



Factors Associated With Maternal Mortality in Midlands Province 2012



Kufakwanguzvarova W Pomerai^{1,2*}

¹Mberengwa district Hospital, Africa

²Provincial Medical Directors Office, Africa

*Corresponding author: Kufakwanguzvarova W Pomerai, Mberengwa district Hospital, Box 36 Mberengwa, Provincial Medical Directors Office Midlands province, Box 206, Gweru Zimbabwe, Africa

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Abstract

Background: Maternal mortality remains a major public health challenge in Zimbabwe. Death of a pregnant woman may cause so much psychological pain and leads to destruction of families, husbands loose wives, children loose mothers and friends are lost. Thousands of pregnant women die daily giving birth. This study was conducted to investigate causes of maternal deaths in Midlands province and recommend possible strategies to prevent loss of life during birth.

Results: All of 39 notification forms were analysed. Majority 30% had primary education followed by those who had no education at all 28%. There were discrepancies in reporting and notifying maternal more deaths were reported than notified, most variables captured on the notification form were missing. Post Partum haemorrhage was the leading cause of death 20.5%, followed by eclampsia, 17.9%, HIV/AIDS 12.8% and the least was anaemia. Median age of cases was 28 (Q123: Q33:34). The median number of Ante Natal Bookings was 2 (Q10:Q33). Sixty six percent of deaths were avoidable.

Conclusion: The study revealed poor quality of care in the health centres as evidenced by haemorrhages as leading cause of death, as well as HIV which are easy conditions to manage. Low level of education was associated with death this may be due to poor health seeking behaviour by the mothers as compared to those who were educated. Incomplete form feeling makes the data analysis difficult. there need for training health workers in Basic Emergency Obstetric and Neonatal Care, Health education and promotion on early booking and also provision of essential medical products like blood and blood products.

Keywords: Maternal mortality; Factors; Intervention; Quality

Introduction

Maternal mortality (MM) is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy irrespective of the site or duration of the pregnancy, from any cause related to or aggravated by the pregnancy, or its management but not from accidental or incidental causes [1]. Maternal mortality is measured per 100 000 live births and the ration is called the maternal mortality ration (MMR). MMR is a very good measure of quality of health care or health delivery in a country [2]. The World Health Organisation (WHO) estimates that more than 500 000 women die every year in the world due to complications related to pregnancy or childbirth; half of them live in Sub-Saharan Africa [3].

In 2003, the WHO and the United Nations Population Fund (UNFPA) produced the world maternal mortality index. The average in Africa is 400 deaths for every 100,000 live births, in industrialised countries 20 per 100,000, and in developing countries 440 per 100,000. Maternal mortality is unacceptably high. About 800 women die from pregnancy- or childbirth-related complications around the world every day. In 2010, 287 000 women died during

and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented [2]. There are big differences between countries, some countries have high MMR of 1000 or more per 100 000 live births. There are also large disparities within countries, between people with high and low income and between people living in rural and urban areas.

The risk of maternal mortality is highest for adolescent girls under 15 years old. Complications in pregnancy and childbirth are the leading cause of death among adolescent girls in most developing countries. Other risk factors include poverty, residing in rural areas, lack of access to health care, multi parity, little or no education, HIV/AIDS, and malaria [4,5].

Women in developing countries have on average many more pregnancies than women in developed countries, and their lifetime risk of death due to pregnancy is higher. A woman's lifetime risk of maternal death – the probability that a 15 year old woman will eventually die from a maternal cause is 1 in 3800 in

developed countries, versus 1 in 150 in developing countries [5]. Maternal Mortality ratio in Zimbabwe is very high. The Zimbabwe Demographic Health Survey estimates the MMR for Zimbabwe to approximately 900 per 100 000 live birth [6]. This is an increase from the 2005-2006 ZDHS which estimated the MMR for Zimbabwe to around 695/100000 [7].

Causes of MM can be classified as direct or indirect. Major direct causes in Africa are haemorrhage (34%), infection (10%), hypertensive disorders like eclampsia (9%) and obstructed labour (4%). This is different from the developed countries where haemorrhage only accounts for 13% and the primary cause of maternal mortality is hypertensive disorders such as eclampsia. Indirect causes represent 20% of the total; they are pre-existing or concurrent diseases that are not complications of pregnancy, but that are complicated during pregnancy or aggravated by it [8]. However in Zimbabwe the major causes of MM are; AIDS-defining illnesses (25.5%), Post partum haemorrhage (14.4%), Hypertension/eclampsia (13.1%), Puerperal sepsis (7.8%), Complications arising from abortions (5.8%), Malaria (5.8%) [9].

In light of such high MMR in Africa a set of time bound goals have been set to try and improve maternal health in the world. These time bound goals are called Millennium Development Goals (MDGs). The specific goal for the improvement of maternal health is MDG 5 which seeks to reduce by three quarters the 1990 MMR by the year 2015 [10].

Several interventions have been put in place the ministry of health and Child Welfare in Zimbabwe in an effort to improve maternal health thereby achieving the MDG. Such interventions include, Exemptions of payment to all pregnant women, free post natal care, Intermittent presumptive treatment (IPTp) for malaria, iron and zinc supplementation during pregnancy, free Ante Natal care services which includes HIV testing and introduction of More Efficacious Regiments at 14 weeks of gestation (MER 14), Emergency Neonatal and Obstetric Care (EmNOC), that is basic at clinic level and comprehensive at hospital. The comprehensive EmNOC includes complicated service like caesarean sections, vacuum extraction, use forceps and blood transfusion [11].

Several intervention are in place to curb maternal mortality in Zimbabwe, these include, health education and promotion on family planning and child spacing, ante natal care checkups where a pregnant woman is expected to have been examined by a skilled health worker at least once during her pregnancy, Intermittent presumptive treatment(IPT2) for malaria in all malarious districts, HIV/AIDS screening during ANC and administration of more efficacious regiment(MER14), Non communicable disease screening like hypertension ie pregnancy induced hypertension (PIH), diabetes and many others including nutritional supplementation like zinc and iron supplements [11].

In 2012 Midlands province recorded 39 deaths. The province is among provinces with high MMR in Zimbabwe and this study will be conducted to determine the causes of the MM that occurred in the province in 2012 and to come up with recommendations to

assist the provincial and district health workers improve maternal health and prevent maternal deaths thereby achieving MDG5

Broad objective

To determine the factors associated with maternal mortality in Midlands Province 2012.

Specific objectives

- I. To describe the demographic characteristics of the deceased mothers by person, place and time.
- II. To determine the factors associated with maternal mortality in Midlands province.
- III. To assess the availability of maternal health resources in the province.
- IV. To come up with recommendations.

Materials and Methods

Study design

Descriptive study using retrospective records review.

Study population

Deceased mothers in 2012.

Sampling

All cases recorded as maternal mortality cases will be included into the study.

Sample size calculation

The sample size was calculated using the Dopson formula $n = z^2 pq/d^2$, where n was the required sample size, Z is a test statistic, p is expected prevalence in the population, q= 1- expected prevalence in the population, d is the desired precision. Assuming the proportion of maternal mortality due to AIDS defining illness is 26% [9], a desired precision of 5% and a confidence level of 95% a minimum sample size of 48 will be required.

Where Z is 1.96, P= 0.26, Q = 1-0.26 = 0.74, D=10 %

Data collection: The maternal mortality investigation form will be used as a questionnaire to collect all variables that are captured by the form(age, place of death, cause of death, level of education and many others) as it was completed by the health worker reporting the maternal mortality case.

Data analysis: Epi info 3.5.1 will be used to calculate proportions, means and medians.

Ethical considerations: Confidentiality will be maintained throughout the study. Permission to carry out the study was sought and granted by the Medical Research Council of Zimbabwe.

Findings: A total of 39 maternal mortality notification forms were reviewed. Table 1 attached shows the demographic characteristics of the deceased mothers.

Most women 7 (58%) died with one day after delivery. Most women 22(76%) had previous pregnancies before. One of the deceased mothers had miscarried after 24 weeks of pregnancy.

Nine (40%) had complications during the previous pregnancy. Majority of the women had spontaneous labour, significant number were either missing or unknown as shown in Figure 1 only one had induced labour.

Table 1: Socio demographic Data of Deceased mothers in Midlands Province 2012 Zimbabwe.

Characteristic	Frequency N= 39	%
Level of education		
None	11	28
Primary	12	30
Secondary	10	25
Tertiary	6	15.3
Employment		
Unemployed	24	61.5

Informally employed	6	15.4
Formally employed	4	10.3
Marital status		
Single	5	12.8
Married	27	69.2
Divorced	1	2.6
Widow	2	5.1
Median age	28	Q1=23,Q3=34

Majority of the women had normal vertex delivery, the second largest number had missing data as shown above as shown in Figure 2.

Majority of the notifications had missing information on which health worker attended to the deceased mother as shown in Figure 3.



Figure 1: Distribution of deceased women by initiation of labour Midlands province 2012.



Figure 2: Distribution of deceased women by mode of delivery Midlands Province 2012.

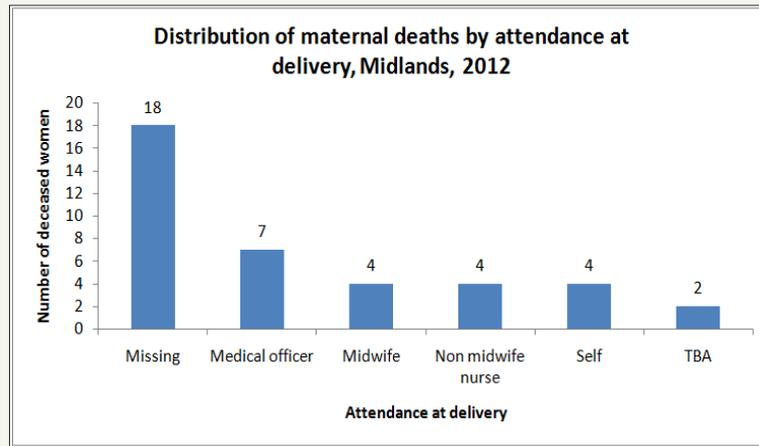


Figure 3: Distribution of deceased women by attendance at delivery Midlands Province Zimbabwe 2012.

The median weight of mothers at booking was 58 (Q₁:52:Q₃:69). Median gravid number was 3 (Q₁:2:Q₃:4). Median number of ANC visits among the cases was 2 (Q₁:0:Q₃:3). Majority 8 (20%) had unknown blood group because they were not examined, Three (21.4%) had A positive, and one (7%) was B positive. Majority 10 (66%) of cases had longitudinal foetal lie, 2 (13%) had oblique foetal lie, three (20%) had transverse only 15 (38%) of the 39 forms had this variable filled in.

Five (33.3%) were rhesus factor positive, ten (66%) had unknown rhesus factor, only 15 (38%) of the forms had this

variable rhesus factor filled in. Five (16%) were syphilis positive, the rest had unknown syphilis result. One (7%) of the participant was Hepatitis positive while twelve (92%) were negative and the rest had missing results. Nine (45%) were HIV positive six (30%) were negative and the rest had unknown status. Nine (56%) were anaemic while seven (44%) were not anaemic. Four of the thirty two cases were reported to have suffered from proteinuria, two had glycosuria.

PPH was associated with most deaths, followed by eclampsia, HIV/AIDS and the least was DIC as shown in Figure 4.

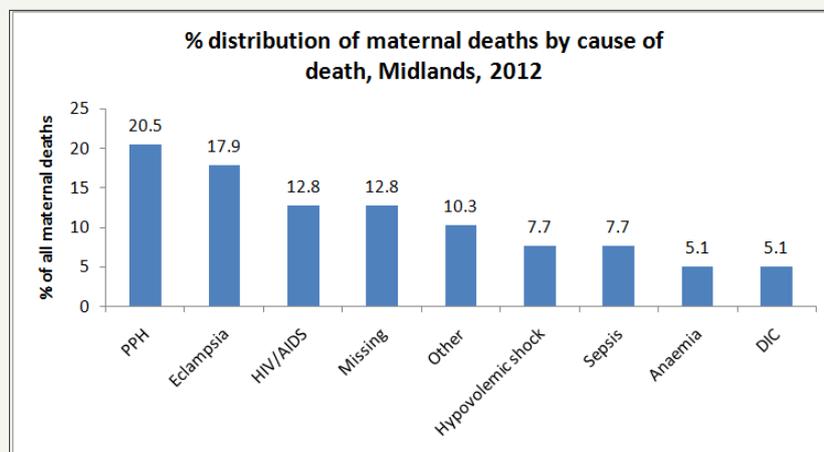


Figure 4: Distribution of Maternal Deaths by Cause of death Midlands province Zimbabwe 2012.

Six (43%) had their ANC at council clinics, five (36%) had ANC at district hospital, one (7%) had ANC at rural hospital, and two had ANC private hospital. Four (26%) had ANC provided by midwife, eight (53%) was provided by non mid wife, and three (20%) was provided by a doctor. For those who were reported to have been admitted in a waiting mother's shelter only three cases had reasons for admission namely, distance which was long, threatening abortion, and bad previous obstetric history. Five (71%) had cephalic presentation of labour, the rest had missing information. Nine (81%) had spontaneous labour the rest had missing information.

Fourteen (87.5%) had PNC at district hospital, one (6%) had PNC at clinic, and one (6%) had PNC at the private clinic. Five (33%) received PNC from a general practitioner, two (3%) by midwife, and seven (46%) was offered by non midwife. In terms delays twenty (77%) were reported to be first delay meaning the patient delayed to seek medical help, five (19%) were second delay meaning the first part of medical care delayed the rest had missing data. Majority 24 (85%) of forms were filled by nurses, one by a general medical doctor, and one by an obstetrician. Seventeen (61%) were investigated the rest were not investigated by time this study was done, Only two cases (7%) were investigated in time the rest

were not investigated in time. Seven (24%) used the wrong form while twenty two (75%) used the correct form.

Discussion

The study revealed that there was a discrepancy between the reported cases and cases that had forms filled in because the reported cases were 42 while the actual cases who had forms filled in to notify maternal deaths were thirty nine. There is need for training health workers in the importance of accurate and complete reporting as well as the importance of reporting maternal deaths. The median age of cases was 28 years this is in contrary with many authors who report that maternal mortality is associated with teenage pregnancy. The occurrence of deaths in older women like this may be attributed to poor care by health workers in public institutions where these deaths were reported.

Majority of cases had none or primary education, this could be due to the fact that low education is usually associated with poor health seeking behaviours and may be the mothers reported to the hospital late or did not have ANC. Several authors have supported this fact [4,5]. This can be supported by the findings in the study because majority of the women were not employed and maybe they did not have money to travel long distances to clinics or wait for husbands to give them money for health care. The fact that majority of women died within one day after delivery may mean that there is poor care in the hospital this poor care maybe attributed to the lack of resources in the hospital as reported by the managers we interviewed. Lack of resources mixed with bad obstetric history as reported in the study may be a receipt for disaster hence the several deaths that were reported. Due to poor form filling behaviour by health workers who left many portions of the notification forms blank.

Median number of ANC visits was low (two) against a standard of four or more as stated in the reproductive health guide lines of Zimbabwe this means these women had poor health seeking behaviour and may have complications that were not detected because of their not attending ANC, attending ANC helps medical workers detect complications and manage them in time.

Majority of the cases had unknown blood group, the lack of blood group matching shows poor medical care by health workers. The non testing of blood group may be due to lack of laboratory workers and also sundries to carry out the tests. The knowledge of blood group helps when there is need for blood transfusion during delivery or caesarean sections. The testing of blood group is key in this province since the most common cause of death was PPH. PPH may be the leading cause of death because the country faces a huge shortage of blood to transfuse patients. Several authors also reported PPH as a major direct cause of deaths during pregnancy [8,9].

Majority of cases had longitudinal foetal lie this may mean that there could have been some confounding by other factors like prolonged labour or haemorrhage or pregnancy induced hypertension eg eclampsia.

Majority of cases had unknown rhesus factor this again may reveal poor medical care by health workers and also poor form filling skills by health workers. There is need for training health workers in form filling and maternal mortality surveillance so that form filling is improved where all variables are entered and analysis of data is made easier and also evidenced based decisions made. Few women were tested for HIV, Syphilis and hepatitis revealing poor care and maybe lack of resources in the public health sector. Knowledge of such infectious diseases may lead to early interventions like Prevention of mother to child transmission of HIV. The fact that majority of cases were HIV positive may mean that most deaths could be associated with HIV infection as most forms recorded.

Majority of cases were anaemic yet most of the cases had unknown blood group this means blood transfusion will be difficult without knowledge of blood group. This condition may have been due to haemorrhage or poor nutrition due to poor diet, co morbidity and poverty. Good diet can prevent malnutrition hence prevent anaemia in pregnant mothers.

A huge proportion of cases had their ANC done at clinics. This may have led to poor examination skills by the primary care nurses who had no training in maternity or midwifery. Our interview with health managers we noted that no clinic had a mid wife hence there may be poor ANC services in the clinics this is also revealed by the fact that majority of cases received ANC from non midwife health workers. There is need for the ministry of health to train nurses in midwifery and emergency obstetric care for survival of mothers hence reduction of maternal mortality in the province.

Majority of women had their PNC done at district hospitals, this could be due to the fact they could have been referred from clinics after complication during pregnancy and then they decessed at the district hospital. Some challenges like transport and communication may delay referrals and then the patient.

Majority of cases who had caesarean sections had emergency caesarean sections meaning the patient would be in a complication state and the fact that they died may be due to lack of skills by the operating doctor because the province has very few anaesthetic nurses and only one gynaecologist. Training more specialist can be a solution to such mortalities in the province.

Another reported cause of mortality was HIV infection though no CD4 count was done this again points to poor care of patients in the health centres. In terms of delay the most reported delay was the first delay meaning that patients were delaying seeking help. This can be supported by the few ANC visits and maybe the mothers had poor health seeking behaviours. It could also be because the health workers were reporting falsely putting the blame on the deceased patients to cover up on their poor care or maybe it was the truth. Very few 19% were associated with delays by health workers from one level to the other. The delays could be due to lack of transport, fuel and communication as was reported by health managers reported in our interviews. Majority of cases were not investigated

in time this was reported to be due to competing programs, lack of transport, fuel and also delay in submitting forms by the reporting centres.

In conclusion the leading cause of maternal deaths in Midlands province were, PPH, Eclampsia, HIV/AIDS, Hypovolemic shock, sepsis, anaemia, and DIC. We therefore recommend the training of EMONOC on all medical workers, provision of essential medical sundries for maternal health, introduction of quality programs in maternal health, and training health workers in proper form filling.

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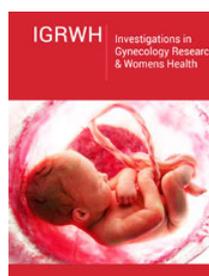
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