

March 1998

MC-S89



MedCom

-the Danish Health Care Data Network towards the year 2000

The Danish Ministry of Health ● The Ministry of Social Affairs ● The Danish National Board of Health
The Association of County Councils in Denmark ● The National Association of Local Authorities in Denmark
Copenhagen Hospital Corporation ● Copenhagen and Frederiksberg Local Authorities
The Danish Pharmaceutical Association ● The Danish Dental Association
The Association of Danish General Practitioners ● Kommunedata ● Tele Denmark

A nation-wide network

MedCom is a project involving co-operation between authorities, organisations and private companies linked with the health care sector. The purpose of this co-operation is to establish a coherent Danish health care data network. MedCom is thus to contribute to the implementation of that part of the Government's IT political action plan which concerns the establishment of a nation-wide health care data network for information interchange.

The parties behind MedCom

The parties behind MedCom are the Danish Ministry of Health, the Ministry of Social Affairs, the Danish National Board of Health, the Association of County Councils in Denmark, the National Association of Local Authorities in Denmark, Copenhagen Hospital Corporation, Copenhagen and Frederiksberg Local Authorities, the Danish Dental Association, the Association of Danish General Practitioners, the Danish Pharmaceutical Association, Kommunedata and Tele Denmark/Dan Net.

From MedCom I to MedCom II

The first MedCom project took place in the period from 1995 to 1997. Its purpose was to develop and test nation-wide EDI communication standards of the most frequently used messages in the Danish health care sector. The second MedCom project is taking place in the period from 1997 to 1999 inclusive. The project is made up of four main elements: the Dissemination Projects, the Local Authority Projects, the URP Prescription Project and Pilot Projects.

MedCom II's budget

Income:	
Original contributions	25.000.000 DKK
Municipal contributions (National Associations of Local Authorities, Ministry of Health, Ministry of Social Affairs, Copenhagen and Frederiksberg Local authorities)	3.780.000 DKK
The Pharmacies Fund for the URP project	1.108.000 DKK
Total income	29.888.000 DKK
Expenditure:	
Basic expenses	8.150.000 DKK
Dissemination projects	7.500.000 DKK
Local Authority projects	4.930.000 DKK
MedCity and other pilot projects	3.700.000 DKK
URP prescription project	1.108.000 DKK
Gathering phase	500.000 DKK
Project implementation and reserve	4.000.000 DKK
Total expenditure	29.888.000 DKK

MedCom's steering group

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In co-operation with the county councils, local authorities and the other players in the health care sector, the Ministry of Health will draw up an action plan for the establishment of a health care network based on the MedCom project, so that systematic exchange of information between doctors, hospitals, pharmacies, local authorities and health authorities (i.e. results, extracts from records, prescriptions, accounts, etc) can switch to electronic communication by the year 2000. The project also includes communication of measured results, X-ray pictures, etc and systems for remote diagnosis.

From "The Government's IT Policy Action Plan"

MedCom is to co-ordinate

Trials involving communication between the parties of the health sector are in progress in many places. Examples include image communication between hospitals in Viborg and Aalborg, the booking of hospital treatment from doctors' practices in South Jutland, communication of electronic patient records between hospitals and doctors' practices, tele-medicine, EDI communication - and much more.

In order to gain a better overview and to create an opportunity for co-ordination between these many projects and initiatives, MedCom's steering committee has decided that MedCom is to attempt to survey the initiatives in progress within inter-sector communication in the health sector. Where possible, MedCom is to secure the exchange of experiences and greater consistency between the projects.



MedCom II is creating greater coherence

The government has long given the development of a Danish health care data network high priority, says health minister Birthe Weiss. "The advantages are clear: MedCom II will create greater coherence. Communication is being improved between the many parties of the health service: hospitals, pharmacies, the practice sector and now also the local authorities. Patients will notice the advantages in the form of better quality, service and coherence in

the treatment of their illness. In the longer term, rationalisation gains are also possible in respect of costs and time. Following the good results of MedCom I it was therefore clear that we should continue with disseminating the standards developed and implementing new projects in this area."

MedCom in Brief EDI-history

The Local Authority Projects

These projects are to secure a basis for the integration of the local authority health care sector with the rest of the health care sector via the Health Care Data Network.

MedCity

A pilot project which is to test out new forms of electronic communication as a supplement to EDI.

The Dissemination Projects

These projects are to ensure widespread use of electronic communication using EDI standards for the types of message which were covered by MedCom's first project period.

The Ultra-Rapid Prescription (URP)

The URP project is to ensure optimisation of the technology and work processes behind the electronic prescription.

Doctors' and hospitals' systems in Denmark MedCom personnel

The history of EDI in the Health care sector

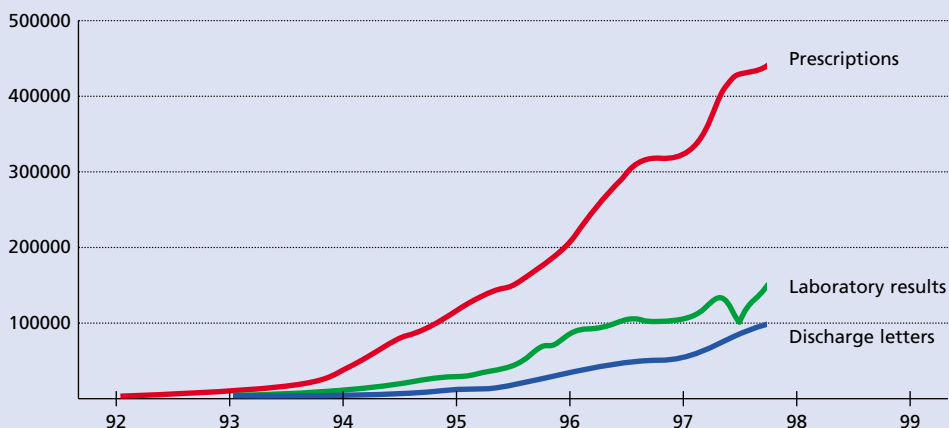
It started in the Eighties

In the late Eighties interest in electronic communication between the various parties in the health care sector increased. On the initiative of the Association of County Councils, therefore, local projects were started at the hospitals in Vejle and Silkeborg, amongst other places. The projects were financed by Kom-munedata's Technology Fund and, together with the 1991 DSI report "IT across (Sector) Boundaries", helped to draw attention to the need for cross-sector communication.

In parallel with these projects, an experiment involving communication between 10 pharmacies and 11 medical practices was carried out in Amager in 1989-90. This experiment was groundbreaking for EDI communication in Denmark, and since the Amager experiment all EDI projects in the health care sector have had the same technological basis:

- standardisation of the message content
- EDIFACT syntax
- use of existing telephone lines for communication

Number of messages per month from 1992 to nov. 1997



- use of VANS suppliers and traditional E-mail based "mailbox technology".

In 1992 three large regional EDI projects started:

- FynCom, in Funen County
- the Odder project in Århus County
- the Copenhagen General Practitioners' Laboratory (KPLL) in Copenhagen.

All three projects take the technology used in the Amager project as their starting point.

MedCom I

In order to prevent the counties each "reinventing the wheel", in 1992 Funen County Council submitted a proposal for organising a joint nation-wide project to which all would contribute – this was MedCom I.

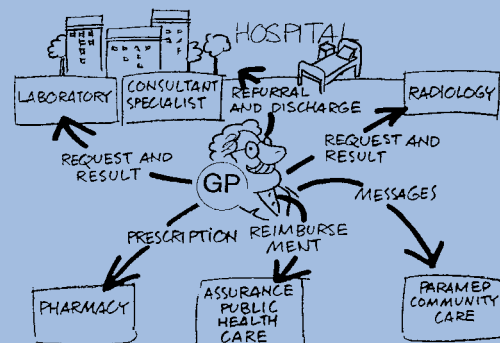
The purpose of the project was to develop nation-wide standards for the most frequent cross-sector communication flows in the health care sector. MedCom I took place from 1995 to 1997 and during this period standards were developed and tested in a number of pilot projects. Overall the MedCom I projects involved the majority of suppliers of IT

The six communication flows

It is not just on paper that Denmark has a single-stringed health system with the general practitioner as "gate-keeper" to the other treatment services. This position as a "nodal point" means that the general practitioner receives far

more cross-sector information than the other parties in the health care sector - both in absolute and relative terms.

However, this communication is very simple: the majority of the communication to and from general practitioners can be described in just six communication flows:



What is EDI?

systems to the Danish health care sector.

At the end of 1996 the standards were developed - and tested in 25 pilot projects involving virtually all the hospital systems and the majority of doctors' systems in Denmark. However, use of the standards was sluggish. Consequently, the decision was made to implement MedCom II.

MedCom II

The purpose of MedCom II is to ensure massive dissemination of the EDI communication by the year 2000. In addition, the municipal health care sector is being brought into MedCom II and, moreover, the standardised communication is being supplemented with non-standardised use of Internet-based communication in a larger pilot project.

At international level

EDI-based communication in the health care sector has also been developing in other countries for a number of years - based on exactly the same "pillars of technology" as are used in Denmark. Britain has had an extensive nation-wide EDI programme since the late Eighties, and work is also advanced in the Netherlands and the other Scandinavian countries.

National health insurance accounts, prescriptions, laboratory results and requisitions, referrals and discharge letters, X-ray requests and results and communication with the local authority health care sector.

EDI stands for Electronic Document Interchange and is an advanced form of communication of an electronic form with its predefined fields. An EDI standard makes it possible to send particular information (e.g. a discharge letter) fully automatically from a sending system to a receiving system - without the need to prepare for the communication locally. EDI is therefore communication between IT systems, whereas ordinary electronic mail is communication between people.

The lack of integration of IT systems is a major problem in all sectors - not just in the health care sector. And in other areas, too, the possibility of integration "from all to all" is being sought by the use of EDI. The problems are not related to IT, but to the lack of technical standardisation of the information to be communicated. The information is not sufficiently structured and defined to be able to be "understood" by an IT programme.

The messages must therefore be standardised. The sender and recipient must agree on the information that a message must and can contain, the order in which the information is to be able to be read, etc. In addition, the IT systems of both recipients and senders are to be set up for this form of communication.

All in all, it is an extensive task. Which is why MedCom first and foremost developed EDI standards for the most frequent types of message, these at the same time having the greatest possibility of relieving the administrative burden on the health care sector.

Local Authorities in the network

Objective of the local authority projects

The local authority part of MedCom is to support the implementation of a number of EDIFACT messages developed specially for the municipal area in the period 1995-96. This is to be done through a number of pilot projects in which, as far as possible, all the systems are incorporated into the standards.

The pilot projects thus form a basis for the subsequent dissemination of electronic communication. They ensure that the systems are tested and adjusted and that they can be taken into use by other users of the same systems without major problems.

At the same time the projects are thus to support the dissemination of electronic communication between local authorities and the health care sector. At the end of the MedCom project, as great a part of the volume of messages as possible are to be communicated electronically.

Finally, the local authority projects have the aim of supporting and coordinating the development and implementation of new message standards - related to the messages that have already been developed.

The areas concerned are:

- communication between the local authority, hospital and general practitioner in the area of children/young people

Budget for the local authority projects	
Project organisation, including MedCom staff	2.500.000 DKK
The communication projects <ul style="list-style-type: none"> ● local authority-hospital ● local authority-pharmacy ● local authority-the Social Appeals Board 	1.550.000 DKK
The EDI-Internet project	500.000 DKK
Meetings of the project organisation	380.000 DKK
MedCom-financed part of the local authority projects	4.930.000 DKK

- communication between the local authority and general practitioner in connection with socio-medical co-operation
- reports from the local authority to official and national authorities over and above what is already part of the local authority projects
- messages between the local authority, hospital and general practitioner in the area of the elderly, above and beyond what is already part of the local authority projects
- the extent to which it succeeds in testing out electronic communication in practice between the relevant systems to form a basis for increasing the volume
- the extent to which it succeeds in establishing electronic communication in one or more areas between local authorities and other parties in each of the country's counties
- the extent to which it succeeds in its goal of at least half of the country's local authorities having developed plans for establishing electronic communication within the area of the Health Care Data Network.

Success criteria

The degree of success of the municipal part of the MedCom project is to be measured in terms of:

- the extent to which it succeeds in incorporating the standards into the relevant systems - in other words pharmacy systems, hospital systems, local authority systems in the area of welfare and disability pensions, IT systems at the Social Appeals Board, etc.

Pilot projects and dissemination plans

The course which the local authority sector is taking in relation to electronic communication has much in common with the development and implementation of EDIFACT standards for general practitioners, hospitals, pharmacies, etc under the MedCom I project. Whilst the com-

The Health Care Data Network is growing

munication standards for the local authority projects have been drawn up in advance, they are to be incorporated into the systems on the market in the course of the project. They are then to be tested out in a number of pilot projects in selected local authorities before they can be spread widely to the whole of the country. This process is identical to that of the MedCom I project.

The project plan from the local authority sector also includes drawing up a long-term dissemination plan. This plan is to form part of the end-product of the MedCom II project and is to ensure that the work in the MedCom II project is utilised and used to the greatest extent possible.

In May 1997 the National Association of Local Authorities in Denmark decided to join in the MedCom project. This was in view of the positive experience that had been had in Funen, where work was already in progress on linking the local authority and county council health care sectors more closely by means of electronic communication.

The municipal social authorities exchange approx. 14 million routine messages with the rest of the health care sector annually, for example in connection with the admission to and discharge from hospital of recipients of municipal home help and the submission of invalidity pension forms from general practitioners to the local authority, and in the form of information on subsidised medicine from the local authority to pharmacies. The entry of the local authorities into the MedCom co-operation thus marks an essential step in the development of the Health Care Data Network.

For the patients it is the closer contact between hospitals and home help schemes that will bring about the greatest direct improvements. Up-to-date knowledge of where a recipient of home help is currently situated during a course of treatment, for example, is essential if we are always to be able to implement the right assistance measures in the patient's own home at the right time.



Photograph: Birgitte Jordahn

A necessary development

"For us, the fact that the local authorities have also become part of the nationwide health care data network is an entirely natural and necessary development," says Mayor Evan Jensen, Chairman of the National Association of Local Authorities in Denmark.

"As the public authority which is closest to the population, we have extensive communication with the parties of the health service. This is true not only in the case of children, for instance in connection with health visiting, but also in the case of the working population - for example, regarding benefit during illness - and the elderly, in connection with district nursing. Co-ordination is crucial if we are to be effective in our work and for people not to feel that they fall between the different bodies. For us, the MedCom project is one of the ways in which we can encourage services for our population which are characterised by unity and coherence."

Local Authority Projects in MedCom

Local Authority/Hospital Project

Advice of admissions, from hospital to local authority.

Amongst other things, this message is to be used in connection with the processing of sick pay and health visitors. The electronic transfer of the message means both time and financial savings, but also enhances the quality of the work because the right information will be there when needed.

Advice containing patient information, from local authority to hospital.

A message is sent from the local authority to the hospital as to whereabouts in the municipality the hospital can obtain further information - for example, in connection with the admission to hospital of a person who has received help from the health visitor service. This information will bring about time savings in connection with the obtaining of information by the hospital.

Advice from hospital to local authority concerning discharge of patients.

This will strengthen the co-operation between the hospital and health visitors, for example by increasing the opportunities for rapid and accurate follow-up of the hospital treatment after the patient has been discharged.

Communication channels.

These three messages are distributed according to plan to Kommunedata's Case and Advice System (the C&A system), which is used in around 240 of the country's local authorities. This solution is paving

the way for rapid dissemination of the messages. If the local authority has subject-specific systems, for example in the area of welfare, the message can be shown in the welfare system via interfaces with the C&A system.

Message notifying completion of treatment, from hospital to local authority health visitor service.

This notification message is used in connection with the discharge from hospital of persons who are to receive home nursing services. In addition to notification of the time when treatment will be finished, the message contains a description of the hospital's recommendations as regards assistance to the person concerned, e.g. aids, meals on wheels, practical assistance, etc. The message is sent before the person is discharged.

Care report from hospital to the local authority health visitor service.

This report contains information about persons receiving services from the health visitor service. The message contains a brief résumé of the admission, information on current medication, etc.

Communication channels.

These messages are to be sent to the welfare systems used in the local authorities, possibly via Kommunedata's C&A system. The messages will increase the quality of cross-sector communication and simplify the work processes in both the hospital and the local authority.

Volume of communication.

The volume of messages covered by these communication flows is approx. 2.9 million.

Local Authority/Pharmacy Project

Subsidised medicines - message from the local authority to the pharmacy.

These messages concern decisions relating to both pension legislation and benefit legislation. The electronic solution saves the pharmacist having to key in information and the current subsidy information will always be there for the assistant. In the longer term the aim is to set up a nation-wide database of subsidies. This will mean that all the pharmacies can see all the subsidies and thus serve customers living in a completely different place in the country without the person having to produce a document. This will benefit both the pharmacy and the patient.

Medicine accounts - message from the pharmacy to the local authority.

The account information concerns the pharmacy services that the local authority pays for in the case of persons receiving subsidies under the pensions or benefits act. Electronic communication eases the administrative work both in the pharmacy and in the local authority administration.

Communication channels.

The messages are to be sent between the systems used in the country's pharmacies, and a joint municipality pharmacy settlement system.

Volume of communication.

The volume of messages covered by these communication flows is approx. 500,000 subsidies and approx. 6m settlement notices, which are gathered together and forwarded in approx. 75,000

The administrative burden is relieved

messages depending on the frequency of dispatch.

Local Authority/Social Appeals Board Project

Appeal report from the local authority to the Social Appeals Board concerning invalidity pension decisions.

On conclusion of invalidity pension cases the local authority draws up a report of several pages which is sent to the Social Appeals Board. Here it is keyed in for use in higher follow-up in the area. If these reports are transferred electronically the administrative work of both the local authority and the Social Appeals Board is eased.

Communication channels.

The message is to be sent through the invalidity pension systems used in the country's local authorities and the Appeals Board's IT system.

Volume of communication.

The volume of messages covered by the Local Authority/Social Appeals Board Project is approx. 50,000.

Electronic document interchange provides a great number of benefits in the form of savings in work time and reduced expenditure on postage, paper and telephone. However, just as important is the improvement in the quality of communication due to fewer errors, which automatically follows from keying in the same information fewer times.

As the situation stands at present, information on medicines, for example, is recorded several times by the individual parties - **by the doctor** when he issues the prescription; **at the pharmacy** when the medicine labels are printed and the sale is recorded for use for settlement with the national health insurance scheme and local authority (unless the doctor sends the prescription electronically); and **in the local authority health visitor service** when medicine lists are printed out and once more when dosage labels are printed out. This process is laborious and a source of many errors.

With electronic recording and transfer the information will only be keyed in once at source - by the prescription issuer. All the other stages in the chain can reuse this information for their own purposes.



Online to the local authorities

"The pharmacies are probably the group which was quickest to realise the advantages of the MedCom project. Today all pharmacies are online and I would think that today around a third of all prescriptions issued for the first time are transferred electronically," says Paul Bundgaard, Chairman of the Danish Pharmaceutical Association.

"If the local authorities also come on board, this will relieve our everyday work further - both as regards subsidies and the transfer of funds.

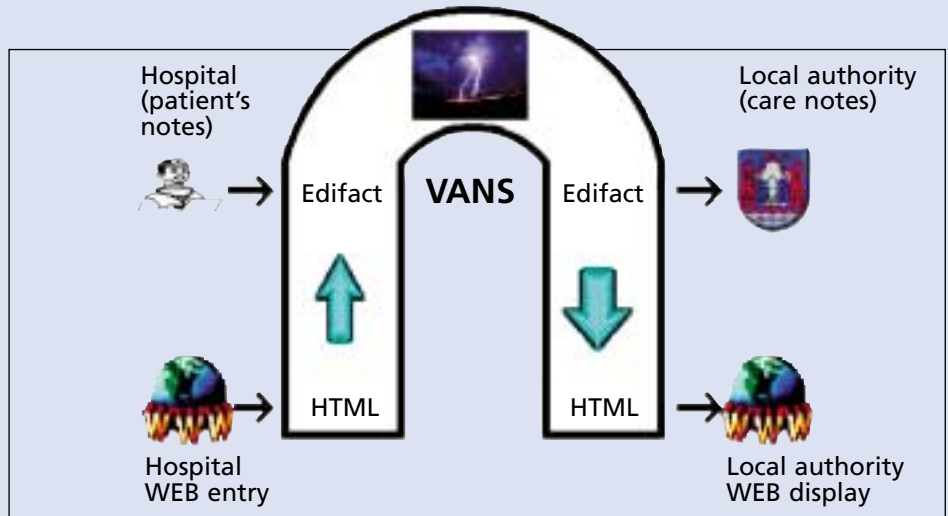
"It will also be of benefit for the patients who have their medicine charges paid for them by the local authorities through the benefits system, or for the elderly who receive a medicine card from the local authority. Otherwise they have had to collect the papers first from the local authority, which must send notification to the pharmacy in

question at the same time. "If the local authority is on line the subsidy can be sent electronically directly to a number of pharmacies at once. A patient may well use several different pharmacies. There may perhaps also be the possibility of us finding the information ourselves in a local authority database. The local authority can transfer the subsidy given in the same way, so that the two things happen at the same time," says Paul Bundgaard.

EDI and the Internet

Integration of EDI and the Internet

The Internet offers opportunities for introducing users of the Health Care Data Network who would not otherwise have the communications systems required to take part in EDI communication. In other words, this solution builds a bridge between the Health Care Data Network and the Internet.

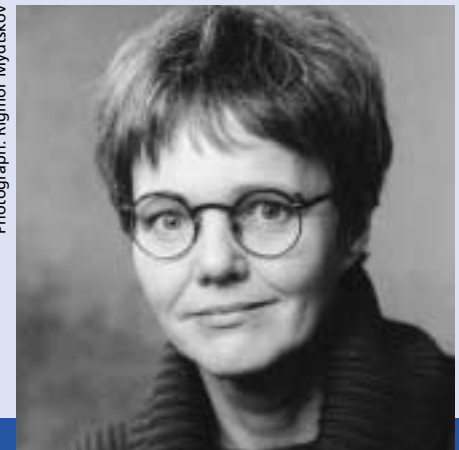


Timetable for the Local Authority Projects

Year	1998				1999			
	1	2	3	4	1	2	3	4
Local authority-hospital								
Agreements entered into with IT partners (Care systems and hospital systems)	█							
Configuration of IT systems (admission, admission results, discharge)		█						
Configuration of IT systems (notification and nursing report)			█	█				
Pilot test (admission, admission results, discharge)			█					
Pilot test (notification and nursing report)					█	█	█	
Local authority - pharmacy								
Entry into agreement	█							
Configuration of IT systems (billing)		█						
Pilot test (billing)			█					
Configuration of IT systems (grants)			█	█				
Pilot test (grants)					█	█		
Local authority - the Social Appeals Board								
Entry into agreement	█							
Configuration of IT systems		█						
Pilot test			█	█				
Internet EDI solution								
Development of solution	█							
Pilot test (notification and nursing report)		█	█					
Pilot test (reporting to the Social Appeals board)				█	█			
Pilot test (any other messages)				█	█	█	█	
Dissemination plan for the municipal area								
Information activities	█	█	█	█				
Preparation of plan				█	█	█	█	
Gathering round							█	█

The starting point for the use of EDI is system-to-system communication. However, not all the parties who have the systems can join in the communication. To enable these organisations to communicate elec-

Photograph: Rigmor Mydtskov



Improved quality, better service

With the establishment of such an extensive electronic network as MedCom, I see a number of good opportunities to improving communication in the health sector and the social services sector, says minister of social affairs, Karen Jespersen. I expect the national health care data network to be able to increase securi-

Great differences in size

tronically with the other parties nonetheless, a solution is established which uses the Internet technology as a front-end for the already established VANS solutions in the area of EDI. Such a solution provides the security associated with EDI communication and at the same time is very economic to obtain. Nor does it involve great organisational expenses to implement it.

The Internet-based solution may be used as a temporary solution and can be replaced at any time with an integrated EDI solution without having to change the principles of the dispatch/receipt procedures in technical terms. Nor is it necessary to inform the communicating partners.

In a first phase this solution will be developed for use in communication between hospitals and the health visitor service. In the second phase it is planned that it will be used for reporting to the Social Appeals Board. However, in principle it could be used for communication of all MedCom standards.

Work on the local authority projects differs from that of the other MedCom projects in several areas. One is that it involves closer co-ordination with the actual system development side, and with the standardisation work that is in progress on the content side under the auspices of the National Association of Local Authorities.

Denmark has 275 local authorities of very different sizes. The challenge for MedCom is to support both small and large local authorities irrespective of their own resources. The task is also to ensure that the solutions developed can be used regardless of the size of the municipality.

Many local authorities do not run their own IT solutions but use joint municipal solutions. These solutions are developed and run by Kommunedata, which is therefore a crucial co-operation partner in the dissemination of the health care data network.

However, it is essential that the communication solutions developed can also be used in other suppliers' systems. Those local authorities wishing to and having the resources for their own operations must be able to obtain the same communication facilities from their suppliers.

ty and result in time savings in connection with the passing on of factual information. And what is perhaps more significant: it is capable of providing a common knowledge base across sectors. This will in turn form fertile ground for more effective solutions. The nation-wide health care data network can thus help to improve the quality of treatment and level of service received by the citizen. I see particularly good opportunities for the elderly who

receive home help. Here the health care data network can help to solve some of the problems that many people have experienced in connection with communication between general practitioners, hospitals and local authorities. This is of great significance in such a complex area as the health and social services sector, where many different people and authorities are each trying to help the same person in their own way. The health care data network is

thus, in my view, a tool that can help to make things run more smoothly when a citizen needs help from both the primary health sector and the county council sector. Overall, we must ensure that the citizen does not "notice" that several public bodies have to contribute assistance. I therefore also regard the MedCom co-operation as a signal to the authorities for more co-operation and greater flexibility – for the sake of the citizen.

MedCity - a city in the provinces

Experiments with new forms of electronic communication

In addition to dissemination of the existing MedCom standards, MedCom II is also concerned with trials of new forms of electronic communication. In this connection pilot projects are to be carried out involving communication flows between the parties in the health care sector in which electronic communication was not previously part of the picture. In view of this it was decided to implement the MedCity project.

The purpose of MedCity

The project has the following purpose:

- to gain experience of electronic communication on a large scale/ in everyday operation between many of the parties of the health care sector, focusing on clinical use and the establishment of specialist health co-operation relationships.
- to investigate the advantages and disadvantages of electronic communication via the Internet, including for pictorial material and other documentation, as a supplement to EDI communication.

An experimental environment

MedCity may be seen as an experimental environment in which the many possibilities offered by the Internet are to be assessed and tested out as a supplement to EDI. The participants will be many of the parties in the health care sector:

Budget for MedCity	
Project organisation	150.000 DKK
Technical health co-operation, including co-operation agreements in phase 1	330.000 DKK
Information material	100.000 DKK
Preliminary investigation, including technology	250.000 DKK
Dental accounts with copy to Danish Dental Association	200.000 DKK
Implant registration to Danish Dental Association	100.000 DKK
Internet initiatives	70.000 DKK
Evaluation	200.000 DKK
Total	1.400.000 DKK
MedCom personnel, etc.	1.800.000 DKK
MedCom-financed part of MedCity budget	3.200.000 DKK

medical practices, hospital departments, health visitor groups, pharmacies, the county health insurance scheme, dental practices, dental college and Dental Association.

More than standard messages

Behind the project lies the thesis that there is a need for electronic interchange of health knowledge beyond the high volume, routine messages that can be communicated most appropriately via MedCom's EDI standards. MedCity is therefore to be seen as a further step towards realisation of the vision of the Health Care Data Network for exchanging information across sector boundaries.

The technical solutions

The project is based to a pronounced degree on existing technical solutions. These may be divided into three main categories:

EDI communication, primarily based on MedCom's dissemination pro-

jects, including referral/requisition from the medical practice to the hospital, medical history/test results from the hospital to the medical practice, prescriptions from the medical practice to the pharmacy and accounts from the medical practice to the national health insurance scheme. In addition some of MedCom's local authority projects will be a part of the MedCity project. Finally, EDI-based accounts will be implemented from dental practices to the national health insurance scheme, with a copy message that has been made anonymous being sent to a clinical database of the Dental Association.

E-mail-based communication via the Internet, which is partly to replace telephone notifications and partly to be used to support specialist health co-operating relationships. Amongst other things, this will concern expert guidance with the aim of increasing the quality of investigation and treatment at the lowest possible cost level.

Moving knowledge instead of patients

The facilities of the Internet for communicating images and sound are to be tested out for communication of digitised dental X-ray pictures, mucus membrane images, images of the skin and ECG graphs, for example.

Other information exchange via the Internet, which includes amongst other things the opportunities for making available general information (for example, information on visits from hospital departments to general practices), electronic forms (for example, for implant registration with the Dental Association) and data warehousing (for example, password-protected access to key figures concerning one's own medical practice's drawings on hospital departments).

Finance

MedCity is partly financed by DKK 3.2m from MedCom's pilot project budget, including payment for MedCom staff, etc. In addition, some of the expenses are being paid by participating parties.

The general practitioner has a very central role in the Danish Health Service. Nearly 90% of all patient contacts take place in the general practice. The remaining approx. 10% of patients are referred for specialist treatment at a specialist medical practice or hospital.

Modern information technology, in which it is easy and cheap to communicate text, images and sound material, makes it possible for even more treatment to be carried out in the general practice. For example, the general practitioner can use the facilities to search for general medical information on the Internet. Electronic communication also makes it possible to obtain direct expert guidance from selected specialists.

The MedCity project is to chart the organisational preconditions for utilising these technical possibilities. The project is also to clarify how the pattern of visitation will be affected when the new opportunities are taken into use.

In other words, the intention is to find out the extent to which it is possible and appropriate to move specialist medical knowledge out to the patients in their own practice instead of moving the patients from their own practice to a specialist.



The Internet at several levels

"The Internet is more flexible than any other system as regards the transfer of files," says Mogens Engsig-Karup, IT Manager at Århus County Council.

"Instead of the doctor having all information in connection with an admission transferred, with the Internet an authorised user can himself search for the relevant information in the respective IT systems - for example, information concerning laboratory or X-ray investigations. In principle there is no difference between finding information on what time the train goes to York on 24 May, and the result of Mrs. Smith's laboratory sample on 28 August 1997.

"Another advantage of involving the Internet in the MedCom project is that electronic messages - including the usual EDIFACTs - are cheaper to send over the Internet, compared to the systems provided by the VANS suppliers. The Internet is a more open system, but any security problems can be solved satisfactorily."

Timetable

Preliminary investigations

The first half of 1998 has been set aside for a preliminary investigation which will firstly clarify the legal and security matters and secondly test out digital cameras, scanners and other technical elements.

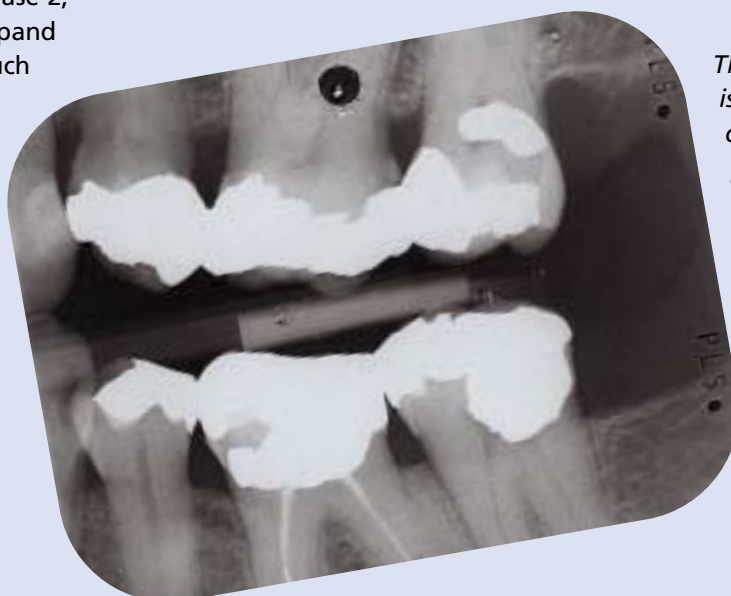
Initial sorting specifically for the health care sector amongst the Internet's innumerable technical possibilities with a view to limiting the project to that which provides the greatest health gain is another independent part of the project's preliminary investigation.

Operational phases 1 and 2

The second half of 1998 has been set aside for operational phase 1, in which 25 parties enter into agreements with MedCom concerning use of the equipment in the contexts chosen on the basis of the preliminary investigations.

On the threshold to 1999 a mid-way evaluation will be carried out and the project will be set up. This will be followed by operational phase 2, in which the intention is to expand the circle of participants as much as possible. Operational phase 2 will take place in the first half of 1999. The project will be concluded with a report in autumn 1999.

Timetable for MedCity								
Year	1998				1999			
Quarter	1	2	3	4	1	2	3	4
Health sector co-operation								
Preparatory specialist groups	■	■						
Co-operation agreements for participation in phase 1 of the project			■	■				
Co-operation agreements for participation in phase 2 of the project					■	■		
Technology, preliminary investigation								
Compilation and testing of IT package	■							
Health sector assessment of opportunities offered by the IT package	■							
Technology, implementation								
Installation of IT packages		■						
Training in use of IT packages		■						
IT-technical support			■	■	■	■		
Development								
Dentists' billing with copy message	■	■	■					
Implant registration in the Danish Dental Assoc.	■	■						
County internet initiatives	■	■						
EDI-kommunikation								
Dissemination projects in operation			■	■	■	■		
Local authority projects in operation			■	■	■	■		
Evaluation								
Description		■						
Registration			■	■	■	■		
Midway evaluation					■	■		
Report								■



The Danish Dental Association is to gain experience of the communication of X-ray pictures between dental practices and dental colleges as part of the MedCom project.

The Internet is to be evaluated

Other pilot projects

EPR pilot project

MedCom's steering group has earmarked DKK 100,000 for a preliminary investigation of how MedCom's standards can be updated for use in communication between electronic patient records in hospitals and medical practices.

This project will be implemented as a MedCom pilot project in 1999.

Specialists' project

In order to support electronic communication of doctors' letters and referrals between medical practices and specialists, MedCom's steering committee has set aside DKK 200,000 to implement MedCom's standards with this purpose in mind.

Since work on the Danish Health Care Data Network started in the early Nineties, use of the global Internet has undergone explosive growth, primarily for information searches and for exchange of electronic mail. The immediate advantages of the Internet are that access is cheap, communication of text, images and sound is easily accessible and finally that the Internet is widespread globally.

In various contexts initiatives have been started to utilise the Internet for specialist health use. There is no doubt that in the future the Internet will form an important part of the Danish Health Care Data Network. The Internet will supplement MedCom's EDI-based dissemination projects and local authority projects, which focus on the big routine flows of communication.

MedCity's combination of EDI and Internet is to be seen as an attempt to meet the need for electronic communication in the health care sector in full - both routine and less standardised communication.

Easier to keep statistics

"We joined in MedCom II because we want to participate in technological development in this area," says Jens Harbo, the representative of the Danish Dental Association in MedCom's steering group.

"For dentists MedCom will provide advantages in relation to the electronic transfer of prescriptions and settlement with the national health insurance system. In addition, the Danish Dental Association will be able to obtain information on an ongoing basis for statistical use, rather than having to wait to get the figures from the national health insurance scheme.

"The MedCity project is of particular interest with the new communication channels which are suitable for use by dentists. We are also interested in the possibility of sending X-ray pictures electronically, e.g. to colleagues in connection with operating on wisdom teeth."



Photograph: Lars Horn / Baghuset

Rapid and massive dissemination

Objectives

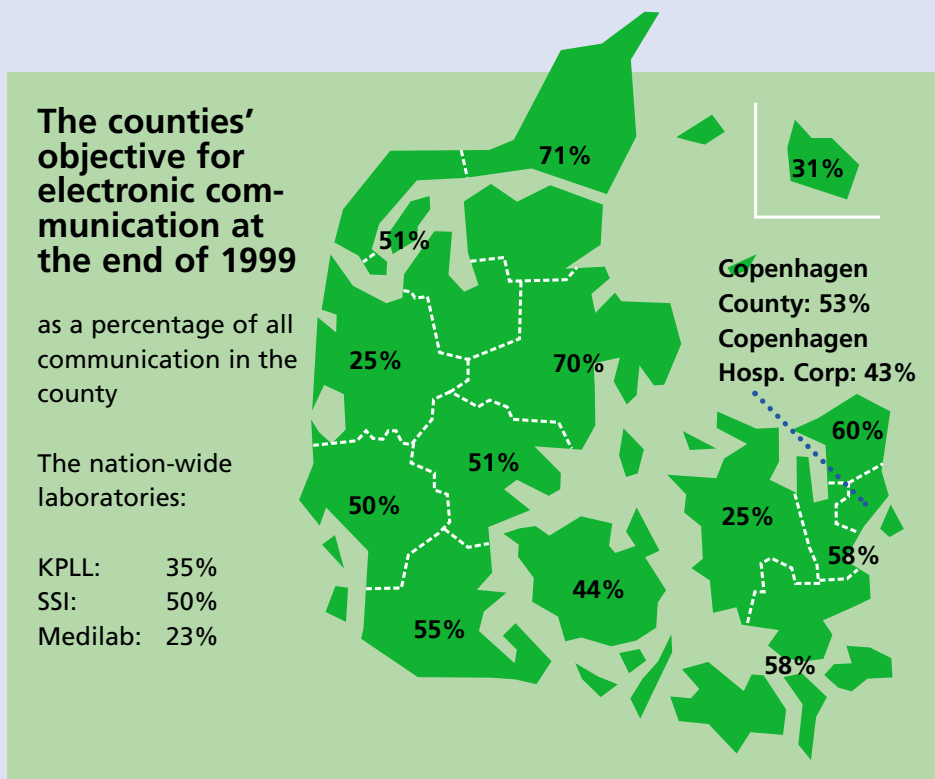
MedCom's dissemination projects are to ensure rapid and massive dissemination of the communication standards developed in connection with MedCom I.

Broad co-operation

The dissemination projects are based on broad, co-ordinated co-operation between all the parties involved in the health care sector: county councils, hospitals, laboratories, doctors, pharmacies, IT system houses and VANS suppliers.

Principles of the dissemination projects

The principles of the dissemination projects are:



Objective for MedCom's dissemination projects at national level at end of 1999	Number of dissemination projects	All messages number/month	Objective for end of 1999		
			EDI communication		% of all messages
			per month	per year	
Hospital replies in the form of discharge letters, X-ray results, etc to medical practices	59	377.000	226.000	2.712.000	60%
Hospital referrals for admission, out-patient treatment, X-ray, etc from medical practices	38	168.000	87.000	1.044.000	52%
Laboratory results from chemistry, pathology and microbiology laboratories to medical practices	38	497.500	353.000	4.236.000	71%
Laboratory requisitions to chemistry, pathology and microbiology laboratories from medical practices	23	208.750	83.000	996.000	40%
National health insurance bills from medical practices and pharmacies	12	11.200	4.000	48.000	36%
Prescriptions from medical practices and emergency services	5	1.667.000	1.234.000	14.800.000	74%
Total	175	2.929.450	1.987.000	23.836.000	68%

The dissemination is rooted locally

- that all counties and three nation-wide laboratories, the National Serum Institute, Copenhagen General Practitioners' Laboratory (KPLL) and Medilab wishing to take part in the dissemination projects have drawn up concrete dissemination plans for the projects in the county. These plans include a date for the start of test operation, a date for the start of dissemination and an objective for overall communication in the county at the end of 1999 for each type of MedCom message.
- that, through a co-operation agreement with MedCom, doctors' systems not wishing to take part in the dissemination projects undertake to implement and support MedCom's EDI interfaces amongst all their EDI users in line with communication being offered by the counties.

Finally, it is up to the individual county or laboratory to ensure that the "hospital side" is ready to communicate on the dates which the county specifies in its dissemination plan.

Objectives

The counties and laboratories have drawn up a dissemination plan stating an objective for overall communication in the county by the year 2000.

If all the counties and the three nation-wide laboratories carry out the dissemination projects in accordance with the plan, the total communication at the end of 1999 will amount to 23.8 million EDI messages per year. This is equivalent to 68% of the total communication of the most frequent messages in the primary health care sector.

The dissemination of MedCom's standards is to be ensured through 159 dissemination projects spread across the entire country. The main players are the county councils and the national laboratories, but many other parties in the health care sector and the IT industry are also involved. Through co-operation agreements with MedCom the county councils and national laboratories have undertaken to make an extraordinary effort which will involve major investment in both labour and financial resources until the turn of the millennium. Moving from being a successful pilot project to successful dissemination is a greater step than may appear at first glance. For example, the individual counties face a major challenge if all the departments of all the county's hospitals are to change over their work processes within a two-year period, so that the communication out of the hospital can move from paper to IT.

Photograph: Chr. Asbol



The counties have a responsibility

"The counties have to do something active and concrete to get everyone on board," says section head Tove Charlotte Nielsen. She is the project manager at Vejle County Council, which was one of the first counties to start using electronic referrals from medical practices to hospitals.

"It is one thing to show that it can be done, but quite another to spread the use of the electronic communications system. The county council is responsible for the MedCom standards being implemented in the hospitals' IT systems and for resources being put into implementing the process and into follow-up.

"Our task now is to motivate the general practitioners and the hospital departments to use the new opportunities. In Vejle County the dissemination project has been divided into five separate projects, representing the systems and activities which are to be implemented: the patient administration system, the X-ray system, the laboratory system, the pathology system and the emergency services system."

Towards the year 2000

Timetable and Budget

The dissemination project was described by MedCom's dissemination group in spring 1997 - and in August and September by and large all counties, national laboratories and doctors' systems decided to join in the project. In November 1997 the first dissemination projects started test operation and the majority of the other dissemination projects will start in spring 1998.

In parallel with this work a number of projects and work groups have been appointed, each focusing on a particular sub-area of electronic communication in the health care sector.

Budget for dissemination projects

Staff, etc.	2.500.000 DKK
Dissemination group	100.000 DKK
Project management group	700.000 DKK
Technical group and receiving systems	600.000 DKK
County contracts	1.500.000 DKK
Doctors' systems	500.000 DKK
Pharmacy project	200.000 DKK
Information material, statistics	500.000 DKK
Miscellaneous	200.000 DKK
D1 The KPLL-method	150.000 DKK
D2 Use projekt	250.000 DKK
D3 Clinical side project	100.000 DKK
D4 Hotline og EDI expert	150.000 DKK
Other sub-projects	50.000 DKK
Total dissemination projects	7.500.000 DKK

Timetable - The Dissemination Project

Year	1997				1998				1999			
	1	2	3	4	1	2	3	4	1	2	3	4
Dissemination group	■	■										
Project management group			■	■	■	■	■	■	■	■	■	■
Plans for county, laboratory and doctors' systems		■										
Entry into co-operation contracts			■									
Doctors' systems capable of MEDDIS and MEDRPT				■								
Doctors' systems capable of MEDREF, MEDREQ and MEDRUC				■								
175 regional dissemination projects				■	■	■	■	■	■	■	■	■
MedCom county rounds and conference		■	■	■		■	■		K	■	■	
Stop "EPIKRI" and "LABRES" 1 October 1998							■					
Sub-projects												
D1 The KPLL method			■	■	■							
D2 "What is the use?" project			>	>	■							
D3 "Clinical side must not be forgotten" project			>	>	■							
D4 Technical group, receiving systems, gathering round			■	■	■	■	■	■	■	■	■	■
D5 Written message example - version 2.3			■									
D6 Copenhagen Hospital Corporation project: Pixi book and partnership table				■	■							
D7 Counties group				■	■	■	■	■	■	■	■	■
D8 Lab. requisitions exp. groups					■							

IT assignments on many fronts

County Rounds

Three "county rounds" are to be carried out within MedCom, on the following themes:

1st round (1997)

Elaboration of county plans and implementation of the dissemination projects.

2nd round (1998)

What is the use? County meetings focusing on the treatment and service side of cross-sector electronic communication.

3rd round (1999)

The Danish Health Care Data Network - outlook and opportunities for development.

In the past ten years information technology has made serious inroads into the Danish health care sector. Examples of this are the hospitals' patient administration systems, laboratory systems and the ever-increasing use of electronic record systems amongst general practitioners. More recent initiatives include the testing of electronic booking systems for managing general practitioners' referrals to hospitals, clinical databases for use in health research and the introduction of electronic patient records at hospitals and in local authority care of the elderly.

The Danish Health Care Data Network is thus just one of several current IT projects. However, the Health Care Data Network is not independent. Its success is wholly dependent on the IT systems in the health care sector between which the network establishes connections. If it is to be possible to reap the benefits of the Health Care Data Network in a future and more IT-intensive health service, it is necessary for communication across sector boundaries to be given high priority and for the network to be integrated into the many new IT projects.

More people need to come on board

"Prescriptions, results of samples and information to the patient's own doctor must be communicated quickly and securely, so that nobody waits longer than is absolutely necessary," says mayor Kresten Philipsen, who is also chairman of the Association of County Councils in Denmark.

"MedCom has created the framework for electronic communication between many of the parties in the health service. The counties must now seriously utilise the opportunities. More general practitioners, hospitals and departments must join the network and links must be created with local authorities.

"We have only seen the start of IT in the health service. The county councils are now investing just as much in being able to give patients a fixed time for preliminary examinations and further treatment using electronic booking systems. At the same time, telemedicine, video communication and electronic patient records are major development tasks that lie ahead. The experience from the MedCom co-operation will undoubtedly benefit the counties here."



Photograph: Bo Jarner / Pressehuset

National target and status

The dissemination project - status and aims

The graphs below shows the aims set for the communication of Med-Com's messages - and the actual communication at the start of the dissemination.

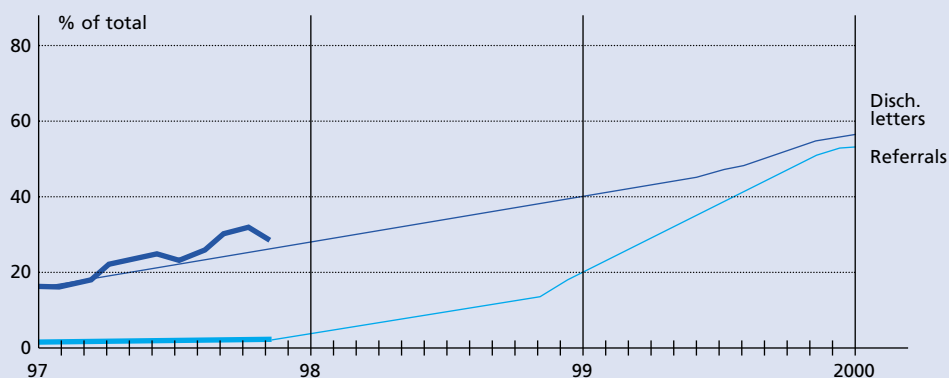
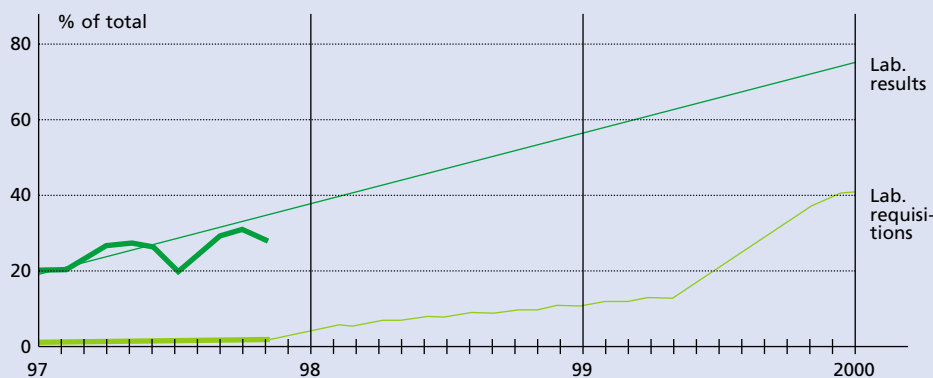
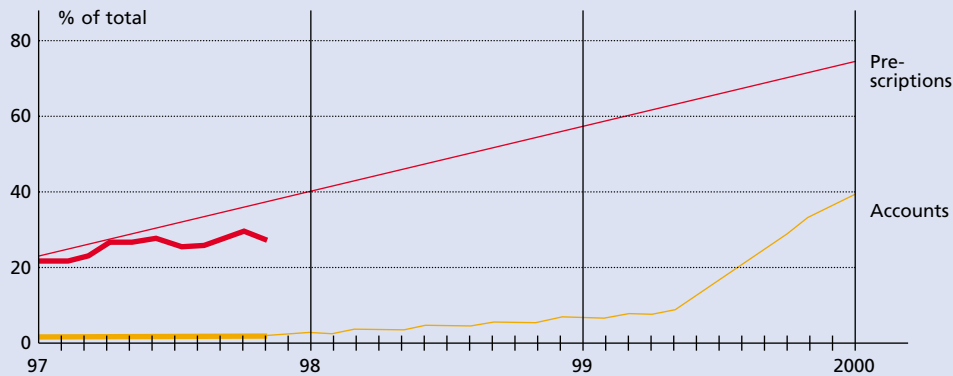
In order to be able to achieve the targets set, the communication must

grow more quickly in future. It is essential to have targeted, fast and solid input from all parties in the health care sector - not least as regards referrals, requisitions and national health insurance invoices.

A demanding task

The implementation of 175 dissemination projects will require substantial resource input from both hospitals and doctors' system suppliers.

- In the hospitals the implementation of the dissemination projects requires all relevant IT systems to have been purchased and implemented. In addition, an overall procedure must be set up in which each hospital department and laboratory joins the system and changes its procedures and routines with a view to using the communication in everyday operations.
- In the case of the general practitioners, the process first requires the participating IT system houses



Photograph: Peter Eilertsen



Better follow-up

"We are receiving an ever-increasing share of our messages electronically. Amongst other things, it means we have a better opportunity to follow up the treatment given by the

The technology cannot do it alone

to implement their EDI systems amongst all their users. Secondly, the implementation of the dissemination projects requires the county councils to introduce a registration procedure and carry out PR activities that result in all doctors with EDI in the county using the communication.

www.medcom2.dk

Updated information, references, national statistics, etc can be obtained from MedCom's Web page. The address is www.medcom2.dk

emergency medical services," says GP Jens Parker, who has been involved in MedCom since 1996. "We get all the details of what happened the previous day, so we can follow up the treatment. Previously it took longer and some of the information was out of date before it got here by post. "We also get results from the Microbiology Department electronically, so the patients can get advice and treatment quicker. As far as printing prescriptions is concerned, today there is not a pharmacy in the country that cannot receive prescriptions electronically. It gives general practitioners administrative advantages and it is my feeling that electronic communication is thought to be positive in practice by both doctors and patients."

The opportunities offered by information technology are both fascinating and great - including in the health care sector. In fact, the advantages of the new technology are so obvious that it is easy to be swept along without thinking about possible drawbacks. However, the establishment of the Health Care Data Network has, from the start, been based on recognition of the fact that "the technology cannot do it alone". And close co-operation with specialist health users of the Health Care Data Network has ensured a good dose of healthy scepticism.

One example of an important problem is that electronic communication suddenly makes it possible for the sender to move large quantities of information from the hospital to the general practitioner with minimal effort. However, the information is not necessarily relevant to the recipient. In this case it is not IT but co-operation and mutual understanding which shows us the way forward.

The practice consultant schemes will pay a crucial role in this fine-tuning of the functionality of the Health Care Data Network, just as the Health Care Data Network supports the practising consultants' efforts at achieving better co-operation between general practitioners and hospitals.

On the purely technical side it is important to find a suitably low common denominator to ensure widespread use of the Health Care Data Network. The latest new computers and software are only for IT-freaks. The Health Care Data Network is a tool for everyone.

Many people are joining in

Over half of all parties in the health care sector use EDI in everyday operations. In November 1997 1,076 general medical practices, 154 specialist medical practices, 320 pharmacies, 11 emergency medical services and 2/3 of all hospitals exchanged a total of 682,654 messages.

The EDI peak in November 1997

The EDI peak shows how far the individual counties have come with regard to EDI communication, both in absolute figures and in relation to total communication. The comparison between the counties is based

on the assumption that the use of prescriptions, laboratory results, discharge letters, etc is evenly distributed across the country (in proportion to the population in each county).

On this basis it is possible to calculate how great a share of these messages are actually sent using EDI in each county. The EDI peak covers both the old and the new EDI standards.

Conference

In June, 16.-17., 1999 MedCom will be holding a joint conference focusing on all forms of cross-sector communication and on electronic communication in the health care sector. The conference will focus on the effect on treatment of better co-ordination and continuity in the health care sector. Amongst other things, experience abroad with the booking of hospital treatment and shared care between hospitals, primary doctors and health visitors will be dealt with. Another topic will be cross-sector multimedia communication.

The EDI Peak - November 1997 - Per cent

Proportion of messages in each county sent by means of electronic communication (EDI)

	Messages - per cent						EDI-users - per cent		
	Discharge letter	Referral	Lab. result	Lab. requisition	Health Ins. acc.	Pre-scription	General pract.	Specialist	Pharmacies
1 Funen County	52	0	87	0	0	37	74	39	91
2 North Jutland County	32	1	71	0	0	46	78	33	95
3 Vejle County	54	0	49	1	0	35	65	15	91
4 South Jutland County	67	2	38	0	0	32	75	70	95
5 Viborg County	53	0	29	0	0	40	66	47	95
6 Århus County	50	0	30	0	2	35	64	14	97
7 Roskilde County	26	0	54	0	0	29	55	24	73
8 Bornholms County	0	0	13	0	0	44	67	0	100
9 Ribe County	2	0	12	0	13	28	58	16	100
10 Storstrøm County	16	0	8	0	0	23	49	15	86
11 Ringkøbing County	0	0	20	0	3	15	40	28	88
12 Copenh. Hosp. Corp.	7	0	6	0	2	14	36	17	95
13 Frederiksborg County	0	0	0	0	1	17	37	7	100
14 Copenhagen County	3	0	0	0	0	14	38	15	100
15 West Zealand County	0	0	0	0	0	6	14	15	83
Gen. Pract. Lab. (KPLL)			25	0					
Nat. Serum Institute			25	0					
Medi-lab			0	0					
Total	24	0	28	0	1	28	54	24	94

The EDI Peak - November 1997 - Number

Number of messages in each county sent by means of electronic communication (EDI)

	Number of messages						Emergency medical services		
	Discharge letter	Referral	Lab. result	Lab. requisition	Health Ins. acc.	Pre-scription	Memo	Pre-scription	Referral
1 Funen County	16384	3	31027	38	0	53180	1727	2307	0
2 North Jutland County	10411	142	26968	0	0	66274	1379	5250	0
3 Vejle County	12760	22	12637	88	0	34306	908	3311	0
4 South Jutland County	12876	140	7500	0	0	26350	0	0	0
5 Viborg County	8438	0	5249	0	0	28480	868	1303	0
6 Århus County	20573	31	14119	0	26	62864	2042	4643	0
7 Roskilde County	3690	0	9099	0	0	17957	648	2205	0
8 Bornholms County	2	0	467	0	0	6561	0	0	0
9 Ribe County	345	0	2058	0	62	20027	0	0	0
10 Storstrøm County	2498	0	1577	0	0	17455	712	1341	0
11 Ringkøbing County	46	0	4137	0	15	11271	0	1390	0
12 Copenh. Hosp. Corp.	1457	0	2450	8	22	19706	1732	5554	0
13 Frederiksborg County	20	0	0	0	8	16197	16	2973	0
14 Copenhagen County	71	0	0	0	0	23451	1328	3401	0
15 West Zealand County	4	0	55	0	0	5547	0	0	0
Gen. Pract. Lab. (KPLL)			7557	0					
Nat. Serum Institute			12910	0					
Medi-lab			0	0					
All of Denmark	89575	338	137810	134	133	409626	11360	33678	0
Of which new stand.	4%	100%	10%	100%	100%	0%	0%	0%	100%

Some key figures

- 24% of all discharge letters, 28% of all laboratory results and 28% of all prescriptions are sent using electronic communication.
- Eight counties sent between 30% and 70% of all messages using EDI.
- In nearly all the counties prescription communication has reached a considerable size, particularly if hospital results are also sent in the county in question.
- The communication of the new messages from medical practices to hospitals is still low, despite the fact that initial pilot projects in these areas were completed over a year ago.

A project manager's reminder list

1. Hospital IT system and hospital departments OK?
2. Test doctors found from each doctors' system?
3. Milestone 1 - agreements with all OK?
4. Test doctors have implemented the EDI interface?
5. First message sent - and receipt checked by everyone?
6. Error correction carried out - and error-free communication completed?
7. Milestone 2 - test operation approved?
8. EDI solution implemented by all doctors in the county?
9. Registration procedure drawn up and advertised and EDI officer appointed?
10. Hospital department by hospital department dissemination discussed?
11. Milestone 3: project description and registration procedure ready?
12. Hospital side: series of meetings, information, IT equipment training?
13. Doctors' side: PR material, Medical District Association, practice consultant scheme?
14. Project progress satisfactory? If not go to 12.
15. Milestone 4: all hospitals, all EDI-doctors and objective reached.

Who Can Do What When?

Dissemination plans as at 1. September 1997

All the county councils, Copenhagen Hospital Corporation, the National Serum Institute, Copenhagen General Practitioners' Laboratory (KPLL) and MediLab have prepared dissemination projects for MedCom's messages. In all, 175 dissemination projects are planned - each project covering one particular message in a particular county. The counties have set out four milestones in the dissemination plans - and one target for total communication at the end of 1999.

Milestone 1 Start of test

The county starts communication of the relevant message with a test

doctor from each doctors' system represented in the county.

Milestone 2 End of Test

The county approves the communication with each individual doctors' system.

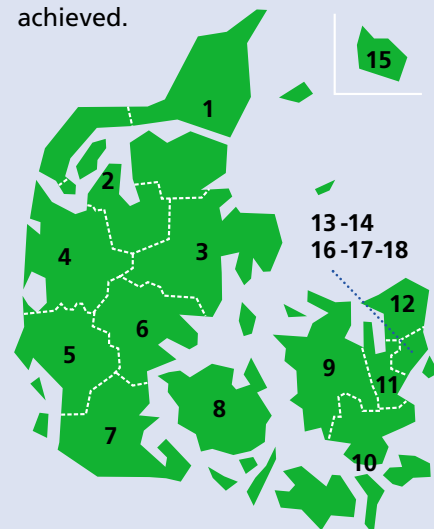
Milestone 3 Start of dissemination

The county starts communication of the message in question between more and more hospital departments and laboratories and all doctors with EDI in the county.

Milestone 4 End of dissemination

The county communicates between all relevant hospital departments and laboratories and all medical

practices with EDI in the county in everyday operations - and the communication aimed at has been achieved.



The county tests doctors' systems
 The county sends from some hospitals
 The county sends from all hospitals to all EDI-general practitioners.

1. North Jutland County

Project leader: Laila Christensen 9635 1000

The counties plans of 1 september 1997	97	98					99					Deadline milestones								
		N	D	J	F	M	A	M	J	J	A	S	O	N	D	99	1	2	3	4
3-1 Discharge letter	MEDDIS	1	2	3												75	1.11.97	1.12.97	1.01.98	1.03.98
4-1 Out-patient memo	MEDDIS	1	2	3												75	1.11.97	1.12.97	1.01.98	1.03.98
5-1 Casualty letter	MEDDIS	1	2	3												75	1.11.97	1.12.97	1.01.98	1.03.98
6-1 X-ray results	MEDDIS	1	2	3												75	1.11.97	1.12.97	1.01.98	1.03.98
16-1 Emerg. services memo	MEDDIS	1	2	3												75	1.11.97	1.12.97	1.01.98	1.02.98
1-1 Admission referral	MEDREF		1	2	3											75	1.01.98	1.02.98	1.03.98	1.04.98
2-1 Out-patient referral	MEDREF		1	2	3											75	1.01.98	1.02.98	1.03.98	1.04.98
7-1 X-ray requisition	MEDREF		1	2	3											75	1.01.98	1.02.98	1.03.98	1.04.98
9-1 Chemistry lab. results	MEDRPT						1		2	3						75	1.06.98	1.09.98	1.10.98	1.03.99
11-1 Pathology results	MEDRPT							1		2	3					75	1.08.98	1.10.98	1.11.98	1.04.99
13-1 Microbiology results	MEDRPT				1		2	3								75	1.04.98	1.06.98	1.07.98	1.02.99
8-1 Chemistry requisition	MEDREQ							1		2	3					40	1.09.98	1.12.98	1.01.99	1.12.99
10-1 Pathology requisition	MEDREQ									1		2	3			50	1.01.99	1.04.99	1.05.99	1.11.99
12-1 Microbiol. requisition	MEDREQ										1			2	3	75	1.05.99	1.10.99	1.11.99	

2. Viborg County

Project leader: Jens Grønlund 8727 1700

3-2 Discharge letter	MEDDIS	1	2	3												80	1.11.97	1.12.97	1.01.98	1.12.99
4-2 Out-patient memo	MEDDIS	1	2	3												80	1.11.97	1.12.97	1.01.98	1.12.99
5-2 Casualty letter	MEDDIS	1	2	3												80	1.11.97	1.12.97	1.01.98	1.12.99
6-2 X-ray results	MEDDIS	1	2	3												80	1.11.97	1.12.97	1.01.98	1.12.99
1-2 Admission referral	MEDREF		1	2	3											80	1.01.98	1.02.98	1.03.98	1.12.99
2-2 Out-patient referral	MEDREF		1	2	3											80	1.01.98	1.02.98	1.03.98	1.12.99
7-2 X-ray requisition	MEDREF					1				2	3					75	1.05.98	1.12.98	1.01.99	1.12.99
9-2 Chemistry lab. results	MEDRPT	1	2	3												80	1.11.97	1.12.97	1.01.98	1.12.99
13-2 Microbiology results	MEDRPT		1		2	3										80	1.01.98	1.04.98	1.05.98	1.12.99

3. Århus County

Project leader: Kjeld Erbs 8944 6666

The counties plans of 1 september 1997			97	98												99				Deadlines milepæle											
			N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	99	1	2
3-3	Discharge letter	MEDDIS	1		2	3																					90	1.11.97	1.01.98	1.02.98	1.12.99
4-3	Out-patient memo	MEDDIS	1		2	3																					90	1.11.97	1.12.97	1.02.98	1.12.99
5-3	Casualty letter	MEDDIS	1		2	3																					98	1.11.97	1.01.98	1.02.98	1.12.99
6-3	X-ray results	MEDDIS	1	2	3																						90	1.11.97	1.12.97	1.01.98	1.12.99
1-3	Admission referral	MEDREF											1	2	3												50	1.10.98	1.12.98	1.01.99	1.12.99
2-3	Out-patient referral	MEDREF											1	2	3												50	1.10.98	1.12.98	1.01.99	1.12.99
7-3	X-ray requisition	MEDREF			1	2	3																				90	1.01.98	1.02.98	1.03.98	1.12.99
9-3	Chemistry lab. results	MEDRPT			1				2	3																	80	1.01.98	1.06.98	1.07.98	1.12.99
11-3	Pathology results	MEDRPT							1				2	3													80	1.06.98	1.10.98	1.11.98	1.12.99
13-3	Microbiology results	MEDRPT			1				2	3																	50	1.01.98	1.06.98	1.07.98	1.12.99
8-3	Chemistry requisition	MEDREQ			1				2	3																	80	1.01.98	1.06.98	1.07.98	1.12.99
10-3	Pathology requisition	MEDREQ							1				2	3													80	1.06.98	1.10.98	1.11.98	1.12.99
12-3	Microbiol. requisition	MEDREQ			1				2	3																	50	1.01.98	1.06.98	1.07.98	1.12.99
14-3	Doctor's account	MEDRUC			1	2	3																				50	1.01.98	1.02.98	1.03.98	1.12.99

4. Ringkøbing County

Project leader: Knud Erik Klode 9675 3000

3-4	Discharge letter	MEDDIS								1	2	3															60	1.08.98	1.09.98	1.10.98	1.12.99
6-4	X-ray results	MEDDIS						1	2	3																	60	1.05.98	1.06.98	1.07.98	1.12.99
9-4	Chemistry lab. results	MEDRPT			1	2	3																				60	1.01.98	1.02.98	1.03.98	1.12.99
11-4	Pathology results	MEDRPT						1	2	3																	60	1.05.98	1.06.98	1.07.98	1.12.99

5. Ribe County

Project leader: Tom Onsberg Henriksen 7542 4200

3-5	Discharge letter	MEDDIS						1	2	3																	50	1.04.98	1.06.98	1.07.98	
4-5	Out-patient memo	MEDDIS						1	2	3																	50	1.04.98	1.06.98	1.07.98	1.12.99
5-5	Casualty letter	MEDDIS						1	2	3																	50	1.04.98	1.06.98	1.07.98	1.12.99
6-5	X-ray results	MEDDIS						1	2	3																	70	1.04.98	1.06.98	1.07.98	1.04.99
1-5	Admission referral	MEDREF						1	2	3																	70	1.04.98	1.06.98	1.07.98	1.12.99
2-5	Out-patient referral	MEDREF						1	2	3																	70	1.04.98	1.06.98	1.07.98	1.12.99
7-5	X-ray requisition	MEDREF						1	2	3																	60	1.04.98	1.06.98	1.07.98	1.12.99
9-5	Chemistry lab. results	MEDRPT						1	2	3																	60	1.04.98	1.06.98	1.07.98	1.12.99
11-5	Pathology results	MEDRPT																									60				1.12.99
13-5	Microbiology results	MEDRPT																									60				1.12.99
14-5	Doctor's account	MEDRUC			1	2	3																				50	1.01.98	1.02.98	1.03.98	1.12.99

6. Vejle County

Project leader: Tove Charlotte Nielsen 7583 5333

3-6	Discharge letter	MEDDIS	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
4-6	Out-patient memo	MEDDIS	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
5-6	Casualty letter	MEDDIS	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
6-6	X-ray results	MEDDIS	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
16-6	Emerg. services memo	MEDDIS								1	2	3															70	1.06.98	1.07.98	1.08.98	1.12.98
1-6	Admission referral	MEDREF			1	2	3																				70	1.01.98	1.02.98	1.03.98	1.12.99
2-6	Out-patient referral	MEDREF			1	2	3																				70	1.01.98	1.02.98	1.03.98	1.12.99
7-6	X-ray requisition	MEDREF			1	2	3																				70	1.01.98	1.02.98	1.03.98	1.12.99
18-6	Emerg. admission memo	MEDREF								1	2	3															70	1.06.98	1.07.98	1.08.98	1.12.99
9-6	Chemistry lab. results	MEDRPT	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
11-6	Pathology results	MEDRPT	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
13-6	Microbiology results	MEDRPT	1	2	3																						70	1.11.97	1.12.97	1.01.98	1.12.99
10-6	Pathology requisition	MEDREQ			1	2	3																				70	1.01.98	1.02.98	1.03.98	1.12.99

7. South Jutland County

Project leader: Kristian Hjerresen 7433 5050

3-7	Discharge letter	MEDDIS	1					2	3																		75	1.11.97	1.05.98	1.06.98	1.12.99
4-7	Out-patient memo	MEDDIS	1					2	3																		75	1.11.97	1.05.98	1.06.98	1.12.99
5-7	Casualty letter	MEDDIS	1					2	3																		75	1.11.97	1.05.98	1.06.98	1.12.99
6-7	X-ray results	MEDDIS	1					2	3																		75	1.11.97	1.05.98	1.06.98	1.12.99
16-7	Emerg. services memo	MEDDIS			1	2	3																				75	1.01.98	1.03.98	1.04.98	1.12.99
1-7	Admission referral	MEDREF						1	2	3																	50	1.06.98	1.09.98	1.10.98	1.12.99
2-7	Out-patient referral	MEDREF						1	2	3																	50	1.06.98	1.09.98	1.10.98	1.12.99
7-7	X-ray requisition	MEDREF			1			2	3																		75	1.01.98	1.05.98	1.06.98	1.12.99
9-7	Chemistry lab. results	MEDRPT	1	2	3																						75	1.11.97	1.12.97	1.01.98	1.12.99
11-7	Pathology results	MEDRPT			1	2	3																				75	1.01.98	1.03.98	1.04.98	1.12.99

Who Can Do What When?

8. Funen County

Project leader: Tove Lehrmann 6613 3066

The counties plans of 1 september 1997			97		98					99					Deadlines milepæle					
			N	D	J	F	M	A	M	J	J	A	S	O	N	D	99	1	2	3
3-8	Discharge letter	MEDDIS	1	2	3											75	1.11.97	1.12.97	1.01.98	1.01.99
4-8	Out-patient memo	MEDDIS	1	2	3											75	1.11.97	1.12.97	1.01.98	1.01.99
5-8	Casualty letter	MEDDIS	1	2	3											75	1.11.97	1.01.98	1.02.98	1.12.99
6-8	X-ray results	MEDDIS	1	2	3											40	1.11.97	1.12.97	1.01.98	1.12.99
1-8	Admission referral	MEDREF		1	2	3										75	1.01.98	1.02.98	1.03.98	1.01.99
2-8	Out-patient referral	MEDREF		1	2	3										75	1.01.98	1.02.98	1.03.98	1.04.98
7-8	X-ray requisition	MEDREF		1	2	3										40	1.01.98	1.02.98	1.03.98	1.12.99
11-8	Pathology results	MEDRPT	1	2	3											75	1.11.97	1.12.97	1.01.98	1.01.99
13-8	Microbiology results	MEDRPT				1	2	3								75	1.03.98	1.04.98	1.05.98	1.01.99
10-8	Pathology requisition	MEDREQ		1	2	3										75	1.01.98	1.02.98	1.03.98	1.01.99
12-8	Microbiol. requisition	MEDREQ					1		2	3						75	1.05.98	1.08.98	1.09.98	1.12.99

9. West Zealand County*

Project leader: Jette Rosbæk 5787 2533

3-9	Discharge letter	MEDDIS								1	2	3				60	1.02.99	1.04.99	1.05.99	1.11.99
4-9	Out-patient memo	MEDDIS								1	2	3				60	1.02.99	1.04.99	1.05.99	1.11.99
5-9	Casualty letter	MEDDIS								1	2	3				60	1.02.99	1.04.99	1.05.99	1.11.99
6-9	X-ray results	MEDDIS							1	2	3					70	1.11.98	1.01.99	1.02.99	1.12.99
11-9	Pathology results	MEDRPT								1	2	3				70	1.01.99	1.02.99	1.03.99	1.08.99
13-9	Microbiology results	MEDRPT							1	2	3					70	1.09.98	1.10.98	1.11.98	1.02.99

10. Storstrøm County

Project leader: Birgit Nielsen 5482 3232

3-10	Discharge letter	MEDDIS	1	2	3											70	1.11.97	1.12.97	1.01.98	1.12.99
4-10	Out-patient memo	MEDDIS	1	2	3											70	1.11.97	1.12.97	1.01.98	1.12.99
5-10	Casualty letter	MEDDIS	1	2	3											70	1.11.97	1.12.97	1.01.98	1.12.99
6-10	X-ray results	MEDDIS	1	2	3											70	1.11.97	1.12.97	1.01.98	1.12.99
1-10	Admission referral	MEDREF							1	2	3					70	1.10.98	1.11.98	1.12.98	
2-10	Out-patient referral	MEDREF							1	2	3					70	1.10.98	1.11.98	1.12.98	
7-10	X-ray requisition	MEDREF							1	2	3					70	1.10.98	1.11.98	1.12.98	
9-10	Chemistry lab. results	MEDRPT	1	2	3											70	1.11.97	1.12.97	1.01.98	1.12.99
11-10	Pathology results	MEDRPT							1	2						70	1.10.98	1.11.98		
13-10	Microbiology results	MEDRPT				1		2	3							70	1.04.98	1.07.98	1.08.98	1.12.99
8-10	Chemistry requisition	MEDREQ	1	2	3											70	1.01.98	1.02.98	1.03.98	1.12.99
10-10	Pathology requisition	MEDREQ							1	2	3					70	1.10.98	1.11.98	1.12.98	1.12.99
12-10	Microbiol. requisition	MEDREQ					1	2	3							70	1.06.98	1.07.98	1.08.98	

11. Roskilde County

Project leader: Jens Henning Rasmussen 4643 3232

3-11	Discharge letter	MEDDIS	1	2	3											75	1.11.97	1.12.97	1.01.98	1.04.98
5-11	Casualty letter	MEDDIS	1	2	3											75	1.11.97	1.12.97	1.01.98	1.04.98
4-11	Out-patient memo	MEDDIS	1		2	3										75	1.11.97	1.03.98	1.04.98	1.12.98
6-11	X-ray results	MEDDIS	1	2	3											75	1.11.97	1.12.97	1.01.98	1.04.98
16-11	Emerg. services memo	MEDDIS	1	2	3											60	1.11.97	1.12.97	1.01.98	1.09.98
1-11	Admission referral	MEDREF		1	2	3										40	1.01.98	1.02.98	1.03.98	1.12.98
2-11	Out-patient referral	MEDREF		1	2	3										40	1.01.98	1.03.98	1.04.98	1.12.98
7-11	X-ray requisition	MEDREF		1		2	3									40	1.01.98	1.06.98	1.07.98	1.12.98
9-11	Chemistry lab. results	MEDRPT	1	2	3											75	1.11.97	1.12.97	1.01.98	1.03.98
8-11	Chemistry requisition	MEDREQ		1		2	3									40	1.01.98	1.06.98	1.07.98	1.12.98
14-11	Doctor's account	MEDRUC			1	2	3									75	1.04.98	1.06.98	1.07.98	1.12.98
15-11	Pharmacy account	MEDRUC				1	2	3								75	1.07.98	1.09.98	1.10.98	1.03.99
17-11	Emerg. services' prescr.	RECEPT	1	2	3											60	1.11.97	1.12.97	1.01.98	1.09.98

* Re West Zealand County: The dissemination plan is of 9 Feb. 1998

12. Frederiksborg County

Project leader: Anny Føns 4829 4829

The counties plans of 1 september 1997			97		98												99				Deadlines milepæle											
			N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	99	1	2	3
3-12	Discharge letter	MEDDIS													1	2	3											75	1.10.98	1.12.98	1.01.99	1.12.99
4-12	Out-patient memo	MEDDIS													1	2	3											75	1.10.98	1.12.98	1.01.99	1.12.99
5-12	Casualty letter	MEDDIS													1	2	3											75	1.10.98	1.12.98	1.01.99	1.12.99
6-12	X-ray results	MEDDIS													1	2	3											75	1.10.98	1.12.98	1.01.99	1.12.99
1-12	Admission referral	MEDREF													1		2	3										75	1.10.98	1.03.99	1.04.99	1.12.99
2-12	Out-patient referral	MEDREF													1		2	3										75	1.10.98	1.03.99	1.04.99	1.12.99
7-12	X-ray requisition	MEDREF													1		2	3										75	1.10.98	1.03.99	1.04.99	1.12.99
9-12	Chemistry lab. results	MEDRPT	1	2	3																							75	1.11.97	1.12.97	1.01.98	1.12.98
11-12	Pathology results	MEDRPT													1	2	3											75	1.09.98	1.10.98	1.11.98	1.05.99
10-12	Pathology requisition	MEDREQ													1	2	3											75	1.09.98	1.10.98	1.11.98	1.05.99
14-12	Doctor's account	MEDRUC		1	2	3																						50	1.12.97	1.01.98	1.02.98	1.08.98
15-12	Pharmacy account	MEDRUC		1		2	3																					75	1.12.97	1.02.98	1.03.98	1.10.98

13. Copenhagen Hospital Corporation

Project leader: Peter Pedersen 3531 3531

3-13	Discharge letter	MEDDIS	1	2	3																							65	1.11.97	1.12.97	1.01.98	1.06.98
11-13	Pathology results	MEDRPT	1		2	3																						65	1.11.97	1.02.98	1.03.98	1.12.98
13-13	Microbiology results	MEDRPT	1	2	3																							65	1.11.97	1.12.97	1.01.98	1.12.98
10-13	Pathology requisition	MEDREQ															1	2	3									40	1.04.99	1.06.99	1.07.99	
12-13	Microbiol. requisition	MEDREQ		1	2	3																						40	1.12.97	1.01.98	1.02.98	1.12.99
14-13	Doctor's account	MEDRUC		1	2	3																						33	1.12.97	1.01.98	1.02.98	1.06.99
18-13	Emerg. admission memo	MEDREF		1				2	3																			65	1.01.98	1.06.98	1.07.98	1.12.98

14. Copenhagen County

Project leader: Jan Stokkebro Hansen 4488 4488

3-14	Discharge letter	MEDDIS													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
4-14	Out-patient memo	MEDDIS															1	2	3									50	1.01.99	1.03.99	1.04.99	1.12.99
5-14	Casualty letter	MEDDIS															1	2	3									50	1.01.99	1.03.99	1.04.99	1.12.99
6-14	X-ray results	MEDDIS													1		2	3										50	1.08.98	1.12.98	1.01.99	1.12.99
1-14	Admission referral	MEDREF													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
2-14	Out-patient referral	MEDREF													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
7-14	X-ray requisition	MEDREF													1		2	3										50	1.08.98	1.12.98	1.01.99	1.12.99
9-14	Chemistry lab. results	MEDRPT													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
11-14	Pathology results	MEDRPT													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
13-14	Microbiology results	MEDRPT													1		2	3										50	1.08.98	1.12.98	1.01.99	1.12.99
8-14	Chemistry requisition	MEDREQ													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
10-14	Pathology requisition	MEDREQ													1	2	3											50	1.10.98	1.12.98	1.01.99	1.12.99
12-14	Microbiol. requisition	MEDREQ													1		2	3										50	1.08.98	1.12.98	1.01.99	1.12.99
14-14	Doctor's account	MEDRUC		1		2	3																					50	1.12.97	1.02.98	1.03.98	1.12.99
15-14	Pharmacy account	MEDRUC				1		2	3																			50	1.03.98	1.06.98	1.07.98	1.12.99

15. Bornholms County

Project leader: Hanne Müller 6595 1165

3-15	Discharge letter	MEDDIS			1	2	3																					70	1.02.98	1.04.98	1.05.98	1.12.98
5-15	Casualty letter	MEDDIS	1	2	3																							70	1.11.97	1.12.97	1.01.98	1.09.98
6-15	X-ray results	MEDDIS															1	2	3									70	1.01.99	1.04.99	1.05.99	1.12.99
9-15	Chemistry lab. results	MEDRPT	1	2	3																							70	1.11.97	1.12.97	1.01.98	1.04.99

16-17-18. Laboratories*

Project leaders: KPLL: Niels Hornum 3313 7430, SSI: Ole Sprøgel 3268 3268, Medilab: Erik Riber 3374 3000

23-16	KPLL - Chem.lab.results	MEDRPT	1	2	3																							60	1.11.97	1.12.97	1.01.98	1.12.99
24-16	KPLL - Chem. requisition	MEDREQ		1	2	3																						10	1.12.97*	1.01.98	1.02.98	1.12.99
19-17	SSI - Chem.lab.results	MEDRPT		1	2	3																						85	1.12.97	1.01.98	1.02.98	1.01.99
20-17	SSI - Chem. requisition	MEDREQ				1	2	3																				15	1.03.98	1.04.98	1.05.98	1.01.99
21-18	Medilab - Chem.lab.res.	MEDRPT				1	2	3																				30	1.03.98	1.05.98	1.06.99	1.12.99
22-18	Medilab - Chemistry req.	MEDREQ				1	2	3																				15	1.03.98	1.05.98	1.06.98	1.12.99

* Re Laboratories: The dissemination plan is of 9 Feb. 1998.

* Re 24-16 KPLL - Chem. requisition: 1. milestone 1.12.97, reached 22.12.97.


Co-operation with doctors' systems and recipients

Co-operation with 10 Doctors' System Houses

Virtually all the doctors' system houses have entered into co-operation contracts concerning participation in MedCom's dissemination projects. These are:

- Ascott Software A/S - Æskulap
- Nordteamgruppen ApS - Novax
- PC-Idé- PC-praksis
- A-Data ApS - PLC
- EG Data-Inform - Midoc, Midocvagt and Medwin
- Datagruppen Vejle - Multimed and Multimedvagt
- RAMBØLL - Medex and I-praksis.
- EM-data A/S - EMAR
- Docbase A/S - Docbase
- Aver & Lauritzen ApS - Ganglion

These system houses represent a total of 1,294 medical practices and 370 specialist medical practices - or approx. 65% and 48% respectively of all medical practices in Denmark. In addition, 11 of the 15 emergency medical services are represented.

Doctors' systems in the counties															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
 The system is represented amongst specialist medical services or general practitioners in the county.	N. Jutland	Viborg	Århus	Ringkøbing	Ribe	Vejle	S. Jutland	Funen	W. Zealand	Storstrøm	Roskilde	Frederiksb.	Cop. Hosp.	Copenhagen	Bornholm
Æskulap															
Novax															
PC-praksis															
PLC															
Midoc / Medwin															
Multimed															
Medex															
I-praksis															
EMAR															
Docbase															
Ganglion															

Undertakings by the doctors' system houses

The co-operation contracts between doctors' system houses and MedCom mean

- that the doctors' system houses developed all MedCom's MEDDIS and MEDRPT interfaces by 1 October 1997
- that the doctors' system houses developed all MedCom's MED-REQ, MEDREF and MEDRUC interfaces by 1 December 1997

Receiving houses:

Message:	Receiving system house:	Contact person:	Telephone:
Clin. chem. results	Novax	Erling Abildgaard, Poul Erik Nielsen, Jimmy Hansen, Torben Lund	8621 0211
Mikrobiology results	PLC	Paul Dan Samsing	3833 0440
Pathology results	Multimed	Erik Jacobsen, Carsten Jørgensen	7572 5499
Discharge letter	Æskulap	Anders S. Rasmussen, Jesper Petersen	9848 8194
X-ray results	Æskulap		
Mikrobiology requisition	Adabakt	Henrik Hvolris, Hvidovre Hospital	3632 2949
Referral	Kommunedata	Joan Madsen, Peter Olesen, Rikke Andersen, Jens Nielsen	8678 4111
X-ray requisition	Kommunedata		
Nat. Health ins. account	Kommunedata		
Pathology requisition	Funen County Council IT-dept.	Lars Poulsen	6541 3459

Bridge between users and IT suppliers

- that the doctors' system houses will have implemented these interfaces amongst their EDI users at latest when the counties offer the communication in question.

Agreements with receiving houses

MedCom has entered into agreements with a number of IT system houses with a view to supporting the development of other suppliers and ensuring uniform, nation-wide use of the standards.

The receiving system houses have undertaken to receive EDI messages from other IT system houses wishing to be able to send the message in question until 1 March 1998. In addition to assisting with testing, the receiving system will check that the messages comply with the standard. The receiving houses are also gathering examples of the operating messages etc of the various systems. Each system house has drawn up a guideline for how the co-operation and testing is to be carried out in practice.

The MedCom project is characterised by close co-operation between users and private suppliers of IT systems to the health care sector. The suppliers thus actively participated in the pilot projects during MedCom I together with the users and carried out the necessary product development in this context.

The supply side again has a central role in the dissemination projects. Nearly all suppliers of doctors' systems have thus undertaken, in a co-operation agreement with MedCom, to be able to communicate using MedCom's standards in line with the counties offering the communication. The users amount to over 1,500 medical practices and specialist medical practices divided between 10 suppliers.

The IT suppliers operate under free market conditions and therefore constantly adapt their products in line with the rapid developments in the IT market. With regard to the dissemination projects, it has therefore been necessary to secure the suppliers' support for communication of the MedCom standards in both old and new versions of the IT systems.

Increasing security

Every year the Pathology Institute in Vejle receives 60,000 cell and tissue samples along with an equally large number of cards containing information about the patient and from where the sample originates.

"By receiving the information electronically we are able to copy the whole thing from the card, and consequently the risk of misreading disappears," says senior physician Jan Rasmussen of the Pathology Institute. "In addition, it allows us to send the sample results electronically direct to the recipient's IT system. This saves posting the results, which means a saving of up to 3 days where weekends are involved. At the same time all the samples are given a bar code which identifies the sample, which helps to increase security further."

The Pathology Institute has been participating in the MedCom project since 1996.

The next step is to widen the use of the system, since only 5% of the doctors in Vejle County currently take advantage of the opportunity to communicate with the Pathology Institute electronically.



The URP Project in MedCom

The Ultra-Rapid Prescription

In 1995-96 the data transmission group appointed by the Danish Pharmaceutical Association carried out a study of prescription communication based on EDIFACT. The results were published in the report entitled Prescription Time Measurements 96, in which a number of circumstances that can affect the sending of prescriptions as EDIFACT messages were pointed out, along with opportunities for improving communication.

In order to realise the opportunities for improving the electronic communication of prescriptions, the Pharmacies Fund of 1991 granted funds to implement the URP project - the Ultra-Rapid Prescription.

This project is being carried out as part of MedCom.

Purpose of the URP project

The URP project is to reveal the problems involved in sending EDIFACT prescriptions, and guidelines are to be drawn up which ensure the rapid and smooth communication of prescriptions.

Budget for the URP-project		
Participants	Task	Amount
Supplier	System development, statistical model and measuring unit for recording the pharmacies' emptying times. Weekly measurements including reporting	268.200 DKK
DanNet	Preliminary investigation - 300 hours at DKK 875	262.500 DKK
Centre for Health Telematics	Implementation of projects, project management. Meetings held with supplier, participants, project group	340.000 DKK
	Evaluation and publication	37.500 DKK
System house	Elaboration of prototype	50.000 DKK
Consultant	Description of systems and elaboration of guidelines	150.000 DKK
Total including VAT		1.108.200 DKK

Course of the project

The solutions for rapid and smooth communication of prescriptions are to be developed on the basis of investigations of the telecommunications infrastructure, analysis of the doctors' systems and time measurements and an economic calculation of consequences of the proposals

made. A system for time-monitoring of prescription transmissions will then be developed and tested.

Preliminary investigation

Preliminary investigation of the technical telecommunications infrastructure in the Health Care Data

Timetable								
Year	1997				1998			
	1	2	3	4	1	2	3	4
Preliminary investigation								
Elaboration of proposals for improvements (including interviews and questionnaire)								
Establishment of time measurement unit								
Ideal model, clocks set								
Elaboration of prototype Evaluation/report								

Laboratory experience groups

To ensure uniform nationwide solutions for the requesting of laboratory investigations by medical practices, three experience groups - one each in the fields of pathology, clinical chemistry and clinical microbiology - have been appointed under the auspices of MedCom. MedCom's task is to co-ordinate

The prescription must be rapid-ultra-rapid

Network is to be carried out by Dan-Net. The result of the analysis will be the charting of the current infrastructure and economic considerations in relation to the use of the infrastructure. Factors such as selective emptying of mailboxes or selective push, or prioritisation of particular time-critical types of EDIFACT are some of the circumstances that the report will shed light on.

In addition, the report will set out guidelines/recommendations for how the most optimal telecommunications infrastructure in the Health Care Data Network can be achieved; firstly from a technical point of view, and secondly in economic terms.

Finally, the analysis will point out realistic improvement measures and provide guidance on the implementation of improvements in an economic and technological perspective.

In parallel with this work, all current transmission procedures will be investigated and described. This applies both to doctors' systems and to the systems of the emergency medical services and pharmacies.

to be continued on the next page

The electronic communication of prescriptions is one of the oldest forms of standardised electronic communication in the health care sector. The volume of communication is high and there are immediate advantages for the general practitioner, pharmacy and patient from the prescription being entered in one place and communicated electronically direct to the pharmacy. This meant that people were quick to start local experiments with electronic communication in this area in several parts of the country.

The electronic prescription became widespread in connection with MedCom I, but surveys in 1995-96 revealed that communication was not as quick as it should have been. This is the background to the URP project, which is to clarify the problems involved in rapid and secure prescription communication and then highlight actual models for solutions, resulting in an ultra-rapid prescription.

The vision is a solution in which the details of the prescription are taken directly from the doctors' system, from where they can be integrated into the pharmacy system quickly and without errors. Here the details are re-used on delivery of medicine to the patient, and can also be used when printing out the text on the medicine label, updating the pharmacy stock, etc.

these solutions such that all the laboratories' needs can be met and such that the solutions provided by the doctors' systems can be used all over the country.

Participants include representatives of all the laboratories that have requisition projects within MedCom and representatives of general practitioners, practice system suppliers and the clinical companies DSKK,

DSKM, DSPAS and EDB-PS.

The groups have been very positive and committed and have worked quickly, and agreement has now been reached for the first time on:

- uniform nationwide sample identification and bar code numbering for pathology and clinical microbiology
- what kind of information must

and can be sent with requests for clinical microbiology, pathology and cytology

- how investigations can be requested electronically from the clinical chemistry laboratories.

The work of the groups has been so successful that the members have expressed a desire to continue this co-ordination between suppliers, medical practices and laboratories.

The Ultra-Rapid Prescription (URP)

This will be done by means of a number of interviews and visits to users and software suppliers, in which experience and suggestions for improvements are gathered. In connection with this work a questionnaire on prescription communication has been sent out to all the pharmacies in the country and to doctors with a location number.

Elaboration of suggestions for improvements

Detailed guidelines and suggestions for improvements will be drawn up for each individual system supplier based on the preliminary investigations - the conclusions of the preliminary analysis, results of the time measurement experiments and the prescription notice.

The purpose of these guidelines is to provide a basis for uniform procedures amongst doctors and pharmacies, so that the targets for rapid prescription communication can be realised. The guidelines will be sent out to all doctors and software houses that use prescription communication in Denmark. The aim is for simple adjustments to be incorporated on an ongoing basis during the project period.

A set of modification proposals describing how the individual systems can achieve effective prescription communication with associated acknowledgements will be drawn up using the experience gained from the preliminary investigation and the elaboration of the guidelines. A prototype communication solution that incorporates the modification proposals will be drawn up in connection with the project.

Distribution of pharmacy systems in the counties

As at 31th January 1998, 94% of the country's pharmacies can receive EDI prescriptions.	Bornholm	Frederiksberg	Frederiksborg	Funen	Copenh. Hosp.	Copenhagen	North Jutland	Ribe	Ringkøbing	Roskilde	Storstrøm	South Jutland	Vejle	West Zealand	Viborg	Århus
Apoteksdata																
CITOSYS																
Pharmasys 3																
Søren Thygesen Data																

Establishment of time measurement unit

Based on the experience of the original preliminary project in respect of time measurement, a monitoring unit will be established which will constantly monitor the time taken from the time the prescription is generated by the doctor until the mailbox at the pharmacy is emptied.

The unit is to be established such that measurements encompass around 100 medical practices using at least eight different doctors' systems, one emergency medical service system which sends EDIFACT prescriptions and approx. 30 pharmacies, covering all the pharmacies' systems.

Ideal model, clocks set

In the time measurement report from the preliminary project it was pointed out that the clocks integrated in the system solutions are set differently. This naturally has consequences for the times "stamped" on the prescriptions and for the time measurements themselves. In connection with the URP project efforts will be made to ensure that

all the systems involved work with the same time.

The clocks will be set correctly in eight different doctors' systems in eight medical practices and one system in an emergency medical service. All the IT systems involved will

The Copenhagen General practitioners' Laboratory (KPLL) method

The task of this project is to lay down the standards that are to be used when updating analysis files in connection with communication in the laboratory field. In addition, it is to negotiate with the major laboratory systems concerning implementation of this standard.

Participating in the working group are: Mogens Schlamovitz, MOS informatik; Stig Korsgaard, SST; Michael Thomsen, Labka; Niels Hornum, KPLL; Niels Jørgen Christensen, Århus County Hospital; Margit Kisbye, Sygehus Fyn Svendborg; Jens Møller, Århus Municipal Hospital, Clinical Microbiology

Objectives

be checked daily and adjusted in accordance with the "speaking clock" if necessary. An alternative solution is for an atomic clock to be installed. Time measurements in the eight systems are to clarify whether the objectives can be achieved.

Evaluation/report

Prior to the project being concluded it will be evaluated, and a report will be drawn up and published as soon as possible thereafter.

Further course of events

Making the individual systems ready and incorporating guidelines into the individual systems do not fall within the scope of the project. The individual guidelines will be incorporated into the National Board of Health's prescription test.

Dept. and Ib Johansen, MedCom. The group has held two meetings to date. The aim is for the work to be concluded in April 1998.

There is now agreement on the use of the PRODAT message for electronic updating of files. These are divided into two parts:

- An analysis code file in the traditional sense to support the receipt of electronic laboratory results. The file will be nationwide and based on IUPAC codes, and will replace the current one based on LABRES.
- A database containing information to be used for electronic requisitions. This file is individual to the laboratory concerned and is intended to be updated locally.

If all the systems are optimised in accordance with the guidelines of the URP project, the aim in the longer term is to achieve:

95% of all EDIFACT prescriptions reaching the pharmacy no more than 5 minutes after being sent from the emergency medical services.

95% of all EDIFACT prescriptions reaching the receiving pharmacy no more than 20 minutes after being sent from a medical practice.

99% of all prescriptions reaching the receiving pharmacy no more than 30 minutes after dispatch from the medical practice or emergency services.

Photograph: Tommy Verting



Requirements of the URP

Poul Due, a pharmacist at Frederiksberg Pharmacy, emphasises that the following are a must if the objective of the URP project is to be met and the realisation of the objective measured:

- permanent link to VANS
- stamping of dispatch and receipt time on the prescription
- much stricter structure to EDIFACT data, so that data from the prescription can be used in the prescription systems to a much greater extent than at present
- rate updates required of all EDIFACT users on equal terms with the pharmacies - by all accounts this is likely to become a reality from the beginning of 1998.

Doctors' systems in Denmark

IT and EDI in the health care sector

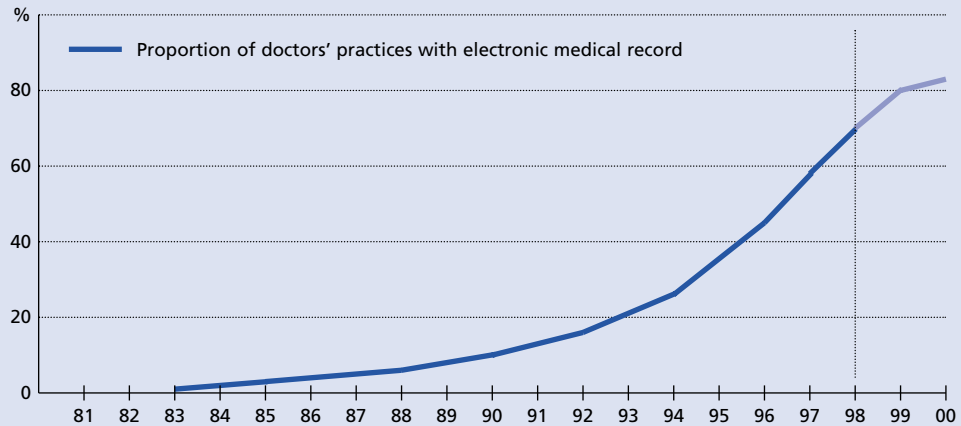
In recent years IT systems have been widely introduced into the Danish health care sector and IT systems are now used for the most common tasks in most hospitals, medical practices and pharmacies.

Cross-sector communication in the health care sector typically takes place by the information being printed out from one IT system (e.g. in a hospital) and sent by post (e.g. to a medical practice) where the letter is read and keyed in again in the recipient's IT system.

This can be avoided if the communication is standardised (EDI) and sent electronically directly from one system to the other.

Clinical side must not be forgotten

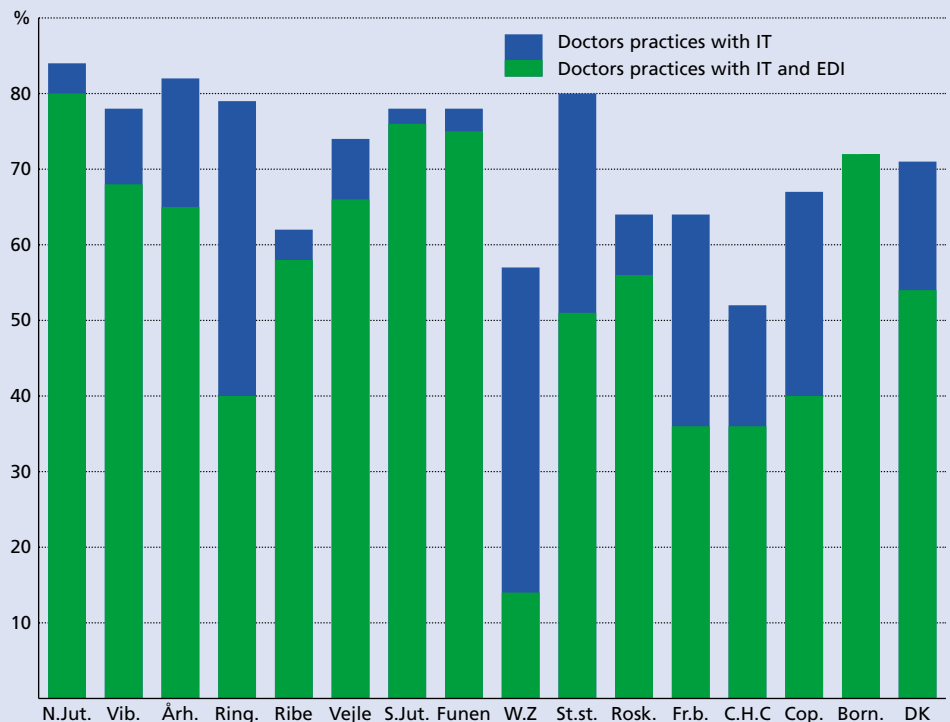
Finn Klamer, a general practitioner in Øster Ølby, chairs a project group that is to describe how MedCom's messages can support the health service's efforts at optimising treatment quality and patient service. Amongst other things, this involves cross-sector co-operation on the disposal of the content of referrals and discharge letters. In concrete terms the work is to result in a document entitled "Clinical Aspects of Electronic Communication", which will be sent out to all general practitioners, hospital departments and county councils.



EPR systems in general practices in Denmark

The spread of electronic patient record systems in general practices in Denmark started in spring 1993 and experienced explosive growth in

'94-'95, following a slow development phase lasting 10 years. This course of development is typical of many IT systems in the health care sector.



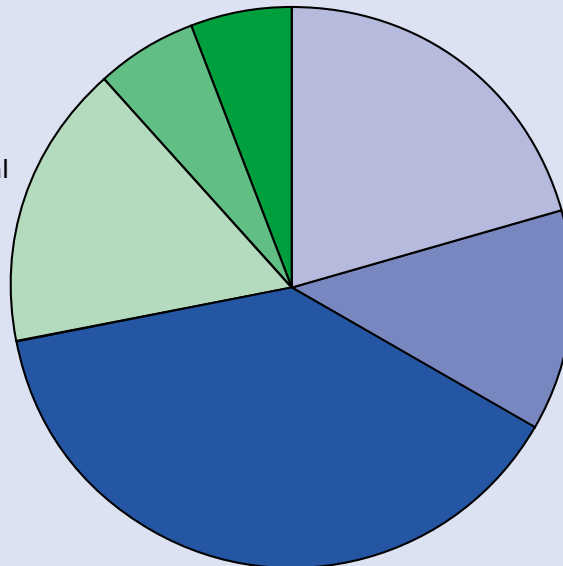
Medical practices with IT and EDI, May 1997

The use of IT systems in general medical practices varies from just over 80% in Western Denmark to well over 60% in Eastern Denmark. For specialist practitioners the level

is between 30% and 50%. In the counties that transmit hospital results the majority of practitioners have procured EDI.

Most of the general- and specialist medical practices have EDI:

Over 70% of all general medical practices and 40% of specialist practitioners now have electronic patient records, and their use in specialist medical clinics is growing rapidly.

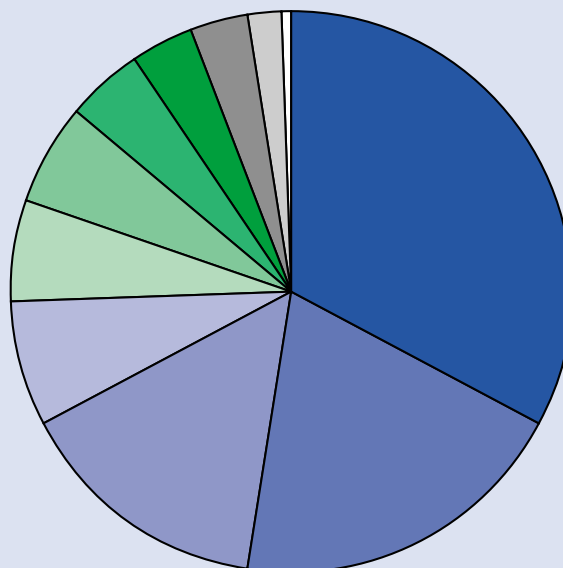


General- and specialist medical practices with IT, December 1997

- GPs without IT (569)
- GPs with IT (344)
- GPs with IT and EDI (1060)
- Specialists without IT (450)
- Specialists with IT (163)
- Specialists with IT and EDI (157)

10 system houses

Distribution of system suppliers amongst general- and specialist medical practices using EDI.



EDI doctors' systems in Denmark, December 1997

- Æskulap (402)
- EG datainform (237)
- Rambøll (182)
- PLC (85)
- PC-ide (73)
- Apex (69)
- Novax (57)
- Emar (44)
- Multimed (40)
- Ganglion (22)
- Others (6)

Pharmacy systems in Denmark

In 1987 the "800 kroner rule" was introduced. This involved recording medicine use per person. The rule was abolished after a year, but the rules involved led to a massive introduction of IT systems in pharmacies. Pharmacies in Denmark have since continued the trend - and must be described as the most advanced IT and EDI users in the health care

sector. Virtually all pharmacies have been using "Pharmalink" EDI communication for automatic ordering from wholesalers since 1991 and bar codes for quality assurance and stock control are very advanced. All pharmacies use IT systems - and virtually all use EDI for prescription communication.

Who is able to communicate?

The number of pharmacies, general practitioners and specialist practitioners with a location number - and thus able to communicate electronically - is increasing all the time. Monthly updates of the location number table are available on diskette from the National Board of Health, Office for Medical Information Technology (tel. +45 3391 1601).

Hospital systems

Hospital systems, May 1997

In the first MedCom project by far the majority of IT suppliers to the Danish health care sector developed MedCom's communication modules. These suppliers are shown by a ●.

Translation:

Kem. lab.	Chemistry laboratory
Mikrobio.	Microbiology
Patologi	Pathology
Patientsys.	Patient systems
Røntgen	X-ray
Sygesikr.	National Insurance
Lægevagt.	Emergency Medical Service

Value for money?

Viborg County Council is chairing a project group which is to analyse the value of electronic communication in the health care sector in more detail. This work is to shed light on the financial, organisational and health aspects of cross-sector communication in the health care sector. In concrete terms, the work is to result in a method description and the provision of actual examples of the benefit of electronic communication.

Viborg County		
Kem. lab.	B-data	●
Mikrobio.	MADS	
Patologi	B-data	
Patientsys.	B-data	●
Røntgen	Siemens	
Sygesikr.	EDB-gruppen	●
Lægevagt	Midoc	●

North Jutland County		
Kem. lab.	Labka	●
Mikrobio.	ADbakt	●
Patologi	B-data	
Patientsys.	B-data	●
Røntgen	B-data	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

Ringkøbing County		
Kem. lab.	Labka/B-data	●
Mikrobio.	MADS	
Patologi	B-data	
Patientsys.	EDB-gruppen	●
Røntgen	Kodak	
Sygesikr.	EDB-gruppen	●
Lægevagt	Midoc	●

Vejle County		
Kem. lab.	Labka	●
Mikrobio.	Labka	●
Patologi	IBM	●
Patientsys.	KMD	●
Røntgen	Kodak	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

Ribe County		
Kem. lab.	B-data	●
Mikrobio.	MADS	
Patologi	B-data	
Patientsys.	EDB-gruppen	●
Røntgen	Ribe-sys	
Sygesikr.	EDB-gruppen	●
Lægevagt		

Funen County		
Kem. lab.	Qlinch/Declab	
Mikrobio.	FynSys	
Patologi	FynSys	●
Patientsys.	FynSys	●
Røntgen	FynSys	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

South Jutland County		
Kem. lab.	Labka	●
Mikrobio.	SønSys	
Patologi	B-data	
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

Bornholms County		
Kem. lab.	B-data	●
Mikrobio.		
Patologi		
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	KMD	●
Lægevagt		

Copenhagen Hospital Corp.		
Kem. lab.		
Mikrobio.	ADbakt	●
Patologi	B-data	
Patientsys.	KMD	●
Røntgen		
Sygesikr.	KMD	●
Lægevagt	Midoc	●

The Copenhagen General practitioners' Lab. (KPLL)		
Kem. lab.	Netlab	●
Mikrobio.		
Patologi		
Patientsys.		
Røntgen		
Sygesikr.		
Lægevagt		

Copenhagen County		
Kem. lab.	Sunquest	
Mikrobio.	ADbakt	●
Patologi	RS, KMD	
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

National Serum Institute		
Kem. lab.	VGL IMS	
Mikrobio.		
Patologi		
Patientsys.		
Røntgen		
Sygesikr.		
Lægevagt		

Medi-Lab		
Kem. lab.	ML SYS	
Mikrobio.		
Patologi		
Patientsys.		
Røntgen		
Sygesikr.		
Lægevagt		

Frederiksborg County		
Kem. lab.	Labka	●
Mikrobio.		
Patologi	B-data	
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	EDB-gruppen	●
Lægevagt	Multimed	●

Roskilde County		
Kem. lab.	Labka	●
Mikrobio.		
Patologi	KMD, RS	
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

Storstrøm County		
Kem. lab.	B-data	●
Mikrobio.	MADS	
Patologi	RS, KMD	
Patientsys.	KMD	●
Røntgen	KMD	●
Sygesikr.	KMD	●
Lægevagt	Midoc	●

Århus County		
Kem. lab.	Labka	●
Mikrobio.	MADS	
Patologi	RS, KMD	
Patientsys.	KMD	●
Røntgen	Kodak	●
Sygesikr.	BEMA	●
Lægevagt	Midoc	●

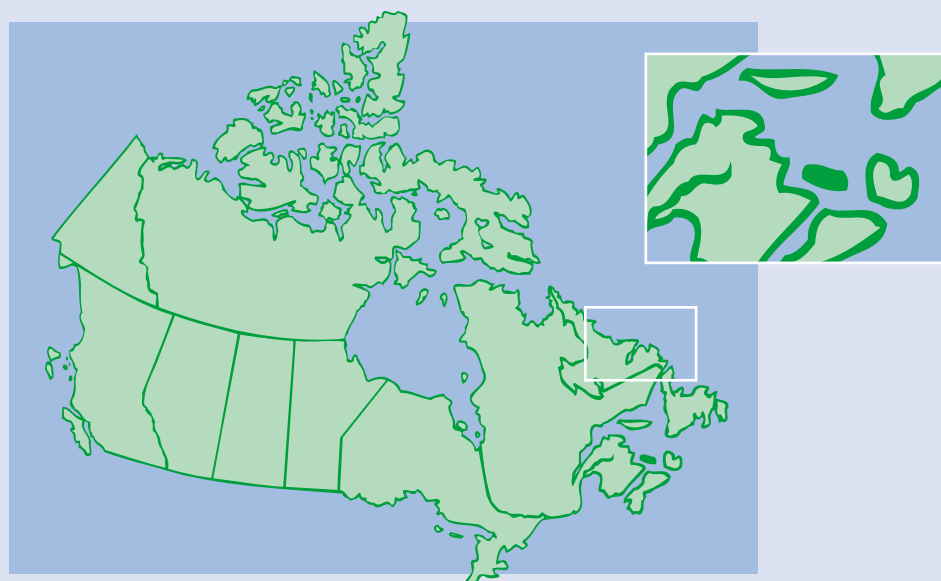
West Zealand County		
Kem. lab.	Labka/B-data	●
Mikrobio.	ADbakt	●
Patologi	RS, KMD	
Patientsys.	SMS	
Røntgen	Phillips	
Sygesikr.	KMD	●
Lægevagt		

MedCom and Europe

International network

The experience gained from the Danish work within the area of standardised electronic communication in the health sector has been so positive that it has for some time been natural to establish contacts with similar activities in Europe. These involve amongst other places Norway, the Netherlands and Britain, where equivalent activities have been taking place since the early Nineties. As a result of this work Denmark has become involved in a

number of ways in both EU projects and other activities within the area of electronic communication in the health sector.



The CoCo project

The aim of this project is to build up regional health care data networks in 10 regions of Europe - according to precisely the same method as is being used in Denmark. CoCo is one of the biggest of the EU's research and development projects, with a total budget of DKK 60m. Funen County Council is chairing the project.

PRIMACOM

The purpose of this project is to develop a regional health care data network in a region of Hungary - and part of the EU's Inco-copernicus programme. PRIMACOM co-operates closely with the CoCo project - and is also led by Funen County Council.

The WISE project

The purpose of this project is to co-ordinate the EU projects working on regional health care data networks. The project is led by Olivetti. Denmark has a central role in describing an overall strategy for the introduction of electronic communication in the health sector at European level.

CEN and EBES

The purpose of CEN and EBES is to develop European EDIFACT standards for communication within the health sector. Denmark has a central position in the work of both organisations. Stig Korsgaard from The Danish National Board of Health chairs the relevant working group in EBES.

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Photographs: Klinisk Foto, Odense University Hospital (Grethe Nielsen: Finn Folsted)

The Dissemination Projects		messages per year	Local authority projects		messages per year
Counties			Hospitals		
1	Referral for admission from medical practice to admissions dept. (MEDREF)	400.000	26	Admission advice from hospital to local authority (MEDDIS)	1.300.000
2	Out-patient referral from medical practice to out-patient dept. (MEDREF)	1.000.000	27	Admission reply from local authority to hospital (MEDDIS)	600.000
3	Discharge letter from hospital to general and specialist medical practices (MEDDIS)	1.300.000	29	Hospital giving notice to local authority (MEDDIS)	600.000
4	Out-patient memo from hospital to gen. and specialist medical practices (MEDDIS)	1.500.000	30	Care report from hospital to local authority (MEDDIS)	200.000
5	Casualty letter from hospital to general and specialist medical practices (MEDDIS)	800.000	32	Nursing report from hospital to local authority (MEDDIS)	200.000
6	X-ray results from hospital to general and specialist medical practices (MEDDIS)	620.000	The Social Appeals Board		
7	X-ray referral from general and specialist medical practices to hospital (MEDREF)	620.000	40	Pension decision report from local author. to the Social Appeals Board (RDRMES)	50.000
8	Chem. lab. req. from general and specialist medical practices to laboratories (MEDREQ)	780.000	Pharmacies		
9	Chem. lab. results from laboratories to gen. and specialist medical practices (MEDRPT)	3.730.000	41	Medicine grants from local authority to pharmacies (MEDRUC)	500.000
10	Pathology. req. from gen. and specialist med. practices to path. institute (MEDREQ)	600.000	42	Medicine accounts from pharmacies to local authority (MEDRUC)	75.000
11	Pathology results from path. institutes to gen. and specialist med. practices (MEDRPT)	600.000	Second priority, local authority projects		
12	Microbiology req. from gen. and specialist medical practices to laboratories (MEDREQ)	500.000	Hospitals		
13	Microbiology results from laboratories to gen. and specialist med. practices (MEDRPT)	500.000	28	Nursing letter from local authority to hospital (MEDDIS)	200.000
14	Doctors' accounts from gen. and specialist medical practitioners to national health insurance scheme (MEDRUC)	130.000	31	Notification reply from local authority to hospital	200.000
15	Pharmacy accounts from pharmacies to national health ins. scheme (MEDRUC)	4.000	33	Notice of birth from hospital to local authority (MEDDIS)	67.000
16	Emergency service memos from emergency services to general practitioners (MEDDIS)	300.000	32	Notification of birth from hospital to local authority (MEDDIS)	67.000
17	Emergency service prescriptions to emergency pharmacy (MITRE)	300.000	35	Discharge letter from hospital to doctor (MEDDIS)	67.000
18	Emerg. service referrals to hosp. (MITRE)	5.000	General practitioner		
		13.689.000	36	Requisition of medical forms to medical practice (MEDREF)	150.000
Laboratories			37	Medical forms from medical practice to local authority (MEDDIS)	150.000
19	Chem. laboratory results from Nat. Serum Institute to medical practice (MEDRPT)	720.000	38	Medicin order from local authority to general practitioner	400.000
20	Chem. laboratory req. to National Serum Institute from medical practice (MEDREQ)	240.000	39	Child examination notice from doctor to local authority (MEDDIS)	300.000
21	Chem. laboratory results from Medical Laboratory to medical practices (MEDRPT)	50.000	Local authority projects in total		5.126.000
22	Chem. laboratory requisition to Medical Laboratory from medical practices	15.000	Total messages		40.280.000
23	Chem. lab. results from Copenhagen GP's Lab. (KPLL) to medical practices (MEDRPT)	370.000	 <p><i>Danish Centre for</i> Health Telematics</p> <p>COUNTY OF FUNEN Heden 18 DK-5000 Odense C Tel. +45 6613 3066 Fax +45 6613 5066</p> <p>The Danish Ministry of Health Holbergsgade 6 DK-1057 København K Tel. +45 3392 3360 Fax +45 3393 1563</p>		
24	Chem. lab. req. to Copenhagen GP's Lab. (KPLL) from medical practices (MEDREQ)	370.000			
		1.765.000			
Pharmacies					
25	Prescriptions from general and specialist practitioners to pharmacies (MITRE)	19.700.000			
Dissemination project in total		35.154.000			