GREETINGS FROM INDIA
Regional High-Level Meeting on eHealth
Bangkok, Thailand, 17th to 19th November 2013

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More Health Workers means Better Health Care
No Health Worker means No Care
Health Facilities in India

- Health Sub Centres: 1,48,366
- Primary Health Centres: 24,049
- Community Health Centres: 4,833
- Hospitals (Sub District, District & Medical College Hospitals): 12,760
### Current Scenario of HRH - India

**Total Medical Colleges**
- **387**
  - Govt.: **181**
  - Private: **206**

**Producing 52000 Medical graduates every year**

**Average Annual Output**
- **131** medical graduates per medical college per year

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### Average annual output of Medical Graduates in different countries

<table>
<thead>
<tr>
<th>Region</th>
<th>Average Annual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Europe</td>
<td>125</td>
</tr>
<tr>
<td>North America</td>
<td>110</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>220</td>
</tr>
<tr>
<td>Western Europe</td>
<td>149</td>
</tr>
</tbody>
</table>

### Other Medical Professionals

<table>
<thead>
<tr>
<th>Role</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>6,91,633</td>
</tr>
<tr>
<td>AYUSH Doctors</td>
<td>5,34,091</td>
</tr>
<tr>
<td>Nurses</td>
<td>7,43,324</td>
</tr>
<tr>
<td>ANMs</td>
<td>3,61,879</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>4,92,923</td>
</tr>
</tbody>
</table>

*Source: 12th Plan Document, Planning Commission*
Current Scenario of HRH

DOCTORS

- Number of Doctors — 8.67 Lakhs (as per Indian Medical Registration)
- Available (80%) — 6.90 Lakhs (approx)
- Doctor Population Ratio — 1 : 1739 (Current)
- Target ratio — 1 : 1200 by 2025
- Additional Doctors required — 4 Lakhs by 2022

Doctor per 1000 population compared to

- CHINA — 1.6
- U.S.A — 2.6
- U.K. — 2.3

1.5 Lakhs in 50,000 PHCs
0.8 Lakhs in 12,500 CHCs
1.1 Lakhs in 5,642 SDH/DHs
0.5 Lakhs in 800 MCHs
4 Lakhs by 2022
Current Scenario of HR – contd….

**NURSES**

- **Nurses registered** – 14 Lakhs
- **Available (40%)** – 7.4 Lakhs (Approx)

<table>
<thead>
<tr>
<th>Country</th>
<th>Nurse - Population Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>3 : 1</td>
</tr>
<tr>
<td>South Africa</td>
<td>5 : 1</td>
</tr>
<tr>
<td>USA</td>
<td>3 : 1</td>
</tr>
<tr>
<td>UK</td>
<td>5 : 1</td>
</tr>
</tbody>
</table>

**US with less than 1/3rd of India’s population has 30 Lakh active Nurses**

- **Nurse - Population Ratio** – 0.6 : 1000
- **Nurses + ANM Vs Doctor Ratio** – 1.6 : 1

- **According to Planning Commission**
  - Additional Nurses required – 16.2 Lakhs by 2022
  - India has 250 health workers per Lakh population and Target by 2022 is 500 per Lakh population
  - To achieve a target of 500 health workers per Lakh we need additional 240 Medical Colleges, 500 GNM & 970 ANMs Training Institutes by 2022
Nurse density in India as compared to other countries (n/1000 population)

<table>
<thead>
<tr>
<th>Country</th>
<th>Nurse density per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>0.75</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>1.58</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.82</td>
</tr>
<tr>
<td>Japan</td>
<td>7.79</td>
</tr>
<tr>
<td>USA</td>
<td>9.37</td>
</tr>
<tr>
<td>UK</td>
<td>12.12</td>
</tr>
</tbody>
</table>

Nurse to doctor Ratio in India as compared to other countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Nurse to doctor ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>3.19</td>
</tr>
<tr>
<td>Thailand</td>
<td>7.69</td>
</tr>
<tr>
<td>Japan</td>
<td>4.04</td>
</tr>
<tr>
<td>USA</td>
<td>3.65</td>
</tr>
<tr>
<td>UK</td>
<td>5.54</td>
</tr>
</tbody>
</table>

More Nurse-midwives = Fewer Maternal Deaths

Current Scenario of HR – Contd....

Allied Health Workforce available - 62.65 Lakhs (Approx)
Additional Workforce required - 64.10 Lakhs

State-wise short-fall

<table>
<thead>
<tr>
<th>State</th>
<th>Short-fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bihar</td>
<td>5.28</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>5.64</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>10</td>
</tr>
<tr>
<td>West Bengal</td>
<td>4.62</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>4.22</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>3.68</td>
</tr>
</tbody>
</table>
Huge NRHM Effort for HRH (increase in the HR since 2005)

- Doctors: 10,000
- ANMs (Allied Health Ps.): 47,000
- Paramedics: 1,50,000
- Nurses: 2,70,000
- ASHAs: 8,60,000
Will adding numbers suffice? What about competencies?

Clinical Skills of Faculty of select high focus states

But we can fix it

Result after 6 weeks training

N=74

Source: NNC Kolkata, 6 weeks training report
<table>
<thead>
<tr>
<th>State</th>
<th>Population (millions)</th>
<th>% of World Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharastra</td>
<td>112</td>
<td>1.8%</td>
</tr>
<tr>
<td>Bihar</td>
<td>104</td>
<td>1.8%</td>
</tr>
<tr>
<td>West Bengal</td>
<td>91</td>
<td>1.3%</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>85</td>
<td>1.25%</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>73</td>
<td>1%</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>72</td>
<td>1%</td>
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<tr>
<td>Rajasthan</td>
<td>69</td>
<td></td>
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<tr>
<td>Karnataka</td>
<td>61</td>
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<tr>
<td>Gujarat</td>
<td>60</td>
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<tr>
<td>Odisha</td>
<td>42</td>
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<tr>
<td>Kerala</td>
<td>33</td>
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<tr>
<td>Punjab</td>
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<tr>
<td>Chattisgarh</td>
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<tr>
<td>Haryana</td>
<td>25</td>
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<tr>
<td>Delhi</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>200</td>
<td>3%</td>
</tr>
<tr>
<td>Brazil</td>
<td>193</td>
<td>5%</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>128</td>
<td>3%</td>
</tr>
<tr>
<td>Bihar</td>
<td>106</td>
<td>2%</td>
</tr>
<tr>
<td>West Bengal</td>
<td>94</td>
<td>1.5%</td>
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Sources: State of World Population 2010 and Census India 2011
India: Unity in Diversity

- It has 29 states and 6 union territories
- There are 18 official languages, 114 languages, 216 mother tongues and 900 dialects in India.
- Hindi: National language. English: commonly used for national, political, commercial & educational purposes
- 7th largest country, 2nd most populous (1.237 billion).
- 1 out of 5 people in the world = Indian
What to Do? Where to Go?
Current Focus Areas

1. Establish Public Health Cadre in rural areas - reduce dependence on doctors
   - Establish Community Health Officers at Sub centres
   - Training, recruitment and deployment at district level

2. Enhance the quality of HRH education and training
   - Introduce pre service & In service trainings & up gradation of skills for HRH
   - Infuse technology in HRH education and training
   - Develop a National Health Information Technology Network

3. Create road map for career growth for all categories of health workers

4. Bridge courses for the AYUSH, Nursing & Allied Health Professionals
5. Transform HRH management systems
   ❖ Recruitment, retention, performance
   ❖ Rational pay and incentives
   ❖ Cadre review, transparent and fair transfer policy
   ❖ Career tracks for professional advancement

6. Invest in Health Sciences Research and Innovation
   ❖ Increase budget
   ❖ Expand capacity
   ❖ Establish centres of excellence
   ❖ Boost research at Medical schools
7. Create HRH - MIS for correct deployment in focus areas

8. Introduce Reforms in regulatory bodies
   - Support MCI reforms & Strengthen other councils
   - Career tracks for professional advancement
   - Set up National Allied Health Sciences Board/ Council
   - Introduce standardization & accreditation of processes, services & institutions in health
Solution ??

Teamwork
EXPECTED OUTCOMES

- Increase of around 17,400 MBBS seats annually [total as per two schemes]
- Training of 300 candidates as Nursing faculty
- Adding 20,000 nurses annually
- Training 2,04,000 paramedical (allied health) professionals
CERTAIN REALITIES .......
Last decade: 4 Pilots in SEAR have shown usefulness of Telemedicine

3 step implementation approach for Pilot projects

• Step 1: Improve access to Information (tele-education)

• Step 2: Improve access to Medical Advice (tele-consultation)

• Step 3: Improve access to diagnosis & patient management (tele-radiology, tele-pathology etc)
TELECOM SUBSCRIPTION STATUS
as on 30.09.2013

INDIA

• Total subscriptions : 899.86 mn ( Wireless = 870.58 mn )
• Urban subscriptions : 543.18 mn ( Wireless = 520.21 mn )
• Rural subscriptions : 356.68 mn ( Wireless = 350.37 mn )
• Active wireless subscribers : 738.89 mn ( 84.87% of the total )
• Broadband subscriptions : 15.36 mn

World Bank study has estimated that a 10% increase in broadband connectivity leads to 1.38% increase in Gross Domestic Product (GDP)

Broadband penetration in India at present is less than 2%.
WORLD

• Globally there are 6.8 bn mobile users globally with 3.5 bn in Asia Pacific
• Mobile-cellular penetration rates stand at 96% globally
  - 128% in developed countries
  - 89% in developing countries
• Over 2.7 bn people are using the Internet (39% of the world’s population)
  - 77% in the developed countries
  - 31% in the developing countries
Telemedicine

Human resource

SYNERGY

Tools

Connectivity
The NKN - a state-of-the-art multi-gigabit pan-India network = unified high speed NW backbone for all knowledge related institutions in the country

- Designed to support Overlay, Dedicated, and Virtual Networks - will seamlessly integrate with the global scientific community at multiple gbps
- NKN has already connected 831 institutions including 151 Medical institutions till date
- Various applications envisaged are Countrywide Virtual Classrooms, Collaborative Research, Grid Computing, Virtual Library, Sharing of Computing Resources, Network Technology Test-bed and e-Governance etc.
State Wide Area Network (SWAN)
National Optical Fiber Network (NOFN)

- SWAN provides high speed bandwidth connectivity from State – District – Block Level
- On 25-10-2011, Govt. of India approved setting up of NOFN estimated to cost about Rs. 20,000 cr (approx. 3.4 bn $ USD) to provide connectivity to all the 2,50,000 Gram Panchayats (GPs in villages) in the country
- Gigabit Passive Optical Network Technology
- MoHFW has initiated process to leverage NKN and NOFN Initiatives of Govt. of India and considered establishment of National Medical College Network (NMCN), National Rural Telemedicine Network (NRTN) and Mobile Health Projects
NMCN Services

Services

Digital Library

Virtual Classroom

Live Streaming

Web Casting

National Medical College Network

Video-Conferencing
NMCN Services

• Besides Health Education Content Delivery, Central Repository of Medical Education Content & Digital Medical Library Network, Technology Enabled Skill Transfer & Mentoring, Platform for Interactive Distance Learning in an Adaptive Environment the Tele-consultation, Tele Follow-up services and m-Health shall be initiated under the NMCN

• Virtual Class Rooms, Digital Lecture Theatres shall be utilized for UG Lecture Sharing, Remote Participation in CME, Skill Share among health professionals (Medical, Dental, Nursing and Others), Open Online Courses for Medical & Public Health Professionals and Carrying out Structured skill-based online courses etc.

• Digital Library in the medical college shall have access to global knowledge resource and every health professional shall have that available for capacity building and skill development
NMCN Services........

- Tele-CMEs Facility shall be located in the hospital near the clinical service areas meant for Continuous Professional Skills Development for HRH, Multi-conferencing environment - both hardware and web conference with facility for Clinical Case Material Preparation, high speed internet access and end point compatible to video streaming and web-casting.

- Every medical institution shall, then, have a Knowledge Park, its web portal and contribute to medical science knowledge hub, nationally and internationally and becoming a Virtual Health University.

- Gradually many more initiatives under e-Health namely e-Governance, MCTS, HMIS, EHRs/EMRs, Public Health Programs etc. shall be very productive for India’s Health Scenario.
Proposed System and Network Architecture of NMCN
Telemedicine Integrated Digital OT @ SGPGI
Tele-presence Suite @ SGPGIMS
Web-Streaming

Surgical complications after liver transplantation

- Hepatic artery thrombosis
- Portal/ hepatic venous thrombosis
- Biliary complications
Virtual Class Room / Digital Lecture Theatre

- Under Graduate Lecture Sharing
- Remote Participation in CME
- Skill Share among health professionals (Medical, Dental, Nursing, Allied Health Professionals and Others)
- Open Online Courses for Medical & Public Health Professionals
- Carrying out Structured skill-based online courses
- Etc. etc.
High Definition LCD TV
High Definition 6000 lumens Projector
Large motorized Projection Screen
HD hardware based Video Conferencing

Audio Mixer with Amplifier
VGA Switcher for Sharing Content
Xeon Servers
Router with Wide Area Application Accelerator Module
Tele-CME

- Facility to be located in the hospital near the clinical service areas
- Meant for Continuous Professional Skills Development for HRH
- Multi-conferencing environment - both hardware and web conference
- Facility for Clinical Case Material Preparation
- Facility for high speed internet access
- End point compatible to video streaming, web-casting
Video Conferencing Unit

Diagnostic Kits of Vital Parameters like ECG, BP etc.

A3 Scanner with Transparency Adaptor

46” LCD Display  Video Conferencing Codec  IBM Server  Printer  Lenevo PC

Tele-CME
Knowledge Network Enterprise

Telemedicine HUB at (STBMI)

- Nephrology
- Endocrine Surgery
- Radiology
- Tele-Clinic
- Neurology
- Mobile Kiosk @ WARD
- Nuclear Medicine
- Mobile Kiosk @ Doctor's Duty Room
- OT Cafeteria
- Immunology
- Pathology
- Radiotherapy
Sometimes the *chains* that prevent us from being free are more *mental* than *physical*. 
90% of People can't see what's wrong with this picture
Can you???
IT'S A LONG ROAD
but it's worth it
WHO Regional High Level Meeting on eHealth at Bangkok, Thailand

17th to 19th November 2013