RMNCHN in Bihar

What did we learn? Summary of approaches and lessons across ten years
<table>
<thead>
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<th>OUTLINE</th>
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<td>Focus of the intervention</td>
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<td>Domain Specific lessons</td>
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<td>Choices in the implementation strategy</td>
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<td>Directional Scenarios</td>
</tr>
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</table>
Partners

- DFID
- NIPI
- UNICEF
- UNFPA
- Saving New Born Lives
- Emory University
- AMDD
- ABT Associates
- BBC Media Action
- Engender Health
- Janani
- Pronto
- IHI
Focus of the intervention

**DOMAIN FOCUS**

- Kicked off the intervention with focus on Neonatal Mortality Rate (NMR), Maternal Mortality Rate (MMR), Stunting, Contraceptive use
- Anaemia during pregnancy and PNMR were later added to the intervention

**STRATEGIC FOCUS**

- Interventions with known efficacy were utilized
- Attempted to find and use strategies to ensure implementation with reasonable fidelity and within contextual realities
- Deep consultations with PSTs and technical partner to design and finalize “technical and strategic package”
- Implementation strategies were chosen to get to the impact using a combination of published and tacit know-how of effective operational approaches
## Technical Intervention package – core and innovations

<table>
<thead>
<tr>
<th>Maternal</th>
<th>Newborn</th>
<th>Nutrition</th>
<th>Immunization</th>
<th>Family planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Counsel (families) for birth and emergency preparedness (mother and newborn)</td>
<td>1. Essential package of newborn care, including STSC, for all births (institutional and home)</td>
<td>1. Breastfeeding – a) early initiation; b) exclusive in first 6 months; c) breastfeeding for 24 months</td>
<td>1. Fully immunized child by ensuring no left-outs and reducing drop-outs - BCG, DPT3, OPV3, MCV1, MCV2</td>
<td>1. Community-based counselling: Integrate postpartum and post abortion FP counselling and referral</td>
</tr>
<tr>
<td>2. Quality management of routine deliveries at PHCs</td>
<td>2. Extra care for small baby including consistent STSC/KMC</td>
<td>2. Appropriate complementary feeding</td>
<td></td>
<td>2. Facility-based counselling and services: Promote FP use in public sector through Family Planning corners</td>
</tr>
<tr>
<td>3. PHC-driven facilitative process to build BEmOC capabilities</td>
<td>3. Application of chlorhexidine on cord for prevention of neonatal sepsis</td>
<td>3. IFA: Uptake and use during pregnancy</td>
<td></td>
<td>3. Expand access to quality services for family planning with focus on female sterilization and IUDs</td>
</tr>
<tr>
<td>5. Referral package - tailored for (a) PHCs, and (b) Home deliveries or problems identified at post partum evaluation</td>
<td></td>
<td>5. Improved uptake of birth spacing methods - test use of incentives</td>
<td></td>
<td>5. Introduce and scale up new contraceptive technologies – longer term priority</td>
</tr>
</tbody>
</table>

~~~75% of the interventions are community based
~~~40% of the interventions represent innovations

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1: Referral package is to be used by the ANMs and doctors at PHC to refer up to district hospitals; and for home deliveries to refer up to PHCs
# Core solutions and innovations

## Cross-cutting solutions

<table>
<thead>
<tr>
<th>Strengthening data driven management</th>
<th>Improving capabilities of and tools for frontline workers</th>
<th>Optimizing incentives for providers and clients</th>
<th>Creating partnerships with private sector providers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paper-based mapping enumeration, registration and name based tracking</strong></td>
<td><strong>Paper based tools and job aids</strong></td>
<td><strong>Team-based incentives e.g. sub-centre and PHC</strong></td>
<td><strong>Increase access and quality of services through private providers</strong></td>
</tr>
<tr>
<td><strong>Self-driven quality improvement process for facilities</strong></td>
<td><strong>Sub-centre level platform for ASHA, AWW and ANMs</strong></td>
<td><strong>ICT enabled continuum of care services</strong></td>
<td><strong>Market based partnerships for delivery of goods/services e.g. CHX, MMP, Injectibles</strong></td>
</tr>
<tr>
<td><strong>Facility-based observations of deliveries to make decisions on program design and planning</strong></td>
<td><strong>Mobile based tools and protocols</strong></td>
<td><strong>Mobile based guidelines, protocols</strong></td>
<td><strong>Redesign of key elements of immunization service delivery</strong></td>
</tr>
<tr>
<td><strong>Longitudinal/ cohort studies to assess behaviour changes post intervention</strong></td>
<td><strong>Mobile efficiency tools like scheduler, reminders and due-lists</strong></td>
<td><strong>Mobile efficiency tools like scheduler, reminders and due-lists</strong></td>
<td><strong>— session sites</strong></td>
</tr>
<tr>
<td><strong>LQAS surveys</strong></td>
<td><strong>Family timeline services developed by BBC</strong></td>
<td><strong>Family timeline services developed by BBC</strong></td>
<td><strong>— vaccine delivery kits</strong></td>
</tr>
</tbody>
</table>

Note: Solution #12 has been detailed out when we describe the relevant technical interventions and so will not be described separately in this section.
DOMAIN SPECIFIC LESSONS
ENBC
Weak New-born care through community-based identification, referral and management
Asphyxia management through nurse mentoring

Weak New-born care through facility-based interventions
Neo-natal sepsis – pilot
CHX pilot (not implemented)
Asphyxia management
Focus on iatrogenic asphyxia
Support the strengthening of SNCUs
Pneumonia - Diarrhoea pilot – treatment of childhood illness
Estimated Neo-natal Mortality Rates and Post Neo-Natal Mortality Rates and their causes

Weak New-born care through facility-based interventions
Neo-natal sepsis – pilot
Asphyxia management
Focus on iatrogenic asphyxia
Support the strengthening of SNCUs
Weak New Born tracking through digital interventions
Incorporated SNCU support in nurse mentoring
**DOMAIN SPECIFIC LESSONS**

- Bihar stands lowest among EAG states, close to national average
- Neonatal sepsis (<6%), diarrhoea (<5%), pneumonia (<5%) are no longer dominant cause of death in rural Bihar
- Morbidity remains significant (55% children aged <5y had one episode of illness in the previous 3m*), care-seeking is very high (93% sick children underwent treatment*), effective treatments are available from private sector.
- Asphyxia (44%) and complications of preterm birth (30%) persists as main cause of death among neonatal whereas SIDS and complicated illnesses for post neonatal
- Strong emphasis in GoI policies, but need much sharpening to produce impact

* Vulnerability Study CARE-BTSP-CML 2014-20
** Annual Household Survey CARE-BTSP-CML 2014-20
CAUSES OF NEONATAL MORTALITY (N=340)

- Asphyxia: 2.00%
- Prematurity: 17.00%
- Pneumonia/Sepsis: 6.10%
- Others: 30.20%
- Indeterminate: 44.10%

* Neonatal Mortality Study CARE-BTSP-CML 2016
Supportive Care Saves Newborn Lives.

Saving lives of very low birth weight babies by strengthening newborn care services: *Learnings from Bihar for potential scale-up*
India

- Contributes >1/4\textsuperscript{th} of global neonatal deaths
- ~0.75 million neonatal deaths annually in India, the highest in the world.

States

Contribution of 4 states-Uttar Pradesh, Madhya Pradesh, Bihar and Rajasthan

- ~55\% of total neonatal deaths in India
- ~15\% of annual global neonatal deaths.
- Despite progress, pace of decline in Bihar was apparently quite slow in the decade between the last two NFHS rounds.
- However, according to SRS data, Bihar has had the lowest NMR among the large EAG states since 2011.
These are the SRS trends in NMR over time, showing Bihar NMR has been low since a long time, and signs of a late dip at the last measurement.
Rationale and Evidence: Focus on preterm and very low birth weight babies

- In India, and in Bihar, around a third of all neonatal deaths are from complications of prematurity. In addition, low birth weight and premature birth underlie deaths due to asphyxia, sepsis and other causes as well.

- In the SEARCH studies
  - **67.5% of all neonatal deaths** at the baseline came from the babies with birthweight < 2000 gm.
  - The interventions reduced NMR by 70%. *The total reduction in neonatal mortality during intervention (1996 to 2003) ascribed to sepsis management, was 36%; reduction ascribed to supportive care of low birth weight (LBW) neonates, 34%.*
  - In the subgroup preterm-LBW, the mortality impact was the greatest (82%). For this group, supportive care was deemed responsible for 75% of the mortality impact, not antibiotics.
Current Newborn Care Programmes

Main programs that emphasize preterm-LBW interventions:

• Facility Based Newborn Care (FBNC)
• Home-Based Newborn Care (HBNC)
• ASHA (Module 7)

Known Gaps:

✔ Last mile implementation coverage and quality
✔ Oversight and support from supervisors
✔ Outcomes based monitoring

Challenge: how to achieve sufficient intensity to get impact at scale under Bihar conditions?
**Current Protocols**

- ASHA module 7 identifies two kinds of ‘high-risk’ neonates:
  1. Preterm/LBW (< 2000 g, < 37 weeks, not feeding from Day 1)
  2. PSBI/Neonatal sepsis (lost interest in feeding, reduced activity / limp, cold to touch)

- Both are generally referred to as ‘high-risk’, but the two types require completely different approaches to prevent death:
  1. **Preterm/vLBW (but not sick)**: Supportive care for at least the first week after birth (sepsis prevention, warmth, exclusive breastfeeding)
  2. **Sick (PSBI) neonates (whether or not preterm/vLBW)**: Clinical management, including parenteral antibiotics

These are detailed in the ASHA module as well as HBNC guidelines.
Adaptations in Bihar

To make it operationally simpler and clearer to differentiate, describe and initiate the right action, two discrete terms have been used:

1. Preterm/vLBW: *‘Weak’ newborn* कमज़ोर शशु
2. PSBI/Sepsis: *‘Sick’ newborn* बीमार शशु

Given the circumstances, the same criteria for identification of preterm / vLBW as used for HBNC are applied for use by labor room ANM/GNM (< 2000 g, < 37 weeks, not feeding from Day 1) for identifying and initiating action and using adequacy of breastfeeding as an indicator for referral decisions.

However, it is recognized that determination of gestational age is not easy to ensure in all facilities, and *birthweight using digital scales is a good proxy*.

✔ Immediate assessment emphasized for babies delivering in public institutions considering around 60% of all rural deliveries are in government hospitals currently.

✔ Strong insistence on ensuring first day home visits in all deliveries at home or in private institutions for identification of WNB.
Launched in 2015 as a joint initiative of Government of Bihar and the TSU/CARE, WNBC program addresses mortality in the highest risk group of neonates (birth-weight < 2000 gm, gestational age at birth < 37 completed weeks, or not feeding well from the day of birth) termed Weak New-Born (WNB). Formal state guidelines were issued in 2016, covering babies born in public facilities as well as those born elsewhere. The main interventions for babies born in public facilities are:

### 1. Identification of weak newborn babies born in public health facilities:
- Digital weighing scales for birthweight
- Digital application / printed calendar for estimation of gestational age
- Observation of breastfeeding

### 2. Informing the family that the baby is weak and requires extra care:
- Initiation of breastfeeding, dry cord care and Kangaroo Mother Care (KMC) in the facility
- Pre-discharge counselling of mothers and families for:
  - KMC at home
  - Delayed bathing x 1 wk
  - Frequent breastfeeding
  - Handwashing, dry cord care
  - Danger signs and referral
- Issuing a ‘Passport’ to the baby for extra care at home and follow-up & with counterfoil passed on to ANM for follow up.

### 3. Tracking and supporting newborn care:
- Daily telephonic follow-up with family and ASHA during first week by PHC staff.
- Daily home visit by ASHA for first week.
- Referral of babies ≤1800 gm and not sucking well to SNCUs.
- Confirmation of status of baby at 1 month
Role of TSU/CARE

- Design, development:
  - Technical Protocols
  - Training Material
  - Monitoring formats

- Capacity Building:
  - Medical Officers
  - Front Line Workers
  - Supervisory Staff

- Documentation of lessons and refinements to strategy

- Weak Newborn Care

- Monitoring:
  - Line-listing & follow-up
  - Review Meetings
  - Annual Assessment
  - Surveys

NITI presentation
Independent Assessments by CML Unit of TSU

Scope:
- ‘Weak’ babies born in non-teaching government facilities of Bihar

Objectives:
- Assess survival of WNB at the end of the neonatal period
- Assess the coverage of services provided to WNB families during this period

Sampling for each round until 2019:
- 171 hospitals randomly selected (same facilities repeatedly assessed) – a third of all facilities
- All WNB listed during previous two months in the selected facility (based on birthweight and other criteria) followed up at home for in-depth interview of parents

Additional assessment in 2019:
- All 552 non-teaching government hospitals in the state included
- All WNB listed during previous one month in the selected facility (based on birthweight and other criteria) followed up at home for in-depth interview of parents

<table>
<thead>
<tr>
<th>Round</th>
<th>Assessment timing</th>
<th>vLBW Babies born during</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-1</td>
<td>Pre-intervention</td>
<td>Feb-Apr 2015</td>
<td>1445</td>
</tr>
<tr>
<td>R-2</td>
<td>Interval between intervention and assessment (in months)</td>
<td>6</td>
<td>Sep-Oct 2015</td>
</tr>
<tr>
<td>R-3</td>
<td>18</td>
<td>Sep-Oct 2016</td>
<td>1398</td>
</tr>
<tr>
<td>R-4</td>
<td>30</td>
<td>Sep-Oct 2017</td>
<td>2722</td>
</tr>
<tr>
<td>R-5</td>
<td>42</td>
<td>Sep-Oct 2018</td>
<td>2755</td>
</tr>
<tr>
<td>R-6</td>
<td>54</td>
<td>Sep-Oct 2019</td>
<td>2767</td>
</tr>
<tr>
<td>Bihar</td>
<td>55</td>
<td>Nov 2019</td>
<td>4136</td>
</tr>
</tbody>
</table>
ASSESSMENT FINDINGS
Pathways of Risk Reduction

Identification of Weak Newborns:
- Proportion identified as weak: 2.1% to 3.4% – (Expected @ ≤ 2000 g: 5.1%)
- Rounding errors in birthweight: 69% to 24%
- HMIS reporting of LBW has about doubled

Reach of intervention:
- Informed in facility that weak at birth: 66% to 77%
- Counselling (facility) on additional care: 39% to 52%
- Weighed at least once after facility birth: 22%
- One or more 1st wk FLW home visit: 49% to 65%
Coverage of home visits and counselling increased substantially

FLW visit in 24 hours of coming home

1 or more FLW visit in first week

3 or more FLW visits in first week

Counselling on delayed bathing

Counselling on skin-to-skin care

Counselling on frequent feeding
Pathways of Risk Reduction (Cont.)

Comprehensive Intervention Score (CIS):

- Comprising (as reported by mother):
  - Informed that baby was weak
  - Thermal care
  - Breastfeeding
  - Cord care
  - 3 or more visits at home

‘Good’ score: 5x improvement
‘Average’ score: 3x improvement
Practices improved

- **Skin-to-skin care:**
  - At facility before discharge: 15% to 27%
  - At home after discharge: 10% to 23%

- **Delayed bathing**
  - 48 hours or more: 48% to 63%
  - 7 days or more: 10% to 27%

- **Timely initiation of BF:** 65% to 80%
Families counselled in hospital more likely to practice additional care
Families counselled in hospital or home or both were even more likely to practice

<table>
<thead>
<tr>
<th>Practices of mother</th>
<th>Counselling at facility</th>
<th>Not-counselled</th>
<th>AOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>STSC Immediately after birth</td>
<td>70%</td>
<td>63%</td>
<td>1.35</td>
</tr>
<tr>
<td>Delayed bath</td>
<td>42%</td>
<td>31%</td>
<td>1.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Counselling at facility/home</th>
<th>Not-counselled</th>
<th>AOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>STSC at Home and at Hospital</td>
<td>31%</td>
<td>3%</td>
</tr>
<tr>
<td>Delayed bathing and STSC both practiced at facility and home</td>
<td>10%</td>
<td>1%</td>
</tr>
<tr>
<td>Exclusive breast feeding</td>
<td>57%</td>
<td>49%</td>
</tr>
</tbody>
</table>

*Adjusted for gender, religion, caste, mother age, mother's education, father occupation and wealth index P< 0.05
COVERAGE AND OUTCOMES OF INTERVENTION COMPONENTS
Home visits and counselling strongly associated with better survival

**Any visit by F.L.W and mortality**

- Mortality rates:
  - Baseline: 12%
  - Visited: 11%
  - Non visited: 16%

  25% 23% 26% 25% 24% 27%

  6% 11% 14% 11% 16%


**0.54 AOR***

*Adjusted for gender, religion, caste, mother age, mother's education, father occupation and wealth index P< 0.05, Bihar 2019

**Counselling for skin-to-skin care and mortality**

- Mortality rates:
  - Baseline: 19%
  - ‘15: 9%
  - ‘16: 9%
  - ‘17: 11%
  - ‘18: 7%
  - ‘19: 10%

  18% 16% 21% 22% 22% 20% 20% 22%

  9% 15% 11% 14% 10% 15%


**0.73 AOR***

**Counselling for delayed bathing and mortality**

- Mortality rates:
  - Non counselled: 6%
  - Counseled: 11%

  18% 16% 21% 20% 21% 20% 22%

  9% 15% 11% 14% 10% 15%


**0.50 AOR***

**Mortality rates**

- Baseline: 12%
- ‘15: 11%
- ‘16: 14%
- ‘17: 11%
- ‘18: 7%
- ‘19: 10%

- Non visited: 16%
- Visited: 18%

NITI presentation
Coverage of caring practices increased substantially from the baseline

<table>
<thead>
<tr>
<th>Skin to Skin Care (STSC)</th>
<th>At Facility</th>
<th>At Home</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>39%</td>
<td>37%</td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td>31%</td>
<td>29%</td>
</tr>
<tr>
<td><strong>2018</strong></td>
<td>28%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>2019</strong></td>
<td>27%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>1395</td>
<td>1395</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delayed Bathing</th>
<th>First bath after 48 hours of delivery</th>
<th>First bath after 7 days of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td>48%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>2015</strong></td>
<td>55%</td>
<td>16%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>62%</td>
<td>28%</td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td>62%</td>
<td>27%</td>
</tr>
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</tr>
<tr>
<td><strong>N</strong></td>
<td>1395</td>
<td>1395</td>
</tr>
</tbody>
</table>
Caring practices are strongly associated with better survival

Practice of STSC
- 18% Not Practiced
- 21% Practice
- 0.47 AOR*

Practice of Delayed Bathing
- 19% Not Practiced
- 27% Practice
- 0.36 AOR*

Practice of both, STSC and delayed bathing
- 17% Not practiced
- 21% Practiced
- 0.07 AOR*
Impact of Early Initiation of Breastfeeding: A cautionary note

- **What these assessments found:**
  - *Early breastfeeding (first breastfed within an hour after birth) is significantly associated with higher mortality in this group (≤ 2000 g)*
  - The lesser the birthweight, the greater the mortality difference between those breastfed or not breastfed early.
  - This effect is limited to the 0-2 d period.

- **Implications:**
  - This negative impact is most likely due to enthusiastic attempts to feed very small babies who are unable to suck and swallow well.
  - While reliable gestational age data is not available in these assessments, it is likely that the babies most at risk are those born prematurely, at less than 34 weeks.
  - Since sucking and swallowing reflexes are poorly developed in these babies, feeding them without adequate care is probably leading to death by choking and aspiration.
  - Such babies die within the first few days, which explains why the increased death is limited to 0-2 days. Babies surviving beyond this age probably have well-developed sucking and swallowing reflexes are able to feed adequately.
  - Programmatically, it **re-emphasizes the need to observe the first few feeds carefully among WNB, and avoid feeding further if the baby is not taking feeds well. Such babies need to be referred to the SNCU or equivalent hospitals.** This is already mentioned in the state guidelines and must be carefully followed.
CHANGES IN OVERALL OUTCOMES
(MORBIDITY AND MORTALITY)
Incidence of mother-reported illnesses, including PSBI, reduced substantially, but increased again during last year

N=1445                      N=1705                    N=1398                    N=2722                  N=2755                      N=2767

Baseline. 2015 2016 2017 2018 2019

55% 50% 41% 40% 39% 44%

Rapid Breath Fever Jaundice Stopped Breathing Less Active Pneumonia Chest indrawn Unconscious Cold to touch Diarrhoea Discharge from Blisters Convulsions

11% 9% 8% 7% 6% 4% 3% 2% 2% 2% 1% 1% 1%
Birthweight adjusted morbidity reduced over time

Birth weight adjusted morbidity during first month of life across rounds

% Weak newborns who experienced some health problems during first month


Assessment rounds

F-test
P < 0.0001

The values were adjusted for birth weight as distribution of birth weights were different in different rounds
Unadjusted mortality rates have remained constant

Neonatal mortality varies widely by gender and birth weight, and birth weights were differently distributed in different rounds. Thus, in order to get a reliable estimate of mortality, variation in birth weight across rounds needs to be adjusted for.

1 - vLBW implies babies with birth weight <= 2000 gms
Caveat: Data not collected over 12 months, hence seasonal trends not identifiable
Birthweight and gender adjusted mortality has declined since baseline.

The crude mortality estimates cannot be compared across rounds as the distribution of birth weight and gender composition of LBW newborns varied across rounds. Thus, using generalized linear regression, the crude mortality estimates were adjusted based on combined birth weight distribution. The adjusted estimates presented are Least Squared Means. The downwards and statistically significant slope of the regression line suggests an overall declining trend in neonatal mortality across rounds, despite an increase noted in last year.
The biggest mortality gains are in the middle birthweight group (1500-1800 gm): This is similar to what was observed in SEARCH studies.
In 2019, a WNB girl is around 50% more likely to survive than a WNB boy. The main mortality gains are also among WNB girls.

The distribution of gender varied across rounds. Thus, birth-weight adjusted mortality estimates were presented for each gender.
Both 0-2 days and 3-27 days neonatal mortality show a significantly declining trend across rounds. However, the declining trend in early neonatal mortality is more prominent as it has not increased substantially in the post-handover period. However, late neonatal mortality has gone into an upward spiral post-2017.
Summary: Improvements from baseline (2015) to 2019 and association of mortality with intervention components

**Identification**
- vLBW children identification increased from 2% to 4% after the initial phase of intervention and then has stabilised at around 3.4% - still an improvement of 70% over baseline
- Practice of rounding-up error in birth weight as 2000 gm declined from 69% to 24%

**Reach of Intervention**
- Informing the mothers of identified weak newborns (that the child was of low birth weight) increased from 79% at baseline to 84%
- Counselling on additional care also improved – mostly at facilities, not much at baseline
- The above gains were achieved despite significant increase in workload as the number of identified vLBW newborns went up

**Quality of Counselling**
- Advice on thermal care-advices on both delayed bathing (3% at baseline to 15% in 2019) and KMC (7% to 19%) before discharge from facility increased substantially
- Similar advices from outreach FLWs showed lesser improvement
- Counselling on EBF showed improvement at facilities but not much in the outreach

**Practices of Mother**
- Practice of STSC in 2019 (in facility as well as home) was higher than the baseline – 27% from 15% at facility and 23% from 10% after returning home
- Delayed bathing (after 7d) improved from baseline (10% to 27%)
- 78% mothers reported early initiation of breastfeeding as against 65% at baseline

**Contribution of Intervention Components**
- Among telephonically followed up, odds of death was 45% lower
- At least 1 visit by FLW, reduced odds of neonatal death by 50%
- Counselling for Thermal care, Early Breastfeeding and Cord care were impactful – reduced the odds of neonatal death by about 50%
- Odds of neonatal death was 93% lower among those who practiced Delayed bathing, STSC at birth & followed it at home

Birth-weight adjusted neonatal morbidity: Reduced by about 15% from the baseline (2015) to 2019.
Birth-weight adjusted neonatal mortality: Reduced by about 15% from the baseline (2015) to 2019.
Summary of the Intervention

- The WNB focus in Bihar derives from existing national guidelines for newborn care at home and in facilities.
- The guidelines for identification and care of ‘high-risk’ babies in ASHA Module 7 have been applied to the facility-to-home continuum in the state issued guidelines.
- Implementation on the ground has been much more intense for non-teaching government hospital births than for babies born elsewhere. Around 60% of all births in rural Bihar takes place in government facilities, most of them in non-teaching facilities. Around 1.8 million institutional deliveries are thus directly impacted by the interventions annually.
- Interventions consisted mainly of supportive care provided by the family, guided by counselling by hospital nurses and ASHAs, with oversight by ANMs.
- After initial intensive co-facilitation for about one year, the TSU withdrew to more distant facilitation roles, while implementation continued through staff in delivery points, ANMs and ASHAs.
- The equivalent interventions for babies delivered at home or in private facilities are not covered by these assessments.
Summary of Implications

- In the SEARCH studies, 67.5% of all NMR at the baseline came from the babies with birthweight < 2000 gm, and a small additional portion from preterm babies with higher birthweight.
- The mortality impact in Bihar appears mainly in the 1500-1800 gm group of babies. This is very similar to what was observed in the SEARCH studies: most of the ~80% mortality reduction in a similar weight / gestational age group came from supportive care (similar to that implemented in Bihar), not from antibiotics.
- The major points of program interest in the presented assessments are the strong and consistent positive associations between several key components of the intervention (home visits, counselling about additional care) and caring practices by the family, and between practices and mortality.
- Overall coverage (reach) of these interventions increased substantially from the baseline, thus likely spreading mortality impact widely. However, coverage is still much less than universal. Increasing this coverage should therefore be expected to provide further substantial mortality gains.
- The mortality impact as measured is all-cause reduction within this group, not just in the ‘complications of prematurity’ component of neonatal mortality.
Mainstreaming Weak Newborn Care

- **Integration**: WNBC protocols have the potential to be integrated with newborn care interventions - HBNC, FBNC, MAA and RBSK.

- **Institutionalization**: WNBC can easily be institutionalised within the system and implemented through FLWs without upsetting the current operating structures and systems.

- **Strengthening**: By virtue of positioning of its components within the existing newborn care programmes, WNBC model strengthens and accelerates these programmes.

- **Addressing** systemic challenges that are barriers to the implementation of community-based newborn programmes:
  - lack of skilled personnel,
  - issues of logistics
  - weak supervision and monitoring systems
Costing

- The annual cost for printing various registers and formats is estimated around Rs. 23 lakhs for the entire state of Bihar.

- **No separate expenses** were incurred for training staff nurses and FLWs; they were trained during their routine meetings. Incentives for home visits by ASHAs were met through existing HBNC provisions.

- By utilising the existing resources efficiently, the WNBC model proves to be highly cost-effective, does not entail extra costs for the government, makes it easy to replicate and sustained.

- Detailed formats for line listing of weak newborns, counselling formats for ASHAs and reporting formats for health facilities developed can easily be integrated with the health MIS to strengthen online monitoring and programmatic review by the implementation agencies.

- Technical support costs could be met through existing or external agencies.
Lessons Learnt and Conclusions

- This collaborative effort has demonstrated a simple and cost-effective intervention that reduced neonatal deaths and morbidity by strengthening capacities of FLWs (ASHAs in outreach and Staff Nurses/ANMs in labour rooms) to identify and aptly respond to the immediate care needs of weak newborns.

- Improved mechanisms of reporting, mentoring and supportive supervision helped the FLWs to focus on delivering services and support equitably to all families through robust name-based tracking systems.

- WNBC is highly amenable to scale-up with no extra cost through existing government programmes.
Recommendations

- **Prioritize** preterm-lbw babies as they account for majority of all newborn deaths.

- **Adapt** evidence-based WNBC protocols for the care of preterm and or LBW babies born in facilities thus capitalizing on the rise in institutional deliveries.

- **Scale-up capacity building** to strengthen the counselling skills of FLWs as increased contact, improved counselling and message delivery by FLWs are likely to have contributed to changes in newborn care practices.

- **Support with MIS** appropriate to adapted protocol

- **Institutionalise the above** through focused technical assistance at district and sub-district levels.
Anemia

- **2011**: IFHI
  - MMP: Introduction and promotion for mother and children

- **2012**: TSU Phase - I
  - IFA: Uptake and use during pregnancy
  - Procurement Enhanced through BMSICL

- **2013**: TSU Phase - II
  - IFA: Uptake and use during pregnancy and post-partum
  - WIFS
  - Last mile distribution problems being addressed
• Bihar has relatively lower level of anaemia in pregnancy (< 10% severe), but affects all groups, as elsewhere

• Life cycle approach in GoI guidelines for iron deficiency has enhanced efforts to tackle anaemia – especially WIFS, postpartum (24% consumed some IFA tab.**), in addition to antenatal supplementation

• Consumption of IFA in pregnancy has been close to 70% of tablets distributed (mean no. of IFA received during pregnancy increased from 41 tab. to 51 tab. and Consumption increased from 29 tab. to 37 tab. between 2015-20**)  

• After long years of disruption in supplies, distribution of IFA has been increasing in last three years, with some disruption due to COVID

* Vulnerability Study CARE-BTSP-CML 2014-20

** Annual Household Survey CARE-BTSP-CML 2014-20
### Nutrition

<table>
<thead>
<tr>
<th>Year</th>
<th>Activities</th>
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<tbody>
<tr>
<td>2011</td>
<td><strong>IFHI</strong></td>
</tr>
<tr>
<td></td>
<td>- Appropriate complementary feeding</td>
</tr>
<tr>
<td></td>
<td>- Breastfeeding – mainly early initiation;</td>
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<td>- MMP: Introduction and promotion for children</td>
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<td>2012</td>
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<td>2013</td>
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<td>2014</td>
<td><strong>TSU Phase - I</strong></td>
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<tr>
<td></td>
<td>- Appropriate complementary feeding</td>
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<td></td>
<td>- Breastfeeding – mainly early initiation; also EBF</td>
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<tr>
<td></td>
<td>- Bal Kuposhan Mukt Bihar campaign</td>
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<td>2015</td>
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<td>2016</td>
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<td>2017</td>
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<tr>
<td>2018</td>
<td><strong>TSU Phase - II</strong></td>
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<tr>
<td></td>
<td>- Appropriate complementary feeding</td>
</tr>
<tr>
<td></td>
<td>- Breastfeeding – mainly early initiation; also EBF</td>
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<td></td>
<td>- Complimentary feeding days – community-based events</td>
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<td></td>
<td>- Exploring wasting</td>
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<tr>
<td>2019</td>
<td></td>
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<td>2020</td>
<td></td>
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<td>2021</td>
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</table>
DOMAIN SPECIFIC LESSONS

• Major reduction could be seen from NFHS 4 to 5 (48.3% to 42.9%)
• Significant gains in sanitation (improved sanitation facility 21% to 46%#, and Handwashing has reached 60% in 2020*), but CF rates stay low (Timely Initiation of CF remained on an average at ~55% between 2018-20 and Dietary Diversity among 9-11m children remains ~ 19% between 2017-20*)
• Poshan Abhiyan made a promising start – will need stronger focus on a few interventions to get ICDS and Health programs to start accelerating
• Other GoI programs (HBYC, MAA, etc) have strong intent, but fall short on the ‘how’ part of it.

# NFHS-4 & NFHS 5
** Annual Household Survey CARE-BTSP-CML 2014-20
Maternal Health

- Quality management of routine deliveries at PHCs
- PHC-driven facilitative process to build BEmOC capabilities
- Referral package pilot - tailored for (a) PHCs, and (b) Home deliveries or problems identified at post partum evaluation

IFHI

- Quality Management of deliveries
- Nurse Mentoring (AMANAT)
- Additional focus on PPH and C-sections

TSU Phase - I

- Quality Management of deliveries
- Nurse Mentoring (AMANAT Jyoti)
- Additional focus on blood availability

TSU Phase - II
• MMR is falling (<150) with probable significant contribution from AMANAT and private sector
• PPH is a dominant cause; mortality from puerperal sepsis is low and abortion yet an unknown. MDR is picking up but not uniform in capturing deaths.

**Barriers:** Lack of CEmONC access is primary barrier (Unsupported doctors & nurses in CEmONC situation)
- Lack of serious policy/program focus on all clinical emergencies
- Lack of oversight on intrapartum care in labour rooms

• Delay in reaching the right hospital and getting definitive treatment are common
• Reforms in blood banking (27 DH & 10 Medical colleges have functional Blood banks covering all districts of Bihar*) and referral transportation have brought these services to the threshold of effectiveness (98% of L2 facilities & all L3 facilities have ambulances; 886 ambulances present at 552 delivery points#)
• LaQshya boosted formal attention to QI, needs thoughtful implementation to prevent mechanisation

*Blood bank Study CARE-BTSP-CML 2020
#Facility Assessment Study CARE-BTSP-CML 2019
** Annual Household Survey CARE-BTSP-CML 2014-20
WHY DO PREGNANT WOMEN DIE IN BIHAR? (N=547)

* Maternal Mortality Study CARE-BTSP-CML 2018
# Family Planning

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<tbody>
<tr>
<td>IFHI</td>
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</tr>
</tbody>
</table>
|      | Mobile IUCD Vans  
Leverage private sector pharmacies and providers to drive use of injectables  
Improved uptake of birth spacing methods - test use of incentives  
Introduce and scale up new contraceptive technologies – longer term priority |
|      |      |      |      |      |      |      |      |      |      |      |      |
| TSU Phase - I |      |      |      |      |      |      |      |      |      |      |      |
|      | Partner with Engender Health for the PMU  
Quality Improvement in TLs  
Improved Quality of Fixed Day services |
|      |      |      |      |      |      |      |      |      |      |      |      |
| TSU Phase - II |      |      |      |      |      |      |      |      |      |      |      |
|      | Improved Quality of Fixed Day services  
Focus on spacing methods – Pilot for 0-1 parity couples  
Injectable (Antara/Chayya rollout)  
Family Planning Logistics Management Information Systems (FPLMIS) rollout |

![TFR Chart](chart.png)
Major reduction in TFR from NFHS 4 to 5 (3.4 to 3), accompanied by improvements in mCPR.

**Ground Level**
- There has been a steady focus on improving access to contraception (45 facilities had fixed day services, PPIUCD and lately Antara)
- Studies have shown:
  - Surprisingly significant spacing between consecutive births (24 months [median] in 2016 as well as 2018*)
  - Mistrust of modern contraceptives among young couples (most users prefer traditional methods- 60% of women aged 15-19 y *)
  - Reduced but persistent son preference (number of preferred male children reduced between 2016-18 from median 2 and mean 1.6 to median 1 and mean 1.5)
  - Dependence of permanent methods (Female Sterilization around 77% among users of any FP methods)
  - These appear to be largely deliberate, thought-out choices by young couples who take their own decisions, much less influenced by the older generation than generally presumed.

* Currently Married Women of Reproductive Age Survey CARE-BTSP-CML 2016,2018 , # FP fortnight Study Jan-June’20
Response to COVID-19
RMNCH Services affected during lockdown (Apr) and resumption in July*

- Services affected the most during April
- Services marginally provided during April

Coping with COVID – Mode of coping by families for daily expenses during covid-19#

- Spent savings: 71%
- Borrowed money to buy food: 68%
- Reduced other expenditures: 52%
- Sold household goods and assets: 29%
- None of these: 9%

[Telephonic FLW study]

[Graph showing service coverage]

[Bar chart showing service coverage during April and July]

[Table showing mode of coping by families]
**Immunization services**

**Disrupted in April (2%) & reached 87% in July’20**

- 34 (52%) **reminded** (home visit > phone call)
- 17 (26%) teamed with other FLW to help in **reaching venue**
- 14 (21%) Couldn’t help much

**Adaptations to conduct VHSND**

- By maintaining **physical distance** (76%)
- By ensuring **self protection** (56%)
- Organising
  - in separate groups/timings (8-10%)
  - As usual (21%)

**Engagement in VHSND**

Among all (2673)

- ANM ~95%
- ASHA ~89%
- AWW~86%

**April**

- Yes: 99%
- No: ***

**July***

- Yes: ***
- No: 99%

***Differences were statistically significant assuming α=0.05***
### Impact of COVID-19

<table>
<thead>
<tr>
<th>Impact</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss in income</td>
<td>84%</td>
</tr>
<tr>
<td>Problems with food supply</td>
<td>67%</td>
</tr>
<tr>
<td>Long distance travel restrictions</td>
<td>62%</td>
</tr>
<tr>
<td>Shops being closed</td>
<td>62%</td>
</tr>
<tr>
<td>Not visiting family/friends</td>
<td>55%</td>
</tr>
<tr>
<td>Fear of household members getting sick</td>
<td>50%</td>
</tr>
<tr>
<td>Staying indoors</td>
<td>45%</td>
</tr>
<tr>
<td>Less able to access health services</td>
<td>25%</td>
</tr>
<tr>
<td>Household members have gotten sick</td>
<td>24%</td>
</tr>
<tr>
<td>Increase in housework</td>
<td>11%</td>
</tr>
<tr>
<td>More household arguments</td>
<td>9%</td>
</tr>
<tr>
<td>Others</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

(N = 78435)

(N = 78435)
Food insecurity: Increased

Food insecurity* during the previous 12 months among families

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>15598</td>
<td>15622</td>
<td>15606</td>
<td>15687</td>
<td>15616</td>
<td>15636</td>
</tr>
<tr>
<td>%</td>
<td>14</td>
<td>18</td>
<td>17</td>
<td>15</td>
<td>19</td>
<td>26</td>
</tr>
</tbody>
</table>

Food Insecurity in the last one month

- **Due to lack of resources**
  - Rarely/Sometimes: 22%
  - Often: 3%

- **Decreased meal frequency due to unavailability of food**
  - Rarely/Sometimes: 12%
  - Often: 1%

- **Slept hungry due to lack of food**
  - Rarely/Sometimes: 8%
  - Often: <1%

*Some family members had to cut the size of meal/skip meal because of lack of availability of food/money
Mothers in Households where any member suffered from COVID were more likely to be…

- Visited by FLWs
  - ≥2 times During last trimester: 132% ↑ (AOR = 2.32)
  - Anytime during last trimester: 36% ↑ (AOR = 1.36)
  - Anytime during pregnancy: 31% ↑ (AOR = 1.31)
  - Within 24hrs after delivery: 18% ↑ (AOR = 1.18)
  - Within 3 months from delivery: 14% ↑ (AOR = 1.14)

- Advised by FLWs
  - To wear mask during breast-feeding— if having COVID: ~4 times ↑ (AOR = 5.06)
  - Anytime during pregnancy: 46% ↑ (AOR = 1.46)

Practicing

- Initiation of complementary feeding (6 to 8m): 49% ↑ (AOR = 1.49)
- Full immunization: 46% ↑ (AOR = 1.46)

Less likely to be…

- Feeding babies with
  - Exclusive breastfeeding: 60% ↓ (AOR = 0.40)
  - Minimum dietary diversity: 43% ↓ (AOR = 0.57)
  - Minimum acceptable diet: 38% ↓ (AOR = 0.62)

AOR = Adjusted (for socio-demographic factors) Odds Ratios statistically significant [p-value = ≤0.05]
CHOICES IN THE IMPLEMENTATION STRATEGY
Direct ‘horizontal’ facilitation (IFHI) vs top-down ‘vertical’ (TSU)

As per guidelines Vs Despite/Beyond guidelines – almost always went beyond, at times against

First level hospitals Vs District Hospitals (DH) - – targeted CEmONC in DH

Doctors vs ANMs vs MAMTAS - chose to work with ANMs

Institutional birth vs quality of intrapartum care – focused on the latter until lately

Tweak tools vs invent tools – mostly the latter

Low focus on ANC, growth monitoring (~15-20% of children aged 3-23m were weighed*) , THR (10% of pregnant women received THR for at least 3 months, <5% women/children received complete THR*)
SUPERVISION AND MONITORING

STRATEGIES

ASHA vs AWW vs ASHA + AWW – chose the latter, with ANMs as supervisors (!)

QI, Nurse Mentoring, ILA, CCS/CAS – a combination of delivery channels for TA, capacity/skill building, supervision, planning

Household surveys (LQAS), facility assessments, direct observations of deliveries – designed as monitoring mechanisms
<table>
<thead>
<tr>
<th>STRATEGIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage vs outcomes – primary focus remained on the latter</td>
</tr>
<tr>
<td>Facility-based (MMR, asphyxia, contraceptive services) vs outreach-based (preterm birth, anaemia, stunting)</td>
</tr>
<tr>
<td>HMIS vs independent measurements – (why ‘vs’?) – mostly relied on the latter</td>
</tr>
<tr>
<td>Microsystems vs support systems – ‘systems’ work effectively began during IFHI</td>
</tr>
<tr>
<td>Opportunistic (BFHI, BKMB, Poshan Abhiyan, ASHA modules) vs proactive efforts (ILA, QI, NM, WNB) to leverage top-down change</td>
</tr>
<tr>
<td>Manual vs digital technology</td>
</tr>
</tbody>
</table>
Key Decisions

- Building ground-up vs top-down
- Designing and implementing measurement strategy driven by ToC/ToA
- Strengthening domain-agnostic ‘delivery channels’ as the primary operational strategy
- Decision to burn bridges at the IFHI-TSU transition (esp. for outreach work)
- Embedding IT into the program
- The 70:30 rule
- Moving from flat structure to the vertical TSU organizational structures
- Not claiming credit or publishing the same.
Directional Scenario
WHAT COULD BE DONE DIFFERENTLY? (WHAT IF..)

Assuming we have achieved less than what was feasible with the given resources:

Should our focus have been different?
- Systems vs impact
- Morbidity vs mortality

Should our strategies have been different?
- cRCTs instead of scale interventions
- HMIS instead of independent measurements
- ‘Preservice’ kind of capacity building instead of on-the-job
- Leadership focus instead of workforce focus
- More vs less embedded in departments
- More vs less investment in ICDS

Could we have organized ourselves differently?
- Larger vs smaller TSU team
- More vs less of technical specialization
- More vs less of managerial interventions

Could we have found or made room for more effective facilitators?
- Self-evidently, yes. Why did it not happen?
WHAT IS LIKELY TO SUSTAIN IF TSU INTERVENTIONS STOPPED?

**IMPACT**
- Trends will sustain, unlikely to observe bending

**HEALTH BEHAVIOURS**
- What is not flat already is likely to flatten

**SERVICE COVERAGE**
- Likely to see sustained growth

**SERVICE QUALITY**
- Unlikely to see improvements, or only slow growth

**WORKFORCE SKILLS**
- Rate of improvement will likely slow down

**PROGRAM STRATEGIES**
- Likely to regress in sharpness

**LEADERSHIP CAPACITIES**
- Will remain bureaucrat-dependent
CORE STRATEGY INSIGHTS

Adequacy for impact vs feasibility at scale:
Don’t attempt intervention intensity that is unlikely to be effective. Most programs fail to achieve impact because they lose intervention intensity at the last mile.

Bend the curve when the bending can still be measured: As mortality rates fall, the effectiveness of interventions becomes difficult to judge.

Attempting to finish the business may give more bang for the buck than waiting for ‘government’ to do it: Some key interventions simply don’t excite them, nor will they the private sector.

RMNCHN efforts need to be integrated and normalized - quickly outgrowing the utility of a ‘vertical’

The very few, ‘simple’ interventions to get to impact are doable, but distractions abound – and the fount is at the top. Overcoming these may be the primary intervention – conceivably, this would apply to all of health.
Go to the people.
Live with them.
Learn from them.
Love them.
Start with what they know.
Build with what they have.
But with the best leaders,
When the work is done,
The task accomplished,
The people will say
‘We have done this ourselves’.

- Lao-tse in 7th century B.C.