A

Health

Telematics

Policy

in support of
WHO's Health-for-All Strategy
for Global Health Development

Report of the
WHO Group Consultation on Health Telematics
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Table of Contents

Executive Summary

Executive summary

At the threshold of the new millennium, the world health community faces exceptional challenges and opportunities in a rapidly changing world, with the 'double burden' of old and new diseases falling most heavily on the developing countries. In view of the considerable expectation that recent advances in information and communications technologies can offer real and practical opportunities for global health improvement, the World Health Organization (WHO) convened a Group Consultation on health telematics to examine both the benefits and risks of the use of these technologies, and propose action for integration health telematics in the overall policy and strategy for the attainment of health for all in the 21st century.

The Consultation report offers a working definition of health telematics as well as specific applications for telemedicine, tele-education in health, and telematics for health research and for health services management (section 3.3). Opportunities, barriers and critical issues are presented in section 4, including ethics and right of access to information, legal and policy issues, technical and administrative factors, sustainability, and human and cultural factors. The report outlines in section 5 the strategic elements of a proposed WHO policy integrating health telematics into health for all, as a window of opportunity, with particular attention to the needs and capacities of developing countries, elements include awareness and promotion, capacity-building, standards, regulation, quality of service, cost-benefit analysis, partnerships, financing and evaluation.

The conclusions and recommendations of the consultation are presented in section 6, dealing first with the appropriate use of health telematics in the overall policy and strategy for health for all, and for major public health purposes, including global surveillance of diseases and health hazards, building on new and existing means of partnership and institutional collaboration. Recommendations are made on planning and utilization of health informatics, driven by the health needs of people in Member States. Specific recommendations address the policy governing health telematics research and funding, as well as for dealing with relevant ethical and legal issues and regulatory structures. Finally, the report recommends to the Director-General the establishment of an advisory committee on health telematics and an internal task force, and the development of a network of existing and new WHO collaborating centres focused on health development aims and appropriate health telematics applications, policies and programmes, consistent with the overall policy of health for all.

1. Introduction

The World Health Organization (WHO) convened an international Group
Consultation on WHO's Telemedicine Policy in relation to the Development of
the Health-for-All Strategy in the 21ˢᵗ Century from 11 to 16 December, 1997, in
Geneva, Switzerland, in order to advise it on the development of a health
telematics policy (see Annexes 1 and 2). In view of
the rapid evolution in information and
communications technologies and their increasing
application in the health care sector, WHO wished
to investigate how telematics could contribute to
the practice of health education, health promotion
and patient care, in the context of implementation
of WHO's health-for-all strategy in the 21ˢᵗ century.
This report represents the policy proposal as
formulated by the Group Consultation.

During the course of the meeting, the
Consultation adopted the following
definition of health telematics: *"Health
telematics is a composite term for health-
related activities, services and systems,
carried out over a distance by means of
information and communications
technologies, for the purposes of global
health promotion, disease control and
health care, as well as education,
management, and research for health."*
(see 3.3).

2. Background

The current focus on the development of a policy for health telematics is
congruent with the overall research policy of WHO as outlined in the document
entitled "A research policy agenda for science and technology to support global
health development". This policy framework, defined by WHO's Advisory
Committee on Health Research (ACHR), underlined the critical role of
information and communications technology.

The health telematics policy needs to be integrated within the broader framework
of WHO's technology policy in support of health for all in the 21ˢᵗ century. In the
assessment and promotion of new technologies for health, the technology for
health component of the new research policy agenda explicitly considers: the
ability to contribute to life and health; the potential to promote equity; the respect
for privacy and individual autonomy; and the degree of focus on determinants of
health. The technology for health policy adopts a long time-frame and broad view
with regard to the transfer of technology, as the benefits and applications of
technology are not immediately understood, realized, or affordable. The further
development of the health telematics policy should complement the objectives of
the technology for health policy.

2.1 Trends in health at the threshold of the
21ˢᵗ century

Over the last decade, there have been rapid gains in most measures of health, such
as life expectancy and infant mortality. However, declines in health have occurred
in countries undergoing severe political and economic change. Recent examples
can be found in many countries of the former USSR and sub-Saharan Africa,
attributable in the latter case to the increasing impact of HIV/AIDS. Disparities in
population health status have increased between countries at different levels of

1

development and within most countries when stratified by measures of social status. Further, there is concern that many of the public health gains made over the past decade will not be maintained in the face of cutbacks in investment in public health infrastructures and in health systems and services.

All countries are experiencing increases in chronic and degenerative diseases caused by, *inter alia*, tobacco consumption, high fat diets, physical inactivity and stress. In many of the rapidly growing cities of the developing world, increased levels of violence and injuries reflect declines in social stability and cohesion. At the same time, infectious diseases constitute a huge burden for the least developed countries. Current developments in international trade, transportation, labor, and migration have serious implications for health conditions and health development strategies, including the application of health telematics.

Many old and traditional challenges associated with poverty-related diseases and development problems such as illiteracy, gender issues, infectious diseases and high levels of maternal mortality and malnutrition beset the developing world. In the least developed countries and those of sub-Saharan Africa, less than half the population has adequate access to care and an even lower proportion has access to adequate sanitation. In the least developed countries just over a third of women are literate, compared to the almost universal literacy levels attained in the industrialized world. This will have important implications for the introduction of new technology. The literacy gap is mirrored by an even larger gap in technological capability. For example, the industrial countries have more than nine times as many scientists and technicians per 1000 people as the developing countries, and about 13 times as many scientists and technicians engaged in research and development.

Health systems and services have had to cope with these challenges. The third evaluation of the implementation of WHO's health-for-all strategy, which covered the period from 1991 to the end of 1996, indicated that access to health services on a worldwide basis continues to increase, particularly for those elements of primary health care that influence child health and survival.

By improving the quality of, and equity of access to, health care, new information and communications technologies create unprecedented opportunities for human development, particularly education. Through these technologies, high-quality learning opportunities can be made available to many people, in many locations, on a 24-hour basis. However, only those people who possess the necessary knowledge and skills to orient themselves in the new information environment can utilize these opportunities.

2.2 Advances in information and communications technologies

Among the technologies that provide a direct benefit to health, telematics can address some of the problems mentioned above and can increase access to medical and health care. The role of technology was acknowledged in the Alma-Ata Declaration of 1978, which states that *"primary health care is essential health care*

based on practical, scientifically sound and socially acceptable methods and technology, made universally accessible... at a cost that the community and country can afford to maintain". In developing its global health-for-all policy, WHO has given explicit attention to the role of technologies for health.

The health telematics policy now recommended by the Consultation is postulated on the belief that advances in health care are a core requirement for social, economic and human development. Health telematics can serve as a lever for growth and development in communities struggling to escape poverty by permitting access to vast new pools of information, knowledge, ideas and concepts. Telecommunications can be used to promote global health. Opportunities exist for schools, clinics and community libraries as important points for interaction and the dissemination of health information.

Information and communications technologies are evolving rapidly. The costs of both equipment and use are falling. The growth in use of the Internet continues to be exponential. Many countries now recognize the importance of telecommunications for social and economic development. Consequently, significant new investments are being made in telecommunications to extend and improve networks in many countries. Regulatory barriers, high license fees, customs duties and non-tariff barriers (such as type approval) have restricted the benefits offered by new information and communications technologies in many developing countries. However, the World Trade Organization (WTO) recently concluded two major agreements which will significantly liberalize the regulatory environment and lower the costs of equipment and services. The first is the Information Technology Agreement (ITA), concluded in 1996, signatories to which agree to reduce customs duties to zero by the year 2000 on a wide range of information and communications technologies, including those used for health telematics. The second is the Agreement on Basic Telecommunications, concluded in February 1997, by means of which signatories are committed to liberalization of their telecommunications markets from 1 January 1998. This agreement is expected to increase competition, lower costs, increase the range of services and improve access to telecommunications.

Advances in science and technology have made substantial contributions to health care in the past. With increased liberalization in trade, there is a potential for them to yield even greater benefits for all in the 21st century. In particular, rapid progress in several fields should allow poorer countries to take maximum advantage of developments in technology and benefit from experiences of other countries. Strong partnerships between the private and public sectors will increase the chances that health telematics will contribute to health worldwide. Researchers, planners and decision-makers in a diverse range of geographic and development settings must be encouraged, in a spirit of international solidarity, to share expertise and resources.

In view of the above, WHO must have a clear global policy for health telematics, established within the broader policy framework of health for all and developed in close collaboration with the international scientific and academic community and with other partners such as the International Telecommunication Union (ITU) and the telecommunications sector.

2.3 Benefits of health telematics

From the experience gained so far in the deployment of telemedicine projects and services in countries around the world, a number of direct benefits from health telematics can be identified. Among them, without any ranking, are the following:

- Remote monitoring of chronically ill patients reduces days in hospital.
- Effective use of health telematics leads to overall reductions in waiting times in health care systems.
- Information and communications technologies can overcome the isolation of severely ill or handicapped patients.
- Information and communications technologies enable patients to exchange information about their experiences and give them a voice within the health care system.
- Information and communications technologies can create opportunities for health information and education to be made available in a variety of community contexts (including schools, homes and health care centres) and to hitherto disadvantaged and underserved populations, including those in urban, suburban and rural areas.
- Communities can use information and communications technologies, self-help, and health education networks to encourage peoples' participation in promoting their own health.
- The availability of multiple media (visual, textual, audio, graphic) can help overcome barriers of illiteracy by providing the user with a choice of preferred media to receive and contribute information.
- More people can be diagnosed and treated at their local clinics or hospitals, though without the facilities of urban referral hospitals. For the first time, it is technically feasible to contemplate the provision of universal health care.
- Telecommunications can assist in providing health education, information and patient care to those segments of the population hitherto beyond reach in rural and isolated areas. Health care professionals no longer need to be restricted by geographical boundaries and distance.
- Training and continuing education can be made available to health professionals who may otherwise be isolated in rural areas. Health telematics provides an opportunity for sharing knowledge and experience.
- Scarce resources such as specialists and expensive equipment can be shared by a much greater number of patients.
- Health telematics allows the global sharing of skills and knowledge. Access to international centres of excellence for various specialties becomes possible from many locations. Medical expertise can be available to anyone on request.
- Health telematics can lead to improvements in public health services, including information and disease surveillance.
- Health telematics makes possible improved quality of care through advanced techniques enhancing the effectiveness of consultations and second opinions, as well as improved quality management.
- Cost savings can be achieved by reducing the transport of patients and travel of health professionals, as well as by allowing home care of patients who would otherwise require hospitalization.

- Specialist support to mobile medical units can be provided in disaster relief and emergency situations as well as to those occurring on ships or aircraft, or in ambulance services.
- Health telematics has improved overall health care management. It has improved the availability of human resources and reduced the cost of training local health care professionals.
- Health telematics has increased collegial support to medical personnel working in remote and isolated areas and resulted in increased job satisfaction.

Thus an appropriate health telematics strategy will help overcome the current barriers to access, strengthen health promotion and improve the quality of health care for all.

2.4 Health telematics for underserved, rural and remote populations

2.4.1 Barriers to health telematics in underserved, rural and remote populations

Among the most commonly encountered barriers to the effective implementation of health telematics in countries with underserved, rural and/or remote populations are the following:

- lack of information;
- lack of training and training opportunities;
- lack of political commitment;
- lack of resources;
- frequent changes of capable personnel;
- lack of the necessary infrastructure (electricity, maintenance, etc.);
- restrictive regulations in the use of communications facilities.

With creative solutions tailored to particular cases and countries, health care professionals in developing countries can nevertheless overcome these barriers, especially when they collaborate with and get support from the telecommunications (telecom) network operators, their ministries of communications and national regulatory authorities.

By seeking obtain collaboration with the telecom community, health care professionals will improve their chances of acquiring the facilities they need for health telematics. The two communities can gain greater political support and strengthen applications to international development agencies if they work together. Health care professionals can benefit from the experience of the telecom network operators and improve the support and service they are likely to get from them. For their part, the telecom network operators can also benefit improved

communication with clients with high reliability requirements, which is likely to have a place in national priorities.

Carefully planned and collaborative pilot projects offer significant potential for developing countries. One example of collaboration might involve a district hospital and the telecom operator working together to link limited resources in rural and remote areas to clinical centres able to offer the requisite expertise. The two players could seek the support, participation and/or blessing of their national ministries of health and communications, which in turn might seek support from international organizations, such as WHO, ITU, the World Bank, and the European Commission. Such a collaborative undertaking would help the originating partners (the hospital and the telecom operator) gain access to resources and expertise and increase the chances of the sustainability of particular projects. If a small-scale pilot project shows cost savings or if the benefits clearly outweigh the costs, e.g. by improving the quality of, and equity of access to, health care, then it could be demonstrated to political leaders whose support may be necessary for the more widespread implementation of health telematics.

Health care professionals are keen to benefit from modern information and communications technologies as well as from contacts with those in the developed countries who may have experience and capabilities of benefit to the developing countries. A careful balance needs to be established in undertaking projects. Developing countries should not be a laboratory for the developed countries, nor should there be a dependency on the hand-outs of developed countries. However, if a project is carefully constructed and sustainable (even if only in the medium and long term) and if it provides the basis for expansion of the health telematics network, the country will benefit.

2.4.2 Need for special support

The needs of developing countries are different from those of the more advanced countries. In order to provide effective assistance with regard to the implementation of health telematics, WHO should give advice and necessary technical support to, and sometimes be directly involved in, efforts:

* to develop awareness and obtain political commitment at the highest levels for the implementation of health telematics;
* to ensure that the basic infrastructure needed for health telematics is available before implementation begins; for example, adequate and reliable telecommunications and access to global networks should be prerequisites for any such programme;
* to adopt the use of health telematics as a national health priority and to encourage the development of health telematics links especially within the country;
* to develop training centres to provide health workers with necessary skills in the use of this technology and to use health telematics as a means of training and continuing education for all health care professionals;
* to build linkages (e.g. through global networks such as the Internet) between developing and developed countries in the epidemiological surveillance of significant diseases;

- to assist in the development of health telematics services;
- to assist developing countries in generating the proposals and business plans which will help them acquire the resources necessary to ensure the sustainability of health telematics projects;
- to adapt the use of health telematics to national health priorities.

2.5 Potential dangers

WHO and its partners must be careful not to raise undue expectations about the prospects for health telematics to solve the world's health problems. If the potential benefits of health telematics are to be realized, it will be necessary to be aware of, and to guard against, the possible dangers of injudicious or improper use of these technologies.

Quality is a crucial prerequisite in the exchange and acquisition of health information, as only scientifically sound, reliable and verifiable references are useful in health telematics networks. As in any open information networks, this quality is not necessarily assured. The possibility of incorrect, biased, or even fraudulent information regularly reaching the consumer, without having been adjudicated by scholarly or peer review, is not negligible. While paper-based publication has established criteria and selection procedures to assure a measure of quality, no such 'restrictive' mechanisms are easily available for assessing the material being made available in the multi-user, open health telematics networks.

Information and communications technologies can be used for fraudulent purposes or to create misinformation. Some unqualified people may pass themselves off as experts or specialists, and be instrumental in the wide dissemination of wrong or harmful information. It will, therefore, become increasingly important to assess critically, and utilize cautiously, any information or knowledge disseminated on global networks.

Another danger arises from the increasing, and in itself desirable, interest people are showing in assuming responsibility for their own health. The increasing frequency of self-diagnosis and self-medication, using information provided by unscrupulous or uncontrolled purveyors of medicinal "cures" currently using the Internet to market their wares or services, could pose a risk to the health of people who fall prey to their persuasive but misleading marketing. Only aggressive education and awareness-raising will be able to counteract this.

For these and other reasons, it is of utmost importance for the successful development of health telematics to ensure that, on the one hand, only high-quality information enters the health telematics network, and, on the other, that the public is educated and encouraged to use all such information in a prudent manner.

Finally, it should be stressed that adoption of the new telematics approaches must not be at the expense of other basic health priorities such as potable water, immunization, paper-based health information, etc.

2.6 Need for a policy

Although WHO has been involved in a range of telematics-related initiatives, it has not as yet addressed, explicitly and comprehensively, the policy that should govern the integration of health telematics in the Organization's policy of health for all, and in particular in the strengthening of health systems at international, country and community levels.

In view of the health trends mentioned, and the potential benefits and dangers of advanced information and communications technologies, WHO recognizes the need for a policy on the use of health telematics in support of health for all in the 21st century.

3. Vision, aims and definitions

3.1 Vision for health telematics in global health development

A compelling vision for health telematics is that it should become a key tool in WHO's efforts to achieve its overall goal of health for all in the 21st century.

3.2 Aims of WHO's policy for health telematics

The strategy for health for all is to achieve an increase in life expectancy and quality of life for all, improve equity in health between and within countries, and ensure access to primary health care and other elements of sustainable health systems and services. One of the paramount aims of the policy for health telematics is to use information and communications technologies to increase equitable access to and exchange of health information and education in order to provide opportunities for people to improve and maintain their own health. Health telematics should strengthen the capacity and permit the cooperative networking of all relevant providers of health. This includes the provision of information and advice on health care over distance by all health professionals and between institutions. Thus health telematics use is not an aim in itself, but rather a means of attaining health aims of people.

In underserved urban and remote and rural areas, health telematics should be used to increase the amount and quality of human resources for health promotion, protection and patient care. In this way, countries will be enabled to improve their efforts in disease surveillance, prevention and control. Telematics should also help in such areas as health systems, nutrition, water supply, sanitation, and environmental health. Telematics technologies offer particular promise for the health of specific population groups, such as mothers and children, adolescents, the elderly, the disabled, and those isolated by distance. Health telematics should have a significant impact on healthy human behavior and improved education, with particular reference to overcoming illiteracy through the use of multimedia. Moreover, telematics technologies provide unique opportunities for distance learning and continuing education for all health providers.

Health telematics is not viewed as a one-way process, but as having the potential to facilitate interaction and participation, so that validated and scientifically-based knowledge is tempered with local voices and experience. Thus research in health development should be facilitated, internationally and at country and local levels.

The aim of WHO's health telematics policy must be to bring the benefits of these technologies to all peoples. Experience in some developed countries has shown that their application can enhance the cost-effective use of human, technical and financial resources. However, attention must be focused on how to ensure that these advantages are appropriately realized in developing countries and underserved areas in response to their priority needs.

3.3 Definition, concept and functions of health telematics

There are many different definitions of the various aspects of telecommunications related to health care. A formal definition is important for legislative and policy purposes. For the purpose of WHO's health telematics policy, the following definition is proposed:

"Health telematics is a composite term for health-related activities, services and systems, carried out over a distance by means of information and communications technologies, for the purposes of global health promotion, disease control and health care, as well as education, management, and research for health".

The concept of health telematics encompasses the following functional areas:

• tele-education;
• telemedicine;
• telematics for health research;
• telematics for health services management.

Tele-education for health is a dynamic process by which change can be catalyzed in attitudes, knowledge, information and skills, by means of information and communications technologies, by and for consumers, health professionals and communities, for the purpose of fostering improved health.

The most important ideas in tele-education include:

• lifelong learning;
• health promotion;
• participative education;
• education without frontiers;
• continuing professional education.

Telemedicine is the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communications technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.

10

Telematics for health research comprises a variety of scientific activities aimed at solving health problems, including:

- collaboration and networking among individuals and centres for the sharing of ideas, results and access to core competencies, information and knowledge bases;

- development of new telematics technologies and applications;

- evaluation and validation of health telematics and its effects on individuals, societies and health disciplines.

Telematics for health services management is the use of information and communications technologies for the planning, implementation, financing and evaluation of disease control and of the quality, efficiency and effectiveness of service provision. It also comprises surveillance and monitoring of the determinants of health as well as the management of human and technical resources.

These functions are applied with appropriate emphasis within and between various levels of the health system (i.e., global, regional, national and local).

11

4. Opportunities, barriers and critical issues

4.1 Opportunities

Some of the key opportunities and benefits which health telematics offers to global health development have been indicated in section 2.3. These dramatic opportunities for global health improvement must now be seized. It has long been recognized that the appropriate application, by developing countries, of advanced telecommunication and information technologies to health care delivery and research is not a luxury, but an opportunity for 'leapfrogging' the technological development cycle and allowing underserved people to benefit from a standard of health care long taken for granted in developed countries.

Especially important are the new levels of diagnostic and therapeutic quality which can be achieved by using health telematics to service physicians and nurses in remote or otherwise isolated areas - e.g. with teleradiology and/or teleconsultation. Faster and easier access to medical knowledge is possible, as is improved communication between care providers and receivers. Health telematics also offers new possibilities for the monitoring of patients, sometimes at home. This will be especially valuable for people with handicaps and those isolated by distance or other barriers. The worldwide surveillance and control of viruses and other disease vectors is facilitated by health telematics, as are efforts at collaborative research to find answers to global problems. These and many other wonderful opportunities are made possible by the appropriate application of health telematics; but none of them will be realized if the risks, barriers, and critical issues are not discussed thoroughly and dealt with in advance. The rest of this section addresses the most important of these issues.

4.2 Ethical issues and the right of access to information

The practice of health telematics will present special ethical problems. Maintaining the confidentiality of information and the privacy of patients, and safeguarding the integrity of information systems, will present continuing challenges. Gender issues are important and will have a significant impact on the way that health telematics is developed and utilized. Cultural differences among participating countries (and professionals) will have an impact on what is perceived as ethical. WHO should identify model guidelines and practices to ensure the protection of information while permitting the sharing of non-identifiable information that is fundamental to the research necessary for promoting health.

Access to national and international medical expertise is one of the most significant opportunities presented by health telematics. With the increasing recognition that access to information and knowledge is a basic human right, there is now a unique opportunity for WHO to encourage the free exchange of health information, knowledge and expertise throughout the world. In furtherance of this objective, WHO should encourage and promote a diversity of strategies to assist individuals in identifying and gaining access to appropriate sources of high-quality information and expertise.

Health telematics applications that transcend national boundaries are evolving
rapidly, presenting enormous challenges to traditional legal and regulatory
structures. WHO should identify those areas where further international
cooperation would advance the objective of providing primary and other essential
health care services and information through health telematics. It should also
encourage the Member States to accommodate health telematics within their
health systems.

4.3 Legal and policy issues

There are a wide variety of legal and regulatory issues associated with health
telematics. Countries that are using or planning to use health telematics as part of
their health systems will need to consider the interaction of these new technologies
with their laws governing:

- the security and confidentiality of patient-specific information; Health telematics raises
new challenges, especially with regard to preserving the confidentiality of patient-specific
information, that need to be carefully addressed.

- liability, standards of care, and medical malpractice; Telemedicine often involves more than
one health care provider. Attention needs to be devoted to clearly assigning responsibility
and liability for ensuring appropriate care in this context.

- computerized transactions; Commercial health telematics transactions involve important
legal issues. These include determining where the transaction "occurred" and which courts
and laws will govern any subsequent disputes resulting from the agreements achieved.

- licensing and professional standards for providing care; Some countries regulate and
license health professionals on a regional or state level. The use of health telematics is
forcing these countries to re-examine the most appropriate manner to provide full access to
national and international medical expertise.

- regulation of medical devices; As the technologies evolve which make telemedicine
possible, some countries are beginning to evaluate the quality and effectiveness of related
applications and exploring whether or not they should be regulated under the nation's
medical device laws.

- telecommunications infrastructure and requirements for universal service; Laws requiring
universal access to health telematics are being explored in many countries as part of
strategies to provide comprehensive health care services.

- teimbursement for public and private medical services; Several countries have begun to
explore the most appropriate method of financing the ongoing operation of telematics
systems. Possible solutions are now evolving and are expected to continue to evolve as the
benefits, costs and capabilities of these systems become more clearly defined.

Some countries have already adopted guidelines, regulations or laws that address
one or more of these areas. Others are just beginning to explore the issues. Sharing
information on regulatory practices will be valuable to all countries as they work
toward creating legal environments that facilitate the appropriate use of these
technologies.

Telematics links can reach around the world. In many cases the individuals providing the health care services and the patient will be located in different countries. In order to take full advantage of the potential for sharing knowledge and expertise internationally, it would be useful to promote:

- model guidelines for maintaining the confidentiality of patient data transmitted between countries;
- open systems architecture to ensure maximum interoperability of health telematics systems;
- systems to share information on the qualifications and training of health practitioners engaged in health telematics;
- policies that encourage global access to medical expertise;
- clearinghouses of information on health telematics devices that have been evaluated and approved for use by individual countries.

4.4 Technical and administrative factors

The fact that the adoption of telematics has been slower in the health services than in other sectors can be understood in terms of a number of factors that tend to impede its introduction in systems and situations which directly affect the health and security of patients and communities. These factors include, but are not limited to, the following areas.

4.4.1 Product proliferation
The number and variety of existing and anticipated products and components which are directly applicable in the area of telematics are vast. A comprehensive discussion or evaluation of these would be outdated before it is published. In addition, the constant advances in telecommunication and information technologies are so frequent, numerous and complex that if a list of products were to exist it could not be kept up to date.

4.4.2 Market-driven abandonment of products and technologies
Some telematics-relevant products, and even technologies, may be abandoned by manufacturers, although they are effective, because the total market for the items concerned is too limited to justify product support or because business priorities have shifted.

4.4.3 Regulation of telematics software
Uncertainty as to how national regulatory agencies in the developed world (e.g. the US Food and Drug Administration) will deal with medical software will affect the use of health telematics software in other parts of the world. In a developing country, it will be difficult, both practically and ethically, for telematics advisors to advocate nationwide acceptance of a piece of medical software that is not cleared for general use in the country of origin. Here the issue of software engineering quality control becomes a key factor, and some interesting questions arise. For example, will the ISO 9000 family of standards be universally accepted and used, and how will quality assurance issues be established and maintained?

4.4.4 Market-driven features
As health services are only part of the market for telematics technologies, some features of telematics products will be clinically useless, adding unnecessary cost. The massive adoption by commercial interests (banking, entertainment, retail, etc.) of such medically relevant technologies as smartcards, hand-held computers and decision-support systems "may dominate technical, pricing and other decisions" - i.e., clinical utility, patient acceptability and health impact may not be the governing factors in design.

4.4.5 Widely differing technical requirements
User needs and circumstances will vary from country to country, making it difficult to determine which technology or combination of technologies is best suited to each situation. The local development of technology and applications is extremely important, provided that it takes into account the need for compatibility with international standards and systems.

4.4.6 Major technical challenges
The sheer variety and complexity of the technologies concerned will present a number of barriers to the successful implementation of health telematics, for example:

- the rapid pace of technological change affecting the nature and extent of hardware and software options;
- the multiplicity of hardware and software options and pricing schemes;
- the scarcity of standards to assure that different hardware and software options will work together well;
- the requirements for specially adapted space, training and upgrading of skills, and support staff;
- the diversity of needs and circumstances among users.

4.4.7 Hardware and software quality
The issue of hardware and software quality will require intensive research. Standards such as ISO 9000 for software quality will be key aspects of any health telematics policy.

4.4.8 Technological obsolescence
The problem of technological obsolescence is the natural corollary of rapid technological advances. The determination, acquisition and implementation of technological configurations for specific national and regional needs, as well as the concomitant upgrading and maintenance contracts, must be carried out with care.

4.4.9 Appropriate and intermediate technology
In order to maximize the probability of successful implementation, it will be necessary to focus on the appropriateness of the health telematics systems being proposed. Ultimate success will come more easily if the technological configurations are selected or designed with an eye to the developmental and economic readiness of the society into which health telematics is to be introduced.

4.5 Human and cultural factors

Some of the human and cultural factors that can facilitate or impede the introduction of health telematics are outlined in the following sections.

4.5.1 Transdisciplinarity

The cross-disciplinary and cross-cultural sharing of knowledge implicit in health telematics cannot occur without new approaches to how learning, research, service delivery and communication are designed and managed. One research approach particularly well suited to addressing and solving multi-dimensional global problems, is encompassed in the concept of transdisciplinarity. In the words of the 1997 Declaration of Locarno, "*Universal sharing of knowledge cannot take place without the emergence of a new tolerance founded on the transdisciplinary attitude, one which implies putting into practice the transcultural, transreligious, transpolitic, and transnational vision*". The need for a problem-oriented policy suggests that the concept of *transdisciplinarity* be endorsed as a useful methodological and philosophical orientation for global health telematics, as it stresses the necessity, not just of several disciplines working together (or attempting to), but of people transcending their cultural and disciplinary boundaries and limitations in the interest of finding practical and lasting solutions to global health problems. Health telematics can be effective in the long term only if it is designed and applied according to the principles of transdisciplinarity.

Transdisciplinarity: "transdisciplinary research ... that which is between, across and beyond all of the disciplines"; from the *Declaration of Locarno* (back cover).

4.5.2 Resistance to new ways of doing things

Some health professionals may find it difficult to adapt to new methods and techniques, especially if these are based on advanced technology. The fear of technology overtaking human skills is just one of the concerns that tend to limit the prospects of health telematics.

4.5.3 Cost and cost recovery

If a service is provided in one country (or jurisdiction) and payment is made in another, the issue of how much, how to pay and to whom, will arise. Without a clear resolution of this issue, the implementation of health telematics will be impeded.

The cost of health telematics is made up of three elements: the capital cost; the cost of operation; and the indirect cost in the form of support personnel, infrastructure, etc. Lack of a policy on how to recover this cost, to what extent and at which point in time, may inhibit health telematics implementation. Over-commercialization of health telematics services and the desire to make them totally profit-making activities may badly affect their popularity. Cost recovery may involve at least the initial investment, the telecommunications cost and the time of the professionals providing the services.

4.5.4 Lack of information

Experience of health telematics is not well documented or communicated. There is a lack of reliable information both at the professional or technical level and at the

public awareness level. Many health professionals, decision-makers and members of the public are not fully aware of the potential of health telematics.

4.5.5 Lack of infrastructure

It has been said that the communities that most need health telematics are those that most lack infrastructure. Infrastructure for health telematics should not be developed in a stand-alone mode. It should build on and use the existing infrastructure. In many countries, the telecommunications networks are not well developed or are still under development. The health telematics infrastructure is the means by which medical data and any subsequent remote medical analysis are exchanged between the requester and the provider of the service. That is, it comprises the communications software and the communications medium between the two locations. The telecommunications needed would also depend on the telematics services to be supported, which could require narrow or broadband, standard or high-speed telecommunications. The health telematics infrastructure could be simple or complex, reasonable or costly, depending on the types of health telematics services to be provided.

4.5.6 Knowledge and skills of users

The knowledge, attitudes and skills of personnel who operate and use health telematics may be a serious barrier if they are not taken into consideration in the early stages of development. Three interrelated facets of human resources are connected to the success or failure of health telematics implementations:

- management and administrative personnel involved; Such staff should be made fully aware of the background, rationale and expected results of the initiative, and their input and contribution to its success should be specified. They must be fully involved if health telematics is to be integrated into health services in general.

- physicians and all other health personnel. Full briefing; training and education should be provided to all those involved with new projects. They should fully realize that health telematics is not a new branch of medicine that they have to learn; rather it is a new way of delivering medical and health care to the patient. The acceptance of health telematics by health personnel and their commitment are crucial to its success.

- consumers. Health telematics applications need to be based on peoples' needs; Research and needs assessment must inform applications designed to promote health. The development of user-friendly interfaces (based on research with users) will encourage people to make full use of health telematics.

4.5.7 Ergonomic issues (man-machine interface)

Health telematics is technology-intensive. Accordingly, all equipment, operating systems and software should be user-friendly: they should be safe to operate, easy to use, easy to learn and environmentally friendly, and they should not unduly generate stress (physical or psychological), cause illness, or give rise to fear or resistance.

4.5.8 Illiteracy

Computer illiteracy, to say nothing of conventional illiteracy, may be a barrier to the implementation of health telematics. Intensive information and awareness-

raising campaigns, as well as training, should be used to overcome this. The availability of multiple media (visual, textual, audio, graphic) can help overcome barriers of illiteracy by providing the user with a choice of media to receive and contribute information.

4.5.9 Differences in health systems

As mentioned earlier, health telematics services should be integrated in the health care delivery system. These systems differ, and no one single model of health telematics can fit all of them. This requires a special effort to adopt and adapt health telematics so that it forms an integral part of the health system. The organizational structures of different systems require different telematics configurations.

4.5.10 Cultural and linguistic differences

The current linguistic limitation of network and other software to a few of the world's main languages must not be allowed to hide the multiplicity of cultures and languages which comprise the constituencies that are to be linked by using health telematics. Efforts to make a positive impact on the health of peoples must take into account the need to be sensitive to cultural variation. The integration of cultural and linguistic differences - e.g. in icon design, screen appearance, and terminology - should be considered an important aspect of successful implementation, and will require linguistic and anthropological involvement.

There are many communication challenges, besides those imposed by distance alone, which health telematics will create and, therefore, have to deal with. These involve differences of culture and history, of values, of economic reality, of perception, and of language and meaning. Cultural and linguistic differences will be among the most interesting and difficult challenges of health telematics. Preparing health telematics professionals, building capacity in health care, and conducting successful programmes will require careful attention to the cultural issues involved, both with regard to ethnicity and language and with regard to professional "cultures". The expertise needed to address many of these important cultural, linguistic and communication issues is to be found in the social sciences, especially anthropology.

As most failures of telematics programmes are associated with human and cultural factors, those seeking to implement an international health telematics project or facility should:

- ensure that all sectors of society are considered with regard to equity and fair representation; especially important will be the need to enlist women in the development and implementation of health telematics projects and programmes;

- ensure that projects and programmes in health telematics are not technology- or vendor-driven, but rather are driven by the needs and preferences of patients, health care professionals, and clients;

- document patient and clinical benefits, as well as cost savings;

- choose or design hardware and software configurations that are ergonomically sound, safe and user-friendly;

- allow adequate time for training and upgrading of skills;

- emphasize applications-driven design, and engineering principles that take human factors into account.

4.6 Sustainability

WHO's vision is of a future world in which the benefits of science and technology will be equitably available to all countries and peoples, in accordance with the goals and values of the policy of health for all. Health telematics technology should be appropriate, in the sense that it employs practical, effective, scientifically sound and socially and culturally acceptable methods and technology that can be made available at a cost the country, community or individual can afford – in short, that it aims at sustainability. In this way, health telematics can help make health central to development, and can help build sustainable health systems – health by and for people.

Sustainability involves a number of factors:

- commitment of senior decision-makers and key user communities;
- affordability (cost based on standards);
- product stability;
- cost-benefit and cost-effectiveness;
- ease of use (user interface);
- cultural and social acceptance;
- applicability to local conditions (i.e., appropriate technology, legal constraints);
- future funding, self-reliance and human resource development;
- adherence to a user-driven (i.e., market demand);
- robustness (low maintenance).

Most health telematics pilot projects have been supported by such sponsors as international agencies, telecom operators, and university hospitals. While various examples of commercial health services can be cited – such as those involving teleradiology – they have focused on relatively well-to-do clients. Otherwise, there have been few instances of commercially viable health telematics services to the population at large.

Sustainability of pilot projects may not be achievable in the short term, especially in developing countries, but there may be significant demand for health telematics

19

services. Sustainability should be the objective of these projects, certainly in the medium to long term. Consideration should be given at an early stage to how the project might be sustained on a long-term basis. Pilot projects should be evaluated carefully to determine their cost-effectiveness and cost-benefit. Politicians will be interested especially in projects that can be shown to have yielded significant cost savings and/or more efficient deployment of scarce resources.

5. Strategic elements

5.1 Rationale

The objective of WHO's policy on health telematics is to encourage the use of information and communications technologies as a means of extending health for all, to provide advice on its introduction, and to stimulate related partnerships for delivery of health care. WHO's health telematics policy is oriented towards all countries. Even in developed countries there are people with no access to health care, such as the poor in inner cities and outlying urban areas as well as those living in rural or isolated areas. This health telematics policy identifies key issues involved in the introduction of health telematics and provides a strategy for the roles which WHO can play in the further deployment of health telematics.

5.2 Critical success factors

Health telematics systems and services should be dictated by health needs and should not be technology-driven. Factors which, if neglected, will contribute to failure need to be identified at an early stage of planning. Some of the most important critical success factors are set out below.

5.2.1 Integration with the overall health infrastructure
Health telematics services must function seamlessly within the overall health system to ensure that a certain degree of balance is achieved. The national health information system and the national health services as a whole should incorporate health telematics as an integral part, not as an auxiliary service added piecewise to the other components. WHO and its Member States should work towards integrating it into their existing programmes.

5.2.2 Awareness and promotion
The full participation and involvement of the various partners in health telematics is influenced by the level of awareness of the value and potential of health telematics. A promotional and educational campaign should precede, accompany and follow the planned activities. People in general fear the unknown, especially when advanced technologies are involved.

5.2.3 Sustainability
Health systems involving telematics components must be developed for the long term. The initial investment should take this into consideration and should be such as to ensure their sustainability over time. A sound business plan must be developed to ensure long-term economic viability.

5.2.4 Capacity-building
Human resources development and capacity-building for health telematics will require considerable attention and investment around the world and in all sectors involved in telematics. Participatory education, skills training, continuing professional education and lifelong learning will be very important.

21

5.2.5 Competition

The telecommunications and information technology sectors are witnessing a high degree of competition. Price-performance ratios are improving and health telematics initiatives should take advantage of this by careful product and service selection. That having been said, large corporations sometimes try to drive smaller, and often more client-sensitive, suppliers out of the market by offering particularly attractive deals. The likely dangers and disadvantages of the resulting *de facto* monopolies should be recognized and guarded against.

5.2.6 Standards

Clinical and technological standards should be arrived at and agreed upon. These standards may differ in their applicability from country to country, but in all cases the technological standards should ensure forward and backward compatibility, open architecture, modularity and capacity for upgrading. Health telematics uses advanced technology, which involves computers, sound, video and image processing, and telecommunications. Each of these components has its own standards, which have to be combined to get the best results. Many systems are described as "proprietary", which means that they are unable to communicate with equipment from outside their own system. This kind of equipment should be avoided in favor of open standards. The choice of health telematics technology should be based on how the need can be met by the least expensive and most accessible technology that complies with the standards. The adoption of standards is essential for the effective exchange of information.

5.3 Implementation

5.3.1 Quality of health care services

Fundamental to all discussions and activities concerning health telematics must be a concern with the quality of health care provided to patients and the community. The role of health telematics must include the setting of standards, technology assessment and programme evaluation, and the monitoring of quality in every aspect of health-related activities, systems, products and services.

5.3.2 Raising awareness of health telematics benefits and applications

There is a need to raise awareness among all the existing and potential players in health telematics, particularly with regard to the need for specific health telematics legislation and policy. WHO should provide advice on the implementation of health telematics, initially through pilot projects, together with policy guidance. There are many health telematics sites on the Internet that are appropriate for use in developing countries. These sites need to be identified so that appropriate listings can be provided to potential users.

5.3.3 Pilot projects

Countries should begin by undertaking some limited pilot projects, before nationwide introduction of health telematics. Even simple forms of health telematics may yield high returns on the investment. Telematics should not replace existing services until its cost-effectiveness and safety have been demonstrated by

outcome-based research.

Given current budgetary constraints, WHO may not be able to contribute significant amounts of funding for pilot projects. Accordingly, the ways in which it adds value to health telematics activities already taking place or to possible new initiatives should be centered on its knowledge of health problems and priorities around the world, its network of contacts, building partnerships, encouraging countries to remove barriers to health telematics, helping countries to evaluate the cost-effectiveness of pilot projects, etc.

5.3.4 Evaluation of cost-benefits

The value of health telematics has to be demonstrated over and over again, especially with regard to its application in developing countries. WHO should encourage the evaluation of the cost-effectiveness of health telematics, taking into account other priorities in the developing countries. Key experts in this area are the health economists, who should in future be involved in health telematics initiatives and discussions.

It is also worth recalling the Declaration of the Second International Congress on Education and Informatics (Moscow, 1-5 July 1996), which recommended that: "UNESCO, in cooperation with WHO, should consider reassessing the effects of information and communications technologies on the health and behaviour of children and students and disseminate the results and any recommendations to teachers, programme designers, students and the community at large".

The *Report on Telemedicine and Developing Countries* prepared by Study Group 2 of the ITU Development Sector in 1997 notes a number of factors to be taken into account in evaluating the cost-benefit of telemedicine projects, especially in developing countries. It provides a simple, user-friendly framework for the assessment of such cost-benefits. Among other things, it notes that an important factor to keep in mind when preparing a cost-benefit assessment is that telemedicine (or deployment of health telematics) is conducted in a complex and ever-changing technological, medical and political environment. Costs and priorities can change rapidly, and cost/benefit assumptions valid a few years ago, or even last year, may no longer be valid now. Many countries have experienced an improvement in cost-benefit ratios over a number of years. Projects that at first could not find funding have subsequently become feasible and have been approved. The costs of information and communications technologies are falling rapidly and the prospects for deployment of health telematics are becoming correspondingly better.

5.3.5 Legislation, policy and regulation

Keeping in mind that legislation and national policy are the prerogative of each Member State, WHO recognizes that some developing countries may wish to have its advice with regard to appropriate elements to be included in national legislation and policy on health telematics. Thus WHO should be ready to provide such advice.

5.4 **Resources**

5.4.1 Financing health telematics
The implementation of health telematics projects covers four distinct phases:

1. Preliminary studies, which identify particular medical or health care needs, assess how the project proposal can help meet those needs, identify the equipment, service and communication infrastructure requirements, and assess the expected costs and potential benefit and what each of the partners can bring to the project.

2. Pilot projects, in the form of small scale application projects to address issues of organization, acceptability and interoperability, help raise the awareness of governments and health care professionals, and demonstrate potential advantages.

3. Evaluation of initial experience.

4. Operational implementation.

Financing and expertise for implementation can come from several different sources. Public funds could concentrate on the preliminary phase and pilot projects (seed funding). Operational implementation of health telematic services could then be left to private investment for commercial services or government funding for public health services. It may well be the case that financing for any of the phases could come from several different sources at the same time, such as the following:

Government funding – Ministries of health, communications and/or industry may be willing to sponsor projects to test the cost-effectiveness of health telematics services before larger-scale deployment.

Development and aid agencies – The World Bank, regional development banks, and national aid agencies, such as the Danish International Development Agency (DANIDA), the United States Agency for International Development (USAID), the Norwegian Agency for International Development (NORAD), the Swedish International Development Agency (SIDA), the Canadian International Development Agency (CIDA), and the United Kingdom Overseas Development Agency, etc., may be willing to support pilot projects. In some instances, national aid agencies may tie assistance to the use of suppliers from their country. The European Commission has also supported pilot projects. Member States should be particularly encouraged to include user-oriented health telematics components in existing and future telecommunications projects funded by the multilateral financial institutions, such as the World Bank and the regional development banks.

International organizations – The United Nations Development Program (UNDP), the International Telecommunications Union (ITU), the United Nations Economic Commission for Africa (ECA) and United Nations Educational Science and Cultural Organization (UNESCO) have supported some pilot projects and acted as catalysts in bringing other partners together.

Universal service obligation – Government policy-makers and regulators sometime impose a universal service obligation (USO) on telecom operators as part of the licensing process. In the United States of America (USA), the Telecommunications Act of 1996 has a provision whereby telecom operators in a given country are obliged to provide telecommunications capacity for telematics delivery in remote and rural areas at rates similar to those charged to urban consumers. The telecom operators are reimbursed the difference in charges through a universal service fund which in turn is funded through interconnection charges. Such a model could be considered in funding health telematics in rural areas of other countries.

Insurance companies – Insurance companies may fund health telematics services in view of the savings to them in the cost of transporting patients. Opportunities to involve international airlines, hotel chains and insurance companies, all of which have made massive investments in top-quality wide area networks, could also be considered.

5.4.2 Building partnerships
The success of health telematics will depend on how successful project champions have been in building partnerships among some of the key players who could or should be involved in deployment of a project or service. The effective development and deployment of health telematics projects and programmes will require expertise, services and equipment from many different players.

Equipment can come from manufacturers and their distributors. Health telematics services may come from hospitals, telemedicine institutes, service providers, consultants, universities and ministries of health, among others. Communications services will be provided by telecom operators (including satellite operators and terrestrial operators providing fixed and mobile communications), broadcasters and cable companies. Furthermore, the collaboration taking place between WHO and the ITU should be mirrored at the national level, especially in developing countries, in collaboration with the ministries of health and communications, hospitals and telecom operators.

Building partnerships to undertake a project in one country could also involve partners from other countries. Partnerships can be formed not only in the context of pilot projects but also for commercial services. In the latter instance, still other players may be involved, for example, insurance companies, pharmaceutical companies, airlines (which may want to have equipment on aircraft for vital signs monitoring), and shipping lines and cruise agents (which may want to provide crew or passengers with access to on-board medical services).

There are still other players who can make an important contribution to health telematic services, including, for example, regulators, standard-setting bodies, professional associations and certification bodies.

Without attributing meaning to the order in which they are listed, the potential stakeholders in the utilization of health telematics include:

- public health and health care professionals, such as physicians, medical specialists, nurse clinicians/practitioners, nurses, midwives, epidemiologists, pharmacists, and auxiliary health staff;
- other professionals concerned with the broader area of international health policy, planning and communication; including anthropology, economics, education, informatics, and management;
- health care consumers, i.e. patients and their families;
- schools, departments and faculties of medicine and nursing, allied health sciences, social science, computer science, telecommunications, and other relevant academic disciplines;
- national academies of science, and international academic societies;
- telecommunication and computer equipment manufacturers;
- telecom operators and service providers;
- computer equipment and software suppliers;
- professional associations;
- health management organizations;
- community and university hospitals;
- insurance companies;
- pharmaceutical companies and medical device manufacturers;
- ministries of health (or equivalent);
- regulators and licensing authorities.

While the list of potential stakeholders is long, not all will be involved in each and every project. On the other hand, still others could usefully be involved. In summary, an opportunity exists for WHO to build new partnerships and improve collaboration with stakeholders, including international organizations (e.g. the ITU, the World Bank, ECA), academic disciplines and institutions, nongovernmental organizations, telecom operators and other members of the private sector, for the purpose of mobilizing resources and realizing the benefits of health telematics, with special attention to the least developed countries.

6. Conclusions and recommendations

6.1 Conclusions

The conclusion was reached that WHO should recognize the need to take immediate further action to incorporate appropriate health telematics measures, as reflected in this paper, in its strategy of Health for All for the 21st century, as well as in the operations of all its divisions and regional offices. Further collaboration with other international organizations, nongovernmental organizations and national agencies will be required in this regard. Equally, Member States will need to take similar action at global, regional, national and local levels.

It was further concluded that WHO should recognize that information and communications technologies are evolving rapidly with significant declines in cost. Health telematics offers such significant potential for developing countries that WHO's support of its wider use for health development where appropriate, is highly desirable. Investment in health telematics can help ensure that the gap between developed and developing countries does not grow even wider.

6.2 Recommendations

With regard to the Organization's overall health-for-all policy, it is recommended that WHO and Member States:

1. Integrate the appropriate use of health telematics in the overall policy and strategy for the attainment of health for all in the 21st century, thus fulfilling the vision of a world in which the benefits of science, technology and public health development are made equitably available to all people everywhere.

2. Explore and promote the best use of health telematics in public health: e.g. in disease surveillance, prevention and control, health education, health promotion, health systems and service development, nutrition, water supply and sanitation, and environmental health, with particular attention to developing countries and specific population groups that are most in need or underserved.

3. Strengthen the global surveillance system of WHO to map health hazards, pathogens, vectors and diseases, comprehensively and in appropriate detail, using health telematics surveillance systems for the generation and dissemination of valid, up-to-date and continuous information for disease control and health promotion.

4. Build new partnerships with academic institutions, national academies of science, and other academic and research organizations, ensuring the involvement of all relevant, specific disciplines, especially those dealing with cross-cultural health informatics and related issues.

5. Improve existing collaborations with stakeholders, including international organizations (e.g. the ITU, the World Bank, ECA), and nongovernmental organizations, for the purpose of (a) mobilizing resources and (b) realizing the benefits of health telematics, with special attention to the least developed countries.

With regard to specific action by Member States, it is recommended that Member States:

6. Use health telematics as a means to address their information needs and health care requirements, and to specifically include health telematics in their overall planning for health development, education, research programmes, and telecommunications.

7. Use participatory approaches to capacity-building, and support the transfer of such technologies and knowledge for training, education, and empowerment of individuals, families and communities; and emphasize the critical appraisal skills needed to evaluate information and its sources.

8. Ensure that the development of health telematics be driven by the health needs of people, in accordance with the functional and operational capabilities of WHO's divisions, regions and Member States, assuring equitable access to information for all.

9. Increase governmental collaboration in health telematics matters, including development planning, among all relevant sectors, such as health, education, communications, science and technology, and finance.

10. Make health telematics an integral part of emergency health care and disaster triage and relief efforts.

With regard to policy governing health telematics research, it is recommended that WHO and Member States:

11. Collaborate, especially in developing countries, in pilot projects which are sustainable and which provide a sound foundation for the further development and expansion of health telematics applications.

12. Explore innovative funding mechanisms, after the pilot-study stage, for making health telematics available to national populations, with a special focus on innovative approaches.

13. Emphasize health telematics in the Organization's research policy agenda being developed by the WHO Advisory Committee on Health Research.

28

With regard to legal and regulatory issues, it is recommended that WHO and Member States, individually and collectively:

14. Ensure that health telematics policies and initiatives take into account the relevant ethical and legal issues.

15. Establish a process for gathering information about Member States' legal and regulatory structures concerning health telematics, and for analyzing and helping to harmonize and highlight those frameworks that have proved to be successful in promoting and effectively utilizing health telematics.

With regard to specific action by the Director-General of the WHO, it is recommended that the Director-General:

16. Establish an advisory committee on health telematics, which would meet regularly, at least once a year, (a) to review WHO's health telematics strategy and the progress made in its implementation, (b) to develop strategic, tactical and operational guidelines regarding health telematics systems and programmes, including elements that could support the development of national health telematics legislation and policy, and (c) to make recommendations to the Director-General.

17. Establish an internal task force on health telematics, representing divisions and regional offices, to guide the implementation of the proposed strategy and to provide a link with the proposed WHO advisory committee on health telematics.

18. Establish a network of existing and new WHO collaborating centres, focused on health development aims, and with responsibilities in training, research, evaluation and the provision of advice on the implementation of international, national and local health telematics applications, policies and programmes.

Annex I

Terms of Reference

The Group Consultation was asked by WHO to:

- prepare a policy paper which could be used to improve WHO's health strategy;

- formulate guidelines for WHO's involvement in the development of telemedicine and health telematics;

- take into account the needs of the public health services and be sensitive to the socio-economic and cultural differences of developed and developing countries;

- outline the basic principles of WHO's programme on health telematics, its aims and purposes and its relationship to both the governmental and private sectors;

- identify main problems encountered in the implementation of health telematics;

- propose practical steps to introduce health telematics/telemedicine;

- provide a possible definition for health telematics/telemedicine.

Annex 2

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