Peter Pedersen, CHC
- Bjørn Perrild, Kongens Lyngby
- Hanne Boje Rasmussen, Odense
- Peter Wendelboe, Grenaa

- Lars Hulbæk, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom



Initial dissemination of teledermatology can additionally form the basis for increased interdisciplinary co-operation between the home care service, medical practices and dermatologists in the area of wounds. Finally teledermatology can prepare the way for other telemedicine solutions in relation to general practice in the future, for example in cardiology.

## Timetable for teledermatlogy

| | 2002 | | | 2003 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 11 | 12 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| **Communication project** | | | | | | | | | | | | | | | |
| Project preparation | ■ | ■ | ■ | | | | | | | | | | | | |
| Co-operation agreements | | | | ■ | | | | | | | | | | | |
| Healthcare recommend. | | | | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| System devel. (MedBin) | | | | ■ | ■ | ■ | ■ | ■ | | | | | | | |
| Spearhead dissemination | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

## MEDBIN – images by EDIFACT

In conjunction with implementation of the consolidation project and with inspiration from the EU CoCo project, the idea arose of employing existing EDI solutions to transfer items other than smaller text-based documents. These may, for example, be images and text documents of significant size. Mention can be made here of X-ray images and pathology images as well as a common basis of data for medication and patient listing for general practice.

In co-operation with Datagruppen MultiMed, KMD, Vejle County, B-Data and Århus County, in the spring of 2002 MedCom carried out a trial on the exchange of images from the Institute of Pathology at Vejle Hospital to medical practices and the exchange of skin images between GPs in Vejle County and specialists in skin diseases in Århus County. The trial was an unconditional success. MedCom has therefore decided to draw up joint Danish guidance for this EDI message, known as MEDBIN.

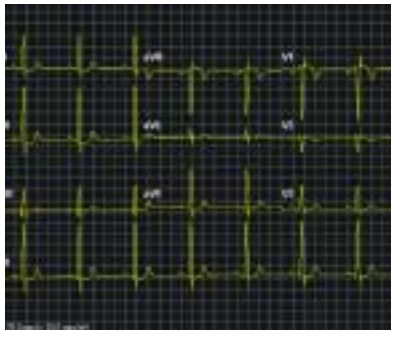
MEDBIN is used today for the transfer of skin images and is employed in MedCom's dermatology project and for the transfer of medication updating files and electrocardiograms.

**Edifact – with MEDBIN elements**

| | |
|---|---|
| | PNA+PAT+PatCPR:::CPR:IM+++SU:PatEnavn+FO:PatFnavn' |
| | RFF+XPI:PatErstatCPR' |
| Binary elements | S11+11' |
| | UNO+Objektlbnr+AID:Objektrefnr+OBJ:OBJEKTTYPE:OBJEKTEXTENSION:91+Objektstoerrelse:14:1:A' |
| The object file | SelveObjektet |
| | UNP+Objektstoerrelse+Objektlbnr' |
| Number of repetitions | UNO/UNP can be repeated up to 10 times. The max. size of the ActualObject (SelveObjektet) is 20 Mbyte |

*Eye fundus image*

*X-ray image*



*ECG*

# EDI via Internet

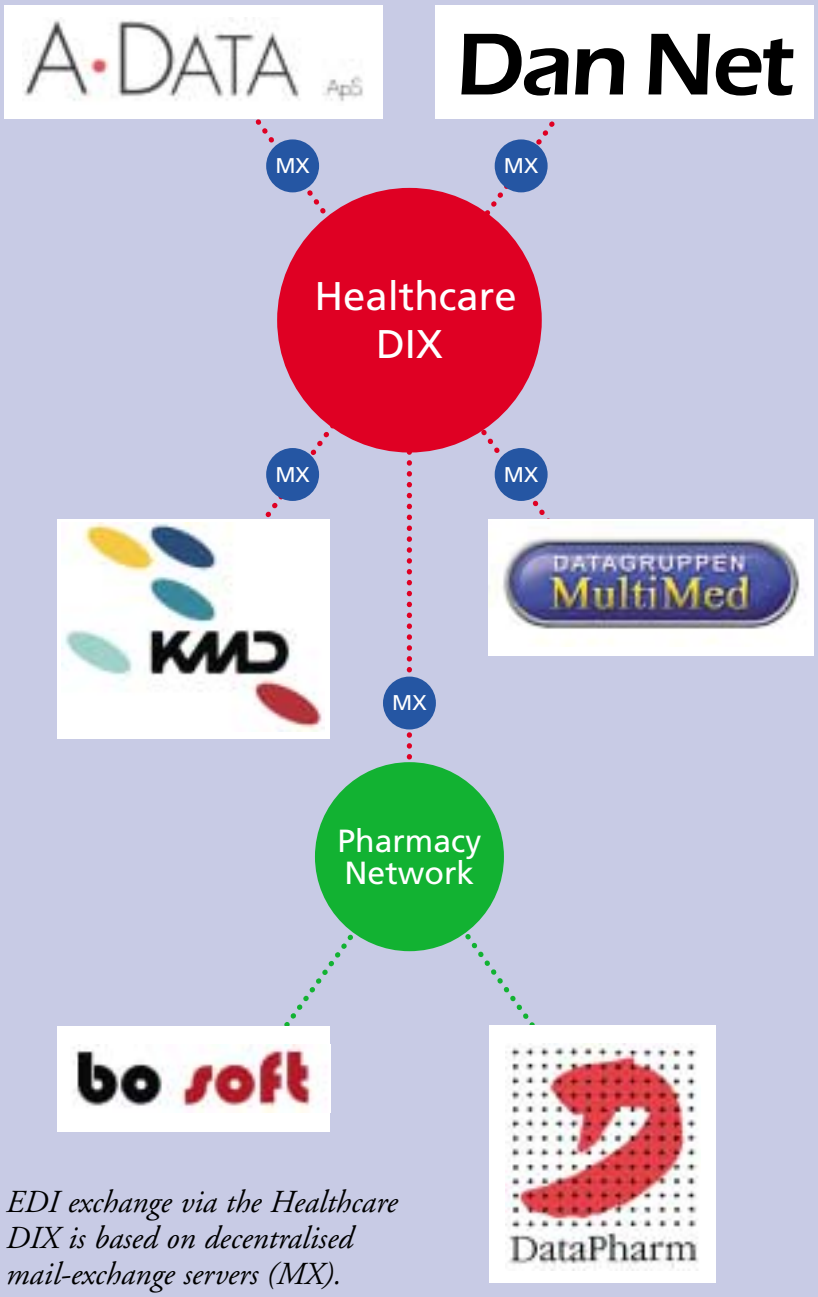
In connection with the testing of the technical infrastructure, co-operation agreements with the VANS suppliers in the present-day healthcare data network ensure that the suppliers together with any other future network providers in the Internet-based healthcare data network are able to handle EDI mail via the Internet over the HealthcareDIX (SundhedsDIX).

The purpose of this is to ensure coherence between the existing healthcare data network and the future healthcare data network in the area of EDI. It requires all parties in the Internet-based healthcare data network to apply the same envelope standard. Only a change in envelope wrapping is concerned, as the EDI standards are applied in the same way as today. To support the dissemination of EDI mail via the Internet, there is a need for MedCom to ensure uniform envelope wrapping by offering supplier testing in the period 2003-2005, in accordance with the EDI mail standard. The dissemination of EDI mail can accordingly be based on the free market.

The trial, which was completed in September 2003, involved KMD, Dan Net, Data-Gruppen MultiMed, A-Data, Apotekernettet, DataPharm and CitoData (bo soft A/S).

## Project Group

- Jørgen Granborg, A-Data ApS, PLC
- Carsten Jacobsen, KMD A/S
- Erik Jacobsen, DataGruppen MultiMed ApS
- Bo Nielsen, bo soft A/S
- Morten Pedersen, Datapharm A/S
- Michael Rasmussen, Dan Net A/S
- Palle Runer, DataPharm A/S
- Ole Sprøgel, Dan Net A/S
- Lise Wormstrup, KMD A/S
- Lars Hulbæk, MedCom
- Claus Duedal Pedersen, MedCom
- Martin Bech, UNI-C
- Ib Lucht, UNI-C




*EDI exchange via the Healthcare DIX is based on decentralised mail-exchange servers (MX).*

# The local authorities and healthcare communication

## Hospital-Local Authority XML project

The reason for the Hospital-Local Authority XML project is to expand the use of a number of electronic messages – the electronic admission message, admission report and discharge message. All three messages strengthen communication between hospital and local authority, where there has traditional been problems in ensuring communication on admission to and discharge from hospital.

As of September 2002, only 17% of the Danish population were covered by messages of this type, despite the opportunities that exist in facilitating the procedure and ensuring better patient treatment by virtue of electronic communication.

The target group for the project is primarily those hospitals and local authorities that do not use these electronic messages. At the same time, those hospitals and local authorities that already exchange advices and admission results have long wanted to expand electronic communication. There is a need to make possible a regular exchange of information before, during and after an admission.

This desire, with a solid foundation in healthcare, can be met by supplementing the standard messages with the possibility of sending and receiving technical and clinical messages and all ECR systems in the local authorities and all PAS systems in the hospitals.

At the same time, the project is aimed at expanding the use of correspondence messages and warning of completion of treatment. The correspondence message can fulfil a large number of communication needs for which there is a demand in the hospitals and local authorities. The free-text field of the message can be filled in for instance by re-using existing recordings from ECRs, including information on medication and services provided and functional assessment. From the hospital, action and retraining plans can be written directly into the correspondence module of the PAS system.

The aim of the Hospital-Local Authority XML project is therefore:

- to ensure that the use of advice of admission, admission result and advice of discharge is extended to hospitals and local authorities that cover 75% of the Danish population at the end of 2004
- to ensure the necessary technical conditions for a sharp increase in the use of the correspondence message and warning of completion of treatment, so that counties representing 75% of the Danish population offer these communication options to interested local authorities at the end of 2004
- for the project to support other key initiatives in relation to the healthcare sector, including in particular:
  - Building-up of the XML database of the Ministry of Science
  - The work of the National Board of Health with G-EPR
  - Further development by the National Association of Local Authorities/Ministry of Social Affairs of Common Language
  - Build-up of the Public Healthcare Portal
  - The work of the Digital Taskforce on legal barriers to digital administration.

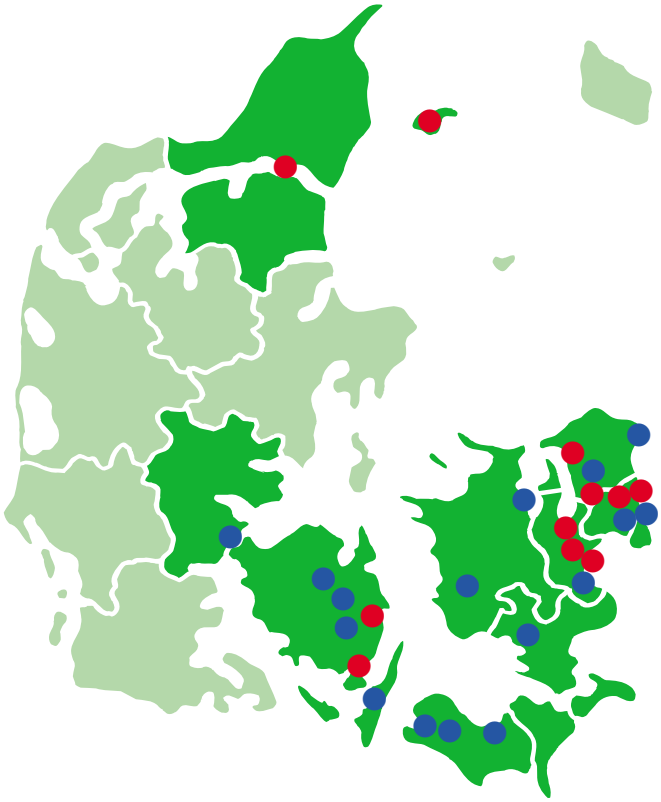
The Hospital-Local Authority XML project is to be seen in the context of the general work on EDI-XML translation. This work is necessary with a view to preparing the Public Healthcare Portal.

The EDIFACT standards for advices and admission results are technically the simplest of all MedCom standards. It is therefore logical to use these standards for a first testing of options in EDI-XML translation.

The project is to ensure that coherence is created between the development of the healthcare data network and the overall XML work in the Ministry of Science. At the same time, a framework was created for expanding basic communication solutions among hospitals and local authorities.

## Participants in project

- County taking part in the local-authority project
- County not taking part in the local-authority project
- Local authority in the healthcare data network
- Local authority in the healthcare network additionally taking part in the Hospital-Local Authority XML project



**North Jutland County:**
Aalborg
Læsø

**Funen County:**
Odense
Årslev
Ørbæk
Ryslinge
Rudkøbing
Svendborg

**Vejle County:**
Fredericia

**West Zealand County:**
Holbæk
Slagelse

**Frederiksborg County:**
Frederiksværk
Stenløse
Slangerup
Helsingør

**Roskilde County:**
Skovbo
Roskilde
Køge
Vallø

**CHC:**
Copenhagen
Frederiksberg

**Copenhagen County:**
Søllerød
Lyngby-Tårbæk

**Storstrøm County:**
Højreby
Næstved
Nakskov
Sakskøbing

## Hospital-Local Authority XML project timetable

| | | |
|---|---|---|
| **2002** | Project preparation | |
| **2003** | **January** | Supplier co-operation agreements and pilot participant co-operation agreements signed. |
| | **May** | Information to all Danish local authorities concerning dissemination activities in 2004. |
| | **September** | Supplier testing and MedCom certification carried out. |
| | **December** | Minimum of 3 months of pilot operation carried out. |
| | **Continued dissemination in 2003** | Marketing from relevant parties behind MedCom. |
| **2004** | Dissemination co-operation agreements with counties/CHC | |
| | **End** | Spearhead dissemination in (at least) one county with all local authorities carried out. |
| | **Whole of 04** | Marketing from relevant parties behind MedCom. |

## MedCom IV Local-Authority Group

- Lene Meyer Grosen, Project Manager, Frederiksb. County
- Marianne Strand, Project Manager, Stenløse Loc. Auth.
- Kim Snekkerup, Administrative Consultant, Frederiksværk Local Authority
- Lisbeth Rasmussen, Senior Nursing Officer, Fun. County
- Alice Kristensen, Project Manager, Svendborg Local Authority
- Lissi Veltzé, Home Care Manager, Ørbæk Local Auth.
- Susanne Grøntoft Larsen, Sen. Systems Consultant, CHC
- Merete Halkjær, IT Cons., Copenhagen Local Authority
- Anne-Marie Falch, Project Manager, North Jutl. County
- Isabelle Andersen, Head of Day Care, Læsø Local Auth.
- Kirsten Skovrup, Head of Section, Aalborg Local Auth.
- Jens Henning Rasmussen, Head of IT, Roskilde County
- Agnete Seidelin, Project Co-ordinator, Roskilde Loc. Auth.
- Anne Danborg, Head of Home Care, Skovbo Local Authority
- Birgit Nielsen, Project Manager, Storstrøm County
- Søren Skafte Jensen, IT Officer, Nakskov Local Auth.
- Kim Østerbye, Senior IT Consultant, Ribe County
- Lene Bilslev-Jensen, Project Cons., The Digital Taskforce
- Bentt Nielsen, Development Consultant, National Board of Social Services

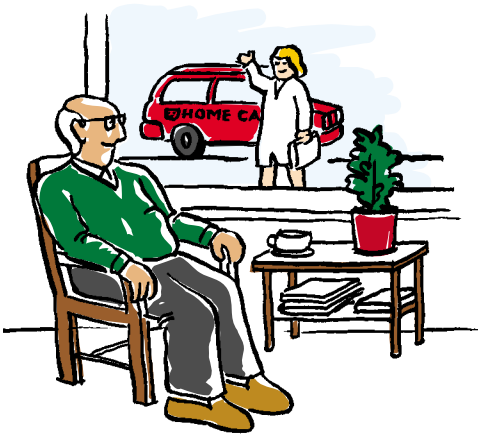
- Dorthe Skou Lassen, Project Manager, MedCom
- Lars Hulbæk, Project Manager, MedCom
- Iben Søgaard, Project Secretary, MedCom

# The Hospital-Local Authority project and Common Language

Common Language II is a conceptual framework which the local authorities can use to describe the functional capacity of citizens whose needs are assessed by the local authority and the services provided in the area of the elderly and disabled. Common Language II provides an overview of the citizen's overall functional capacity.

The overriding objective of Common Language II is to create political and technical coherence in the effort that is made. The target group for Common Language II is politicians and specialised staff, primarily the needs assessors.

Common Language II constitutes a clinical database that collects information on all citizens whose needs are assessed and can




be used for broader technical development, as well as managerial and political priority-setting. Common Language II has not been developed to be used in the clinical situation, where services are provided at the home of the individual citizen.

A needs assessor makes a functional assessment through eight areas of assessment at four levels of functional capacity and records the allocation of services in a services catalogue. In addition, the effect of the home and the use of technical aids on the person's functional capacity is assessed. The registration of technical aids follows a classification system in accordance with an international standard on "Technical Aids for Disabled Persons".

Common Language II is based on ICF, which forms part of the Health Service Classification System (SKS). The development of Joint Language II is being coordinated and integrated with the work of the National Board of Health with ICF within SKS.

MedCom is monitoring development by being represented in the National Association of Local Authorities (KL) reference group for Common Language.

The development of Common Language II is being dealt with by KL and can be followed on the KL website: www.kl.dk/fs

## Commentary

### Better coherence

**The Minister of Social Affairs, Henriette Kjær**

"Many elderly people find that they have to tell the same story time after time. The same personal information has to be given to the home care service, the hospital, the GP and perhaps the home care service again," says Henriette Kjær, the Minister of Social Affairs "That isn't clever, it's inappropriate!

It also happens that elderly people simply 'slip out' of the system, because during the course of an illness changes may have occurred in the elderly person's home care – and he or she is simply discharged. The systems therefore have to become better at talking to each other.

Under the MedCom co-operation, targeted effort is made to disseminate the electronic communication between hospitals and local authorities, so that better coherence is created between the social and healthcare sectors. The result might perhaps be that elderly people avoid having to give the same information repeatedly. It would, in any case, be a good start."

# The LÆ form project

The project on LÆ forms is intended to ease the written communication between the local authorities and general practitioners and between the local authorities and specialists both in hospitals and in private practice.

LÆ forms are used in many areas in municipal administration, for instance in connection with voluntary early-retirement pension and sickness benefit. Electronic versions of the forms are a natural part of doctors' practice systems, but at present the forms are not sent electronically.

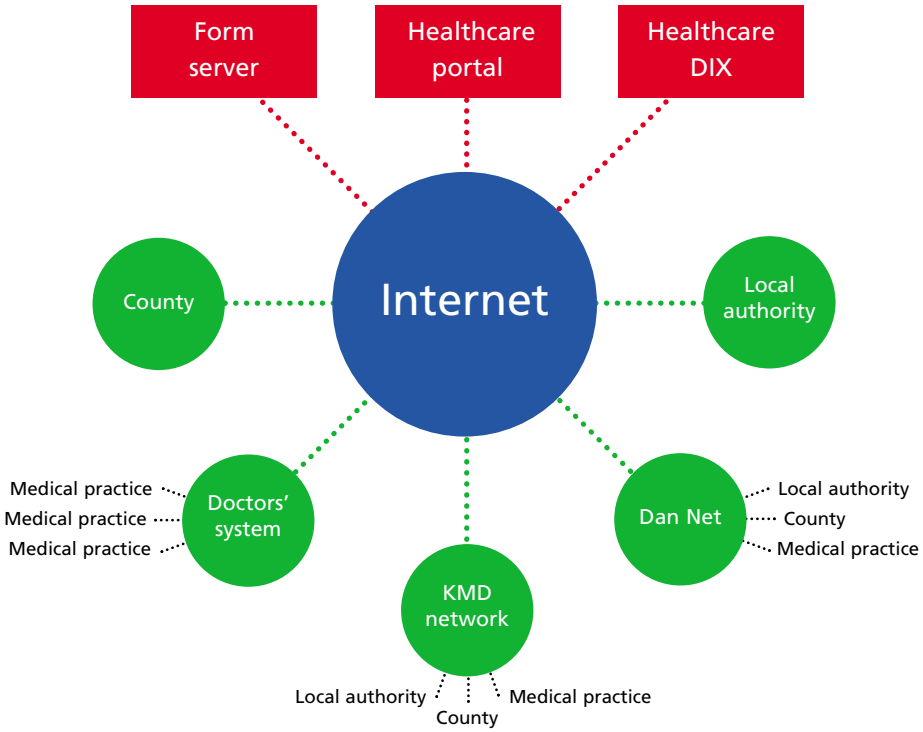
The LÆ forms are standardised by the certification committee of the Danish Medical Association, which consists of representatives of general practitioners and the National Association of Local Authorities. The procedure in using LÆ forms comprises two steps:

1. A request is sent from the local authority requesting completion of a certificate. The application can be sent to a GP or to a specialist in private practice.
2. The recipient sends relevant information back to the local authority on a certificate.

The purpose of the LÆ form project is to make it possible to carry out both steps one and two electronically.

## Timetable

**April-Oct. 2003:** Pre-analysis.
**November 2003:** Start-up of technical pilot project.



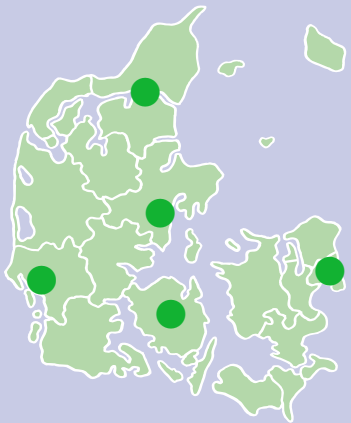

*The LÆ form project is intended to prepare the way for the electronic exchange of more of the forms used in the healthcare sector. The project is testing integration between the basic systems of the healthcare sector via a central form server, which is accessed through the Healthcare Portal and the HealthcareDIX.*

## Project Group

The participants in the project's pre-analysis group are:

- Morten Hein, Ministry of Social Affairs
- Marie Munk Jensen, Ministry of Finance
- Anne Marie Nielsen, Esbjerg Local Authority
- Claus Nielsen, National Association of Local Authorities
- Lars Nielsen, Odense Local Authority
- Mette Brøsted Nielsen, Esbjerg Local Authority
- Jens Parker, General Practitioner, Copenhagen
- Charlotte Henius Meier, Nat. Assoc. of Local Authorities
- Morten Elbæk Petersen, The Public Healthcare Portal
- Marianne Rosted, Aalborg Local Authority
- Kurt Samsø, Århus Local Authority
- Dorte Schwartz, Copenhagen Local Authority
- Lene Bilslev-Jensen, Ministry of Finance

- Lars Hulbæk, MedCom
- Dorthe Skou Lassen, MedCom



- The participating municipalities are: Aalborg, Århus, Esbjerg, Odense and Copenhagen

## Commentary

Photograph: Søren Wesseltoft Fotografi

### Co-operation and coherence

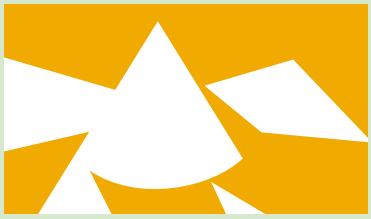
**Ejgil W. Rasmussen, Mayor**
**Chairman of the National Association of Local Authorities**

"Good co-operation between healthcare professionals in local authorities and counties is vital if we are to be able to make a coherent effort, particularly in relation to the elderly and in community healthcare in the local authorities," says Ejgil W. Rasmussen, Chairman of the National Association of Local Authorities.

"Unfortunately, far too often we see failure of communication when a person moves between the various bodies involved. Electronic communication between the parties may help towards them all being updated for example on a person's insulin treatment, so that the home care service healthcare service can implement the necessary cost changes or so that the necessary action plan reaches all the parties who are concerned with the person.

The National Association of Local Authorities has therefore actively re-entered the MedCom co-operation. In line with the local authorities having reached almost 85% coverage of electronic care records, the opportunities for electronic co-operation have substantially increased. And new areas are appearing in the fields of healthcare and vulnerable children and adolescents. Here it is important that the experts become aware of any failures as early as possible."

## Perspective



### The IT Lighthouse's local authority-medical practice communication

The IT Lighthouse project "Exchange of information in the healthcare sector" comprises a range of communication flows between the care system of Aalborg Local Authority and four general practitioners with four different doctors' systems. It specifically relates among other things to communication on home care status, prescription renewal and correspondence.

**Home care status:** Regular updating of the doctors' system with information on services provided by the local authority to the patient/client.
**Prescription renewal:** Prescription renewals directly from the medication card of the care system to the doctors' system.
**Correspondence:** Patient-attributable, but non-structured exchange of information.

In April 2003, the statistics for communication between the local authority and the four doctors showed that 14 correspondence messages, 2196 messages on home care healthcare status and 212 prescription renewals were sent in the course of the month.

The project is being carried out under the project management of Aalborg Local Authority.
Further information can be found at: http://www.detdigitalenordjylland.dk/index.php/m/142

# The hospitals and health-care communication

## From hospital to hospital

The aim behind MedCom's hospital projects is to support the electronic communication of patient data between hospitals in different counties.

### No nation-wide communication between hospitals

Today it is possible to carry out EDI communication between any hospital and any medical practice, regardless where in the country the hospital or medical practice is located. It is not, however, possible at present to carry out EDI communication between hospitals in different counties.

The projects are intended to support the introduction of EPR systems in the hospitals and ensure that information can be exchanged between IT systems in treatment units in different counties – and therefore also to support the communication between treatment units and other parties within the hospitals and between hospitals in the same county.

The objective is that by the end of 2005:

- **the XML communication project** has resulted in large-scale nation-wide use of all relevant MedCom messages for communication between hospitals.
- **MedCom's SUP project** has resulted in participating counties having established extract systems and transfer of EPRs and patient data to a county/inter-county SUP database/browser, from which secure Internet access to relevant internal and external users is established.

**The XML EPR communication project** is essentially based on the experience acquired in MedCom's present communication projects with the primary sector, while **the SUP project** is based on a similar project carried out by the counties of Vejle, Viborg and Århus.

### The Hospital Project Managers Group

MedCom's two hospital projects are co-ordinated by the Hospital Project Managers Group.

- Karin Argir, Capio Diagnostik
- Lone Behnfeld, South Jutland County
- Hans Henrik Bøttger, Århus County
- Anne-Marie Falch, North Jutland County
- Ole Filip Hansen, Viborg County
- Morten Hansen, Vejle County
- Lone Hassingboe, North Jutland County
- Hans Erik Henriksen, IBM
- Svend Holm Henriksen, Odense University Hospital
- Søren Rosenørn Jakobsen, Acure
- Michael Johansen, B-DATA
- Jørgen Schøler Kristensen, DADL
- Per Wagner Kristensen, DADL
- Dorthe Skou Lassen, Funen County
- Søren Lorentzen, Frederiksborg County
- Finn Mathiesen, Danish Society of Radiology
- Lisbeth Nielsen, Association of County Councils
- Sanne Nørgaard, CSC Scandihealth
- Helle Stockfleth Olsen, Statens Serum Institut
- Jan Petersen, National Board of Health
- Jørgen Hjelm Poulsen, Danish Society for Clinical Biochemistry
- Jens Peder Rasmussen, Systematic
- Kim Østerbye, Ribe County

- Karin Demkjær, MedCom
- Lars Hulbæk, MedCom
- Gitte Henriksen, MedCom
- Henrik Bjerregaard Jensen, MedCom
- Ib Johansen, MedCom
- Jens Rahbek Nørgaard, MedCom
- Claus Duedal Pedersen, MedCom
- Iben Søgaard, MedCom

Taken together, the two projects will signify a marked improvement in electronic communication:

- **The XML EPR communication project** will boost the efficiency of daily routine communication between the treatment units of the hospitals and between these and the clinical diagnosis units in the form of referrals, reports, discharge summaries, laboratory results etc., in the same way as has been done for communication with the primary sector.

- **MedCom's SUP project** will provide easy and unimpeded browser access to record data across hospitals and internally for the large groups of doctors and nurses who are not using the EPR and PAS systems concerned beforehand.

The projects are co-ordinated with the National Board of Health's national G-EPR development, which in the longer term is intended to result in substantially more uniform and advanced EPR systems in the Danish healthcare sector.

MedCom's XML EPR standards will therefore be broadened in the autumn of 2003, so that they are prepared for the communication of the corresponding messages as EPR systems based on G-EPR are introduced.

## Laboratory communication between counties

With the introduction of the "Good Laboratory Results" and common IUPAC analysis codes in all the counties and national laboratories, it became possible to exchange laboratory results between the clinical biochemistry systems of the various counties.

CSC-Labka and B-Data have developed a module, so that RPT01 – clinical biochemistry results can be received directly from other laboratories.

Samples which are forwarded from the local laboratory for analysis in an out-of-county or service laboratory are received and introduced automatically into the cumulative reply schema of the local laboratory, immediately after approval in the service laboratory. Without any manual keying at all. The same MedCom standard, RPT01, which is used to send results to medical practices is used.

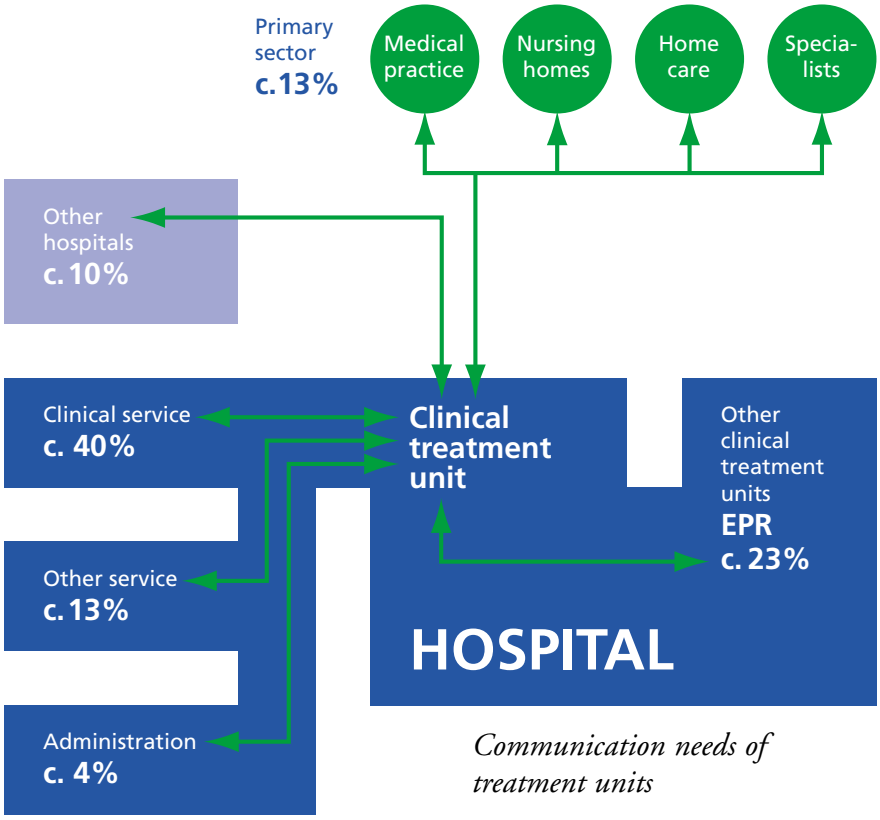
| | RPT01 between counties, April 2003 | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **From / To** | N. Jutland | Viborg | Århus | Ringkøbing | Ribe | Vejle | S. Jutland | Funen | W. Zealand | Storstrøm | Roskilde | Frederiksb. | CHC | Copenhagen | Bornholm | KPLL | SSI | Greenland |
| North Jutland | | | 33 | | | | | | | | | | | | | | | |
| Viborg | | | | | | | | | | | | | | | | | | |
| Århus | | 534 | | | | 32 | | | | | | | | | | | | |
| Ringkøbing | | | | | | | | | | | | | | | | | | |
| Ribe | | | | | | | | 325 | | | | | | | | | | |
| Vejle | | | | | | | | 88 | | | | | | | | | | |
| South Jutland | | | | | | | | 266 | | | | | | | | | | |
| Funen | | | | | | | | | | | | | | | | | | |
| West Zealand | | | | | | 12 | | | | | | | | | | | | |
| Storstrøm | | | | | | | | | | | | | | | | | | |
| Roskilde | | | | | | | | | | | | | | | | | | |
| Frederiksborg | | | | | | | | | | | | | | | | | | |
| CHC | | | | | | | | | | | | | | | | | | |
| Copenhagen | | | | | | | | | | | | | | | | | | |
| Bornholm | | | | | | | | | | | | | | | | | | |
| KPLL | | | | | | | | | | | | | | | | | | |
| SSI | | | | | | 1 | | 1398 | | | | | | | | | | 47 |
| Medilab | | 66 | 227 | | | | | | | | | | | | | | | |

# The XML EPR project

The XML EPR communication project is working to adapt MedCom's communication standards for the primary sector to communication of the corresponding messages within the hospital and between hospitals – that is to say to the communication of referrals, summaries, laboratory results etc.

These messages are used at the rate of 150-250 per hospital bed per week in the hospital's treatment units and consequently tie up substantial resources: on average around 10% of total working time in the hospital.

The objective is that by the end of 2005 the XML EPR project at national level has led to extensive use of all relevant MedCom messages for communication internally in the hospitals and between hospitals – to the same extent as is the case today in the primary sector.




*Communication needs of treatment units*

## G-EPR

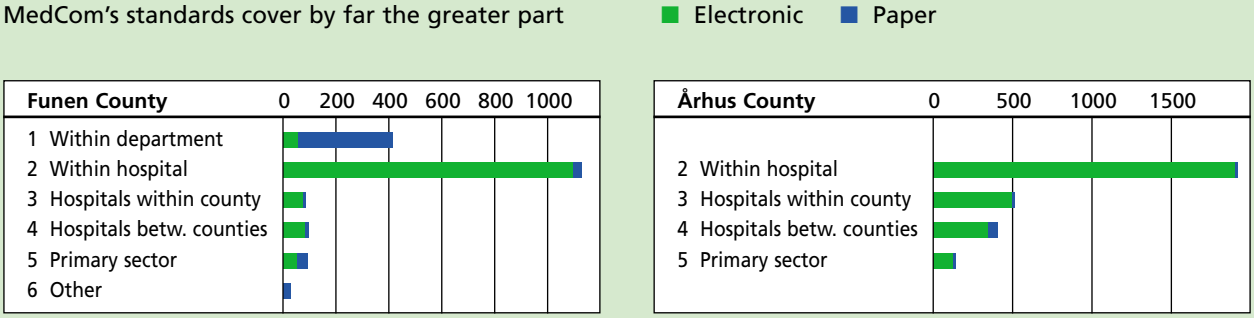
The development of EPR systems is to be based on the national G-EPR, Basic structure for Electronic Patient Record. G-EPR describes a common model for documentation of the clinical work process and will gradually be expanded to include detailed descriptions of important areas of work, e.g. image diagnostics.

The basic structure is aimed at making EPR systems more structured and uniform at national level. At the same time, more uniform use of data will make it easier to exchange information between the EPR systems. A G-EPR reference

## Perspective

### XML EPR

Hospital paper records are full of forms which it would be advantageous to exchange electronically. MedCom's standards cover by far the greater part of the contents of paper records. That is to say, laboratory results, X-ray results, referrals etc. can be communicated in MedCom's EPR standards.



implementation has been started up which comprises a test database for the testing of G-EPR.

In line with the introduction of EPR systems based on G-EPR, new ways of obtaining more flexible access to data in the healthcare sector will arise. G-EPR thus creates the framework for the long-term development of EPR systems and joint use of patient systems in Denmark. The XML EPR communication project is to be viewed as part of a realistic option for communication between EPR systems, based on a joint G-EPR structure.

While G-EPR necessitates the development and introduction of a new type of EPR systems, the XML EPR communication project is based on existing IT systems and on communication between the IT systems used in the healthcare sector today.

## OiO – Public information Online

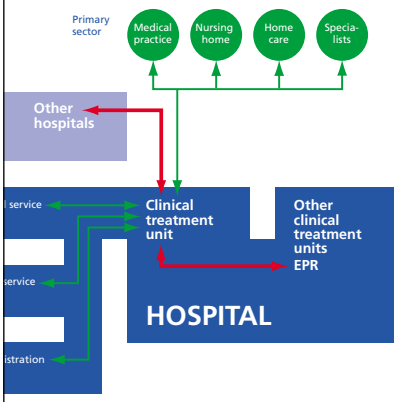
MedCom's XML documentation is drawn up in accordance with the guidelines for OiO – Public Information Online (see www.oio.dk/xml). OiO is a collective concept for the documentation of standards for the public sector drawn up by the Ministry of Science, Technology and Development in co-operation with the National Association of Local Authorities and the Association of County Councils.

## Implementation of XML EPR

The methods and timetables for the introduction of EPR systems differ widely in the individual counties and CHC. For this reason, the XML EPR communication project is divided into two implementation periods: Group 2004 and Group 2005 – and into three communication packages: the Primary Package, the Hospital Package, the Clinical Package.

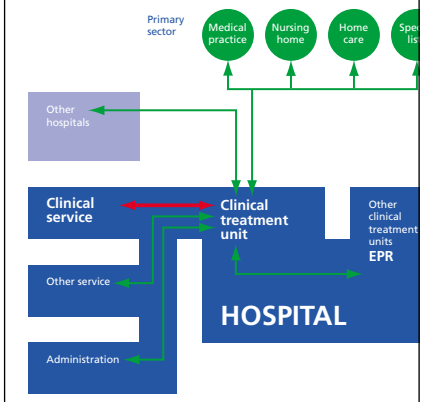
It is intended that every county or CHC chooses which communication packages and which implementation periods are best suited to its own IT strategy.

Each communication package covers fundamental communica-




**Hospital Package**

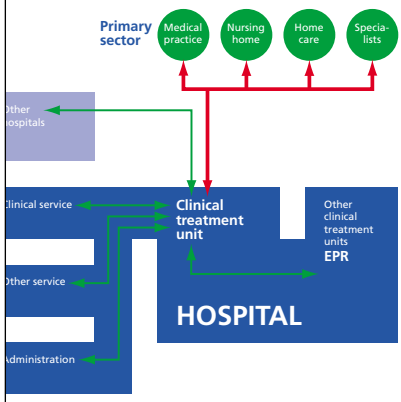
**Between hospitals and EPR and PAS:**
XML Discharge summary
XML Outpatient summary
XML Hospital referral
XML Booking result
XMLEDI Correspondence letter
XML Personal master data
XML Medication data




**Clinical Package**

**Between radiology departments, EPR and any PAS:**
XML Image diagnostics summary
XML Image diagnostics referral

**Between laboratories, EPR and any PAS:**
XML Laboratory results
XML Pathology results
XML Microbiology results
XML Immunology results
XML Laboratory request
XML Pathology request
XML Microbiology request




**Primary Package**

**Between EPR and medical practice – possibly via PAS:**
XMLEDI Discharge summary
XMLEDI Outpatient summary
XMLEDI Hospital referral
XMLEDI Booking result
XMLEDI Correspondence letter

**Between EPR and home care – possibly via PAS:**
XMLEDI Admission advice
XMLEDI Admission result
XMLEDI Discharge advice
XMLEDI Warning of completion of treatment
XMLEDI Correspondence letter

tion needs between treatment units and other major parties:

- **The Hospital Package** covers communication between hospitals and mutually between treatment units.
- **The Clinical Package** covers communication between treatment units and laboratories and radiology departments.
- **The Primary Care Package** covers communication between treatment units, medical practices and the home care service.

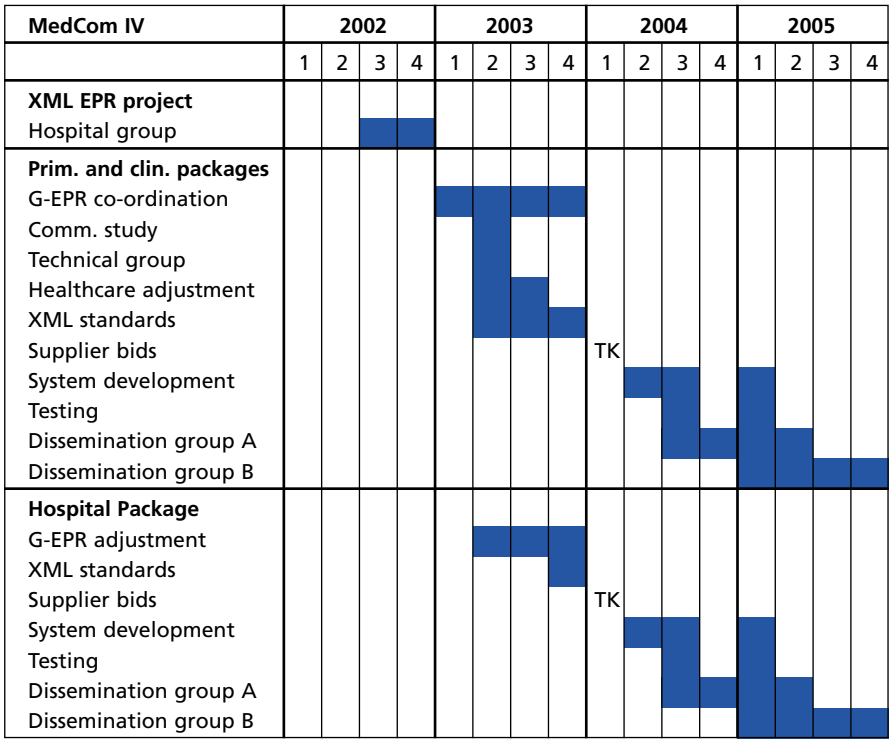
The Correspondence Letter message should be included in all communication packages, as this message is already implemented today in all doctors' systems and is in addition expected to be implemented in all local-authority care systems. The Correspondence Letter will therefore be the only message capable of being sent between almost all parties in the healthcare sector, apart from laboratories and radiology departments.

Depending on which communication packages the individual county/CHC chooses to take part in, it will be necessary to involve the IT suppliers which the counties are already using at present in the areas concerned. Communication of the Clinical Package, for example, will involve the county's laboratory systems, radiology systems and EPR systems.

After the implementation period, it will be possible to communicate the messages concerned between all hospital departments and all hospitals which have implemented the same communication packages both within the country and at national level.

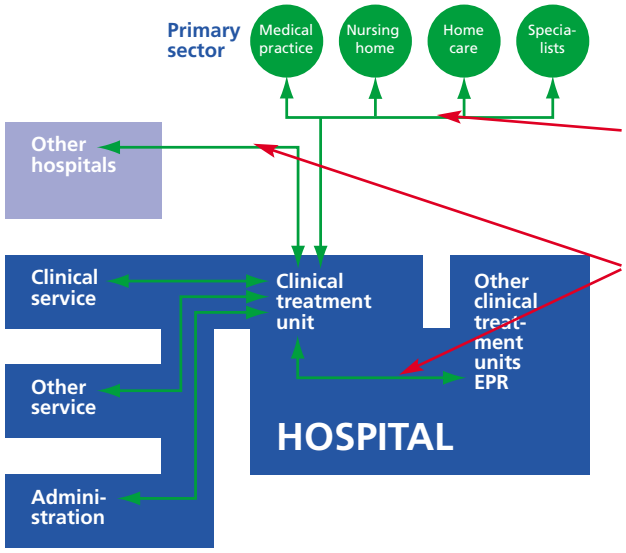
The XML EPR communication project is equivalent in size and implementation to the projects carried out in the primary sector since 1994. The project may involve roughly the same number of IT systems and require the development of

## Timetable for the XML EPR communication project

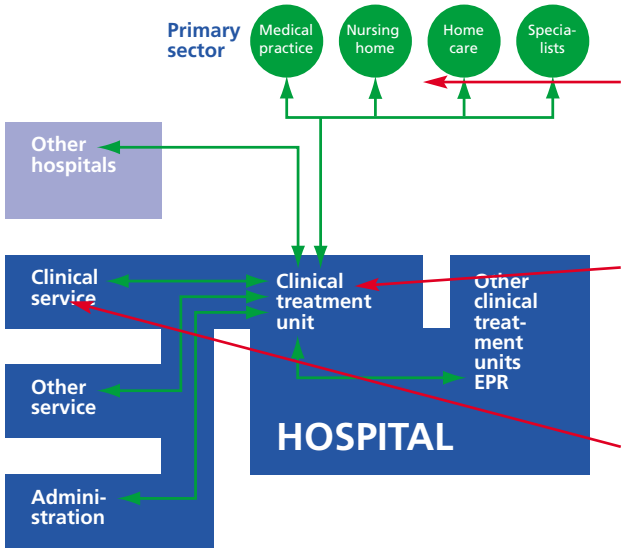



## What can be done more easily?

- **The whole communication packages are disseminated at once – greater impact and overview.** In the primary sector the individual messages are introduced individually over the years. Dissemination of whole communication packages on a large scale will make both system development and implementation substantially more efficient.
- **Prior testing bypasses MedCom.** In the primary sector, a number of pilot projects were carried out in 1994-1996 which were to test communication for the first time. Today it is possible to carry out prior testing of both the sending and receipt of messages, so that it is possible to start directly with dissemination.
- **Mandatory positive and negative acknowledgement safeguards logistics.** In 2002, mandatory acknowledgement for the primary communication was introduced. This eases administration and fault-tracing, and it is consequently expected to be used on the hospital side from the outset.




*XML between and in hospitals. EDIFACT to the primary sector. XML EDIFACT conversion of the primary package*




*Use of Clinical IT today: Virtually full IT coverage everywhere – however only 7% EPR in treatment units and 50% ECR in home nursing.*

## Number of interfaces

if all communication packages are implemented

| | Number systems | Interfaces per system | Interfaces total |
|---|---|---|---|
| EPR systems | 8 | 35 | 280 |
| PAS systems | 6 | 25 | 150 |
| X-ray systems | 8 | 6 | 48 |
| Laboratory systems | 6 | 8 | 48 |
| Blood-bank systems | 4 | 4 | 16 |
| Pathology systems | 4 | 6 | 24 |
| Microbiology systems | 5 | 6 | 30 |
| Total | 41 | 90 | 596 |

roughly the same number of communication interfaces. On the basis of experience from communication in the primary sector, however, it is possible to substantially improve efficiency and simplify implementation and dissemination.

In a single area, however implementation is more complex. In the primary area EDIFACT is used as communication syntax, while XML syntax is used in the hospital area. For this reason it is necessary to convert the EDIFACT message of the Primary Package to XML syntax.

Almost all IT suppliers have opted to take part in the communication with the primary sector. Provided this remains the case for communication in the hospital area, the project will altogether comprise over forty clinical IT systems.

## Participants

With the exception of Ringkøbing, all counties west of the Great Belt have decided to take part in MedCom's XML EPR project. Counties east of the Great Belt have not yet taken a decision in the autumn of 2003.

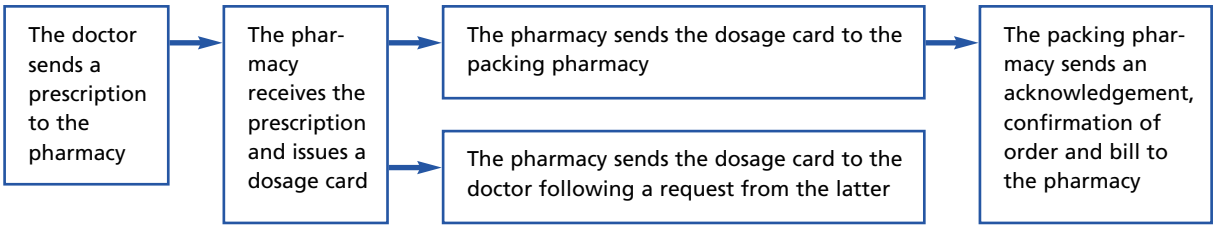
## Dose dispensing and new prescription

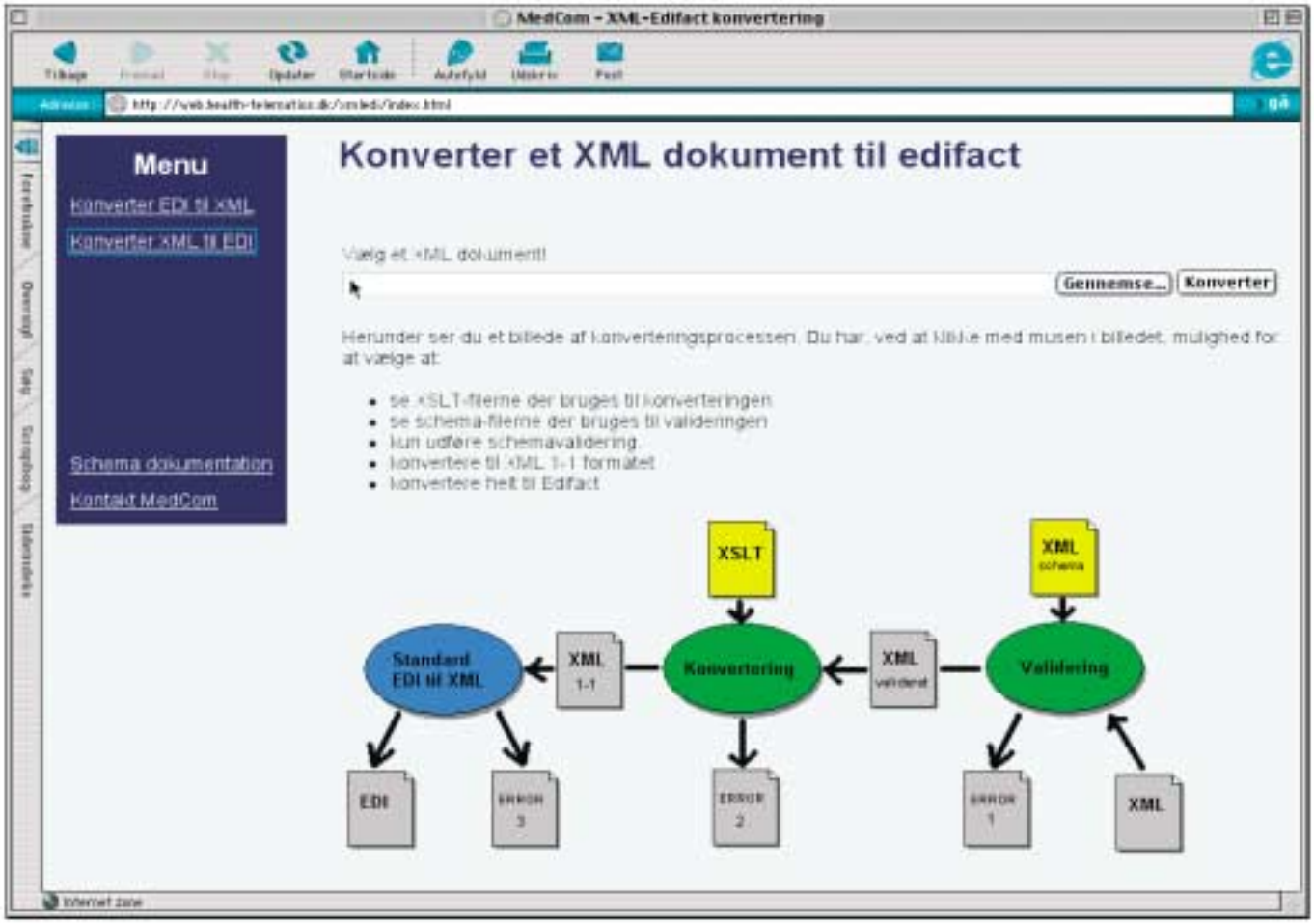
MedCom is taking part in the development of a new message for the electronic exchange of dose information between pharmacies. XML messages have now been developed for this area under MedCom, so that both information on medication which can be dose-dispensed and billing information can be transferred electronically between the pharmacies.

The messages were tested in the first quarter of 2003 in a pilot project between the various pharmacy systems currently used in those pharmacies that can dose-pack.

In connection with a planned review of the EDI prescription in the autumn of 2002, a wish was expressed by the Dose Dispending Group for it to be possible to state on the prescription whether it is desired that a drug is dose-dispensed.

Following an agreement with the Danish Medicines Agency this is now possible, and MedCom has produced a new version of the EDIFACT prescription with associated examples of text and has sent it out to all relevant suppliers.




*To support the work of IT suppliers on XML EDIFACT conversion, MedCom has developed a Web-based converter, available via www.medcom.dk or directly at the address http://web.health-telematics.dk/xmledi*

## Commentary

# Digitisation supports quality and coherence

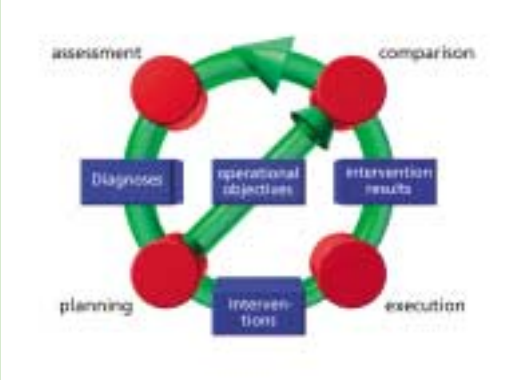
**Vagn Nielsen, Head of Department, Ministry of the Interior and Health,
Chairman of the MedCom Steering Group**

With the startup of MedCom's XML EPR communication project, the focus has been on the communication of referrals, summaries, laboratory results etc. within the hospitals and between the hospitals.

The routine communication of these message types is quite extensive in the hospital sector, and it is therefore expected that the digitisation of this area will contribute to a major boost in the quality and coherence of patient progressions.

I would like to emphasise the fundamental need for the project to be in agreement with the national standardisation work (Basic structure for Electronic Patient Record) taking place under the National Board of Health. Against this background, it is anticipated that the project will also boost the dissemination in the hospital sector of electronic patient records based on G-EPR, Basic structure for Electronic Patient Record.

## Perspective




## The XML EPR communication project and G-EPR

It has been decided that the development of EPR systems is to be based on the national G-EPR, Basic structure for Electronic Patient Record. G-EPR describes a common model for documentation of the clinical work process and will gradually be expanded to include detailed descriptions of important areas of work, e.g. image diagnostics.

The development of G-EPR is expected to take place over a prolonged period, as all the elements in the basic structure are not yet ready.

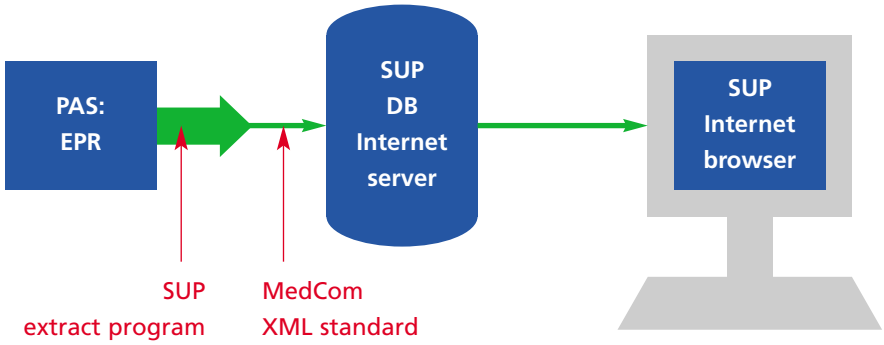
A number of solutions partially based on G-EPR will therefore be put into use and developed gradually as the individual elements in the main structure are completed and migration to a full EPR based on G-EPR takes place.

All these systems and their variants should be assured of communication coherence and co-existence. It is intended that this coherence is ensured by:

- MedCom IV's XML EPR standards being assured of G-EPR compatibility in the development of XML-extended standards, which in addition to the content of present-day elements are expanded to include G-EPR elements, as these are developed.
- G-EPR migration solutions incorporate communication solutions based on XML EPR.

The XML EPR communication project is therefore to be seen as part of a realistic option for communication between EPR systems, which is based on a joint G-EPR structure.

# MedCom's SUP project




*SUP – Standardised Extract of Patient Data*

The purpose of MedCom's SUP project is to provide access to viewing PAS and EPR patient records via a fairly general Internet browser – both within the county and across county boundaries.

After the project has been carried out, it is expected that the county/CHC has put into effect:

- electronic SUP extracting of patient record data from all departments that use the IT systems mentioned
- Internet access for relevant healthcare professionals in their own county and other counties who have a legitimate need justified in healthcare terms for the information

The project is intended to provide access to viewing selected patient data in the PAS and EPR systems of others – whether these are used elsewhere in the same county or in other counties.

In addition, a major user group will be doctors and nurses who are not users of the PAS and/or EPR systems on a daily basis. Simple Internet lookup will often be more appropriate for such groups of personnel than having to use the complex production systems concerned directly.

It is intended that every county/CHC chooses which EPR and/or PAS systems are to be implemented in which implementation periods, on the basis of what fits in best with the county/CHC's own IT strategy.

The SUP project means that extract programs are established from the PAS and EPR systems of the county.

These extracts of patient data are transferred via a nation-wide MedCom XML standard to an SUP database/browser, which makes it possible to gain access to viewing selected record data and patient information via a fairly general Internet browser.

The SUP database/browser can either be established as a county database or jointly between several counties.

All users with secure Internet access can gain access to an SUP database in the same way as access is obtained to other websites on the Internet.

On the website, the user is asked for his password – and if the user is set up in the SUP database, he can obtain an overview of the extracts of the patient record contained in the database by searching on the patient's civil registry (cpr) number.

Continued browsing in an SUP record is illustrated below and proceeds according to the same principles as are normally applied on the Internet.

Use of the SUP browser is

*The user chooses record D and obtains an overview of the contents of the record.*

*The user chooses note overview – and reads a note.*

logged in the same way as the use of other patient systems. Use is checked by the county's security organisation in the same way as the use of other IT systems – with the difference that access by external users also has to be checked.

## The closed HealthcareIntranet

A closed, nation-wide HealthcareIntranet (SundhedsIntranet) is being constructed in 2003 as part of MedCom's Internet strategy. The HealthcareIntranet is based on linking together existing county intranets in setting up VPN connections to a nation-wide node (the HealthcareDIX – SundhedsDIX). The node is operated by UNI-C.

The communication of SUP extracts is expected to take place in the use of the nation-wide HealthcareIntranet in such a way that

- SUP extracts from EPR and PAS systems are transferred to the SUP database via the HealthcareIntranet.
- users who have access to SUP extracts from records on the SUP servers of others have to be able to use PC installations that have installed VPN access to the secure HealthcareInternet.

## Timetable

Most counties in western Denmark have decided to take part in MedCom's SUP project.

The aim of the project is to provide access to the EPR and PAS patient data of the counties via a general Internet browser. For this to be possible, regular extracts of patient data from EPR and where appropriate PAS systems to the SUP system have to be established.

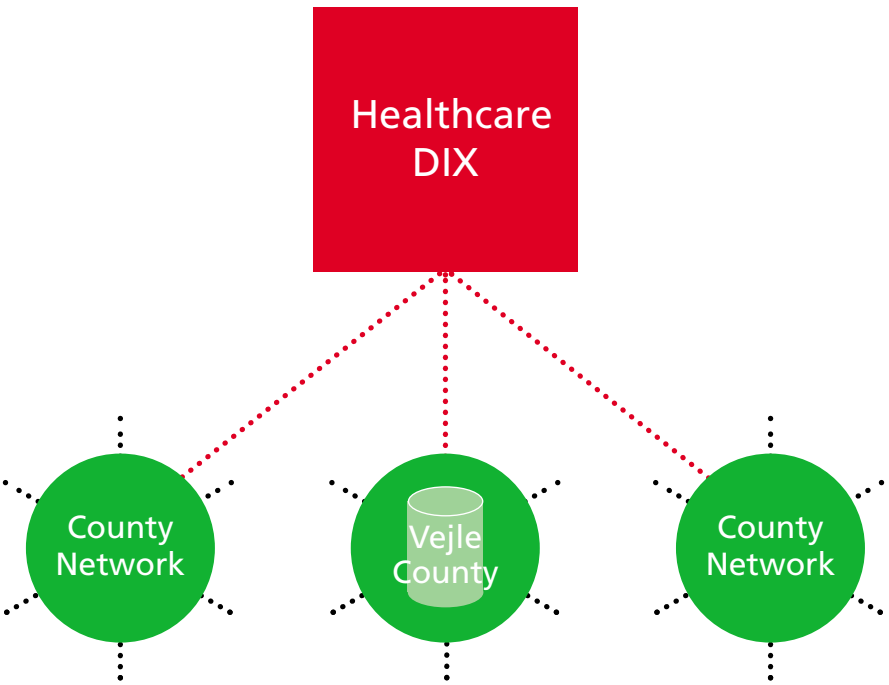
The project is based on the existing SUP project, which is being carried out by the counties of Vejle, Viborg and Århus. In this project it is planned that a Version 2 will be put into effect with extracts of record data from Vejle County. The project is based on an SUP database developed by IBM and an SUP browser solution developed by B-data. The project will be part of the Public Healthcare Portal.

The aim of MedCom's project is to expand the SUP solution to all the participating counties. It has not yet been clarified whether the individual counties in this context will put into effect their own SUP solutions or join forces on common development and operation.

With a view to speeding up commissioning of the SUP system and minimising risk and costs, it is expected that all the participating counties will join forces for a common SUP solution in a start-up period up to the autumn of 2004. The start-up period is based on a solution currently being put into practice in Vejle.

In this event, it is expected that:

- the SUP solutions of the counties can be implemented with access via the Healthcare Portal at the beginning of March 2004.
- programming of SUP extract systems from the counties' EPR and PAS systems can start at the beginning of December 2003.
- Vejle County puts into effect SUP extracts with access via the Healthcare Portal in mid-November 2003.
- completed tender documents are available for extract suppliers at the end of October 2003.
- costs in the establishment and operation of the common solution have been clarified in mid-September 2003.




*The SUP project uses the closed HealthcareIntranet*

## Timetable for SUP start-up project

| | 2003 | | | | | 2004 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SUP Start-up project** | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | Maj | June | July | Aug | Sep | Oct | Nov | Dec |
| Counties' attitude to SUP Start-up project | 19 | | | | | | | | | | | | | | | | |
| Vejle SUP in operation via Healthcare Portal | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| Overheads and organisation of joint SUP solution | | 8 | | | | | | | | | | | | | | | |
| Completed tender documents for extract systems | | 30 | | | | | | | | | | | | | | | |
| Bids received from suppliers | | | 27 | | | | | | | | | | | | | | |
| Adjustment of existing SUP DB/Browser | | | ■ | ■ | | | | | | | | | | | | | |
| Extract systems: Development | | | | | ■ | | | | | | | | | | | | |
| Implementation and mapping | | | | | | ■ | | | | | | | | | | | |
| Testing | | | | | | | ■ | | | | | | | | | | |
| Dissemination: Users joining DIX and SUP via portal | | | | | | | | ■ | ■ | ■ | | | | | | | |
| Improvements and possible invitation to tender | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ |

## Participants

With the exception of Ringkøbing, all counties west of the Great Belt have decided to take part in MedCom's SUP project.

| | Project manager | EPR system | PAS system |
|---|---|---|---|
| North Jutland County | Anne Marie Falch | | |
| Viborg County | Ole Philip Hansen | B-Data | |
| Århus County | Hans Henrik Bøttger | AAA | |
| Vejle County | Morten Hansen | IBM + CSC | |
| South Jutland County | Klaus Bo | EPJi | GS Åben |
| Ribe County | Kim Østerbye | Accure/Nora | |
| Funen County | Dorthe Skou Lassen | MediCare | FPAS |

# International activities

Work was also done in other European countries in the nineties on the development of EDI-based communication in the healthcare sector – based on the same technological foundation as in Denmark.

The UK, the Netherlands and the Scandinavian countries have been working on large, EDI-based healthcare data networks since the start of the nineties. Similar projects and national strategies have seen the light of day in all European countries in recent years. No other countries have, however, achieved a level of use that comes close to that in Denmark. Co-operation organisations have also been established in IT within the healthcare sector in other European countries – organisations that are more or less similar to MedCom. On the initiative of the Swedish CareLink, these organisations have been brought together in an organisation known as ELO, which at present comprises:

## Denmark:

**MedCom.**
www.medcom.dk

## Finland:

**STAKES – Research and development centre for the social and healthcare area.**
The task of STAKES is to promote welfare and health. The objective is for the whole Finnish population to have equal access to effective social and healthcare services of high quality.
www.stakes.fi

## France:

**EDISANTE – L'échange de données informatisé dans la Santé.** Web-based exchange of healthcare data. This association of players in the healthcare area works to develop and promote use of the Internet to pass on healthcare data.
www.edisante.org

## Netherlands:

**Nictiz – Nationaal ICT Instituut in de Zorg.**
Nictiz is attached to the Dutch Ministry of Health and is aimed at disseminating electronic patient records and ensuring electronic communication in the Dutch health service.
www.nictiz.nl

## Italy:

**FIASO – Federazione Italiana Aziende Sanitarie e Ospedaliere.**
Association for healthcare and hospital operation in Italy. FIASO puts the citizen at the centre in relation to the services that can be obtained through the health service. www.fiaso.it

## Norway:

**KITH – Informasjonsteknologi for et bedre helsevesen.** Information technology for a better health service. The principal aim of KITH is to ensure that information and communication technology are used to achieve effective and reasonable co-operation and development in the health service.
www.kith.no

## United Kingdom:

**UkeHA – UK eHealth Association.**
Electronic forum for healthcare communication in the United Kingdom. UkeHA represents all organisations and individuals with an interest in the development of eHealth – electronic healthcare communication in the United Kingdom.
www.ukeha.org.uk

## Czech Republic:

**Medtel.** Medical Telematik is an independent non-profit organisation which aims to ensure electronic healthcare communication in the Czech Republic and between the Czech Republic and other European countries. Medtel is financed by the Czech Ministry of Health. www.medtel.cz

## Sweden:

**Carelink – the Swedish network for healthcare communication.** Carelink is a national co-operative body, the aim of which is to promote the use of IT in the Swedish health service. www.carelink.se

## Germany:

**ATG – Aktionsforum Telematik im Gesundheitswesen.** Action forum for healthcare telematics. The aim of ATG is to integrate telematics as an important tool in the health service for the development of up-to-date treatment and care of high quality.
www.atg.gvg-koeln.de

# International interaction

The Danish development work took on an international dimension as long ago as the early nineties. The background was a wish on the part of the Danes to enter into close co-operation with related communication projects abroad in order to gain and provide inspiration. In brief, the intention was to achieve synergies in the interaction between these projects across national boundaries.

Experience has shown that the effort put into international co-operation was both correct and necessary. There are countless examples of how experience from a national project has been of benefit at the international level – and vice-versa. Ideas and experiences from similar projects in virtually every EU member state have had a great impact on the situation and the prospects for the use of information and communication technology in the Danish health service. At the same time, we find that the Danish development work has also left its mark in the way other countries have chosen to exploit the potential of the new technology.

## Websites

**MedCom:**
www.medcom.dk

**CoCo:**
www.medcom.dk/dansk/coco

**PrimaCom:**
www.primacom.dk

**Picnic:**
www.medcom.dk/picnic

**JUST:**
www.justweb.org

**ciTTis:**
www.cittis.dk

**Open ECG:**
www.openecg.net

**HC-INTEREST:**
www.hc-interest.dk

# International projects 1996-1999

## CoCo

Coordination and Continuity in Health Care was the main heading of the CoCo project, which brought together 11 regional project organisations in 10 countries.

The majority of the projects focused on the communication to and from the GP, in the form of written messages – prescriptions, referrals, discharge letters, requests etc. However, CoCo also covered projects relating to multimedia communication between the primary and secondary sectors.

The building-blocks in CoCo were the regional projects. CoCo passed on standards, guidelines, test systems and other services to the regions. Communication was carried out and tested in pilot projects. The pilot projects emphasised that the regional networks could be slightly different with regard to size and aim, but that they should be built up on the basis of the same standards and the same structure.

## PRIMACOM

PRIMACOM – PRIMAry Care Physicians COMmunication Network carried out and evaluated pilot projects in Hungary and Slovenia with western European co-operating partners. This work comprised:

- development of the necessary tools and guidelines
- establishment of contact between software firms in Denmark, Italy, Hungary and Slovenia
- electronic contact between healthcare professionals
- communication of structured messages to ensure re-use of data in different systems, which are based on European standards, existing infrastructure and regional systems

## WISE

13 organisations in 10 EU member states joined forces in the WISE co-operation – Working in Synergy for Europe – to exchange knowledge and experience in efforts to establish and expand regional healthcare data networks in Europe. WISE was a kind of umbrella for EU projects concerned with regional healthcare data networks, including CoCo. The idea behind WISE was to view the regional and national effort in healthcare communication in an international perspective and broaden experience and solutions at European level. WISE focused on User Group Support, Synergy Promotion and External Promotion. One of the results of the project was the book “Building Regional Health Care Networks in Europe”, published by IOS Press.

## Commentary

### A development of national as well as international significance

**Commentary by Ilias Iakovidis, Ph.D., Deputy Head of Unit-eHealth, European Commission, DG Information Society**

Within the vast working area of eHealth, which focuses on application of information and communication technology, the fast and reliable communication of vital health data has a high priority. Electronic communication is the cornerstone of effective and quality health services and is highly advantageous not only to professionals but certainly also to the patients.

The EU is supporting initiatives in this field during the last 15 years and has in different ways supported a cross border co-operation on eHealth applications with the ultimate objective of supporting citizen centred health care.

MedCom, the Danish health data net, has consistently participated in the international co-operation and has contributed to the exchange of experience and inspiration. At the same time, MedCom has managed to initiate a development of the Danish health data net, which has been recognised with honourable mention as the "best practice" example in the recent eHealth 2003 Ministerial Conference.

MedCom and the Danish health data net have acquired valuable experiences that should play part in the development of future eHealth systems and services not only in Denmark but also to serve as example to all the countries that are preparing their deployment strategies. The European Commission follows new MedCom projects with great interest and it is very gratifying that the Research and Development programmes of EU is part of the success of MedCom.

# International projects 2000-2002

## Propractition

The Propractition project focuses on the continuing training of healthcare professionals using the Internet and websites. The objective of Propractition is to teach doctors to co-operate, so that two doctors each in their own hospital, for example, can reach agreement on diagnosis and treatment in difficult cases.

## PICNIC

PICNIC – Professionals and Citizens Network for Integrated Care. The EU project involves regional system suppliers, technology centres, companies and universities in nine EU member states.

The objective of PICNIC is to support/assist the regional system suppliers in implementing the next generation of secure, user-friendly healthcare data networks and to bring together the European market for healthcare telematics services.

PICNIC provides/offers Open Source components for Web services for the healthcare data network and a structure for local healthcare data networks. Components have been implemented in the pilot projects that offer

- telemedicine collaboration services
- shared record services
- reimbursement services

## JUST

Fifteen partners from seven countries are taking part in the JUST project. JUST supplies IT support for training in action to be taken in the event of accidents, among other things in the form of a CD with an interactive multimedia course and a website. Both aim to teach volunteers how they can help when they encounter cardiac arrest, an asthma attack or a person who is unconscious. The contents of the

CD comply with international recommendations and are used by several European organisations in conjunction with first-aid courses for volunteers.

# International projects 2002-2004

## ciTTis

The aim of this INTERRREG project is to develop a structure that can bring together all forms of telemedicine solutions, so that they can be used in the collaboration between healthcare professionals across all forms of telemedicine solutions. Co-operation in telemedicine involves the use of a protocol which shows the data stream in connection with the co-operation between healthcare professionals. The clinical documents and images are transferred by means of European standards.

A large part of the INTERREG project will focus on the organisational changes that follow when it is possible for co-operation to take place across organisational and geographical boundaries. The project will develop guidelines on how best to implement the new IT co-operation service.

The IT co-operation service is an environment where it is possible to carry out examination, monitoring, treatment and administration of patients using direct access to expert knowledge and patient information, regardless where the patient or the relevant information is in purely geographical terms.

## OpenECG

OpenECG aims to increase knowledge of and disseminate the use of the electronic ECG standards. OpenECG brings together representatives from national cardiology centres, hospital directors and producers of and dealers in ECG equipment.

An open ECG portal will help producers and system integrators in creating equipment and software which together can ensure smooth exchange of electrocardiograms. System managers and users can find the necessary information to draw up suitable and clear specifications in connection with the purchasing of new IT systems via the portal.

## HC-INTEREST

The Nordic project HC-INTEREST – Health Care record INTEroperability and Record STructure – has created the basis for Electronic Health Care Records (EHR), which can be used in all the Nordic countries. The objective is to exchange and consequently re-use information in different EHR systems.

The project is based on European standards for EHR models and messages and combines these with national enhancements, so that models and messages suit Nordic needs. Medical treatment was used as a test area on the basis of the Danish National Board of Health model. The HC-INTEREST project has

- produced proposals for the basic elements of a harmonised EHR structure
- developed operational EHR messages on the basis of the proposed basic elements in the structure and terminological standards
- tested the EHR messages in a pilot project where medical messages were generated/combined on the basis of the basic elements and the models

# Nordic co-operation

In 2001, Nordic co-operation was initiated between organisations working on healthcare data networks at national level. KITH from Norway, CareLink from Sweden, STAKES from Finland, the Icelandic Ministry of Health and MedCom have since met twice a year.

The aim is to develop experience and establish projects across boundaries. In several cases knowledge of communication solutions or the infrastructure in healthcare data networks has been re-used in another Nordic country.

## Perspective

# Nordic Health care Network group

Since the beginning of 2000, there has been ever closer co-operation between the organisations in the five Nordic countries which are working on the application and implementation of IT solutions and electronic communication in the health service.

Norway, Sweden and Denmark are all involved in the work of establishing nation-wide closed IP-based healthcare data networks. This firstly led to a number of bilateral meetings, exchange of documents and experience, to the great satisfaction of all the participants.

Plans for IP-based healthcare data networks became reality in the spring of 2003.

In Sweden, the Swedish Sjunet network has already gone through its second tendering round, and is a well-established network in which all the county councils (landsting) take part.

In Norway, five regional networks have been set up following the re-organisation of the healthcare sector into five regions, and it is planned that these networks will be linked together.

In Denmark, MedCom is well under way with a large-scale pilot project in which all the counties, pharmacies, Copenhagen Local Authority, a number of GPs and other parties are connected to a closed network.

Broadly speaking, Norway has focused on developing telemedicine, Sweden on establishing a secure IP-based infrastructure and Denmark has developed and implemented EDIFACT communication on a large scale.

Against this backdrop, the first meeting of the Nordic Health care Network was held in conjunction with the Vitalis conference in Gothenburg on 4 March. It was decided at the meeting to form a permanent Nordic working group and make the group a sub-group of NTA.

# Aims of the Nordic Health care Network

The establishment of the Nordic Health care Network serves several purposes, but overall the network is intended to foster greater exchange of experience and ideas between the Nordic countries. Experience to date has shown that there are great similarities and interesting differences between the structure of the health service, the use of IT and the development and implementation of IT in the health service in the Nordic countries. The aim of the Nordic Health care Network is to utilise these similarities and differences to:

- ensure the greatest possible re-use of solutions across national and regional boundaries in the Nordic countries
- assist in creating an open and homogeneous Nordic market for IT solutions for the health service
- create contact and the possibility of exchange of experience between national and regional projects
- inform broadly about Nordic solutions and projects
- support the development of a Nordic market for healthcare services
- solve practical problems in connection with healthcare projects in the Nordic countries

Published in December 2003 by MedCom, Rugårdsvej 15, 2., 5000 Odense C. **Editor:** Lars Hulbæk, MedCom.
**Text:** arki•tekst kommunikation. **Layout/dtp:** Christen Tofte. **Printed in Denmark by:** one2one. **Print run:** 1000. **ISBN:** 87-90839-67-6

# Good EDI letters

## Doctors' systems capable of sending/ receiving MedCom's Good EDI Letters

MedCom carried out a consolidation project during the period 2000-2002 in which all senders and recipients of EDI messages in the healthcare sector underwent testing and approval. The approval means that the system concerned can use MedCom's messages as described in Good EDI Letters.

All doctors' systems have undergone testing for each individual message. The types of message for which the doctors' system concerned is approved are marked in green on the chart below. Doctors' systems that are not approved are marked in red on the messages concerned.

The version that fulfils the approval is also stated in the chart.

Pattern at 12 September 2003
Message possible
Message not possible

| | | | Æskulap | Æskulap Win | Æskulap spec. | Nowax Win | PC.Praxis | PLC | MedWin | MultiMed | Medicare | EMAR DOS | EMAR WIN | Docbase | Ganglion DOS | Ganglion DOS | Darwin | WINEDI | Patina |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grant entitlement for specialists | | | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No |
| Version of system | | | 7.0 rev.7 | | 6.7 rev.8 | 1.5. 05.07 | 15-4 2002 | 3.93 | 3. 14. 19 | 0204 01 3.00 | 5.2 | 01A 05 | 3.0 | 1.1 85 | 6.4 | 3.5 | 1.9.2 | | |
| DIS | Recip. | Discharge summary | | | | | | | | | | | | | | | | | |
| | | Outpatient summary | | | | | | | | | | | | | | | | | |
| | | Casualty summary | | | | | | | | | | | | | | | | | |
| | | Image diagnostics summary | | | | | | | | | | | | | | | | | |
| | | On-call GP service summary | | | | | | | | | | | | | | | | | |
| | | Specialist summary | | | | | | | | | | | | | | | | | |
| | | Booking result | | | | | | | | | | | | | | | | | |
| | | Physiotherapy summary | | | | | | | | | | | | | | | | | |
| | | Correspondence letter | | | | | | | | | | | | | | | | | |
| | Send | Specialist summary | | | | | | | | | | | | | | | | | |
| | | On-call GP service summary | | | | | | | | | | | | | | | | | |
| | | Image diagnostics summary | | | | | | | | | | | | | | | | | |
| | | Correspondence letter | | | | | | | | | | | | | | | | | |
| REF | Send | Hospital referral | | | | | | | | | | | | | | | | | |
| | | Image diag. referral | | | | | | | | | | | | | | | | | |
| | | Specialist referral | | | | | | | | | | | | | | | | | |
| | Recip. | Specialist referral | | | | | | | | | | | | | | | | | |
| RPT | Recip. | Laboratory results | | | | | | | | | | | | | | | | | |
| | | Pathology results | | | | | | | | | | | | | | | | | |
| | | Microbiology results | | | | | | | | | | | | | | | | | |
| | | Cervix cytology results | | | | | | | | | | | | | | | | | |
| | | Immunology results | | | | | | | | | | | | | | | | | |
| REQ | Send | Laboratory request | | | | | | | | | | | | | | | | | |
| | | Pathology request | | | | | | | | | | | | | | | | | |
| | | Microbiology request | | | | | | | | | | | | | | | | | |
| | | WebReq | | | | | | | | | | | | | | | | | |
| RUC | Send | GP | | | | | | | | | | | | | | | | | |
| | | Specialists | | | | | | | | | | | | | | | | | |
| PRE | Send | Prescription old version | | | | | | | | | | | | | | | | | |
| | | Prescr. new w/o dose-d. | | | | | | | | | | | | | | | | | |
| | | Prescr. new w. dose-d. | | | | | | | | | | | | | | | | | |
| CTL | Recip. | Negative acknowledgement | | | | | | | | | | | | | | | | | |
| | | Positive acknowledgement | | | | | | | | | | | | | | | | | |
| | | Neg. VANS acknowledgement | | | | | | | | | | | | | | | | | |
| | Send | Negative acknowledgement | | | | | | | | | | | | | | | | | |
| | | Positive acknowledgement | | | | | | | | | | | | | | | | | |

# What can the counties do now?

## Overview of EDIFACT messages in operation in the individual counties and CHC

Green indicates that the messages are underway and have been disseminated to more than 50% of possible messages. The numbers in the boxes indicate what percentage of messages are sent electronically.

Yellow indicates that the message has been started and is being disseminated.

Red indicates that the message has not yet been put into use.

| Position at 19 September 2003 | Counties | | | | | | | | | | | | | | | Lab. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North Jutland | Viborg | Århus | Ringkøbing | Ribe | Vejle | South Jutland | Funen | West Zealand | Storstrøm | Roskilde | Frederiksborg | CHC | Copenhagen | Bornholm | KPLL | SSI | Capio |
| EDI-doctors % | 94 | 92 | 91 | 82 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 81 | 79 | 89 | | | |
| Spec. H doctors % | 65 | 78 | 50 | 72 | 42 | 67 | 81 | 69 | 70 | 60 | 51 | 64 | 53 | 52 | 80 | | | |
| 3 Discharge summary | 94 | 92 | 91 | 82 | 65 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 81 | 79 | 89 | | | |
| 4 Outpatient summary | 94 | 92 | 91 | 82 | 65 | 96 | 98 | 89 | 92 | 40 | 88 | 10 | 5 | 0 | 89 | | | |
| 5 Casualty summary | 94 | 92 | 91 | 82 | 0 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 51 | 20 | 89 | | | |
| 6 Image-diagnostics summary | 94 | 92 | 20 | 82 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 0 | 70 | 0 | 89 | | | |
| 16 On-call GP service summary | 94 | 92 | 91 | 82 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 81 | 79 | 89 | | | |
| 43 Specialist summary | 52 | 66 | 38 | 30 | 65 | 55 | 70 | 55 | 52 | 45 | 41 | 46 | 41 | 40 | 68 | | | |
| 50 Physiotherapy summary | 12 | 13 | 15 | 18 | 15 | 17 | 25 | 15 | 12 | 12 | 13 | 14 | 12 | 13 | 16 | | | |
| 49 Booking result | 51 | 60 | 5 | 0 | 0 | 50 | 0 | 60 | 25 | 20 | 25 | 0 | 0 | 0 | 0 | | | |
| | | | | | | | | | | | | | | | | | | |
| 1 Admission referral | 65 | 26 | 0 | 70 | 65 | 51 | 74 | 59 | 20 | 51 | 6 | 0 | 5 | 0 | 0 | | | |
| 7 Image-diagnostics referral | 65 | 65 | 10 | 51 | 74 | 59 | 22 | 51 | 0 | 0 | 0 | 0 | 70 | 0 | 0 | | | |
| 44 Specialist referral | 6 | 25 | 10 | 8 | 5 | 5 | 5 | 4 | 10 | 4 | 1 | 3 | 1 | 1 | 3 | | | |
| | | | | | | | | | | | | | | | | | | |
| 9 Clinical chemistry results | 94 | 92 | 91 | 60 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 80 | 79 | 89 | | | |
| 11 Pathology results | 94 | 92 | 91 | 82 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 90 | 80 | 79 | 89 | | | |
| 13 Clinical microbiology results | 94 | 92 | 91 | 82 | 87 | 96 | 98 | 89 | 92 | 86 | 88 | 0 | 80 | 79 | 89 | | 55 | |
| 54 Clinical immunology results | 94 | 92 | 0 | 78 | 87 | 96 | 0 | 89 | 0 | 86 | 88 | 0 | 0 | 0 | 0 | 0 | | |
| | | | | | | | | | | | | | | | | | | |
| 8 Clinical chemistry request | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | | 0 |
| 10 Pathology request | 0 | 32 | 0 | 0 | 0 | 63 | 0 | 54 | 0 | 0 | 10 | 45 | 0 | 0 | 0 | | | |
| 12 Clinical microbiology request | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | |
| | | | | | | | | | | | | | | | | | | |
| 14 GP billing | 54 | 73 | 20 | 52 | 43 | 75 | 71 | 50 | 70 | 20 | 55 | 71 | 48 | 45 | 0 | | | |
| 14 Specialist billing | 39 | 43 | 13 | 33 | 21 | 25 | 58 | 25 | 50 | 26 | 24 | 27 | 21 | 36 | 0 | | | |
| 15 Pharmacy billing | 100 | 100 | 70 | 100 | 36 | 74 | 100 | 85 | 88 | 79 | 100 | 100 | 86 | 55 | 0 | | | |
| 48 Dentist billing | 12 | 4 | 6 | 15 | 12 | 27 | 9 | 32 | 18 | 1 | 22 | 30 | 17 | 27 | 0 | | | |
| 47 On-call GP service billing | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | | | |
| 53 Physiotherapist billing | 10 | 2 | 30 | 4 | 8 | 9 | 13 | 10 | 40 | 4 | 25 | 14 | 46 | 42 | 0 | | | |
| SSI billing | 100 | 100 | 0 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 0 | | 88 | |
| MediLab billing | 100 | 100 | 100 | | 100 | 100 | 100 | 100 | 100 | | 100 | 100 | 100 | 100 | 0 | | | 94 |
| KPLL billing | | | | | | | | | 100 | | | 100 | 100 | 100 | | 100 | | |
| | | | | | | | | | | | | | | | | | | |
| 25 GP prescription | 80 | 82 | 68 | 59 | 64 | 75 | 77 | 70 | 66 | 61 | 60 | 54 | 37 | 43 | 84 | | | |
| 17 On-call service prescription | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | | | |

# Centre for Health Telematics

**Centre manager**
**Henrik Bjerregaard Jensen**
MedCom
Mobile +45 4036 8619
hbj@
health-telematics.dk

**Consultant**
**Lars Hulbæk**
MedCom
Mobile +45 4036 8615
Lhf@
health-telematics.dk

**Deputy Chief of Section**
**Tove Lehrmann**
FynCom
Mobile +45 4036 8618
tle@
health-telematics.dk

**Deputy Manager**
**Ib Johansen**
MedCom
Mobile +45 4036 5620
ijo@
health-telematics.dk

**Secretary**
**Pia Reinhardt Juel**
Medcom
Mobile +45 2066 8700
prj@
health-telematics.dk

**Consultant**
**Henning Voss**
International
Mobile +45 3034 1555
hvo@
health-telematics.dk

**Secretary**
**Anita Folleraas**
MedCom
anf@
health-telematics.dk

**Secretary**
**Annette Larsen**
MedCom
ala@
health-telematics.dk

**Secretary**
**Jennie Søderberg**
International
Mobile +45 4026 6308
jsb@
health-telematics.dk

**Consultant Claus Duedal Pedersen**
MedCom
Mobile +45 4036 8629
cdp@
health-telematics.dk

**Consultant**
**Dorthe Skou Lassen**
MedCom/FynCom
Mobile +45 4040 5402
dsl@
health-telematics.dk

**Consultant**
**Niels Rossing**
International
Mobile +45 2178 2191
nr@
health-telematics.dk

**Project assistant**
**Gitte Henriksen**
MedCom
Mobile +45 2342 2256
ghe@
health-telematics.dk

**Consultant**
**Karin Demkjær**
MedCom/FynCom
Mobile +45 2320 2786
kde@
health-telematics.dk

**Consultant**
**Tove Kaae**
International
Mobile +45 2427 5739
tok@
health-telematics.dk

**Secretary**
**Iben Søgaard**
Medcom
ibs@
health-telematics.dk

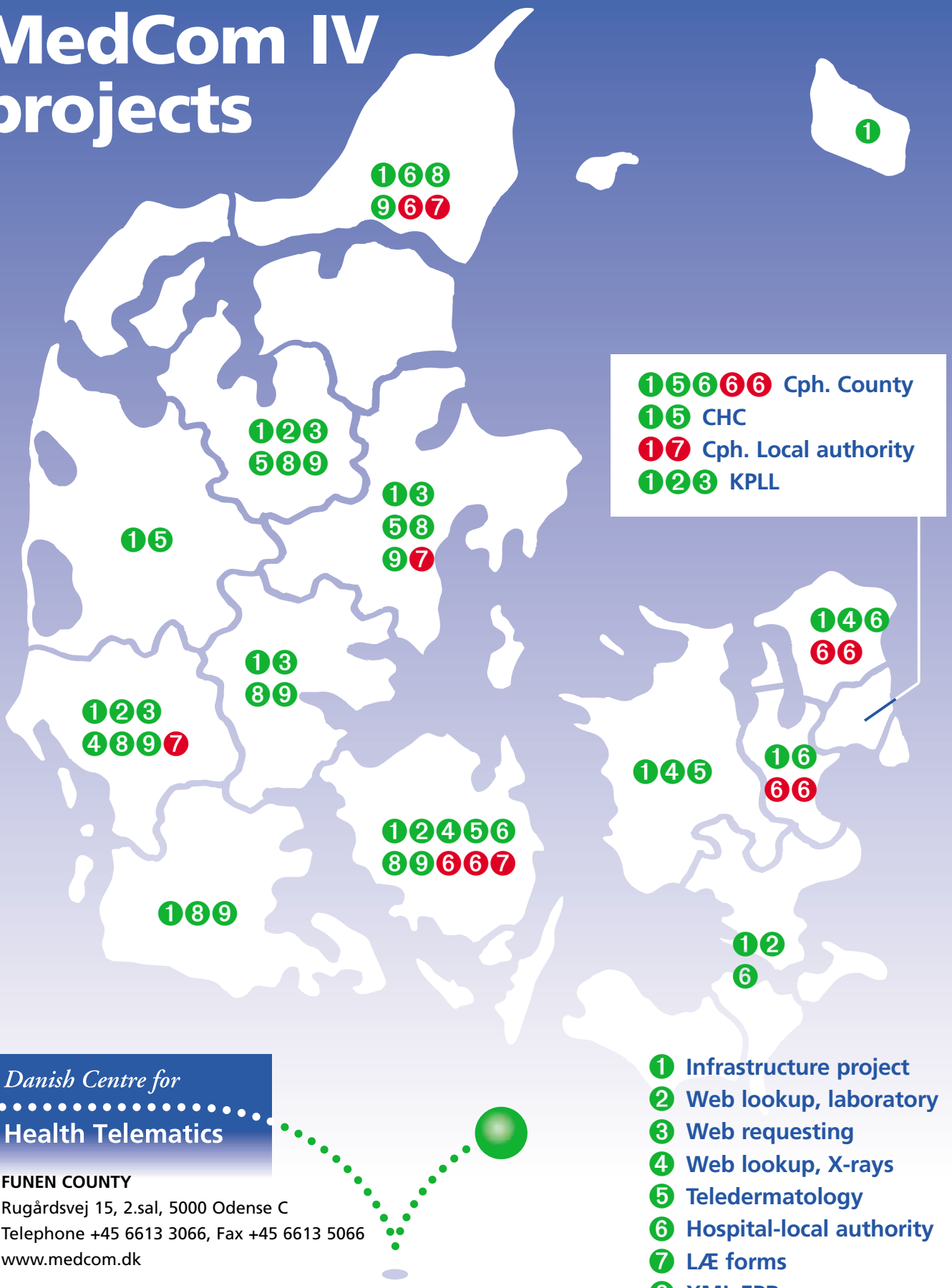
**Secretary**
**Karina Hasager**
FynCom
Mobile +45 2612 0361
khs@
health-telematics.dk

**Building assistant**
**Alis Jørgensen**
The Centre
Mobile +45 5131 8566

**Consultant**
**Jens Rahbek Nørgaard**
Medcom
Mobile +45 2482 1453
jrn@
health-telematics.dk

**Consultant**
**Lisbeth Jørgensen**
FynCom
Mobile +45 2427 5739
lij@
health-telematics.dk

# MedCom IV projects




*Danish Centre for*
**Health Telematics**

**FUNEN COUNTY**
Rugårdsvej 15, 2.sal, 5000 Odense C
Telephone +45 6613 3066, Fax +45 6613 5066
www.medcom.dk

**Ministry of the Interior and Health**
Slotsholmsgade 10-12, 1216 Copenhagen K
Telephone +45 3392 3360, Fax +45 3393 1563

1 Infrastructure project
2 Web lookup, laboratory
3 Web requesting
4 Web lookup, X-rays
5 Teledermatology
6 Hospital-local authority
7 LÆ forms
8 XML EPR
9 SUP
● Local authorities