Needs Assessment of Telemedicine in Afghanistan and a Global Call for Action for an International Tri-Partnership Mechanism

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Outline

• Background: Afghanistan Health Needs
• Study Methodology
• Results
• Review of Telemedicine Initiatives in Afghanistan
• Telemedicine Applications
• Implementation of Telemedicine
• Challenges
• Recommendations/Strategies for a Sustainable National Telemedicine Program
• Conclusion
Demography and Overview of Healthcare in Afghanistan

- Health provisions very minimal or entirely absent
- Estimated population of 30.51 million (growing annually at 2.3%)
- Life expectancy at birth m/f (years, 2013) = 47/45
- Risk of mortality under five (per 1,000 live births, 2013) = 129
- Maternal mortality rate= 1,600 per 100,000 live births
- Leading cause of death in Afghanistan: communicable, maternal, perinatal, and nutritional conditions
- One doctor for every 100,000 people
Health Challenges and Constraints

- Limited technical capacity in human capital
- Inadequate financing for key health programs
- Lack of access to health due to dispersed population, geographical barriers, and lack of transportation infrastructure
- Poor quality of health and social services
- Lack of security for successful implementation of programs
- Lack of mechanisms for effective regulation of for-profit private sector clinics and pharmacies
- Health financing system inefficiently managed and limited coverage
- Health information system poorly developed
WHO-ATLAS eHealth Country Profiles, Global Observatory for eHealth Series

REVIEW OF RESULTS FOR AFGHANISTAN:

- No national telemedicine policy identified
- Lack of technical expertise was the only validated barrier reported
- Most needed to support telemedicine development: clinical possibilities and infrastructure
- Response was “No” to other factors such as cost and cost effectiveness, evaluation, legal and ethical, effect on human resources, and patients’ perception for what was needed to support telemedicine development
Research Approach

-Aim-
To give an accurate account of the telemedicine landscape in Afghanistan and provide recommendations to build a national telemedicine initiative for Afghanistan

RA 1: Survey: An Afghanistan Telemedicine Needs Assessment Survey employing quantitative and qualitative data fields administered to key-opinion healthcare leaders and stakeholders within the country of Afghanistan

RA 2: Literature Review: methodical research of peer-reviewed literature on telemedicine to collect information on any current or past telemedicine projects implemented in the country of Afghanistan

Med-e-Tel Luxembourg, International Society of Telemedicine and eHealth, April 11th, 2014
Following databases initially searched for primary studies involving telemedicine in Afghanistan:
- The Cochrane Central Register of Controlled Trials (CENTRAL), part of the Cochrane Library, www.thecochranelibrary.com, (searched April 18, 2013)
- MEDLINE, Ovid (1947 - 2013) (searched April 26, 2013)
- PUBMED, Ovid (1996 – 2013) (searched May 1, 2013)
- Google Scholar, (searched May 20, 2013) using the key terms associated with telemedicine including: eHealth, telemedicine, developing countries, and Afghanistan.

Selection criteria included randomized controlled trials and non-randomized controlled trials and/or studies pertaining to telemedicine initiatives/projects in Afghanistan for the civilian/national population

Electronic search produced a total of 56 records (titles and abstracts of all articles were screened and full copies of all the reports deemed eligible were retrieved for closer inspection)

Only two studies met the inclusion criteria set out in the protocol

Data collection expanded to Internet searches using Google search engine for web sites of organizations providing telemedicine services in developing countries (specifically Afghanistan) and projects that have been implemented or are currently being implemented were investigated in detail
**Results: Case Studies in Literature**

- **Case 1.** “Health Needs and eHealth readiness assessment of health care organizations in Kabul and Bamyan” completed by Durrani, Khoja, Naseem, Scott, Gul, and Jan, studied the needs of the Aga Khan Development Network (AKDN) healthcare institutions working in Afghanistan.

- **Case 2.** References to telemedicine practices in Afghanistan were identified in the article, “Supporting Hospital Doctors in the Middle East by Email Telemedicine: Something the Industrialized World Can Do to Help,” written by researchers Patterson, Swinfen, P., Swinfen, R., Taha, and Wootton.
### Results: Organizations Identified

<table>
<thead>
<tr>
<th>DATE OF INITIATIVE</th>
<th>RESPONSIBLE ORGANIZATION</th>
<th>TELEMEDICINE INITIATIVE</th>
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<tbody>
<tr>
<td>2006</td>
<td>Roshan in partnership with the Government of Afghanistan (GOA) and Cisco Systems</td>
<td>Beginning of an initiation and growth of a telemedicine project through cooperation of several large organizations in aim to improve the delivery of healthcare in Afghanistan</td>
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<tr>
<td>June 20, 2007</td>
<td>The Aga Khan University Hospital (AKUH) in Karachi, Pakistan, Aga Khan Health Services, the French Medical Institute for Children (FMIC) in Kabul, Afghanistan in connection with Roshan, Government of Afghanistan, Cisco Systems, and Bamyan Hospital</td>
<td>Formal inauguration of Afghanistan’s first telemedicine project. Joint telemedicine project with respective organizations. First phase of project-linking FMIC Kabul to AKUH Karachi. Second phase-extending the link to Bamyan Provincial Hospital(region plagued with highest level of maternal and child mortality). Initial service provided: teleradiology, the electronic transmission of radiological patient images. Goal of telemedicine project: an average of 60 to 80 transmissions and 10 to 15 teleconferences between hospitals per month, with the numbers increasing over time.</td>
</tr>
<tr>
<td>March 1, 2010</td>
<td>(AKUH) in Karachi, Pakistan, Aga Khan Health Services, the French Medical Institute for Children (FMIC) in Kabul, Afghanistan in connection with Roshan, Government of Afghanistan, Cisco Systems, and Faizabad Provincial Hospital</td>
<td>Announcement of the extension of Afghanistan’s first Telemedicine link to Faizabad Provincial Hospital in the northeastern province of Badakhshan. Faizabad Provincial Hospital(second provincial hospital to be connected to telemedicine link). [Badakhshan, while having a population of 823,000, roughly 8,300 children under five years old die in the province yearly(many of them from preventable diseases). For every 100,000 live births, approx. 2,200 women die from complications related to childbirth in province.]</td>
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<td>2010</td>
<td>La Jolla Golden Triangle Rotary Club Foundation’s Afghanistan Global Connections Exchange Program in partnership with MedWeb</td>
<td>Implementation of telemedicine project (pathology specialty) at the Nangarhar University Medical School(where both students and faculty are being taught ICT(information communication technology) courses) and the Nangarhar University Teaching Hospital(where roughly twenty female Obstetrics-Gynecology physicians are obtaining internet/computer training and continued medical education as well). MedWeb partnership- mesh approach to mobile telemedicine entailing the tracking of data from cellular phones to Hospital Information Systems, employing DICOM and HL7 standards. Established applications feed back to medical centers, district hospitals, and regional hospitals.</td>
</tr>
<tr>
<td>2011</td>
<td>The Swinfen Charitable Trust</td>
<td>Implementation of telemedicine links between medical practitioners in the developing world and expert medical/surgical specialists from various developed countries providing free telecom care. 200 telemedicine cases in Afghanistan facilitated at low cost service.</td>
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<tr>
<td>January 1, 2013-present</td>
<td>Roshan Community in conjunction with the French Medical Institute for Children (FMIC), the Aga Khan University Hospital (AKUH) in Karachi, Bamyan Provincial Hospital (BHP) and Cisco Systems</td>
<td>Joint partnership telemedicine project (service developed to deliver teleradiology, e-learning, hospital management, nursing training and specialist clinics) extended to Kandahar Province with Merwis Hospital in Kandahar Province.</td>
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<td>Present</td>
<td>Medical Missions for Children in partnership with Novartis</td>
<td>Initiation of exploring feasibility of setting up Telemedicine Outreach Program(TOP) in Kabul, Afghanistan. TOP program initiated to provide medical and technological expertise needed to bring specialized medical care to diagnose and treat sickest children in world through U.S. “volunteer spirit” of pediatric specialist medical community.</td>
</tr>
<tr>
<td>Present</td>
<td>Raqim Foundation in partnership with World Health Partners</td>
<td>Primary plans set to begin a telemedicine pilot study with health clinic in Durul-Amaan Province in and in Heart, Afghanistan. Medical images/pathology reports of patients to be sent to UCSF medical facilities for specialists to diagnose and submit treatment plans. Foundation currently working on solar panel capacity to improve connectivity for pilot study to formally begin.</td>
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Table 1: Telemedicine Efforts in Afghanistan by Date and Responsible Organization
Survey Methodology

Telemedicine In Afghanistan Survey

**Purpose:** to determine the perceptions and attitudes on the strength of knowledge of telemedicine utilization within the country and to determine the current needs of healthcare leaders and community health centers in providing, continuing, and expanding telemedicine services

**Completed By:** Select healthcare leaders in Afghanistan, including but not limited to Ministry of Public Health directors, hospital administrators, physicians, health management officers, and leading healthcare consultants within country

**Response:** A total of 22 healthcare leaders received and completed the survey out of a total of 32 healthcare professionals who were provided a link to the survey, yielding a response rate of 68.8% (22/32).
Survey Results

**Telemedicine Use and Capacity/Capabilities Assessment:**
- Of the survey respondents, 15(68.2%) of 22 stated their organization transmits health related information by electronic means, while 7(31.8%) stated their organization does not.

![Graph showing types of devices used to transmit health-related information by electronic means.](image)

Figure 1. Types of Devices Used(by percentage) to Transmit Health-Related Information by Electronic Means. (Results from Question #8 of survey)

-A total of 3(out of 21) respondents stated their respective organization utilizes telemedicine programs for patients in the community, while 17(of 21) participants stated No, and stated they did not know/refuse to answer.

-When asked whether their respective organizations have the technical capacity/resources to support telemedicine programs, 40.9%(9 of 19) stated they did have capacity/resources, while 54.5% (12 of 19) stated they did not. 4.5% (1 of 19) stated they did not know whether their organization had such technical capacity/resources for telemedicine.

**Telemedicine Funding:**
- 3 of 21(14.3%) survey participants stated their respective organization has funding to support telemedicine initiatives.

-When asked if the participant feels initiatives in telemedicine are financially sustainable in Afghanistan and the country can reach a steady state of operation with these telemedicine projects, 20 respondents answered with 12(60%) stating No and 8(40%) stating Yes.

**Telemedicine Policy:**
- When asked if the participant was aware of any national, regional, or local policy/legislation associated with telemedicine in Afghanistan, 90%(18 of 20) stated a firm no, while 10%(2 of 20) affirmed they did not know.

-When asked if participant’s organization has developed specific policies for telemedicine programs, 78.95%(15 of 19) of participants stated No, while only 10.53%(2 of 19) stated Yes, and another 10.53%(2 of 19) stated they did not know.

**Telemedicine Opportunities:**

![Graph showing specialty of healthcare telemedicine which would have greatest impact.](image)

Figure 2. Participant results to the question of what specialty of healthcare telemedicine would have the greatest impact
Survey Results

Regions and Populations:
- When asked what regions (province, district, sub-district, rural village) in Afghanistan participants felt would benefit the most from using telemedicine as a means of providing effective and accessible healthcare, participants suggested:

  - all the provinces
  - Kabul, Mazar, Nangarhar, Herat, Kunduz
  - the cities where education level is a bit high as well as having electric and net facilities
  - provinces for managerial services and collection of information in the rural and district level they would benefits for receiving professional advises during emergencies and disasters
  - The provincial capitals and district centers in close vicinity to major cities will be the ideal places to start with (western province of Herat)
  - Kabul-Mazar-Herat-Kandahar-Jalalabad

- When asked what specific populations in Afghanistan should be targeted and would benefit the most from telemedicine projects, suggestions included:
  - populations in rural areas
  - women and children
  - directly, all the staff in health systems and indirectly, the population which are living in catchment of health facilities
  - the whole population (no exceptions)
  - those under the poverty line who have no physical means of going abroad for further check up and treatment

Figure 3. Telemedicine sites currently present in Kabul, Badakhsan, Kandahar, Bamiyan, and Jalalabad based on research findings
Core Needs

Figure 4: Support Barriers as Causes for Unsuccessful National Telemedicine Initiative in Afghanistan

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Discussion

• Telemedicine: key to future health access for Afghanistan
• An interdisciplinary and intersectoral approach is crucial
• Creation of a conducive environment for telemedicine with appropriate funding, clear policies, and necessary capacity
• Networking with local institutions and other academic facilities at regional and international level needed
• Assessment of availability of telemedicine market in Afghanistan necessary
• **Recommendation #1.** Installation of knowledge of telemedicine in all medical facilities and “buy-in” of all national healthcare practitioners

• **Recommendation #2.** Creation of Policies and Procedures for Telemedicine Implementation

• **Recommendation #3.** Technological Capacity Building Through Joint Partnership Effort

• **Recommendation #4.** Multifaceted Business Proposal for Telemedicine Global Tri-Partnership Program
Current and Future Clinical Needs and Potential Programs

- Teleradiology
- Teletrauma
- Telepathology
- Telecardiology
- E-Mental Health
- Telestroke—congress of neurologists, neurosurgeons and neuroradiologists to launch a telestroke program
- Teleophthalmology (ophthalmology consultations)
TOWARDS A SUSTAINABLE AND INTEGRATED NATIONAL TELEMEDICINE PROGRAM

• Advances in information technology
  – Telemedicine and e-health
• Standardization activities in Telemedicine/eHealth
• Education and access to information
  – Electronic resources and applications: e-seminars, e-lectures, e-books and e-journals, etc
• Amalgamating resources of geographically separated regions
• Ensure applicability and efficiency in many areas of clinical medicine
• Aiming for low cost, high effectiveness implementation methodology
• Continuous alliance of new partners with innovative concepts/ideas
• Championing unconventional methods for improvement to access to healthcare
<table>
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<tr>
<th>OPPORTUNITIES</th>
<th>CHALLENGES</th>
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<tr>
<td>- Diverse geography</td>
<td>- Telemedicine adoption by all stakeholders</td>
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<td>- Gap in healthcare infrastructure</td>
<td>- Credentials and competence of the remote physician</td>
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<td>- Low cost local technical solution (i.e.: m-health adoption)</td>
<td>- Broadband internet yet to be operational in rural regions of country</td>
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<tr>
<td>- Willingness of healthcare leaders to expand telehealth knowledge and capabilities</td>
<td>- Legal, ethical and social issues yet to be addressed</td>
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<tr>
<td>- Good environment for effective research</td>
<td>- Evaluation &amp; Identification of Best Telemedicine Practices</td>
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<td>- Integration into national health system</td>
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3 Pronged Approach

Assess, Develop, Establish, Integrate

Governmental
(national and regional)

Developmental

Academic

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Conclusion

• Reaching all regions of country crucial for comprehensive health stabilization and improvement
• Overarching goal to improve health, reduce disparities, and protect against global threats

“We need to develop and disseminate an entirely new paradigm and practice of collaboration that supersedes the traditional silos that have divided governments, philanthropies and private enterprises for decades and replace it with networks of partnerships working together to create a globally prosperous society.” -Simon Mainwaring
Thank You Kindly

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