
Expanding Healthcare Through Telemedicine in Pakistan

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Table of Contents

- History of Telemedicine initiatives in Pakistan
- Services Planned in the Pilot
- Network
 - Sites
 - Architecture
- Infrastructure
 - Connectivity & Communication
 - Electronic medical facilities
 - Medical and support staff & physical infrastructure
- Critical Success Factors for the Project
- Way forward and next Steps

Pakistan: Brief geography and Demographics

Total area: (803,940 sq km)

Population (2006 est.):
165,803,560 (growth rate: 2.1%);
About 60% of population is rural

Population density per sq mi:
551 (asymmetric spread)

Life expectancy: 63.4;

Diverse terrain

Administrative distribution

- Provinces
- Divisions
- Districts
- Tehsil



History of Telemedicine Initiatives in Pakistan

- Early focus on using telemedicine for expanding healthcare to rural Pakistan started in 2000.
- Mostly NGOs introduced the concept through some local Hospitals as partners.
- Rudimentary store and forward tele-consultation setups were done to start with.
- Government interest started in 2005 with the availability of multiple sources of bandwidth including the national satellite.
- Integrated policy framework is in the works in parallel with the full-scale pilot projects for real time remote consultations through network enabled medical equipment at remote end.

PAKSAT-HealthNET Project

- **Services planned**

- The project is designed to offer Basic telemedicine services including
 - Tele-diagnosis/consultations: Specialists in hub hospitals will be able to examine patients remotely and provide diagnosis and consultations
 - Tele-treatment: Patients diagnosed with a disease or their doctor will be able to seek specialist advice on treatment to be offered
- Diseases covered will include ENT, skin, chest, cardiology, psychiatry
 - Specialists will be able to examine the patients, their medical history, test results and vital signs like heartbeat, blood pressure, temperature, breathing etc thorough electronic medical facilities available at remotes

PAKSAT-HealthNET Project

- **Network**

- **Sites**

- PAKSAT-HealthNET is designed as a pilot project to set-up a telemedicine infrastructure linking three urban hospitals with twelve hospitals in rural/remote areas
 - Number of rural sites proposed to be covered in each province under this project are as follows
 - PUNJAB1 (Holy Family)
 - » (Attock, Khushab, D.G Khan & Pindi-Gheb)
 - PUNJAB2 (Mayo)
 - » (Gujrat, Sahiwal, Rajanpur, Jhang)
 - SIND (JPMC)
 - » (Shikarpur, Mirpurkhas, Ghambat, Jacobabad)

PAKSAT-HealthNET Project

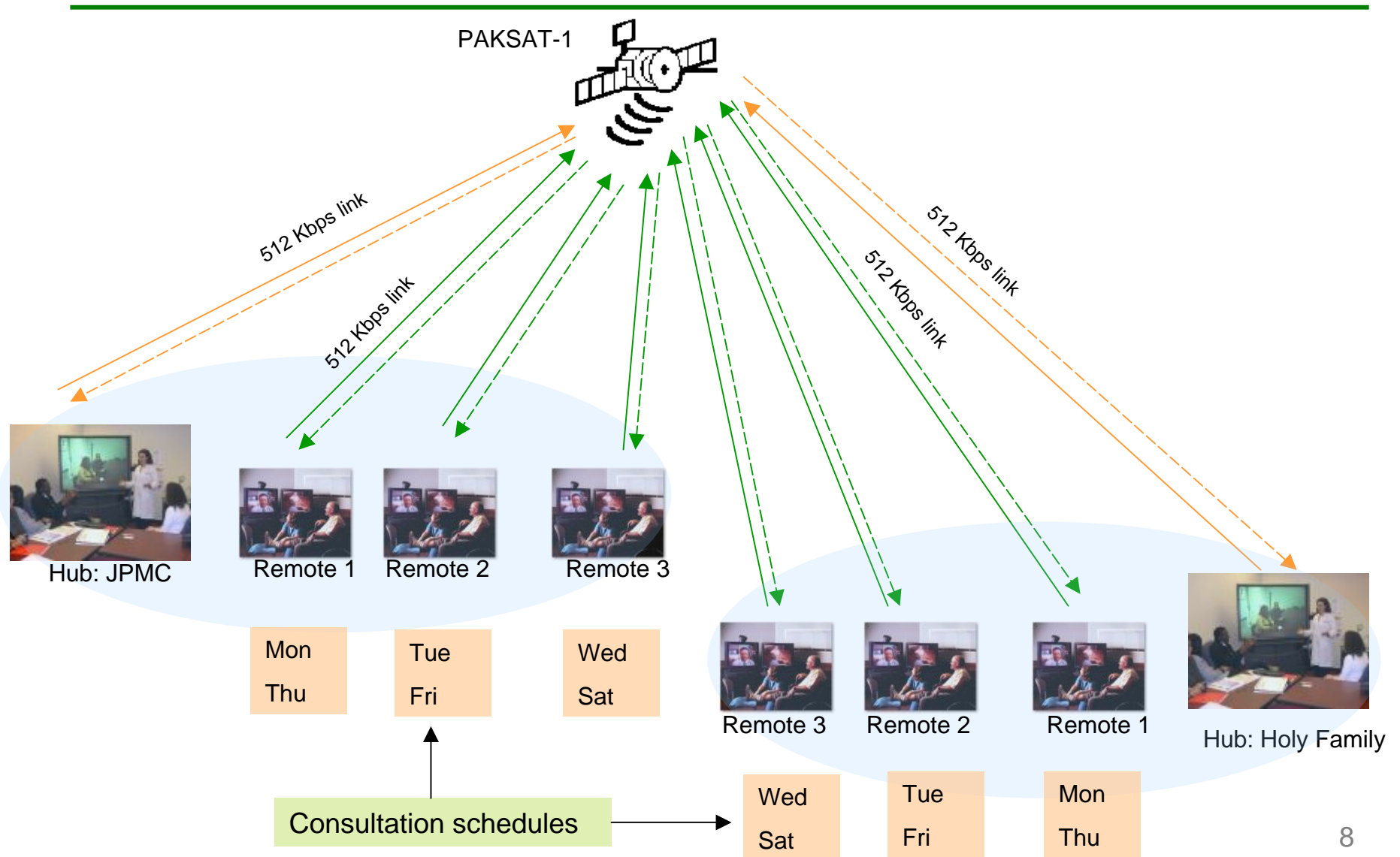
- **Network**

- **Architecture**

- PAKSAT-HealthNET will comprise of hubs and each hub is to be connected to 4 rural hospitals (remotes)
 - Mayo, JPMC and Holy Family have been identified as hubs because these are already involved in telemedicine projects and specialists working there have the domain experience, thereby ensuring faster ramp-up of the project by reducing training requirements at hubs
 - The remotes can be district or tehsil level hospitals

PAKSAT-HealthNET

Network Overview



PAKSAT-HealthNET Project

- **Infrastructure**

- **Connectivity**

- Each hub will be connected to 4 remotes through a full duplex VSAT star network utilising PAKSAT-1 Ku-band capacity
 - 512kbps full duplex data connectivity will be provided between remotes and the hub
 - PAKSAT bandwidth to be offered free or at a discount

- **Communication**

- Each site will be provided with
 - Desk-top Video conferencing set-up
 - VPN based broadband data network for electronic transfer of video, voice, imaging and text data between remotes and the hub
 - Hub will be able to communicate with one remote at a time
 - Each remote will be assigned specific days in week to connect with the hub as per schedule
 - Hub will host the central server and patient database

PAKSAT-HealthNET Project

- **Infrastructure**

- Electronic medical facilities

- Each remote will be provided with
 - 1 X Digital stethoscope
 - 1 X Digital ECG
 - 1 X Digital dermascope/ autoscope
 - 1 X Digital camera
 - Realtime transmission of patient data through VPN based data network
 - Each Hub shall maintain 1 X of each item as spare for maintenance purpose
 - Customised telemedicine software already being used in current telemedicine projects by JPMC and Holy Family hospital shall also be provided at remotes and hubs

PAKSAT-HealthNET Project

- **Infrastructure**

- Medical and support staff

- Medical specialists and support staff at the hub
- At-least a junior doctor and support staff at the remotes
- I.T support person for operation and maintenance of electronic and ICT equipment at hubs and remotes

- Physical infrastructure

- At least one room at each location dedicated within the hospital premises, which will be set-up as the telemedicine center.
- Furniture and fixtures for the telemedicine center
- Availability of electricity and telephone in the hospital premises

Project Management

- Funding
- Policy guidelines
- Oversight



- Project Monitoring
- Project coordination between programme and federal, provincial and distt. governments
- Representatives from MoIT, health deptt. SUPARCO/PAKSAT and heads of Mayo, JPMC & Holy Family hospitals

- Project implementation & management
- Project coordination
- Project reporting
- Representative of the organisation designated as the executing agency



- Design, Installation & commissioning of technical set-up
- Maintenance of technical set-up
- Representatives of SUPARCO

- Local project implementation & management
- Project coordination
- Project reporting
- A Professor from hub hospital with experience in tele-medicine



Critical Success Factors for the Project

- **Public Awareness**
- **Cooperation of Remote hospitals**
 - Interest of doctors and staff in participating hospitals
 - This can be ensured by the provincial/federal health departments by institutionalizing telemedicine as permanent part of healthcare delivery
 - Incentives?
- **Training**
 - Proper training to doctors & support staff of participating hospitals in the use of telemedicine equipment, facilities, software and processes
 - Participating tele-medicine associations to organise training at the Hubs.
- **Leveraging the existing knowledge & experience**
 - By involving telemedicine associations in implementation and management of the program at regional level
 - These associations have developed experience, software, processes, training modules and basic facilities for telemedicine which will help in faster and successful ramp up of the program.

Critical Success Factors for the Project

- Long term Ownership by provincial health departments for Efficient Operations and Sustainability
- Scaling the pilots to integrate into the other phases of nationwide telemedicine plan
- Standardized deployments for ease of integration and expansion of telemedicine network.
- Integration of EMRs across the network or at least at the hubs in the first phases
- Integrated automatic consultant/connectivity Scheduling systems for smooth and ensured Hub/remote connectivity.

Policy Support and Political will are Perhaps the Most Critical part of the Puzzle. Success depends on long term Perseverance and Appropriate phasing of the modular expansion program

Way forward and next Steps

- Quick rollout of pilots.
- Formulation of policy and inclusion in the Universal service program
- Utility evaluation and adaptation for expansion in phase II
- Expansion of coverage to further tehsil level hospitals.
- Health Net call center for handling initial consultations and also for knowledge dissemination.
- More active interaction and involvement in regional and global initiatives for knowledge sharing and practical applications.