A question of access? Reducing high maternal mortality in Africa
The MSF experience from rural Burundi

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• High maternal mortality ratio – 800 maternal deaths /100,000 live births (MMEIG, 2012)
• Insufficient progress made towards achieving the MDG 5 target
• Main reasons: Poor access to and availability of Emergency Obstetric Care (EOC)
• Since 2006, MSF has managed an intervention in rural Burundi to reduce maternal mortality
Study setting Kabezi

- Population ~ 198,000
- ~9900 expected deliveries/yr
- One district hospital
- 9 health centre maternities: 1-70km from CURGO
MSF intervention

i) EOC referral facility (CURGO) & family planning

i) Emergency patient transfer service from peripheral facilities → CURGO (referral criteria, 3 ambulances, HFR)
Research question

Can we rapidly and substantially reduce maternal mortality in rural sub-Saharan Africa by ensuring access to CEmONC?
Study objectives

i) Report on the MSF intervention

ii) Model its impact on reducing maternal mortality
### Methods (1):
Assessing impact: study description

<table>
<thead>
<tr>
<th><strong>Study Design:</strong></th>
<th>Retrospective analysis of CURGO and health centre data</th>
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<tbody>
<tr>
<td><strong>Study Period:</strong></td>
<td>Jan – Dec 2011</td>
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<td><strong>Study Setting:</strong></td>
<td>Rural district – Kabezi</td>
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<td><strong>Study population:</strong></td>
<td>Women transferred to CURGO with obstetric complications</td>
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<td><strong>Ethics Approval:</strong></td>
<td>Burundi Ethics Committee &amp; MSF Ethics Review Board</td>
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Methods (2)
Assessing impact: definitions

1. Severe acute maternal morbidity (SAMM): list of criteria: obstructed labour, ectopic, APH, ...(annex)

Responsible for the majority of maternal deaths: 10.1% risk of death

2. Death to SAMM ratio:

- Ratio of maternal deaths to cases of SAMM
- Indicator for quality of maternal care (if low percentage this is indicating high standard of care)
Methods (3) Assessing impact

Total maternal deaths in Kabezi

\[ \text{Burundi MMR} \times \text{expected n° of deliveries in Kabezi} \]

\[ \downarrow \]

Deaths averted by the MSF intervention

Expected no. of deaths among obstetric patients referred to CURGO*
- (Actual no. of deaths + expected no. of deaths post discharge from CURGO)

* No. of cases of SAMM in study x 10.1%
### Results (1): Characteristics of the study population

<table>
<thead>
<tr>
<th>Characteristics of the study population</th>
<th>n (%)</th>
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<tbody>
<tr>
<td><strong>Total transferred to CURGO</strong></td>
<td>1385</td>
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<tr>
<td><strong>Women with SAMM</strong></td>
<td>765 (55)</td>
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<td><strong>Main SAMM defining conditions</strong></td>
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<tr>
<td>Prolonged/obstructed labour needing C-section or instrumental delivery</td>
<td>267 (35)</td>
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<td>Complicated abortion</td>
<td>226 (30)</td>
</tr>
<tr>
<td>Ante- or post-partum haemorrhage</td>
<td>91 (12)</td>
</tr>
<tr>
<td>Dead baby in utero with uterine contractions &gt;48h</td>
<td>46 (6)</td>
</tr>
<tr>
<td>Severe Pre-eclampsia/eclampsia</td>
<td>18 (2)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>15 (2)</td>
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</tbody>
</table>
Results (2): MSF impact in Kabezi

Total maternal deaths in Kabezi

\[
\frac{[800 \times (4.7\% \times 198,000)]}{100,000} \downarrow
\]

\[74 \text{ deaths}\]

Burundi MMR x expected no. of deliveries in Kabezi

\[\frac{74}{74} = 74\%\]

Maternal deaths averted by the MSF intervention

Expected no. of deaths among obstetric patients referred to CURGO\(^*\) – (Actual no. of deaths + expected deaths post discharge)

\[77 - (1 + 21) = 55\]

\(^*\) No. of cases of SAMM in study x 10.1% = 765 x 10.1% = 77
Results (3): Impact in relation to MDG 5

Maternal Mortality Ratio 1990-2010 and MDG 5 target in Kabezi district, Burundi

Reduction in maternal mortality ratio = 74% deaths (→ 208/100,000 live births)
Main factors underpinning the success of the MSF intervention

1. High coverage of complicated obstetric cases and caesarean sections (80% and 92% respectively)

2. Timeliness of referrals
   - Efficient ambulance referral system
   - Good surgical capacity at the CEmONC facility (42% of all admitted women underwent a major surgical intervention; 22% underwent minor surgery).
Feasibility of the MSF intervention

• Operational costs for the CURGO project ~ €2 million
  → € 3.2/ inhabitant / year

• Cost of ambulance referral system:
  • €0.43 Euros/capita/year

• Non specialist surgical staff:
  • 92% of major procedures performed by general practitioners with surgical skills
  • Anaesthesia provided by nurses in 96% of cases.
Conclusion

In a rural district of Burundi

• Providing an efficient patient emergency transfer service with an EOC referral facility, was associated with an 74% reduction in maternal mortality

• This “strategy” offers a possible way forward for achieving the MDG 5 target in rural Africa
Acknowledgements

Many thanks to the patients and clinical staff at CURGO and the health centres in Kabezi and to the relevant Health authorities.
Annex: 1. Referral criteria to CURGO

- First pregnancy and aged > 35 yrs
- Previous deliveries > 5
- Women’s height < 1.5 m
- Previous uterine intervention e.g. caesarean section
- Excessively high uterus
- Abnormal presentation of baby/umbilical cord
- Bleeding during pregnancy
- Post-partum hemorrhage
- Prematurity < 37 weeks gestation
- History of difficult delivery
- History of obstetric fistula
- Baby dead in utero & uterine contractions lasting > 48 hours
- General medical pathologies: severe anaemia, malnutrition, asthma, diabetes, cardiovascular or renal pathologies, infections (fever > 38°C for ≥ 24 hrs)
- Severe malaria
- Pre-eclampsia/ eclampsia
- Prolonged labour (> 12 rs)
- Premature rupture of membranes (with no contractions for ≥ 12 hrs)
Annex 2: CEmONC

Box: Standard package of Comprehensive Emergency Obstetric care in CURGO

- Antibiotics
- Oxytocin and anticonvulsants
- Manual removal of the placenta
- Removal of retained products following abortion
- Assisted vaginal delivery
- Surgery (caesarean section, hysterectomy, laparotomy)
- Safe blood transfusion
- Newborn care including care for sick and low birth weight newborns (Essential medicines, blood transfusion, oxygen, basic and advanced resuscitation)
Annex 3: SAMM criteria

Assessing impact: definitions

• Severe acute maternal morbidity (SAMM):
  • Prolonged/obstructed labour
  • Pre-eclampsia/eclampsia
  • Ante- or post-partum haemorrhage
  • Uterine rupture
  • Dead baby in utero > 48 hours
  • Complicated abortion
  • Sepsis
  • Severe malaria
  • Ectopic pregnancy
  • Severe anaemia
  • Emergency hysterectomy
  • Abnormal position of baby/elevated uterus, requiring C-section

Responsible for the majority of maternal deaths: 10.1% risk of death