Country on a Mission: The Remarkable Story of Bangladesh’s in National COVID-19 Response

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COVID19 is Changing that Context Rapidly
Policy Makers Need Dashboards with Real-time Data, Not Data Gathered from Surveys

- **High risk case identifications**
- **Disease Progression Prediction**
- **Hot zone identification**
- **Resource Allocation:** Health Workers, testing facilities, hospitals, isolation units, ICU, etc.
- **Prioritize Vaccine Recipient**
- **Timely policy response (Health):** Contact tracing, quarantine, partial lockdown, full lockdown
- **Timely policy response (Non-Health):** Workplace, schools, transportation, Industry, Relief and food support
COVID-19 Collective Intelligence System

**Data collection**
- Citizen Self-report
- Automated Contact Tracing
- Report from COVID-19 Tests
- Frontline Workers Self-report
- Report by CST

**Data analysis**
- Doctors’ Pool (4,000 doctors)
- Medical advice
- e-Prescription
- Data Analytics
- Verification by Doctors
- High-risk cases
- Hotzones
- Recommendations

**Decision making**
- Dashboard for Healthcare Providers (DGHS, IEDCR, public and private)
- Medical decisions
- Dashboard for Govt. Administration (Cabinet, field admin, police)
- Admin decisions
- Multi-stakeholder Communication
  - corona.gov.bd
  - TV, radio, community radio, phone, social media
Use Case: Self-reported Syndromic data streams and human verification process helps to identify potential high-risk zones before suspected get tested

Data Sources
- 333 (Hotline)
- *3332# (USSD)
- App/ Web interface

Human verification
- Based on response to questions in the IVR system
- Based on telecom operator’s screening algorithm

Classified as high risk

- 21 Million self-reporting
- 1.2 Million analyzed by Telecom using ML
- 221K verified by doctors and tested by DGHS

(A) Teletalk and Robi providing regularly
(B) High court rule
Use Case: Tracking movement of COVID positive patients for contact tracing and home quarantine enforcement
Use Case: Hospital capacity and suspected patients load management

Resource mapping may be helpful for early preparation
COVID-19 Dynamic Facility Dashboard for Bangladesh

Hospital Information

Bed Occupancy Rate (%) by Division (2nd Week of July)

- Barishal: 66%
- Chattogram: 70%
- Dhaka: 70%
- Khulna: 76%
- Mymensingh: 111%
- Rajshahi: 87%
- Rangpur: 68%
- Sylhet: 65%

Resources need to be deployed in Mymensingh

Rajshahi needs attention

Bed Occupancy Rate (%) by Division (Last week of August)

- Barishal: 22%
- Chattogram: 30%
- Dhaka: 35%
- Khulna: 21%
- Mymensingh: 25%
- Rajshahi: 19%
- Rangpur: 16%
- Sylhet: 38%
COVID-19 National Dashboard

• Real time disease progression monitoring
• Policy guidance to field administration and field health administration
• Real time policy advocacy on resource allocation
Use Case: Zoning Based on COVID-19 Patient Location Cluster at Ward Level in City Corporations

- **Barisal City Corporation COVID Situation**
- **Cumilla City Corporation COVID Situation**
- **Gazipur City Corporation COVID Situation**
- **Chittagong City Corporation COVID Situation**
Impact of Covid-19 on Education

35,000 Institutions 20,873,064 Students 621,158 Teachers

District wise Affected Institution

**Chattogram District**
- Edu. Institution: 1,283
- Student: 1,184,298
- Teacher: 25,102

**Dhaka District**
- Edu. Institution: 1,218
- Student: 1,685,775
- Teacher: 49,371

**Coxs Bazar District**
- Edu. Institution: 1,183
- Student: 808,952
- Teacher: 20,229

**Mymensingh District**
- Edu. Institution: 1,183
- Student: 673,847
- Teacher: 18,649

**Dinajpur District**
- Edu. Institution: 1,156
- Student: 490,278
- Teacher: 19,150

**Rajshahi District**
- Edu. Institution: 1,071
- Student: 470,147
- Teacher: 21,496

**Jashore District**
- Edu. Institution: 997
- Student: 428,768
- Teacher: 18,329

**Bogura District**
- Edu. Institution: 987
- Student: 523,127
- Teacher: 17,795

**Tangail District**
- Edu. Institution: 888
- Student: 522,907
- Teacher: 14,787

Source: BANBEIS and Data of higher secondary to tertiary education

Map data © OpenStreetMap contributors

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Public facing dashboard

Corona.gov.bd

21M visits
Mask Distribution in Different Districts

Correlation between infection and mask distribution

10 Highest and Lowest Districts Based on Mask Distribution
Doctors Pool

4,450 Doctors

435K Patients served
### Telehealth Services initiatives

<table>
<thead>
<tr>
<th>Service Center</th>
<th>Started On</th>
<th>Data/Services Provided</th>
</tr>
</thead>
</table>
| **COVID-19 Telehealth Center**  | **June 13, 2020** | ➢ Data shared by DGHS.  
➢ Managed by a2i, ICT Division  
➢ Technical support (CRM, Server, VPN)  
COVID-19 (+VE) & Suspected Patients.  
15.33 Lac Telehealth Services  
6.81 Lac Patients Served |
| **333 Telehealth**              | **March 15, 2020**| ➢ Managed by a2i, ICT Division  
➢ Technical support (CRM, Server, VPN)  
Patients with COVID-19 & General Medical Conditions  
63 Lac+ Telehealth Services  
1500+ Per day Patients Served |
| **Ma Telehealth Center**        | **June 14, 2020** | ➢ Managed by a2i, ICT Division  
➢ Technical support (CRM, Server, VPN)  
Pregnant & Lactating Mothers & Children  
4.28 Lac Telehealth Services  
79,987 Patients Served |
| **CST Telehealth Center**       | **Dec 21, 2020**  | ➢ Managed by a2i, ICT Division  
➢ Technical support (CRM, Server, VPN)  
COVID-19 (+VE) & Suspected Patients.  
37,082 Telehealth Services  
19,000 Patients Served |
Step by step Telehealth Services for Covid-19 patients

1. Patient Data Receive
   - Performed by ICT officer
   - From DHIS2, DGHS
   - Every day

2. Patient Data Validation
   - Performed by ICT officer
   - Data formatting
   - Data filter
   - Duplication remove

3. Patient Basic Information Collection
   - Performed by HIO
   - Responsive patient identification
   - Basic non-medical data collection
   - Forward for medical assessment

4. Medical Assessment
   - Performed by Doctor
   - Medical data collection
   - Identify Comorbidity

5. Medical Consultation
   - Tele-treatment by Doctor
   - Doctor’s counselling
   - Caregiver counselling
   - e-Prescription

6. Covid-19 Patient Follow-up
   - Performed by Doctor
   - Health status collection
   - Tele-treatment by Doctor
   - Doctor's counselling
   - e-Prescription

7. Close Case
   - Performed by HIO/Doctor
   - Status collection (Cured/Dead)
   - Counselling (Patient/Caregiver)
   - Close the case

8. Covid-19 Telehealth Service Centre

Patient Data Insertion
- Performed by ICT officer
- Into CRM System
- Assign to HIO

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Provided Services

- Medical Assessment of Covid Patients
- Follow up Calls Based on Disease Severity Status
- Emergency Food Service
- Emergency Medicine Service
- Emergency Hospitalization Service
- Burial Support

Services Provided by Covid19 Telehealth Center
Proportion of COVID-19 Patient by Co-Morbidity Status

- Co-Morbid: 40,826
- Non Co-Morbid: 163,305

Total Patients = 204,132
Proportion of COVID-19 Patients Co-Morbidity Status by Diseases/Conditions

Proportion of Co-morbid Diseases (n=40,826)

- Diabetes: 36%
- Hypertension: 35%
- Kidney Disease: 3%
- Heart Failure: 4%
- Stroke: 4%
- Asthma: 9%
- Others: 9%
## Telehealth Data Comparison with PCR Data

Total in PCR: 573828

Total in telehealth: 204132

### % representation in PCR and telehealth

<table>
<thead>
<tr>
<th>Location</th>
<th>PCR</th>
<th>Telehealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barishal</td>
<td>2,684</td>
<td>2,179</td>
</tr>
<tr>
<td>Chattogram</td>
<td>4,352</td>
<td>15,509</td>
</tr>
<tr>
<td>Dhaka</td>
<td>5,497</td>
<td>61,515</td>
</tr>
<tr>
<td>Khulna</td>
<td>2,917</td>
<td></td>
</tr>
<tr>
<td>Mymensingh</td>
<td>1,973</td>
<td></td>
</tr>
<tr>
<td>Rajshahi</td>
<td>6,293</td>
<td></td>
</tr>
<tr>
<td>Rangpur</td>
<td>3,447</td>
<td></td>
</tr>
<tr>
<td>Sylhet</td>
<td>3,313</td>
<td>3,007</td>
</tr>
</tbody>
</table>

### Telehealth patient count

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Sylhet</td>
<td>3.3%</td>
</tr>
<tr>
<td>Rajshahi</td>
<td>3.2%</td>
</tr>
<tr>
<td>Chittagong</td>
<td>3.2%</td>
</tr>
<tr>
<td>Mymensingh</td>
<td>2.0%</td>
</tr>
<tr>
<td>Khulna</td>
<td>5.5%</td>
</tr>
<tr>
<td>Dhaka</td>
<td>61.5%</td>
</tr>
<tr>
<td>Borno</td>
<td>2.7%</td>
</tr>
<tr>
<td>Rangpur</td>
<td>2.2%</td>
</tr>
<tr>
<td>Sylhet</td>
<td>2.1%</td>
</tr>
<tr>
<td>Sylhet</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

### PCR Patient count

- Sylhet: 3.3%
- Rajshahi: 3.2%
- Chittagong: 3.2%
- Mymensingh: 2.0%
- Khulna: 5.5%
- Dhaka: 61.5%
- Borno: 2.7%
- Rangpur: 2.2%
- Sylhet: 2.1%
- Sylhet: 1.3%
- Sylhet: 2.5%
a2i Supporting Govt of Bangladesh

• **Supporting vaccine registration:** Repurposing assets/initiatives
  • 333 Telemedicine service by doctors/Health Information Officers (HIO)
  • Union Digital Centres entrepreneurs
  • NGOs and voluntary org network created during COVID
  • Advocacy for integrating with popular apps (telco, money transfer)

• **Reporting Adverse Effect Following Immunization (AEFI):**
  • Repurposing system developed in 2016 by a2i Innovation Fund for DG Drug Administration
  • Integrating with 333 Telemedicine service, as necessary

• **Issuing international travel certificates** Exploring best practices/systems/standards to prevent reinvention of the wheel and deploy quickly and sustainably
  • Reviewing India DIVOC (Gates Foundation)
  • Reviewing Common Pass (World Economic Forum)
  • Reviewing WHO Smart Certificate team (ID2020)
• **Supporting policy decisions with big data analysis**
  • Integrating COVID-19 dashboard, vaccination dashboard and AEFI dashboard
  • Analyzing vaccination LNOB issues
  • Analyzing telemedicine data for COVID patients
  • Analyzing socio-economic recovery data from multiple data sources
Thank You