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Conceptual issues in development of telemedicine in the Republic of Moldova

I. Ababii, C. Gaindric, O. Lozan, I. Brinister

Abstract

The article discusses a concept of development of telemedicine in the Republic of Moldova that determines the role and place of telemedicine in the structure of health services and sets priority development directions, considering the processes of development of the Republic of Moldova and its objective of integration with the European Union.

In the article we refer to telemedicine as to the use of information technology to deliver medical services and information from one location to another [1].

1 Background

The process of information society development in the Republic of Moldova bases on the National e-Strategy for Building an Information Society "Electronic Moldova", approved by the Government Decision nr. 255 from March 9, 2005. In the framework of the Strategy, e-Health chapter refers to the need of telemedicine implementation in health care system.

During last years, a strong growth in utilization of ICT in health care system is observed. A range of management information systems for primary care, health care insurance administration, a National Automated Information System "State register of medicines", management information systems for blood transfusion service (including the National register of donors and the informational register of blood products), and for monitoring and evaluation of the National programme on control and prevention of tuberculosis were developed.

Automation of medical information and data circulation is being on an initial stage of development.

Presently, pilot telemedical projects are implemented in the area of perinatology and neurology. Telemedical videoconferencing and Web-based education support are applied in distant learning programmes for health professionals. There is some trial experience in conducting international telemedical consultations.

Recently, a telemedical link for consultation of neurology patients was implemented between the Neurology and Neurosurgery Institute in Chisinau, and neurology department in the municipal hospital in Balti. Using a videoconferencing link and a hospital management suite implemented in the Institute, neurology specialists from Balti can conduct real-time consultations with high class specialists of a leading republican institution. The implemented neurology telemedical system is expected to considerably increase the quality of care provided to neurology patients, especially in emergency cases, and become a lighthouse experience for other health care institutions in Moldova.

At the international level, implementation and utilization of telemedical services frames into a general effort of modernization of health services with the purpose of improving quality and accessibility of them.

Telemedicine optimizes utilization of health care systems resources and reduces the costs of treatment and care by improving communication among providers and access to health information for patients. Telemedical distant learning environments help to improve training of doctors and nurses, and educate and manage patients with chronic conditions. Calculations suggest that presently, about 0.1% of potential telemedicine demand is met in developing countries [2].

A EU report covering wider area of e-Health [3] outlined that the economic impact of all ten sites participated in the Study on Economic Impact of e-Health was positive, and on average it took four years to reach the level of benefits prevailing over costs. Utilization of e-Health solutions, including telemedical ones, grew, in some cases, exponentially, and showed a steady growth over a longer period of time, in others. While the economic impact of e-Health benefits surged by ten times between 1994 and 2004 from €20 million to €200 million per

year, the associated costs remained stable, and did not exceed €100 million per year. In all e-Health applications a prominent impact was observed over the effect of the application on timeliness, effectiveness and efficiency of health service.

WHO continuously supports the efforts of the member states in developing telemedicine by providing assistance in identification of priorities, elaboration of e-Health and telemedical policy documents, consolidation of the legal, normative and ethical base in the area of health information utilization, dissemination of best practices and facilitation of implementation for National technical programmes.

In the Regulation COM (2008) 689 from 4.11.2008 on telemedicine for the benefit of patients, healthcare systems and society, the European Commission underlines the importance of telemedicine, and, for better implementation of telemedical services offers its member-states large facilities for building the confidence and acceptance of telemedical services, introduction of legal clarity, solution of technical issues of compatibility and standardization, and facilitation of market relation in the area.

During 2009-2011, EU member-states are required to complete baseline evaluations and develop national regulation regarding access to telemedical services, including accreditation, jurisdiction and professional accountability, service reimbursement methods, confidentiality and security of data.

Best international telemedical practices include both telemedical services improving access of patients to health services in hard-to-reach areas and in critical conditions, and telemedical services targeting improvement of quality of health care services, optimization of health care system resources utilization, reduction of individual expenditures of patients in highly populated areas with a better access to ICT.

2 Baseline scenario

Despite the progress in health sector reforms, there is a range of drawbacks and problems related to accessibility and quality of health services, and to organization of health services for the population:

- distribution of health care personnel over the territory of the Republic of Moldova is non-uniform;
- there is a disparity in the level of professional training of health care personnel from rural and urban areas;
- emergency service, due to lack of mobile consulting and diagnostics tools, looses critical time to save lives of patients;
- the quality and volume of health care services provided can not be fully managed under existing practices of health services provision;
- private expenditure for patients from rural areas for visiting municipal and republican health care facilities, are much larger than for inhabitants of municipalities;
- systems for management of chronic conditions, remote monitoring and home care are underdeveloped;
- management of emergency situations, natural disasters and man-caused catastrophes is weak.

The professional level of health care personnel does not correspond to the growing requirements in health care system, and distant professional consulting and training resources are limited.

Continuous professional training of health personnel presently uses the methods that do not fully ensure continuity of professional training, and imply in training process additional considerable side costs (extended absence from work place, cost of travel and accommodation of health care personnel during the training etc.)

ICT infrastructure in health care system is underdeveloped limiting the possibilities for optimization of health data circulation. Existing capacities of health care system provide weak continuity of health information among different care levels.

Access to ICT in professional activity, and IT knowledge among medical personnel is subambient. The level of awareness and acceptance of telemedical services is limited.

Existing instruments for informing the population regarding health, disease prevention and promotion of health lifestyle are not ample for improvement of the population's health, if we consider growing non-communicable and communicable morbidity and mortality, and prevalence of pernicious behaviour and habits observed.

There is a disparity between offer and demand for health services on-line in Moldova. More than a third of Internet users in the Republic of Moldova [4] are pushed to look for health information in the Internet on foreign health information resources. Presence of national health care institutions on the Internet does not exceed 5% [5], and national useful health information resources are limited.

Cooperation in the area among different stakeholders is inadequate and does not allow effective coordination of the integrated development of telemedicine.

International professional and scientific integration of health care institutions and doctors from the Republic of Moldova is insufficient, both on crossborder cooperation between health care facilities and health care personnel, and in accessing international sources of medical data for application in professional and scientific activity.

3 Telemedicine development path

Telemedical services represent a range of secured processes of obtaining, transmission, reception, processing, storing and analysis of medical data and information with further formulation of a diagnosis and recommendations for treatment, or direct provision of health service, or distant learning in health care, using ICT available.

The term telemedicine refers to:

- Telemedical consultations - medical consultation with the purpose of remote diagnosing or treatment by the mean of ICT. A complete clinic case or separate clinic data case be the object of a telemedical consultation [6].
- Telemonitoring/telemetry - a range of telemedical services to remotely monitor and manage health of a patient [7].

- Telemedical distant learning - distant learning using telemedical links (videoconferencing, Web, etc.), including professional training of medical personnel, educating patients and the population.

Introduction of telemedical consultation, tools for patient monitoring, distant learning for medical personnel, patients and the population is expected to contribute to solving of a range of issues in health care sector.

Considering the need for an integrated approach to issues of telemedicine development, social importance and economic impact of them, the issue of infrastructure development for telemedical services should be tackled as well, while developing telemedicine projects and implementing them in clinical practice. Following directions and measures are suggested for development:

- implementation of telemedical consultative services in different level of care (primary, hospital, emergency care);
- creation of remote monitoring and home care services based on ICT for elderly, convalescent patients, for patients with chronic conditions, disabilities, pregnant women and young mothers;
- introduction of modern distant learning methods with application of telemedical technologies as videoconferencing and Web to training of medical personnel;
- stimulation of public health care institutions to increasing connectivity for institutions, equipping the institutions with productive modern and compatible IT equipment and medical appliances with the capacity to obtain, stock, transmit, receive and analyze digital data and images within national telemedical network;
- creation of telemedical service for emergency situations and disasters;
- wider application of Internet and other communication services in public health programmes;

- creation and maintenance of web-pages of health care institutions, through a common effort of the Ministry of Health and health care facilities;

- elaboration of standards and ethical code of conduct for exchange of medical information and provision of telemedical services in the Internet.

Facilitation of international cooperation in the area of telemedicine is especially important. Participation to regional and international telemedical networks and projects, joining international professional associations, facilitation of exchange programmes in telemedicine contributes to knowledge transfer, and improves access of doctors to reliable international health data and medical information.

Information technology underlying telemedicine, offers new possibilities for collaborative work of health professionals from different countries with proficient communication and health data exchange. Accumulated experience shows that development of international cooperation between clinicians by the mean of telemedicine contributes to growth of the quality and accessibility of health care services with simultaneous reduction of costs in many cases.

It can be observed that development directions refer to different domains of health care and ICT. Proper management of coordination and monitoring of the development of telemedical support for health care system is important for optimal utilization of available resources, and maintenance of continuity and integrity of telemedical services. Therewith, efficient coordination helps to better accumulate national experience and knowledge in the area of telemedicine.

Introduction of new market condition in health care increased opportunities for investment attraction, including private, in health care system. Application of private-public partnerships can be one of the means for attracting investment for telemedical services by health care institutions.

4 Evaluation of the impact of telemedicine development for the Republic of Moldova

Implementation of telemedicine in the Republic of Moldova will contribute to:

- approximation of high quality health services to the patients home, including rural and isolated areas;
- improvement of the quality of professional medical training at all levels of care;
- improved informing of the population regarding health, and accessibility of useful public health information.

International experience suggests that along with growing utilization rate of a telemedical service, the cost of the service decreases in comparison with the costs of a similar traditional health care services and training methods. By anticipating higher utilization levels for a telemedical services, an advanced paypack period on investment into telemedicine can be achieved.

It is expected that successful implementation of telemedical consultations will contribute to financial savings in health care system, through extending the range cost-effective health services available at primary and secondary level, and optimization of patient pathways in system.

Telemedical monitoring and homecare services should contribute to prevention of hospitalization and reductionist duration with concomitant savings.

Economic impact of telemedicine in Moldova can be demonstrated on the example of the emergency service. The process of emergency solicitation involves a telephone probe that reduces the number of unjustified solicitations.

Evaluation of the application of videoconferencing to continuous education of medical professionals demonstrated high appreciation of this method of training and its quality. The economic efficiency of

telemedical training was found much higher compared to traditional education and training means.

Rapt interest to telemedicine in developed countries is conditioned by the social impact of telemedicine on accessibility and quality of health care services and strengthening health and quality of life for the population.

Telemedical consultations contribute to levelling distribution of health care personnel in the country, and bring specialized health care closer to patients home. Private expenditure of patients on costly travel to republican institutions goes down correspondingly. Application of telemedical consultations can improve access to health services of a range of target groups (poor, pregnant women and young mothers, patients with chronic conditions, disabled, prisoners, other socially vulnerable groups).

Telemedical remote monitoring improves the quality of supervision and treatment of patients in outpatient conditions, prevention and early detection of complications and emergency conditions. Telemedical homecare prevents institutionalization of persons with special needs and improve the quality of their lives in communities.

Improving the quality of health care services is indispensable from the continuous professional training of health care personnel. Introduction of new forms of professional training with application of ICT will contribute to the growth of competences among health care personnel that will help to improve the quality of health care services they provide.

Provision of the access to reliable health information for the population and patients will contribute to increase of personal responsibility for health, accompanying reduction of health risks, and improvement of the national health indicators.

Wide introduction of telemedical services will also influence the transparency of relations between health care provider and patients, simultaneously reducing corruption in health care system.

The possibility of extending the access to cost-effective medical service in rural or isolated areas is an important argument for development of telemedicine in the Republic of Moldova, where more than half of

the population lives in rural areas.

Stimulating participation of health institutions from the Republic of Moldova to international telemedical networks should improve mobility both for patients and health professionals from Moldova and other countries, regarding obtaining required health service or getting a consultation of a health profession anywhere, including abroad.

In case the country fails on effective coordination of development processing in telemedicine, telemedical applications will continue developing in a sporadic way, a fact proved by early experiences in many countries. The costs of isolated telemedical projects jumps high, but the results obtained can be non-satisfactory. Most of patients will be deprived from the opportunity to benefit from cost-effective ICT facilities that improve accessibility and quality of health services.

Without wider application of ICT in clinical practice, the costs of health care services will be strongly dependent on the continuous growth of health care personnel reimbursement expenditure, both medical and non-medical.

Utilization of existing methods of continuous professional training will continue training of weak health care personnel, maintaining the inadequacy of health care system capacities.

The process of European integration of the Republic of Moldova will be affected by the incapacity of the country to correspond to EU community requirements to the process of maintaining population's health.

Through wider implementation and utilization of telemedicine, Republic of Moldova will make an important step to realization of the human right on qualitative health services in the necessary place at the right time.

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List of acronyms

1. **EU** - European Union
2. **ICT** - Information and Communication Technology
3. **IT** - Information Technology
4. **WHO** - World Health Organization

I. Ababii, C. Gaindric, O. Lozan, I. Brinister Received May 20, 2009

I. Ababii, O. Lozan, I. Brinister,
State University of Medicine and Pharmacy N.Testemitanu
E–mail: *nicolae@mededu.moldline.net*,
olozan@usmf.md, *ybrinister@hotmail.com*

C. Gaindric,
Institute of Mathematics and Computer Science,
Academy of Sciences of Moldova,
str. Academiei 5, 2028, Chisinau, Moldova.
E–mail: *gaindric@math.md*