

---

# **Socio-economical impact of telemedicine in Russian Federation**

Elena V. Khasanshina, MD, PhD and Max E. Stachura, MD

Center for Telehealth  
Medical College of Georgia  
Augusta, Georgia, USA

## **Abstract**

*Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status general and specific for health education, health care, diagnosis, monitoring, management, and research. During the last ten years, telemedicine in Russian Federation (RF) has become more common, despite the fact that all publications are developmental reports without studies of outcomes evaluation and effectiveness. Information on social-economic impact is lacking. Although telemedicine in Russia can be expected to have social and economic implications for communities, healthcare providers, patients and others, most available publications to this date focused on its feasibility, estimation of cost saving, and some reference to social benefits. Russian and English language literature searches were used to encompass telemedicine evidence in terms of the social aspects, and economic performance for populations and individuals. The main benefits we looked for are access to healthcare services, cost resources, cost-effectiveness, education, social isolation, health outcomes, quality of care, and quality of life. For better understanding of telemedicine's place in society, we also present an overview of both the Russian healthcare system and telemedicine.*

## **I. Healthcare system in Russia**

With the establishment of the Soviet Union its healthcare system developed based on healthcare principles articulated by Nikolay Semashko [1]: (1) governmental responsibility for health, (2) a close relationship between

medical practice and the findings of science, (3) highly trained professionals and high quality professional care, (4) coordination of health promotion, medical treatment, and rehabilitation, (5) universal and free access to services, and (6) a preventive approach to “social diseases”. The results of this approach led to the assertion that the Soviet health care system was one of the U S S R ’s greatest achievements [2].

Using these principles, health care was provided by personnel who were employees of, paid by, and who received their medical supplies from the state which centralized control of the healthcare system. Thus, the system which was financed by government revenues could be an asset in the pursuit of economic and social development plans. The focus was on increasing the numbers of both hospital beds and medical personnel, improving community prevention, urban sanitation, hygiene, and promoting routine medical check-ups. Beginning in the 1920s, a network of facilities was built in order to reach even remote settlements and provide basic health coverage to the entire population [3]. Quality of care varied, was better in urban than in rural areas, but was a significant improvement over what had existed previously [4].

Unfortunately, with time there was deterioration of it adherence to these principles. That resulted in less effective healthcare, and were diverging of the health status of the Russian and Western populations [1, 5]. Specifically, the paternalism inherent in Soviet philosophy allowed the failed development and/or atrophy of individual responsibility for crucial life-style issues recognized in the West such as diet, obesity, and use of alcohol and tobacco [5]. Officials relied on growth of health care facilities, resources, supplies and manpower, but neglected quality or

effectiveness of care. Individuals saw themselves embraced in State medical facilities that shouldered the entire responsibility for an individual's health, reducing or absolving them of individual responsibility and encouraging their consumption of health care services without regard to cost.

Further, political separation between the West and the Soviet Union, abetted by the arms race, isolated Soviet medical science from Western advances in medical technology, knowledge and treatments, including new pharmaceuticals. With a stagnating economy in 1980s, the system could not afford the treatments that were coming on line in the West [6]. In Russia, access to quality care increasingly depended on whether you were "connected".

Health care and the health status of the Russian population fared poorly as a consequence of the collapse of the Soviet Union in 1991, in part because government revenues were no longer able to sustain the inherited system [7].

Government leaders recognized the problems and identified areas of focus that include encouraging family practice-based primary care of high quality, promotion of healthy lifestyles, prevention, and de-emphasis of a dependency and excessive use of secondary and tertiary care [1]. However, according to Rozenfeld [5], while Russia is searching to improve public health care and health promotion, current uneven development of the healthcare system, together with an ineffectively organized health care delivery system hampered by a lack of funds, equipment, and supplies is generating popular dissatisfaction with medical personnel and the services they provide. An essential difficulty is that Russia has still not completed the "first epidemiological transition" (the eradication of infectious diseases and epidemics), so that

manpower and financial resources can be focused on issues of life-span elongation and other goals of the “second epidemiologic transition [5]. In other words, diseases typical of previous periods of lower socio-economic development are still present and it is difficult to move into the realm of managing chronic disease.

Since perestroika in the Russian Federation, health care and other systems, are attempting to deal with the process of decentralization. There are 89 regions with varying degrees of autonomy. Initially, each was trying to balance the responsibility for funding and delivering health care while trying to design and put into place a new system of health insurance [7] and then reversing the process in parallel with more recent efforts at central government reform [8]. Economic and social status of the population are priority task for RF government. The new models must face the reality of finding new ways to work. Current model of management and finance in Russia presented on figure 1.

In the current Russian healthcare system, a portion of the total medical organizational structure is federal [10]. Each of the federal health care organizations carries out all activities in the sphere of health care, the property for doing which is federal – including buildings, medical equipment, and staff. Each of these organizations report to and are subordinate to a specific federal department. There are 17 federal ministries and/or organizations which have their own health care service components. Of these, the three largest are: Ministry of Railroads - 782 healthcare organizations; President’s cabinet - 56 healthcare organizations; Russian Academy of Science - 36 healthcare organizations. Federal healthcare organizations connected with regional and government for referrals, and policies what work on this territory.

Regions are having portion of healthcare system what independent from the center (Federal Government) in finances, and almost in policies. Regional, local, and private healthcare providers are responsible for following federal and regional policies. Insurance divided into mandatory/obligatory, and voluntary. Obligatory required having by each individual, voluntary is optional and depends on diseases base or program of healthcare services.

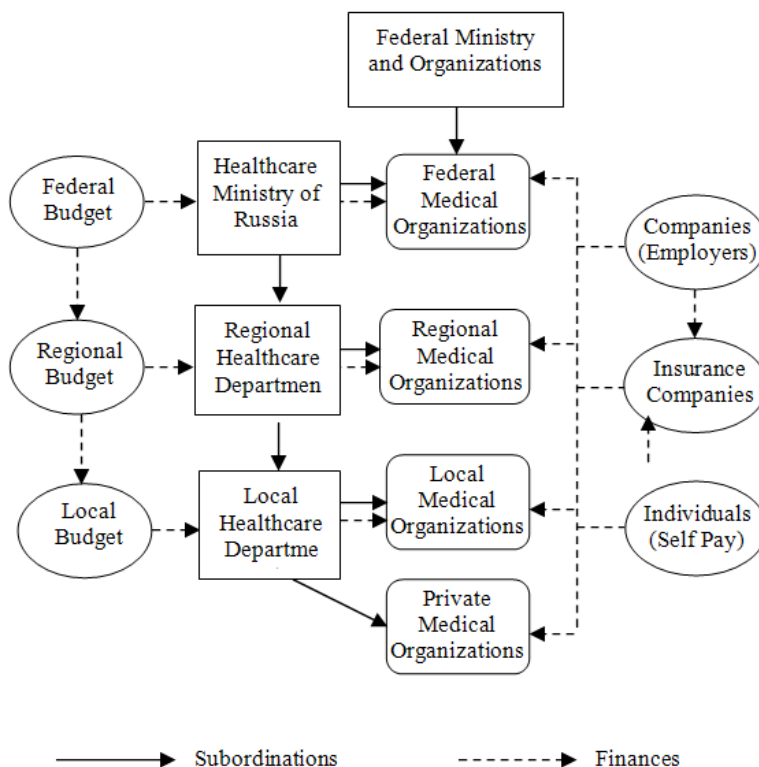


Figure 1. Flow of Decision-Making Responsibilities and Finances [9].

Current reorganization in RF healthcare system is oriented to investment in the acquisition of technology and its integration into the healthcare system. Organizational changes are in direction to increase effectiveness of use existing potential without monetary investment [11]. Telemedicine is addressing both these aspects.

## **II. Telemedicine in the Russian Federation**

There are some characteristics of RF and its health care system that demonstrate the potential value of telemedicine/telehealth:

There is a large difference in the level of available diagnostic and treatment options between federal (Moscow, St. Petersburg), regional, and rural medical facilities.

Huge distances separate population and there is a general lack of affordable transportation for patient and healthcare specialist travel to get or deliver specialized medical care.

“Strong need to raise corporatism of physicians and their expertise level instead of this (to overcome these) difficulties.” [12]

The current aggressive development of broadband telecommunication access in the RF is allowing the potential of providing telemedicine/telehealth services to remote communities

Knowledge of information technology by potential end users is not something new and there is widespread use of computers on a day-to-day basis.

“Computers and digital communication channels become cheaper and transportation/living costs tends to rise.” [12]

There is an aggressive existing market for telecommunications, video-conferencing, telemedicine/telehealth equipment, and software.

“The new economic structure in Russia has influenced every segment of Russian society. While the shift to free-market enterprise has created many opportunities for businesses and industry, it has also provided many challenges for health-care facilities, which are trying to maintain satisfactory public health-care services with dwindling state support and an increased emphasis on local community support.” [13]

The first telemedicine started in Russia as space flight telemetry in 1960, starting with more than 10 different physiological parameters monitored continuously during space flight. [14, 15]

The first RF application of earth telemedicine was Spacebridge to Armenia implemented with the participation of NASA, and others. Medical consultations were provided through telemedicine to victims of earthquake in Armenia in 1988. In 12 weeks, 209 teleconsultations were conducted in about 20 medical specialties. Based on these consultations many preliminary diagnoses and treatments were changed [14] in a very positive demonstration of the potential for telemedicine use in civil emergencies.

The first Russian telemedicine network "Moscow – Russian regions", initiated in the late 1990s uses videoconferencing technology for consultations and education by the Bakulev's Scientific Centre for Cardiovascular Surgery using ISDN channels [16]. This project was initiated in the late 1990s to connect with regional healthcare providers that needed expertise from federal medical centers.

Several telemedicine networks are now established in different parts of Russia “mostly by efforts of the enthusiastic healthcare authorities, physicians and

engineers using different kinds of telecommunication channels, communication and terminal equipment". [17]

### ***Russian Federation Telecommunication***

In Russia, there are "are quite a number of the Russian medical institutions using different telemedicine technologies. There are also several telehealth networks created around the scientific medical centers and large hospitals. They use store-and-forward technology and real-time video conferencing over ISDN and IP-channels." [17] The development of these telemedicine services is strongly dependent on the general telecommunication infrastructure in the RF. The telecommunications infrastructure is of inconsistent quality and accessibility throughout Russia. "In rural areas, there are an estimated 54,000 small communities with no telephone access whatsoever. In the country as a whole, there are some 22 phone lines per 100 people, compared with the United States with 60 lines per 100 people, and the waiting list for basic services currently has 3.5 million names" [18]. That shows the needs and potential for continues development of telecommunication in Russia.

According to Russian Federal Statistics, the volume of telecom services in 2004 increased 27% compared to 2003 [19]. Telecommunications become used for wide areas, but most business. In healthcare the Internet access is no longer a nonsense. Now in most healthcare provider organizations required the Internet connection to use for contact with regional and/or federal governments for statistic and policy information exchange. The state of telecommunications in Russia can be summarized as follows: "well developed, but low speed telephone lines suitable for digital connections up to 33.6kbit/s"; new digital telecommunications (fiber optic network) available mainly in the large cities [14]; financial problems in



medical organizations making it difficult to apply new information and telecommunication technologies in practice [20].

“Ten years ago the quality and spreading of telecommunication backbones didn’t allow to create the wide telehealth networks. The big investments have been made by the Russian Government into development of these backbones since that time. For many large medical institutions a question of access to the quality telecommunication channels is now only a question of last mile.” [17]

“During the last several years many Russian hospitals and medical institutions became connected to the Internet or even have possibilities of ISDN-based videoconference facilities. Low speed network services like e-mail and others based on modem connections could be assumed to be of great importance in application for telemedicine.” [14]

#### ***Examples of current Russian telehealth projects and networks***

The most successful network is "Moscow – Russian regions". Its participants use video-conferencing technology for consultations and education using ISDN lines. There are more than 40 current participants with a geographic footprint that covers 6 different time zones. In 2002, many medical specialties conducted 1240 real-time teleconsultations and 800 hours of continuing distance education lectures. Participating consulting sites include the Bakulev Scientific Centre for Cardiovascular Surgery, the Moscow Scientific Institute for Pediatrics and Children's Surgery, the Russian Government Medical Centre, and the Burdenko Scientific Centre for Neurosurgery. Consultants

and lecturers from other federal medical centers are also invited. [17]

The Russian Ministry of Railways implemented its own fiber-optic backbone connecting the main Russian railway stations throughout the country. "This Ministry has its own healthcare institutions rendering services to the railways workers and this corporate backbone is also used for teleconsultations and distance medical education". [17]

There is a wide activity of store-and-forward e-mail consulting that is not really regulated. For example, the Centre of Telemedicine for Children in Moscow consults through e-mail with any Russian physician or patient. These consultations are free of charge for all state medical institutions [21]. There are a number of Internet sites describing and/or offering telemedicine services [22].

### ***Management and Legal issues***

In 2000, "The concept of telemedicine technologies development" was worked out and endorsed by appointed the RF Ministry of Healthcare and in 2002 the conceptual document was approved at the Parliamentary hearing and recommended to the Russian government as a basis for defining a federal program. Following these recommendations, the Ministry of communication and informatics took a decision to support the telemedicine section of the program "Electronic Russia" [23].

There are no established of the national policy and standards of the telemedicine system in Russia. Telemedicine raises a broad range of legislative, ethical, technical and regulation issues.

Through management at the federal level, Russian telemedicine may become more unified if the Russian

Ministry of Healthcare receives proper funding for further development and integration of the various telehealth projects and networks. This problem may in fact be solved if this funding is provided in the ambitious Federal Program “Electronic Russia” [17]. However, current “... difficulties included the absence of legal regulations, commonly accepted financial mechanisms for federal funding; absence of adequate training of telemedicine professionals both medical and technical personals; absence of common standards for medical data transfer; and reliable communications with the most remote hospitals.” [24]

### *Economic efficiency of Telemedicine*

Resources for financing development telemedicine program in Russia current are federal, regional budget, budget of medical organization, or big industry company such as Russian Railroad Company and GasProm natural gas delivery and distribution company. Investment in Telemedicine also possible by private clinic practices or insurance companies what has no evidence now.

Reimbursement for telemedicine consultation comes from patient self-payment and insurance company payments. “The cost can range from 2500 Rubles to 5000 Rubles (80–160 USD). Pricing structure is based on case complexity and status of consulting physician.” [24]

Trials considering the financial viability of telemedicine are underway in the RF. For example, Selkov reported a study demonstrating that patients save money using teleclinic services instead traveling to the consultants. He therefore suggested that small-scale investment in a tele-consultation center could be profitable. Performing a market assessment of what services are needed assesses the “real market demands of these services...” and guarantees the availability of “... real money for development

innovative technologies in regional medicine. Our research has shown that tele-consultations centers are economically feasible.” [25] There are several evidences in literature indicated cost-saving by using telemedicine (Table 1).

However, no centralized financing for telemedicine equipment and last mile connectivity has emerged. Recently, in 2003, the Russian Ministry for Communications and Informatization financed the creation of several telemedicine sites in Tcheboksary and its environs under Federal Program “E lectronic Russia”. These sites provide real-time teleconsultations for childhood diseases. The financial model involves the site receiving the consultation purchasing both the equipment and last mile connectivity, and paying the consulting site both the cost of telecommunication traffic and the professional fee of consulting physician. The patient who receives the consultation reimburses traffic costs and the professional fee of consulted physician. For real-time teleconsultation using video-conferencing technology, the total cost varies from 100 to 300 US\$. This is a very large amount of money for many Russians, but not when compared to the total costs of, for example, round trip air tickets to Moscow, Moscow housing, and the professional fee of consultants. However, as in the US, local RF physicians are not happy to lose the patient and the income derived from his/her care, “... So the question of telemedicine financing is very hot (in Russia) now .” [17]

Table 1. Cost-saving and social benefits from Telemedicine programs in Russia.

<b>Information about program</b>	<b>Cost-saving benefits</b>	<b>Social benefits</b>
Irkutsk Regional program, 2002 [26]. ISDN connection, 30 patients	Telemedicine cost is 250,000 rub. Saved to region 1,670,000 rub.	60% of telemedicine clients had no need to travel for necessary healthcare services to Moscow/aboard
Irkutsk-Moscow, 2004 [27]. ISDN connection 400 tele-consultations	Used money from federal budget directed for cover hospitalization to Moscow medical centers from region. Federal budget saved 12 million rub.	Most of teleconsultation patients from rural/remote sites. Access to medical experts with educational purpose from rural/remote sites.
Chuvashskaya Republic, 2003-2005 [11] VSAT satellite + DSL, 624 teleconsultation (within republic) 449 (outside with federal medical centers)	Telemedicine saved: 2003-700,000 rub 2004-1,600,000 r. 2005-1,759,900 r.	Increasing qualification of medical personnel on day-to-day base without travel. 344 hours tele-lectures with federal centers and saved: 2003-600,000 rub 2004-1,300,000 r. 2005-1,429,900 r.
Arhangelsk, 1997-1999 [28] ISDN, store-and-forward 121 tele-consultations	Telemedicine cost is 195,000 rub. Saved 201,000 r. More saving from store-and-forward	-

Nizhnegorodskaya Oblast [28] Store-and-forward consultations, telephone lines for EKG transport	Cost of teleconsultation is 170- 310 rub. It is less in 3,2-6,1 times then in person. Travel of provider cost 800-1200 r. Travel of patient is 500-1000 inside region. More than 2000 to federal centers. With accompanying it increase in 1.8 times.	-
Irkutsk – federal medical centers, 2002-2003 [29] ISDN line 366 patients	Federal budget provided 150,000-250,000 rub for surgery in federal medical center based on teleconsultations' conclusions.	2/3 of patients are rural. 135 cardiovascular disease, 70 are kids. 52 patients with tuberculoses spend in hospital 48 days compare with 96 days what without tele-expertise.
Omsk-Moscow [30] Store-and-forward images	Telemedicine cost \$200. Flight costs near \$1,000. Saving money for region.	Approximated: \$100,000 can help: (1) 93 patients to get services going to Moscow, (2) 483 patients using telemedicine. Increase quality of healthcare.
Irkutsk-Moscow [31] ISDN line	Telemedicine cost is 6,000 rub. Travel is 25,000-	Increase access to expert healthcare services. Budget in

	30,000 rub. Saving money for region.	3,500,000 rub. allows expert consultation for 117 patients in-person, for 380 using telemedicine
--	---	---

As the price of computers, communication systems and service lines comes down, and as Russian hard- and software is increasingly available, the highest medical and social benefit from telemedicine's diffusion in the RF will occur with relatively low capital investments. For example, while the estimated equipment cost for the workplace of a doctor who wishes to start using telemedicine is several thousand USD, parts of that equipment (computer and scanner) can be used for other purposes and, therefore, the investment risk is lowered.

There are multiple ways of estimating the economic efficiency of telemedicine: (1) a comparison of costs of obtaining a consultation in a distant federal medical centre in the usual way and those associated with using local telemedicine capabilities. Of course, the farther a patient lives from, for example, Moscow the more money he saves. (2) Another common approach is to estimate the time to recovery of technology investments in telemedicine. Thus, introduction of no-film radiology into clinics is economical because film expense is eliminated, and there is a more efficient distribution of labor resources.

However, while they are very important, evaluation of economic efficiency cannot be restricted to such business practice approaches alone but should also include effects on the healthcare structure and long-term outcomes in terms of population health. World wide preliminary evaluation of telemedicine predicts improvement of

medical care quality through elevation of the diagnostic-therapeutic process and more prudent use of the labor and physical resources. The latent potential is high here. For example, three years of teleconsulting for only three clinical categories (congenital heart disease, surgical tuberculosis, and oncologic hematology) in the Irkutsk region (Siberia) brought an economic benefit of almost five million rubles as a result of reduction of the period of treatment and hospitalization, and appropriate expenditure of the federal quota [13].

Eventual acceptance of telemedicine is assured by the fact of non-uniform distribution of medical professionals and resources which is present in varying degrees in all countries, Russia not excepted. It is believed that in the near future these trends will become even stronger [2]. For this reason, telemedicine services like tele-consultation and distance education will be increasingly demanded by providers and consumers alike.

There is federal program "Children of North" by which investment was made from federal budget into telemedicine connectivity for diagnostic consultations between Moscow and north regions of Russia in 2001-2002. To determine social and economic effect of disbursing budget funds for the implementation of measures «Provision of Diagnostic Medical Equipment and Machines to Telemedical Centers» and «Provision of Children's Medical and Educational Institutions with the Drinking Water Cleaning and Disinfection». There in 2004 conclusion were made "... investment of federal money in telemedicine is expedient and efficient, because with its help significantly increases quality of healthcare services for population, with significant decrease its cost" [32].



It is obvious money saving for patient to access adequate healthcare services not available in the regions. Because of indirect cost-saving for federal, regional budgets telemedicine is not developing rapidly. Insurance companies as well do not have direct cost-saving. However, it is necessary all participants invest in telemedicine: federal and regional budgets, insurance companies, private healthcare providers, and patients [30, 31].

*Telemedical education.* “It should be noted that the basis for the development of tele-education throughout the rural and remote districts of the country is the understanding of economic efficiency of information technologies for cutting the costs associated with training process of each doctor. Our research has shown that tele-education’s centers are economically feasible. The main result of the research was the fact that telemedicine education and consultations centers in small cities and villages are a good return on small investments. For the local population such a centre provides an access to the world leading specialists, while the expenses of the individuals needing such studies and individual consultations are significantly lower than the ones they have to incur for traveling to a training center or clinic. Our colleagues from the Central Syberia assert that, each teleselection for specialist from remote village is forty times cheaper than the same one in regional training center” [33]

In current economic situation in RF the use of telemedicine possible only if used maximum effective technologies, which let decrease requirement from budget compare with traditional healthcare services. For instance, of-line (store-and-forward) consultation can take 60% of necessary consultation from videoconferencing [28].

### *Social Impact of Telemedicine*

Telemedicine is supposed “improve the quality of medical care, contribute to strengthening of the structural and functional links within the system providing healthcare services to the people of Russia, and expedite achievement of the state of the art technological level and integration into international networks. The governmental agencies should demonstrate their commitment to forwarding telemedicine by participation in, among others, long-range planning of development of telemedicine and associated areas of social life including healthcare, education, communication and technology and budgeting at different levels, and to draw up and adhere to a complex program of telemedicine diffusion into the regional healthcare systems. There should be incentives for medical employees, students, and physicians to learn and practice telemedicine technologies, and specialized research programs to inquire into the role of human factor in telemedicine maturation and assimilation. A matter of importance is to make a structure that will design and validate hard- and software for use in telemedicine systems, and oversee compliance with requirements to the quality of services, confidentiality of medical data and interoperability of telemedicine applications.” [15] In the end of 1980<sup>th</sup> there 12-15 millions per year were coming to Moscow for medical expertise, in 1997 was only a million, and the same now, there more them ten millions whom telemedicine can help [34].

*Federal medical centers prospect.* Use if telemedicine allow central medical centres see more patients through videoconferencing. There are difficult cases what needed to patient presentation at the medical canter. Using telemedicine patient arrived to medical expert who already know anamnesis and preliminary laboratory

data, what short time of patient on hospital bed. This allows them proved medical expertise in more efficient manner and as result of this more patients could get it.

*Regional perspective.* “Regional networks permit efficient use of medical resources by rational choices about appropriate technology and assignment of specialists, as well as referral. This will have not only a medical impact but also an economic one in terms of allocation of resources allocated for profiling of medical institutions and personnel assignment.” [24]. Saving federal money from quite and local budget, as it showed above, allow t us this resources for other social program in the region. Payment what should go to federal medical centers will be collected locally as payment to local healthcare providers, pharmacy and other and benefit community finally.

*Telemedical education.* “Providing their citizens with equal access to high-quality education independent of the distance of their location from large centers of science” is important social problem in Russia what telemedicine allow to address as “the post graduation training doctors in regional clinics.” [33, 35] Authors presented data what 600 lectures were given by leading Russian experts in importance areas of medicine such as cardiac surgery, children surgery, and others for more than 35 regions from central Russia to East Siberia. Presented advantages are saving money for region, high-level expertise and knowledge sharing through out the country, process of education does not interrupt care of patients. One study has shown that for Central Siberia region to organize and sponsor a lecture for rural and remote healthcare providers by expert from a federal medical centers is 40 times more expensive than one tele-lecture [33]. “It should be noted that the basis for the development of tele-education throughout the rural and remote districts of the country is

the understanding of economic efficiency of information technologies for cutting the costs associated with training process of each doctor. For the local population such a centre provides an access to the world leading specialists, while the expenses of the individuals needing such studies and individual consultations are significantly lower than the ones they have to incur for traveling to a training center or clinic.” [33]

*Rural perspective.* Because of situation after perestroika and current, it is necessary for the RF to maintain the standard of living, and healthcare specifically, in any communities. If all time cities experienced with concentrate healthcare providers, rural sites always lack it. As said before technology available in cities are not always accessible in rural areas. If regional healthcare organizations have opportunities connect using broadband with federal medical centers, rural healthcare providers do not. However, the Internet now in almost all remote areas and uses e-mail for exchange medical data and get advice from regional specialists. For example, in north-west Russia ten rural health care providers attempted to improve the management of significant social disease for RF, tuberculosis, patients by using e-mail communication with the Arkhangelsk Regional Tuberculosis Centre as a second opinion. E-mail sped up communication and increased the availability of specialist advice. 64% of patients were saved a round trip to a specialist center, and in 51% the patients the correct treatment was initiated from 1 to 4 weeks earlier than would have been possible without e-mail access [36].

*Healthcare provider.* “The regional physicians are not very happy to refer the patient having money to their colleagues in Moscow or another city.” [17]. There data what only 10% of people coming to Moscow medical

centers need to travel to get adequate medical services. The 90% could get it staying in region and use video consultations to access medical expertise [37]. It could help local provider with increase knowledge from second opinion, and keep clients in their practice. It will support new work places and guarantee existed.

*Patient and its family.* Telemedicine allow patient to be treated locally without necessary travel to Moscow. “The farther a patient lives from, for example, Moscow the more money he saves, particularly on tickets.” [38] Only ones are get reimbursement from regional or federal budget because amount money is limited. Many of patients can have medical expertise only by using telemedicine because some of them not transportable or they simply cannot afford to pay for travel and fee for medical services in Moscow. In some clinical situation, there are no time for face-to-face consultation, and using telemedicine sort period of waiting save lives. It is much easier for patients to get adequate diagnosis and treatment. Other aspect of benefit for patient’s health is possibility of continues monitoring and consultation by medical expert what impossible with travels.

Preliminary evaluation predicts improvement of the quality of medical care through intensification of the diagnostic-therapeutic process and more prudent use of the labor and physical resources [38].

“Telematics is supposed to essentially improve the quality of medical care, contribute to strengthening of the structural and functional links within the system providing healthcare services to the people of Russia, and expedite achievement of the state of the art technological level and integration into international networks. The governmental agencies should demonstrate their commitment to

forwarding telemedicine by participation in, among others, long-range planning of development of telemedicine and associated areas of social life including healthcare, education, communication and technology and budgeting at different levels, and to draw up and adhere to a complex program of telemedicine diffusion into the regional healthcare systems.”[23]

### **III. Discussion and needed action**

Aging of the Earth’s population is another objective reason why the number of patients who will require permanent monitoring by medical personnel will increase dramatically. Modern healthcare systems place emphasis on the competence of family doctors, medical assistance clinics, ambulatory/home management, and the benefits of preventive medicine. This circumstance increases the demand for remote monitoring of patients at home, at work, and in school. Economic expansion onto new territories, employment of modern patterns of work management (shift work), emergence of new markets of medical services triggered by, in particular, the growing mobility of population will speed up deployment and acceptance of mobile telemedicine services in the RF, again by consumers and providers alike, and that does not even take into account the need to respond to natural disasters and man-made industrial accidents. These and other factors objectively underlie a growing demand for telemedicine services in the RF and the range of situations in which they will be applicable.

Factors objectively influencing evolution of a healthcare sector should be sought for in general trends of the national policy, economy, social life and technology within the observable timeframe. Acceptance of telemedicine is preconditioned by the distribution of labour

forces, including medical professionals, which is present in varying degrees in all countries Russia not excluded, and worldwide. The ground for this is economic disproportions and continued urbanization. It is believed that in near future these trends will become even stronger. For this reason, telemedicine services like teleconsultation and distributed education will be of growing demand.

At the same time, the rapid development of new telemedicine/telehealth technologies and creation of a worldwide universal information space lays a solid foundation for successful assimilation of informatics and telemedicine in healthcare. Distribution of information to patients, reliance on prophylaxis, enhanced acceptance of the need for and support of self-treatment, and the promotion and acceptance of the need for health life styles will all be enhanced in the RF by the availability of telemedicine services.

“The telemedicine may become a very important direction of the development of the national health care services. There is also a joint initiative of the President of the Russian Federation and the President of Italy unveiled at one of G8 summits. They had suggested to promote the telemedicine technologies to the problem regions of Africa and Central Asia where many people suffer from AIDS/HIV, tuberculosis, malaria. The medical institutions and the telecommunication providers of the Russian Federation are experienced enough to participate in this initiative.” [17]

Telemedicine support new work places or guarantee existed, save money for patients, increase accessible and quality of healthcare, especially in such social important groups like elderly population, powdery, children, invalids,

and for such social deceases like tuberculosis, infection and parasite deceases, cancer, AIDS and others.

Finally, even good evidence for the cost-saving has been presented in literature, the social-economic impact indicators have not been examined consistently. There are not specific studies on socio-economic impact of telemedicine. Importance of this is instrument for policy makers in developing approaches telemedicine integration in modern Russian healthcare system.

#### **IV. References**

1. Shubnikov, Eugene, Russian Health Profiles in Transition, FSU Supercourse, NATO/OTAN Advanced Research Workshop, <http://www.publichealth.pit.edu/supercourse/supercoursePPT/22011-2301/22041.ppt>
2. McKee M, Balabanova D, and Pomerleau J. Health sector reform in the former Soviet Union: where now? Health and Demography in the States of the Former Soviet Union Conference. April 29-30, 2005 Cambridge, MA <http://www.wcfia.harvard.edu/conferences/demography/papers/McKee.pdf>
3. Field MG. Doctor and Patient in Soviet Russia. Cambridge, MA: Harvard University Press, 1957.
4. Davis C. The economics of the Soviet health system. Cambridge: Cambridge University Press, 1979
5. Rozenfeld BA. The Crisis of Russian Health Care and Attempts at Reform. The RAND Corporation. [http://www.rand.org/pubs/conf\\_proceedings/CF124/CF124.chap5.html](http://www.rand.org/pubs/conf_proceedings/CF124/CF124.chap5.html)



6. Field MG. The Soviet legacy: the past as prologue. In: McKee M, Healy J, Falkingham J. Health care in central Asia. Buckingham:Open Univ Press, 2002
7. Shishkin S. Problems of transition from tax-based system of health care finance to mandatory health insurance model in Russia. *Croat Med J* 1999; 40: 195-201
8. Danishevski K, McKee M. Reforming the Russian health care system. *Lancet* 2005;365:1012-4. [http://missinglink.ucsf.edu/lm/russia\\_guide/Administrative\\_reform.pdf](http://missinglink.ucsf.edu/lm/russia_guide/Administrative_reform.pdf)
9. Stachura ME, Telehealth and the Nuclear Cities of the Russian Federation: Need, Implementation Barriers, Impact Potential, and Policy Issues, 49 pp. <http://www.nceeer.org/index.htm>
10. Shishkin SV, Potapchik EG, Salahutdinova SK. Federal budget financing of federal medical organizations. Institute economic of transformation period. Scientific paper N 29P. Moscow 2001:46p
11. Telemedicine in Chuvashskaya Republic. Official website of Republic government. <http://gov.cap.ru/hierarchy.asp?page=../12/21752/86961/117447/117452> (on Russian)
12. Eltchiian R, Mironov S, Emelin I. Russian Telemedicine Project. MEDINFO 2001. V. Patel et al (Eds). Amsterdam: IOS Press 2001;870
13. Schulman ED, Burton DC, Domatov ER. Establishing a low-cost telemedicine link in far-eastern Russia. *Journal of Telemedicine and Telecare* 2002; 8(2):74-76
14. Buravkov CV. Recent Advances in Russian Telemedicine. *Annals of the Academy of Studenica* 2001;4:27-30
15. Orlov OI. Telemedicine in Russia. Telemedicine Foundation (Russia) 04.08.2005. [http://eng.telemed.ru//articles/Orlov\\_E.htm](http://eng.telemed.ru//articles/Orlov_E.htm)

16. Russian Medical Center for Cardiovascular Surgery.  
<http://www.bakulev.ru/care/telecons.htm>,  
<http://www.bakulev.sovintel.ru/telemed.htm> (on Russian)
17. Eltchiyan R, Emelin I, Fedorov V, and etc. Telemedicine in Russia. MEDINFO 2004. M. Fieschi et al (Eds). Amsterdam: IOS Press 2004;953-955
18. BISNIS Bulletin, April 2004. Trends in the Russian Telcom Market. Andrey Gidaspov
19. CNews Analytics 2005.  
[http://www.cwtg.ca/magis/Russian Telcom Market .pdf](http://www.cwtg.ca/magis/Russian_Telcom_Market.pdf)
20. Buravkov CV. Telemedicine: capabilities of telecommunications in clinical practice in Russia. Journal of Telemedicine and Telecare, 1999; 5(1): S1:31-33
21. Center for Children Telemedicine website.  
<http://www.telemednet.ru> (on Russian)
22. Russian Foundation of Telemedicine.  
<http://www.telemed.ru> (on Russian and English)
23. Orlov OI. Telemedicine in Russia. 04.08.2005.  
[http://eng.telemed.ru/articles/Orlov\\_E.htm](http://eng.telemed.ru/articles/Orlov_E.htm)
24. Orlov OI, Levanov VM, Merrell RC, and etc. A Pilot Telemedicine Project in the Privolzhsky District, Russia. Telemedicine J and e-Health. 2003;9(3):291-5
25. Selkov A, Selkova E Stolyar V, Chueva N. Eight-years experience in marketing of regional telemedicine projects in Russia. "Med-e-Te l" The International Trade Event and Conference for eHealth, Telemedicine and Health ICT, Luxembourg, 2005. [www.medetel.lu](http://www.medetel.lu)
26. To question about quality of telemedicine consultations. International Telemedicine Center, 11/20/2002. [www.telemedcare.ru](http://www.telemedcare.ru) (on Russian)

27. Completed first phase “building” of telemedicine in Irkutskaya Oblast. 09/30/2005. Official website of Irkutskaya Oblast government. [www.goirk.ru/news/794.2.html](http://www.goirk.ru/news/794.2.html) (on Russian)
28. Levanov VM, Sergeev DV. Economic aspects of telemedicine services. Medical observer, 2003;5:4p. <http://www.mfic.nnov.ru/articles.shtml?articles/2003/05/art15.inc#0>
29. Our achievements in Irkutskaya Oblast. Telmedicine News. International Telemedicine Center, 05/15/2004. [www.telemedcare.ru](http://www.telemedcare.ru) (on Russian)
30. Robskiy SU. Practical use of equipment and systems Cisco Systems in telemedicine. Moscow, 04/27/2005. (on Russian)
31. Economic effectiveness. Telemedicine Project. International Telemedicine Center. <http://www.telemedcare.ru/index.php?navigation=project> (on Russian)
32. Ryabukhin S. Report on the results of auditing the disbursement of funds allocated for the implementation of the federal target program «Children of the North». [www.ach.gov.ru/eng/bulletins/2004-3.php](http://www.ach.gov.ru/eng/bulletins/2004-3.php) (abstract on English), [www.ach.gov.ru/bulletins/2004/arch3/11.rtf](http://www.ach.gov.ru/bulletins/2004/arch3/11.rtf) (full paper on Russian)
33. Atkov O, Stolyar V, Chueva N, and etc. EA. Tele-education in Russia: support reform and development of the health delivery system. “Med-e-Tel” The International Trade Event and Conference for eHealth, Telemedicine and Health ICT, Luxembourg, 2006. [www.medetel.lu](http://www.medetel.lu)
34. Telemedicine is a market for billions. “Infocom-online” e-newspaper, 2002. [www.infocom-online.ru/index.cfm?id=117](http://www.infocom-online.ru/index.cfm?id=117)

35. Atkov OY, Stolyar VL, Selkov AI, Selkova EA. Educational Efficiency of Modern Telemedicine. “Med-e-Tel” The International Trade Event and Conference for eHealth, Telemedicine and Health ICT, Luxembourg, 2003. [www.medetel.lu](http://www.medetel.lu).
36. Uldal SB, Nikishova E, Rakova N, and etc. Using e-mail in the management of tuberculosis patients, north-west Russia. Int J Tuberc Lung Dis. 2005 Dec;9(12):1367-72.
37. Modern information and telemedicine technologies on service of practical healthcare in Russian Federation regions. International Center of Telemedicine, 2002. [www.telemedcare.ru/](http://www.telemedcare.ru/) (on Russian)
38. <http://www.nnsa.doe.gov/na-20/gipp.html> and personal comment from Gennady Z. Karataev – head Sarov local government.