

Review Article

Is maternal mortality worsening in Sudan?

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Abstract

Historically, the magnitude of maternal mortality lessened globally, since the mid-forties, due to availability of antibiotics, blood transfusion services and improved antenatal care. In Sudan, the introduction of midwifery care in 1922, the obstetric and gynaecology specialty in 1955 and family planning in 1965 lead to major improvements. The adoption of primary health care (PHC) in 1978, mother child health/family planning (MCH/FP) being its major component, the safe motherhood initiative in 1987 and the International Cairo Conference on Population and Development (ICPD) in 1994 were crucial factors. Its assessment became more reliable by household surveys. Unfortunately, inspite of

concerted efforts, its levels worsened, particularly where armed conflicts prevailed, recently partially settled by peace agreements. Major health reforms, in addition to specific reproductive health measures, are necessary to meet the millennium development goals (MDG) of reducing the maternal mortality ratio by 3/4th by the year 2015.

Keywords: ICPD, MDGs

Introduction

Sudan has unique, well-established obstetric and midwifery services⁽¹⁾. Maternal mortality (MM) was a concern of the obstetric and gynaecological (OB/GYN) society since its inception in the mid fifties (Annex 1).

Annex 1. Literature of Maternal Mortality, Sudan 1971-2003 (2)

Modawi S	2 nd OB/GYN Congress	1971	
Karoom HO	SMJ	1972	
WHE0056 Bakr SA	Friendship Hall	1982	WHE (WHO document in English)
WHE0198 El Fadil S ⁽²⁶⁾	AMB	1982	AMB . (Arab Medical Bulletin)
WHE El Nayal ZM ⁽²⁷⁾	AMB	1982	
WHE Ahmed, G.M ⁽²⁸⁾	AMB	1982	
WHE Hassanein, OM	AMB	1982	
WHE1263 Baldo MH ⁽²⁾	FHE/PMM/85.9.19	1985	FHE (Family Health English document) PMM (Programme Maternal Mortality)
WHE2405 Rahman TA ⁽²⁹⁾	AMB	1989	
WHE2406 Awad M.A ⁽³⁰⁾	AMB	1989	
WHE2407 Marghany OA	AMB	1989	
Umbeli T & A/Salab MA	19 th Conference	2003	
El Sanosi, et al	19 th Conference	2003	
Abdallah Ali Mohamed	19 th Conference	2003	

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Successive local assessments of MM were referenced by WHO^(2,3). The Federal Ministry of Health (FMoH), Sudan undertook MM assessments as part of an MCH survey (MCHS) (1993), a sole motherland service (SMS) 1999 (Table1) and most recently, a household survey (2007) (Table 2). The MM ratio was also

Table 1:
Safe motherhood mortality and service indicators, FMoH SMS 1999

Safe motherhood survey (SMS)	1999
The Infant mortality rate	68/1000 LBs.
Neonatal mortality rate	31/100,000 LBs.
Percentage of deliveries attended by trained personnel	57%
Caesarean section rate at national level	2.4% (WHO range (5%-15%) 7% (10% in the early1990)
Contraceptive prevalence rate	5.9%
Total fertility rate is	17.5% of married women in the childbearing age.
The pregnancy rate is	5.9% risk pregnancy
High-risk pregnancy is	15%

Table 2:
Maternal mortality ratios per 100,000 by Willayah, FMoH, Family Health Survey 2007

South Darfur	1581	Gezira	355
Kassala	1414	Sennar	320
West Darfur	1056	Khartoum	311
Gedarif	609	River Nile	161
Blue Nile	515	Red Sea	166
South Kordofan	503	Northern	94
White Nile	366		
The average ratio for 15 northern provinces is 638,000. The MM ratio is 1,107 per 100,000 for all Sudan			

reported to be highest in Southern Sudan⁽⁴⁾. In 2005 a reproductive health (RH) strategy, including a road map for reducing MM was drafted, guided by the MDGs, that include reducing under-5 mortality by 2/3rds, MM by 3/4 and extreme poverty by 50% by 2015⁽⁵⁾.

Politically, the Sudan's peace accords of South, West and East have important reproductive health (RH) implications. Attaining peace and stability is a major challenge, the influx of returnees may worsen the magnitude of MM, however.

This article reviews MM in Sudan, levels, causes and prevention strategies.

Information sources

Peer-reviewed publications on Maternal and neonatal mortalities (M&NMs) in Sudan are scarce, however. The following sources are cited:

1. A "Road Map" for reduction of MMs July 2006. The Federal Ministry of Health

documents, a joint collaboration with the Obstetric and Gynaecology Society.

2. The National RH strategy 2006-2010, August 2006.
3. A pre-conference workshop report for reduction of MM, 10-11 February 2007.
4. RH ethical issues workshop report, July 2007.
5. The FMoH, Sudan 2005 Statistical Health Report.
6. Faculty of Medicine, University of Khartoum theses' abstracts book for the period 1994 -2000.
7. Peer-reviewed articles and the proceedings of local (OB/GYN) scientific meetings.
8. Agency publications and documents.
9. The OB/GYN Society web-site: ogssd.org

Compilation and interpretation of data

The MM ratio was 539/100,000LBs in 1993, 509 since 1999, but unfortunately a recent FMoH press release in December 2007 of results of a

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household survey gave a MM ratio of 638 for North of Sudan and 1107 for the entire Sudan, including the South, the results of which were not released. However, United Nation fund for population activities (UNFPA) reported a MM rate for South Sudan of 2030/100,000 births in June 2007 as the worst in the World. Skilled birth attendance was less than 5%. Donors' blood was between 7% and 9% HIV positive⁽⁴⁾. In 2006, a prospective MM and child mortality (CM) study was conducted at a disadvantaged district of Sudan, using a communal registration system. Out of 1913 births, there were 268 childhood deaths and 13 maternal deaths, the MM ratio was 680 per 100,000 live births, compared with household survey results above⁽⁶⁾.

As to indirect causes of MM, malaria comes first, as shown by a retrospective community-based study in Kassala State⁽⁷⁾. In the slum dwellers (SDs) sector, mortality of women in reproductive age (WRA) was 314/100,000 WRA, the urban sector having the lowest rate of 199/100,000 WRA. The MM rate was also highest in the internally displaced population (IDPs) and SDs (168 and 126/100,000 WRA),

lowest in the urban population, 47/100,000 WRA. The MM ratio was also very high in SDs, IDPs, and refugee population (1207, 1192 and 914/100,000 live births (LBs) respectively, 397/100,000 LBs in the urban population. Malaria was the major cause of MM in the three sectors, except in the IDP population, where related causes contributed to 70% of deaths. Kassala harbours refugees from Ethiopia. Malnutrition, anaemia and TB are prevalent; Kassala was the seat of armed conflict, ended recently by a peace agreement. The MM ratios of IDPs and refugees exceed a 1000, but less than the recent ratio for Kassala of 1413.

Table 3 gives numbers, ratios and causes of MM for three Sudanese hospitals, but births were only given for Kassala hospital. Hospital ratios or rates are not representative, however, as only serious cases come to hospital. The MM ratio of 802 for Wad Medani hospital was therefore readjusted multiplying 802 by the geometric mean of the SMS 1999 MM ratio, by the life-time risk of maternal death; a range of a MM ratio 634–570 was obtained. The causes were hopefully audited.

Table 3: Maternal mortality data from three hospitals, Sudan

	Kassala	Omdurman	Wad Medani
1. Year	1997 -1998	1998 – 2001	1998 - 2002
2. Number of maternal deaths	72	199	118
3. Live births	3061	not given	not given
4. MM/Ratio/100,000 LBs	2351	308	802
5. Causes	Malaria & Anaemia	Sepsis & Eclampsia	Haemorrhage & Malaria
6. % direct causes	41.7	61.8	---
7. Time of death	54.2%	46.2%	---
8. Blood transfusion	59/72 needed it 34/59 had it	---	---
9. Following Caesarean	not given	not given	2/3rds
10. Rural	not given	not given	2/3rds

Source: Proceedings of the 2003 19th OB/GYN Congress

Malaria was a shared cause of MM in the three hospitals, being the most common for two hospitals.

It had a special OB/GYN conference at which a national treatment protocol was approved^(8,9). The present situation and

future plan for malaria control, based on a 10-year study, was presented to the 2006 OBGYN meeting. Its prevalence with pregnancy was 3.7%. Quinine and Artemisinin- were the standard treatment. Hopefully a malaria vaccine is found.

Drastically reducing MM and morbidity of poor women is a major global concern^(10,11). Emergency obstetric services (EOS) are promoted. A strong official commitment to financing MM-reduction has been expressed. Partnership with defined roles would achieve the aims of the Road Map.

MM reduction has long been a concern of the Sudanese obstetricians. They spearheaded promoting district OB/GYN/RH care. Regular OB/GYN congresses, two yearly, with an interval scientific meeting were convened. Recently as a collaboration with FIGO, WHO and the Sudan Family Planning Association (SFPA), Reproductive health (RH) matters were addressed⁽¹⁾. The MM reduction workshop, July 2007 discussed seven strategies to reduce MM covering: the road map, updated curriculum of village midwives (VMWs), counting maternal deaths, standards of operations (SOPs), the 5-year RH strategic plan. The challenges to the Road Map are: political and technical commitments, appropriate investment, the right strategies, policy and legislations and public-private-Non-governmental organization (NGO) mix.

The goal is to reduce MM from 509 to 260/100,000LBs and neonatal mortality to 20/1000 LBs by the year 2010 and attain an MM ratio of 140 by the year 2015. Considering the recent household survey results the RH targets and goals need revision. Overall, efforts are made to incorporate the local RH priorities in the curricula stress MM reduction as an MDG. Some proposed strategies are: integrative multidisciplinary, free-standing modules or including specific issues such as gender in other departments⁽¹²⁾. The Ahfad Medical College has been

promoting such incorporation and is strengthening RH leadership skills.

As regards training, a priority strategy of the Ministry of Health (MoH) is to strengthen midwifery services by updating midwifery curricula and increasing village midwifery schools from 23 in the nineties to 40 in 2003 is a priority. The number of certified (VMW) reached 8809 then. Safe Motherhood training materials have been adapted from WHO materials⁽¹³⁾. Previously, expanding the role of practicing (VMWs) proved a success, but was not maintained⁽¹⁴⁾.

As to capacity building a protocol of Emergency Obstetric Care (EMOC) and a manual were developed by the FMOH, UK and Sudan Fertility Care Association (SFCA). The Gezira University Population Center awards RH postgraduate degrees. Experiences of Gezira MoH of strengthening the structure of RH facilities and improving competencies of rural doctors are exemplary⁽¹⁵⁾.

FP, an important strategy for reducing MM, is integrated with other RH/PHC, for promoting overall health, specifically reducing maternal mortality and morbidity, rather than for demographic goals per se. Partnerships with non-health sectors to reduce gender and other disparities are necessary. Advocacy, quality and access are to be stepped-up. India's policy, of a more comprehensive RH and child health needs to FP demographic goals per se led to success⁽¹⁶⁾. This is not to underestimate the need for FP services.

Apart from public services, SFPA, established in 1965, with 12 national clinics and the SFCA, established in 1978, deliver contraceptive services. Coverage, quality and data management need much improvement, including in private sector. Transportation, logistical support and commodity distribution are to be improved.

The unmet need for FP among women in reproductive age (WRA) (15-49) in the outskirts of Omdurman, the national capital⁽¹⁷⁾ was assessed by a multistage random sampling

technique, selecting 530 ever-married women. Current users were 21.3%, three times the national prevalence of 7%, an old estimate. The unmet need was 30.7%. Combined contraceptive pills use was 92%. Knowledge of contraception was 61.3% for a single method and 22.4% for 2 or more methods. Sources of knowledge were relatives 48.6%. Child spacing is to be promoted by an information education communication (IEC), training and providing free services.

A survey on utilization of family planning services and predisposing, in urban and rural Khartoum state in 2002, showed that 51.4% of women surveyed used modern contraception. No significant difference between urban and rural settings. Contraceptive pills were the most commonly used modern method (47.7%) followed by intrauterine devices (10.2%) and injections (7.5%). Breast feeding was equally used by the two groups, around 33% for each. The rhythm method and withdrawal were mostly used by urban women (22.2% and 8.6% respectively) than rural women. Use of male methods (condoms and sterilization) was extremely low. Socio-economic status, knowledge and education level were the most important determinants of using modern methods⁽¹⁸⁾.

Discussion

Unfortunately, the current MM rates/ratios are increasing. Possibly, the spread of armed conflicts hamper RH care delivery and increase MM ratios and rates, possibly are direct causes. The successful implementation of peace with rehabilitation and resettlement will improve the situation. Development is however a long-term process and attaining the MDGs will be delayed requiring setting new targets, goals and strategies.

The reliability of the methods of MM assessment determines the usefulness of rates and ratios. Assessing MM being difficult, indicators such as rate of assisted vaginal deliveries by trained personnel, excluding

traditional birth attendants (TBAs) and caesarean section (CS) rates are alternatives⁽¹⁹⁾. Poor RH services also cause high perinatal mortalities. The latter provide an alternative indicator of quality of maternity care services. It was studied in Sudan^(20,21). Breastfeeding is promoted, for its cost and fertility reduction benefits.

The most recent MM ratios by the FMOH household survey, reflect a great disparity between Darfur and Kassala villages of around 1500 and just 93 for the Northern. A difference is expected, realizing the armed conflict in the west and east and the relative stability and better socio-economic status in the northern state. However, in 1999 the MM ratio for greater Darfur State was 524 (3 provinces) and the greater Northern State (2 provinces) 319. The ratio of 94 is probably an underestimate. Haemorrhage necessitates anaemia prophylaxis, improving nutrition and availing safe blood transfusion. Hypertension and diabetes mellitus are generally increasing, particularly in pregnancy. Routine BP checking and screening for diabetes in mid-pregnancy are important. Administering tetanus toxoid is needed; its prevalence of 2 doses being just 52% in 1999. In southern Sudan delivery outside the labour ward may be preferred. Cow-dung ash may be applied to the stump of the umbilical cord. Puerperal pyrexia is to be treated adequately and notified. Unsafe abortion, as a cause of mortality, even miscarriage, is unfortunately neglected, requiring investigation and prevention.

Auditing individual MM cases, mainly at hospital level, helps prevent MM, based on the concept of the road to maternal death, which hypothesizes that there is always more than one cause, including socio-economic factors. A case-finding, integrated approach of MM was implemented in Saudi Arabia in 1997, supported by Eastern Mediterranean Regional Office (EMRO). It identifies more maternal deaths and is of reasonable cost than

surveys^(22,23). It is worth trying locally. An EMRO publication calls for research, making 10 propositions for undertaking such research⁽²⁴⁾.

As to medically associated causes, malaria ranks high, paralleled only by viral hepatitis. Malaria prophylaxis in pregnancy, intermittent prophylaxis in endemic areas and use of special mosquito nets are beneficial.

In Sudan, medical colleges increased from 5 to 26, including private ones, with shortcomings mainly unemployment, requiring reforms. Unfortunately, paramedical training is not similarly expanded. A policy of incorporating VMWs in the official cadre was previously approved, but not implemented. A current declared FMoH included distributing 125 ambulances, establishing 40 service centers and 15 model centers, retraining 4000 VMWs, 230 paramedics and 1000 general doctors.

Pregnant women refrain from hospital delivery for fear of premature caesareans. Cost-recovery worsens the situation, with possible prolongation of labour at home and maternal death. A FMoH policy of free cesarean sections started to be implemented early February 2008. Cesareans can cause more MM in developing countries⁽²⁵⁾, almost five times that of developed ones. Research is needed. VMWs are to have a reasonable payment for transferring at-risk cases to hospital, as doctors get paid for operating on them. As a fifth-year medical student, one was coached by a midwifery school principal and guided by a VMW, on conducting the required 20 deliveries at home level traditional birth attendants (TBAs), although not recognized, do exist, but will gradually become phased out.

Other non-medical handicaps to better RH care include poor infrastructure, long distances, bad roads and lack of transportation. Important positive developments are stable electric power, availability of petrol, widespread telecommunications and computers. Promoting antenatal care (ANC)

and FP at PHC level, specially accessibility and quality and reliable information is emphasized.

Promoting contraception will prevent unintended or unwanted pregnancies. The use of vacuum aspiration and misoprostol for missed abortion and post-partum haemorrhage will reduce mortality.

Free or reasonable health care costs are necessary. Health insurance covers mainly employees; to be more comprehensive.

In conclusion the review reflects worsening MM results. War certainly has serious implications, both locally and nationally. The reliability and validity of mortality results need ascertaining by in-depth analysis, as to their significance and level of confidence, for setting new targets and goals. Survey reports on MM are to be pre-reviewed and published to ensure accuracy and wider dissemination. The annual statistical health reports lack adequate and reliable MM data. A national census is planned for the year 2008 and will provide useful mortality indicators.

A macro-situation analysis of the overall RH status, including MM, is timely to assess demographic and health data, policy, managerial and operational aspects. The recent national health plans and strategies, the recent household survey results and the recommendations of the OB/GYN congresses and meetings offer valuable base-line information. Congress and scientific meeting papers are preferably pre-reviewed.

Unfortunately, a situation analysis can be costly, but its benefits are worthwhile. Evaluating the quality RH care can be more specific, less costly and useful.

It is hoped that the information provided by the review will be useful to managers, students and registrars of community medicine and obstetrics and gynaecology.

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