

# ICT BASED HEALTH GOVERNANCE PRACTICES THE INDIAN EXPERIENCE

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*Electronic Health commonly described as the health sector use of information and communication technology, has rapidly spread around the world. Increased use of ICT is stimulating the technology insertion into the health sector. A steering committee on health constituted by the Planning Commission suggested in its report for the 12<sup>th</sup> Plan (2012-17) states that all the district hospitals, primary health centres and sub centres should be linked to the leading tertiary care centres through telemedicine, Skype and similar audio visual media. The committee also urged to give utmost importance to M-health i.e. use of mobile phones as communication tool for health development.*

The accountability for consistent delivery of health services, cohesive health policies, the communication and decision making processes in the health sector remains comparatively low as compared to other sectors. Distribution of medicines and providing good health facilities like Citizen Health Information System (CHIS) which is a biometric based health information system which constantly updates the health record of every citizen-family in government health institutions is a complex procedure, involving numerous functions at various levels. Monitoring and controlling the flow of medicines and facilities such as evidence based and guideline compatible clinical support and placing the health information on GIS platforms to improve the quality of care to patients through electronic medical records in such an environment is a challenging job. It has been observed that due to improper monitoring of medicine flow and above mentioned health facilities, there is an increased risk of theft and under utilization of medicines and facilities. Monitoring of medicine flow and health facilities is of prime importance for authorities as Indian government in its 12<sup>th</sup> Plan has emphasized the need for increased outlay on health sector and the government had issued a clear direction to states and central health systems to create adequate capacity to meaningfully absorb the increased outlay by making the transition to electronic medical records and to develop an ICT based Disease Surveillance Mechanism.

A study carried by Trakroo and Lalitendu observed that the absenteeism of doctors in rural areas was prevalent in India.. No computing facilities were available for civil surgeons and there was no electronic data transmission system between primary health centres, community health centres, and district and state health departments. There were significant delays in data availability, data analysis and planning processes (Trakroo, P.L. and Lalitendu, Jagatdeb, 1992: 243-244).

Further, there has been a continuous decrease in patient/ Out Patient ratio. Everyday there are complaints of non-availability of medicines and diagnosis facilities in government health institutions. These require an extensive use of information and communication technologies in health sector. As a part of the National Rural Health Mission, the union ministry of Health is setting up an Expert Committee as a part of 12<sup>th</sup> Plan to suggest a mechanism to link all the health service providers to a network which will have links of all the public and private laboratories and the network will generate the figures and statistical information needed at different levels for policy making. It will also generate alerts for disease surveillance.

To improve the health care system at government health institutions, it was decided in 12<sup>th</sup> Plan to introduce electronic governance in health institutions with the mission of setting up an efficient, effective, transparent ICT enabled and integrated electronic health system. Electronic health refers to the use of information and communication technology based-tools and services in the health sector. Whether e-health tools are used behind the scenes by healthcare professionals or directly by patients, they play a significant role in improving the health of all citizens (Rao, 2012:96-116).

In Indian context, E-health covers the interaction between patients and health-service providers, the transmission of data from institution to institution, and peer-to-peer communication between both patients and health professionals. It also covers health information networks, electronic health records, telemedicine services, wireless and portable communication systems, health portals and

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many other ICT- based tools assisting disease prevention, diagnosis, treatment, health monitoring and lifestyle management (Kanungo, Shivraj, 2004:155-164).

E-health systems provide patients with better information – on treatments, on their condition, and on improved standards of living thus makes the health communication systems simpler for health care professionals to access and share general and patient –specific information. The use of electronic patient records allows health professionals to see and study a person’s medical history quicker than paper files, and these records typically include information about a specific treatment in a particular health institution (www.webmd.com). A patient’s condition can be monitored remotely, either freeing up a hospital bed which would have been required with previous monitoring equipment, or providing a better standard of care for the patient. On-line tools can help patients to understand their conditions better and make it easier for them to find and talk to fellow sufferers through on-line support groups, possibly boosting a patient’s spirits in the face of serious illness (Boybjerg, R., Miller, R. and Shapiro, D., 2007).

Two major dimensions of health governance are very important.

1) Application of ICT for the development of an e-health system and;

2) Application of governance for sustainable and interoperable e-health services.

In recent years, both the central and state governments of India have supported various initiatives for the development of an efficient e-health system at all levels to make health services and facilities more accessible, suitable and acceptable for the masses. Various initiatives in health governance have been taken to improve access to quality and cost-effective healthcare facilities. Learning from the experience of others makes a great deal of sense, especially in the field of e-health. This is why the Government of India is committed to sharing good practices as a means of accelerating the uptake of e-health solutions and improving both policy-making and research. Health information on the Websites of government health institutions is regularly updated and monitored to tap into solutions that have worked already, to discuss various health problems in such forums, and to debate issues with a wide range of experts and stakeholders. Government of India is funding various e-health projects to foster a community of exchange and the sharing of best health practices, experiences and expertise. The union health ministry in 12<sup>th</sup> Plan decided to give a big push to support telemedicine

services in primary, secondary and tertiary care. Disease surveillance based on reporting by health service providers and clinical laboratories to detect and act on disease outbreaks and epidemics would be an integral component of the system.

As far as the second dimension is concerned, ensuring the sustainability of health governance systems is a key societal and economic challenge for India. One of the hurdles in the efficient deployment of e-health facilities is the lack of inter-operability of e-health solutions across the states and union territories governed by the federal system. Addition to the major difficulties that this brings to cross-border operations of e-health systems, it leads to a large fragmentation of the e-health markets and a weakening of government suppliers of e-health products or services. The importance of this issue is recognized in various e-health action plans.

Initiatives are being taken by both the state and central governments to build on existing national/regional inter-operable health solutions, expertise and experience, and to progress step-by-step. Today, with the help of Internet, anyone can assess his/her health risks, fill a prescription, manage a chronic condition, make a decision on treatment, and consult a health-care provider without leaving home. The expanding ICTs promise to usher in a wealth of innovative solutions for seemingly intractable problems in health and health care, including quality, access and cost (Bhatnagar, Subhash, 2000:39-45).

The government of India has increased its health expenditure to 3.04% of GDP. As per the draft of 12<sup>th</sup> Five Year Plan document, the total public funding by the centre and states, plan and non-plan, on core health is envisaged to increase to 1.87% of GDP by the end of the 12<sup>th</sup> Plan. When viewed in the perspective of broader health sector, including e-health, the total government expenditure as a proportion of GDP in the 12<sup>th</sup> Plan is an increase of 3.04% of GDP by the last year of the 12<sup>th</sup> Plan.

The tentative allocation for 12<sup>th</sup> Five Year Plan for Ministry of Health and Family Welfare has substantially increased to Rs. 300018 crore, which is an increase of 202% over actual allocation for 11<sup>th</sup> Plan period. As per the Economic Survey of 2012, the expenditure on health (centre and state combined) stood at Rs. 1,15,426 crore in 2011-12 as against Rs. 45,428 crore in 2005-06. As a percentage of GDP, it increased from 1.23% in 2005-06 to 1.30% in 2011-12.

As per World Health Statistics 2012 published by World Health Organization, private and general government expenditure on health as percentage of total expenditure

on health for India in 2009 is 69.7% and 30.3 per cent respectively and Out of Pocket expenditure as percentage of private expenditure on health for India in 2009 stood at 86.4%. Even after taking so many initiatives both at financial and policy end to achieve the goal of Universal Health Care for All, still a large number of people do not have health insurance.

In common practice, e-health is the use of emerging ICT, especially the internet, to improve or enable health and health care. The term bridges both the clinical and non-clinical medical and health sectors and includes both individual and population health-oriented tools and techniques. But compared to other industry sectors, such as finance and commerce, the adoption and integration of ICT in the medical and health sector is unfolding much more slowly. As with most other ICT-related sectors, the e-health field is being driven primarily by for-profit medical and health care companies. At present, many of the most recognized e-health companies are consumer-oriented portals that seek to be “one-stop shops” for health information and health-related products. The most common focus of these multinational health companies seems to be on providing tools, solutions, products, or services that support some aspect of clinical care or e-commerce, including administrative transactions, clinical information systems, telemedicine and tele-health, and sales of health related products. With the exception of providing consumers with health information, some companies are more focused on population-oriented e-health tools partly because of perceptions about the viability and scope of this market segment (Srivastava, S.C. and Thompson, S.H. Teo, 2007:365-378).

Business models employed by e-health providers include advertising, sponsorship, merchandise, transaction fees, licensing fees for service, clinical service, data and intermediary, and subscription models. In practice, many health companies rely on a combination of revenue streams. Many commercial e-health companies face an uncertain future as e-health business models are still evolving.

Even today, most government and private health institutions are very slow in adapting and integrating ICT into their workflow because of inadequate training, lack of public health-oriented e-health tools, and cost considerations. Online applications that support public health functions are limited. There are essentially two major drivers that influence employer policies and decisions about implementing e-health tools: the containment of health care costs, which often accounts for a substantial proportion of corporate expenses; and enhancing employee health and satisfaction,

which may lead to greater productivity, less absenteeism, reduced staff turnover, and reduced workers compensation claims (Tapscott, D., 1998:85-93). The following issues also need to be considered in context of Health governance practices.

#### Quality Issues

As in the “offline” health care industry, quality assurance and improvement are major issues for the e-health sector. Consequences of poor quality e-health applications include inappropriate treatment or delays in seeking appropriate health care, damage to the patient-provider relationship, and violations of privacy and confidentiality. Proposed approaches to ensuring quality of e-health resources include – accreditation, certification, rating systems, public disclosure of key information about a health site or product etc. Organizations have proposed competing standards and guidelines for e-health sites, and further consensus building or unification of approaches may reduce confusion among the public. Regardless of which approaches to voluntary quality assurance and improvement are adopted, they will need to be evaluated for effectiveness in promoting quality or changing developers’ and consumers’ behaviour. Current quality assurance strategies were developed for relatively static health interventions, and further efforts are needed to explore new models that address the dynamic nature of e-health technologies.

#### Privacy, Confidentiality and Security Issues

In last few years, many of the widely publicized breaches of network security and global computer viruses have elevated the issue of online data and computer security to the public eye. Health institutions across the world fear that personal health data will be used to limit health insurance coverage. Analysis of the privacy policies and practices of some popular e-health information sites of public and private health providers in India, reveals that most of these sites did not meet minimum fair information practices, such as providing adequate notice and giving users control over their information. Until the public is confident that their health information will not be shared or sold without their consent, and that databases are secure from spyware, malvers, adwers and viruses, many types of e-health tools, such as electronic (Protti, Denis and Catz, Mariana, 2002:35).

#### Access and Digital Divide Issues

If we view the statistics of the divide at the global level, the picture is alarming. Only 6% of the world’s entire population today are Internet users. Of these 429 million,

88% are in industrialized countries. Africa, Asia and the Middle East together account for only 1% of the users. The United States and Canada together account for 57% of the internet users. The richest 20% account for 94% of the world's Internet users, while the poorest 20% account for 0.2%.

It is perhaps useful to contrast the Indian situation to that of the US to fully illustrate the digital divide. Only 0.6% of the Indian population is online, as compared to 54% in US. Even within this minuscule population of internet users in India, the divide is sharp. The state capitals alone account for 79% of Internet connections in the country. The penetration of ICT to rural India is still a dream. Consider this against the situation in US –: Internet users in rural areas are now almost even with the national average (53% as against the national average of 54%).

The digital divide is creating a gap between rich and poor nations at an international level, and between rich and poor states at a domestic level. The widespread access to ICTs is giving developed nations and states an advantage, whereas the lack of access is leaving developing and poor countries and states at a disadvantage (Patnaik, Satyanarayana and A. Saravanan, 1999:43-45).

#### Content and Application Development Issues

A variety of disparate individuals and entities are involved in e-health development, and, as a result, development efforts are typically uncoordinated and essentially independent— even within the public sector. Not surprisingly, there is considerable overlap and gaps in e-health content. Current market forces are driving rapid e-health development in some areas, such as clinical care support, health care transactions, and business-to-business commerce. Most e-health sites and tools, however, do not offer population health-related functions, such as population-based registries and community health tools, perhaps reflecting the perception that implementing such functionality may not translate into substantial revenue. Although new business models that support development for small markets are evolving, market demand and investors are unlikely to spur development efforts in certain neglected areas. Therefore, it is likely that targeted efforts will be needed to address the gaps in e-health development.

Further, many e-health content developers have limited expertise or experience in technical or topic-specific areas that are critical for product development and evaluation. Increased information exchange and collaboration among developers, and between developers and other stakeholders (e.g., developers and users, designers and evaluators) may

result in more efficient uses of special expertise and development resources and the improvement of the quality and effectiveness of resulting applications. The challenge is to foster collaborative e-health development in the context of market competition and the desire to safeguard proprietary approaches (Story, Mark, 2003:23-27).

#### Integration of E-Health Segments Issues

Lack of integration and communication among the fields of health care, public health, and personal health also carry over into the online world. There is a need to integrate the various features and functions of e-health tools, including health information and support, transaction processing, electronic health records, clinical and public health information systems, compliance and disease management programs, and behavior change and health promotion. In addition to potentially improving operational efficiencies in delivering health care and public health services, such integration promises to augment the ability of professionals to provide a seamless continuum of care. Although the Internet offers an unprecedented opportunity to integrate various health-related sectors, many longstanding political, economic, structural, and competitive barriers to collaboration and integration must still be overcome. And, with regard to information systems sponsored by public and private health organizations, the lack of common data definitions and structure standards may make integration efforts unrewarding even if the political will for integration exists.

#### Framework Development

ICTs based health governance and telemedicine are largely technology-intensive initiatives. To ensure optimal and sustainable investment in the area, health should be positioned as one of the key social sectors in national ICTs policies. The Information, Communication and Space Technology (ICST) division of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Secretariat has conducted a study of 25 ICST policies and strategies, both draft and approved versions and six ICST related policies and programs in 24 member states in the region to assess the levels of synergies between ICST and health. The study found that ten out of 31 of the ICST policies have no mention of health, with the rest having some components related to e-health or telemedicine. However, it is not only ICST policies and strategies that address and promote e-health, some governments have articulated visions, objectives and activities of how to use ICST in the health sector in other forms, such as national five year plans in China and science and technology masters plans in Maldives.

In India, the Department of Information Technology, Ministry of Communication and Information Technology has prepared the “Recommended Guidelines & Standards for Practice of Telemedicine in India” to standardize services of different telemedicine centres. The guidelines aim at enhancing inter-operability among the various telemedicine systems being developed in the country. These standards are to assist the Ministry, state governments and health providers in planning and implementing operational telemedicine networks. The ministry also took an initiative, in a project, for defining “The framework for Information and Communication Technology Infrastructure for Health” to efficiently address information and communication needs of different stakeholders in the health-care sector. A National Task Force on Telemedicine was established in 2005 to address various e-health issues at the national level. A number of subcommittees of the Ministry of Health and Family Welfare are working on various e-health issues to develop and amend a national e-health policy document.

It is important to keep in mind, that e-health is an important part of the overall e-governance network state wide in India. The Ministry of Communication and Information Technology has launched the national e-governance Action Plan to facilitate the development of e-health system within the country. The government has planned that nearly all Primary Health Centre’s (PHCs) and Community Health Centre’s (CHCs) in both at rural and urban areas should have access to e-health information through Internet. The reach of e-health services, both by public and private sectors, would extend to the village level through these health centres. Indian Space Research Organization (ISRO) has already developed the concept of Village Resource Centre to provide a variety of e-services including – tele-education, tele-medicine, interactive farmers’ advisory services, tele-fishery, e-weather services, water management, and e-commerce services. These centres will also provide connectivity to specialty hospitals, thus bringing the services of expert doctors closer to the village (Indian Central Bureau of Health Intelligence: Policy Reform Options Database, 2007).

#### Policy Framework

Many countries in Asian regions still lack a clear policy direction of the role of e-health, coupled with a lack of political commitment and a clear legal framework. A clear-cut policy framework is essential for systematic and coordinated development of e-health initiatives. Especially in a sensitive field like health care, where patient data is private and sensitive in nature, this poses a major impediment towards the adoption of e-health (Joshi,

2012:135-142)

In setting up a policy framework for e-health, multi-disciplinary collaboration, with the active participation of both telecommunication operators and health care professionals, should play a significant role. In most countries in the Asian and Pacific regions, there currently exists a need to bridge the gap between telecommunication and health care communities at all levels. National and state ministries of health and communication and information technology also need to work together towards the introduction of an e-health policy and the achievement of a unified service system which covers emergency services and health and social information systems. A national level organization with a multi-disciplinary composition is necessary to bring together all the stakeholders and to raise awareness of the new technologies as well as the need for collaborations (Mittal, A., Parul, Roy, Prasan and Saronwala, Anupam, 2004:303-311).

#### Legal Framework

A legal framework also plays a significant role in encouraging the wider use of e-health. E-health allows services to be delivered at a distance, oftentimes outside of standard health-care settings and with a preservation of anonymity if the patient so wishes. Thus, it can have serious implications for health-care regulators and lawyers, as well as for medical professionals. For example, liability is a major fear for many medical actors, and can influence the speed and manner of adoption of new technologies, including electronic medical records and other functionalities. A clear legal framework is critically needed to allow health practitioners and health institutions to understand the legal risks and rewards of moving to e-health functionalities.

All the emerging ICTs and trends generally practiced in the health governance sector are on their own. Their convergence could shift basic paradigms in health and health care. Potential examples of such converging applications include wireless, sub-cellular biosensors that monitor individual health parameters in real-time; techniques for meta-analyses of genetic, biophysical, and behavioral information to inform development of personalized health interventions including therapies; and tailored, broadband, interactive multimedia health communications (Faisal, Nishat Mohd and Rahman, Zillur, 2008:181-202).

What will be the ultimate impact of emerging information and communication technologies on the future of health and health care? It is unclear how these and other upcoming technologies will evolve or how rapidly they will be

integrated into health interventions and programs. Undoubtedly, as new e-health technologies are developed and deployed, our capacity and processes to assess and make informed decisions about their appropriate use will be tested. In the near future, several fundamental societal questions will need to be addressed. What are the policy, ethical, and legal issues around these emerging technologies? Who will have access to cutting-edge technologies? Who will pay and how much? What should be the standards and guidelines for appropriate use of these technologies? What are the implications of these technologies for health care and public health systems in terms of quality, access, and cost? Clearly, the impending availability of enhanced Internet access, innovative interactive tools and devices, integrated health information systems, and gene-based screening, diagnostic tools, and therapy, will force further public debate about the central issues of quality, privacy and confidentiality, clinical appropriateness, public policy, cost and financing, and resource distribution.

The major fields of e-health rapidly developing in India include electronic medical records, hospital automation and e-learning. The majority of private and a few of public sector hospitals have adopted electronic medical records and hospital automation. Health system development projects by state governments, aided by The World Bank, are promoting rural electronic health records. In 1998, the Centre for Development of Advanced Computing (C-DAC), an autonomous public scientific organization, deployed the total Hospital Information System software, developed for the first time in India, in collaboration with the Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow (Kapoor, L., Mishra, S.K. and Singh, K., 2005:312-315).

E-learning has also been growing in the health sector, including online open-access bibliographies ([www.eifl.net](http://www.eifl.net) and [www.elibrary.ru](http://www.elibrary.ru)). Two government agencies, the National Informatics Centre and the Indian Council of Medical Research have established the Indian Medical Literature Analysis and Retrieval System Centre to cater to the information needs of the medical community in the country. This centre has developed various Web-based modules, including the union catalogue of journal holdings of medical libraries of India. Premier health institutions are also actively involved in sharing their academic activities over the telemedicine network.

The Ministry of Health and the Ministry of Family Welfare are currently implementing a network called the "Integrated Diseases Surveillance Programme." The Network connects

all the district hospitals with medical college hospitals of a state to facilitate tele-consultation, tele-education, training of health professionals, and monitoring disease trends. Similarly, the "National Cancer Network" has been implemented to connect 25 regional cancer centres with peripheral hospitals to facilitate the national cancer control programme. The Ministries of Health, Family Welfare and Communication and Information Technology are also initiating the networking of all public medical colleges with high bandwidth fibre to facilitate e-learning and are also establishing more than 100 telemedicine networking nodes all over the country in collaboration with the state governments for the diagnosis and monitoring of tropical diseases (Salah H. Mandil, 1998:79-104).

State governments, often in collaboration with Indian Space Research Organization (ISRO), have tried various initiatives. The governments of Orissa and Uttarakhand have supported networking of secondary level hospitals to strengthen health-care facilities. The state government of Chattisgarh has established a state-wide network, linking state public medical colleges to each other and also further to premier health institutions across the country. The Rajasthan state government has established a telemedicine network which not only connects all the medical colleges and district hospitals of the state, but also six mobile vans with e-health equipments (E-Governance Initiatives in Rajasthan, 2007). The Karnataka State Telemedicine Network Project also has set up 30 nodes.

In addition to ministries and state governments, and often with their support, some tertiary level hospitals with specialties have also taken initiatives in e-health. For example, Sanjay Gandhi Post-Graduate Institute of Medical Sciences (SGPGIMS), a premier health institution started its telemedicine activities in 1999 in a project mode. At that time it had networked 14 national and international partner nodes and had carried out tele-education and tele-health care activities. SGPGIMS has also established the School of Telemedicine and Biomedical Informatics to develop human resources in the health governance sector (Mahapatra, A.K. and Mishra, S.K., 2007:67-69). Various private health institutions are also active in establishing an e-health system. Sir Ganga Ram Hospital in New Delhi has already launched its telemedicine centres in Haryana and Rajasthan states. Under the National Blindness Control Programme, Shanker Nethralaya in Chennai, Meenakshi Eye Mission in Madurai and four other private hospitals have launched Mobile Tele-Ophthalmology services for early diagnosis and treatment of ophthalmic diseases with the support of ISRO. So, the scale and scope of e-health initiatives in India is expanding daily.

One of the biggest impediments towards the wider use and universal acceptance of e-health is the lack of awareness among patients in general towards ICT innovations and methods. This is especially problematic with ICT initiatives in health information dissemination. People may not be aware of such initiatives, or they may not have appropriate access to computers or the internet.

An ICT based health governance system in India requires health service providers to be equipped both with technical skills and certain inter-personal skills. Thus, the availability of an appropriate mix of competencies and skills is central to the wider diffusion and adoption of e-health. Technical skills concerned with ICTs and clinical processes enabled by those technologies are necessary to set up e-health applications. At the same time, the delivery of e-health services to citizens requires strong inter-personal and managerial skills, incorporation of customer relations management approaches, efficiency measures, and modern management techniques (Anastasia, Constantelou and Vasiliki Karounou, 2005).

Other significant factors for the establishment and expansion of an ICT-based health governance system in India include financial and technical support. Unfortunately India has very low public spending on health care. Naturally, this inadequate funding leads to a lack of appropriate financial support of ICT in health care. Innovative initiatives may never get off the ground for lack of financial support to be upgraded and mainstreamed. Rapid technological growth is a significant feature of the ICT sector. However, financial constraints might prevent poor nations from keeping up with the innovations and the latest technologies available in the market. The e-health sector requires heavy investment in the relevant infrastructure, including power supply, transport and Internet connectivity. Although, the 12<sup>th</sup> Plan has a focus on the financial boost up in health sector.

Thus, there is a need for a clear national vision on the establishment of an ICT based e-health system in India. This vision should take into account financial and human resources, capacities and gaps at national and state levels, and should be based on an assessment of the overall e-health status in the country. The assessment should include an analysis of cost-effective e-health models which could be applied in each region of the country, based on different levels of e-health system development. Here, multi-stakeholder cooperation is essential. Public-private partnerships should be promoted with close communications between health, ICT and trade officials as well as those among health-care providers and between

health-care providers and policy makers (Lal, Ram and Haleem Abid, 2002:69-81).

A strong policy and regulatory framework is also required for the balanced development of an ICT-based e-health system at both state and central levels. Policy initiatives should include those that address standards and guidelines governing quality of e-health, integrating e-health in ICT policy in general and building in reimbursement for expenditures for services availed through e-health within health schemes.

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- <http://www.eifl.net>. (The website consist information regarding electronic information for Libraries (eIFL) program, which provides access for medical libraries and other medical and health institutions in 39 countries to EBSCO's various databases, which contain over 5,000 full text scientific and biomedical journals).
- <http://www.healthinternetwork.org>. (The website of WHO and Health Inter-Network Access to Research Initiative (HINARI), which provides access to over 2,100 full text journals related to health and medicine).
- <http://www.elibrary.ru>. (Website of Russian Foundation for Fundamental Research consisting information and access to nearly 2,000 medical and scientific journals and databases through the web).
- <http://www.webmd.com> (The website provides the opportunity to post questions in an on-line discussion forum and the consultants affiliated with the website will reply).