Diagnosis of the telehealth situation in the countries participating in the IDB project – Colombia

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COMPONENT 1: STANDARDS

■ Does the country has a national policy of standards for the Communication Technology and Health Informatics areas (health informatics and telehealth)? If yes, does it has any internet site? Which are the standards on health informatics and telehealth used in the country? Which are the needs for telehealth standards in the country?

With regard to health informatics, the country has been developing information standardization with the progress made at the national health system. At the moment the General System of Social Security in Health has the Comprehensive System of Social Protection (SISPRO), that includes the Comprehensive System of Information in Health. However, this system is more focused on the insurance area, due to the identification of the population affiliated to the system. The Individual Registry of Service Provision (RIPS) deals with service providing and other registries for administrative support. This standardized information can be seen at the webpage *http://www2.sispro.gov.co/paginas/salud.aspx*. At present there is not any national policy of standards for telehealth, although there are already some plans to build them.

The use of standards to regulate the medical practice in the country has been very limited. For example, the International Classification of Diseases (ICD-10) and the International Classification of Health Interventions (ICHI) had been used for disease typification. Both of them can be seen at *http://www.pos.gov.co/Paginas/cupspos.aspx*. These standardizations had made possible to carry out objective analysis on the health situation in the country and they had been helpful to guide in the decision making process. With regard to health informatics, there is not any regulation on the information systems used by health service providers. Neither there is not any regulation for communication rules for medical devices, nor between the information systems. However, some minimum requirements had been defined for the electronic medical record, that had been established in Resolution 1448/2006 by the Ministry of Social Protection, *"Whereby qualification conditions are defined by institutions providing health services using telemedicine"*. There are also some references registered in Law 527/1999. *"Access and use of data messages, electronic commerce and digital signatures are defined for handling electronic data"*. These standards had been the basis for the implementation and development of telemedicine as a form of providing health services; although such standards do not form *per se* a standard, they do include some fundamental elements, such as for example the compulsory character of confidentiality and integrity of medical information using data encoding techniques. On the other hand, the DICOM standard is the default standard for medical images because capturing devices are equipped with this standard as image format, although its use is not regulated.

Therefore, it is necessary to define a framework for health institutions in order to reach access universality to health services and to enable the interoperability between computer systems. Some efforts had also been made internationally to standardize medical processes

such as the architecture of clinical documents, product labeling, medical records, rules of clinical decisions support and the exchange of health data. The messaging standard HL7 developed by the American National Standards Institute based on a model of classes covering most medical processes is the first step towards standardizing data exchange between applications (facilitating the development of interfaces).

On the other hand, the communication development creates the need for information systems to get integrated across cities, regions or countries. Thus, it is necessary to carry out standardization processes in order to ensure interoperability between systems.

The system will carry on using ICD-10 together with SNOMED CT for disease classification. DICOM will still be used for imaging and CUM and ATC/DDD for drugs. The procedure classification (ICHI) will be reviewed.

The country does not have a standardization policy to identify service providers. However, patients are standardized with their personal identification number.

With regard to Internet sites, sites such as DNP *www.dnp.gov.co*, Ministry of Information and Communication Technology, *www.mincomunicaciones.gov.co*, Ministry of Social Protection, *www.minproteccionsocial.gov.co* and HL7 Colombia: *www.hl7.org.co* are used.

- Does the country take part in International groups/studies of standard producing organizations (ISO/TC215 Health Informatics, HL7, DICOM, IEC, IEEE)? Is participation individual or at the government level?

  Colombia participates in:
  - ISO – IEC: The Colombian Institute for Technical Standards and Certification (ICONTEC). The goal of this body is to encourage standardization, certification, metering and quality management in Colombia. It has the voluntary participation of National Government representatives, private sectors of production, distribution and consumption, the technological sector in its different areas and any individual or company interested in taking part.
  - ICONTEC: as the National Standardization Organism (ONN) represents Colombia before international and regional standardization bodies such as the International Standardization Organization (ISO), the Internation Electrical-Technical Commission (IEC) and the Pan-American Standards Commission in the Pacific Basin (COPANT) *http://www.icontec.org/.*

- HL7: Foundation HL7 Colombia is an open organization that welcomes different entities from the health sector. Its goal is to promote knowledge, use and implementation of HL7 standard in Colombia. The main program of HL7 Colombia is to promote and standardize in the country the use of HL7 standard for exchanging, handling and integrating electronic information on health *www.hl7.org.co*.
- IEEE: The IEEE chapter in Colombia addresses student areas. A Student Area is a group officially formed at the world IEEE, composed of undergraduate and graduate students from different academic programs of a given university which main goals are the constant professional recycling, research, development and implementation of new technologies.

One of its main activities is to organize and participate in technical conferences and talks of professionalization, knowledge generation through research, development and implementation of new technologies.

- Which is the government or civil institution belonging to the national system of standardization and also recognized by ISO? Is this institution also organized to produce standards on health informatics and telehealth?

The institution certified by ISO in Colombia is ICONTEC, which is the competent body to certify Accreditation of Service Providing Institutions in Health within the Compulsory System of Quality Assurance. However, work has not started yet on standard definitions for telehealth. ICONTEC is expected to take on the responsibility to carry out certification of telehealth related standards.

- Which is the role of the Ministry of Health in the country regarding standardization? Is its role more of a regulator using standards produced nationally and internationally by other institutions or is it also the producer of technical standards? How is the Ministry of Health currently organized regarding health informatics and telehealth issues? Please explain.

The Ministry of Social Protection in Colombia issues policies and verifies if technical standards are being adequately used. The Ministry of Social Protection using its regulating role, has defined minimum standards for service provision in health using telemedicine within the Compulsory System of Quality Assurance regarding the Single Qualification System. Standards related to the topic are as follows:

- Resolution 1995 of 1999: *"Whereby guidelines of medical record in Colombia are defined"*, setting up a precedent in the validity of electronic medical record;
- Law 1122/ 2007 – SGSSS Reform: It promotes telemedicine services in places with difficult access;
- Law 1151 National Development Plan 2006-2010: It establishes that 0,3% of the Payment Unit for Training;
- U.P.C of the Contributory and Subsidized Regime must go to telemedicine coordination and financing services;
- Act 1011/ 2006, *"Whereby the Compulsory System of Healthcare Quality Assurance of the General System of Social Security in Health is established"*;
- Resolution 1448/ 2006: Whereby the qualification conditions for health service providing institutions using telemedicine are defined.

Technical standards issued by the Ministry of Social Protection are based on the previous knowledge of international standards. Thus, the Ministry organizes meetings with stakeholders of the country to discuss the standards with academic institutions, industry and associations.

- Technical standards production processes follow an open building process with the participation of producers, consumers and neutral groups (universities and government)? Please describe.

In general the Ministry of Social Protection carries out a participatory process involving different players of the Health System in the process of building technical standards. As it was mentioned in the previous question the Ministry also works with other key players. Projects are previously published in the webpage of the Ministry of Social Protection before they are approved and issued in order to make adjustments when necessary.

There are other technical standards production processes in Colombia supported by ICONTEC and based on ISO standards. With regard to the health sector, the Single Accreditation System (SUA) of the Compulsory System of Healthcare Quality Assurance contributes to ensure people's right to life and therefore, their right to health. It also ensures respect and promotion of values like equity, fairness, solidarity and dignity by healthcare organizations. ICONTEC is the institution in charge of certifying the Accreditation of Health Providers as a voluntary process implying the responsibility of *"attesting to the quality of healthcare organizations"*, a mission done with a full political and social commitment and a deep ethical standard, since accreditation represents a challenge that should contribute to improve healthcare services provision. ICONTEC leads a cultural transformation process with the organizations of the sector, promoting a voluntary and fully responsible participation of companies in the self-assessment, improvement and external evaluation processes with due confidentiality, right attitude, respect, flexibility and reliability.

On the other hand, the HL7 Colombia organization promotes the Technical Committees with the participation of its members. These Committees address the promotion and use of the HL7 V3 CDr2 version generating implementation guidelines that specify the standards of interchangeable and interoperable CDA "documents" between Colombian health organizations. The HL7 Technical Committees are in full operation at the moment, each committee has its own work plan and is run by a Coordinator. Each committee is composed of an interdisciplinary group of HL7 members and the main outcome of the committees is the specification of implementation guidelines for the use of HL7 V3.

COMPONENT 2: MANAGEMENT OF TELEHEALTH PROJECTS

- Is there any national or state/department-level telehealth Project in the structured public setting? If yes, please enclose the project.

A national project has been in operation for the last four years. It is related to health service provision using telemedicine covering 140 Public Health Institutions (IPS) in the most remote regions in the country. Two types of services are provided: Tele basic care and Tele-intermediary care including training and continuous education using Tele-education. The project is funded by the national government and it is coordinated by the Ministry of Social Protection, its operation is done by a Health Promotion Entity and Health Service Provider known as CAPRECOM. The Project has the participation of three Reference Centers, National Universities of Colombia and Caldas through its Telemedicine Centers and the Cardiovascular Foundation from Colombia.

In addition there is a binational project between Colombia and Peru called Rural Telemedicine Network in

the Putumayo River Basin. The feasibility study has already been done and the project will start in the following days covering 13 health providers in both countries.

■ Are there any municipal or university level initiatives related to telehealth that would enable the country to experiment telehealth projects? Are these initiatives public, private or mixed?

There are telehealth projects developed by some universities as for example the National University of Colombia, the University of Caldas and the University of Cauca, among others.

There are also some initiatives at the provincial or city level which are mixed initiatives with the participation of the national government and the private sector as for example operators and ICT industry.

The private sector also has experiences of Health Service Providers like the University Hospital of Santa Fe of Bogota, the Cardiovascular Foundation from Colombia, and private institutions such as Saludcoop, a Health Promotion Company, telemedicine companies as ITMS from Colombia and CINTEL, among others.

In addition, some territorial organizations had made important efforts like the government of the department of Meta that finances and coordinates health service provision using telemedicine in all its municipalities.

■ Is there any regulation related to the professional exercise of telehealth at professional boards in the healthcare area?

The only regulation on telehealth until now has to do with Resolution 1448/2006 that establishes the standards to provide health services using telemedicine. However, the Ministry of Social Protection is currently in the process of organizing the patient-centered Unified Information Service. There is also a bill pending sanction of the president *"whereby the guidelines for telehealth development in Colombia are established"*, that establishes the responsibility of the physician for the use of telemedicine in providing health services.

The National Learning Service (SENA) together with several entities, issued the competency standard for healthcare services operators using telemedicine.

■ Is there any remuneration policy for procedures or actions related to telehealth?

With regard to health service provision using telemedicine, the payment of procedures and activities is done according to the fees already existing in Colombia. Therefore, the same fees of face to face health services are applied.

■ Are there any national, state or local assessment projects of the implemented experiences?

A cost-effectiveness study comparing health service provision using telemedicine and the traditional face to face service was done.

COMPONENT 3: STRATEGIES FOR THE USE OF TELEHEALTH IN THE PROMOTION, PREVENTION AND PROVISION OF HEALTHCARE SERVICES

■ Assess the initiatives of your country, regarding healthcare services offer through telehealth resources as being: non existent, planned, executed, installed and advanced. Comments.

There has been some progress in the initiatives done by the country on healthcare services using telehealth, since it is currently developing the third stage of the project with the goal of extending intensive tele- care services to five pathologies, namely: initial treatment of cranio-encephalic trauma, medical or surgical originated sepsis, acute coronary syndromes, chronic obstructive pulmonary disease exacerbation and complications related to pregnancy and labor. At the moment 140 municipalities from 27 different departments provide services using telemedicine, most of them are located in very remote areas across the country. The target population of the project is those affiliated to the General System of Social Security in Health from both regimes and the poor population that does not belong to the system estimated in approximately 10 million people.

■ Assess the initiatives in your country, health prevention and/or promotion through telehealth resources as being: non existent, planned, executed, installed and advanced. Comments.

We consider it is installed, however it is necessary to further emphasize health promotion and disease prevention using ICTs.

■ With regard to the number of initiatives already described and having into account the level of telehealth development in the country, please describe the key success factors and the difficulties found.

With regard to health service provision using telemedicine and training and continuous education through telehealth, the following factors are important to mention:

Success Factors

- Development of our own technologies designed to better adapting to the needs and infrastructure of the country;
- Connectivity available in most regions of the national territory;
- Training provided to all people involved in telemedicine projects;
- Specialized medical service provision according to the needs of each region;
- Favor the most remote regions of the country with health services using telemedicine;
- Reduction of patient referrals to large or medium sized cities, contributing to reduce medical care costs both for patients and their families and for the health system.

Difficulties

- Connectivity interruptions, specially in very remote places;
- Limited commitment of healthcare professionals to use the tool, as well as the failure of healthcare institutions top management to optimize the use of telemedicine for providing health services;
- High rotation of healthcare staff working at the service providers companies where the project operates specially among professionals doing their rural internship;
- Not fully developed training on the use of ICTs at Higher Education institutions;
- Public order related issues in several regions of the country.

COMPONENT 4: STRATEGY FOR A RESEARCH NETWORK ON TELEHEALTH - RELATED TOPICS

- Are there any health institution carrying out videoconferencies sessions (IP, H323)? If yes, which? Classify the initiatives on this as: non existent, planning, put into operation, advanced or not applicable.

Yes, some Service Providers Institutions have videoconference sessions through the RENATA network with IP H323, as well as several universities like the University of Antioquia and the National University of Colombia that uses an Internet channel with H263, making communication possible with first and second healthcare level Service Providers Institutions with satellite infrastructure, which is not that good. Videoconferences are used in the telemedicine project coordinated by the Ministry of Social Protection. There are also other platforms used to do videoconferences and staff training such as the Observatory of Healthcare Quality.

The Pablo Tobón Uribe hospital in the city of Medellín has Webex communication channels, enabling videoconference via IP from any assistance or administrative area. They are used in surgery and radiology, among others.

- Are there any health institutions that carry out webconference sessions? If yes, please state which ones. Classify the initiatives on this regard as: non existent, planning, put into operation and advanced or not applicable.

It is advanced in universities like the University of Antioquia and the National University, also at the Ministry of Social Protection and at those health institutions working with the RENATA network, such as the Santa Fe of Bogota Foundation, the Cardiovascular Foundation from Colombia, the Pablo Tobon Uribe Hospital, among others. The Cardiovascular Foundation from Colombia, for example, uses the telemedicine, research and education network and it signed a contract with the University of Pittsburg for some services using telemedicine.

- Which health related topics are being treated today in virtual sessions by Health Research Groups? Will topics like surgery, for example, be adequate for virtual sessions? Classify the initiatives on this regard as: non existent, planning, implementation, put into operation, advanced or not applicable.

Virtural sessions are carried out in some universities for training. There are some examples:

- During the last seven years training sessions and activities of continuous medical education are carried out at the National University, initially using the university network at different units and more recently using the educational platform Sofía. This platform has allowed putting together virtual courses on the 15 existing specialties available to physicians of the 43 first and second level hospitals which are members of the University in the project led by the Ministry of Social Protection.
- There are also private entities such as IDALIBA that works on different topics. Below some of the modules prepared:

- High blood pressure and its complications;
- Chronic Obstructive Pulmonary Disease;
- Diabetes mellitus and its complications;
- Obesity, Dislipidemias and Atherosclerosis;
- Mental Diseases;
- Pulmonary Thromboembolism;
- Irritable Bowel Syndrome;
- Peptic acid Disease;
- Tropical Diseases: Dengue, Malaria, Leishmaniosis;
- Ophidic accident (snakebites) and bites from poisonous animals;
- Course on Pandemic virus A (H1N1);
- Sleep Obstructive Apnea;
- Adult and Paediatric Gastroesophageal Reflux Disease;
- Asma in adults;
- Asma in children.

There are some training experiences of virtual courses on surgery such as the transmission of surgeries using ICTs. It is important to note that the Cardiovascular Foundation from Colombia does monthly virtual sessions with the University of Pittsburg for the case analysis of paediatric cardiovascular surgeries and children in cardiovascular intensive care.

- Is there a National Project, such as the Telemedicine University Network in Brazil, integrating University and Teaching Hospitals, universities and health research and educational institutions? How do they practice their integration? If there is any, please state which. Classify the initiatives on this regard as: non existent, planning, implementation, put into operation, and advanced or not applicable.

We do not have a telemedicine university network in Colombia but we do have the RENATA initiative that has a platform for organizing material.

COMPONENT 5: TRAINING AND CERTIFICATION COURSE OF TRAINING MATERIAL

- Are there any telehealth modules in undergraduate or graduate health related degrees at the main universities in your country? Which?

Although we do not have much information on this, we know that universities such as the National University, the University of Antioquia, the Pontificia Bolivariana and

CES have some work on this topic.

Here the experience of some universities:

The National University:

- There are three courses on advanced telemedicine for all undergraduates at the schools of health and engineering at the university. The training experience for the National Learning Service is important because the university has trained lecturers who are training technologists in telemedicine.

University of Antioquia:

- Medical Informatics I: In the first semester with some introduction to the role of the physician in the world of ICTs. Information retrieval and adequate use of technology.
- Medical Informatics II: This subject is studied in the fifth semester aligned with the introduction to clinical areas. It includes legislation, context and reach of medical informatics, ICTs and Health, social medias, practical tools of telehealth.
- Internship: There is experience in telemedicine followed by the Telemap projects and the e-health component of ARTICA (Regional Partnership of Information and Communication Technologies)
- Continuous Education: Graduate Degree in Computer Sciences and health (virtual), duration 180 hours.
- Surgical Instrumentation: It is similar to the Medical Informatics I content of Medicine.

Pontificia Bolivariana University:

It has the cross-curricular proposal implemented in the School of Medicine. The extension to the Degree of Nursing is being considered. It includes the following:

- Generalities on e-health – Public Health;
- On-line learning tools in Medicine – anatomic and histological models;
- Medical and assistance registries;
- Legal aspects;
- Ethical aspects;
- Types and varieties;
- Medical record;
  - Structure;
  - Content;
  - Legislation;
  - Uses;
  - Assistance;
  - Legal;

- Educational;
- Financial Administrative;
- Supporting system for decision making Internal Medicine;
- e-health impact and the information era on professional practice Public Health;
- Social medias and medicine Public Health;
- Consumer informatics (patient – information systems relationship);
- Gathering, storing, analyzing and showing clinical information;
- Comprehensive Health Information System in Colombia;
  - History;
  - Importance (Internship);
  - Conceptual basis;
  - Policies and Strategies;
  - SIIIS Structure (Internship);
  - Reporting systems (Internship) Public Health;
  - Coding Systems (Internship) Public Health;
  - Information flow;
  - Vital and epidemiological statistics (Internship) Public Health;
- Telehealth (Internship UED).

■ On the context of healthcare services, are there structured training courses on telehealth? Which ones are they and which institutions produce them?

The development is still in an early stage but there are some progress done since several universities and the National Learning Service have made some efforts to structure telehealth courses. The National Learning Service for example provides technical specialization in telemedicine.

■ Are there content certification processes related to health topics disseminated through the structure of telehealth government projects? How is it done?

We know of the Degree on Computer Sciences and Health at the University of Antioquia. The telemedicine project coordinated by the Ministry of Social Protection includes the tele-education component and it provides certification. In addition, the National Learning Service offers a series of virtual courses with its respective certification.

■ Is there any teaching institution working with 3D organic modeling, animations in courses for healthcare professionals?

Yes, at several universities such as CES, the UPB, the University of Antioquia and the National University, the latter has been developing simulations. The *Nukak3D*, developed by the Bioingenium group at the National University is available at the open source platform sourceforge with more than 5.000 downloads in the last two years around the world.