

Predictors of maternal mortality among women of reproductive age seeking health care services at Kisii Level 5 Hospital

Osoro AA¹, Ng'ang'a Z², Mutugi M³, Wanzala P⁴

¹Kisii Medical Training College, P.O. Box 1165-40200, Kisii, Kenya

² Institute of Tropical Medicine and Infectious Diseases, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000 – 00200, Nairobi, Kenya

³ Department of Zoology, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000 – 00200, Nairobi, Kenya

⁴ Centre for Public Health Research, Kenya Medical Research Foundation (KEMRI), P. O. Box 54840 - 00200, Nairobi, Kenya

Correspondence to: Mr. A.A. Osoro. Email: alfredosoro2013@gmail.com

Abstract

Background: The safe motherhood initiative was launched in 1987 as a flagship to set a base to reduce maternal mortality. Despite efforts by government and international agencies, Kenya has continued to experience a rise in maternal mortality.

Objective: The purpose of this study was to identify the antecedents' factors which have contributed to maternal deaths in Kisii County, Kenya.

Methodology: A retrospective review of 72 maternal deaths which occurred between 1st January 2009 and 30th June 2010 was undertaken by an independent obstetrician. Interviews were conducted with relatives of the deceased women using a confidential questionnaire for female death based on distant as well as proximate factors that may have contributed to maternal death. Health care workers were also interviewed to assess the ability and readiness of the hospital to offer emergency obstetric care.

Results: Among the 72 maternal deaths recorded during the study period 42 (58.3%) were as a result of direct obstetric complications which included haemorrhage, post-partum sepsis, pre-eclampsia and abortion. Thirty-three (45.8%) were as a result of indirect causes such as peritonitis, heart disease, HIV/AIDS, anaemia and convulsive disorders. Access to care was hampered by lack of money for transport and hospital user fees. Transport was also unavailable in some cases where money was not the problem. Besides, long distance to the hospital caused delay to seek care. But even for those who were prompt at the hospital also experienced delayed care as health service providers were unavailable as they were attending to other cases. Delay in service provision by healthcare workers, delayed quality obstetric emergency response and delayed care while at the hospital continue to be a challenge to maternal care.

Conclusion: Maternal mortality continues as a result of failure of the health system, lack of access to quality care, poor health infrastructure, women empowerment and socio-economic issues.

Key words: Maternal mortality, Quality of care, Women empowerment, Health infrastructure

Introduction

The World Health Organization (WHO) estimates that over 350 women per 100,000 live births die of avoidable maternal deaths and more than 8 million women suffer complications related to pregnancy and childbirth every year in the developing world (1). Even though Maternal Mortality Ratio (MMR) has decreased from 1990 to 2010 (1100 to 675 per 100,000 live births, respectively) worldwide, the high rate in the developing countries is appalling (2). For instance, in sub-Saharan Africa, the lifetime risk of maternal deaths for women is 1 in 39, while in the United States, it is 1 in 2,400 and in Sweden it is 1 in 14,100 (3). The MMR in Kisii County, Kenya is slightly higher at 500/100,000

compared to the national average of 488/100,000 live births (4-6). With this trend, it is unlikely that Kenya will attain the Millennium Development Goal (MDG) number 5 by 2015 (6, 7).

The numbers of women who die or suffer from morbidity following childbirth complications reflects the poor state of maternal health in a country. One way to determine factors contributing to maternal mortality and the proximate cause of death is a confidential inquiry. Information obtained from such a tool could guide policy-makers to formulate policies and interventions aimed at reducing the burden (6, 8-10). The purpose of the study was therefore to identify antecedent factors that predict maternal mortality in Kisii County, Kenya.

Materials and Methods

A retrospective study was conducted using both qualitative and quantitative methods at the Kisii General Hospital. The study population comprised of relatives of women who had died as a result of pregnancy and childbirth while seeking care at the hospital. A structured questionnaire was administered to the immediate adult family member, who was present and attended to the deceased. The interview was conducted by a registered nurse with two clinical officers in an undisturbed location. After formal introductions and establishing the purpose of the visit, detailed information was sought on the woman's condition prior to her death.

Data variables: The study sought to identify the socio-demographic variables, the underlying factors to maternal mortality, risk factors antecedent to maternal mortality under-consideration such as number of previous pregnancies, duration of the pregnancies and complications such as miscarriage or induced abortion. The nature of delivery; whether vaginal-cephalic, vaginal-breech, or caesarean and place of birth were also determined. The person who conducted the delivery was identified and interviewed separately.

We established the previous pregnancy outcomes and risk factors antecedent to maternal death such as failure to seek healthcare services promptly upon the onset of labour, lack of transport and long distance to health facilities and any other, lack of money for user fees and any other reason or lack thereof for not seeking prompt healthcare services.

Data collection methods and tools: All medical records of maternal deaths which occurred during the study period (1st January 2009 to 30th June 2010) were sorted and recorded in an entry proforma in the order in which they occurred. These included the age, parity, socio-economic and socio-demographic characteristics, booking status, referral sources and cause of death. A Confidential Questionnaire of Household (CQH) (Q3) during the study period was sorted and recorded.

A structured questionnaire was then administered to the healthcare workers to establish the ability of the institution in providing emergency obstetric care, the state of preparedness of the staff to cope up with the workload and emergency situations, and the availability of referral facility.

Qualitative data were sorted out and categorized into themes of predictors of delivery outcomes and complications. We identified emerging themes and then linked them to factors associated with maternal mortality. Quantitative data were cleaned and summarised into proportions using SPSS version 16.0.

Ethical consideration: Those who participated in the study gave informed consent and confidentiality was maintained throughout the process. Counseling services

were available for those relatives who exhibited psychological or emotional distress. Ethical approval was granted by the Ethical Research Committee from Kenya Medical Research Institute (KEMRI) Protocol No.1851 of November 2010. Permission to conduct the study was obtained from the provincial director of medical services in Nyanza and the local administration was informed.

Results

On qualitative analysis of the study data, five themes emerged from the study as contributing to maternal mortality in Kisii County. These were the age of the women, the community's infrastructures, and socio-economic factors, the hospital factors and policy-framework issues.

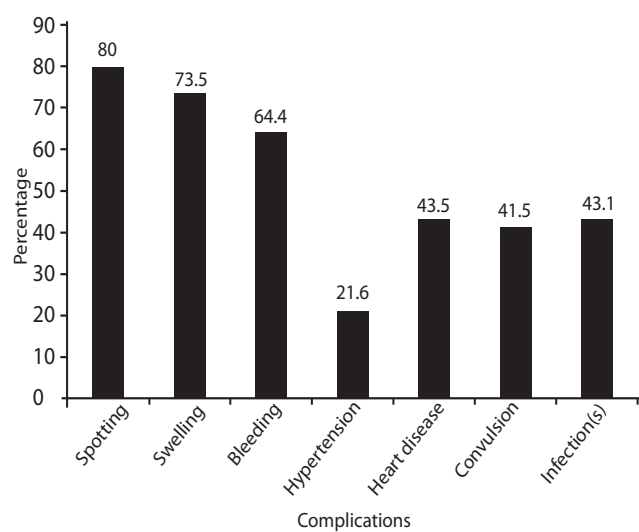
Demographics: Table 1 summarizes the socio-demographic characteristics of the study population. There were 72 cases of maternal deaths studied during this period. The age ranged from 15 to 45 years.

Table 1: Demographic characteristics of the deceased women (N=72)

		No.	(%)
Age (years)	15-20	14	19.4
	21-25	29	40.3
	26-30	21	29.2
	31-35	7	9.7
	36-45	1	1.4
Marital Status	Single	21	29.2
	Married	47	65.3
	Separated	3	4.2
	Widowed	1	1.4
Education	None	4	6.9
	Primary	5	6.9
	Secondary	33	45.8
	College/tertiary	29	40.3
Religion	Catholic	35	48.6
	Protestant	33	45.8
	Others (SDA)	4	5.6
Occupation	None	2	2.8
	Farmer	19	26.4
	Housewife	29	40.3
	Business-woman	18	25.0
	Formal employment	4	5.6
Residence	Rural	50	69.4
	Urban	15	20.8
	Peri-urban	7	9.7

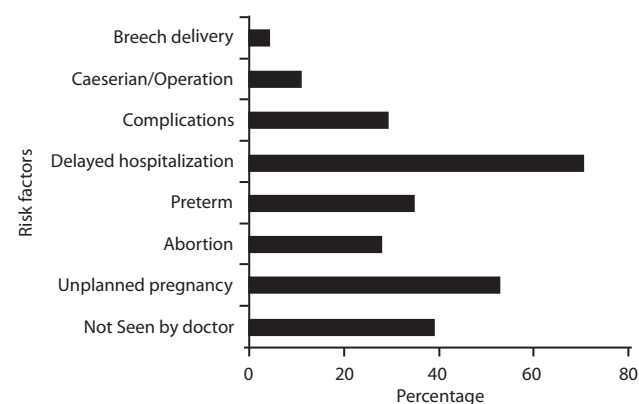
Underlying factors to maternal mortality: Figure 1 shows the complications reported as antecedent to the maternal deaths. Fifty-eight (80%) of the women experienced spotting bleeding, 53 (73.5%) experienced body swelling, and 46 (64.4%) had severe bleeding in pregnancy, while 16 (21.6%) had raised blood pressure. Further, 31 (43.5%) had pre-existing heart disease and 30 (41.5%) and 31 (43.1%) had convulsive disorders and postpartum infections respectively.

Figure 1: Underlying factors to maternal mortality as described by relatives of deceased women or from verbal autopsy



Immediate risk factors associated with maternal mortality: Figure 2 summarizes the immediate factors presenting with maternal deaths. Out of 72 women, 38 didn't plan for their pregnancies, 20 pregnancies ended in abortion. Fourteen deliveries were preterm, while 25 occurred at home and 51 mothers didn't go promptly to hospital when labour started. Sixty-one had normal delivery, 8 of them were operated, while 3 were breech deliveries. Although majority of the deliveries were normal, they were accompanied with risk factors that led to maternal death.

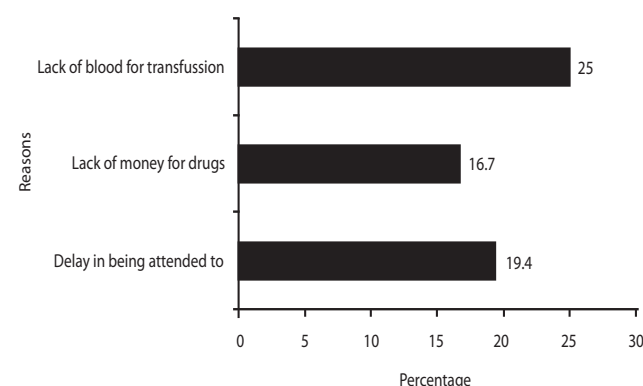
Figure 2: The immediate risk factors associated with maternal mortality



Outcome of pregnancy and childbirth complications antecedent to maternal death: The indirect causes of maternal mortality as reported by the adult kins of the deceased and collaborated by the obstetrician were; pre-eclampsia, bleeding, postpartum sepsis, pregnancy-induced hypertension and heart disease. Persons who conducted the deliveries included: doctors (16.7%), nurses/midwives (44.4%), traditional birth attendants (23.6%) and relatives (4.2%). There were 8 (11.1%) women who delivered unaided.

Risk factors and complications antecedent to maternal mortality: Some of the risk factors antecedent to maternal mortality included; delayed hospitalization, unplanned pregnancies, obstetric complications, abortion, failure to secure medical attention and preterm birth. Fifty one (70.8%) women were reported to have failed to seek prompt healthcare when they needed it. Reasons given for this poor health seeking behavior included; lack of transport to health facilities and lack of funds to cater for the user fees charged at the facilities. However, 17 (23.6%) women had no compelling reason for failing to seek prompt healthcare.

Figure 3: Reasons for delay in receiving care at the institution



Factors affecting accessibility to maternal health services: Figure 3 presents a summary of the reasons given by relatives for delay in receiving care at the institution. Delay in accessing healthcare services from the healthcare providers was reported by 14 (19.4%) subjects, while 6 (8.3%) reported lack of blood for transfusion following severe bleeding and 12 (16.7%) had no money for purchasing prescription drugs.

Discussion

Majority of the women who succumbed to maternal mortality in Kisii County were young aged between 21-25 years which is a great loss to society. Adolescent girls aged between 15 and 24 years are vulnerable to maternal death because of non-use of antenatal care (1). Mortality among this group and their children is a global collective failure of health system. Bleeding, heart diseases, infections/sepsis and convulsive

disorders were the major causes of maternal death in our study population. They show similarities with other previous studies done (12), the significant proportion of death due to cardiac disease requires further investigation. Another salient finding was abortion-related deaths (27.8%), with a distinctive pattern being observed among women aged 15 to 19 years. This could indirectly imply failure to access reliable contraceptives among this population (13). The study revealed 44.4% women having been attended by skilled health workers yet they succumbed to death. This could partly be explained by the fact that some of the women sought healthcare services 'too late' for any meaningful interventions to be undertaken. Some maternal deaths occurred following transport problems, late referral from lower facilities or delayed decision-making, either at the healthcare facility or at home.

Out of the seventy two deceased women, 23.6% had no reported reason for failure to seek obstetric care. It was observed that some women do not seek healthcare services due to lack of independence in decision-making process on key issues affecting their own lives; for example, decision to seek medical attention was heavily influenced by the husband, mother-in-law and other family members. A similar trend has been observed in South East Asia (14).

Lack of transport, money and poor accessibility to hospitals due to distance were some of the challenges that prevented timely access to healthcare. This was particularly worse at night or during rainy seasons. Limited access to financial resources is a major limiting factor among women and this impacts negatively on control over their lives. In situations where women have no control over their own or the family income, their ability to use maternity services especially where user fees are involved is constrained. Therefore, the economic dependence of women on their husbands has direct influence on their lives as it hinders the use of maternity services (15). Most women (69.4%) in our study population resided in rural areas with limited access to skilled attendants hence resorting to seek services of TBAs; a common trend in poor nations (16).

At health institutions, delays in service provision were cited as a major challenge. It was reported there were few staff on duty busy with other patients. There is thus a major deficiency in human resources. Lack of blood and blood products for transfusion impacted negatively on the provision of quality maternity care. These are institutional problems that are common, and delay emergency obstetric care (7).

The limitation of this study is that no control group has been studied, which could have helped establish determinants of mortality in context. However, this study is unique as it examined maternal mortality in the context of the community and the health care facility. This has provided an extended view of the

health infrastructure and its potential role in maternal health provision. It presents a health infrastructure for maternal health care that extends from the health facility to the household in the remote community. Its resources are not limited to medical personnel and hospital consumables, but include the physical infrastructure (like roads and vehicles) and non-physical socio-economic and cultural attributes including community (especially women) empowerment.

Conclusions

Maternal mortality continues as a result of failure of the health system, lack of access to quality care, poor health infrastructure, women empowerment and socio-economic issues. These multi-factorial issues must be addressed urgently to scale down the burden of mortality and morbidity. Improving socio-economic status of women and empowerment in decision-making, antenatal care, increasing access to skilled delivery, increasing contraceptive uptake and strengthening healthcare system, will scale down the burden of maternal mortality. This study should be followed up by a large scale community-based study, which can provide useful data to inform the healthcare authorities, and community-leaders to plan appropriate interventions to reduce the burden of maternal death.

Acknowledgements

This work received partial support from "Strengthening Nurses' Capacity in HIV Policy Development in sub-Saharan Africa and the Caribbean funded by the Global Health Research Initiative (GHRI), a collaborative research funding partnership of the Canadian Institutes of Health Research, the Canadian International Development Agency, Health Canada, the International Development Research Centre, and the Public Health Agency of Canada.

Conflict of interest: The authors have no conflicts of interest.

References

1. WHO. Beyond the Numbers: Reviewing Maternal Death and Complications to Make Pregnancy Safer, WHO Press, Geneva. 2004.
2. WHO; UNICEF and the World Bank. Trends in maternal mortality 1990-2010, Geneva, WHO. 2012.
3. UNFPA, WHO, UNICEF and the World Bank. Trends in maternal mortality: 1990 to 2010. Released new report. 2011.
4. Kenya National Bureau of Statistics (KNBS) and ICF Macro. Kenya Demographic and Health Survey 2008-09. Calverton, Maryland: KNBS and ICF Macro. 2010.

5. Yumiko, K. A manual for partnership workshops. Samokike project: Japanese International Co-operation Assistance – Kisii /Kericho Project. 2008.
6. Thaddeus, S. and Maine, D. Too far to walk: maternal mortality in context. *Social Sci Med.* 1994; **38**: 1091-1110.
7. Van Dillon, J.S., Stekelenburg, J., Schutte, J., Walraven, G. and van Roosmalen, J. The use of audit to identify maternal mortality in different settings: is it just a difference between the rich and the poor? *Healthcare Quart.* 2007; **10**: 131–137.
8. United Nations; WHO. World Bank Partner to combat Maternal Mortality. The World Bank Group News. 2000; Release No. 2000/080/S.
9. WHO; United Nations Millennium Project, UNDP. 2005.
10. UNDP. Accelerating Progress on Maternal Health in Africa: Lessons from Emerging Policy and Institutional Innovation. 2013; Working paper No. 11.
11. UNFPA and UNICEF. Situational analysis of women and children in Kenya. 2000.
12. Graham, W.J. Maternal mortality: Evidence gap and measurement traps. *J Obstet Gynaecol.* 2010.
13. Petros-Barvazian, A. World priorities and targets in maternal and child health for the year 2000. *Intern J Gynaecol Obstet.* 1984; **22** (6): 429-505.
14. WHO. Maternal Mortality and Morbidity Report, World Health Organization. Geneva, Switzerland. 1999.
15. WHO. WHO Bulletin: Managing Maternal Mortality: Special series. Geneva, Switzerland. 2001.
16. Ashford L. Resource Flows for International Population Assistance: UNFPA. 2001, UNFPA Document.