Healthcare for All: Role of ICT in Transforming Health

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Structure of the Presentation

Quality of Care
Cost
Equity
Asymmetry of Information

What has been the experience here & elsewhere

What is being contemplated in Kerala
Healthcare Ecosystem

Policy

Community

Hospital

Big Data

EHR

EMR
Overview of Application of ICT in Health Sector

- Personalized:
  - Critical Care
  - Institutional Care
  - Ambulatory Care
  - EMR
  - M-HEALTH / Tele Medicine
  - Patient Engagement

- Population Based:
  - Public Health
  - Preventive Health
  - Promotive Health
  - EHR
  - Advocacy
  - Web Information
ICT and Population Health (Nutrition)

This map of San Francisco city was obtained by analysis of city-wide cell phone mobility Data and interviews with local citizens – Restaurants, stores and entertainment were differently color coded.
Government of Punjab & IT University of Punjab developed an open source software based on the one developed by CDC, US to identify and control the spread of Dengue in 2012 & 2013.
ICT & Quality of CARE

mPEDIGREE

Medication Purchases & Diagnostic Trends
Using text messages customers can validate the certification and authentication of pack of medicines and to discern broader patterns such as changes in doctor prescription preferences.

DIMAGI

To check fraudulent data entry by Frontline Health Workers (FLWs) developed on a Core platform commcare, presently practiced in 50 organizations in 30 countries. The idea is to determine the value of Views of FLW on patients’ needs as Physicians have little time.

Care Data

Availability & value of clinical data across all health & care services in England Patient care experience

UK – Mastodon.C

Government funded analysis of validation in prescribing pattern across UK to see whether the variations in prescriptions are physician centric or patient centric & to see whether there could be savings.

1 Billion Pounds
<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Fair health - 2009 a non profit company buys the data from private payers and maintains a web site that provides information on the possible Out-of-pocket expenses, choose health plans and negotiate with buyers.</td>
</tr>
<tr>
<td>Ghana</td>
<td>Ghana resorted to data analytics to trace suspicious and fake Mediclaims. Although, it is in initial stages, the fake claims have come down drastically thereafter.</td>
</tr>
<tr>
<td>Qatar</td>
<td>By combining EHR with hospital readmission rates, medication prescriptions and online social data provide rich information on health risk profiles, care plans, improve communication to facilitate Behavior changes</td>
</tr>
</tbody>
</table>
What is being done in Kerala

**M-care**
A handheld device developed by C-DAC to collect demographic & family health data, using a PDA. This was practiced in 120 Sub-centers covering a population of 7.7 Lakhs

**Tele-medicine (Cancer & Ophthalmology)**
Sanjeeveni & Sanayanam

**Picture Archival Communication System (PACS)**
Regional Cancer Center has implemented this making it easy to report on complex radio images by pooling the HR resource in the Institution

**Q-Management System**
SAT hospital has a state of facility to fix appointments with doctors of choice for patients

**DR SMS**
Provides information about the nearest hospitals and facilities available for the citizens.
Tele-consultation in Rural Telemedicine Project
Sanjeevani - Tele-Oncology

<table>
<thead>
<tr>
<th>Population covered</th>
<th>22,87,053</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screened</td>
<td>51713</td>
</tr>
<tr>
<td>Full blown cancer identified</td>
<td>139</td>
</tr>
<tr>
<td>Early stage cancers identified</td>
<td>273</td>
</tr>
<tr>
<td>Cryotherapy given for early stage cervical cancers</td>
<td>125</td>
</tr>
<tr>
<td>Patients referred to RCC, Trivandrum</td>
<td>241</td>
</tr>
<tr>
<td>Cervical inflammation cases</td>
<td>3672</td>
</tr>
<tr>
<td>Other disease identified</td>
<td>4348</td>
</tr>
</tbody>
</table>
Sunayanam
Mobile Tele-Ophthalmology Unit
(January 2011 to June 2013)

<table>
<thead>
<tr>
<th>Camps conducted</th>
<th>218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients screened</td>
<td>6357</td>
</tr>
<tr>
<td>Glaucoma cases identified</td>
<td>422</td>
</tr>
<tr>
<td>Diabetic Retinopathy cases identified</td>
<td>806</td>
</tr>
</tbody>
</table>

E-nayana software developed by C-DAC is used to transmit image of Retina from the Field the specialist in the Regional Ophthalmic Institute, Trivandrum
SAT Hospital, Medical College Trivandrum

3500 OPD consultations a day  2900 Inpatients

- Integrated Queue Management system
- Ensures patient meets the same doctor during every OPD visit
- Helps build Doctor-Patient relationship
- Facilitates learning as it allows doctor to observe effects of treatment prescribed by himself
- Subsequent Consultations are easy as there is no need to learn history afresh
The project is aiming to:

- Create an elaborate and accurate database of demographic and healthcare information.
- Automate the healthcare service delivery.
- Create a central database of EMR of Citizens.
e-Health - Project Components

A Central Repository of Demographic, Public Health and Healthcare data pertaining to the State (Digitized Family Health Register)

A high Bandwidth reliable Network connecting all hospitals (in Public Sector) in Kerala linking to Central patient Data Repository (WAN)

Centralized Healthcare Information System including EMR and EHR
Digitized Family Health Register

- Aadhaar to be used as the Primary Key as Kerala has a very high % of Aadhaar Registration
- Other existing digital databases about citizen data such as PDS database (Ration Card), Socio Economic Census database, EPIC etc will be compiled to create a base data
- Field Survey Using Smart phones/Tablet

WAN

- High Bandwidth Primary and Secondary Connectivity at every Hospital

Centralized Healthcare Information System

- Real-time data capture
- One citizen – One EMR Policy
- Centralised Picture Archiving and Communication System (PACS) and Radiology Information System (RIS)
- Conformity with GoI EMR/EHR Standards
- Seamless information flow to GoI Frameworks (IDSP, MCTS, HMIS)
- Strict Access Control to ensure confidentiality
- Web interface for each private institution to report the data on diseases regularly.
Need of an integrated solution

State Health Information System

- Alerts for Communicable Diseases
- Control of Non-communicable Diseases
- Removal of Health hazards
- Immunization Follow up
- Information and communication

- Communication of Alerts, follow ups, Programmes, Schedules
- Multipurpose health worker at Sub Centre enter data at the point of service through PDA

- Information from existing citizen DBs
- Existing and Future Reporting Requirements from State & Central Government
- Demographic Details
- Health Details
- EHR
- Past Medical Records
- Current Medicine usage

Other Departments
- LSGD
- District Admin
- Labour, Social Welfare etc

Legacy Systems
Integration with Other Department Applications

Health Department

Reports Engine
MIS Reports, Dash boards
Summary

ICT could transform the Health Sector by:

- Providing Information
- Engaging Patients / community
- Enhance the skills of the physicians
- Abort / Contain epidemics of communicable diseases
- Sound policy formulation

Thank you