

MANAGEMENT IN HEALTH CARE PRACTICE A Handbook for Teachers, Researchers and Health Professionals	
Title	e-HEALTH
Module: 3.4	ECTS (suggested): 0.2
Author	Ivan Eržen, MD, PhD, Assistant Professor Chair of Public Health, Faculty of Medicine, University of Ljubljana, Slovenia
Address for correspondence	Ivan Eržen Chair of Public Health, Faculty of Medicine, University of Ljubljana, Zaloška 4, Ljubljana, Slovenia and Institute of Public Health Celje Ipavčeva 18, Celje, Slovenia E-mail: Ivan@zzv-ce.si
Keywords	health informatics, e-health, strategy, information technologies, communications technologies
Learning objectives	After completing this module students should: <ul style="list-style-type: none"> • be familiar with the complexity of challenges in health sector due to demographic situation, development of technologies, present and future health situation; • understand the key role that modern information and communications technologies will play in future health care system in order to bring out efficient service; • know the national situation; good examples of e-health approach that were introduced and are successful used by one or more partners in health care system.
Abstract	e-Health describes the application of information and communications technologies across the whole range of functions that affect the health sector. e-Health tools or solutions include products, systems and services that go beyond simply internet-based applications. They include tools for health authorities and professionals as well as personalised health systems for patients and citizens. It can improve access to healthcare and boost the quality and effectiveness of the services offered. Examples include health information networks, electronic health records, telemedicine services, personal wearable and portable communicable systems, health portals, and many other information and communication technology-based tools assisting prevention, diagnosis, treatment, health monitoring, and lifestyle management. When combined with organisational changes and the development of new skills, e-Health can help to deliver better care for less money within citizen-centred health delivery systems.
Teaching methods	An introductory lecture gives the students first insight in characteristics of cross-sectional studies. The theoretical knowledge is illustrated by a case study. After introductory lectures students first carefully read the recommended readings. Afterwards they discuss the characteristics local public health organisations and infrastructure. The students will discuss the about the appropriateness of the actual organisation and try to find out the weaknesses and strengths of that kind of approach.

Specific recommendations for teachers	<ul style="list-style-type: none"> • work under teacher supervision/individual students' work proportion: 30%/70%; • facilities: a computer room; • equipment: computers (1 computer on 2-3 students), LCD projection equipment, internet connection, access to the bibliographic data-bases; • training materials: recommended readings or other related readings; • target audience: master degree students according to Bologna scheme.
Assessment of students	<p>Presentation of good examples of e-Health approach that were introduced and are successful used by one ore more partners in health care system.</p>

e-HEALTH

Ivan Eržen

THEORETICAL BACKGROUND

Challenges and expectations facing contemporary health sectors

Healthcare systems around the globe face major challenges⁵, even if their nature and scale varies significantly between industrialised and developing countries. These challenges include (1,2,3):

- rising demand for health and social services, due to an ageing population and higher income and educational levels. In particular, by 2051, close to 40% of the Union's population will be older than 65 years old;
- the increasing expectations of citizens who want the best care available, and at the same time to experience a reduction in inequalities in access to good health care;
- increasing mobility of patients and health professionals within a better functioning internal market;
- the need to reduce the so-called "disease burden", and to respond to emerging disease risks (for example, new communicable diseases like SARS);
- the difficulties experienced by public authorities in matching investment in technology with investment in the complex organisational changes needed to exploit its potential;
- the need to limit occupational accidents and diseases, to reinforce well-being at work and to address new forms of work-related diseases;
- management of huge amounts of health information that need to be available securely, accessibly, and in a timely manner at the point of need, processed efficiently for administrative purposes, and
- the need to provide the best possible health care under limited budgetary conditions.

Facing these challenges and looking at the possibilities it was found that one of the key tools that would be effective is the proper usage of information and communication technology in health sector. Like in other sectors this approach got a special name: **e-Health**.

The role of e-Health

e-Health describes the application of information and communications technologies across the whole range of functions that affect the health sector (1,2). e-Health tools or solutions include products, systems and services that go beyond simply internet-based applications. They include tools for both, tools for health authorities and health professionals, as well as tools for personalised health systems for patients and citizens. It can improve access to healthcare and boost the quality and effectiveness of the services offered. Examples include health information networks, electronic health records, telemedicine services, personal wearable and portable communicable systems, health portals, and many other information and communication technology-based tools assisting prevention, diagnosis, treatment, health monitoring, and lifestyle management. When combined with

organisational changes and the development of new skills, e-Health can help to deliver better care for less money within citizen-centred health delivery systems.

e-Health: systems and services that benefit the health sector

e-Health can deliver significant improvements in access to care, quality of care, and the efficiency and productivity of the health sector. e-Health can become key drivers for change, and productivity gains, in such areas as infrastructure and skills development, internal business processes, procurement procedures and supply chain management, marketing and sales, and functions of the extended business (4).

The amount and complexity of health-related information and knowledge has increased to such a degree that a major component of any health organisation is information processing. The health sector is clearly an information intensive sector which increasingly depends on information and communication technologies. These technologies are supporting progress in medical research, better management and diffusion of medical knowledge, and a shift towards evidence-based medicine. e-Health tools support the aggregation, analysis and storage of clinical data in all its forms; information tools provide access to the latest findings; while communication tools enable collaboration among many different organisations and health professionals (1).

Empowering health consumers: patients and healthy citizens

Both as patients and as healthy citizens, people can benefit from better personal health education and disease prevention. They need support in managing their own diseases, risks – including work-related diseases - and lifestyles. A growing number of people are looking proactively for information on their medical conditions. They want to be involved actively in decisions related to their own health, rather than simply accepting the considerable discrepancy (“asymmetry”) in knowledge between themselves and health professionals. e-Health services provide timely information tailored to individuals in need. Specialised online resources are available for health education, safety and security at work and lifestyle management.

Examples of personalised systems for monitoring and supporting patients include wearable or implantable communication systems for continuous monitoring patients’ heart conditions. These systems can help shorten or completely avoid the stay of patients in hospitals, while ensuring monitoring of their health status. Having access to comprehensive and secure electronic health records has been shown to improve quality of care and patient safety. This will facilitate appropriate treatment of patients in providing health professionals with a better knowledge of the patient’s history and of previous interventions by other colleagues.

Assisting health professionals

The priority of medical professionals is to offer best quality care within available resources and, above all, according to the Hippocratic oath, doing no harm to the patient (*primum non nocere*). However, unfortunately, medical errors still occur. Some of these might be avoided²¹ by making good use of e-Health systems that can provide vital information, alerts, and make best practices, expert advice and results of clinical treatment more widely available.

e-Health tools and applications can provide fast and easy access to electronic health records at the point of need. They can support diagnosis by non-invasive imaging-based systems. They support surgeons in planning clinical interventions using digital patient specific data, provide access to specialised resources for education and training, and allow

radiologists the possibility to access images anywhere. Thus, the workplace is being redefined and extended. Digital data transfer enables more effective networking among clinical institutions, and the creation of virtual network of centres of reference. Electronic health records also enable the extraction of information for research, management, public health or other related statistics of benefit to health professionals.

e-Health can benefit not only health professionals but all the staff employed in the health sector including nursing, care, and administrative staff (for example: in 2002, this was 17.5 million persons in the European Union of 25 Member States or 9.3% of total workforce). Furthermore, e-Health can contribute to achieving a safer working environment for health practitioners. Safer working environment is a very important issue. In the European Union, health and social services have an accident rate which is 30% above the average by sector of accidents recorded²³. Most accidents relate to infectious diseases and dangers, back injuries, and shocks and hazards associated with electrical equipment or compressed gases (5).

Supporting health authorities and health managers

Health authorities and managers are responsible for the proper organisation and running of health systems (6). They do this against the background of increasing budgetary pressures and rising patient expectations. e-Health systems can play a major part in meeting those pressures by making the health sector more productive, and delivering better results with fewer resources. Unfortunately, the currently available paper-based information aggregation and processing has major limitations.

A proper management of public health and clinical health can be undertaken only on the basis of comprehensive and high-quality administrative and clinical data. Health authorities would benefit from better access to more comparable data on health issues. There is a need for data, and an underlying infrastructure, that help health authorities to collaborate - for example, on how to tackle communicable diseases.

Integrated and comprehensive data can be provided in good time using e-Health tools, such as electronic health records and support for care flow management. Automatic data extraction from electronic health systems that meet legal requirements on data protection and privacy could provide missing data that facilitates proper evaluation of much needed resources and eradicates the huge administrative burden of filling in separate forms for reimbursement - a clear example of a productivity gain to be achieved through e-Health systems and services. These initiatives form a definite trend in the aim to modernise healthcare systems (7).

Increased networking, exchange of experiences and data, and benchmarking, is also necessary at the national but also at the international level. Drivers for this include the need for improvements in efficiency, and the increased mobility of patients and health professionals under an emerging internal market in services. The situation requires the integration of clinical, organisational, and economic information across health care facilities, so as to facilitate virtual enterprises at the level of jurisdictions and beyond.

e-Health systems can empower managers by spreading best practices and helping to limit inefficient and inappropriate treatment. This is the single most important step in releasing resources and ensuring broad access for everyone to quality care. In addition, e-Health opens new opportunities for people who live in remote areas with only limited healthcare services, as well as marginalised groups (such as persons with different degrees of disability, whether minor or more severe). e-Health is already proving in Europe and in the developing world that it can provide a platform for telemedicine services such as

tele-consultations (second medical opinion), telemonitoring, and telecare, either in the home or the hospital.

Major challenges for wider implementation

Despite the availability and proven benefits, e-Health systems and services are still not yet widely used in real-life medical or health situations. In many places, development is still at a pilot phase, often financed through research grants. The speed of organisational change is often slow, and it can take many years to achieve full implementation. A broad range of challenges remain to wider implementation (1).

1. Commitment and leadership of health authorities.

Commitment and leadership of health authorities, in particular related to financial and organisation issues, are essential elements for the successful deployment of e-Health. For e-Health to improve the way healthcare is provided, it must be combined with organisational changes and the development of new skills in users. e-Health was often traditionally perceived by health authorities as a low spending priority. However, it is now seen as a matter of substantial importance within public health policies;

2. Organisational and cultural approaches

Moreover, organisational and cultural approaches relating to the way health care is delivered varies between countries and between organisations. Typically, in the health area, the introduction of new applications, techniques, and medicines has been slow, yet – in organisational terms – the introduction of information and communication technologies has developed relatively fast. Hospitals too will be important players in the evolution towards e-Health, and their involvement in adoption will be central to new forms of healthcare delivery (8);

3. Interoperability of e-Health systems.

Interoperability should enable the seamless integration of heterogeneous systems. This will allow secure and fast access to comparable public health data and to patient information located in different places over a wide variety of wired and wireless devices. However, this depends on standardisation of system components and services such as health information systems, health messages, electronic health record architecture, and patient identifying services;

4. User friendliness of e-Health systems and services.

A top priority for health providers in using an e-Health system is speed in getting the desired, high-quality results. There is an absolute need for fast connection, connectivity, and high speed. This highlights the importance of ensuring broadband connection for online health services and infrastructure for regional health information networks;

5. Confidentiality and security issues.

Firstly, the confidentiality and protection of patient data is governed by the general European Union rules of data protection, as well as by the requirements of e-Privacy legislation regarding communications infrastructure. The requirement for confidentiality makes health information systems security critical. Another important legal issue is liability in the event of problems - such as technical malfunctions of the system, network, or provision of the service itself - that result in serious harm to a patient (9);

6. Issues relating to the mobility of patients.

Another challenge is issues relating to the mobility of patients, including the cross border circulation of goods and services, among which e-Health services are of

growing importance. Stronger cooperation among health providers across Europe is needed to enable wider implementation;

7. Needs and interests of users.

The take-up of e-Health systems and services would take place more rapidly were the needs and interests of the user communities (health professionals, patients, and citizens) to be taken on board. In general, these should be better integrated into the development and promotion of e-Health;

8. Access for all to e-Health.

The equal access of all groups of society to health services is an important goal in the public health policy field (10). There is a risk that certain parts of society - such as lone parents of families, isolated communities, inner city communities, individuals with literacy and numeracy challenges, groups of immigrants, homeless persons, elderly persons and disabled persons – could remain excluded from the possibilities offered by e-Health (including Internet-based health services) if special efforts are not made to counterbalance such trends. On the other hand, e-Health can offer considerable possibilities for the provision of health services to such individuals, groups, and communities;

9. Common understanding and concerted efforts by all stakeholders.

No single stakeholder can carry through implementation successfully on its own without the active co-operation of all the others. Each of the stakeholders, health authorities, professionals, consumers, industry, has the power to veto an implementation, if it is not perceived as beneficial. Only through concerted efforts by all stakeholders, can we ensure a successful implementation where all partners benefit, thereby creating a win-win situation.

Concluding remarks

E-Health offers important opportunities for improved access to better health systems to the citizens. It can empower both patients and healthcare professionals. It offers governments and tax payers a means - through substantial productivity gains - to cope with increasing demand on healthcare services. It can also help to reshape the future of health care delivery, making it more citizen-centred.

This e-Health Area will provide a framework for exchanging best practices and experience in the country and between them. It will allow common approaches to shared problems to be developed over time. Through e-Health a better access and better, more efficient, services as well as on the overall productivity of the healthcare sector is expected. Besides e-Health will become common place for health professionals, patients and citizens. An important prerequisite is that e-Health will be adequately resourced within healthcare budgets.

EXERCISE

Task 1

Carefully read the part on theoretical background of this module. Critically discuss the challenges and possibilities of further development and introduction of e-Health solutions.

Task 2

Find the official EU web address dealing with health care and health promotion issues. Analyse the organisation of the web place and discuss it with your colleagues.

Task 3

Find web sites in your own language- assess them according to the impression you have. Compare the assessment with those of your colleagues and discuss what might be the reason for difference in the assessments

Task 4

Discuss the characteristics, strengths and limitations of selected survey with your colleagues.

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RECOMMENDED READINGS

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