India’s experience with Immunization Supply Chain Strengthening

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India’s Immunization Program
(Scope and scale)

- One of the largest public health programs in the world
- Targets 30 million pregnant women; 26.7 million newborns annually with 9 million sessions planned
- >27000 cold chain points for storing and distributing vaccines
- 12 Antigens (8 National and 4 Sub-National) BCG, DPT, OPV, IPV, Measles, Hepatitis B, Tetanus, Hib containing Pentavalent vaccine (DPT+HepB+Hib) provided nationwide, Measles-Rubella vaccine, Pneumococcal Conjugate Vaccine, Rotavirus vaccine & JE vaccine in select states/districts
- India is the largest manufacturer of vaccines with a functional National Regulatory Authority.
**Major Programme Milestones**

**Challenges of Supply Chain:**
1) **Introduction of New Vaccines** -- Increase in consumer inventory & require more cold chain space..
2) **Switching from one vaccine to another** -- Phase in: Phase out challenges
3) **Global Shortage** -- Needs effective management for optimum utilization eg. Global shortage of IPV

- **2011:** Last wild polio virus reported from India; Penta introduced
- **2013:** India certified polio-free
- **2014:** Open vial policy; JE 2nd dose intro
- **2015:** MNTE validated; IPV intro; Mission Indradhanush
- **2016:** RVV introduction
- **2017:** MR campaign
Every week around 0.2 million immunization sessions are held which translates to more than 10 million immunization sessions annually.
Universal Immunization Programme
(Quantum of Vaccines)

INDIA IS A SELF PROCUREMENT COUNTRY FOR VACCINE LOGISTICS, COLD CHAIN EQUIPMENT etc.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Routine Immunization Vaccine</th>
<th>Quantity (in million doses)</th>
<th>S.no.</th>
<th>Routine Immunization Vaccine</th>
<th>Quantity (in million doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hep-B</td>
<td>16</td>
<td>7</td>
<td>DPT</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>TT</td>
<td>72</td>
<td>8</td>
<td>BCG</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>b-OPV*</td>
<td>165</td>
<td>9</td>
<td>Measles</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>IPV</td>
<td>55</td>
<td>10</td>
<td>MR^</td>
<td>85</td>
</tr>
<tr>
<td>5</td>
<td>RVV</td>
<td>22</td>
<td>11</td>
<td>JE^</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Pentavalent</td>
<td>65</td>
<td>12</td>
<td>PCV</td>
<td>09</td>
</tr>
</tbody>
</table>

In addition 650 million doses are procured for Polio NID
Universal Immunization Programme
Ensuring regular supplies

• Large Cohort – Large Requirement

• Projections are done for 2 years of cycle

• Lead time of 1 years is taken into account while planning vaccine supplies.
  
  Procurement orders are placed accordingly
  
  Adequate Buffer is kept at the National level
Buffer Stockist, Supply directly to states with Accessibility issues. Act as Shock Absorber

Supply Vaccines to respective lower echelons

Last point of storage, supply vaccines for last mile consumption.

No Storage, vaccines to be returned to PHC/UHC after session

Buffer Stock is periodically rotated
Vaccine supply mechanism in India

Stock Driven supply

Vaccine push bimonthly to State stores by manufacturers and GMSDs
Supply timeline shared in advance

Supply chain equilibrium maintained through push pull
Stock oscillates between 1-3 month

Vaccine pulled by recipient stores as additional demands and supplied from national buffer at GMSD
Challenges in Immunisation Supply Chain Management

- Uninterrupted Supply of Vaccines & Logistics
- Events to Absorb Shock when there is low yield and Batch Failure
- Short Shelf life of vaccines compared to other drugs
- Requires Cold Chain throughout the Supply Chain & Storage.
- Equitable distribution based on Consumption

Hence, **Real time visibility at all levels in efficient manner is important.**
In 2014, Pilot took place in Bareilly and Shajahanpur to digitalize vaccine and logistics stock.

As of now, **12 states, 371 districts** and around **11,000 Cold-Chain points** along with **14,000 Temperature Loggers** installed in India. With a plan of Nation-wide scale up.
HOW IT WORKS
Real-time Visibility of Vaccine Data
USAGE & TRANSFORMATION

People, Information & Procedures

Transformation
Weekly timely Reporting Rate (of Cold Chain Point) > 95%

Health centers updating their vaccine data on eVIN in the last 7 days

2 Million Transactions every month

- Rajasthan: 93.53
- Gujarat: 93.93
- M.P.: 94.68
- Chhattisgarh: 94.86
- Manipur: 96.49
- Assam: 96.49
- Odisha: 96.53
- U.P.: 98.11
- Jharkhand: 98.34
- Bihar: 99.69
- Nagaland: 100

National %
Reduction in Stock Out Events

<table>
<thead>
<tr>
<th>State</th>
<th>Pre-eVIN</th>
<th>Post eVIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam</td>
<td>497</td>
<td>233</td>
</tr>
<tr>
<td>Bihar</td>
<td>1405</td>
<td>186</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>880</td>
<td>142</td>
</tr>
<tr>
<td>Gujarat</td>
<td>241</td>
<td>241</td>
</tr>
<tr>
<td>Jharkhand</td>
<td>241</td>
<td>84</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>518</td>
<td>84</td>
</tr>
<tr>
<td>Manipur</td>
<td>194</td>
<td>68</td>
</tr>
<tr>
<td>Nagaland</td>
<td>106</td>
<td>18</td>
</tr>
<tr>
<td>Odisha</td>
<td>152</td>
<td>106</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>298</td>
<td>298</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>432</td>
<td>193</td>
</tr>
</tbody>
</table>

National

Pre-eVIN: 6002
Post eVIN: 1645

* 72% reduction in stock out events
Stock Out Duration Reduced – Post eVIN

Days

Pre-eVIN | Post eVIN
---|---
Assam: 5.04 | Assam: 4.06
Bihar: 3.2 | Bihar: 1.9
Chhattisgarh: 5.08 | Chhattisgarh: 4.3
Gujarat: 3.2 | Gujarat: 2.5
Jharkhand: 5.1 | Jharkhand: 3.07
Madhya Pradesh: 5.7 | Madhya Pradesh: 4.7
Manipur: 4.9 | Manipur: 0.9
Nagaland: 6.4 | Nagaland: 6.4
Odisha: 6.4 | Odisha: 4.4
Rajasthan: 6.04 | Rajasthan: 1.93
Uttar Pradesh: 4.1 | Uttar Pradesh: 3.2
National: 5.01 | National: 3.32

- Days: 0-7
# eVIN Transformation into Government System

## eVIN Costing Elements

<table>
<thead>
<tr>
<th>Category</th>
<th>One Time Cost by GAVI HSS support</th>
<th>Annual Recurring Cost (Taken by entirely by Government)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrastructure</strong></td>
<td>Software – development, license etc</td>
<td>Hosting, Software testing and maintenance</td>
</tr>
<tr>
<td><strong>Mobile Phones</strong></td>
<td>Handset and SIM card procurement</td>
<td>Data cost (SIM)</td>
</tr>
<tr>
<td><strong>Temperature Loggers</strong></td>
<td>Logger device, SIM card for loggers, Installation costs</td>
<td>SIM data, Logger maintenance</td>
</tr>
<tr>
<td><strong>IT Infrastructure</strong></td>
<td>Laptops, internet dongles</td>
<td>AMC, internet charges</td>
</tr>
<tr>
<td><strong>Capacity Building</strong></td>
<td>Training needs assessment, material development etc</td>
<td>Refresher trainings, upgrading of eVIN modules/material</td>
</tr>
<tr>
<td><strong>Human Resources</strong></td>
<td>Staff recruitment cost – includes costs outsourced HR agency</td>
<td>Salary for - State and Regional officers, District manager; travel and DSA</td>
</tr>
</tbody>
</table>
## Vaccine Logistics Management with eVIN

<table>
<thead>
<tr>
<th>eVIN States</th>
<th>Non-eVIN States</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Visibility across all Vaccine Stores.</td>
<td>2. Visibility till National and State stores.</td>
</tr>
<tr>
<td>5. Timely expiry alerts based on consumption.</td>
<td>5. No expiry date alerts.</td>
</tr>
<tr>
<td>7. Consumption based equitable distribution</td>
<td>7. Uneven distribution</td>
</tr>
</tbody>
</table>
Improved & Efficient Health System

Thank You