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Apollo Tele Health Services
13 Million tele consults in 21 yrs
10,000+ per day now
Digital Health Care in Public Private Partnership Mode


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Abstract

Background: Health care is provided in developing countries, in a milieu of acute shortages of health care infrastructure and personnel. Governments are realizing that digital health through public private partnerships (PPPs) could address this

Keywords: PPP in telehealth, telehealth, remote health care, telemedicine and PPP, telemedicine

Introduction

Public private partnership (PPP) projects in health care are a recent phenomenon in India. Figure 1 illustrates the various PPP projects outsourced to Apollo Telehealth Services (www.apollohealth.com). An Urban Primary Health Centre (UPHC) is the first point of health care contact, for those close to the poverty line, living in urban and suburban areas. Through a PPP, Apollo Telehealth Services was designated as the health care provider for 183 UPHCs across nine districts of Andhra Pradesh, a state in South India.1 In addition to primary health care for a defined target population.

Prepresents all aspects of telemedicine and e-health to the reader

Telehealth Patient Portal: Opportunities and Reality

Pages 183-195

Merrell, Ronald C.

Technology Enabled Remote Healthcare in Public Private Partnership Mode: A Story from India

Pages 197-233

K. Ganapathy (et al.)

International and Global Telemedicine: Making It Work

Pages 237-250

Jaworek, Bruce C.

Technology Enabled Remote Healthcare (TeRHC)

A solution is not a solution unless it is universally available to anyone, anytime, anywhere at an affordable cost without compromising quality. This is easier said than done. It is universally known and accepted that providing healthcare in suburban rural areas, particularly in developing countries, is more than a challenge. Geographically the "third world" does not have to follow the advanced countries, nor even progress or leapfrog. After all, how much can a frog leap? Today, emerging economies like India are pole vaulting. There are no technology-enabled legacy systems to disintegrate. Advances in information and communication technologies are mind-boggling. The Indian approach is making "BRIC a reality. This flexible approach to problem-solving, using limited resources in an innovative way or a simple work-around, signifies creativity-a form of trifugal engineering at its peak.

Telehealth in India: The Beginnings

The challenges in evangelising the very concept of telehealth, creating the necessary awareness and persuading the various stakeholders in a then non-existing ecosystem to agree to even pilot projects, were so daunting that it was extremely difficult at that time, to collect reliable data, analyse the data and publish the observations. Publications then were limited [1-6]. In what subsequently became a highly downloaded article [7], the principal author demonstrated that in the recent years.
Population 240 million

Today's Dashboard (12-05-2021)

<table>
<thead>
<tr>
<th>Category</th>
<th>Cumulative</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Beneficiaries Provided Telemedicine Services</td>
<td>280,118</td>
<td>0</td>
</tr>
<tr>
<td>Consultations Completed</td>
<td>334,682</td>
<td>0</td>
</tr>
<tr>
<td>Consultations Rescheduled</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average Feedback of Telemedicine Services</td>
<td>4.43</td>
<td></td>
</tr>
<tr>
<td>Number of Functional Telemedicine Centres at CHCs (Today)</td>
<td>0/120</td>
<td></td>
</tr>
<tr>
<td>EMR Uptime</td>
<td>23:59 (100.0%)</td>
<td></td>
</tr>
<tr>
<td>Doctors Onboard</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

**Patients**

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child (Below 15)</td>
<td>24,651</td>
<td>23,771</td>
</tr>
<tr>
<td>Youth (15-34)</td>
<td>46,779</td>
<td>89,962</td>
</tr>
<tr>
<td>Adult (35-59)</td>
<td>32,038</td>
<td>48,556</td>
</tr>
<tr>
<td>Senior (60 &amp; Above)</td>
<td>19,730</td>
<td>14,633</td>
</tr>
<tr>
<td>Total</td>
<td>123,198</td>
<td>156,922</td>
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</tbody>
</table>

**Speciality wise completed consultations**

- Cardiology 3777
- Urology 1733
- Physiotherapy & Rehabilitation 8349
- Physical Medicine & Rehabilitation 70
- Paediatrics 37735
- Dermatology 90598
- Endocrinology 5951
- Neurology 2052
- Orthopaedics 41919
- Oncologist 143
Govt. Dashboard - Details of Remote Healthcare 100 Digital Dispensaries

Jharkhand  Source: Govt. of Jharkhand  http://jhdd.ind.in/

Real Time Dashboard as on 12th of May 2021
APOLLO TELEHEALTH SERVICES announces launch of India’s largest PPP IN TELEOPHTHALMOLOGY


12th May 2021: The 115 Mukhyamantri e-Eye Kendram Centres have already catered to over 16,57,455 patients in just 168 weeks, in 13 districts of Andhra Pradesh.
Fig 09 Fundus Image Transmission

CHC Center
PMO acquring & uploading Fundus Image
Cloud Server
Uplink
Reported
Reading Center
Remote and Tele-ophthalmologist

Sample of fundus images evaluated remotely @ Chennai sent from Andhra Pradesh
Non gradable Images
Severe NPDR with Maculopathy

Fig 13 Fundus report Illustration

TELEOPHTHALMOLOGY REPORT

PATIENT NAME: ___________________ DATE & TIME: 01-09-2018
PATIENT ID: ___________________ AGE & GENDER: ___________________

RIGHT EYE
LEFT EYE

Macular Scar
Glaucemous Optic Disc
CATARACT

OBSERVATIONS
BOTH EYES – BOTH EYES SEVERE NPDR CHANGES NOTED
WITH MACULOPATHY
RIGHT EYE – HARD EXUDATES, MACULOPATHY +
LEFT EYE – HARD EXUDATES, CIRCINATE PATTERN, MACULOPATHY

REFERRAL NOTE: ADVISED REFERRAL TO HIGHER CENTER FOR FURTHER EVALUATION (OCT, FFA) AND MANAGEMENT

REFERRED TO: GENERAL OPHTHALMOLOGIST, AH-Nizvidu

Fig 14 Patients referred to Higher Centers
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mar ’21</th>
<th>Apr ’21</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL CONSULTATIONS</td>
<td>1,97,714</td>
<td>2,05,681</td>
<td>1,36,77,521</td>
</tr>
<tr>
<td>GENERAL OP CONSULTATIONS</td>
<td>1,83,235</td>
<td>1,92,241</td>
<td>1,24,91,412</td>
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<tr>
<td>SPECIALIST TELECONSULTATIONS</td>
<td>14,479</td>
<td>13,440</td>
<td>11,86,144</td>
</tr>
<tr>
<td>UNIQUE PATIENTS TREATED</td>
<td>1,45,250</td>
<td>39,039</td>
<td>31,99,845</td>
</tr>
<tr>
<td>LAB REFERRALS</td>
<td>28,977</td>
<td>26,293</td>
<td>21,53,033</td>
</tr>
<tr>
<td>LAB TESTS</td>
<td>91,263</td>
<td>80,801</td>
<td>85,07,289</td>
</tr>
<tr>
<td>ANC VISITS</td>
<td>11,774</td>
<td>10,230</td>
<td>5,72,627</td>
</tr>
<tr>
<td>IMMUNIZATION VISITS</td>
<td>26,399</td>
<td>19,919</td>
<td>13,35,496</td>
</tr>
</tbody>
</table>
65 Yr. male (Mr. RS- RM01.0000001035), came to Telemedicine OPD, CHC- Keylong on Saturday, 8th August around 3.45 PM with severe chest discomfort. Coordinators recorded: Pulse-45, BP: 110/60, ECG taken immediately reviewed by ER Specialist at Chennai at 4.02PM. Vitals checked again: PR - 57/Min, BP 90/60mm Hg

Local doctor asked to look for signs of failure & start IV fluids followed by Disprin 325mg stat, T. Atorva 80mg, T. Clopidogrel 300mg stat & Tramadol 50 mg slowly with Emset. PR - dropped to 46/min, SPO2 -94%. Repeat ECG showed ST elevation in Leads II, III & aVF with reciprocal changes in chest leads suggestive of Inferior Wall MI. After ruling out contraindications, immediate Thrombolysis with Streptokinase was done at the remote centre telementored by the ED consultant.

Youtube link for Ram Singh Video: https://m.youtube.com/watch?v=qAed7Vz8Z3A
What makes eUphc unique

**Front Runners**
- First **Digital PHCs** in India
- First PHCs to be converted to Health & Wellness Centers
- Phase I – 164 centers ISO 9001 certified
- Providing Continuum of Care through eUphc

**Operational Efficiency**
- 99% uptime of services
- Lab test results delivered within 2 hours
- Tele-consult TAT of 15 mins
- Neat and clean centers across both zones
- Daily availability of ANC & Immunization
- Upgraded infrastructure with complete digital connectivity

**Innovations**
- Paperless eUPHCs
- Data storage in cloud servers to achieve data privacy
- Real-time dashboard availability for KPI monitoring
- Resources trained in person & virtually
- CDSS and Triage software used
- Usage of Internet Of Things (IoT) & Internet Of Medical Things (IoMT)

**Quality Mgmt & Improvement**
- More than 80% doctors are maintaining above benchmark clinical quality
- External quality assurance for Labs with CMC, Vellore
- FDA & CE Equipment in laboratories
- KPI developed by Postgraduate Institute of Medical Education & Research, Chandigarh

**Resource Utilization**
- 8 hours of availability of Medical Officer
- 365 days availability of services
- Full working hours availability of laboratory & pharmacy
- Real Time attendance monitoring for 1100+ resources

**Impact Created**
- 18% of catchment area catered by eUPHCs
- 20 Lac lives touched in close to 3 years of operation
- 77 Lac of OP visits
- 7.8 Lac Specialty Tele-consults
- 50 Lac Lab tests delivered
MAK Awareness Activities
Entries in EMR made by paramedic
Economic Viability of Tech enabled Remote Health Care

• Calculated Cost 728.20m INR (10m US $) on Lab tests mean cost per test ₹ 3807 (51US $). Actual cost incurred ₹ 584.84m (8 m US$) @ UPHC’s mean cost per test ₹946 (12.8 $)

• Only 31% of tests available @TeRHC centres available in PHC’s

• Lab tests cost 28.84% of that in private labs

• Cost per specialist teleconsultation @PHC ₹ 165 (US $ 2.2)

COVID Tele ICU centers set up in 10 days in Thermal Power Stations located in suburban India for National Thermal Power Corporation, a Govt of India Undertaking.
The Govt, administration, every stakeholder of the Health Care ecosystem in INDIA has realized, accepted that social distancing is here to stay. ICT is as important as O2 and Hospital Beds, Indian Healthcare is becoming DIGITAL !!!
The nicest thing about the future is that it always starts tomorrow

The future is always ahead of schedule

“The future a’aint what it used to be”

– Mark Twain