PROPOSAL ON:

**IMPROVING PRIMARY HEALTHCARE
THROUGH E-CLINICS**

<u>**TFHI:**</u>

Taaleem Foundation Health Initiative (TFHI) is a technology-driven, primary healthcare service delivery platform that is continuously providing school health services to the entire student population of Taaleem Foundation Grammar School System in Balochistan since 1993. It has been involved in health and hygiene related concerns of the students by way of primary data gathering, data updating, developing ICT material on awareness and effective dissemination of the same among the communities served.

TFHI – despite being a subsidiary of Taaleem Foundation – is also registered as a separate legal entity with the Government of Pakistan. Details of its mandate, projects profile, healthcare solutions and futuristic vision are all contained in: www.tfhi.net – the organizational website of the TFHI.

TFHI has ventured in developing technology-based solutions to generating EMR (Electronic Medical Record) and developing USB-enabled digitized gadgets to capture the data of human vitals and transmit the same in the EMR. The EMR software has the inbuilt capability of generating differential diagnosis and suggesting appropriate prescription for the patient / client, using its strong knowledge database and business intelligence. This state-of-the-art solution is applicable to all tiers of healthcare management and can serve as an effective tool for health system strengthening and improving the service delivery.

The **e-Clinic** is an innovative product of TFHI, which has been launched at Quetta in Balochistan on 20th April 2015. This is first of its kind as a primary healthcare facility, where data gathering and generating EMR are essential components, linked with doctors at the Telemedicine Hub and dispensing the drugs locally through a trained healthcare technician.

The **e-Clinic as a product of TFHI** is linked up with the "Doctors Hub" at "The Diabetes Center", Islamabad and "Gulab Devi Hospital", Lahore. The "Doctors Hub" provides live consultation by the General Physicians to the patients at the remote end of e-Clinic, connected through Skype for video communication. The health technician at the e-Clinic generates the EMR through recording the data of human vitals by deploying specially designed gadgets; and adds on differential diagnosis through leading questions suggested by the software. Thereafter the contact is established with the doctor-on-duty at the "Doctors Hub" to share the screen / data about the patient for his / her advice. The doctor has the access to the patient through Skype based video conferencing facility, for examination and advanced investigation if needed. The doctor would complete the medical history by way of entering his observations and diagnosis into the EMR and give away prescription by recording it in the EMR. At the e-Clinic, the health technician would give the print out of the prescription to the patient with further advice on repeat visit of referral if needed.

PROJECT OVERVIEW

Rationale

According to the American Telemedicine Association study, for every 100 clinic going patents, 70% can be treated using Tele-care through telephonic advice. And so much so, with the use of broadband mobile internet connectivity and development of Wireless medical units that send the data and results using mobile connectivity, now the percentage of patients not need to go to hospitals can be further reduced by introduction of remote clinics operating such high tech medical sensors.

As said that Tele-care simply enables care of people using ease of mobility and flexibility of time and location, especially older and more vulnerable individuals, who depend on care from others in their own home. With more and more Pakistanis going abroad to work, while intercity movement of people also create a need to timely healthcare service to members of their immediate family back home.

While we did conduct a survey on the importance of Tele-care services in country, it resulted in 90% of people say that that is their wish and Tele-care allows it to happen. Equally it gives peace of mind to family, friends and careers, knowing that when they are unable to watch over their loved ones.

Pakistan being as densely populated country with a huge Tele-density percentage as compare to its neighbors pose a potential for utilization of these healthcare innovation and get the benefits to the fingertips of millions living in ruling locations that are currently deprived of quality healthcare and proper advisory.

Problem Statement

Like In the case of many other developing countries, Pakistan also faces a critical shortage of qualified and trained healthcare professionals in rural and remote areas. The distribution of the available Healthcare Providers is not equitable across various geographical locations impacting the accessibility to quality healthcare. Patients are the real losers who do not have access to timely and continued medical care.

Issues

a) Urban Rural Divide: Suburban and Rural areas are either underserved or un-served. Especially rural population is deprived of quality healthcare.

b) Shortage of Healthcare Professionals: Pakistan has about 150,000 Doctors Registered with PMDC. Over 20,000 Doctors are practicing abroad, 11,000 Lady Doctors are not practicing due to family reasons, 3,000- 4,000 Doctors have moved to bureaucracy, around 5,000 Doctors have taken up academics and/or administrative roles. Thus, the actual number of doctors available in Pakistan for a population of 185 million is insufficient by any standards. Qualified Para-Medics are also in acute shortage.

c) Quacks and Spiritual Healers are providing healthcare. Often cases are mishandled and patients face extra pain and trauma and travel to metropolitan cities in precarious condition.

d) Government healthcare facilities are in miserable state due to corruption and lack of interest.

e) Fake and expired medicines are freely marketed causing serious harm to patients.

Solutions:

a) It will be unjust to station Doctors at rural locations as their practice, remuneration and CME (Continuous Medical Education) may get compromised. Modern technology has made it possible for the Doctors to collect all clinical data and information about patients effectively to correctly diagnose the disease and advise line of treatment. Over years this will minimize the Rural-Urban divide in quality healthcare. Doctors will continue being stationed at larger cities and rural populations will be served right at their doorsteps.

b) There is no way to produce large number of Doctors in foreseeable future and hence techniques are essential to enhance doctors' productivity. Doctors must spend their quality time only in their core competency and that is clinical examination and decision-making. All other activities may be delegated to expert paramedics and technicians. This will reduce Doctor - Patient episode duration and hence doctors will be able to serve more patients in given time.

c) A lot of Paramedics may be trained as Physicians' Assistants (PAs) to share the work of doctors. These PAs can record the History, Presentation Problem, Current condition, Vitals and Symptoms and the technology can assist Doctors in generating EMR (Electronic Medical Record) and getting differential diagnosis through CDSS (Clinical Decision Support System).

d) Once Diagnosis is finalized, the suggestive prescription will pop up from the CDSS, considering special conditions, age and sex of the patient. Doctor needs to review the same and finalize the prescription for PAs to deliver medicines along with graphical/illustrative prescription for easy understanding of even the illiterate patients.

e) Gradually quacks and illegitimate health practitioners will disappear when qualified professionals will be able provide quality healthcare with enhanced outreach.

f) Government may be provided with practical solutions where private sector can be involved and provide quality healthcare. Solutions must be demonstrated to the Government for their consideration for massive deployment.

g) Medicines need to be procured from Pharmaceutical Manufacturers directly and provided directly to these patients through these e-Clinics.

Project Location

The project aims at catering for the communities living in and around 5 poor pockets of Islamabad capital district, having low human development indicators. These are the communities generally inhabited by the minorities and low-paid workers.

PROJECT PROPOSAL

The Concept

The project aims at setting up 5 e-Clinics in Islamabad Capital Territory, which are manned by trained paramedics; and equipped with state of the art Telemedicine tools and equipment, supported with basic IT infrastructure, continues solar-based power supply, reliable internet connectivity and video collaborative network.

Each e-Clinic is connected to the Islamic International Medical Complex (IIMC), Islamabad, where trained physicians attend to these patients through video link, examine the EMR, review the differential diagnosis and suggest prescription. The IIMC supports deployment of a doctor for 6-8 hours every day. TFHI has also signed an MOU with 'The Diabetes Centre', Islamabad who have offered to provide doctor's services for 8 hours every day.

A unique component in its model is the e-health consulting service, which supports the local clinic staff with live video consultations with a medical doctor. The video-based e-health consultation service has proved itself to not only save time, money and resources at the personnel level, but has been received very enthusiastically by both the patients and practitioners alike. The simple IP based video communication aided with Bio Medical devices and digital stethoscope has enabled access to the qualified doctors, which these patients in particular would otherwise not have had access to.

Project Execution

1. Establish a stakeholder consensus on Community Health objectives through Participatory process;
2. Build a core Patient Records database utilizing specially designed EMR (Electronic Medical Record) and interoperability standards;
3. Create a linkage with bio-medical devices through broadband connection with the back end doctor's hub;
4. Ensure data entry into, and data retrieval from the database / EMR is possible through multiple platforms and end devices (i.e. voice, sms, internet, smart phone)
5. Have already done successful pilot testing of the model at the site of Community & Home Base Care Centre for counseling of HIV patients in Quetta.

Proof of Concept

Taaleem Foundation Health Initiative launched the first e-Clinic of Pakistan in Quetta on 20th April 2015. Mr Rehmat Saleh Baloch, Provincial Minister for Health inaugurated the facility as Chief Guest. Mr Noor-ul-Haq Baloch, Provincial Health Secretary also graced the occasion. Dr Fareed Sumalani, Program Manager Provincial AIDS Control Program and Dr Q (UK based cosmetic surgeon & physician) also attended the ceremony. Details available at: www.tfhi.net

The facility provides technology-enabled EMR (Electronic Medical Record) for each patient along with clinical decision support system, leading to differential diagnosis and suggestive prescription, using specially designed electronic gadgets. Live data is shared with the doctors online for interaction with patient, using video collaborative network. Upon confirmation by the doctors the patient are either dispensed with the medicines or referred to the specialist consultants for advanced investigation and treatment.

Launch e-Clinics at Target Locations

1. Establish a consultation room facility at all sites, linked up with doctors' hub;
2. Deploy EMR solutions, both hardware and software
3. Deploy solar based power generation and storage facility
4. Deploy specially designed e-Clinic kit with all necessary gadgets to capture the data of all human vitals
5. Deploy specially designed CDSS (Clinical Decision Support System) for doctor's assistance to generate differential diagnosis and best possible combo for prescribed medicines.
6. Establish a Quality Control System to ensure quality of care/diagnosis
7. Add dispensary to each e-Clinic where possible

The e-Clinic Gadgets

These e-Clinics will have two Health Assistants: one paramedic and one lady health worker who would be equipped with:

- Blood Pressure monitor
- Glucometer
- Oxygen Saturation meter
- Weight scale
- Height scale
- Tele- Skin analyzer
- Digital Stethoscope
- Tele- Ear, Nose and Throat check up unit
- Tele - Eye testing equipment
- One Laptop
- One Camera and Mic
- Scanner
- Printer
- All this is connected through Broadband Link.

Flow Process:

1. Patient to sit in front of the Video link for live video connection with the doctor
2. The paramedic to generate electronic medical record (EMR) of the patient

3. Paramedic to use the testing units to gather data of human vitals
4. Paramedic to connect with doctors through video call and share screen / EMR of the patient under examination
5. Doctors sitting at hub / Helpline to see the data / examine the patient
6. Doctor to fill in the descriptive part of the medical history in the EMR
7. Doctor to see differential diagnostics and either agree or amend
8. Doctor to record reasons if amendment is proposed
9. The software then suggests corresponding prescription for doctor
10. Doctor may confirm prescription or modify / amend.
11. The patient to be given a 24/7 health support call enter number for seeking additional / supplementary support
12. Patients requiring referral services to be referred to the hospitals for medication and further evaluations.

The Components

There are two major components related to this project, which are the following:

1. HUB: Control center IIMC from where specialists will see the patients through specialized devices and software using internet

2. SPOKES: These are remote locations of e-Clinics, where devices are connected with computers and these computers are connected with Internet, patients come there are placed with devices on their body and make them sit in front of camera and their live consultation is done with doctor at HUB.

Doctors' Hub

It is worth mentioning that the back end facility and the provision of doctors has been arranged with the support of 'Islamic International Medical Complex', Islamabad and 'The Diabetes Centre', Islamabad. The NexSource International and TeleCare Karachi are willing to provide the data server and software up-gradation.

EXPECTED OUTCOMES

In the light of stated objectives and proposed methodology, it is expected that said project will bring about positive changes in the following areas:

Short Term Outcome

o Improved access of patients in the rain or disaster struck locations to quality and timely healthcare

o Access of physician based care in remote locations, where even normal healthcare is not timely and effective;

o Improved linkages between patients and healthcare service providers.

o Improved decision-making power among community during disaster duration pertaining to the health conditions.

o State of art Help Line with appropriate level and location is built, made functional and providing health information and referral services to the callers in such locations.

o Sensitizing both public and private sector on the outcomes and data pertaining to the findings from the visits.

Long Term Outcome

o Reduction in disease burden and epidemics;

o Timely preparation for any expected epidemic;

o Immunization coverage to expectant women and children is increased.

o Increased involvement of men in safe motherhood.

o Data thus generated, demographic and health indicators will be useful for policy and program decision.

o Increased public awareness on specific diseases pertaining to the disaster effects and their conditions,

o Increased linkage with local NGOs and Health care providers.

o Discouragement of quackery

o Collaboration between various organizations working on health issues

FINANCIAL PLAN

Proposed Budget:

These centers will be generating Electronic Medical Records for each patient / client and catering for health assessment, disease management, reporting, and referrals, with a view to providing quality primary healthcare to the general public in the target locations of Islamabad Capital Territory. This would serve as a pilot project of the kind that could subsequently be replicated and up-scaled by the government and the donors in different regions of the country.

In this regard, TFHI, based on its proven track record and friendliness with use of technology for social sector solutions enjoys the comparative advantage of venturing into this kind of a project. To implement the project, TFHI would need following equipment (hardware / software) in order to establish the Telemedicine platform at said locations:

Capital Expenditure per e-Clinic	
Location Development	30,000
Solar Panel and supporting equipment including 5 lights and two fans and charging Laptop + Cell Phone	150,000
Furniture (Examination Table, Lockable Shelves for Medicine Storage, Table + Chairs)	35,000
Basic TeleMedicne Kit (Including BP Apparatus, Examination Camera, Digital Still Camera, Glucometer, Infra-Red Contact Less Thermometer, Digital Stethoscope with Single Channel ECG & Pulse Oxymeter) including Bag	75,000
(OPTIONAL) - Fetal Ultra-Sound Probe for Laptop (For Mother & Child Locations)	25,000
Server + Installation	60,000
Printer	15,000
Miscellaneous	40,000
Total Capital Expenditure	**430,000**
Patients / day	10
Patients / month	250
% charged	100%
Consultation fee charged	100
Other service charges	50
Medicines	50
Lab Charges	50
Visits / month	0
Revenues	
Revenue/patient	250
Consultation fee charged	25,000
Other service charges	12,500
Sales of medicines	12,500
Visit charges	0
Total Revenues	**50,000**
Direct Cost	
Consultant fee (40%)	10,000
IT Partner charges (10%)	2,500
Health assistants' commission (30%)	7,500
Cost of Medicines (75%)	9,375
Total Direct Cost	**29,375**
Direct Cost (% of Revenue)	58.75%

Expenses	
Health Assistants' Salaries	10,000
Electricity Bill	625
IP Connectivity Charges	2,500
Location Rent	2,500
Consumables	3,000
Other expenses	2,000
Total Expenses	**20,625**
Net Profit / Loss	0
Break-Even Patients/Day	**10**

Funding Requirements:

Despite the fact that TFHI would manage local support for basic infrastructure to set up e-Clinic, the availability of funds required to design, develop and deploy the interventions in social sector development always remains a challenge. While TFHI has been successful in doing the R&D part of the project; and has developed institutional linkages with technology partners and doctors' hubs, there is need to rope in some CSR Partner for deploying this solution at 5 locations under controlled environments in the capital district of Islamabad.

The friends and well-wishers of Pakistan are requested to join hands in serving the communities of have-nots of the under-privileged communities. Besides financing the launch of e-Clinic, donation of primary healthcare related medicines remains optional. It is worth mentioning that '**Medibank Trust'** of Helicon Pharma has also shown interest in providing donations of medicines for the needy poor patients at these e-Clinics.

Financial impact on part of CSR Partner for the current project size would be:

a. Capital cost for deploying 5 e-Clinics: PKR 2,150,000

b. Service charges @ 10 % of cost: PKR 215,000

Total cost of the project (a+b):   **PKR 2,365,000**

Summary of Costs:

Capital cost of establishing one e-Clinic: PKR 430,000 (one time only)

Recurring cost of one e-Clinic per month: PKR 50,000 only

Recurring cost of one e-Clinic per annum: PKR 600,000 only