Building Institution for HSS- India Experience of NCCVMRMC and NCCTC

Dr. Srihari Dutta
Immunization Specialist, UNICEF, Delhi
A Joint presentation of NCCVMRMC, NCCTC and UNICEF
Outline of Presentation

• Country overview and programme mile stone
• Gaps in India ISCS based on 10 states VMA
• Philosophy and Principle of HSS-Institution Development
• Structure and Activities of the Centers
• Optimization of Cold Chain HR engagement
• Solarization of Health Facilities
• Fix basics
Immunization Program in India: A Snap Shot

- ~27 million new born targeted for vaccination each year
- ~9 million immunization session held annually
- ~28,000 cold chain points (Last Vaccine Storage Site) in the country
- Vaccine against 7 vaccine preventable diseases
- NIDs for polio conducted every year vaccinating 800 million children
- Catch-up campaign for measles targeting 135 million children completed in 2013
-JE vaccination campaign conducted in 112 endemic districts covering 78 million children
- Hib containing Pentavalent vaccine introduced in the country in 2012

Introduction of IPV, MR and Rotavirus vaccines

- 61% Full Immunization
- Eliminated NNT in all states April 2015
- Certified Polio Free in 2014
MOHFW Divisions – India

1. Blindness Control
2. Bureau of Planning
3. Cancer Control Programme
4. CCA
5. Central Design Bureau
6. CHS
7. Drugs Food Quality control division
8. Emergency Medical Relief
9. ICA IN

10. Immunization
11. Medical Education
12. Medical Tourism
13. Mental Health Division
14. NPCDPS
15. NPHCE
16. NPPCD
17. NRVDCP
18. NGO Division
19. NHM Finance
20. NHM policy & Planning
21. NUHM
22. Infrastructure & HR Division
23. Telemedicine
24. Medical Education Policy - II
25. Dental
26. Nursing
27. PMS
28. PHASE
29. PNCD
30. Principal Accounts Office
31. Procurement
32. Revised National Tuberculosis Programme
33. Statistics Division

34. Training Division
35. Activities of Health and Family Welfare
36. OP & Writoth Marketing

NIHFW
(National Institute of Health and FW
Apex Capacity building Institute of MOHFW)
Immunization Supply Chain System in India

Partners Agencies:

- Level 1 Primary Store
- Level 2 Primary Store
- Intermediate Level 1

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>In operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILR+DF</td>
<td>70000</td>
</tr>
<tr>
<td>Solar CCE</td>
<td>438</td>
</tr>
<tr>
<td>WIC</td>
<td>180</td>
</tr>
<tr>
<td>WIF</td>
<td>25</td>
</tr>
<tr>
<td>Vaccine Carrier</td>
<td>112400</td>
</tr>
<tr>
<td>Cold Box</td>
<td>66000</td>
</tr>
<tr>
<td>TYPE OF STAFFS</td>
<td>NATIONAL</td>
</tr>
<tr>
<td>----------------</td>
<td>----------</td>
</tr>
<tr>
<td>1.25 Billion population</td>
<td>Av. 40 Million population</td>
</tr>
<tr>
<td>30 states &amp; 6 UTs</td>
<td>666 Districts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RI program Vaccine Management</th>
<th>Deputy Commissioner</th>
<th>EPI Officer</th>
<th>Immunization Officer</th>
<th>Medical Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold Chain AEFI, Training &amp; Communication</td>
<td>Deputy Commissioner</td>
<td>Cold Chain Officer</td>
<td>Cold Chain Technician</td>
<td>Cold Chain Handler</td>
</tr>
<tr>
<td>Data Management</td>
<td>Senior Statistical Officer</td>
<td>Demography &amp; Statistics/ Imm Computer Assistant</td>
<td>Statistical Assistant/ Health information Officer</td>
<td>Program Officer/ Health Educator</td>
</tr>
<tr>
<td>Administration &amp; Finance</td>
<td>Under Secretary</td>
<td>State Finance Manager, NHM/</td>
<td>Accounts Manager, NHM</td>
<td>Medical Officer/ Clerk</td>
</tr>
<tr>
<td>RI Communication</td>
<td>Section Officer</td>
<td>IEC and BCC cell</td>
<td>Public Health Education Officer</td>
<td>Health Educator</td>
</tr>
<tr>
<td>No</td>
<td>Indicator</td>
<td>State Stores</td>
<td>Regional Stores</td>
<td>District Store</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------</td>
<td>--------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>1</td>
<td>Vaccine storage Temp</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>2</td>
<td>Cold store capacity</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>3</td>
<td>Building, CC Equip,</td>
<td>+++</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Maintenance of CC Equip, transport</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>Stock management</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>6</td>
<td>Effective Vac Delivery</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>7</td>
<td>Correct Use of diluents</td>
<td>+</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>8</td>
<td>Effective VVM Use</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>9</td>
<td>Vaccine Wastage Control</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
</tbody>
</table>

Strength, Weakness

Immunization Supply Chain Gaps: 10 states VMA 2007-2011

Dr. Srihari Dutta, Building Institution for HSS, 14th TechNet Meeting Bangkok, 11-15th May 2015
5 Areas of Immunization Supply Chain System Gaps

**3 Ps of Health System**
- Process
- Practices
- Policies

For an efficient ISCS

*Improvement Plan (IP) is to Strengthen the existing ISCS to make it Reliable, Affordable, and Efficient.*

Needs System Approach
Institutions for Cold Chain and Vaccine Management-India

1. Blindness Control
2. Bureau of Planning
3. Cancer Control Programme
4. CCA
5. Central Design Bureau
6. CHS
7. Drugs Food Quality control division
8. Emergency Medical Relief
9. IC & IN

10. Immunization
11. Medical Education
12. Medical Tourism
13. Mental Health Division
14. NPCDCS
15. NFHS
16. NPPCD
17. NRHMCP
18. NGO Division
19. NHM Finance
20. NHM Policy & Planning
21. NUHM
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23. Telemedicine
24. Medical Education Policy- II
25. Dental
26. Nursing
27. PMAS
28. PMSSY
29. PNMT
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NIHFW
(National Institute of Health and FW)

A 4 years Journey from 2011

NATIONAL COLD CHAIN & VACCINE MANAGEMENT RESOURCE CENTRE (NCCVMRMC)
Govt of India, NIHFW and UNICEF

UNICEF
Advocacy, Blueprint, Budgeting, FU, Handholding and TA

NATIONAL COLD CHAIN TRAINING CENTRE (NCCTC)
Department of Health & Family Welfare, Government of Maharashtra, Govt of India and UNICEF

Dr. Srihari Dutta, Building Institution for HSS, 14th TechNet Meeting Bangkok, 12-15th May 2015
Philosophy and Principles considered

**Philosophy**

*MOHFW is able to Plan, Manage, Maintain, Fund and run it’s cold Chain system with long term vision*

**Principles**

- MOHFW ownership and investment
- Sustainable funding
- Long term vision
- Institutionalization
- Clear exit plan of initial support
- Within existing MOHFW institution/Infrastructure
- Least additional HR for activities at Sub National Level and below
**NCCVMRC Functionality**

**CAPACITY BUILDING**
- Training of cold chain technicians on ILR/DF, WIC/WIF, Solar CCE repair and maintenance
- Cold chain handlers training
- Effective cold chain & vaccine management course (ECCVMC)
- National Cold Chain MIS training

**MONITORING**
- Central Remote temperature monitoring of cold rooms in States and GMSDs
- Monitoring of cold chain performance through NCCMIS
- EVM assessments + IP preparation
- Regular field visit to state

**EVIDENCE GENERATION**
- National Cold Chain Assessment
- National and state EVM Assessment
- Solar hybrid System assessment
- Other operations research

**Standards and Quality**
- National Cold Chain and Vaccine Logistics Action Plan (NCCVLAP)
- Specification of CCE for MOHFW and states

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ECCVM Course

NCCVMRC Activities

Central Temp Monitoring Cell

NCCVLAP

National Cold Chain & Vaccine Logistics Action Plan
India, September 2014

Ministry of Health and Family Welfare, Govt. of India

EVALUATION REPORT

March 2015
NCCTC Functionality

**COLD CHAIN-Immunization**
- ILR/DF/WIC/WIF/Solar/Generator/Stabilizers Training
- CCE installation (Solar, WIC WIF Generators, SNCUs)
- CCE performance testing
- Temp. monitoring system development
- Indigenous compatible spare parts compilation
- Calibration and temperature mapping of cold rooms
- Equipment specifications
- Assessments/studies on cold chain
- Building and infrastructure standards
- Health transport

**SOLARIZATION OF HEALTH SYSTEM**
- Design of solar hybrid system
- Capacity building on use and maintenance
- Specifications development
- Remote monitoring

**SNCU, FRU, BSU**
- Installation
- Repair/maintenance
- Handler’s training
- MIS development Health Equipment

**COLD CHAIN PLANNING (NON IMMUNIZATION)**
- Central medical store warehouse/store
- State Warehouses and Temp Monitoring

1. Research and Innovation in Cold Chain Technology
2. Make in India Cold Chain Equipment
Capacity building of CC staffs of Afghanistan (CCE, Solar Equipment, Hybrid Solar and SNCU Equipment)
NCCTC Activities

Adaption of newer technology - Face plate contd.....

Indigenous Alarm and Temperature Controller System for WIC-WIFs
- Temperature controller (ERC 102C)
- Acoustic hooter 110 DB
- UPS, for uninterrupted monitoring. Also this UPS can be used to power other devices like data loggers.

Conference/Workshop and Seminar

Workshop on installation & commissioning of Solar Refrigerator

Walk-in-Cooler / Freezer :- Temperature Mapping in WIC/W

ILR / Deep Freezer :- Temperature Controller

Login by Hospital Admin

Solutions to problems in CCE

Overall SPVS system configuration

Solar Panels

Grid

Inverter

RPPPT

Battery Tubular

Load
Initiative to Establishment of CCE test lab @ NCCTC Pune

Initiative on “CAPACITY BUILDING OF COLD CHAIN EQUIPMENT MANUFACTURERS and PROFESSIONAL INSTITUTES IN INDIA on WHO-PQS Standard” has been conducted on 20th October, 2014 at hotel Royal Plaza, New Delhi, to build Indian manufacturers’ and academic institutions capacity towards WHO-PQS compliance by UNICEF in association with MOHFW, NCCTC, NCCVMRC (NIHFW) and NHSRC.

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A typical district in India-SNCUs

- Average population = 2 million
- Average No. of Blocks = 10
- Average number of FRU=4
- Average number of stabilization unit=10
- Average of SNCUs= 2
- Average number of Health Facilities=45
- Average number of new born corners= 45
- Average number of Cold chain equipment=85
- Average number of cold chain technician=1
# SNCU Equipment Repair Maintenance Training by NCCTC

<table>
<thead>
<tr>
<th>FINANCIAL YEAR</th>
<th>Cumulative No. of SNCUs established</th>
<th>New SNCUs added in year</th>
<th>SNCU Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-08</td>
<td>184</td>
<td>--</td>
<td>Information on utilization not available</td>
</tr>
<tr>
<td>2009-10</td>
<td>222</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>2010-11*</td>
<td>263</td>
<td>41</td>
<td>41627</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4442</td>
</tr>
<tr>
<td>2011-12</td>
<td>340</td>
<td>77</td>
<td>3,51,144</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>38,463</td>
</tr>
<tr>
<td>2012-13</td>
<td>421</td>
<td>81</td>
<td>4,41,075</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>51,626</td>
</tr>
<tr>
<td>2013-14</td>
<td>525</td>
<td>104</td>
<td>5,95,303</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>64,392</td>
</tr>
<tr>
<td>2014-15**</td>
<td>548</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>565</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Radiant Heat Warmer,
- Phototherapy Unit,
- Pulse Oximeter,
- Oxygen Concentrator,
- Syringe Infusion Pump,
- Portable suction machine,
- And more……

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# Solarization of Health Facilities

430 Health Facilities with Hybrid Solar Systems for all Health services in Maharashtra and 300 facilities for Immunization only

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Description</th>
<th>Quantity &amp; Consumption for 2.4 KVA</th>
<th>Place of electrical point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lights</td>
<td>13 x 18W = 234W</td>
<td>Male ward, Female ward, MO room, OT, office, Pharmacist room, cold chain room, entrance light, labor room, corridors &amp; Laboratory</td>
</tr>
<tr>
<td>2</td>
<td>Fans</td>
<td>6 x 75W = 450W</td>
<td>Male ward, Female ward, MO room, OT, office, Pharmacist room</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>6 x 40W = 240W</td>
<td>Cold chain room</td>
</tr>
<tr>
<td>4</td>
<td>Shadow less lamp</td>
<td>1 x 275W = 275W</td>
<td>OT</td>
</tr>
<tr>
<td>5</td>
<td>Blood Storage Unit</td>
<td>1 x 500W = 500W</td>
<td>Cold chain room / Labor room</td>
</tr>
<tr>
<td>6</td>
<td>Nebulizer</td>
<td>1 x 100W = 100W</td>
<td>Labor room</td>
</tr>
<tr>
<td>7</td>
<td>Suction machine</td>
<td>1 x 150W = 150W</td>
<td>OT</td>
</tr>
<tr>
<td>8</td>
<td>Fumigation machine</td>
<td>1 x 100W = 100W</td>
<td>OT</td>
</tr>
<tr>
<td>9</td>
<td>Fetal monitor</td>
<td>1 x 100W = 100W</td>
<td>Labor room</td>
</tr>
</tbody>
</table>

**Total Electrical load:** 2161 Watts  
(Load Diversity around 60 %)
On site Installation of Solar Equipment

Dr. Srihari Dutta, Building Institution for HSS, 14th TechNet Meeting Bangkok, 11-15th May 2015
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Year</th>
<th>Period</th>
<th>No. of PHC’s to be equipped with SPVS installations</th>
<th>Estimated Cost of the installations (in Crores)</th>
<th>Hybrid SPVS @ Rs. 13.5 Lakhs each</th>
<th>100% SPVS @ Rs. 23.5 Lakhs each</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2015-16</td>
<td>April- September</td>
<td>66</td>
<td>9.00</td>
<td>15.00</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>October-March</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>2016-17</td>
<td>April- September</td>
<td>130</td>
<td>17.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>October-March</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>2017-18</td>
<td>April- September</td>
<td>130</td>
<td>17.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>October-March</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>2018-19</td>
<td>April- September</td>
<td>130</td>
<td>17.50</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>October-March</td>
<td>150</td>
<td></td>
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<tr>
<td>05</td>
<td>2019-20</td>
<td>April- September</td>
<td>130</td>
<td>17.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>October-March</td>
<td>173</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>1359</td>
<td>182.00</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td><strong>1423</strong> PHC’s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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INR=197.00 Crores; 31.52 million USD
How Solarization helped assuring 24x7 electricity supply for functional Health Facility
How Solarization helped assuring 24x7 electricity supply for a functional Health Facility
Fix Basics :

- HR+ Regular Capacity Building+Empowerment
- Equipments +Adequate Spares +Tools
- Equipment need to be need specifics and country driven
- Review ,Monitoring and supportive Supervision
- Partner’s role is to empower Govt
- Issues in Cold Chain is more than Technology and Managerial
Acknowledgement

- Ministry of Health and Family Welfare, Govt. of India
  - Dr. M.K.Aggarwal, Deputy Commissioner, UIP

- National Institute of Health and Family Welfare, MoHFW
  - Prof. Jayanta K. Das, Director
  - Dr. Sanjay Gupta, Nodal Officer, NCCVMRC

- National Cold Chain Training Centre, Pune
  - Dr. Vitthal Bandal
  - Mr. Durgesh Deshmukh
  - Mr. Yogesh Bhamare

- National Cold Chain and Vaccine Management Resource Centre, NIHFW, New Delhi
  - Dr. Mainak Chatterjee
  - Mr. Paritosh Panigrahi

- UNICEF – Delhi
  - Dr. Genevieve Begkoyian
  - Dr. Gagan Gupta
  - Dr. Satish Gupta
NCCTC New Hostel Building (Under construction)

We invite countries to visit, collaborate and utilize the two National Centers.
Innovation in Technology and implementation Out of Box thinking
Drive for Result
Willing to learn from Failure
Sustainable financing

Advocacy
Partnership
Networking
Optimization