



SAFE DELIVERY

Reducing maternal mortality
in Sierra Leone and Burundi



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SUMMARY

Operational research from MSF's projects in Kabezi, Burundi, and Bo, Sierra Leone, indicate that it is possible to achieve a rapid and substantial decrease in maternal deaths of up to 74 percent by providing access to emergency obstetric care. MSF's research is the first of its kind to quantify the impact of such a model of care on maternal mortality in an African setting.

Despite being highly avoidable, maternal mortality continues to be a major problem in many poor countries. A woman in Sierra Leone is over 200 times more likely to die giving birth than a woman in Sweden. Some 287,000 women worldwide die each year giving birth, leaving behind children who – as a result of their mothers' deaths – are ten times more likely to die prematurely.

Médecins Sans Frontières (MSF) has extensive experience of providing maternal care across the world. In 2011, MSF assisted 192,000 women in delivering their babies.

MSF has been working to save the lives of mothers in Burundi since 2006 and in Sierra Leone since 2008. Both are countries with extremely high rates of maternal mortality, due to problems around access to good quality emergency obstetric care, linked to shortages of qualified health staff, a lack of medical facilities and health systems that have been shattered by years of civil war.

MSF's maternal healthcare model in these two countries consists of an ambulance referral system that transports women in need of emergency obstetric care to an MSF referral hospital. The comprehensive emergency obstetric care provided at the hospital is offered 24 hours a day, seven days a week, and all services are free of charge.

MSF estimates for 2011 indicate that maternal mortality in Burundi's Kabezi district, where MSF is the only emergency obstetric care provider, has fallen to 208 per 100,000 live births, compared to a national average of 800 per 100,000 live births – a 74 percent decrease. For

the same year, in Sierra Leone, MSF estimates indicate that maternal mortality in Bo district has decreased to 351 per 100,000 live births, compared to 890 per 100,000 in the rest of the country – a 61 percent reduction.

The total annual running costs of these programmes are equivalent to just €1.5 for each person in Bo district and just €3.2 for each person in Kabezi district. These programmes do not use state-of-the-art facilities or equipment. The results show that, with a relatively small investment, it is possible to achieve a rapid and substantial decrease in the number of women who die in childbirth.

An international point of reference is the fifth Millennium Development Goal of reducing maternal mortality by 75 percent by 2015, compared to the national ratio in 1990. MSF's estimates indicate that the maternal mortality ratio in Kabezi district is already below this level. In Bo district, MSF is confident that its intervention will result in a 75 percent reduction by 2015.

The model of emergency obstetric care delivery that MSF has adopted in Sierra Leone and Burundi is saving a significant number of mothers from dying from pregnancy-related complications. MSF's positive experience from these countries can serve as an encouraging example for donors, governments and other NGOs who are considering investing in a functional and effective referral system and 24/7 emergency obstetric care in countries where maternal mortality is high and access to emergency obstetric services is limited.

WHY SHOULD WE CARE ABOUT MATERNAL DEATHS ?



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Every year, some 287,000 women die from complications during pregnancy and childbirth.¹ Most are young, active and healthy. And for every woman who dies, another 20 women suffer from chronic ill health or disability due to conditions such as obstetric fistula.

Across the world, in every country and every population group, approximately 15 percent of pregnant women develop complications that are potentially life-threatening.² But the fate of a pregnant woman is very much dictated by where she gives birth in the world. In fact, 99 percent of maternal deaths occur in poor countries,¹ where – for many people – medical services are out of reach or simply unaffordable.

The majority of maternal deaths happen just before, during or just after delivery. While it is often not possible to predict the complications that will result in a mother dying, it is possible to avoid deaths due to such complications, as long as women have timely access to adequate emergency obstetric care. This includes drugs, medical supplies and trained health staff who can detect complications and provide the right treatment.

It is not just the mother who is in danger – the whole family is at risk. Children whose mothers die giving birth to them are ten times more likely to die prematurely², while – without a mother to care for them – older children in the family are also at increased risk. Saving mothers' lives also saves children's lives.

¹ WHO data, available at : www.who.int/mediacentre/factsheets/fs348/en/index.html

² WHO data, available at : www.who.int/features/qa/12/en/index.html

THE FIVE LEADING CAUSES OF MATERNAL DEATHS WORLDWIDE :

HAEMORRHAGE

(severe bleeding)

Haemorrhages usually occur immediately after a woman has given birth.

25%

SEPSIS

(infection)

Giving birth in a hygienic environment minimises the risk of infections. Any infections should be treated with antibiotics.

15%

UNSAFE ABORTION

Abortions need to be performed by skilled medical workers in a safe and hygienic environment.

13%

HYPERTENSIVE DISORDERS

(pre-eclampsia and eclampsia)

Pre-eclampsia can occur during late pregnancy, labour or after giving birth. The final stage – eclampsia – is characterised by seizures.

12%

OBSTRUCTED LABOUR

Caused by a woman's pelvis being too narrow for the baby's head to pass through, by the baby being in the wrong position, or by weak or uncoordinated uterine contractions.

8%

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“I've been here in Bo for five and a half months. I think it's completely different here from the US, where I come from. Most of the cases are much more severe, urgent and life threatening. If MSF were not here, many of these women who come to us every day would be dead. The best part of my job is feeling that I make a difference and just experiencing the gratitude that I get from my patients. The worst part is seeing the deaths and knowing that we can't save everybody.”

Betty Raney, 57, obstetrician, Bo, Sierra Leone

MATERNAL MORTALITY IN SIERRA LEONE AND BURUNDI



SIERRA LEONE

The maternal mortality ratios in Sierra Leone and Burundi are among the highest in the world. Both countries have suffered civil wars that have crippled their healthcare systems and from which they have yet to recover.

The national maternal mortality ratio in Sierra Leone is the third highest in the world (after Chad and Somalia) at 890 per 100,000 live births. Burundi has the fifth highest ratio in the world (after Chad, Somalia, Sierra Leone and Central African Republic) at 800 per 100,000 live births. To put these figures into perspective, the maternal mortality ratio in Sweden is just four per 100,000 live births.

One of the major barriers to rebuilding the healthcare system in Sierra Leone and Burundi is a serious shortage of qualified medical staff. As of 2012, only three obstetricians were registered as working for the Sierra Leonean Ministry of Health, serving a population of over five million people. In Burundi, there are 23 registered obstetricians working for the Ministry of Health, of which all but one are practicing in the capital city Bujumbura.

Unaware of the danger signs, many people do not seek medical care until it is too late. Roads are poor and transport options are limited, even for those who can afford to travel to a health centre. Once they have arrived, they are likely to experience delays in receiving treatment due to shortages of medicines, medical supplies and staff. Even then, the standard of care they receive is often poor.



BURUNDI



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“ I’ve been working for one and a half years for MSF. Being an ambulance driver is a life-saving job. You have to use your energy and strength to do this work. If we have a patient who is in very critical condition, you have to rush to save that life. And the roads are very bad. Sometimes it’s two hours to get to where they are, and the patient is almost about to deliver. Two weeks ago we went to Jimi Gbagbo health centre. In the ambulance, the patient was shouting, oh mister driver, break! oh mister driver, break! She nearly pulled my shoulder for me to break because the road was so bumpy, and she was in pain. The moment we reached the hospital she almost delivered in the vehicle. ”

Foday Kpaka, 43, ambulance driver, Bo, Sierra Leone

MSF'S PACKAGE OF EMERGENCY OBSTETRIC CARE IN BURUNDI AND SIERRA LEONE

In 2006, MSF began working in Kabezi district, Burundi, with the primary aim of reducing maternal mortality. In Bo district, Sierra Leone, MSF has been running a hospital since 2003. In 2008, a new maternity ward was inaugurated. The approach in the two locations is focused on tackling two of the major challenges:

- a) A lack of adequate referral facilities for emergency obstetric and neonatal care.
- b) Poor geographic access to these services for women with complicated pregnancies.

MSF has addressed these gaps in both locations by setting up a central referral facility providing emergency obstetric care, together with an emergency ambulance transfer service to bring women from peripheral health centres to the facility.

MSF and Ministry of Health staff provide antenatal care at health centres to follow up pregnancies and detect complications. Before going into labour, women have the option of staying in a maternity waiting house next to the health centre, in order to be close to a medical facility when it is time to deliver.

When a woman with, or at risk of, a pregnancy/delivery related complication presents at the health centre, the health centre staff will contact the hospital by radio and an ambulance is sent (accompanied by a trained nurse) to collect and transfer the woman to the hospital.

Upon admission to the hospital, a package of comprehensive emergency obstetric and neonatal care is offered, consisting of the following:

- Administration of antibiotics, oxytocics and anticonvulsants
- Manual removal of the placenta
- Removal of remaining tissue following abortion
- Assisted vaginal delivery, preferably with vacuum extractor
- Newborn care including neonatal resuscitation
- Surgery (caesarean section, hysterectomy, laparotomy)
- Safe blood transfusion
- Care for sick and low-birthweight newborns

The ambulance service and package of emergency obstetric and neonatal care are provided 24 hours a day, seven days a week, free of charge. Aside MSF's services, there are no other functioning comprehensive emergency obstetric care facilities that offer 24/7 treatment in either Bo or Kabezi.

“ I was picked up by the MSF ambulance the previous day from Gatumba Health Centre. I was told the baby was in a bad position and that I couldn't deliver normally, that I needed a c-section. This was my first born. I was not afraid. I just wanted my baby. I am aware that there could have been many problems for myself and my baby. I know women who have died from childbirth because they didn't have help like this. I'm feeling very happy today. ”

Mateso Emilienne, 25, mother, Kabezi, Burundi

RESULTS

Operational research from MSF's projects in Kabezi, Burundi, and Bo, Sierra Leone, is the first to attempt to specifically quantify the impact on maternal mortality of improving availability and access to emergency obstetric care in an African setting.

The impact of MSF's intervention was modelled by estimating how many deaths were averted among women transferred to and treated at MSF's emergency obstetric care facility with a severe acute maternal morbidity (SAMM), defined as "a very ill pregnant or recently delivered woman who would have died had it not been that luck and good care were on her side".³

Among women admitted to MSF's referral hospitals, cases of SAMM were identified if the reason for admission included any of the following conditions :

- prolonged and/or obstructed labour (> 12 hours);
- complicated abortion (spontaneous or induced);
- pre-eclampsia/eclampsia;
- ante or post-partum haemorrhage;
- uterine rupture;
- dead baby in utero and uterine contractions lasting > 48 hours;
- sepsis;
- severe malaria;
- ectopic pregnancy;
- severe anaemia on admission;
- requirement of an emergency hysterectomy for any reason;
- requirement of a caesarean section due to excessive elevation of the uterus or abnormal presentation of the baby.

Based on existing data, it was estimated that in the absence of the MSF intervention, 7.5 - 13.2 percent of women with a SAMM would have died⁴. Using this to estimate the number of maternal deaths averted by the MSF intervention, the expected maternal mortality ratio in the respective districts was calculated.



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“This is my third pregnancy. I have one child who is alive and one that died before. I was sad and discouraged when I lost that baby because it was my first pregnancy. Then it took ten years for me to get pregnant again. People said I was unable to have children. They were mocking me.

Last week, I was in my village Lower Sama, and I was starting to have labour pains. I went to health centre in Sumbuya, but the nurses there were not able to deliver my baby so they called an ambulance to the hospital. I was not able to deliver normally, so the doctors gave me a caesarian-section. I am happy now and the baby is OK. I am getting free medication and free food.”

Nyema Fodey, 40, mother, Bo, Sierra Leone

³ Mantel G, Buchman E, Reese H, Pattinson RC (1998). Severe acute maternal morbidity: a pilot study of a definition of a near-miss. *Br J Obstet Gynaecol* 105:985-90.

Pruel A, Bouvier-Colle M-H, De Bernis L, Bréart G (2000). Severe maternal morbidity from direct obstetric causes in West Africa: incidence and case fatality rates. *Bull World Health Organ.* 78: 593-602.

Penney G, Brace V. Near miss audit in obstetrics (2007). *Curr Opin Obstet Gynecol* 19:145-50.

⁴ Fournier P, Dumont A, Tourigny C, Dunkley G & Dramé S (2009). Improved access to comprehensive emergency obstetric care and its effect on institutional maternal mortality in rural Mali. *Bull World Health Organ* 87:30-38.



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SIERRA LEONE

Population in Bo district:
596,366

Total obstetric cases treated by MSF in 2011
amongst women from Bo district:
2,262

Total obstetric cases presenting with a severe acute
maternal morbidity (SAMM):
1874

National maternal mortality ratio:
890 per 100,000 live births

Estimated maternal mortality ratio in Bo district
as a result of MSF's programme:
351 per 100,000 live births

Estimated reduction in maternal
mortality in Bo district associated
with MSF's programme:

61%

BURUNDI

Population in Kabezi district:
198,000

Total obstetric cases treated by MSF in 2011
amongst women from Kabezi district:
1,385

Total obstetric cases presenting with a severe acute
maternal morbidity (SAMM):
765

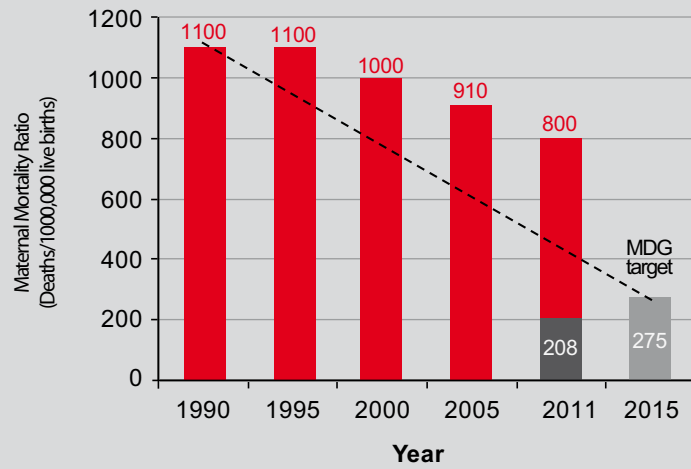
National maternal mortality ratio:
800 per 100,000 live births

Estimated maternal mortality ratio in Kabezi district
as a result of MSF's programme:
208 per 100,000 live births

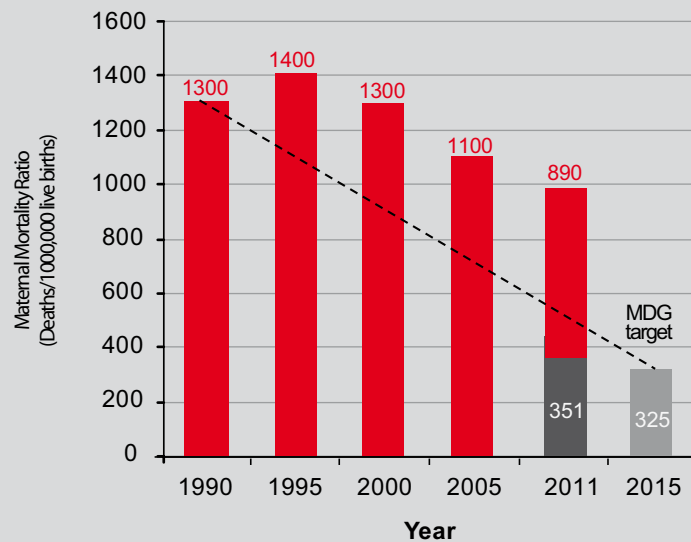
Estimated reduction in maternal
mortality in Kabezi district
associated with MSF's programme:

74%

Maternal mortality ratio 1990-2011 and the 2015 MDG target in Burundi



Maternal mortality ratio 1990-2011 and the 2015 MDG target in Sierra Leone



- Desired national progress toward the MDG target
- Trend in Maternal Mortality Ratio - 1990-2011
- Estimated maternal mortality ratio in Bo/Kabezi district - 2011
- MDG Target for 2015

One of the Millennium Development Goals is to reduce maternal mortality by 75 percent by 2015 (from a baseline level in 1990). In Kabezi district, the maternal mortality ratio has already dropped below this 2015 target. The graph for Bo district shows that it is well ahead of the target trajectory for such a reduction.

Overall, the annual running costs of MSF's maternal health activities was approximately €0.9 million in Bo district and €2 million in Kabezi district. Extrapolated to the total population of the two districts, this amounts to about €1.5 per resident per year in Bo, and €3.2 per resident per year in Kabezi. Although this is a simplistic estimate, it reflects the cost-benefit of this strategy at the population level.



“ I have had six pregnancies. My second child died at two years old after being sick. This is my third c-section. I also had my second c-section here at the MSF hospital. In the past, women would give birth at home. These days, I don't know anyone giving birth at home. Among women, we advise each other to go to clinics or health centres to give birth. I had my first and second child at home, because it was during the civil war and it was not safe to travel at that time. I had a traditional midwife in my village assist me. Now that there is peace, I went to the health centre to have my sixth child. ”

Odette Banyicandabazi, 32, mother, Kabezi, Burundi

CONCLUSION



MSF's analysis shows that, by introducing emergency obstetric care and a referral system, MSF has managed to rapidly and significantly reduce the level of maternal mortality in both of its project catchment areas in Burundi and Sierra Leone.

Achieving these very encouraging results does not require a large investment, and the services do not need to be 'state of the art'.

Maternal mortality remains a significant problem in many countries, yet efforts to tackle it frequently show a lack of direction. A common assumption is that improving access to emergency obstetric care is too costly, but MSF's experience shows that this need not be the case.

In countries with high maternal mortality rates, it is imperative that maternal health is made a priority and that investment is made in strategies that ensure that women have timely access to quality emergency obstetric care.

The model of emergency obstetric care delivery that MSF has adopted in Sierra Leone and Burundi is saving a significant number of mothers from dying from pregnancy-related complications. MSF's positive experience from these countries can serve as an encouraging example for donors, governments and other NGOs who are considering investing in a functional and effective referral system and 24/7 emergency obstetric care in countries where maternal mortality is high and access to emergency obstetric services is limited.

