Neonatal health in India
Refresher Tablet

- Neonatal period/neonate/newborn – first 28 days of life
- Perinatal period – 22 weeks of gestation to 7 days after birth
- Early Neonate – birth to first 7 days of life
- Late Neonate – after 7 days – 28 days of life
- Term – baby born after 37 completed weeks upto 42 completed weeks of gestation
- Preterm – baby born before 37 completed weeks of gestation
- Post-term – baby born after 42 completed weeks of gestation
- Normal birth weight (NBW) : 2500-3999 g
- Low birth weight (LBW) : <2500 g
- Very low birth weight (VLBW) : <1500 g
Size of Problem

• More than **10 million children die** each year from preventable diseases. 27,000 deaths per day.

• About **6 million children die** per year worldwide, aged 1 month to 5 years

• About **4 million newborn die** in first month of life (40 % of all child deaths).

MDG 4 calls for a two third reduction in death rates for children under age of 5 by 2015 and almost 40 percent of these deaths occur in neonatal period
# Where do the neonates die (1)

## Neonatal mortality rate (per 1,000 live births)

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>45</td>
<td>44</td>
<td>42</td>
<td>38</td>
<td>35</td>
<td>34</td>
<td>24</td>
</tr>
<tr>
<td>Eastern and Southern Africa</td>
<td>43</td>
<td>41</td>
<td>38</td>
<td>34</td>
<td>30</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>West and Central Africa</td>
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<td>47</td>
<td>46</td>
<td>43</td>
<td>40</td>
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<tr>
<td>Middle East and North Africa</td>
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<td>24</td>
<td>21</td>
<td>19</td>
<td>17</td>
<td>16</td>
<td>39</td>
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<tr>
<td>South Asia</td>
<td>48</td>
<td>44</td>
<td>40</td>
<td>36</td>
<td>33</td>
<td>32</td>
<td>33</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>24</td>
<td>22</td>
<td>19</td>
<td>15</td>
<td>12</td>
<td>11</td>
<td>54</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>22</td>
<td>19</td>
<td>16</td>
<td>13</td>
<td>10</td>
<td>10</td>
<td>55</td>
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<tr>
<td>CEE/CIS</td>
<td>19</td>
<td>18</td>
<td>15</td>
<td>12</td>
<td>10</td>
<td>10</td>
<td>50</td>
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<tr>
<td><strong>World</strong></td>
<td><strong>32</strong></td>
<td><strong>31</strong></td>
<td><strong>28</strong></td>
<td><strong>25</strong></td>
<td><strong>22</strong></td>
<td><strong>22</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>
Where do the neonates die (2)

Neonatal Deaths: India Vs Rest of the World

(More than 100 neonatal deaths in one hour)
Where do neonates die (3)

India:
Total births - 26 million (2.6 crore) (World Rank No. 1)
Neonatal deaths - 0.94 million (9.4 lakh) (World Rank No. 1)

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal Mortality rate (0-28 days)</td>
<td>36</td>
<td>40</td>
<td>22</td>
</tr>
<tr>
<td>Early Neonatal Mortality Rate (0-7 days)</td>
<td>28</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Late Neonatal Mortality Rate (7-28 days)</td>
<td>8</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Perinatal Mortality Rate</td>
<td>37</td>
<td>41</td>
<td>24</td>
</tr>
</tbody>
</table>

Source: Census 2001 and SRS statistical report 2008
Where do neonates die (4)
Trends in Neonatal mortality in India

• NMR accounts for 70% of IMR and 56% of under-five mortality rate
• There is a wide state variation and rural-urban differentials in NMR
Where do neonates die (5)

*Statewise variation in NMR (SRS 2010)*

<table>
<thead>
<tr>
<th>States</th>
<th>NMR per 1000 live births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madhya Pradesh</td>
<td>44</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>42</td>
</tr>
<tr>
<td>Odisha</td>
<td>42</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>40</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>37</td>
</tr>
<tr>
<td>Jammu &amp; Kashmir</td>
<td>35</td>
</tr>
<tr>
<td>Haryana</td>
<td>33</td>
</tr>
<tr>
<td>Assam</td>
<td>33</td>
</tr>
<tr>
<td>India</td>
<td>33</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>31</td>
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<tr>
<td>Gujarat</td>
<td>31</td>
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<tr>
<td>Bihar</td>
<td>31</td>
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<tr>
<td>Andhra Pradesh</td>
<td>30</td>
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<tr>
<td>Jharkhand</td>
<td>29</td>
</tr>
<tr>
<td>Punjab</td>
<td>25</td>
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<tr>
<td>Karnataka</td>
<td>25</td>
</tr>
<tr>
<td>West Bengal</td>
<td>23</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>22</td>
</tr>
<tr>
<td>Delhi</td>
<td>19</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>16</td>
</tr>
<tr>
<td>Kerala</td>
<td>7</td>
</tr>
</tbody>
</table>
When do neonates die

First 28 Days- Critical period for Newborns
(Maximum deaths in first 28 days)

![Graph showing neonatal deaths by day and week]

- Nearly 3/4th of neonatal deaths occur within 7 days, mostly during first 24 hours
Why do the neonates die
Distribution of causes of death during the neonatal period %

# Childbirth practices in rural Rajasthan: Implication on neonatal health and survival

<table>
<thead>
<tr>
<th>Delivery Practices</th>
<th>Perception behind practices</th>
<th>Process adopted</th>
<th>Neonatal health outcomes</th>
</tr>
</thead>
</table>
| Frequent Vaginal examinations    | 1. Assess progress of labor  
2. Opening up of birth passage                                                                  | 1. Frequent vaginal examination raging from 1 to 28 number were carried out by more than one birth attendant  
2. Frequency increased when TBA perceived that labor contractions are weakening.     | Most women delivered fresh still births                                                                                                        |
| Fundal pressure                  | Reinforce women efforts at bearing down and ease the process of child delivery               | 1. Most common position of applying fundal pressure is attendant sitting behind women seated on floor with hands encircling her abdomen  
2. Fundal pressure often applied in rapid pulses between 50 to 185 times during each delivery | Baby comes out with force and often asphyxiated and sustains birth trauma. Sometimes placenta ejected simultaneously with baby |
| Augmentation of labor            | Women don’t work hard-so unable to generate sufficient strength to deliver child              | 1. Injections and drips used (Mostly oxytocin and valethamate bromide)  
2. In home deliveries TBA or relatives invited modern providers to give injections  
3. Number and timings mostly decided by modern providers                                | Fetal distress and birth asphyxia are common                                                                                                 |
Approaches for neonatal survival (1)
Key interventions to reduce neonatal mortality

<table>
<thead>
<tr>
<th>STAGE</th>
<th>INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconception</td>
<td>Folic acid supplementation</td>
</tr>
<tr>
<td></td>
<td>Family planning</td>
</tr>
<tr>
<td></td>
<td>Prevention and management of sexually transmitted diseases including HIV</td>
</tr>
<tr>
<td>Antenatal</td>
<td>Syphilis screening and treatment</td>
</tr>
<tr>
<td></td>
<td>Pre-eclampsia and eclampsia prevention</td>
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<tr>
<td></td>
<td>Tetanus toxoid immunization</td>
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<tr>
<td></td>
<td>Intermittent preventive treatment for malaria</td>
</tr>
<tr>
<td></td>
<td>Detection and treatment of asymptomatic bacterium</td>
</tr>
<tr>
<td>Intrapartum (birth)</td>
<td>Antibiotics for preterm rupture of membranes</td>
</tr>
<tr>
<td></td>
<td>Corticosteroids for preterm labour</td>
</tr>
<tr>
<td></td>
<td>Detection and management of breech</td>
</tr>
<tr>
<td></td>
<td>Labour surveillance for early diagnosis of complications</td>
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<td></td>
<td>Clean delivery practices</td>
</tr>
<tr>
<td>Postnatal</td>
<td>Resuscitation of newborn baby</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding</td>
</tr>
<tr>
<td></td>
<td>Prevention and management of hypothermia</td>
</tr>
<tr>
<td></td>
<td>Kangaroo mother care (for infants with low birthweight) in health facilities</td>
</tr>
<tr>
<td></td>
<td>Community-based case management of pneumonia</td>
</tr>
</tbody>
</table>
Approaches for neonatal survival (2)
Coverage of key interventions to reduce neonatal mortality

- Contraceptive prevalence rate: 55%
- Tetanus toxoid protection at birth: 73%
- Antenatal care (at least 3 visits): 50%
- Skilled birth attendant: 52%
- Postnatal care within two days of birth: 48%
- Early initiation of breastfeeding: 41%
- Exclusive breastfeeding (< 6 months): 46%

Outcomes:
- Low birthweight: 28%
- Neonatal mortality rate: 35%
## Approaches for neonatal survival

### Community based interventions

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Home Visits for new born care</th>
<th>Other Interventions</th>
<th>Neonatal deaths reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEARCH, India</td>
<td>One intervention, one control</td>
<td>Days 1, 2, 3, 5, 7, 14, 21 and 28</td>
<td>Care at birth, treatment of newborn infections by village worker, extra care for LBW, community mobilization activities</td>
<td>61%</td>
</tr>
<tr>
<td>Ankur, India</td>
<td>Before after</td>
<td>Same as SEARCH</td>
<td>Care at birth, treatment of newborn infections by village worker, extra care of LBW, community mobilization activities</td>
<td>51%</td>
</tr>
<tr>
<td>Sylhet, Bangladesh</td>
<td>Cluster randomized Trial</td>
<td>Days 1, 3 and 7</td>
<td>Treatment of sepsis by village health worker, community mobilization activities, health facility strengthening</td>
<td>34%</td>
</tr>
<tr>
<td>Shivgargh, India</td>
<td>Cluster Randomized Trial</td>
<td>Days 1 and 3</td>
<td>Birth preparedness, hygienic delivery, skin to skin care for all babies, community mobilization activities</td>
<td>53%</td>
</tr>
<tr>
<td>Hala, Pakistan</td>
<td>4 vs 4 clusters, non random</td>
<td>Days 1, 3, 7, 14 and 28</td>
<td>Care at birth, extra care for LBW, community mobilization activities</td>
<td>30%</td>
</tr>
<tr>
<td>Elkut, India</td>
<td>Cluster randomized trial</td>
<td></td>
<td>Participatory action and learning for women by facilitator on strategies to address maternal and newborn health problems</td>
<td>32%</td>
</tr>
<tr>
<td>Care India</td>
<td>Randomized control trial</td>
<td></td>
<td>Community based intervention by utilizing existing government infrastructure, Health education through home visits by ANM and Anganwadi workers</td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Two trials with a factorial design</td>
<td></td>
<td>Participatory women’s groups and health services strengthening to improve maternal and neonatal health outcomes, TBA training on bag and mask resuscitation of newborns with asphyxia</td>
<td>Higher still births and neonatal deaths in control clusters</td>
</tr>
</tbody>
</table>
Approaches for neonatal survival (4)

Government programmes

Reproductive and Child Health – II (2005-10)
• IMNCI: Community & facility
• Skilled care at birth
• Essential newborn care for health professionals
• Home based newborn care
• Up gradation of health facilities

National Rural Health Mission (NRHM)
• ASHAs in each village to improve maternal and child health services
• Strengthening of health facilities
• Creation of SCNUs
• *Janani Suraksha Yojana* (JSY): To promote institutional deliveries
Approaches for neonatal survival (5)

Facility based interventions

Levels of Neonatal Care in India

Neonatologist

Pediatrician

Pediatrician

Medical Officer

Nurse

ANM

ASHA

In labour Room

Newborn Care Corner (1 bed)

Teaching Hospital

District Hospital

Community Health Center

Primary Health Center

Sub Center

Family and Community

Neonatal Intensive Care Unit (NICU) (more than 20 beds)

Sick neonatal Care Unit (SNCU/FBNC) (12-20 beds)

Stabilization Unit (NSU) (4 beds)
Neonatal care

**Essential newborn care**
- Care at birth to all newborns delivered at health facility
- Setting up of newborn care corners at all delivery points (LR+OT)
- Training of health personnel in NSSK and SBA
- Currently 11458 NBCCs functional (estimated number of delivery points: 18,181)

**Sick newborn care**
- Care to estimated 10% newborns, free entitlements under JSSK
- Setting up Newborn Stabilization units at FRUs; & special newborn care units at district hospitals
- FIMNCI and FBNC (4+14) training for the caregivers
- Currently 1674 NBSUs and 395 SNCUs functional across the country

**Home based newborn care**
- 6 visits in 42 days in case of institutional delivery, 7 visits in home deliveries
- Provision of incentive for home visits by ASHAs
- Filling information in MCP card & ensuring immunization (BCGO & birth registration)
- Training of ASHAs in IMNCI plus
Importance of NBSUs

• NBSUs expand the reach of special newborn care within a district, beyond the district hospital

If properly linked to SNCU and NBCC then:
• Reduces delay in initiation of appropriate care (delay in reaching SNCU from a distant area) for sick newborns and improves outcomes
• Helps in stabilizing sick newborns before referral to higher centre
• Prevent overloading of SNCUs at the district hospital
• Reduce the cost of care
Navjeevan
(Promoting neonatal survival in Rajasthan)

- The project is implemented by Department of Medical, Health and Family welfare in collaboration with ARTH, WHO and UNICEF

- Aim is to study the impact on neonatal mortality rate by promoting referral of newborns with danger signs and strengthening first level facilities for improved management of labor, essential newborn care and management of severely ill newborns

- 8 Intervention and 8 Control clusters selected through off-site randomization at WHO, Geneva
Navjeevan
Intervention area

1. Abu Road, Sirohi
2. Choti Sadri, Pratapgarh
3. Chota Dungra, Banswara
4. Devgarh, Rajsamand
5. Ganoda, Banswara
6. Gangapur, Bhilwara
7. Kapasan, Chittogarh
8. Partapur, Banswara
Navjeevan
Intervention

• Establish a 24*7 helpline service to refer sick newborns to CHCs for treatment

• Training of ASHAs in the intervention area to recognize danger signs

• Mobilize families to seek treatment and use helpline for sick newborn

• Establish Newborn Stabilization Units (NBSUs) at CHCs (infrastructure, equipment, supplies and staff training for routine and sick newborn care)

• Improve MIS to capture information on services provided
Navjeevan
CHC strengthening on newborn care

• 5 facility assessments of 8 intervention CHCs on neonatal care facilities have been conducted (assessments conducted based on Indian public health standards guidelines 2010)

• Dissemination of CHC assessment results and liaison with government health officials at district and state levels

• Establishment of Newborn Stabilization Units (NBSU)

• Clinical training of CHC staff (3 batches, supported by UNICEF)
Navjeevan
Major Findings - NBSU

Infrastructure
• Functioning equipments in place at most CHCs
• 24*7 water and electricity mostly available
• Floor area and civil structure as per guidelines in most of places

Human resource
• Major bottleneck in getting the unit operational and sustaining it
• No designated manpower at NBSUs

Trainings
• Huge training need
• Only 50% of the CHC staff could be trained in 3 batches of which only 36% are available to provide services due to transfers of staff

Drugs and Equipments
• Most of the drugs available at all facilities
• Irregularity in supply of drugs from RMSC
• Inventory management lacking at facilities
Navjeevan
Major Findings - NBSU

**Service Utilization**
- less clarity in admission and referral criteria at NBSU
- Mostly underutilized in terms of admissions and duration of stay

**Record Keeping**
- Very basic and irregular record keeping as well as reporting

**Referral**
- Free referral transport available under various national/state schemes
- Minimal referral linkage or communication system

**Assessment of clinical practices**
- Incorrect practices—over use of IV fluids and antibiotics
- Gaps between knowledge and practices in neo-natal care skills
- No SOP followed
Navjeevan
Major Findings – Essential Newborn care

**Labor room conditions**
- Inadequate aseptic mechanisms
- Irregular infection control systems
- Poor infrastructure
- Negligent attitude towards privacy of patients
- Unclean toilets
- Personnel not clear on essential newborn care practices

**Postnatal wards**
- Overcrowded and neglected zone
- Same staff to manage PN ward, LR and NBCC
- BCC practices not done due to lack of time
- Discharge before 48 hrs in most places
- Discharge advice inadequate
Navjeevan
Major Findings – Essential Newborn care

Newborn care corner

• Structural area rather than functional area
• Radiant warmer & resuscitation kits mostly available and in working condition
• Incorrect use of equipment
• Irregularities in sepsis and housekeeping protocols
• Skills practiced to provide essential newborn care are lacking at most of the facilities
Conclusion

• Systems need strengthening

• Strengthen existing NBSUs with manpower for optimum utilization

• Quality of care is major issue

• Functional NBSUs would share the overcrowding of SNCUs

• Individual efforts at certain facilities are laudable.