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Maternal Mortality: A Global Tragedy
A GIS screening approach to the Problem

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ABSTRACT

The Geographical Information System (GIS) is a new approach for looking at global morbidity and mortality.

The GIS is used to produce simple and self explaining maps showing malaria transmission zones and maternal mortality ratios world- wide . Then the same system is used for Sudan taking MMR, expected deliveries and live time risk as indicators.

The presentation also includes strategies for maternal morality reduction in the Sudan based on two international approaches. The first is the Millennium Development Goal MDG, 2000) and the second is the international Conference for Population and Development (ICPD, 1994). The strategy advocates two scenarios for the reduction of maternal mortality in the Sudan. The first is to reduce MMR from 550 per 100000 live births to 138 by the year 2015 based on DHS , 1989 information; and the second is to reduce MMR from 509 per 100000 live births to 127 by the year 2015 . based on SMS, 1999 information.

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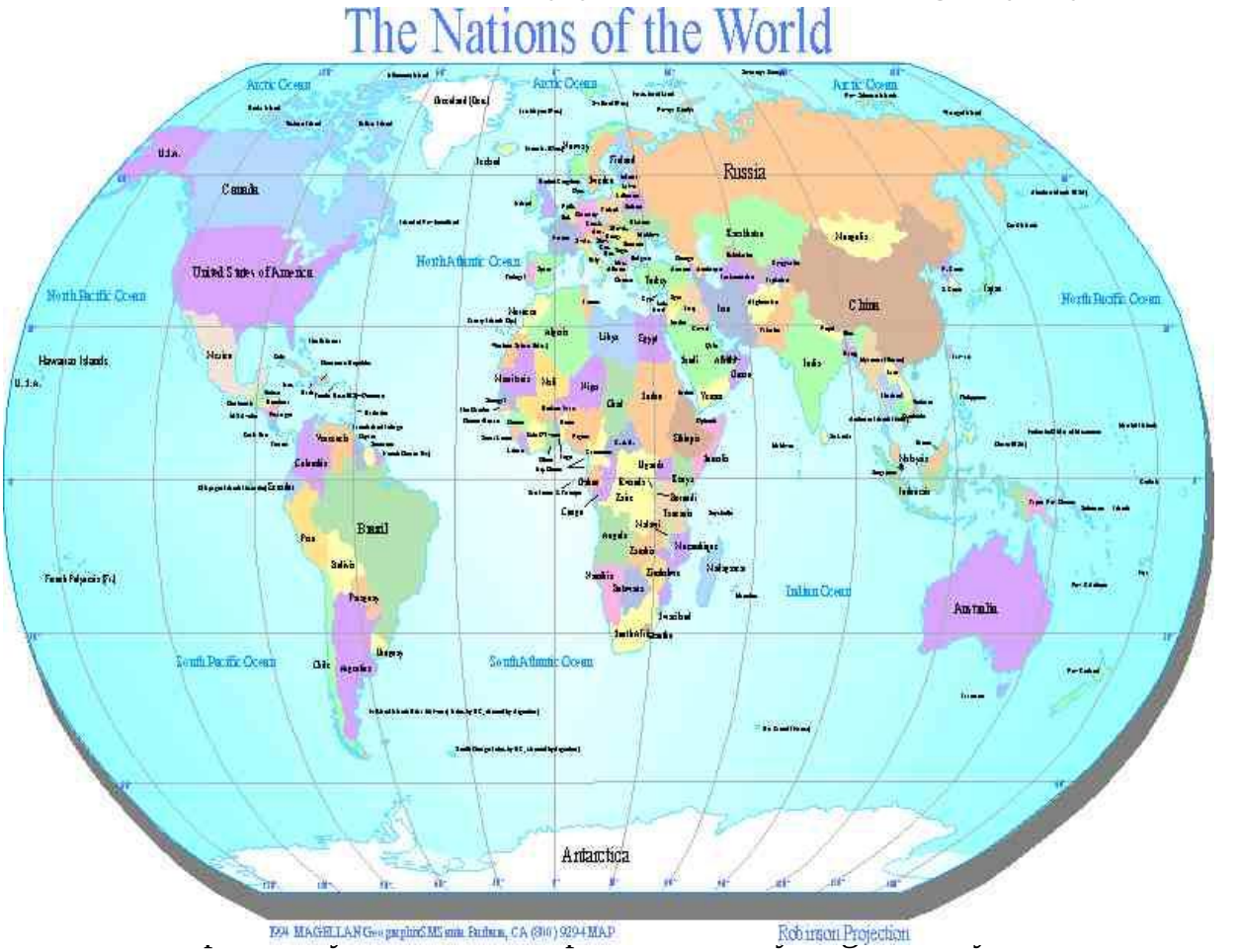
Introduction. Every day at least 1660 women die around the world from the complications of pregnancy and child birth .That is 515,000 women at minimum die every year .The overwhelming majority of



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instance , malaria is a major obstetric problem which is usually fetal if accompanied by a major obstetric complication such as eclampsia.

Malaria is the disease responsible for the bulk of the deaths in developing countries This is illustrated here through Geographical Information System (GIS) developed in the Population Center, University of Gezira .In map (2) is shown maternal mortality world wide.

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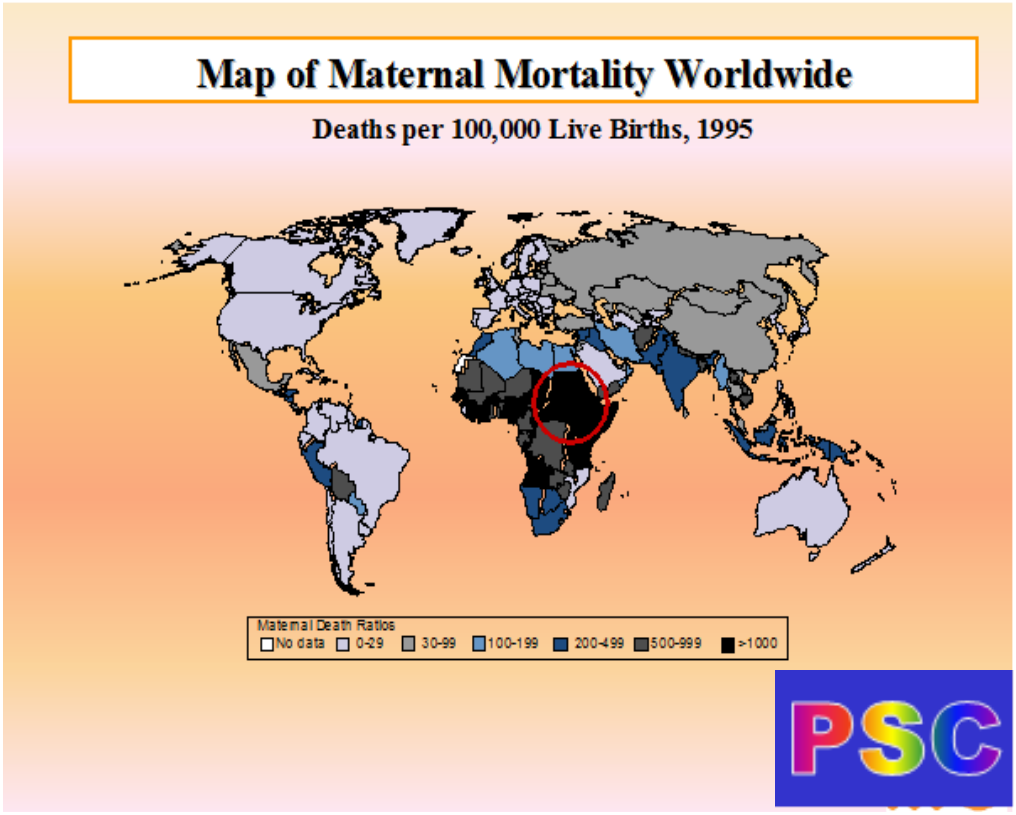
Map of Maternal Mortality Worldwide
Deaths per 100,000 Live Births, 1995
Maternal Death Ratios
No data
0-29
30-99
100-199
200-499
500-999
>1000
PSC

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From the map it is clear that in regions where malaria is endemic the maternal mortality ratio is highest Rates beyond 1000 death per 100000 live birth are found in Central Africa including Sudan Chad, Nigeria ,Ivory coast, Seralione and Senegal. Lowest rates are found in malaria free regions in Europe , North America Australia and some parts of south America , Where incidence of malaria is highest MM Ratio is also highest . This is in Central Africa which is encircled in the map . The map was constructed using data for 1995.

Sudan is considered one of the highest endemacy areas of malaria and highest MMRatio. Conservative estimate based on SMS,1999 put the ratio at 509 deaths per 100,000 live births .There is a huge differential in the expected number of deliveries. For the year 2002 it was estimated that there would be 400,000 deliveries in Khartoum, Gezira and South Dar four as an upper bound while less than 100,000 deliveries in Jungli and Westren Equataria as lower bound. Map(3) again shows the largest number of deliveries are expected in areas where malaria is persistently endemic.

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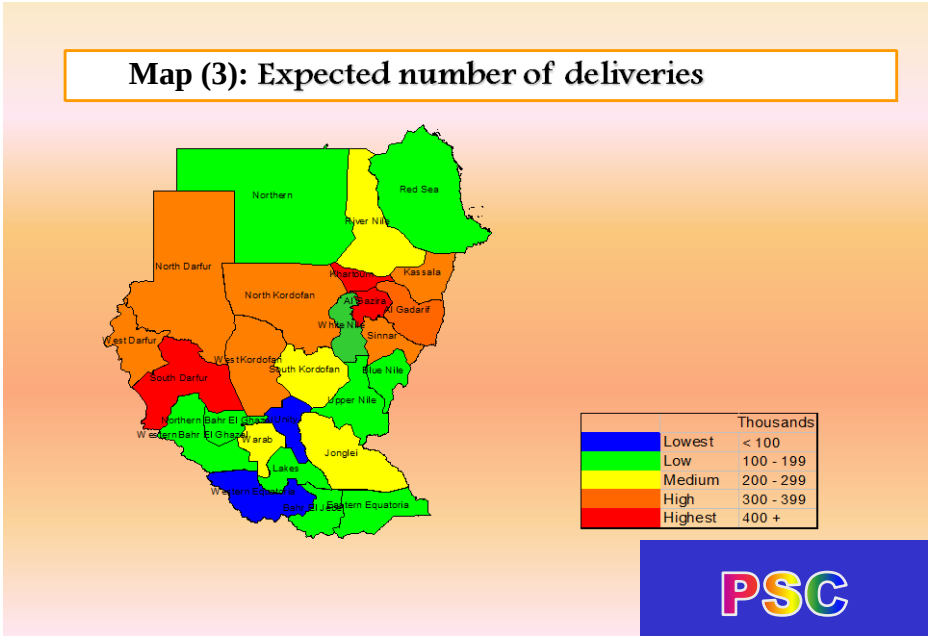

Map(4)shows the distribution of MMRatio by state for Northen Sudan. One of the highest (630deaths per 100000 live births) is in southern Darfour .It has been indicated that in this state there is a high incidence of fistula (MICR2000). Algadarif has the highest MMRatio (644 death per 100000 live births). It has been asserted that Algadarif state has shown increased risk of HIV/AIDS and different types of STDs (NACP,2002).

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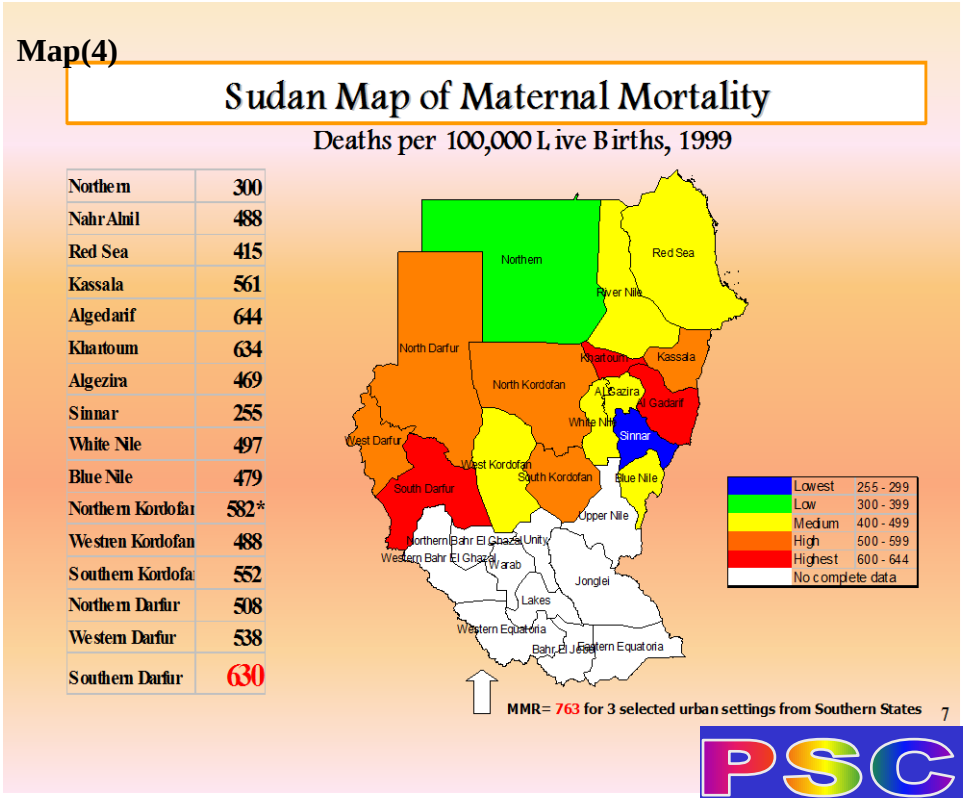
Khartoum has highest MMRatio in the country. MMRatio of 634 deaths per 100000 live births in the capital city where maternal care services are comparatively better can only be explained by the large influxes of displaced people living in shanty town and squatter settlement around the city

Map(4)



There is also evidence that HIV/AIDS is widespread in the capital compared with other parts of Sudan (NACP,2000).

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Life Time risk of maternal mortality:

Life time risk (LTR) Is approximated by the product of the total fertility and maternal mortality ratio .An adjustment factor of 1.2 is included in order to compensate for pregnancy loss i.e pregnancies that do not result in a live birth .Thus LTR is :

LTR ={1/1.2*TFR.MMR}

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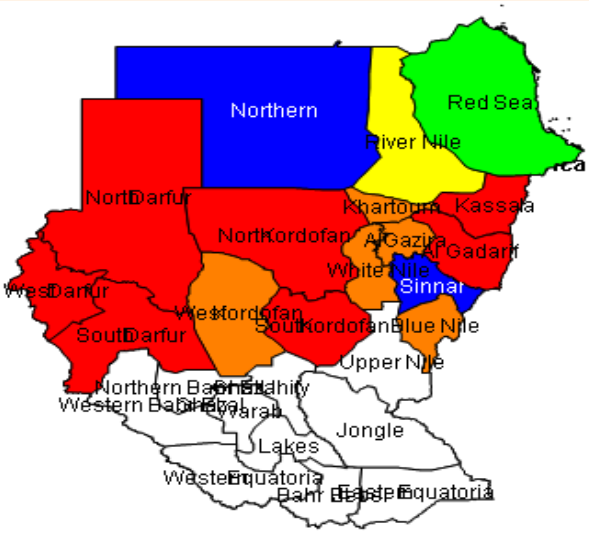
Life Time Risk of Maternal Death



	1 in
Sudan	12
	16
Least developing countries	16
Developing countries	61
Industrialized countries	4085
World Total	75

Lowest	55 +
Low	45 - 54
Medium	35 - 40
High	25 - 34
Highest	< 25
No data	

LTR indictors are calculated using WHO data for all the world and for Sudan based an SMS,1999 Survey by states .This is shown in Map (5). Life time risk is highest in the Sudan even compared with other Africa countries. One women per12 women is likely to have obstetric complications leading to death .The figure is 1 per 16 for Africa and other least developing countries while it is 1 per 4085 for

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industrialized countries.

In summary existing estimates of maternal mortality in the Sudan are very high .With existing instability and deteriorating health services, maternal mortality is expected to be even higher unless a large scale policy oriented intervention is introduced.

Government responsibility is to secure good quality maternal health services which are widely available and accessible. Maternal care statistics are extremely poor in the Sudan . Only 57% of deliveries are attended by skilled provider.

And only 13% receive postpartum care during first 6 weeks following delivery.

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Strategy

- Focus on issues relevant to maternal care .
- Clinical management of malaria is not expected to improve the situation .
- Focus should be on malaria control.
- Identify good process indicators that are closely correlated with maternal mortality.
- Identify priority state for intervention.

The strategy should be based on the Millennium Development Goal(MDG) and ICPD Plan of Action .The target should be to reduce MMRatio by 75% between 1990-2015 as indicated in fig (1)

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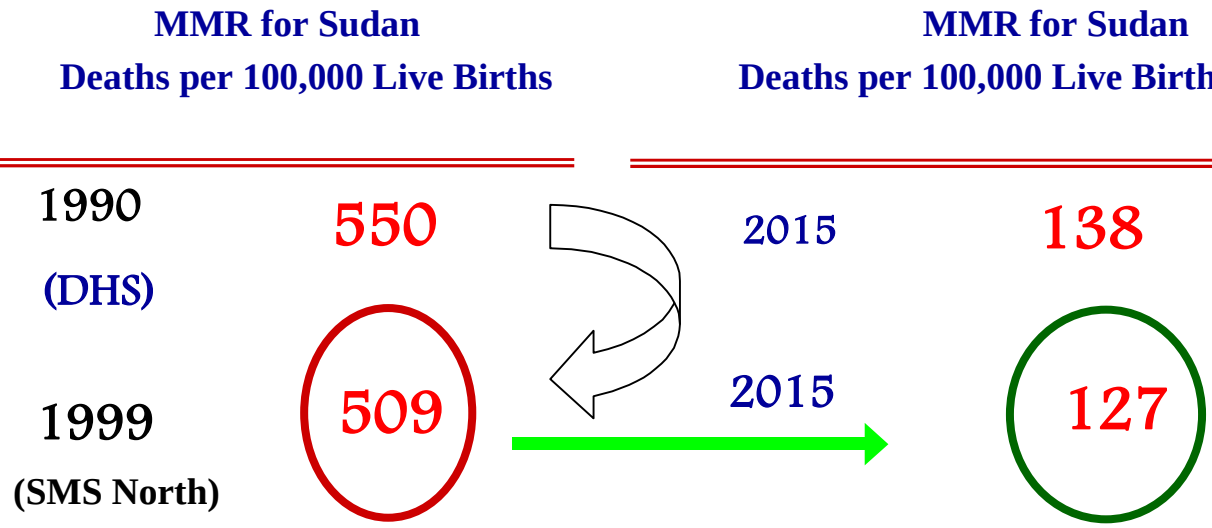
MDG and ICPD Goal

Goal : Improve maternal health

Target: Reduce by three quarters, between 1996 – 2015 The maternal mortality ratio (MMR)



Fig(1)

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