Using AI to Improves Healthcare for the Underserved Billions

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WADHWANI AI
AI FOR SOCIAL GOOD
Low Birthweight Babies

- 20M LBW worldwide, linked to nearly half of neonatal deaths
- ~4M missing LBW in India (out of ~7.6M total LBWs, 26M newborns) - 20-40% newborns not weighed at birth
- Reasons for underreporting
  - Supply chain issues
  - Malfunctioning equipment
  - Data tampering and motivation
  - Cultural taboos
ASHA (community health worker) diary for home-based newborn care (HBNC) visits

<table>
<thead>
<tr>
<th>क.स.</th>
<th>मकन नं.</th>
<th>महिला/पति का नाम</th>
<th>प्रसव दिनाक</th>
<th>स्थान (घरेलू/संस्थागत)</th>
<th>जन्म के समय वर्णन</th>
<th>आशा व एनएचएम की प्रशिक्षण संयुक्त विकिट की दिनाक</th>
<th>शिशु की घर पर देखभाल का कलेंडर</th>
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<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td>20-1-19</td>
<td>C/05-12-19</td>
<td>2.500</td>
<td>23.1.19, 25.1.19, 26.1.19, 2.2.19, 21.2.19</td>
<td>6.5.19</td>
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<td>2.</td>
<td></td>
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<td>2.3.19</td>
<td>उदयपूर</td>
<td>2.500</td>
<td>22.5.19, 24.5.19, 28.5.19, 4.6.19, 11.6.19, 19.6.19, 7.7.19</td>
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<td>3.</td>
<td></td>
<td></td>
<td>11-5-19</td>
<td>उदयपूर</td>
<td>2.500</td>
<td>10.7.19, 12.7.19, 28.7.19, 29.7.19, 30.7.19, 31.7.19, 2.8.19</td>
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VIRTUAL WEIGHING MACHINE

SMARTPHONE-BASED ANTHROPOMETRY

Multiple 2D images (short video)

Weight, head circumference, length
## Primary Health in India

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Details</th>
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<tbody>
<tr>
<td>5500 Community Health Centers</td>
<td>Each serves about 150,000 people</td>
</tr>
<tr>
<td>2500+ Primary Health Centers</td>
<td>Each serves about 35000 (Ideally) has an MBBS degree holding doctor</td>
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<tr>
<td>155000 Subcenters</td>
<td>Each serves about 5500 Managed by Auxiliary Nurse Midwives (ANM)</td>
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<tr>
<td>1 Millions ASHA workers</td>
<td>No medical qualification Community based, home visits</td>
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</tbody>
</table>
AI Can Help Increase Capacity at Frontlines

- ASHA/ANM mediated
- Better triaging
- More reliable data collection
- More efficient and cost effective

Help India’s Health and Wellness Centers become Tech enabled
TB cascade of care

*Numbers for India to illustrate challenges*

**Finding Patients**

1. No care-seeking (~17%)

2. Not identified as TB patient or not reported

**Curing Patients**

3. Loss to follow-up, pre-treatment

4. Loss to follow-up, on treatment

5. Treatment failure

**New active TB cases (burden)**

- Private sector (estimated): ~1.2M (~52%)
- Public sector: ~1.1M (~48%)

**Patients seeking care (care seeking)**

- Private sector: ~1.4M (partially known 0.4M)
- Public sector: ~1.3M

**Accurately diagnosed (diagnosis)**

**Initiating first line (treatment)**

- Private sector: ~1.04M
- Public sector: ~0.1M

**Completing treatment (adherence)**

**Final outcome (outcome)**

- Public sector Cured: ~960K
- Deaths ~423K

**Geospatial case mapping**

- X-ray, Sputum, NAAT, Cough, Ultrasound

**Adherence**
ADHERENCE MONITORING
### Case load / risk score toward case finding

<table>
<thead>
<tr>
<th>Infectors</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Prevalence surveys</td>
<td>• Population density</td>
</tr>
<tr>
<td>• Notifications</td>
<td>• Mobility</td>
</tr>
<tr>
<td>• Drug sales</td>
<td>• Weather</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Susceptibility</th>
<th>Strength of health system</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Economic status</td>
<td>• Mortality</td>
</tr>
<tr>
<td>• Malnutrition</td>
<td>• Health facilities</td>
</tr>
<tr>
<td>• Comorbidity</td>
<td>• Vaccination rate</td>
</tr>
</tbody>
</table>
Adherence Management

Contextual Data
- Program data,
- Local results

Patient Data
- Adherence-related phone records,
- Clinical,
- Socioeconomic

Predictions

Interventions integrated with current systems
- Visit, Call, SMS, etc.

Integrate with existing workflows, Nikshay and app for TB health worker.

Buy-in from CTD, Everwell, implementors
An MoU has signed to explore #ArtificialIntelligence solutions in combating #TB in collaboration with @WadhwaniAI Institute of Artificial Intelligence & Central TB Division on (28th August 2019). @pmoindia @MoHFW_INDIA @drharshvardhan @AS_RNTCP @iamvikassheel @NITIAayog #TBHDJ
Integrated Pest Management
USD 2 MILLION GRANT TO HELP REDUCE CROP LOSSES IN COTTON FARMING
7 questions we ask for AI for scaled social good

• Is this a big problem?
• Does it have an AI solution?
• Will solving the AI part make enough of a difference?
• Will the solution be accepted by stakeholders?
• Does the data exist, or can it be created easily enough?
• Are there partner organizations who can co-create and pilot?
• Are there programs and pathways to scale?
AI-based solutions must work within broader systems and programs for scaled impact
Key Steps in Operationalization

1. Tech POC
2. Dataset creation
3. Solution (Product + Service)
4. Use case definition
5. Pilot
6. Scale
7. Health area
Partnerships Bridge the Tech and Social Sectors

Technology Partners (e.g., Google, AI startups, Innovators)

Governments, NGOs, Domain Experts

Health area

Pilot

Use case definition

Scale

Solution (Product + Service)

Wadhwani AI

Dataset creation

Tech POC
OUR FOUNDERS

Tech entrepreneurs **Dr. Romesh Wadhwani** and **Mr. Sunil Wadhwani** are committing $3M/year for 10 years (total $30M) as well as their own time and the benefit of their entrepreneurial experience.
New Initiative: Contextual AI for Health

- A Multi-phased initiative funded by the Gates Foundation
- Ultimate goal – to build an open AI innovation platform for global health
- Increase system capacity and efficiency
- Empower frontline health workers
- Make Health Wellness Centers more effective

Contextual SOAP
Thank you!