Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.5, No.4, 2015

Assessing the Reporting System of Maternal Mortality: A Case Study of a Health Care Centre in the Asuogyaman District, Ghana

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ABSTRACT
An estimated 287, 000 maternal deaths occurred worldwide in 2010, most of which were in low-income and middle-income countries and these were avoidable. Reduction of maternal mortality has long been a global health priority and is a target in the UN Millennium Development Goals (MDG) framework. The aim of this study was to access the reporting system of maternal death at a Health Care Centre in the Asuogyaman District, Ghana. In this study, we sought to employ both qualitative and quantitative methods using respondents from health facility as well as at the communities. This was carried out from May to Augusts 2004. Data were collected with the help of questionnaires interviews augmented by in-depth interviews, focus group discussions and personal observation. Results of the study showed that, majority (90%) of respondents were aware of the need for proper documentation of maternal deaths. However all the maternal death folders reviewed from the VRA Hospital revealed the absence of auditing of such records. It also became clear during the interviews that, some of the senior managers could not specify the appropriate procedures in proper auditing of maternal deaths as well as the correct time required for this exercise. Much to our surprise, all the community based volunteers were aware somehow of maternal mortality audit. On the issue of safe-motherhood training, the study showed that, majority of the respondents (80%) had been trained in safe motherhood techniques. These included (75%) of all the doctors and (65%) of all midwifes. Our findings was confirmed by the administrators of the Health Care Centre (VRA Hospital). Results of the study showed that, although majority of health care workers especially from the health care system in the district were aware of maternal death, there were no proper documentation of these. However from the point of view of some of the major findings it could be deduced that there were indirect reasons to conclude that the low maternal mortality in the district was related to poor records keeping of maternal death folders.
Key words: Mortality, Safe-motherhood, OPD, Maternal, Pueperum, Pregnancy

1. Brief Background

An estimated 287, 000 maternal deaths occurred worldwide in 2010, most of which were in low-income and middle-income countries and these were avoidable. Reduction of maternal mortality has long been a global health priority and is a target in the UN Millennium Development Goals (MDG) framework (Say *et al.,* 2014). This was a key concern of the Global Strategy for Women's and Children's Health launched by the UN Secretary-General in September, 2010. To reach the target of the 5th MDG, a 75 % decrease in maternal mortality ratio (the number of maternal deaths per 100, 000 live births) between 1990 and 2015 is urgently warranted (Hogan *et al.,* 2010).

Maternal mortality is the death of a women while pregnant or within 42 days of termination of the pregnancy irrespective of the duration or site of the pregnancy. This could be attributed to any cause related to or aggravated by the pregnancy or its management but not from incidental and accidental causes (WHO, 1987). The goal of reducing maternal mortality has been adopted by series of international health and development conferences. This forms an integral component of the programs of action following the 1990 World Summit for children, i.e., the 1994 International Conference on Population and Development (ICPD) and the 1995, 4th World Conference for Women (WHO, 2012). Many countries have also accepted it as a national goal. A particular mention could be made of goal No.5 of the Millennium Development Goal of the United Nations which sets high on its agenda a programme to tackle the problem of maternal deaths with all the seriousness it deserves (Haines & Cassels, 2004). Specifically the goal aims at **"**Improving Maternal Health**"** of this target 6 of goal 5 which seeks to "Reduce by three quarters, between 1990 and 2015". This include the maternal mortality indicator of which among many others encompass; **"**Maternal Mortality Ratio" (UNICEF-WHO) with the proportion of births attended by skilled health personnel (UNICEF – WHO) (WHO, 2003).

The scale of suffering associated with maternity mortality is now increasingly recognized in the world all over.

The major causes of maternal death worldwide are known to be haemorrhage, anaemia, complications of abortion, infections, hypertensive disorders and obstructed labour (Stacie *et al.,* 2010). Unfortunately, this knowledge has not brought to bear the needed for a significant reduction in maternal deaths. This is contrary to what has been expected in spite of the various strategies put in place by different countries across the world. This point was highlighted in the annual report of the UN Secretary General: "Under goal 5, i.e., the uncertainty of maternal mortality estimates do not allow any definite assessment of trends". Recent estimates continue to indicate appallingly high rates of maternal deaths in sub-Saharan Africa and Southern Asia. These have an estimated 529, 000 maternal deaths worldwide in 2000 and 445,000 in the 2 regions (Nawal, 2008). The maternal mortality rate was highest in sub-Saharan Africa, at 920 maternal deaths per 100, 000 live births, followed by South Asia, with 520 maternal deaths per 100,000 live births. Recent data on the proportion of births attended by skilled health personnel indicated a critical factor in reducing maternal deaths. This was evident by a significant improvements in Northern Africa and Eastern as well as South-Eastern Asia (Geeta, 2008).

The facts still remains that measuring maternal mortality is a good indicator to monitor whether the set goals are met or not in our efforts to have it reduced. However in many developing countries, comprehensive national system of registration of births and deaths as well as careful attribution of cause of death, are not available. In such instances, maternal mortality could be estimated through household surveys using direct estimation techniques (Campbell & Graham, 2006).

Fortunately, certain process indicators can be used to estimate maternal mortality with higher precision which also tends to monitor progress of programme. One of such processes aims at focusing on the various components of the reporting system on maternal mortality (Ulin *et al.,* 2004). This involves the working definition of maternal deaths, its classification, the structures in place to identify it and availability of tools sensitive enough to capture these deaths. If well planned and carried out, these measures can prove to be feasible, fast, efficient and cheaper than the traditional maternal deaths surveys. The aim of this study therefore to assess the reporting system employed by health workers with respect to maternal mortality in the Asuogyaman district based on data collected from existing health facilities.

2. Materials and Methods

2.1 Study Area:

Asuogyaman District is in the Eastern Region of Ghana. It was established in 1988 and literally means "River bank states" lying on both sides of the Volta River. The Akosombo dam is located within it. The creation of the dam led to the resettlement of the inhabitants in 8 communities and this has contributed to the creation of some socio-economic and health problems. These include inadequate land for farming, low socio-economic status of the people, increased prevalence of schistomiasis and malaria, etc.

The district covers an area of 1,507.59km with a total population of 87,804 (2012 Census). The district is bordered on the North by the Afram Plains district, on the East by Ho district, on the South by the North Tongu district and West by the Manya Krobo district. There are 139 towns and villages forming 5 Administrative zones but for the purpose of health service delivery, the district has 4 sub-districts. These are Atimpoku/Senchi Subdistrict, Adjena, Gyakiti sub district, Akwamufie/Apeguso subdistrict and Anum/ Boso sub district as shown in (Figure 1) below.

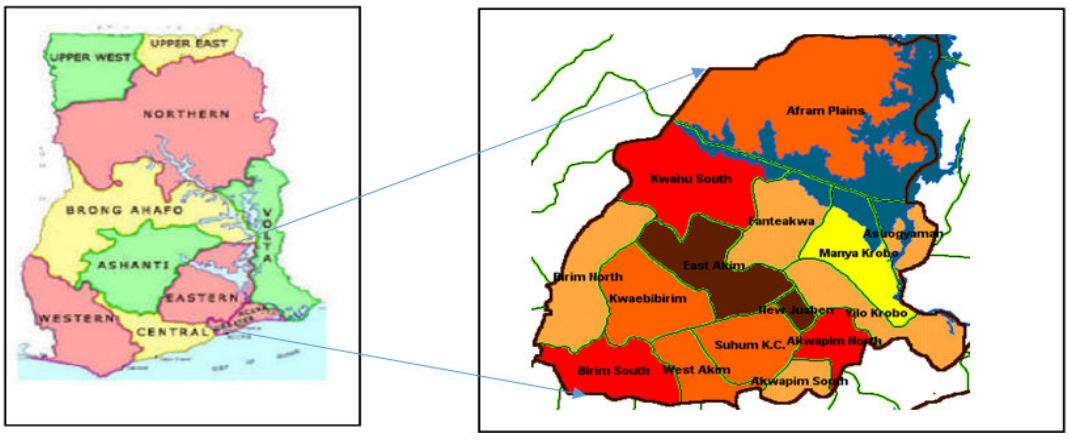

Fig. 1: Showing a Map of Ghana (a) and a Map of sections of Eastern Region with Asuogyaman District.

2.2 Study Approach
The study employed both qualitative and quantitative methods using data collected from the health facility and the study communities. The study was carried out from May to Augusts 2004.

2.3 Health Facilities
As part of this study, there was review of institutional maternal deaths documents of the Volta River Authority (VRA) hospital from January 2001 to December 2003. This was followed by an in-depth interviews of some key health care providers and managers. Some of the issues raised centered on the definition, classification, documentation and certification of maternal deaths. Others included auditing of maternal deaths and whether or not postmortems were carried out on suspicious maternal deaths. This was augmented with a survey on the perception and knowledge of health care providers.

*2.4 **C**ommunity Level*
In-depth interviews were conducted among traditional birth attendants (TBAS) based on the length of one's practices, their level of interaction with the community and the health delivery system. This was augmented with data collected on their involvement in the detection and registration of maternal deaths in the communities. For community based volunteers who doubled as registrars of vital events in the communities, the focus was on how adequate and appropriate the documentation were done as far as maternal deaths were concerned.

2.5 Study Population
The study population included health workers from maternal health units of VRA hospital (district hospital), 1 government health centre (Adjena Health Centre) and 1 private health facility (Hedwig clinic and maternity home). Five (5) TBA registers and 5 community registers at the community level were also included as part of this study. All these facilities were located within 2 sub-districts as shown in Fig 1 above. The basis for the selection hinged on the premise that the VRA hospital represented a typical urban facility while the other facilities i.e., the TBAs and the community volunteers were selected from a rural community.

2.6 Sampling Methods
Purposive sampling method were employed to select the health care providers for the in-depth interviews for TBA and CBV (Community based volunteers). The perceptive survey for the health workers who worked in the maternal health units also followed similar procedures. They were selected from the sub districts and the various health facilities who rendered maternal health services using the multistage sampling method depending on the approximate population size of the relevant providers. The documental review were carried out for all death records from the selected health facilities. These facilities were selected using same sampling method. The selected facilities were VRA hospital, Adjena-Gyakiti Health Centre and Hedwig clinic/maternity home all in the Atimpoku/Senchi and Adjena-Gyakiti sub districts as shown in Figure 1.

2.7 Sample size estimation
Using STATCALC programme of EPI INFO software based on the sample size calculation, an expected frequency of 20 % of health care providers in maternal health units was employed. This required a minimum sample size of 43 health care providers out of 140 at a 95 % confidence level and a worse acceptable factor of 5%. However, this figure was almost doubled to compensate for possible non-responses. A total of 75 health care givers of various categories were interviewed using a structured questionnaire. Fifteen (15) in-depth interviews were conducted with various health care managers or leaders including Medical Superintendent, Administrator, Pharmacists, Chief Nursing Officer, In Charges of units and sub districts, Trained TBA, Community Based Volunteers (CBV'S). In addition, 17 documental were review were made from 7 different folders of maternal deaths from VRA hospital, 5 TBA books and 5 community registers.

2.8 Ethical and Administrative Clearance:
Permission was sought from all concerned authorities before the study began. These included: The School of Public Health, at the University of Ghana. The District Health Directorate of Asuogyaman, representing the Ghana Health Service and The District Assembly. The others were the traditional authority, ethical committee of the University of Ghana and all other recognizable authorities.

3. RESULTS AND DISCUSSION
The study showed that, most of respondents (22) were general nurses, followed by community health nurses (18) and mid wives (15). The study also showed that, there were only 2 pharmacist, with 4 medical doctors as shown in Figure 2 below.

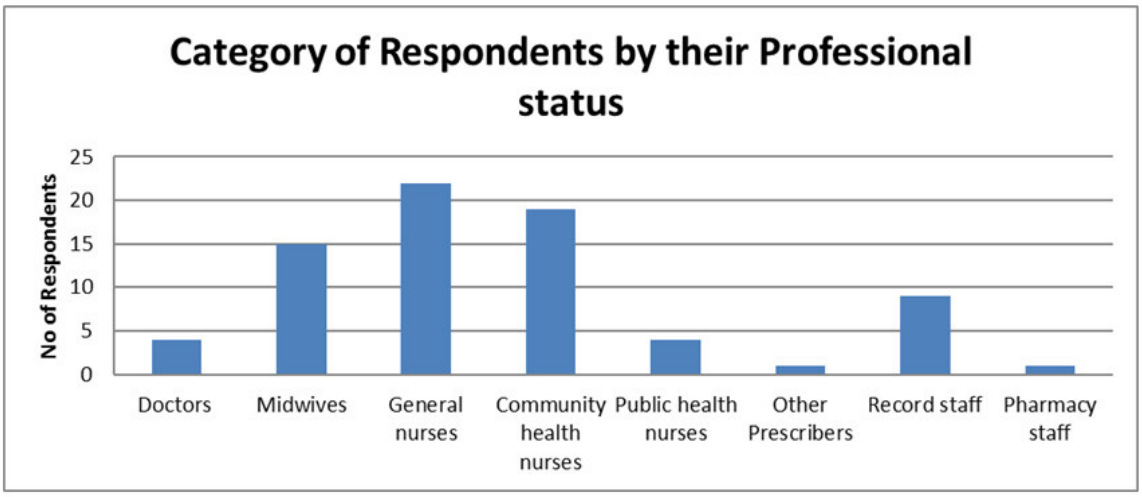

Figure 2: Categories of Respondents by their professional status

The study was also assessed based on the levels of management of respondents and it showed that, majority of respondent (60%) were junior staff compared to senior managers (12%) as shown in the Figure 3 below. It was also established from the study that, about 28% of the respondents were middle level managers at the management levels of their respective health centres. In most health institutions, especially in Africa, the higher one went on Health Care administration ladder, the lower the number of managers required. This observation, researchers have the opinion that, with high quality leadership, there could be effective delegation of duties to effectively deal with health care delivery (Buchbinder and Shanks, 2007). This notion was consistent with this present study.

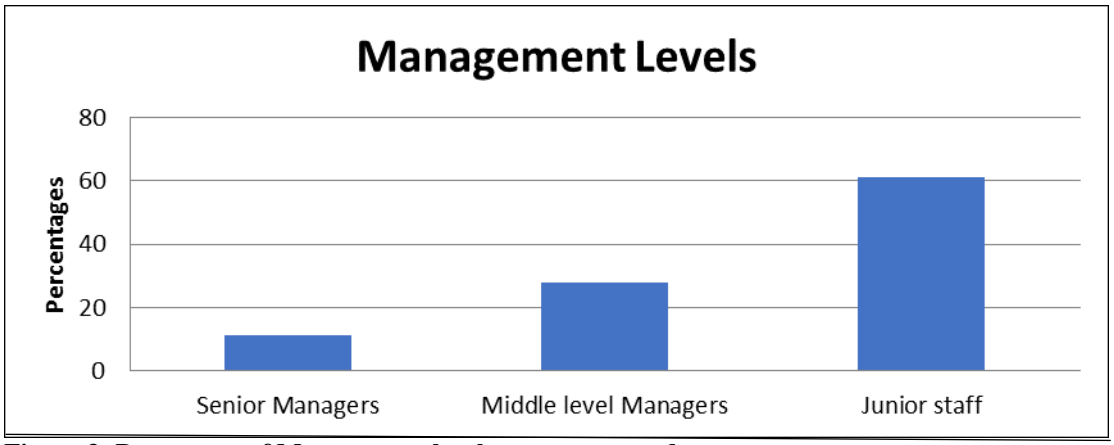

Figure 3: Percentage of Management levels among respondents

As part of the study, we sought to access the stratification of departmental staff and results of the study showed that, greater majority of the hospital staff (22%) were from the general ward, followed by the Out Patients Department (OPD) (17%). The study also showed that, the pharmacy, Midwifery Training School and the District Health Directorate had the least number of staff (2%) compared to the rest as shown in Figure 3. It was realized from the study that, staff at the maternity, ANC (Ante natal care) and Health Centre/Clinic all had staff below 10% in each of their offices (Figure 3).

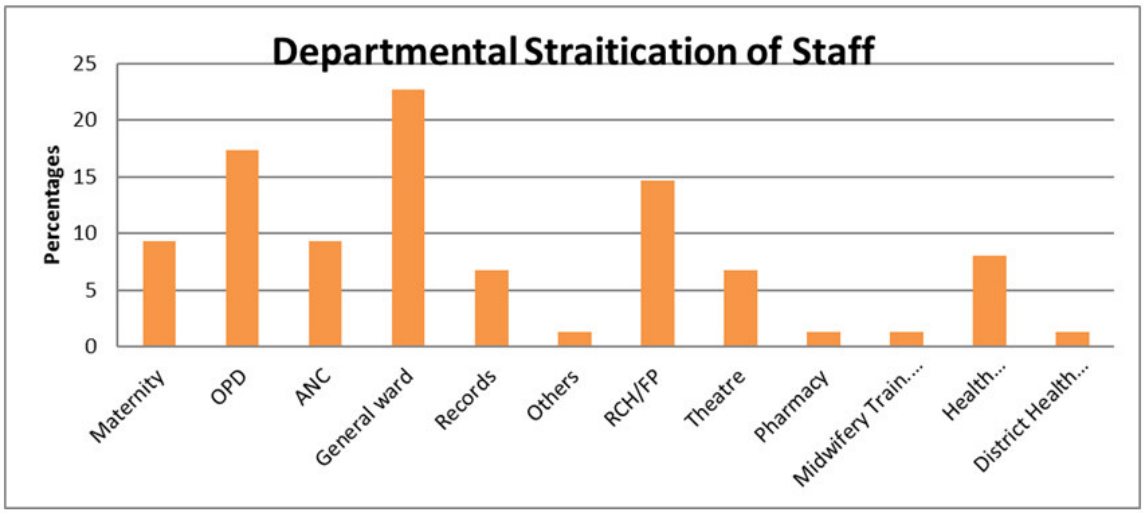

Figure 3: Departmental stratification of members of staff in Percentages

Assessment of the knowledge and perception of health care providers were also analysed during the study to show what percentage of respondents knew the correct answer. Analysis of the results from the study showed that, 23% of the respondents did not know the correct definition of maternal mortality compared to those who knew (75%) as shown in Figure 4. Questions relating to knowledge of gestational age for maternal mortality, delivery deaths and puerperal periods were also posed as part of the study. The results showed that, about 75% of respondents knew the standard answer compared to less than 25% who chose the wrong answers (Figure 4). This was also seen with diagnosing maternal mortality, the role of post mortem and the risk of maternal mortality in relation to the size of the abdomen. It was also realized from the study that, more than 80% of the respondents knew there was the need to document maternal mortality, the role of supervised delivery and the risk or role of unsafe abortion compared to less than 18% of the respondents who had no idea. It has been reported that maternal death is one of the leading causes of death in many developing countries of the world, especially in West Africa (Hanson & P Gluckman, 2014). This open secret may have informed their knowledge of maternal death. This was in line with the study.

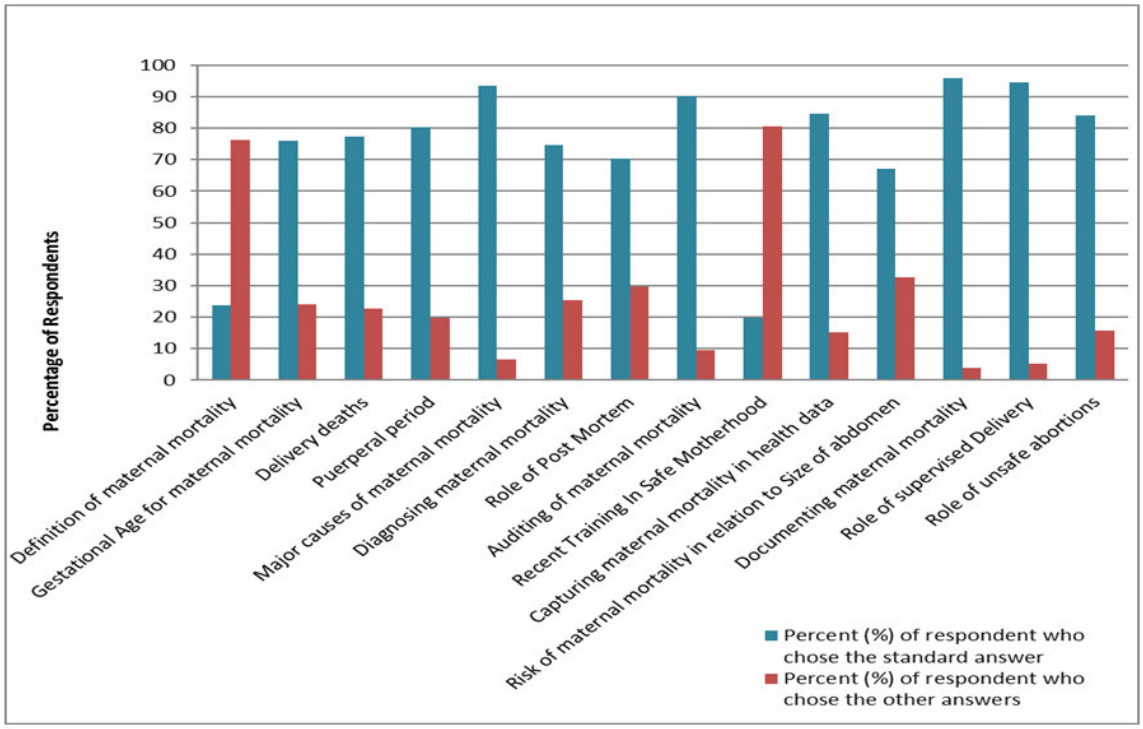

Figure 4: Assessment of Knowledge and Perception of Health Care Providers

An in-depth interview was conducted as part of the study among some respondents and the results showed that,

in all 15 interviews conducted for this category of study, 4 respondents of these were in the community where the study was carried out (Adjena/Gyakiti Sub-District), 1 TBA and 3 community-based volunteers (CBV). Two (2) of the CBVs were males while the 3rd was a female. The facility-based respondents were from the VRA Hospital made up of 3 Doctors; 1 each Head of Departments or Units for Pharmacy, Anaesthesia, Laboratory; MCH and Maternity ward; the rest were the Medical Superintendent, the administrator and the Chief Nursing Officer (CNO) of the VRA Hospital.

The document reviewed included Maternal Deaths Folders from VRA hospital, TBA Registers and Community Registers of vital events from the Adjena/Gyakiti Sub-District. For this part of the study, 7 folders of maternal deaths were retrieved and reviewed. Out of the 15 deaths of women with ages (15 to 49 years) which occurred in the VRA hospital in 2001, 3 were retrieved. In 2002, 19 maternal deaths were recorded but only 5 of these were recorded in the folders. Similarly for 2003, there were 24 deaths and out of these only 4 were retrieved. It is out of these deaths files that the 7 maternal deaths for the 3(three) year period was found and reviewed as shown in Figure 5 below.

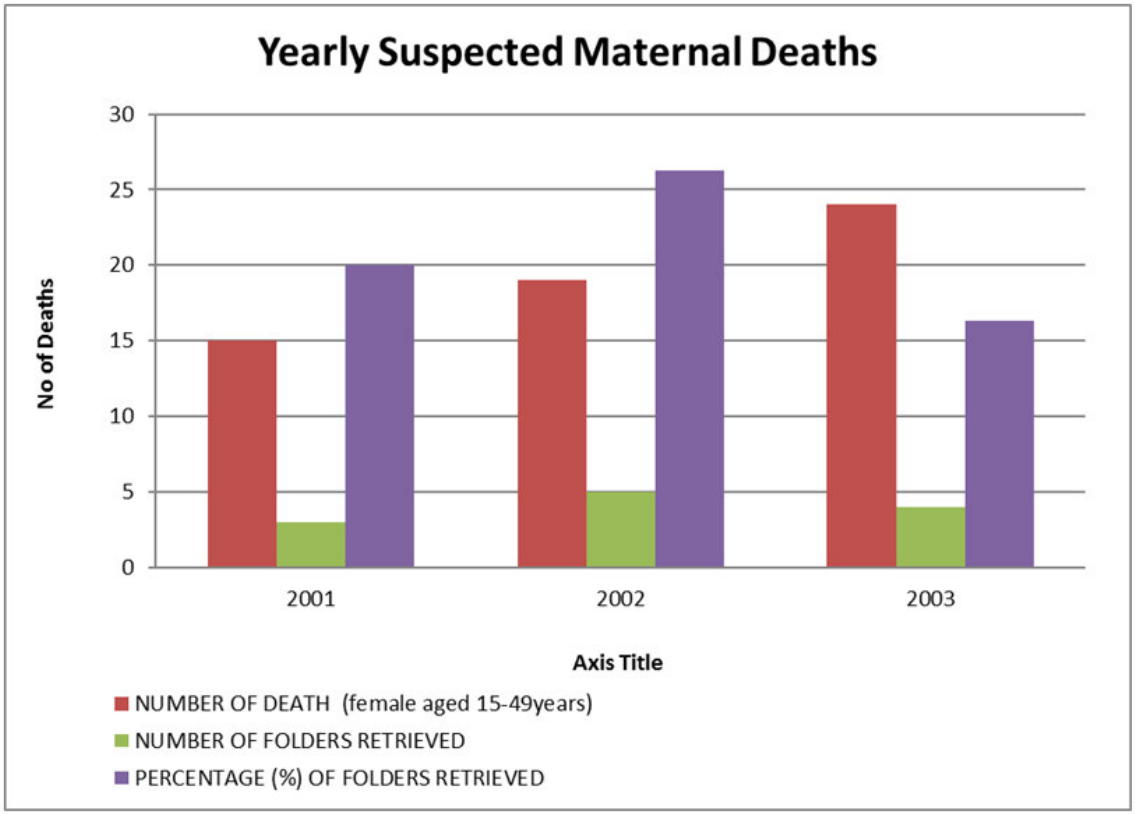

Figure 5: Yearly Suspected Death Reported between 2001 and 2003

The Standard definition of maternal mortality as endorsed by the World Health Organization is death of a women while pregnant or within 42 days of termination of the pregnancy irrespective of the duration or site of the pregnancy. This could be related to or aggravated by the pregnancy or its management but not from incidental and accidental causes (Bustreo *et al.,* 2012). This definition takes into accounts the circumstances surrounding the death of the woman, (pregnant, postpartum, during delivery), the causes (direct and indirect), as well as the exclusion of accidental and incidental causes.

Our study showed that, only 23% knew the standard definition. This finding was in line with some of the responses from both the in-depth interviews and the document reviews. Some of the respondents to the interview were candid enough to say that "I **don't think I am competent to define maternal mortality, rather let me try and explain what I understand by it...**" Documents review from the VRA indicated that, most of the death folders of maternal death had been labeled appropriately.

It was realized from the study that, as the TBAs could not even speak English. As a result, they were not asked to define maternal mortality. In spite of this deficiency, all of their entries were appropriate indicating that if there were maternal deaths, they could correctly register them, regardless of whether it was pregnancy-related, during

labour or puerperal.

The interview with the community volunteers also showed a similar trend with one of the respondents from this category saying "…**Oh, if I knew that she delivered one-and a half months ago, then I could document it here',** pointing to where the pregnancy related death is registered. This meant that, the volunteers understood maternal mortality is not only if the deceased is pregnant but also included pueperum.

During this section of the study(FGD), causes of maternal deaths was also accessed and results of the study showed that, majority of the respondents (93%) knew the appropriate option compared to the remaining (7%). This also did not come as a surprise as this could be attributed to our earlier reason for adequate knowledge of maternal death in our communities. Maternal death or serious illness has long been a frightening risk associated with pregnancy and childbearing in many parts of the world especially in developing countries. Until recently, this has been overshadowed by other death priorities. This is in spite of the fact that rates of maternal mortality in developing and developed countries show greater disparity than any other public health indicator. It is in spite of this development which has triggered a hoped that as knowledge and skill increases coupled with improvements in the measurement techniques, more attention and commitment would be devoted by all stakeholders. This they would do to ensure safety in being a mother especially in developing countries (Hanson & Gluckman, 2014).

Again in the interview most of the respondents did not mince words that, (93%) of the respondents could identify the major causes of maternal death. The TBAs as well as the CBVS were very conversant with the major causes in their own terms and idioms. Among others they knew things like **''Some die from over bleeding, by children touched by the sky** (childhood convulsion) **and some looked white in palm and soles''** Results from documental review confirmed these findings. One TBA said '**If I did all that I could and she failed to deliver, then I knew that I have to refer them quickly to the hospital or could loose them'.** This assertion was also confirmed during documental review from the VRA hospital. It also came up that, although the community registers reviewed had not registered maternal death, there were attempts to assign causes of some death to all others.

In discussions with the TBAs, it showed that, all of them (5) were very familiar with causes such as bleeding in labour, postpartum or even pregnancy as a major cause of maternal deaths. They also mentioned abortion, fitting (Eclampsia) and inability to deliver (obstructed labour) among many others.

We sought to investigate during FGD whether the respondents knew how to correctly diagnose maternal death. The results of this investigation showed that, majority (74%) of the respondents believed it was in-adequate and inappropriate to diagnose maternal death at the OPD just by using clinical acuity. Similarly, a good proportion (70%) of respondents recognized the fact that performing postmortem examination when indicated could help improve on the reporting of maternal mortality.

The study also showed that, during the interviews both at the facility and the community level it become clear that postmortem examination of suspicious deaths could improve the reporting on maternal deaths. One (1) volunteer said "**When we suspect maternal death due to negligence, we inform the police so the body could be transported to VRA hospital in Akosombo for postmortem to be carried out'** implying that the doctors could help identify the cause of death. This knowledge indicated they least could suspect these deaths and alert the appropriate authorities.

However, this clear expression of knowledge does not translate in real practice. This was also confirmed during review of documents of the 7 death folders at the VRA Hospital.

Reporting Maternal Death

The question of knowledge of proper reporting of maternal deaths also arose during the FGD and the results showed that, majority (90%) of respondents knew the need for proper documentation of maternal deaths. However all the maternal death folders reviewed from the VRA Hospital revealed no auditing of any of the maternal deaths recorded took place. In fact 1 doctor said "**No, we don't do it!'**

This was after most of the other respondents had answered "**We do it''**. One of the respondents during the FGD also said he had been instructed earlier by his formal Boss from another Health Care Centre.

However, he is not part of the team mandated to do that.

It also became clear during the interviews some of the senior managers even could not specify the appropriate procedures in proper auditing of maternal deaths as well as the correct time required for this exercise. However, all the community based volunteers were aware of maternal mortality audit. They knew that because though they had not registered any maternal deaths in their area, they had been invited to the sub district level auditing and they appreciated its significance. One TBA said '**Now we are very alert, although we did not attend school, we are still useful in that respect'**.

Safe-Motherhood Training
As part of the study, safe-motherhood training related question was posed and the results of the investigation showed that, majority of the respondents (80%) said they had not been trained in safe

Motherhood techniques. These included (75%) of all the doctors and (65%) of all midwifes.

Findings was confirmed by the administrators of the Health Care Centre (VRA Hospital). In confirmation to this, a senior manager from the Hospital answered "**I don't know how they are trained, the Regional people come and do the training....'** Another one mentioned that he knows that there is a programme like that but mainly for the '**district staff...**' Even though some of the midwives admitted to have been trained 2 years ago, they had not been refreshed and therefore, for them practically the training had **'little effect'** as one put it. At the community level, although the TBAs and CBVs confirmed periodic meeting and seminars in general, they were not specific on safe motherhood orientation. However, these facts could not be confirmed with the document reviews.

Community Documents
A total of 5 trained TBAs; all from Adjena-Gyakiti Sub-district had their documents reviewed in the study. The documents reviewed comprised basically of the registers of the activities of the TBAS.

The entries made into these books included births, deaths, ANC attendance and any other services rendered by the TBA. The year of operation ranged from 1995 to 2004. Again in the community, 5 community registers were reviewed. These were also picked from the same sub-district as the TBA.

The reference period of the review of the documents was from January 2001 to December 2003.

4. CONCLUSION

Results of the study showed that, although majority of health care workers especially from the health care system in the district generally aware of maternal dealth, there were no proper documentation of these. In addition, the study did not directly show low maternal mortality in the Asuogyaman district was due to under reporting. However from the point of view of some of the major findings it could be deduced that there were indirect reasons to conclude that the low maternal mortality in the district was related poor records keeping of maternal death folders and lack of auditing of maternal deaths in health care facilities. It was however surprising to note health care providers covering such a wide range of categories worked in maternal health units but could not identify the standard definition of maternal mortality. The situation would have been understood if other non-technical staffs were enrolled in the study but a situation where we were dealing with frontline care givers whose day to work involved diagnosing and managing maternal health condition was more worrying.

5. RECOMMENDATIONS

The Health authorities in the Asuogyaman district need to streamline the interaction between the VRA (The Hospital system) and the District Health systems in order to facilitate services delivery in general and maternal health in particular. There is the need for the Health delivery system to adopt practical ways of making sure that health records are kept well for further use. They should also improve on the data management system.

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