

**EDITORIAL****Female Reproductive Age Mortality in in Kassala (Role of Malaria)**

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**ABSTRACT****Objectives :**

To determine the mortality rates ,causes and contributing factors in women in reproductive age in Kassala Province.

**Setting:**

A refuge ,acute internally displaced people (IDP) camps, a town slums and an urban area, of total population of 214.100 in Kassala Province, East Sudan.

**Method:**

Community –based retrospective study ,using reproductive age mortality Survey (RAMOS) and verbal autopsy . Data was processed using SPSS for Windows Version11.

**Results:**

121 deaths of female aged15-45 years, in four population sectors (refugees, IDP, slum dwellers & urban population) were identified. Slum dwellers show the highest reproductive age mortality rate 314/100,000women in reproductive age, while urban sector shows the lowest rate 199per 100,000WRA.

Malaria is the major cause of death in three sectors with exception of IDP sector where pregnancy related causes contribute to 70% of death .

Maternal mortality rate is highest in IDP population and slum dwellers(168&126 per100,000WRA)and lowest in urban population(47per 100,000WRA). Maternal mortality ratio is very high in slum dwellers, IDP and refugee population (1207,1192&914 per 100,000 live birth respectively),and 376 per100,000 live births in urban population.

Malaria was found to be the major cause of indirect maternal deaths in all sectors.

**Conclusion:**

This study shows a high discrepancy in reproductive age mortality and maternal mortality between different population sectors in the same location. Malaria is the commonest cause of death in women in reproductive age especially in urban and semi urban settings.

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**Introduction.** Kassala State is located to the East of Sudan, borders Eritrea to the east. It covers <sup>42,330</sup> Km<sup>2</sup>, its population is estimated at <sup>1,584,000</sup>, with an annual growth rate of <sup>2.51%</sup> between 1998-2003<sup>1</sup>. The sex ratio of males per 100 female is <sup>97.8</sup>. The crude birth rate is <sup>37.8%</sup> while the crude death rate is 10.2%. The population comprises Hadandawa, Bani Amer, Amara, Bisharien, Rashaida and Halanga tribes which coexist with northern tribes and Falata tribes of West African origin.

Urban population constitutes <sup>19.3%</sup> of the total population of the State.

Over the last 30 years, Kassala State has faced influx of cross border migrants from Ethiopia and Eritrea and internally displaced seasonal migrants. The later border conflict of 1997 led to another wave of internally displaced people (IDPs), to settle near the main towns of the State. Now, IDP constitutes 10% of the State population<sup>2</sup>. Sudan has hosted refugees in Eastern Sudan States, mainly from Ethiopia and Eritrea. Currently, Sudan hosts <sup>110,000</sup> refugees, <sup>89,687</sup> of whom in Kassala State<sup>3</sup>. They constitute 6 % of the population. The general health facilities in Kassala are moderate. The current ratio is 5 hospitals and 79 beds for <sup>100,000</sup> people<sup>4</sup>. The proportion of births attended by skilled health personnel is 53%. The maternal mortality in Kassala State is <sup>556/100,000</sup> live birth<sup>5</sup>. The under 5 mortality rate is 148 and infant mortality is <sup>101/10,000</sup>. Malaria, diarrhea and tuberculosis are the common diseases in the State. The prevalence of death rate associated with malaria is <sup>32/1000</sup><sup>4</sup>.

In a hospital based study done at Kassala New Hospital for (Obstetrics & Gynaecology hospital), indirect causes of maternal death were found to be <sup>58.3%</sup> with <sup>30.2%</sup> of all deaths were due to complicated malaria and <sup>20.8%</sup> due to anaemia, which is also malaria related<sup>7</sup>. It was also noted that the majority of deaths came from refugees, IDPs and slum dwellers<sup>8,9</sup>. This study was conducted to study maternal mortality on community based level in the four major population sectors in Kassala, namely urban, refugees, IDPs and slum

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dwellers, to investigate the causes and differences between sectors.

**Method.** All deaths among women of reproductive age (WRA, 15 to 45 years of age) are reviewed to identify the cause of each death and ways to prevent such deaths. It is a retrospective, community-based survey, in two phases, as described by WHO, Grubb, Fortney and Bartlett<sup>10,11,12,13,14,15,16</sup>. Phase 1 death identification in which all deaths in the community are identified, and deaths of female aged 15 to 45 are selected. Multiple sources for identification of deaths are used. This include asking people in the

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**Table 1: The total population of sector studied:**

Sector	Urban area	Slum Dweller	Refugee camp	IDP camp	Total
Population	88,709	69,276	36,575	19,540	214,100
WRA*	21,199	16,557	6,142	4,158	48,056
Expected LB	2,727	1,739	547	587	5,600

\* *women in reproductive age*

community (such as health care providers; religious leaders; grave diggers; and community leaders) if deaths among WRA have occurred. When deaths are identified decedent's identification, age, and gender and full address of the household and the respondents are recorded. In phase 2, death review is conducted, through structured questionnaire, conducted by 5<sup>th</sup> year medical students, using standard verbal autopsy questionnaire<sup>17</sup>.

**Table 2: No of deaths:**

Sector	Urban area	Slum Dweller	Refugee camp	IDP camp	Total
All deaths	42	52	17	10	121
Maternal deaths	10	21	5	7	43
Percentage of Maternal deaths	23.8	40.3	29.4	70	35.5

A refugee, acute internally displaced people (IDP) camps, a town slums and an urban area, of total population of 214,100 in Kassala Province, East Sudan. Data was processed using SPSS for Windows Version 11.

**Results.** The demographic characteristics of the population sectors studied are shown in table 1. The internally displaced people in this sector constitute 12.3%, refugees 41% of those in the state while the urban sector constitutes 25% of the town population.

121 deaths of WRA in four population sectors (refugees, IDP, slum dwellers & urban population) were identified. Slum dwellers show the highest

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reproductive age mortality rate 314/100,000 WRA, while urban sector shows the lowest rate 199 per 100,000 WRA.

**Table 3: Rates of deaths:**

Rate	Urban area	Slum Deweler	Refugee camp	IDP camp
Reproductive age mortality rate <sup>1</sup>	199	314	268	240
Maternal mortality rate <sup>1</sup>	47	126	81	168
Maternal mortality ratio <sup>2</sup>	367	1207	914	1192

<sup>1</sup>per 100,000 WRA

<sup>2</sup>per 100,000 LB

Malaria is the major cause of death in three sectors with exception of IDP sector where pregnancy related causes contribute to 70% of deaths. Maternal mortality rate is highest in IDP population and slum dwellers (168 & 126 per 100,000 WRA respectively) and lowest in urban population (47 per 100,000 WRA). Maternal mortality ratio is very high in slum dweller, IDP and refugee population (1207, 1192 & 914 per 100,000 live births respectively), and 367 per 100,000 live births in urban population

**Table 4: Major causes of reproductive age deaths:**

Sector	Urban area	Slum Deweler	Refugee camp	IDP camp
No 1	Malaria (35.7%)	Malaria (15.4%)	Malaria 23%	Malaria (20%)
No 2	Pregnancy Related (23.8%)	Pregnancy Related (40.3%)	Pregnancy Related (29.4%)	Pregnancy related (70%)

**Discussion.** Every day, 1,600 women die due to complications of pregnancy and childbirth. This is 585,000 at a minimum, die every year world wide. 90%

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of these deaths occur in Asia and Sub-Saharan Africa, 10% in other developing region and less than 1% in developed countries<sup>18,19</sup>. Between 25% and 33% of all deaths of women in reproductive age are due to complications of pregnancy or child-birth<sup>20</sup>. More than 600 women die every year worldwide due to pregnancy and childbirth complications. 99% of these occur in developing countries. 40% of these deaths occur in Africa, where only 20% of the world births take place.

In Sudan, maternal mortality ratio is estimated as 660 per 100,000 live births<sup>18</sup>. In safe Motherhood Survey conducted in 1999, maternal mortality for Kassala State was found 553 per 100,000 live births<sup>5</sup>. This data on maternal mortality was obtained by indirect sisterhood method. Figures obtained give a general national or State estimate, but it will not show inter-sectoral variation of mortality. This study was conducted using reproductive age mortality survey (RAMOS). Results from RAMOS are most useful for evaluating the magnitude of maternal mortality and other causes of death among WRA, assessing the importance or burden of maternal causes of deaths relative to other causes of death, and conducting a needs assessment for health care service quality improvement to prevent maternal deaths.

This study shows the large discrepancy of reproductive age mortality between the three vulnerable sectors of the population and the urban sector, although all live in the same locality. This is mainly due to failure of the health services to cope with the increasing number of refugees and IDP.

Malaria is a public health problem throughout the world. Of the estimated 300 million cases each year worldwide, more than 90% occur in Sub-Saharan Africa. Malaria causes maternal anaemia, as well as spontaneous abortions, stillbirths, and low birth weight in newborns. This study shows the role of malaria as either a leading cause or a second cause of death in women in reproductive age. It also shows that when maternity health services improved, as in urban sector, malaria shows the highest percentage of death.

In urban sector, improvement of reproductive health services results in maternal mortality to be below the national estimate, and the SMS estimate for the State.

**Conclusion:** This study shows the big toll of malaria on health of female in

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reproductive age, the high discrepancy in reproductive age mortality, and maternal mortality between different population sectors in the same location. It also discusses the causes of these deaths.

### **References:**

1. UNFPA\CBS population Data Sheet for Sudan by the States, 2002.
2. Kassala State ANA Report 2002.
3. WFP\UNHCR\COR JFAM- Assistance to Eritrean Refugees in central\eastern Sudan (draft) , June 2003.
4. Federal MoH, annual Health Statistical Report 2001.
5. Safe Motherhood Survey 2001.
6. UNICEF Multiple Indicator Cluster Survey (MICS) 2000.
7. Mohammed AA, Abdelrahim SI & Elnour MH 2002 “ Maternal Deaths at Kassala New Hospital (Eastern Sudan)” Journal of the Arab Board of Medical Specializations. Vol. 4 No. 2.
8. World Health Organization. Studying Maternal Mortality in Developing Countries: Rates and Causes. WHO/FHE/87.7. Wessel H., Reitmaier P., Dupret A., Cnattungius S., Bergstrom S. Deaths among women of reproductive age in Cape Verde: causes and avoidability. Acta Obstetrica Gynecologica Scandinavica. 1999;78:225-232.
9. Grubb G., Fortney J., Saleh S., Gadalla S., El-Baz A., Feldblum P., Rogers S. A comparison of two cause-of-death classification systems for deaths among women of reproductive age in Menoufia, Egypt. International Journal of Epidemiology, 17 (2):385-391.
10. Fortney J., Susanti I., Gadalla S., Saleh S., Rogers S., Potts M. Reproductive mortality in two developing countries. American Journal of Public Health; 1986; 76(2): 134-138.

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11. Bartlett L., Khan T., Sultana M., Jamieson M., Wilson H. Results of a reproductive age mortality survey (RAMOS) among Afghan refugee women in Pakistan, 1999-2000. *Journal of Pediatric and Perinatal Epidemiology*, in press.
  12. Bartlett L., Khan T., Sultana M., Jamieson M., Wilson H. The burden of mortality due to reproductive health-related causes among Afghan refugees in Pakistan, 1999-2000 (abstract). In Conference 2000: Findings on Reproductive Health of Refugees and Displaced Persons: proceedings. Washington, D.C., December 5-6, 2000. Reproductive Health for Refugees Consortium, 2001, pg.18.).
  13. Bouvier-Colle en al. Reasons for the underreporting of maternal mortality in France, as indicated by a survey of all deaths of women of childbearing age. *International Journal of Epidemiology* 1991, 20:717-721.
  14. Mohammed AA, Abdelrahiem SI, & Abdelfattah AI 2001 "Reproductive Age Mortality in a Refugee and Internally Displaced People's Camps in Kassala- Eastern Sudan" The 4<sup>th</sup> Congress of the Arab Associations & the Annual Congress of the Lebanese Society of Obstetrics & Gynaecology.20-22 Sept 2001. Beirut Lebanon.
  15. Mohammed AA, Abdelrahiem SI & Elnour MH 2000 "Audit of Maternal Deaths" Sudanese Obstetrical & Gynaecological Society, Police Hospital, Khartoum Nov. 2000.
  16. Walker, GJ et al Maternal mortality in Jamaica *Lancet* 1986, 1(8479):486-488
  17. Campbell OMR, Ronsmans C. Verbal autopsies for maternal deaths. Geneva, WHO, 1995 (Report on a world Health Organization Workshop, London 10-13 January 1994.
  18. WHO\UNICEF. Revised 1990 Estimates of Maternal Mortality: A New Approach by WHO and UNICEF. WHO, Geneva 1996.
  19. UNICEF. The Progress of the Nations. New York, 1996.
- Graham W, Murray S. "A Question of Survival? Review of Safe Motherhood". Ministry of Health, Kenya , 1997.