

INFORMATION TECHNOLOGY STRATEGIES FOR HEALTH AND SOCIAL CARE IN NORWAY

Road Bergstrøm,
Vigdis Heimly

ABSTRACT

Objectives. Provide an introduction to national IT strategies for the health and social sectors, and point out major challenges for the future of eHealth and Telemedicine in Norway.

Methods. The information provided in this article is based on reviews of national strategies and plans, and contact with projects and users in the health and social sectors.

Conclusion. IT in health and social services has the potential to improve welfare, while simultaneously improving the efficiency of the systems. IT in home- and community-care will provide the users with better services closer to home in the coming years. National strategies and action plans are important, but the funding necessary for the recommended actions must also be provided. Organisational issues are important. (*Int J Circumpolar Health* 2004;63(4):336-348)

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Norwegian centre for health
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INTRODUCTION

Health services in Norway

Norway provides extensive health services and a well-developed social security net. About 35% of the annual Norwegian state budget, or 7-8 % of the gross national budget, is spent on health and social care, making it one of the European countries – and the Nordic country – with the highest level of public spending on health per capita. The health and social care sector in Norway, as in other modern societies, faces significant challenges. Its part of the nation's GNP is already substantial, and the increasing mean life expectancy and falling birth rates will dramatically increase the future burden. A specific Norwegian challenge is the low population density, the consequences of which include the likelihood that inhabitants might have long travelling distances to medical services, hospitals are scattered and some are small, and not all hospitals can contain every medical discipline.

Norway has 85 hospitals and 4.5 million inhabitants. The hospitals are owned by the central government and are operated as regional health enterprises. Five main regional health enterprises have been established.

KITH

The Norwegian centre for health informatics, KITH, is a national competence centre with close connections to end-users, vendors, research institutions and the government. The information provided in this article is based on reviews of national strategies and plans, and on contacts established with projects and users in the health and social sectors.

METHODS

National IT strategies and action plans for health and social care

Investment in IT and making broadband available throughout the country is part of the Government's E-Norway plan, which has established ambitious goals for IT development within both the private and public sectors.

IT is also an important tool in the process of implementing the latest national health reform. Some of the main issues in the reform are:

- Regular GP: every citizen has one doctor
- Free choice of hospital
- Central government ownership and responsibility of the hospitals and specialist health services.

Information Technology (IT) has been regarded as a useful tool to improve health services for many years, particularly in primary care. Back in 1997, the Ministry of Health and Social Affairs released the first national action plan for IT development in the health and social sectors. The first plan, called "*More health for each bIT*", was followed up by a second plan, called "Say @!". A third plan, called Te@mwork 2007, gives an outline of governmental measures to promote greater electronic interaction in the health and social sectors.

The main objective is to stimulate electronic interaction and exchange, to strengthen and increase collaboration and efficiency in and between health and social services, and to improve contact with patients, clients and those in need of care and improve the quality of services.

Funding

In Norway, central financing of Say@! within a three years period was 222 million NOK. The contribution from various participating partners (hospitals etc.) largely exceeded this amount. The Norwegian health net and electronic communications have had priority during the period, and account for around 38-39 %% each of total central financing. Telemedicine has received 6 % and public services 4 %.

National competence centres play an important role

A significant contribution to the Norwegian development in health informatics and telemedicine are given by the national centres in the area:

KITH – The Norwegian Centre for Health Informatics is a limited company owned by the Ministries for health and social care and The Association for Municipalities. KITH is developing and contributing to the development and implementation of standardized terminology and coding systems, secure information exchange and

standards for EHR and PACS systems. TheKITH's main location is in Trondheim.

NST – The Norwegian Centre for Telemedicine is part of the University Hospital in Tromsø and aims to provide research, development and consulting in telemedicine, and to promote the introduction of telemedicine services in practice. Since 2002, the NST has been designated by the WHO as a collaborating centre for telemedicine.

KoKom is a national centre located in Bergen. The objective of the centre is to act as advisor to government, both centrally and locally (counties and municipalities) on the running of dispatch centres in the health-care services. The centre is also a member of the national project committee concerning possible Norwegian acceptance of TETRA as the national standard for radio communication in emergency services.

NSEP - The Research Centre for EHR systems was recently established at the Norwegian University of Science and Technology (NTNU) in Trondheim, with funding from the Research Council of Norway and the university itself. The objectives of the centre are to perform multidisciplinary research and university-level education related to EHR systems

Activities and goals for Te@mwork 2007

The Norwegian health net

Five regional health nets and an infrastructure for communication between the nets are already established. During the coming years, the five regional nets and the connecting net shall be further integrated into a uniform net. The Norwegian health net shall provide a good foundation for electronic interaction and information exchange in the health sector. The Norwegian health net shall ensure data quality, security of information, and protection of privacy in the exchange of sensitive information. National funding is provided for the development of different services, standards and security guidelines, as well as for investment in broadband.

Electronic interaction within the health and social services

This focus shall improve the information flow between parties that have already initiated electronic co-operation. This promotes widespread use of electronic message exchange for referrals, discharge summaries, medical records and reimbursements.

Norway has a strong legislation regarding the handling of person-related information. Information security will be addressed by establishing basic requirements for information security, which communicating partners have to declare their adherence to. Specific attention is also given to the widespread implementation of digital signature/PKI (public key infrastructure), where the National Social Security Agency has brought forward a solution available for the whole health-care sector.

The EHR system, whether implemented by hospitals, GPs, or other care providers, is the key to an efficient flow of information. All care providers are required by legislation to document what they do, and an extensive implementation of EHR systems amongst all providers is a prerequisite for efficient electronic cooperation. A national strategy addressing this, as well as research, will be established.

Telemedicine

Telemedicine comprises medical diagnostic and treatment performed using digital information technology to transfer patient information, including medical images and PACS. To a larger extent than before, telemedicine will enable people to be treated, or nursed, in their local environment, or in their homes. During the plan period, telemedicine solutions will be brought into use throughout the country to ensure a greater availability of services. To achieve this, two types of measures are given priority:

- The stimulation of broadband development between hospitals and between hospitals and the primary health services.
- The clarification of responsibility, rules, guidelines and costs in connection to telemedical consultations.

Services to the public

Throughout the plan period, quality-assured information on public health and social services will be made available to the public through the use of internet services.

Inclusion of new parties in electronic cooperation

New groups shall be introduced to, and motivated for, electronic cooperation. The potential of information technology shall be utilized to meet the increasing demand for cooperation and efficient information flow in care processes in an aging population.

Until now, the principal partners in electronic cooperation have been hospitals, GPs, laboratories, radiology institutes and the National Social Security Agency. The inclusion of new parties is governed by the ambition to establish seamless care processes, including not only the above parties, but also municipal institutions in the with care responsibility, such as institutions for elderly and disabled people, rehabilitation units, etc.

- The programme has three main goals: that the care provided by the municipalities should be connected to the infrastructure, so as to enable co-operation with other health services,
- that the technical developments and IT investments should be co-ordinated,
- that the development in this field should be co-ordinated and focused on topics that are currently most urgent; e.g. updated information on the use of medicine, co-operation on individual plans, well-functioning communication between the sectors when patients move from health to social care services, and support from specialised health services to municipality-based care.

RESULTS AND STATUS

Telemedicine – excellent health services available to all

One of the main reasons for the Norwegian emphasis on telemedicine is to achieve the vision of equal health services for all patients in a country with a low population density and long travelling distances to the nearest hospital, or medical expert. Operational solutions are in place in a variety of medical disciplines and care situations.

Some examples are:

- Sounds, images and videos recorded by the primary care doctor and transmitted to a specialist. Examples are stethoscopy, dermatology, ear-nose-throat conditions, examination of optic fundus for diabetes patients.
- Telepathology - pathological support for hospitals lacking this capacity
- Teleradiology - as imaging goes digital, support can be given at distance
- Videoconferencing for psychiatry and cancer care.

Electronic information exchange

The structured exchange of information via electronic messaging has been given priority for more than a decade. The messages cover a variety of applications, such as referrals and discharge letters, requests for answers from medical services (laboratory and radiology), reports to central authorities, transfer of EHR information, etc. As the communication infrastructure is put in place, and the various parts in the communication processes are implementing applications, the volume of electronic messaging is rapidly increasing.

In the assessment of eNorway from June 2004, it was shown that the amount of electronic referrals have increased substantially in hospitals during the last year (Fig1).

PACS

Another area in which electronic communication between actors in health sector is crucial is radiology. Norway has a long telemedicine tradition and the pioneers started with Teleradiology services 15 years ago. Teleradiology is in use for consulting in emergencies, for second opinion and for consulting between hospital and the primary health-care.

Digital X-ray represents an important share of investments within the sector. Every year, 3.2 million X-ray examinations are carried out, and every examination produces several pictures. The large amount of examinations and X-rays makes a digital system more practical than paper copies. Two-thirds of the Norwegian hospitals have already acquired PACS (Picture Archiving and Communication System), and all remaining hospitals are planning to implement PACS by 2005.

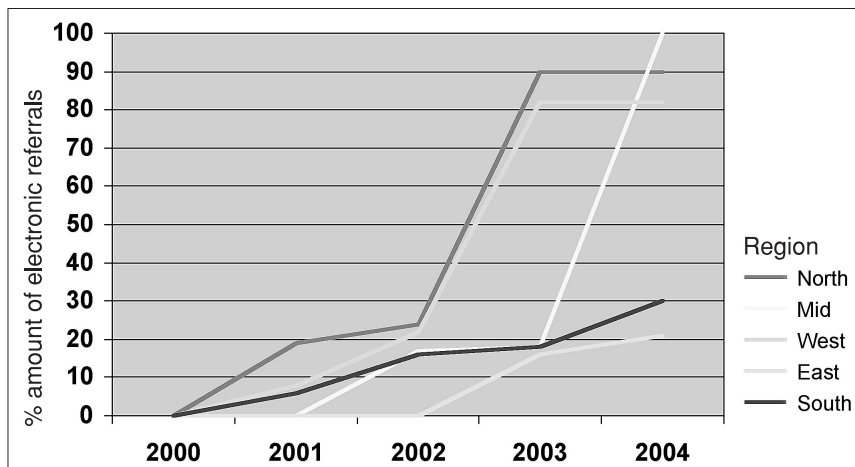


Figure 1. The amount of electronic referrals in Norwegian hospitals.

A special emphasis is put on exchanging digital images between hospitals through the Norwegian Health Net, thus allowing cooperation and second opinions, as well as the rational operation and increased availability of radiology services. Standardization is required to communicate between the different systems and, therefore, the Directorate of Health and Social affairs has suggested that a national project on these issues, involving all regional health companies, should be supported. The project also includes the organizational development required to release the benefits, security aspects and cost-benefit analysis. The project will be based on the successful IHE-NORWAY activities (Integrated Healthcare Enterprise) that started in 2003 with KITH as project manager.

PACS in north Norway

North Norway is a large geographical area with a relatively scarce population. Approximately 450 000 inhabitants are served by one central hospital, 10 smaller hospitals and one 500-bed University Clinic. The overall number of imaging procedures per year is about 430 000 for the whole region and 124 000 in the University Clinic. Geography and demography stimulate the search for teleradiology solutions and most pioneer projects in the Scandinavian area have been originated from the University Clinic in Tromsø. Since 1992, the teleradiological activity has been constantly high (approx. 7500 exams per year) and, in January 2000, Tromsø was the first University Clinic in Scandinavia to adopt a full PACS (except mammography).

Since the mid-1990s, all regional hospitals have had the possibility to send their CT emergency cases for evaluation at the University Clinic. Initially, the networking capacity was poor, but, since 2001, the establishment of a Regional Health Net has facilitated the transmission of images and accompanying information between institutions. A considerable number of emergency transports under difficult conditions have been avoided due to teleradiological services.

Home-care

Care in the homes of the elderly and of other groups in need of care is presently undergoing a development in which IT plays an important role. Important developments within this field include systems that can communicate with the hospitals and other organizations within the health sector, and mobile computers that enable communication while "in the field", without the need to go to a common office.

In Norway, there are several projects working with these questions: The GRO "Comfort Zone for Elderly" focuses on a home-based caring service. The overall goal is to create a complete service package for senior citizens at their own homes, in order to establish an adequate infrastructure in private homes, at home-based caring service centrals, and to private and public services and institutions.

The project "Smart-Home Technology in Norwegian home-based Health and Social Services" studies processes of introducing smart-home technology into municipalities, to reveal to other municipalities how to achieve success and what bottlenecks should be avoided when introducing such technology.

IT for groups at risk for social exclusion

The Information Society promises new opportunities for social inclusion, and have the potential to overcome traditional barriers to mobility, distance and knowledge resources. They can generate new services for disadvantaged people and for people seeking employment, or at risk in the labour market. On the other hand, IT also introduces new risks of exclusion that need to be prevented. Internet access and digital literacy are a must for maintaining employability and adaptability, and for taking economic and social advantage of on-line contents and services.

EHR – the core of patient information

According to the Norwegian legislation, each health-care service provider has to keep its own records, which can be in digital form, and information between service providers is only to be transferred on a need-to-know basis.

A national EPR standard was released in 2001. This standard mainly covers issues related to architecture, archiving and security. A requirement specification for health stations and health-care in primary schools, and another requirement specification for community care, are based on this standard.

- With few exceptions, all GPs and private specialists have EHR systems; this has been the situation for some years.
- 80% of hospital patients are covered by EHR

All hospitals have, or are introducing, EHR systems. Surveys show, however, a large variation in the use of the systems and, to some extent, they parallel paper-based routines, but the situation is rapidly improving.

IT for communication in health-care

The Nordic countries are at the fore-front in eHealth applications. The number of general practitioners using EHR is among the highest in Europe.

The Norwegian Medical Association (DNLF) has initiated the ELIN project, which aims to provide GPs all over the country easy access to the same standardized messages.

Furthermore, videoconferencing (VC) is one tool that is used to achieve seamless care in Norway. One example is a project for the establishment of a network in telepsychiatry. Using VC as a tool, psychiatrists, psychologists and nurses in the hospital can evaluate a patient's condition, before and after the hospitalization period, and perform any necessary adjustments to the treatment.

Automatic supportive techniques comprise one of the applications of telemedicine that can ease the every-day life of the chronically ill. The Norwegian Centre for Telemedicine (NST) is running a project with wireless and automatic transfer of blood glucose data, especially for children and teenagers with diabetes type 1.

Work is in progress to provide web-based health information for citizens and personnel in the health sector. The Norwegian Health Library will, in the first phase, give users access to medical knowledge databases, such as Cochrane and Clinical Evidence, and to medical publications.

Practice-related Electronic Knowledge (PEK) is a sub-project of the National Health Library with focus on providing easy access to clinical guidelines for nurses and clinicians.

The Norwegian centre for telemedicine (NST) is developing a national learning portal on the web called www.helseutdanning.no. The intention is to concentrate all net-based education/courses about health here. Videoconferencing, different types of multimedia applications and interactivity tools will be integrated into this internet-based service.

Furthermore, the reform for providing citizens with the right to choose the hospital in which they want to be treated can be highly

connected to the use of web-based information. Free Hospital Choice Norway (<http://www.sykehusvalg.net>), which allows patients to do just this, is a website developed by the Norwegian Government. It provides full details of available medical specialities and specialists, details of waiting lists and information on individual hospital performances.

DISCUSSION

The future for eHealth and Telemedicine in Norway

Challenges

The application of information technology in health-care can be seen as follows:

An adequate *technical infrastructure* allows easy and secure many-to-many communication. An agreed *information structure* secures a common understanding and correct interpretation between the various applications.

Standardisation and common concepts for information security tie it all together.

Governments are under pressure to deliver more value for taxpayers' money. Administrations have to deliver more and better services, with equal, or fewer resources. The challenge is to achieve productivity growth in the public sector, in order to create more opportunity for service improvement at equal cost. Moreover, with the ageing of the population, public administrations will have to make do with fewer employees and fewer working taxpayers, while still having to provide largely the same number of services of better quality. Civil servants demand more interesting jobs, with more opportunity for self-development and personal interaction.

IT is not a universal solution for all challenges, but it may reduce the stress on the public sector and create new opportunities.

Information technology might provide an answer

"eHealth is the single-most important revolution in healthcare since the advent of modern medicine, vaccines, or even public health measures like sanitation and clean water".(4)

This statement is promising, but also radical, since information

technology, in contrast to medicine and sanitation, is not an integral part of medical practice. Evidence for the above statement is still modest, but support is provided by drawing parallels to other sectors of society. The penetration of information technology into industry and private services (car industry and banking are prominent examples) has had dramatic effects on quality and productivity; the time might now be right for public services to adopt it as well.

IT for health, care and social services

IT in health and social services has the potential to improve welfare, while simultaneously improving the efficiency of systems. There are several driving forces for IT in these sectors. One of the strongest is the demand for increased efficiency. This requirement can be expected to be even stronger as the population gets older in combination with limited financing. Another driving force is the demand for individual treatment and care, combined with requirements for participation and information. Care in the homes is increasing and, for this group, IT may provide new opportunities.

Trends in favour of IT in health and social service:

- Increased proportion of elderly people.
- Working time gets more expensive and computers less expensive
- Increased IT maturity
- Increased demand for individualized care
- Increased demand for more information and participation
- Increased requirements for integrity
- Increased demand for documentation and evaluation
- Increased demand for seamless service processes
- Increased care in the home

Forces that work against IT:

- Slow adjustment of laws and regulations
- Lack of management for change
- Lack of coordination and overview
- Old organizations and work processes
- Lack of common standards
- Attitudes
- Insufficient education and competence

CONCLUSION

IT in health and social services has the potential to improve welfare, while simultaneously improving the efficiency of systems. IT in home- and community-care will provide the users with better services, closer to home, in the coming years. National strategies and action plans are important, but the funding necessary for the recommended actions must also be provided. Organisational issues are important.

The applications and information flows can be categorized as follows: 1) administrative support and activities for seamless health-care, such as electronic health records, 2) telemedicine and consultations

- web- based health information and education
- communication with pharmacies and e-prescriptions
- qualitative registers.

RELEVANT LITERATURE

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Roald Bergstrøm
 Senior advisor
 Norwegian centre for health informatics, KITH
 Sukkerhuset
 NO-7489, Trondheim
 Norway
 Email: roald.bergstrom@kith.no