Ecuador National Program on Telemedicine/Telehealth

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Abstract

The aim of this paper is to show the current situation of the national telehealth project in Ecuador, which is being implemented at the moment. Documents related to the formulation process of telehealth actions in Ecuador and technical feasibility aspects of the proposals were analyzed, together with documents related to the formulation of public policies involving telehealth actions. The next step was to systematize the experience of implementing telehealth actions in Ecuador, considering the context of the telehealth national policy, the main telehealth components planned and implemented, the scope of teleheatlh actions and the description of the first results obtained. The paper concludes saying that the telehealth national project is currently implemented and it first started in the Amazon region municipalities with teleconsultation and training activities enabled by the Ministry of Health and the main universities of the country.

Key-Words: *Information and Communication Technology Projects; Telecommunications; Telemedicine; Primary Health Care.*

Resumen

Programa Nacional de Telemedicina/Telesalud Equador

El objetivo de este artículo es mostrar la situación actual del proyecto nacional de telesalud que está en fase de implantación en Ecuador. Se analizaron documentos referentes al proceso de formulación de las acciones de telesalud en Ecuador y aspectos de viabilidad técnica de las propuestas, además de los documentos relacionados con la formulación de políticas públicas incluyendo las acciones de telesalud. A continuación se realizó una sistematización de la experiencia de implantación de acciones de telesalud en Ecuador, considerando el contexto de la implantación de la política nacional de telesalud, principales componentes de telesalud previstos e implantados, cobertura de las acciones de telesalud y descripción de los primeros resultados obtenidos. El artículo concluye afirmando que está en marcha un proyecto nacional de telesalud, que comenzó su implantación a partir de los municipios de la región amazónica ecuatoriana, con actividades de teleconsultoría y actividades formadoras, facilitadas por el Ministerio de la Salud y por las principales universidades del país.

Palabras-clave: *Proyectos de Tecnologías de Información y Comunicación; Telecomunicaciones; Telemedicina; Atención Primaria de Salud.*

Resumo

Programa Nacional de Telemedicina/Telessaúde do Equador

Este artigo pretende evidenciar a situação atual do projeto nacional de telessaúde que está em fase de implementação no Equador. Foram analisados os documentos referentes ao processo de formulação das ações de telessaúde no Equador e aspectos de viabilidade técnica das propostas, além dos documentos relativos à formulação de políticas públicas envolvendo as ações de telessaúde. A seguir, foi realizada uma sistematização da experiência de implementação de ações de telessaúde no Equador, contemplando contexto da implantação da política nacional de telessaúde, principais componentes de telessaúde previstos e implementados, abrangência das ações de telessaúde e descrição dos primeiros resultados alcançados. O artigo conclui afirmando que atualmente está em curso um projeto nacional de telessaúde, que iniciou sua implantação a partir dos municípios da região amazônica equatoriana, com atividades de teleconsultoria, viabilizadas pelo Ministério da Saúde e pelas principais universidades do país.

Palavras-chave: *Projetos de Tecnologias de Informação e Comunicação; Telecomunicações; Telemedicina; Atenção Primária à Saúde.*

INTRODUCTION

Devised under the scope of the National Plan for Good Living the National Program on Telemedicine/Telehealth has the primary goal of strengthening the health care model through a referral and counter-referral network, ranging from primary care units up to second and third level hospitals. The deployment of online tools helps the National Health System to become universal and free to all Ecuadorians, providing general and specialized medical consultations, either remotely or on an emergency basis, as well as second opinions for diagnostic purposes. The National Plan promotes management, training, literature review, as well as promotion, prevention, research and multiculturalism, in order to guarantee the principles of universality, equity, quality and system efficiency along the Comprehensive Public Health Network.

The National Telemedicine/Telehealth is carried out under the leadership of the Ministry of Public Health (MSP), through the Process of Science and Technology (PCYT) and a strong engagement and cooperation of various public and private institutions, meeting the proposal through the development of projects that will gradually cover the 24 provinces of the country, combined with interagency agreements signed between the MSP, MINTEL, Ministry of Planning and National Development (SENPLADES), National Telecommunications Secretariat (SENATEL), Ecuador Army (FAE) and universities.

General Overview of the Implementation

The implementation of this proposal demands as follows:

- Adequate facilities and connectivity Infrastructure;
- Provide equipment for the selected health units;
- Provide proper connectivity;
- Train healthcare and auxiliary staff as well as community members;
- Set up administration, technical and medical networks to accomplish this new way of providing management and health care;
- Concomitantly to that, a new legal framework should be developed for Telemedicine: Laws, Policies, Health Care Models, Standards, Guidelines, Protocols and Procedures.

Implementation phases:

The implementation of Telemedicine/Telehealth has started throughout the Amazon region and has been divided in three stages:

Phase 1: The Morona Santiago – Pastaza – Napo Pilot Project (2009-2011) is currently ongoing and just about to be concluded. This phase will connect remote and isolated rural areas from Morona Santiago (TAISHA Hospital, San José de Morona Health Centre (SCS San José de Morona) and Pastaza (SCS Musullacta, SCS Santa. Clara, Montalvo) to Macas, Puyo and Tena Municipal Hospitals and to Eugenio Espejo, “Isidro Ayora” Maternity Hospital, “Baca Ortiz” Paediatric Hospital; FAE Teletrauma Centre, all of which being General and Specialty Hospitals. This project is sponsored by the Telecommunication Fund (FODETEL).

Phase 2: Sucumbíos-Orellana-Zamora and Galápagos Project had its proposal approved and prioritized by SENPLADES and sponsored by MINTEL, meant to cover along 2011-2012 the Amazon together with Proyecto Sucumbíos, Orellana, Zamora, Loja and Cuenca, includes areas form the following Amazon Provinces: Sucumbíos (HG Nueva Loja), Orellana (CSC Loreto, HG Francisco de Orellana), Zamora (HB Zumba, HG Zamora) as well as reference hospitals from Loja y Cuenca municipalities.

Complementation of Phases 1 and 2: Inclusion of new areas from the Amazon and Galapagos combined with the integration and strengthening of telemedicine spots managed by Private Technical University of Loja and 2 spots by the Equinocial Technological University of Quito.

Phase 3: Upscaling to a national level over 2012-2014, interinstitutional management phase implemented by the national level system, gradually including new rural areas and expanding telemedicine equipment and service providing.

TELEMEDICINE/ TELEHEALTH NATIONAL NETWORK STRUCTURE

PHASES 1 AND 2: 2009-2012 (AMAZON)

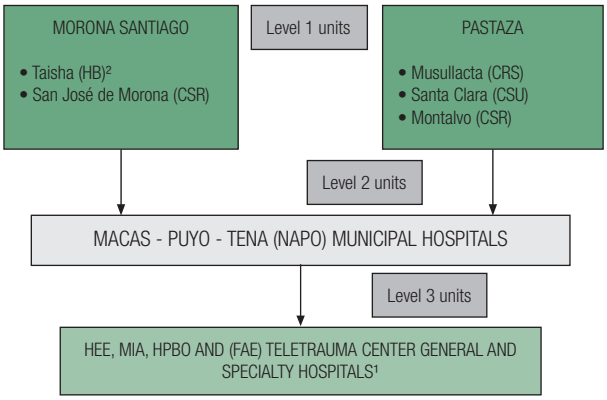

Figure 01: Phase 1.

¹(HEE): Eugenio Espejo Specialty Hospital; (MIA): Isidro Ayora Gynecology/Obstetrics Hospital; (HPBO): Baca Ortiz Pediatric Hospital; Tele-Trauma Center of the Ecuadorian Army.

²HE: Specialty Hospital , HES: Specialty Hospital , HG: General Hospital , HB: Primary Care Hospital , CSU: Urban Healthcare Unit, CSR: Rural Healthcare Unit, PS: Emergency Care Unit.

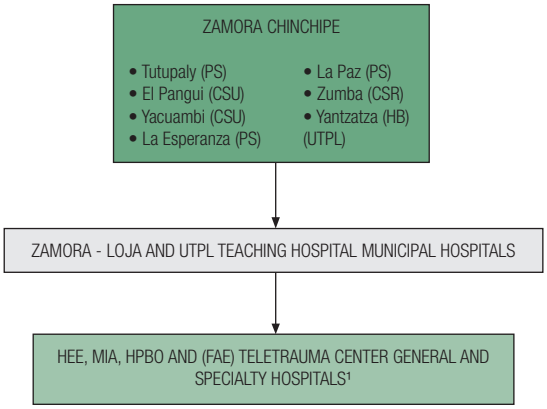

Figure 02: Phase 1–2.

¹(HEE): Eugenio Espejo Specialty Hospital; (MIA): Isidro Ayora Gynecology/Obstetrics Hospital; (HPBO): Baca Ortiz Pediatric Hospital; Tele-Trauma Center of the Ecuadorian Army.

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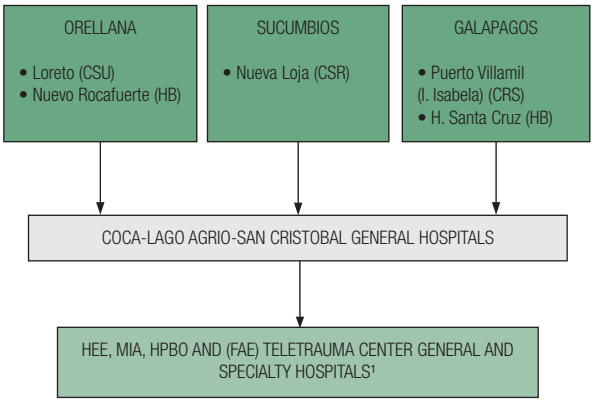

Figure 03: Phase 2.

¹(HEE): Eugenio Espejo Specialty Hospital; (MIA): Isidro Ayora Gynecology/Obstetrics Hospital; (HPBO): Baca Ortiz Pediatric Hospital; Tele-Trauma Center of the Ecuadorian Army.

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National expansion of Phase 3 proposal presents the same structure:

- A transmitter;
- A receptor;
- A communication media to transmit the necessary information: to be provided by the Ministry of Telecommunications and Information Society (MINTEL). To be accomplished at the units of Phase 1 network;
- A media to transform information;
- Physical infrastructure of Healthcare Units (Telemedicine sector or room) and telecommunications.

TELEMEDICINE NETWORK COMPONENTS

- Consultant Centres (primary care Centres: HB, CSU, CSR, PS); Primary care Patients and Physicians;
- Consulting Centres (second and third level hospitals: HG, HE, HES): Specialty and Family Physicians;
- Telecommunication Network, with specific requirements regarding connectivity and quality of service (to be determined);
- Equipment that meet the interoperability standards: medical equipment, computers and communications;

- Human Resources Manager: Coordination, Management, Direction;
- Human Resources Support: IT, telecommunications and biomedical;
- Human Resources Support: administrative.

CONNECTIVITY PHASES 1 AND 2

According to where in the map the Healthcare Units are located the Ministry of Telecommunication defines the type of Connectivity (MINTEL)

- Optic fiber;
- Satellite Plataforms;
- ADSL, etc.

EQUIPMENT: medical, computing and communication equipments.

EXPECTED BENEFITS

The following is expected in general terms with the implementation of Telemedicine/Telehealth:

For the population

- According to the equipment available, it is expected to obtain and exchange information, data, images, audio and video, between healthcare units (1st, 2nd and 3rd level) integrated into the network to carry out diagnosis, treatment, prevention and surveillance actions, as well as for the management of patients, service provision and coordination – feedback between the central and the local level. This will make possible to provide timely, efficient and quality health services to the population;
- To reduce the unnecessary visits of patients to second and third level specialized hospitals for outpatients consultations and the associated economic and emotional cost of the transfers for patients and their relatives to unknown places in search of specialized medical care;
- To offer low income population access to specialized services without having to leave their town.

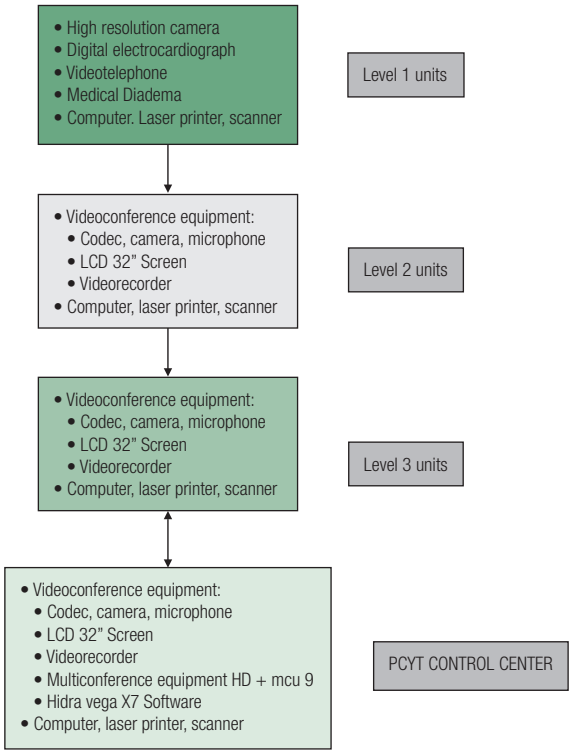

Figure 04: Medical, computing and communication equipments.

For the Healthcare Staff

- To reduce the feeling of isolation and abandonment experienced by rural health professional, since they can be connected to the world and their families;
- To increase the satisfaction level of healthcare professionals at greater resolution centers with the possibility of supporting their peers who are located in remote centers and at the same time be part of the strengthening process of Human Resources in these areas. They also feel they are an active part for the improvement of the Health System focused on the most vulnerable sectors of society.
- To enable personal and professional development of healthcare professionals who work both in urban settings and at remote places since they have access to research and recycling, training and continous education programs.

TELEMEDICINE/TELEHEALTH SERVICES, INITIALLY PLANNED

Telemedicine/Telehealth Services can be organized as follows and according to the equipment found at the healthcare units of the network, it will be possible to carry out the following services:

- **Teleconsultation:** Between physicians working in rural areas and hospitals with specialists.
  - Off-line consultation (e-mail);
  - Real time teleconsultation (videoconference);
  - Urgent teleconsultation (unprogrammed) and (real time).
- Medical and Health tele-assistance
  - Teleconsultation/Telediagnosis:
    - Radiology (not at first level units, we do not have equipment for this);
    - Surgery (at the beginning only videoconferences from large hospitals through smart operating theaters with teaching and education purposes);
    - Dermatology, Cardiology, other specialities;
    - Monitoring and surveillance.
- Telemedicine to provide information services for citizens;
- Patients management and appointments;
- **Tele-education:** Information, training, professional recycling and education services for professionals;
- Research.

URGENT ASPECTS TO TAKE INTO ACCOUNT

The following topics are being discussed by the work team at different national and international meetings:

- We have a legal framework that not only protect us but it is mandatory for the immediate exercise of Telemedicine-Telehealth in the country, as the responsibility of the Ministry of Public Health, Science and Technology and MINTEL: the Constitution of the Republic, Organic Law on Health, Organic Law for the National Health System, National Plan of Good Living, Special Reformed Telecommunication Law, Goals, Strategies and Institutional Plans, Ministry of Public Health and MINTEL. However, it is necessary and urgent to develop: policies, standards and a legal basis specifically for Telemedicine;
- Safety and confidentiality;
- Legal and ethical implications ;
- Definition of standards (using technological and clinical standards);
- Features of the connectivity links in order to transfer medical information, audio, video and images;
- Definition of responsibility levels for physicians, healthcare and auxiliary professionals;
- Definition of medical care through Telemedicine/Telehealth in the country. Gradual application of the model in each implemented phase (1, 2 and 3).

CRITERIA FOR EQUIPMENTS AT MEDICAL UNITS

- Analysis of needs;
- Morbi-mortality statistics;
- Geographical features;
- Level of medical care;
- Available or feasible connectivity services;
- Referral and counter-referral of patients;
- Features of the benefited population.

CRITERIA FOR SELECTING THE LOCATION OF THE UNITS

- Influence area of the healthcare unit;
- Target population to receive the benefits;
- Service demand *per* specialty;
- Morbi-mortality and referral statistics;
- Willingness and leadership of healthcare professionals;
- Specialized medical staff available;
- Feasibility of the Telecommunication Network;
- Distance and accessibility.

INVOLVED INSTITUTIONS

- MSP, MINTEL, SENPLADES, FFAA, public and private universities, other public and private institutions.

PROVINCIAL TEAMS OF THE MINISTRY OF PUBLIC HEALTH TELEMEDICINE/TELEHEALTH

- Health Provincial Directors;
- Hospital Directors ;
- Healthcare Units Directors;

- Local people responsible for telemedicine (at each healthcare unit of the Telemedicine network);
- IT Technicians appointed by the Directors of Operational Units for information technology support.

RELATED PROJECTS AND PROGRAMS

Some projects and programs carried out in Ecuador complement and strengthen the actions of the National Program of Telemedicine/Telehealth:

- National Program of Continuous Education (virtual) for medical staff, led by PCYT-MSP, focused on fourth level training processes with curricular recognition (Implementation of ongoing program);
- Automation of Flagship Hospitals of the Ministry of Health. Pilot Project: Hospital de Macas;
- Structured Wiring Project (connectivity) at 428 healthcare units in 15 provinces;
- Co- participation in the "Implementation of a National Training Program on Telemedicine run by CEDIA-Universities;
- Focus Point-Ecuador in the IDB Project, Public Policies in Telehealth;
- National Plan of Connectivity, having health and education as priorities;
- National Program of Digital Enrolment run by MINTEL;
- With the National Program EURO-SOLAR 91 rural communities without access to electricity will recieved a source of energy with the installation of solar energy kits made of photovoltaic solar panels and a airgenerator for energy production. This program is run by the Ministry of Electricity and Renewable Energy.

QUALITY MANAGEMENT

All actions of management, execution, assessment and development of Legislation for the Telemedicine/Telehealth Program are done using the criteria of Quality Management, such as planning, follow up, measurement, analysis and continuous improvement, with the aim of meeting the needs of the population.

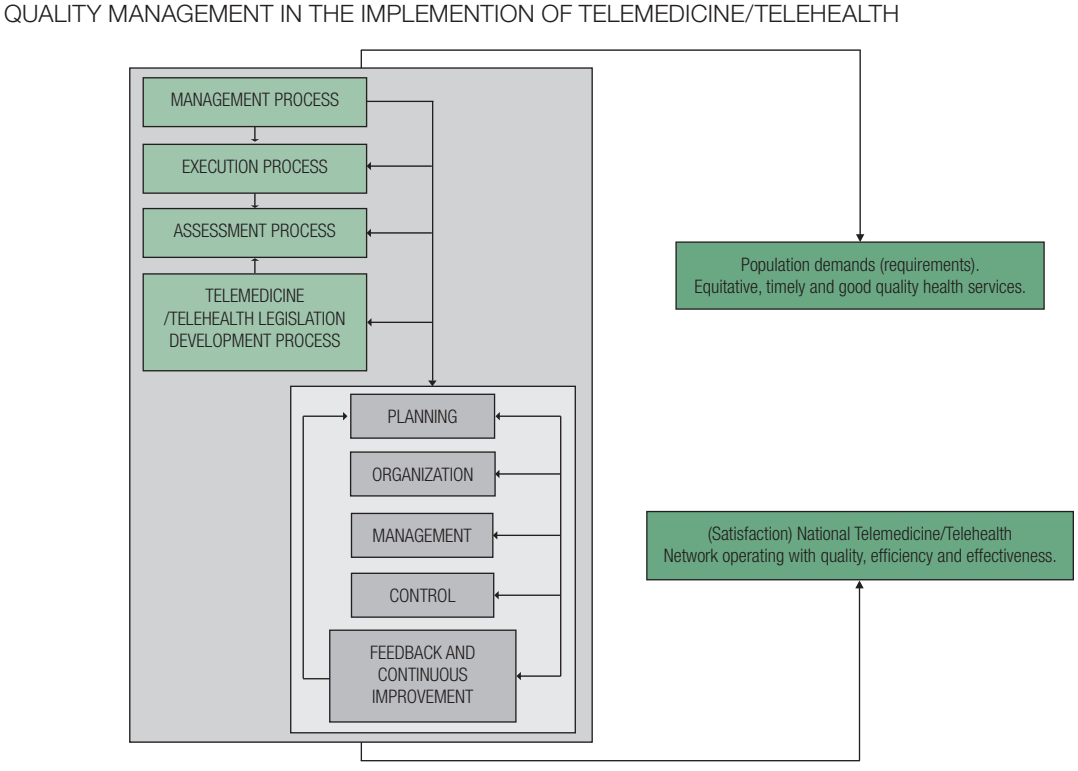

Figure 05: Own work: Quality Management National Telemedicine/Telehealth Program

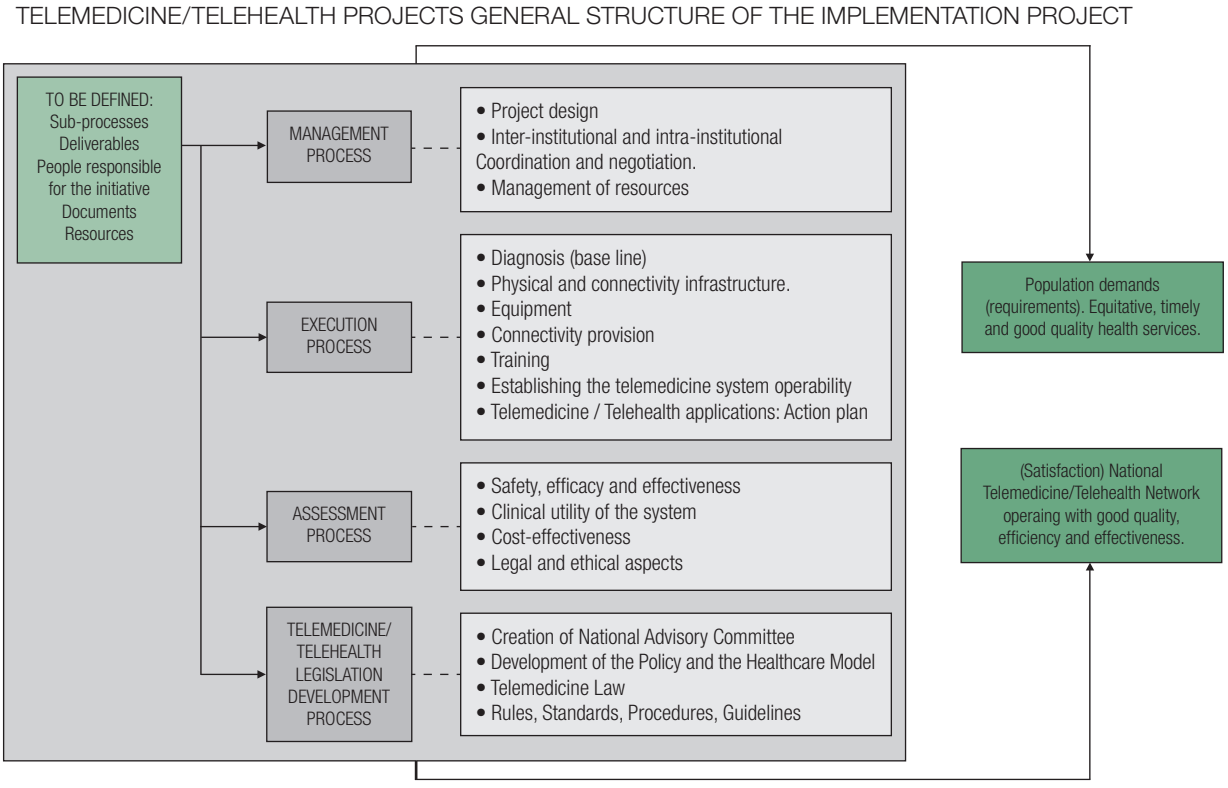

Figure 06: Own work: Quality Management National Telemedicine/Telehealth Program

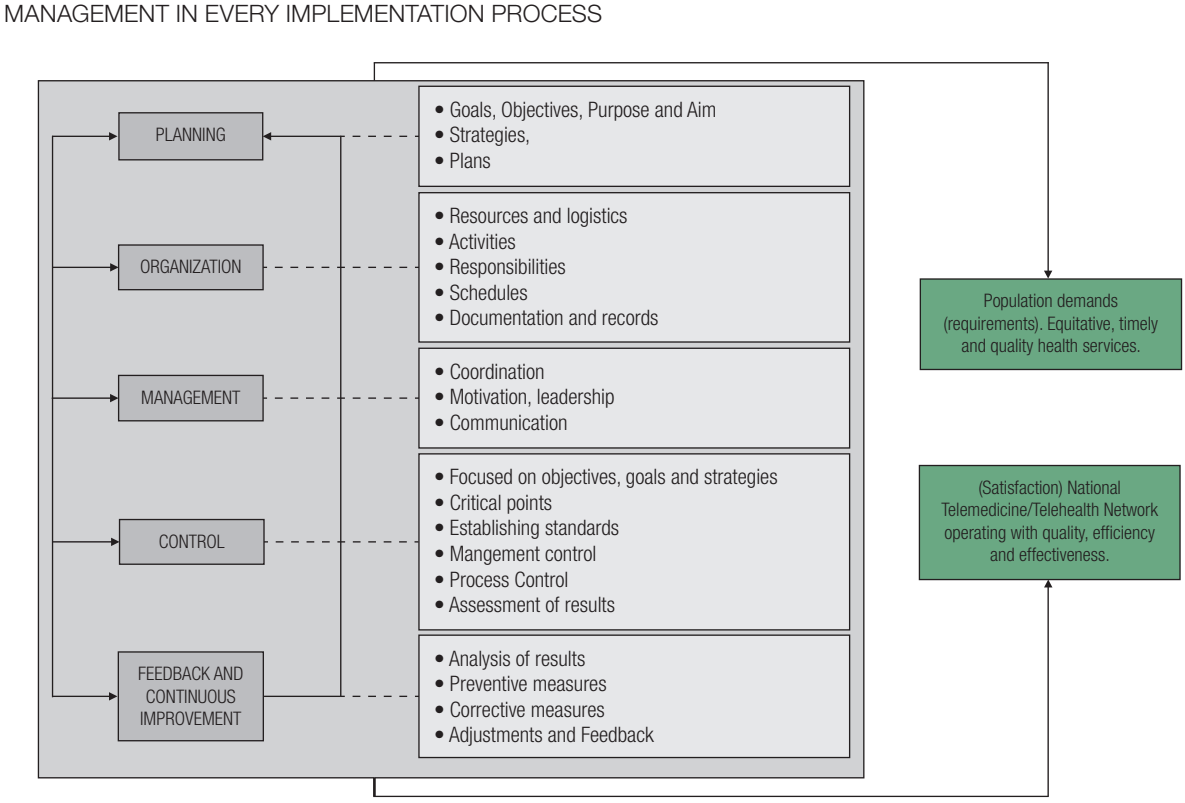

Figure 07: Own work: Quality Management National Telemedicine/Telehealth Program

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