Gains in Afghan Health: Too Good To Be True?

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Background: Afghan Mortality Data

- Child mortality: Under-5 Mortality Rate (U5MR)
- Maternal mortality: Maternal Mortality Ratio (MMR)
- Sparse data on U5MR prior to 2001
  - 1972 survey
  - 1979 census
  - 1997, 2000 MICS
  - All used a summary birth history and indirect estimation methods
- No known data on MMR prior to 2001
  - Major motivator for survey
Mortality Data Post-2001

- High interest in monitoring mortality trends post-2001
  - To assess impact of health programs
  - Especially child mortality (U5MR) and maternal mortality (MMR) because of MDGs

- Flurry of surveys:
  - 2002 Reproductive Age Mortality Survey
  - 2003 MICS (full birth history)
  - 2007-08 National Risk and Vulnerability Survey
  - 2007 “Demographic and Health Survey”

- Serious doubts expressed about estimates from all the surveys
- Hence perceived need for a new survey implementing internationally-accepted methodologies and standards
The Afghan Mortality Survey 2010

- Field implementation:
  - Afghan Public Health Institute
  - Central Statistics Organization

- Technical and logistical assistance:
  - ICF-Macro
  - Indian Institute for Health Management Research
  - WHO/EMRO

- Technical guidance:
  - TAG of recognized experts

- Major funders: USAID, UNICEF
Mortality-Related Data in AMS

- Household questionnaire:
  - Household deaths in last 5 years by age and sex
  - Survival of parents
- Woman questionnaire (ever-married 12-49):
  - Full pregnancy history
  - Full sibling history
- Verbal autopsy:
  - For household deaths in 3 years before survey
    - 28 days and younger
    - 1 month to 11 years
    - 12+ years
AFGHANISTAN

MAP OF AFGHANISTAN

NORTH ZONE
- Balkh
- Samangan
- Faryab
- Jawzjan

NORTHERN
- Sari Pul
- Badghis
- Herat

CENTRAL ZONE
- Bamiyan
- Daykundi
- Ghazni
- Uruzgan
- Zabul

SOUTHERN
- Nimroz
- Helmand
- Kandahar

WESTERN
- Ghor
- Farah

CENTRAL HIGHLAND
- Logar
- Wardak

SOUTH EASTERN
- Nangarhar
- Kunar

NORTH EASTERN
- Badakhshan
- Takhar
- Baghlan

EASTERN
- Laghman
- Kapisa
- Parwan

CAPITAL
- Kabul

CHINA
- TURKMENISTAN
- UZBEKISTAN
- TAJIKISTAN
- PAKISTAN
- INDIA

800 Kilometers

0 200 400
Sampling

- 3 domains (North, Central, South)
  - Urban by domain, rural by province (34 strata)
- EAs obtained from 2011 Census preparatory frame
- 751 EAs selected PPS; 32 households selected per EA
  - 37 EAs not surveyed, 34 for security issues
  - No interviews in rural Helmand, Kandahar, Zabul
  - Supervision issues in South zone
- 98% (North), 99% (Central) and 66% (South) of sample surveyed (87% total)
Fieldwork and Response Rates

- Fieldwork conducted April to December 2010
- Response rates typically high:

<table>
<thead>
<tr>
<th></th>
<th>Residence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Households</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviewed</td>
<td>7,099</td>
<td>15,252</td>
</tr>
<tr>
<td>Response rate (%)</td>
<td>97.8</td>
<td>99.4</td>
</tr>
<tr>
<td>Eligible women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviewed</td>
<td>14,936</td>
<td>32,912</td>
</tr>
<tr>
<td>Response rate (%)</td>
<td>97.5</td>
<td>98.5</td>
</tr>
</tbody>
</table>
## Results: Child Mortality Face Value

*Rates per 1,000 exposed*

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Source of Estimate</th>
<th>Household Deaths</th>
<th>Pregnancy History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonatal</td>
<td>N/A</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Postneonatal</td>
<td>N/A</td>
<td>29</td>
<td>28</td>
</tr>
<tr>
<td>IMR</td>
<td>65</td>
<td>55</td>
<td>53</td>
</tr>
<tr>
<td>Child</td>
<td>20</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>U5MR</td>
<td>84</td>
<td>71</td>
<td>72</td>
</tr>
</tbody>
</table>

*Source: Afghanistan Mortality Survey 2010: Final Report. Table 5.1.1*
Concerns with Child Mortality Results: 1

• Implausible time trends for South Zone:

Source: Afghanistan Mortality Survey 2010: Final Report. Figure 5.1
Concerns with Child Mortality Results: 2

- **Sex ratio at birth (Males/100 Females)**

<table>
<thead>
<tr>
<th>Period</th>
<th>Zone</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>North</td>
<td>Central</td>
</tr>
<tr>
<td>2006-10</td>
<td>107.2</td>
<td>110.0</td>
</tr>
<tr>
<td>2001-05</td>
<td>99.8</td>
<td>109.9</td>
</tr>
<tr>
<td>1996-00</td>
<td>105.7</td>
<td>110.5</td>
</tr>
<tr>
<td>1991-95</td>
<td>106.5</td>
<td>100.9</td>
</tr>
</tbody>
</table>

*Source: Afghanistan Mortality Survey 2010: Final Report. Table C.5*
Concerns with Child Mortality Results: 3

- Under-reporting of neonatal deaths relative to regional DHS surveys (NN:PNN Ratio):

Source: DHS data, AMS Table 5.1.1
Concerns with Child Mortality Results: 4

- By interviewer: proportion of birth histories with zero children dead

Calculated from IR survey dataset
Concerns with Child Mortality Results: 4

- By interviewer: proportion of birth histories with zero children dead (South zone only)

Calculated from IR survey dataset
Conclusions on Child Mortality So Far:

- Results from South zone particularly weak
  - Low coverage of rural areas
  - Implausible time trends
  - Sex ratio at birth
- Overall results show implausible Neonatal: Postneonatal ratio
- High proportions of interviewers recording no child deaths
- So limit analysis to North and Central zones?
Neonatal/Postneonatal Ratios in North and Central Regions vs. S. Asia DHS

- North and Central are no better:

Source: DHS data, AMS Table 5.1.2
Adjusted U5MR Series

- Limit analysis to North and Central zones
- Adjust neonatal mortality rate to fit NNMR/PNNMR ratio model
- Recalculate adjusted U5MR time series
- Plausibility review:
  - Compare with estimates from other Afghanistan surveys
  - Compare with UN estimates for neighboring countries
AMS U5MR Estimates (Adjusted) 1985-2010

Probability of Dying by Age 5

Year

AMS Estimates with Other Survey Estimates

![Graph showing probability of dying by age 5 from 1960 to 2010 with data from various surveys and studies. The graph includes lines for 2010 AMS Adj., NRVA 07-08, DHS 07, MICS 03 Ind, MICS 03 Dir, MICS 00, MICS 97, and NDFG 72.]
AMS Estimates with UN Regional Estimates

![Graph showing the probability of dying by age 5 from 1985 to 2010 for Bangladesh and Pakistan, with lines representing 2010 AMS Adjusted estimates, Bangladesh UN Estimates, and Pakistan UN Estimates.](image-url)
AMS Child Mortality: Discussion

- Estimates are limited to data from North and Central zones
- Substantial adjustment for evidence of under-reported neonatal deaths
  - AMS used a pregnancy history; unlike most DHSs
- Plausibility:
  - Was Afghan U5MR comparable to that of Bangladesh up to late 1990s?
  - Is Afghan U5MR lower today than in Pakistan?
- If results are accepted, annual rate of decline in U5MR is 3.3% since 2001 (vs. 4.4% for MDG-4)
Adult and Maternal Mortality

• Previous studies:
  ▫ No data on overall adult mortality
  ▫ 2002 RAMOS for maternal mortality

• AMS sources of data:
  ▫ Full sibling history
  ▫ Deaths in household in last 5 years
  ▫ Verbal autopsy (to identify maternal deaths)
  ▫ Survival of parents (not examined here)

• Format is very similar to Bangladesh Maternal Morbidity and Mortality Surveys, 2001 and 2010
## Overall Adult Mortality: Reported Probability of Dying between the Ages of 15 and 50

<table>
<thead>
<tr>
<th></th>
<th>Sibling History</th>
<th>Household Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AMS*</td>
<td>BMMS-2001</td>
</tr>
<tr>
<td>Period Before Survey</td>
<td>0 to 4</td>
<td>0 to 4</td>
</tr>
<tr>
<td>Females</td>
<td>0.052</td>
<td>0.084</td>
</tr>
<tr>
<td>Males</td>
<td>0.071</td>
<td>0.083</td>
</tr>
</tbody>
</table>

* AMS estimates are for whole sample; there were no clear differences between the North and Central zones and the South zone

† “Growth Balance” analysis suggests completeness of reporting around two-thirds (but method is sensitive to migration)
Maternal Mortality: Previous Estimate

- 2002 “RAMOS” study
  - Conducted in 4 (of maximum variability in “remoteness”) of 360 districts
  - Format was household deaths of women of reproductive age with VA follow-up
  - Estimated MMR (per 100,000 live births) at between 1,600 and 2,200
## AMS: Pregnancy-Related and Maternal Mortality

<table>
<thead>
<tr>
<th>Period Before Survey</th>
<th>Pregnancy-Related Mortality Ratio – Sibling History</th>
<th>Maternal Mortality Ratio – Household Deaths and VA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AMS*</td>
<td>BMMS-2001</td>
</tr>
<tr>
<td>/100,000 LB</td>
<td>327</td>
<td>449</td>
</tr>
</tbody>
</table>

* AMS estimates are for whole sample; there were no clear differences between the North and Central zones and the South zone
Discussion: Adult and Maternal Mortality

- AMS sibling history estimates (overall and pregnancy-related mortality similar to or lower than in Bangladesh) are implausible
- Estimates based on household deaths are somewhat higher
  - But are much lower than international estimates or the results of the 2002 survey
  - Analysis suggests underreporting of household deaths
- Hard to have confidence in the results
The AMS: Conclusion

- Used state-of-the-art methodology
- Conducted with all possible diligence
  - Supervision problems in insecure areas
- Results have serious flaws
  - Clear error patterns in child mortality estimates
  - Lack of “face validity” even after adjustment
  - Adult and maternal mortality estimates also implausible
- Conventional data collection in conflict zones doesn’t seem to work
  - We need new approaches