Operationalization of WHO guidelines for managing Possible Serious Bacterial Infection (PSBI) in young infants: Lessons from implementation research in rural Bangladesh

PSBI Community of Practice Webinar
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Outline

● Overview of Newborn Infections & PSBI Guidelines

● Implementation Research Study & Lessons Learned
  o Health system readiness
  o Provider performance on guidelines
  o Acceptability of simplified antibiotic treatment

● Implications & Government Actions
Neonatal Mortality

- Neonatal deaths have been decreasing at a lower rate than mortality in older children
  - In Bangladesh → Proportion of under-five deaths occurring in the neonatal period increased from 44% in 1990 to 62% in 2015
- Infections remain a leading cause of death for newborns
  - Globally, contributes one-third of 2.6 million neonatal deaths

Possible Serious Bacterial Infection

● Clinical diagnosis of severe neonatal bacterial infection is challenging
  ○ Signs may be non-specific and difficult to detect
  ○ Reliable diagnostics are uncommon

● Standard practice is to empirically treat with antibiotics based on clinical algorithms for identifying possible serious bacterial infection

● WHO recommends inpatient treatment with 7 to 10-day course of a combination of two injectable antibiotics

Possible serious bacterial infection (PSBI) is a syndrome in young infants (0-59 days) characterized by one or more clinical signs:

○ Convulsions
○ Severe chest in-drawing,
○ Hypothermia (<35.5 ºC)
○ Fever (≥ 38.0 ºC)
○ No movement or movement only upon stimulation
○ Feeding poorly or not feeding at all
○ Respiratory rate ≥60 per minute among infants <7 days old

World Health Organization. Guideline: managing possible serious bacterial infection in young infants when referral is not feasible.
In 2015, WHO revised global guidelines for managing PSBI in young infants

- **Option 1**: Once daily gentamicin injections + oral amoxicillin for seven days
- **Option 2**: Once daily gentamicin for two days + oral amoxicillin for seven days

Bangladesh adopted **Option 2** for implementation at primary health centers
Targeted Primary Health Centers

- Union Health & Family Welfare Center (UH&FWC) provide outpatient services free-of-cost to families

- Staffed by 2-3 providers
  - Sub-Assistant Community Medical Officer (SACMO)
  - Family Welfare Visitor (FWV)

- SACMO designated provider for assessing and treating infants

- Family Planning Inspector (FPI) responsible for Day 8 visit

UH&FWC in Sylhet study area
<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 4</th>
<th>Day 8</th>
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<tbody>
<tr>
<td>SACMO classifies infant based on signs of PSBI present</td>
<td>SACMO counsels on further management &amp; treatment</td>
<td>Caregiver returns to UH&amp;FWC for 2nd gentamicin injection</td>
<td>Follow-up home visit by FPI</td>
</tr>
<tr>
<td>Critical Illness (CI)</td>
<td></td>
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<tr>
<td>Pre-referral antibiotic treatment</td>
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<tr>
<td>Critical Severe Infection (CSI)</td>
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<tr>
<td>Isolated Fast Breathing &lt;7D (IFB &lt;7D)</td>
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* Upazila Health Center (UHC) is the sub-district hospital, which provides inpatient services for ~250,000 pop
Implementation Research Study

- Opportunity to study how interventions work in real-world conditions
- Multidisciplinary stakeholder team to support rollout of national guidelines
  - MOHFW led rollout and implementation of guidelines
  - Implementation support from Projahnmo in Sylhet & MaMoni HSS in Lakshmipur
- Embedded mixed-methods evaluation to document lessons learned

Partners collaborated with MOHFW to provide:
- Training at national, district and sub-district levels
- Joint supervision visits
- Support to facility readiness
- Community mobilization

Discuss early findings → Adjustments to implementation strategies
- Monthly meetings of implementing partners
- Two stakeholder meetings
Evaluation Design

Quantitative

- Household survey
- Health facility checklist
- Case management register review
- Follow-up of cases in the community

Qualitative

- Focus group discussions with providers & caregivers
- In-depth interviews with providers & caregivers
- Key-informant interviews with MOHFW

Key Findings & Lessons Learned

Were health system supports available to ensure providers could deliver the program as planned?

To what extent did providers adhere to the guidelines for classification & dosage?

Where were there gaps in service delivery and care of PSBI cases?

What was the uptake of the intervention by families in the community?
Key Findings → Collaborative Action

- Lack of antibiotics & functioning equipment → Partners & GoB coordinated inputs
- Gaps in infrastructure → Outside scope, but documented challenges
Government Supervision for Providers
N=19

<table>
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<tr>
<th>Supervision Type</th>
<th>Aug-15</th>
<th>Mar-16</th>
<th>Aug-16</th>
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<tr>
<td>Government supervision in previous 3 months</td>
<td>63%</td>
<td>42%</td>
<td>79%</td>
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<tr>
<td>Attended monthly meeting at sub-district hospital</td>
<td>63%</td>
<td>90%</td>
<td>84%</td>
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Key Findings → Collaborative Action

- Low frequency of facility supervision → Joint supervisions aimed to improve quality, not frequency
- Higher frequency of monthly meeting at sub-district hospital → Partners & GoB utilized as opportunity to share lessons
Provider Performance Over Study Period

- Fewer challenges as providers gained practice with algorithm & calculating dosage
- Attributed improvements to feedback in joint supervision & refresher trainings

Many things can be skipped or errors [made], by this inspection one benefit happens…our work gets more accurate.”

- Provider in interview

Fig. Provider errors in classification and treatment of infection cases (N=606) over the study period (Applegate et al, 2020)
PSBI Case Management per Bangladesh Guidelines

PSBI cases classified by study area providers (N=192)

CI
N=43

Accept (12, 28%) 
Declined (31, 72%)

CSI
N=140

Accepted (20, 14%) 
Declined (120, 86%)

IFB <7D
N=9

Accepted (0) 
Declined (9, 100%)

Day 1
Caregiver referral decision

Day 2
Caregiver returns for second injection

Not Applicable

Yes (96, 80%)

Not Applicable

Day 4
Follow-up by health center provider

Not Applicable

Yes (82, 68%)

Yes (5, 56%)

Day 8
Follow-up at home by FPI

Not Applicable

Yes (43, 36%)

Yes (5, 56%)
Referral Acceptance

- Cost, distance, perceived severity of illness, permission not obtained
- Previous experiences with disrespectful care and unavailability of medicines at the sub-district hospital
- Referral compliance is not routinely tracked by providers

Suppose they talk with us angrily, ‘There is no medicine. Why have you come here?...’ When they tell us these, we get hurt. So we do not go. - Mother of infant

There is lack of cordiality to provide service in the higher health care center. As a whole it is seen that [families] have bitter experience. - Provider in interview
Return for Second Injection

- Logistical challenges → Visit fell on a weekend or when the provider was unavailable
- Some caregivers did not return due to fear around injections or concern the infant’s illness did not warrant second injection
- Permission of the husband, mother or mother-in-law was not given

[Mothers] think that the child might die after taking injection... They actually don’t know why [injection is being provided]

- Provider in interview

After giving medicines [baby] became weak. I thought it was the side effects of the injection

- Mother of sick infant

Returned to Health Center for 2nd Injection
N=120

No 20%

Yes 80%
Follow-up by Providers

67% of caregivers received follow-up on day 4
- Some providers reported not initiating follow-up, but relying on the caregivers to return or call if the baby’s condition did not improve.

32% of caregivers received follow-up at home on day 8
- Health workers reported challenges in scheduling visit due to other duties.
- Day 8 visit had not been incorporated in job description.
Few of the expected number of PSBI cases (16.3%) sought care from the study area health centers

- Previous negative experiences with public-sector care discouraged care-seeking
- Caregivers reported seeking care from health centers when they had trust in the provider
- Informal providers (e.g. village doctors) were often the first source of care & served as a source of referral
- Cost was a key factor in mothers choosing public versus private services
Study Implications

- Multi-stakeholder collaboration was key to ensuring facility readiness and program feasibility
- Low coverage (<20%) was a key challenge
- Quality of care identified as a barrier to care-seeking, particularly referral acceptance
- Simplified treatment viewed as more affordable and acceptable for caregivers than inpatient treatment
Operationalization of WHO guidelines for managing possible serious bacterial infection (PSBI) in young infants in Bangladesh:

*Policy to Action*
Journey started with a promise renewed: Bangladesh call for action

Bangladesh declaration for Ending Preventable Child Deaths by 2035

Declaration

Ending Preventable Child Deaths by 2035: Bangladesh Call for Action

Bangladesh reiterates its commitment to end preventable child deaths by 2035 through strengthening previous successes achieved for reducing child mortality. The country has declared its determination to go all out efforts to reduce under-five mortality to 30 per 1,000 live births by 2035.

To achieve this target, in addition to overall development of the health services delivery system, the country will implement the following successful evidence-based strategies and strategic interventions:

a) Activities:

1. Newborn-specific interventions
   1.1 Ensure essential newborn care, including neonatal resuscitation and application of Chlorhexidine in the umbilical cord.
   1.2 Introduce and promote the provision of antenatal steroid for premature labour and Kangaroo Mother Care (KMC) for premature and low birth weight infants.
   1.3 Ensure proper management of newborn infection with antibiotics at the primary care level.
   1.4 Establish a specialized newborn care unit at the sub-district and district level.

2. Ensure delivery by skilled birth attendants at the community level, at the clinic emergency obstetric and newborn care at all sub-district level health facilities.

3. Establish effective referral linkage to ensure continuous of care from the primary to the urban, sub-district, district and higher level hospitals.

4. Strengthen Integrated Management of Childhood Illnesses (IMCI) and facility level health.

5. Engage and reorient approach to ensure exclusive breastfeeding and immunization and complimentary feeding practices after the age of six months.


7. Introduce new life-saving measures through the EPI programme.

b) Strategic Interventions:

1. Revise the existing emergency obstetric and newborn care guidelines to ensure adequate service providers.

2. Establish newborn care services for sub-district.

3. Optimize utilization of existing human resources and increase their competencies.

4. Strengthening of family planning programmes and population policies.

5. Integrated approach for maternal, newborn, and child health interventions including nutrition.

6. Differential programming and use-based resource allocation to address inequity between the poor and the rich, urban and rural, and between gender.
Policy adoption process in Bangladesh

Policy Adoption
- 4 key newborn interventions for national scale up and for national campaign

High Political Commitment
- APR Declaration by Minister MOH on behalf of Honorable PM endorsed 4 key NB interventions

Formation of 4 TWGs for development of guidelines and SOPs on 4 key newborn interventions
- SEPSIS TWG Formed
- Formal & informal sensitization of key stakeholders about AFRINEST & SATT

Dissemination of AFRINEST & SATT in Dhaka
- Consensus to incorporate Simplified regimen

NTWC played a Pivotal Role
Policy to actions: preparedness for capacity building

Incorporation in Ministry of Health’s operation Plan

Endorsed by different regulatory committees

Incorporation in Essential Service Package & UH&FWC manual

Management Algorithm

Dose calculation chart

Case follow up guideline

National Guideline Developed and Endorsed

Comprehensive Newborn Care Package (CNCP) and its training Guideline developed
Implementation research of PSBI guidelines in 3 sites: 2015–2017

Early implementation of PSBI guideline in 10 sub-district of 3 districts

SNL & icddr,b in Kushtia District

Projahnmo in Sylhet District

MaMoni & Projahnmo in Lakhsmipur District
Country action required

- Capacity building of clinical provider
- Quality of care
- Facility Preparedness specially in DGFP facilities
- Increase utilization of services at primary care level facilities (UH&FWC)
- Structured referral network
- Resource allocation