Delivering the MDGs on Maternal and Child Mortality:
A Systematic Review of Impact Evaluation Evidence

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Funded in part through the Japanese PHRD program
MDGs 4 and 5 Continue to Lag

► MDG5: ¾ Reduction in Maternal Mortality by 2015
  • Main Indicator: Proportion of births attended by skilled health personnel

► MDG4: 2/3 Reduction in Under-Five Mortality

► Knowing what to do is no longer the problem; knowing how to do it remains a challenge
Objective of this Systematic Review

- Outcome-oriented approach
- Reviews impact evaluations of interventions to improve five MCM outcomes (SBA, MM, NM, IM, U5M) and those of SBA as an intervention
- Aims to answer the following questions:
  - What interventions demonstrate reductions in maternal and child mortality and increase skilled birth attendance?
  - What do we know about the effects of increasing skilled birth attendance?
  - What important knowledge gaps remain on interventions to reduce maternal and child mortality?
Improved access to essential maternal and child care

Improved access to basic non-health services and nutritious food

Improved healthy practices and lifestyles

Improved care seeking behavior and utilization

Reduced maternal and childhood mortality
Search Criteria

► Impact Evaluations
  • Experimental or Quasi-Experimental design
  • Counterfactual
► Completed 1995 – Present
► Effectiveness / Policy / Field studies
  • (Rather than bio-medical and efficacy trials)
► Low and Middle-Income Countries
► Representative Sample of population of interest
► Peer Review
► Report impacts on at least 1 outcome of interest
  • Skilled Birth Attendance, Maternal Mortality
  • Neonatal, Infant, Under-five Mortality
3 Search Rounds
- Electronic, “hand” and snowball search strategies

Review and coding into 300+ fields

7,000 → 62 studies

Quality Ratings by Internal Validity
- Elements of Construct and External Validity also considered
## Frequency of Impact Evaluations by Outcome and Quality

<table>
<thead>
<tr>
<th>Outcome</th>
<th>AAA-rating</th>
<th>AA-rating</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skilled birth attendant</td>
<td>10</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Neonatal mortality</td>
<td>9</td>
<td>17</td>
<td>26</td>
</tr>
<tr>
<td>Infant mortality</td>
<td>11</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Under-5 mortality</td>
<td>5</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Maternal mortality</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

### AAA-quality Impact Evaluations: Established Causality
- Few, if any, remaining threats to internal validity.

### AA-quality Impact Evaluations: Likely Causality
- Some identifying assumptions untested or unclear

### Consistency Analysis. Key Results driven by AAA-rated IES

### Contextual Information considered as present in IEs

### This is a “baseline” of sorts. Thin evidence means findings are preliminary but still instructive.
Challenges and Cautions for Systematic Reviews

► Representativeness of Interventions—non-random selection
  • Overrepresentation of easily evaluable interventions
  • Focus on “reduced form” studies excludes those with intermediate outcomes
  • Lack of evidence does not imply no effect

► Representativeness of Impact Evaluations
  • Includes only existing studies
  • Publication bias (file drawer bias)

► Interpretation of Results
  • IEs measure partial equilibrium; general equilibrium may be different
  • Null results must be interpreted carefully—we never “accept” zero
  • External validity—changes to time, place, or scale may affect results
Skilled Birth Attendance — Outcome

- Conditional Cash Transfers and Vouchers can improve SBA

- Interventions that bundle quality improvements with increased accessibility found can improve SBA

- Solely training health workforce or increasing awareness of safe motherhood was not observed to yield significant results

- Where reported, effects are larger for more disadvantaged households
Skilled Birth Attendance – Intervention

► No Robust Evidence that *solely* increasing proportion of births with SBA affects mortality
  • Only evaluated program is JSY in India: Null results for NM
    – 2 IEs, AAA and AA quality, both high-powered
    – No effect even in areas with high (or low) quality of health services
  • Critical Knowledge gap: Need more IEs on this MDG indicator

► SBA “+” Can affect mortality and intermediate outcomes
  • PLUS=Provision & Utilization: quality of care, knowledge, access
  • But evidence is mixed across outcomes, even within a given study
  • Unclear what explains variation in results
  • Consistent, if thin, evidence on better U5M, Breastfeeding, Family planning, Postnatal visits, Immunization, Anthropometric outcomes
Maternal Mortality

- Few (8) studies exist, concentrated in SA (5)
- Most studies underpowered to detect effects in MM
- Interventions bundling components of both health care provision and utilization can reduce maternal mortality.
  - Specifically, bundling health worker training and mothers’ knowledge and information (with and without insurance)
- More evaluations are needed
  - Family planning, universal health, referral systems, transport
  - SSA, MENA, and LAC
Interventions in non-health sectors associated with maternal education consistently lowered neonatal mortality.

Knowledge & Information interventions in the sample which change home-based care practices at the community level reduced mortality.

More IEs are needed in:

- Referral Systems and Transportation
- Improvements in Quality and Availability of Health Infrastructure for newborns
- Africa and LAC
Infant Mortality

- Interventions in non-health sectors consistently reduced IM
  - Water and Sanitation
  - Energy
  - Education

- Governance interventions report significant effects in lowering infant mortality

- Training health workers to provide continuum of care services within communities can reduce IM
  - Attention to IE quality and intervention details is important
  - More AAA-quality IEs needed from other health sector interventions, SSA

- Where reported, households from lower SES benefited more
Interventions in non-health sectors consistently report large reductions in under-five mortality.

Public Participation, Service Packages may reduce U5M.

Insecticide Treated Nets are only intervention targeting three main causes of mortality that has IE evidence on U5M.

No AAA IEs of Governance programs; but AA IEs of strategy planning & policy and monitoring & evaluation consistently reveal reduction in U5 mortality.
External Validity Implications: Beneficial Impacts are more likely in problematic areas

Skilled Birth Attendance

Infant Mortality

Neonatal Mortality

Under-Five Mortality
Gaps by Region

Latin America & the Caribbean
- 15 IEs
- 3 SBA
- 1 NM
- 9 IM
- 7 U5

Middle East & North Africa
- 0 IEs

Europe & Central Asia
- 1 IE
- 1 MM
- 1 IM

East Asia & The Pacific
- 15 IEs
- 10 SBA
- 2 MM
- 4 NM
- 7 IM
- 3 U5

South Asia
- 28 IEs
- 15 SBA
- 5 MM
- 18 NM
- 6 IM
- 4 U5

Africa
- 9 IEs
- 5 SBA
- 3 NM
- 3 U5
No significant results for maternal or neonatal mortality

Significant, but often small effects on infant mortality. Larger for U5.
IEs of World Bank Funding and Projects: Skilled Birth Attendance (Outcome)

- SBA often significant, but small effect size
- Of 15 IEs on World Bank, 11 from 3 countries
- SBA & IM IEs concentrated in regions with 2nd-lowest burden

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[12] Bjorkman and Svensson 2009; P(SBA)
[4] Baird and others 2011; P(SBA)
[55] Olken and others 2012b; F(SBA)
[55] Olken and others 2012a; F(SBA)
[50] Newman and others 2002; F(SBA)
[47] Mazumdar and others 2011; F(SBA)
[39] Lim and others 2010; F(SBA)
[26] Frankenberg and others 2009; F(SBA)
[7] Basinga and others 2011; F(SBA)

- Health workforce, Knowledge/Information, Service Package; Indonesia; SME(N=52)
- Health financing; Planning/Policy ; Indonesia; SME(N=12,000)
- Health Infrastructure; Planning/Policy; Water/Sanitation; Bolivia; SME(N=8,009)
- Income increasing; India; SME(N=429,445)
- Income Increasing; India; SME(N=182,869)
- Health workforce, Delivery modality, Service Package; Indonesia; OR(N=6,730)
- Health Financing; Rwanda; OR(N=2,108)

- 1 0 2
- size effect

△ estimate (AAA) □ estimate(AA) 95% conf. int.
## Gaps for the World Bank

<table>
<thead>
<tr>
<th>Intervention type</th>
<th>All impact evaluations (of 68)</th>
<th>World Bank projects (of 109)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance</td>
<td>9</td>
<td>108</td>
</tr>
<tr>
<td>Donor support</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>Provision: health sector</td>
<td>41</td>
<td>107</td>
</tr>
<tr>
<td>Provision: nonhealth</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Utilization</td>
<td>34</td>
<td>66</td>
</tr>
</tbody>
</table>

- Bank could consider more IEs in
  - Governance
  - Non-health

- Donor Support (budgetary support, etc) may be difficult to evaluate with IE methods.
Other Gaps in Impact Evaluation Evidence

By Intervention Type
- Governance
- Health information systems, Health Infrastructure
- Health financing
- Income generating / Labor market interventions
- Agriculture / food security / nutrition
- Transportation infrastructure

Evaluation Components
- Distributional impacts (heterogeneous effects)
  - Where reported (30%), effects are larger for disadvantaged groups
- Cost analysis
In Summary

► In spite of slow progress globally on MDGs 4 and 5, We find evidence of effective interventions to reduce maternal and child mortality.
  • Governance
  • SBA+
  • Non-Health Sectors

► Lower SES households and Countries with higher burdens may see larger results from these interventions.

► There is no IE evidence that increasing skilled birth attendance alone reduces maternal or neonatal mortality.

► Important knowledge gaps remain
  • Region
  • Intervention Type (including SBA)
  • Evaluation components
Thank you
Standardized Effect Size: SBA—Outcome (AAA)
Standardized Effect Size: Maternal Mortality (AAA)
Standardized Effect Size: Neonatal Mortality (AAA)
Standardized Effect Size: Infant Mortality (AAA)
Standardized Effect Size: Under-Five Mortality (AAA)

Note: All measurements are SMD’s.
Findings on Interventions for Mothers

► No Robust Evidence that solely increasing proportion of births with SBA affects mortality
  - Only evaluated program is JSY in India: Gives null results
    – 2 IEs, High and Medium quality
    – No effect even in areas with high (or low) quality of health services
  - Critical Knowledge gap: Need more IEs on this MDG indicator

► Complimentary and reinforcing strategies that simultaneously improve both Provision and Utilization (supply and demand), esp. quality of care, knowledge, and access to services, can improve SBA and reduce MM

► Conditional Cash Transfers, Vouchers promising
  - But cannot disentangle the combined effect of utilization and quality
  - May lead to unintended consequences (increased fertility)
Findings on Interventions for Children

- Community-based interventions which components and improve home-based care may reduce neonatal mortality
- Non-health sector interventions (Education, Water, Energy) can reduce child mortality (NM, IM, U5)
- IMCI and Safe Motherhood not significant
- Though thin, the evidence is consistent that Governance interventions can reduce child mortality
- Evidence from health sector is often significant for AAA-rated IEs, not for AA-rated IEs