

# Sudan

## Achieving MDG 5

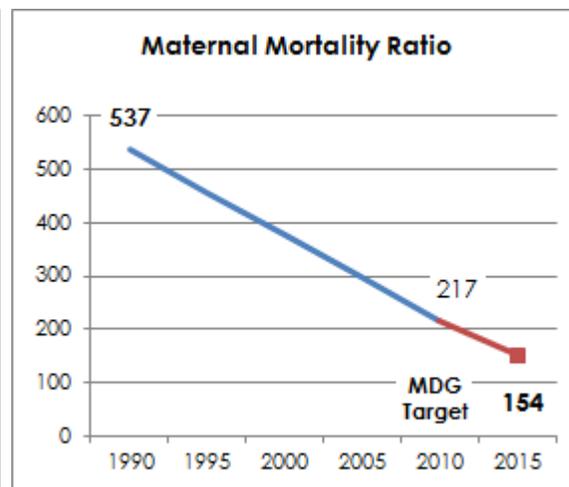
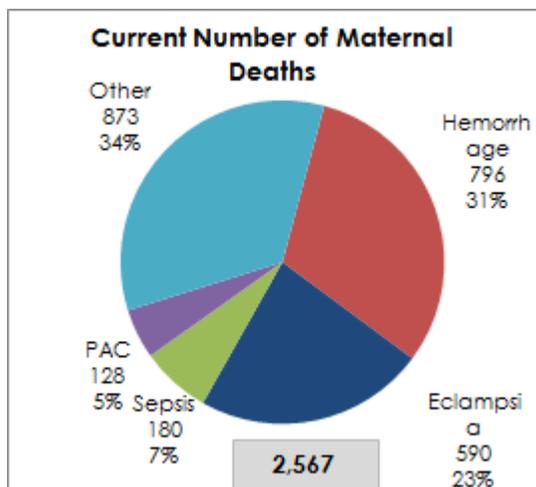
### Maternal Mortality

With a population of over 37 million in 2013<sup>i</sup>, Sudan is the 8th most populous country in Africa. It is also among the top ten countries in the world when it comes to maternal mortality. With an estimated 2,600 women dying in pregnancy or childbirth each year, Sudan accounts for 1% of the global maternal death burden<sup>ii</sup>.

Sudan in the last two decades has made significant progress in reducing its maternal mortality ratio and is currently on track to reach the 75% reduction in the MMR required by the MDG5. According to the SHSHS 2010, it had a MMR of 217 per 100,000 live births<sup>iii</sup>. If the current trend continues, the country should be able to reach its MDG goal of an MMR of 154 (or about 1,800 annual deaths) by 2015.

More than 70% of all maternal deaths in Sudan are due to just four conditions - hemorrhage, eclampsia, sepsis and abortion complications<sup>iv</sup>.

An estimated 400 of maternal deaths are among adolescents<sup>v</sup>.



### Family Planning and Maternal Health

<b>Population:</b>	37,195,349	(vi)
<b>Women of Reproductive Age:</b>	8,958,723	(vi)
<b>% Married:</b>	63%	(vii)
<b>Married WRA:</b>	5,630,966	
<b>Total Fertility Rate:</b>	4.5	(vi)
<b>Contraceptive Use (Any Method):</b>	9.5%	(viii)
<b>Contraceptive Use (Modern Methods):</b>	7.8%	(viii)
<b>Number of Modern Users:</b>	441,204	
<b>Unmet Need:</b>	28.9%	(viii)
<b>Number of Women with Unmet Need:</b>	1,627,349	
<b>Total Number of Births:</b>	1,188,550	(vi)
<b>Antenatal Care Coverage:</b>	47.1%	(ix)
<b>% of Births with Skilled Birth Attendant:</b>	23.1%	(ix)
<b>No. of Births with SBA:</b>	274,555	
<b>No. of Births w/o SBA:</b>	913,995	
<b>% of Births to Adolescents (15-19)</b>	15.4%	(vi)
<b>No. of Births to Adolescents (15-19)</b>	183,059	(vi)

In addition to a 75% reduction in the MMR, MDG5 also calls for universal access to reproductive health care by 2015. The following shows current coverage with key reproductive services in Sudan.

#### Family Planning

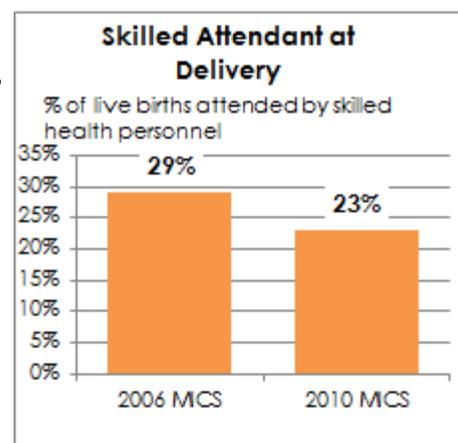
Only 7.8% of Sudan women use modern family planning methods, 28.9% have an expressed unmet need for family planning.

#### Antenatal Care

47% of women have at least 4 antenatal care visits.

#### Skilled Delivery Care

As measured by the latest MICS survey, only 23% of the annual 6.6 million births in Sudan were assisted by a skilled attendant.



### Estimated Impact of Universal Access to Reproductive Health

#### Family Planning

Providing women with access to family planning and making it possible for them to decide how many children they want and when to have them, reduces the overall number of deaths by reducing the number of women dying due to pregnancies they never intended to have.

Meeting only 25% of the unmet demand for family planning in Sudan, i.e., supplying 400,000 additional women with access to family planning would reduce the number of unintended pregnancies by 150,000 and maternal deaths by almost 400. In addition, it would significantly reduce the number of abortions that are particularly high among women with unintended pregnancies.

### Maternal Health

Most maternal deaths are preventable, as the health-care solutions to prevent or manage complications are well known. The following interventions and drugs tackle the four top causes of maternal deaths in Sudan:

- Prevention and management of hemorrhage/treatment of postabortion complications - **Oxytocin/Misoprostol**:
- Prevention and management of eclampsia **with Magnesium sulfate**
- Prevention and treatment of sepsis with **Clean delivery kits** and **antibiotics**

### Number of Maternal Deaths that Could be Prevented

Providing all women with the required maternal health medicines and supplies would prevent an additional 1,100 deaths, reducing the annual number of deaths to under 1,200 and the MMR to about 100, making it possible for Sudan to not only meet, but significantly exceed its MDG target of 154.

In addition, these interventions would have a significant impact on child, and in particular, newborn mortality. Currently Sudan has about 34,000 neonatal deaths a year. About 13% of these, or 4,500, could be prevented by providing women with the above life-saving interventions.

	Current Maternal Deaths	Deaths Prevented	Projected Maternal Deaths
Hemorrhage	796	635	75
Eclampsia	590	284	242
Sepsis	180	147	13
PAC	128	54	60
Other	873	0	778
<b>All MH</b>		<b>1,121</b>	
Averted by meeting 25 % of Unmet Need for FP		<b>279</b>	
<b>TOTAL</b>	<b>2,567</b>	<b>1,400</b>	<b>1,168</b>

### Essential Drug Requirements and Costs

#### Maternal Health Drugs For Universal Coverage

	Units	Total Cost
Oxytocin injections	375,945	\$56,392
Misoprostol tablets	2,579,558	\$722,276
Magnesium sulfate injections	100,633	\$63,399
Clean delivery kits	859,853	\$2,351,697
Other sepsis prevention supplies		\$30,995
Antibiotics		\$175,683
<b>TOTAL</b>		<b>\$3,400,442</b>

Drug and commodity requirements to provide the care detailed above would cost approximately \$5 million, \$1.6 for additional FP supplies and \$3.4 million for maternal health (detailed calculations are available in Annex 1).

### Required health system investments

Additional investments will be necessary to strengthen countries' logistics systems and to ensure that health providers (both at facility and community level) know how to administer these drugs.

## Annex 1. Methodology

The following describes the methodology used to arrive at the impact and cost estimates in the factsheet.

### Maternal Mortality

The number of current annual maternal deaths was calculated using the 2013 MMR from the 2014 publication: Trends in Maternal Mortality: 1990-2013. UNFPA, WHO, World Bank, UNICEF

<http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2013/en/> applied to the estimated number of births in 2013 (based on population data from the UN Population Division).

### Deaths Prevented through Family Planning

The number of unintended pregnancies averted was calculated by comparing the number of pregnancies that would have happened if the 400,000 (25% of the 1.6 million women with currently unmet need in Sudan) had not been able to access contraception to the number of pregnancies that would occur if these women used contraception (i.e. only experienced pregnancies due to failure of their chosen method). It was assumed that 40% of all women would have gotten pregnant if not using contraception. The average failure rate of contraceptives was estimated to be 3%.

Based on regional data collected by the Guttmacher Institute for its 2014 update of "Adding It Up" it was estimated that only about 48% of unintended pregnancies would be carried to term, 39% would be aborted and 13% would end in a miscarriage.

	Number	Comment
<b>Current Number of Women using FP</b>	441,204	Women Married or in Union x Modern CPR
<b>Additional Number of Women Using</b>	<b>400,000</b>	If estimated number of number of women with unmet need available, 25% of that number, otherwise increase in current number of modern method users by 25%
<b>Would have gotten pregnant</b>	160,000	Assumption that without contraception 40% of women would get pregnant in a year
<b>Now getting pregnant (method failure)</b>	12,000	Assumption that 3% of women get pregnant despite using contraception (average failure rate)
<b>Unintended Pregnancies Prevented</b>	<b>148,000</b>	Pregnancies that would have occurred without FP minus births that would occur with FP
<b>Unintended Births Prevented</b>	<b>70,406</b>	Averted Pregnancies x % that would have been carried to term (about 48% of all unintended pregnancies)
<b>Abortions Prevented</b>	<b>57,739</b>	Averted Pregnancies x % that would have been aborted (39%)
<b>Miscarriages Prevented</b>	19,855	Averted Pregnancies x % that would have been miscarried (13%)
<b>Deaths Prevented through Contraception</b>	<b>279</b>	Number of deaths that would have occurred during childbirth/abortions

Note: Family planning reduces the absolute number of maternal deaths in a country but since it reduces both numerator AND denominator of the Maternal Mortality Ratio (defined as deaths per 100,000 live births) the reduction in maternal deaths caused by family planning is not reflected in the MMR. The estimated reduction in number of deaths required to achieve the country's MMR goal differs therefore slightly depending on the assumption made about the number of births. The estimate in the first paragraph uses the current number of births, while the estimate in the Estimated Impact paragraph is based on a lower number of births (originally projected number of births minus unintended births averted through the provision of contraception to women with unmet need).

### Deaths Prevented through Maternal Health Interventions

It was assumed that half of the women currently covered by skilled birth attendance, i.e. about 12%, had access to the three life-saving drugs. This coverage was then scaled up to 100%.

The following effectiveness data were used in estimating the expected reduction in maternal deaths:

Intervention	Effectiveness	Source
1. Hemorrhage Prevention - Oxytocin	62%	Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. In: The Cochrane Library, Issue 1.
2. Hemorrhage Prevention - Misoprostol	43%	30% less effective than oxytocin Gulmezoglu AM, Villar J, Ngoc NTN, et al. WHO multicentre randomized trial of misoprostol in the management of the third stage of labour. <i>Lancet</i> . 2001; 358:689-695
3. Hemorrhage Treatment - Oxytocin	80%	Pollard et al. Estimating the impact of interventions on cause-specific maternal mortality: a Delphi approach. <i>BMC Public Health</i> 2013, 13(Suppl 3):S12
4. Eclampsia Management - MgSulfate	43%	Cochrane Database Syst Rev. 2010 Nov 10
5. Sepsis Prevention - Facility Births	60%	Pollard et al. Estimating the impact of interventions on cause-specific maternal mortality: a Delphi approach. <i>BMC Public Health</i> 2013, 13(Suppl 3):S12
6. Sepsis Prevention - Home Births	60%	Pollard et al. Estimating the impact of interventions on cause-specific maternal mortality: a Delphi approach. <i>BMC Public Health</i> 2013, 13(Suppl 3):S12
7. Sepsis treatment - Antibiotics	80%	Pollard et al. Estimating the impact of interventions on cause-specific maternal mortality: a Delphi approach. <i>BMC Public Health</i> 2013, 13(Suppl 3):S12
8. PAC management - Misoprostol	50%	

The final MMR was calculated by dividing the remaining number of maternal deaths by the number of births expected at the new contraceptive prevalence level (current 1.2 million births annually minus 150,000 averted through increased use of family planning).

### Cost Estimates Family Planning

Unit costs for the different supply methods were taken from UNFPA's RH Interchange database and multiplied by the amount required to provide one couple-year of protection (CYP). It was assumed that 15 cycles of the pill, 120 condoms or 4 injectables would provide one CYP. IUDs and Implant were assumed to provide 3.5 years of protection or CYPs. Their cost was thus divided by 3.5. The RHInterchange price for implants (\$18.80) was replaced with a cost estimate per implant of \$8.50 to reflect the recent price reduction seen, but not yet reflected in the database, due to the introduction of Sino-Implants.

Drug and supply cost for male and female sterilization came from calculations carried out by the Guttmacher Institute for its Adding It Up 3 publication using UNFPA's RHCT costing tool with updated 2013 prices.

It was assumed that new users would adopt methods based on the current modern method mix.

### Cost Estimates Maternal Health Interventions

Based on WHO treatment guidelines the following drugs and supplies were costed using drug prices from both the MH International Drug Price Indicator and the UNICEF Supply Catalogue.

#### Hemorrhage Prevention and Treatment

Drug	Unit Costs	No. of Units Required	Total Costs	Source
<b>Hemorrhage Prevention</b>				
<b>Facility births</b>				
Oxytocin, injection, 10 IU in 1 ml	\$0.15	1	\$0.15	UNICEF
<b>Home births</b>				
Misoprostol, tablet, 200mcg	\$0.28	3	\$0.84	MSH
<b>Hemorrhage Treatment</b>				
Oxytocin, injection, 10 IU in 1 ml	\$0.15	4	\$0.60	UNICEF
<i>For atonic uterus. Not included: Syringes, IV sets, IV solutions</i>				

#### Sepsis Prevention and Treatment

Drug	Unit Costs	No. of Units Required	Total Costs	Source
<b>Non-Severe Cases</b>				
Gloves, exam, latex, disposable, pair	\$0.05	2	\$0.10	UNICEF
Soap for handwashing	\$0.01	1	\$0.01	UNICEF
Chlorhexidine for cord care	\$0.01	1	\$0.01	UNICEF
			<b>\$0.12</b>	
<b>Severe Cases</b>				
Delivery Kit	\$2.74	1	\$2.74	UNFPA 200 FOR \$547
<b>Non-Severe Cases</b>				
Amoxicillin, caplet, 250 mg	\$0.05	2	\$0.10	MSH
<b>Severe Cases</b>				
Ampicillin, powder for injection, 500mg	\$0.14	24	\$3.46	MSH
Gentamicin, injection, 40 mg/ml in 2ml	\$0.09	6	\$0.54	MSH
Metronidazole, injection, 500 mg in 100	\$0.47	8	\$3.76	MSH
			<b>\$7.76</b>	

#### Pre-Eclampsia/Eclampsia Treatment

Drug	Unit Costs	No. of Units Required	Total Costs	Source
Magnesium sulfate, injection, 500 mg	\$0.63	9	\$5.67	UNICEF
<b>For complications</b>				
Calcium carbonate, tablet, 600mg	\$0.02	1	\$0.02	MSH
<i>Needle for initial injection and IV set not included in costing</i>				

<sup>i</sup> UN Population Division. World Population Prospects: The 2012 Revision, data for 2013

<sup>ii</sup> Based on SHHS 2010 MMR of 216/100,000 live births..

<sup>iii</sup> WHO. 2014. Maternal Mortality 1990-2013.

<sup>iv</sup> WHO and UNICEF. 2012 Countdown, Country Profiles

<sup>v</sup> Based on: Blanc et al. 2013. New Findings for Maternal Mortality Age Patterns: Aggregated Results for 38 Countries. PLoS ONE 8(4): e59864.

<sup>vi</sup> UN Population Division. World Population Prospects: The 2012 Revision

<sup>vii</sup> UN Population Division. World Marriage Data 2012.

<sup>viii</sup> UN Population Division. World Contraceptive Use 2012

<sup>ix</sup> UNICEF. State of the World Population 2013

<sup>x</sup> Futures Institute. Spectrum, LiST module.