Understanding the impact of a QI intervention on newborn mortality in 3 central districts in Malawi: a post-hoc theory-based evaluation

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Theme: Understanding, measuring and evaluating improvement
Brief introduction to Bejoy Nambiar

• Institute for Global Health, University College London
  [http://www.ucl.ac.uk/igh](http://www.ucl.ac.uk/igh)-Malawi
  [https://iris.ucl.ac.uk/iris/browse/profile?upi=BPNAM10](https://iris.ucl.ac.uk/iris/browse/profile?upi=BPNAM10)

• Area of work: Maternal, Newborn and Child Health

• Interest in Health Systems Research. Specific focus on Systems Improvement Research.


• Presentation based on study done in Malawi, and PhD:
Delay 1: Reduce Delays in Deciding to Seek Care

Women’s Group intervention

Delay 2: Reduce Delays in Identifying & Reaching Appropriate Medical Facility

Delay 3: Reduce Delays in Receiving Quality Routine & Emergency Maternal/Neonatal Care

Quality Improvement Collaboratives

3 Delays model

Key drivers for change

Empowered Women
Supportive Community
Effective Communication & Transportation
Women-Friendly Care
Clinically Excellent Care
Information-Driven Decision-Making
Effective Support Systems

Reductions in Maternal and Neonatal Mortality

*MaiKhanda Programme in Malawi

Evaluation Overview

Framework for evaluation

INPUT ➔ PROCESS (Mechanism) ➔ OUTPUT

Women’s group intervention

DEC, ADC meetings, Community consent, Identifying and training WGF

Community mobilization thru WG Action Cycle

Awareness on MNH Issues

Women delivering at Health Facilities

MMR decreased

NMR decreased

PMR decreased

Quality Improvement Collaboratives

MoH Sensitization QI teams

PDSA cycles MDR Audits

Case-fatality rate reduced Neonatal complications reduced

Impact Evaluation

Process Evaluation

Economic Evaluation
• Evaluation was funded by The Health Foundation
• Evaluation period: 2007-2012
• Impact evaluation: stratified cluster RCT
• Randomized health centres (n=64)
• Non-randomized CEmoCs (n=9)
• Data collection: Sep’07-Feb’11
## Trial results-effectiveness

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Perinatal mortality</th>
<th>Neonatal mortality</th>
<th>Maternal mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women’s group</td>
<td>0.84 [0.72, 0.97]*</td>
<td>0.90 [0.75, 1.09]</td>
<td>0.91 [0.51, 1.63]</td>
</tr>
<tr>
<td>QI Collaborative</td>
<td>0.99 [0.85, 1.15]</td>
<td>0.86 [0.72, 1.03]</td>
<td>1.18 [0.66, 2.11]</td>
</tr>
<tr>
<td>Combined</td>
<td>0.83 [0.67, 1.02]</td>
<td>0.78 [0.60, 1.01]**</td>
<td>1.08 [0.46, 2.57]</td>
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</tbody>
</table>

*p=0.020

**p=0.057

No effect of QI collaborative on newborn mortality at population level.
Why did we not see an effect?

• Was it related to the **theory/design** of the intervention? *-Did we do the right things?*

• Was it related to **implementation** of the intervention? *-Did we do things right?*

• Evaluation design

Common conversation between implementers and evaluators

![Cartoon images: I know our project works vs. No, you don’t]

2 main challenges:
- Complexity
- Context
Challenges to evaluation design
Evaluating complex QI Interventions

- Impact evaluation cannot explain how or why an intervention worked (or not)
- Impact evaluation does not take into account the complexity of intervention

Dear Mr. Gandhi, we regret we cannot fund your proposal because the link between spinning cloth and the fall of the British Empire was not clear to us.
Evaluation Framework

**INTERRUPTION**

- Implementation strength
  - Dose, Duration, Intensity & Specificity

**Predicted Outcome**

**Intervention Characteristics**
- Intervention design
- Intervention complexity

**Context**
- Macro
- Meso
- Micro

**Mechanism**

**Emergent Outcome**
THEORY BASED EVALUATION

Theory of Change

IMPLEMENTATION
Input-Process-Output

Implementation Strength

CONTEXT
Policies, Framework, Organizational culture
Values, Beliefs, Motivation, Trust

Stakeholder reasoning
Perception Interaction

OUTCOME
QI process evaluation studies

- Resource availability
- Patient perception of Care
- QI Collaborative
- Provision of care
- Newborn case fatality
- Material resources
- Staff motivation
- Human resources
- Provider Knowledge
## Evaluating programme implementation (CFIR)

<table>
<thead>
<tr>
<th>CFIR domains</th>
<th>Process evaluation studies</th>
<th>Monitoring data</th>
<th>Data Deep dive</th>
<th>Progress report</th>
<th>Board meeting minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention Characteristics</td>
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<tr>
<td>Outer context</td>
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<td>Inner setting</td>
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<tr>
<td>Individual characteristic</td>
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<tr>
<td>Implementation process</td>
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Implementation Theory

Timeline Event
January, 2007 First QI breakthrough collaborative
Introduction of Criterion-Based Audits
July 2007 Health Centre work initiated
March 2008 THF grants an additional year to the project for Phase II
Project gets registered as an NGO in Malawi-MaiKhandan
2008 Super-Improver training
May 2008 Second round of proposals with a clear design in place
July, 2008 Health centre work re-initiated by IHI
2009 Implementation of neonatal change ideas
July, 2009 Health Centre work being fully implemented
September 2009 FI Officers based in districts
2010 Bi-weekly visits to health centres; regular visits to CEmOCs

Break Through Collaborative Series

Timeline Event
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Dose

District QI advisors
Focus on health centres
Focus on newborn change package

Intensity

Specificity

Conceptual clarity

Duration

Implementation Strength

Strength

Specificity

Conceptual clarity

Intensity
Evaluating programme mechanism (programme theory)

<table>
<thead>
<tr>
<th>Mechanisms: Successful QI interventions*</th>
<th>Resources necessary for these mechanisms</th>
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</thead>
<tbody>
<tr>
<td>Isomorphic pressure</td>
<td>Collaborative sessions</td>
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<tr>
<td>Networked community</td>
<td>Telecon, workshops; feedback</td>
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<tr>
<td>Social problem with a solution</td>
<td>Political commitment</td>
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<tr>
<td>Harnessing data</td>
<td>Data improvement &amp; feedback</td>
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<tr>
<td>Changing culture &amp; practice</td>
<td>Checklists</td>
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Only 35% of the respondents were able to answer correctly regarding management of a baby who does not breathe spontaneously.
Conceptual clarity

Maternal Death Review

Direct

Recommendations: Implement improvement directly from MDR recommendations.

Change Package

- Identify gaps in practice
- Select ideas to close gaps

PDSA Cycle

- Identify gaps in practice
- Develop ideas to close gaps

Maternal Death Review

Standards

Criterion Based Audit

Improvement directly from MDR recommendations.

Change Package

Ideas for PDSA

Reading Articles

Audit Standards

Learning from other facilities

Approaches to problem identification

Maternal Death Reviews

Standards-based clinical audit

Analysis of labour ward registers

Approaches to problem solving

PDSA cycles

Model for improvement: As understood by THF programme director

Fig: QI model as perceived by the health facility staff
Conclusion

• Success of the QI interventions in Malawi was limited by its implementation strength

• Theory based evaluation of QI interventions provides insight into the mechanism

• The interventions were also influenced by multiple contextual factors

• Evaluating programme theory and programme implementation are important precursors to understand mechanisms and role of context