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Guest Editorial

Maternal and Perinatal Health in Sudan

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Received: July 10, 2023; **Published:** July 22, 2023

Introduction

One of the eight millennium development goals (MDG) that has some progress is MDG 5: Improve maternal health. The two targets for assessing MDG 5 are: Reducing the maternal mortality ratio (MMR) by 75% between 1990-2015 and achieving universal access to reproductive health by the end of the year 2015.

The accountability for women and children's health was launched by the (UN) secretary-general, global strategy for women and children's health. Commitment to be immobilized by governments, civil society organizations, and development partners to accelerate progress towards MDG 4 and 5. The establishment of women's and children's health high level commotion on information to "determine the most effective international institutional arrangement for global reporting, oversight, and accountability on women's and children's health". Political support to reduce maternal mortality specially in developing countries including Sudan with significant HIV epidemics, has come in the from of the global UN plan towards elimination of new HIV infections among children, and keeping mother alive, which aims to reduce half maternal mortality among HIV-positive mothers by 2015.

The fact that the Sudan lacks complete civil registry systems with good correlation of cause of death, making it challenging to assess accurately the extent of progress towards MDG 5. Subsequently, the maternal mortality estimation inter-agency group (MMEIG) comprising the world health organization (WHO), the united nations children's fund (UNICEF), united nations population fund (UNFPA), the united nations population division (UNPD) and the world bank, together with team at the university of California at Berkeley, United States of America, have been working together to generate internationally comparable maternity mortality ratios (MMR), Sudan was among the countries which percepts in methods as well as data sources of MMR, which was improved over time.

Consultation with Sudan and other countries were carried out following development of MMR estimates with the following purposes: to provide the country the opportunity to review the country estimates; to provide the data methods and sources, obtain additional primary data source that might not have been given, reported or used; and to establish dual understanding of the weakness and strength of available data and ensure broad ownership of the results (Appendix 17).

This report presents Sudan estimates of maternal mortality adapted from the global UN estimates of maternal mortality in 2010, as well as trends from 1990 to 2010. The main source is from situation analysis (SA) study done collaboratively by population council and Sudan ministry of health (MOH) with funds from UNFA, UNICEF, and Packard foundation. It was conducted in seven States, namely: Gadarif, Gezera, Kassala, Khartoum, North Kordofan, South Kordofan, and South Darfour. The remaining other nine states were not included

in this study. It is worth to mention that except three states in this study (North Kordofan, Khartoum, and Gezera) all the other states in the study share borders with other neighbor countries namely, Eretria and Ethiopia (Gadarif), Central Africa and South Sudan (South Darfour), Eretria (Kassala).The population of these countries share the health facilities as the health resources in these countries are very little or nil. When planning to improve the health level in these boarder states an effort should be made with collaboration with neighbor countries to raise their health resources in their own border states, otherwise whatever improvement in health facilities provided in these states it will be shared with neighbor countries population and it will be difficult to measure and difficult to improve.

Concepts and definitions

International statistical classification of diseases and related health problems, 10th revision (ICD-10), defined maternal death as: The death of a woman while pregnant or within 42 days of termination of pregnancy, from any cause related or aggravated by pregnancy or it is management, (irrespective of duration and site of pregnancy), but not from accidental or incidental causes. These are further divided into: (i) Direct maternal mortality are those resulting from obstetrical complications of pregnancy state (pregnancy, delivery, or postpartum), interventions, omissions, incorrect treatment, or any other sequelae from the above mentioned causes. Examples of direct causes of death included but not limited to, obstetric haemorrhage, hypertensive disorders in pregnancy, complications of anesthesia, or caesarean section. (ii) The indirect causes comprise of those resulting from previously existing diseases, or diseases that developed during pregnancy aggravated by physiological effects of pregnancy, example are renal and cardiac diseases.

The formally referred as "pregnancy-related death" or the now called "death during pregnancy, childbirth and puerperium" is defined as any death temporal to pregnancy, childbirth, puerperium period, even if it's due to accidental or incidental causes. This later definition is helpful in setting where accurate information about causes of death based in medical certificate is unavailable as in rural areas in Sudan.

In Sudan population-based surveys, provides information the pregnancy-related status rather than maternal deaths, while in modern world (as complications of pregnancy can extend beyond six weeks postpartum, due to increased availability of modern life-sustaining procedures and technologies) enables more women to survive the adverse outcomes of pregnancy and delivery.

Coding maternal deaths

Standard definitions for maternal death was well done by UN, however accurate cause of death is always difficult in developing countries, as most of deliveries occurred at home, and the civil registration systems are not applicable to many areas in the country.

Despite the publication of theICD-10 by WHO it was not implemented in many countries, Sudan is one of them. In 2012 WHO published ICD-MMR aiming to guide countries to reduce errors in coding maternal deaths.

The interaction between HIV and pregnancy showed that there is aggravating effect of pregnancy in HIV infection which may lead to maternal death; usually it can be labeled as indirect maternal death cause. In AIDS the woman pregnancy is incidental, her death may be due to AIDS complication, and they are referred as AIDS deaths.

Proper reporting of both HIV or AIDS and pregnancy in death certificate will facilitate correct coding and identification of maternal deaths.

Measures of maternal mortality

Two major factors measures the extent of maternal mortality:

(i) The risk of death in a single pregnancy or single live birth.

(ii) The fertility level.

Moreover there are other items to be defined:

- MMR: The number of maternal death in a population divided by the number of Live births.
- The maternal mortality rate (MMRate) is defined as the number of maternal deaths in a population divided by the number of women aged 15 - 49 years. This will capture the maternal death per pregnancy (both live birth and stillbirth) and the level of fertility in the population.
- Proportion of maternal deaths (PM) is calculated by the number of maternal deaths divided by the total deaths among women aged 15 - 49 years.

Approaches for measuring maternal mortality

Many factors obscure the provision of accurate civil registry from accuracy in Sudan and developing world, some of the reasons are:

1. Lac of precise identity of deaths of women in the reproductive age or no records at all.
2. Even if the deaths were reported, the cause of death might not be known and has not been reported as maternal death.
3. In Sudan and many developing countries medical certifications of cause of death is not practiced in many provinces, accurate attribution of female death as a maternal death is difficult to achieve.

Misclassification of ICD-10 coding even occur in developed countries with routine registration of death is in place.

Underreporting of maternal deaths frequently occurs in the following:

- Maternal deaths at the early pregnancy months, or those which was not linked to birth outcome.
- Late postpartum deaths.
- Deaths in very young or very old (at extremes of maternal ages).
- Miscoding by ICD-9 or ICD-10 as in Cerebrovascular and Cardiovascular diseases.

Underreporting/misclassification could be due to lack of complete understanding of ICD rules, death certificates doesn't include pregnancy, fear of litigation and willingness to block informations such as abortion.

A variety of sources replace MMR estimates if the civil registration systems are incomplete or inaccurate, these sources include, household survey, census calculations, reproductive age mortality studies (RAMOS), and verbal autopsies. These methods has significant limitation in estimating the true levels of maternal mortality in any population.

In 2006 Sudanese national unity government and the government of southern Sudan reported that the MMR reached 1,107 per 100,000 live births, this put Sudan as one of the highest maternal mortality in the world.

Moreover, every woman who dies there is 20 other women who experience long-lasting or disabilities, such as obstetric fistula, vaginal prolapse, infertility or, depression. The main causes of direct death in women in Sudan are: haemorrhage, infection, and unsafe abortion, and pregnancy induced hypertension, while the indirect causes are: Malaria, anemia, hepatitis (Sudanese government of national unity and the government of south Sudan 2006, Kenaro., *et al*. 2009).

While the infant mortality rate in Sudan was estimated to be 81 per 1,000, half of this figure occurs as neonatal death in the first month of life. Asphyxia, sepsis, and preterm deliveries are the main causes of death (Sudanese government of unity and the government of south Sudan, 2006).

The united nations recommended four pillars for safe motherhood: 1. Family planning (FP), 2. Antenatal care (ANC), 3. Skilled birth attendance (skilled health personnel, commodities, drugs, and equipment) and 4. Emergency obstetrics and neonatal care.

In order to prevent to prevent maternal mortality or disability, the" three delays" model they are:

(i) Delay in deciding to seek care.

(ii) Delay in reaching appropriate care.

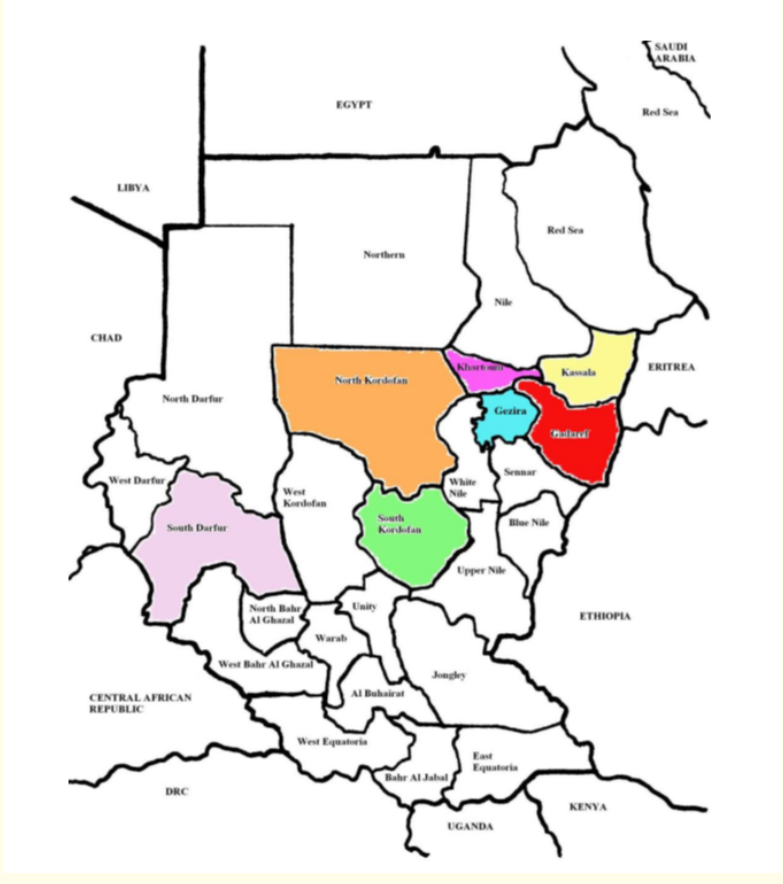
(iii) Delay in receiving care in health facilities.

The health authorities in Sudan should design programs to manage obstetrics complications and to prevent maternal death or injury (UNFPA: No woman should die giving life).

Methodology for 1990-2010 estimates of maternal mortality and infant mortality in Sudan.

Based in (SA) criteria, of reproductive health in Sudan, ministry of health (MOH), with Funds from UNFPA, UNICEF and Packard Foundation, current health status was evaluated in Sudan. The study was carried in seven states, namely, Khartoum, Kassala, Gadarif, Gazera, North Kordofan, South Kordofan and South Darfour.

Data was collected from a total of 348 health care facilities (Primary, secondary and tertiary). They were assessed for their redness for providing reproductive health, the quality of their services are also evaluated. Interviews were conducted in 909 candidates, composed of, physicians, nurses, midwives, health officers and others, 1,029 village mid wives (VMW), 1,0313 clients seeking advice, 1,012 antenatal care visitors.



Findings

Availability and accessibility of reproductive health services:

- Khartoum State (the capital) has the highest health facility staff (28 per facility), Kassala having the lowest (10 per facility).
- Family planning.
- Antenatal care.
- Skilled birth attendance.
- Emergency obstetrics care.

Volume 12 Issue 8 August 2023