Maternal mortality in Bangladesh: a Countdown to 2015 country case study
A significant 40% decline in the maternal mortality

Bangladesh one of few countries with clear, population survey-based statistical evidence of such concrete progress toward MDG5.

Decline accompanied by important changes in maternal health indicators and indicators of socioeconomic development

A real-life opportunity for exploring the driving forces behind population level changes to maternal mortality risk at scale
Main Sources of Data for the Case Study

Bangladesh Maternal Mortality and Health Care Surveys (BMMS) :
   2001: National sample of 100,000 Households
   2010: National sample of 175,000 Households

Maternal deaths confirmed by verbal autopsy

Data from 6 Bangladesh Demographic and Health Surveys

Other data
Maternal Mortality Ratio fell by an impressive 40% in the past decade.

- Required AARR: 5.56%
- Actual AARR: 5.63%

BMMS 2001: 322
BMMS 2010: 194
MDG 5 Target: 143
What may explain this decline?

We believe that the key factors are:

- Reductions in Fertility
- Increased Care Seeking for Maternal Health
Reductions in Fertility
Trends in Contraceptive Use and Total Fertility Rate

Using Modern Contraceptives

<table>
<thead>
<tr>
<th>Year</th>
<th>Using Modern Contraceptives</th>
<th>Total Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>5</td>
<td>6.3</td>
</tr>
<tr>
<td>1989</td>
<td>23</td>
<td>5.1</td>
</tr>
<tr>
<td>1991</td>
<td>31</td>
<td>4.3</td>
</tr>
<tr>
<td>1993</td>
<td>36</td>
<td>3.4</td>
</tr>
<tr>
<td>1996</td>
<td>42</td>
<td>3.3</td>
</tr>
<tr>
<td>1999</td>
<td>43</td>
<td>3.3</td>
</tr>
<tr>
<td>2004</td>
<td>47</td>
<td>3.0</td>
</tr>
<tr>
<td>2007</td>
<td>48</td>
<td>2.7</td>
</tr>
<tr>
<td>2010</td>
<td>54</td>
<td>2.5</td>
</tr>
<tr>
<td>2011</td>
<td>52</td>
<td>2.3</td>
</tr>
</tbody>
</table>
Fertility has fallen:

- more among older women (>50% for women aged 40+ compared to 15% in among women <30 years).
- among high parity births (birth order 4+ down from 30% to 19%).
Increased Care Seeking for Maternal Health
Trends in Coverage of AnteNatal Care and Skilled Birth Attendance

- At least one Antenatal Care visit from a medically trained provider
- Deliveries attended by skilled personnel

- BDHS 1993-94: 26%
  - Antenatal Care: 10%
  - Deliveries: 9%
- BDHS 1996-97: 30%
  - Antenatal Care: 13%
  - Deliveries: 12%
- BDHS 1999-00: 35%
  - Antenatal Care: 16%
  - Deliveries: 21%
- BMMS 2001: 40%
  - Antenatal Care: 16%
  - Deliveries: 21%
- BDHS 2004: 51%
  - Antenatal Care: 21%
  - Deliveries: 32%
- BDHS 2007: 53%
  - Antenatal Care: 27%
  - Deliveries: 32%
- BMMS 2010: 54%
  - Antenatal Care: 27%
  - Deliveries: 32%
- BDHS 2011: 55%
  - Antenatal Care: 32%
  - Deliveries: 32%
Deliveries by Location and Provider (and C-Sections), 2001 and 2010

- BMMS 2001: 6% Home - Medically Trained, 3% NGO Facility, 3% Private Facility, 1% Public Facility
- BDHS 2011: 15% Home - Medically Trained, 3% NGO Facility, 2% Private Facility
- BMMS 2001: C-Section 2.6%
- BDHS 2011: C-Section 17.1%
Care Seeking for Maternal Complications

Sought Treatment from Health Facilities

BMMS 2001: 16%
BMMS 2010: 29%
Cause-Specific Maternal Mortality Ratios (per 100,000 live births): Bangladesh, 2001 and 2010

- Hemorrhage: 35% in 2001, 50% in 2010
- Eclampsia: 26% in 2001, 50% in 2010
- Obstructed: 85% in 2001, 85% in 2010
- Abortion: 26% in 2001, 57% in 2010
- Other Direct: 85% in 2001, 57% in 2010
- Indirect: 26% in 2001, 50% in 2010
- Undetermined: 0% in 2001, 0% in 2010

Maternal Mortality Ratio Range: 0 to 100
How to Explain Mortality Decline at Still Low Levels of Careseeking?

- The Unmet Obstetric Need Network estimated that 0.7% (compared to 1.4% globally) of deliveries in Bangladesh require a major obstetric intervention to avoid a maternal death from absolute maternal indications (AMI).

- In 2005, estimated that met obstetric need (for AMI) ranged from 27-76% in Bangladesh (mean of 50%).

- The near doubling of health facility use for maternal care would have resulted in a further increase in the met need.
  - Thus reducing maternal mortality by a larger amount than might be suggested by the absolute level of care-seeking.
What Accounts for the Increased Use of Maternal Health Services?
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- Numbers and distribution of facilities offering maternal health services has increased
- Improved road transport (roads, bridges, bus services) have reduced travel times
- Mobile phones available nationally, and at low cost
- There have been large gains in female education
- Income at national and household levels have improved, including among poor households
Health Facilities: Availability and Access

A) # of functioning facilities providing delivery services

Facilities Providing Normal Delivery Services
- Private: 308 in 2001, 1556 in 2008

Facilities Providing CEmOC Services

B) Able to reach facilities

Can Reach Facility in 1 Hour
- Public: 98% in 2001, 91% in 2010
- Private: 98% in 2001, 99% in 2010
- Public or Private: 99% in 2001, 93% in 2010

Can Reach Facility in 2 Hours
- Public: 25% in 2001, 86% in 2010
- Private: 25% in 2001, 93% in 2010
- Public or Private: 25% in 2001, 93% in 2010
Changes in Female Education

Education Level of Mothers, 2001 & 2010

- No Education: 44.7% (2001), 22.9% (2010)
- Primary Incomplete: 18.6% (2001), 16.1% (2010)
- Primary Complete: 10.7% (2001), 16.3% (2010)
- Some Secondary or Higher: 26.1% (2001), 44.7% (2010)
From $360 in 1980 to $1,810 in 2010.
In the last 5 years (2005-10), increase has been almost 50%
Using a Statistical Model of Change

- Model used pooled 2001 and 2010 survey data, included:
  - Background variables (economic condition, education)
  - Proximate factors (fertility, health service use)

- First pregnancies: protective
  High parity births and births at ages 35+: risk factors

- Mother’s education and household economic status lost significance

- Prevalence of use of a skilled attendant at delivery (almost entirely in facilities) was highly protective; having a skilled attendant at delivery reduced risk by as much as 60%.

- The model accounted for about one-third of the decline in risk from 2001 to 2010
Factors Contributing to Reduction in Maternal Deaths from 2001 to 2010

Number of Maternal Deaths

- 21% due to reduction in birth rates
- 7% due to change in age and parity
- 24% due to decline in age-parity specific risk of maternal mortality
- Actual maternal deaths per year

12,114
14,310
2,944
1,062
3,456
6,848
To Summarize

- Bangladesh has achieved remarkable reductions in maternal mortality by
  - investing heavily in female education and
  - achieving reductions in fertility, and
  - increasing the availability of CEmOC facilities

- The case study examined health and non-health determinants of maternal mortality to:
  - understand and guide the Bangladesh programme,
  - influence regional and global discourse on approaches to ensuring ever greater reductions in maternal mortality

- The evidence presented provides a strong rationale for accelerating access to and the quality of health-care facilities providing care for maternal complications and safe delivery services in Bangladesh
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Bangladesh Maternal Mortality and Health Care Survey 2010:

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