FACTORS AND OUTCOMES ASSOCIATED WITH SELF AND INSTITUTIONAL MATERNAL REFERRALS IN DAR-ES-SALAAM DISTRICTS AND NATIONAL HOSPITALS

By

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CERTIFICATION

The undersigned certifies that he has read and hereby recommend for acceptance a dissertation entitled: **FACTORS AND OUTCOMES ASSOCIATED WITH SELF AND INSTITUTIONAL MATERNAL REFERRALS IN DAR-ES-SALAAM DISTRICT AND NATIONAL HOSPITALS,** in partial fulfillment of the requirements for the degree of Master of Arts in Health Policy and Management of the Muhimbili University of Health and Allied Sciences.

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Date: 18/11/2009

DECLARATION AND COPYRIGHT

I, **Dr. Mwendwa E. Mwenesi,** declare that this dissertation is my original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

I am dedicating this venture to my parents for the encouragement and support they have always given me, my two sons Jonathan and Gerald and my wonderful husband – Mr. Mitangu Bennet Fimbo for his untiring advises, devotion, endurance and above all his love and support.

ABSTRACT

Background: Improving maternal health by reducing maternal mortality constitutes the fifth Millennium Development goal and represents a key public health challenge in the United Republic of Tanzania.

Despite national and global commitments and efforts to reverse the current maternal mortality rate in Tanzania, the ratio has continued to remain unacceptably high and the figures continue to rise year after year. (529/100,000 in 1996 against 578/100,000 live births in 2005).

Among other factors, referral system that is efficient and of good quality, together with provision of appropriate and timely emergency obstetric care plays a crucial role in the reduction of both maternal morbidity and mortality.

Objectives: Several studies done in Africa and rural parts of Tanzania have found weaknesses in the maternal referral system. This study was therefore conducted to assess the factors and outcomes associated with self and institutional maternal referrals in Dar-es-Salaam districts and National Hospitals, with the assumption that the outcome of maternal referrals reflects the effectiveness of the maternal referral system in the reduction of maternal mortality.

Materials and methods: This analytical cross sectional study used both qualitative and quantitative methods of research design and was conducted in the national and district hospitals in Dar-es-Salaam region from April to May 2009. Data was collected using questionnaires and hospital based obstetric records and database checklists. A total of 392 women who were admitted and had just delivered in the four hospitals were interviewed and their antenatal cards checked for any referral advice or documentation given. Qualitative interview on assessment of the current maternal referral system was also conducted to sixteen selected healthcare workers responsible for maternal care delivery in the four hospitals. Data on maternal referrals for the year 2008 was collected from the obstetric registry books and database at districts and national hospitals respectively.

Results: This study revealed a state of poor functioning of maternal referral system in the city public hospitals with a high percentage of self referrals (51.2%). A strong association

was also found between educational level and economic status with referral status of women. ($P<0.05$). A high maternal mortality ratio of 1,046 per 100,000 live births was found among mothers referred from the district hospital to MNH. Lack of referral guidelines and inadequate human and non human resources were among factors associated with poor functioning of the system.

Conclusion and Recommendations: Urgent review of the current health system policies to address underlying causal factors for poor functioning of the system and provision of maternal referral guidelines to all health facilities is needed. Avoidance of unnecessary maternal referrals due to bad outcomes, together with implementation of emergency obstetric care functions to every facility providing maternal services is recommended.

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LIST OF ABBREVIATIONS

ANC	-	Antenatal Clinic
EmOC	-	Emergence Obstetric Care
HIV	-	Human Immunodeficiency Virus
MDGs	-	Millennium Development Goals
MNH	-	Muhimbili National Hospital
MUHAS	-	Muhimbili University of Health and Allied Sciences
M/NYAMALA	-	Mwananyamala
PMM	-	Prevention of Maternal Mortality
RCH	-	Reproductive and Child Health
RHC	-	Rural Health Center
TDH	-	Tanzania Demographic and Health Survey
U.S.A	-	United States of America
WHO	-	World Health Organization

CHAPTER 1

1.0 INTRODUCTION

1.1 Background

For two decades now the international community has been campaigning to improve maternal health. Global commitments to reduce maternal mortality were first made at the 1987 International Conference on Safe Motherhood in Nairobi.

The 1994 International Conference on Population and Development in Cairo, maternal health was recognized as a key component of the right to sexual and reproductive health. In the year 2000, world leaders reaffirmed their commitment to reduce the maternal mortality ratio by 75 percent between 1990 and the year 2015. Setting of MDG5 goals followed in 2006 by the addition of a target for universal access to reproductive health (1).

A number of middle income countries have been able to reduce dramatically the rate of maternal mortality, but unfortunately most of the low income countries, maternal mortality remains unacceptably high.

Maternal mortality rate is the highest in sub-Saharan Africa compared to other parts of the world and a woman's risk of dying from complications arising during pregnancy, at delivery or soon after delivery over a course of her life time is 1 in 16 in this region, as compared to 1 in 3,800 in the developed world (2).

Access to quality care during pregnancy and especially at delivery seems to be crucial factor in explaining the disparity in maternal mortality between the developing and the developed or industrialized countries.

In Tanzania maternal mortality rate currently ranges between 572 and 960 for every 100,000 live births and the risk of dying during childbirth faced by Tanzanian women is 100 times greater than that faced by women in the high income countries (3). The rate has been increasing in the past few years despite National and International efforts to reverse the trend.

Several factors have been linked to the increased rate of maternal mortality including lack of enough skilled human resource for health, inadequate medical supplies and equipment, lack of emergency obstetric care especially in the rural and semi urban areas, poor infrastructures such as road and vehicles to transfer mothers to health facilities and complications that occur during pregnancy and delivery (4).

Referral system that is efficient and of good quality also plays a crucial role in the reduction of both maternal morbidity and mortality. Good quality obstetric care is a single most important intervention in the prevention of maternal mortality and morbidity.

It has been reported that one of the quickest and most cost effective way of reducing maternal mortality and morbidity and improve the quality of the existing maternal health care is by provision of appropriate and timely emergency obstetric care (5).

Together with other factors attendance at delivery by skilled personnel equipped with necessary supplies and equipments has been found to be strongly associated with reduction of maternal mortality than any other interventions (6).

Studies done in U.S.A have shown that Life threatening obstetric complications often arise suddenly even in those women not identified as high risk during antenatal screening, actually most obstetric complications occur among women with no risk factors (7,8), this therefore calls for timely identification, management and when required undelayed referral of complicated maternal cases to higher levels of health care.

1.2 The Concept of Three Delays

The prevention of maternal mortality (PMM) network developed a 3 delay model whereby they identified the points at which delivery of efficient and effective emergency obstetric care is delayed (9).

1.2.1 Delay in deciding to seek emergency obstetric care

It has been found that even when facilities that are capable of producing emergency obstetric care are easily accessible to women, they may not use these facilities. There are several reasons that explain this, which includes women's status in the family, the issue of privacy in the health facilities together with the desertification with staff attitudes and performance, perception of the woman and the family on the severity of the complication, lack of drugs in the health facility, and the staff not being present in the facility.

1.2.2 Delay in reaching a health facility with emergency obstetric care services.

Once a decision has been made to take a pregnant woman to a health facility that produces emergency obstetric care, several factors may hinder the timely arrival of this woman to the facility, such factors includes, the availability of transport and easy accessibility to the facility with emergency obstetric care services, travel cost, bad condition of roads together with difficult geographical accessibility, especially in remote villages in mountainous areas, lack of ambulances and in most remote villages no car passes for days.

1.2.3 Delay in actually receiving care after arriving at the facility providing emergency obstetric care services.

This is the most critical delay among the three delays were many women die in the hospital after they have overcome the barriers in phase 1 and 2 of the delay model. Delay in decision making of the health care staff on the management of the woman together with lack of essential emergency obstetric care requirements such as availability of drugs, supplies, trained

staff, management and staff attitude are main factors leading to this type of delay. Timely referral of complicated obstetric cases that require higher level of care is also a major factor.

A study done by Nyamtema SA, showed that shortage of blood products, poor socio-economic status and ignorance of most patients, and a poor referral system were also cited as factors that affected obstetric care and pregnancy outcome in 1st referral level facilities in Dar-es-Salaam (10).

1.3 Maternal Referral System in Tanzania

The Tanzanian health system is arranged in a pyramidal form with the rural health centers (RHCs) and community dispensaries as the lowest levels of health care system. In this level, basic obstetrics care such as antenatal care, delivery and treatment of minor conditions is provided.

District hospitals and district designated hospitals comprises the first referral level where necessary drugs, equipments and skilled staff are available to provide the comprehensive obstetric care services. Surgical obstetrics, anesthesia, blood replacement, medical treatment, manual procedures and monitoring of labor, management of women at risk, neonatal special care together with family planning support are among the essential services that should be available at this level (4).

The regional hospitals and the National and specialized hospitals comprises the top referral level. In Dar-es Salaam obstetric care is provided in all levels of health care i.e. dispensaries, health centers, hospitals and Muhimbili National Hospital which is a consultant hospital.

With the above evidence, it is very clear that the maternal referral system and health infrastructure should in general be very well developed. Demographic and health survey figures show that 47% of deliveries are taking place in health facilities (11). Despite these figures and conditions, maternal mortality in Tanzania remains unacceptably high and the figure continues to rise year after year.

1.4 Problem Statement

Delay in receiving care after arriving at a facility is the most critical among the three types of delays which usually leads to fatal results. Effective and timely maternal referrals at district level are one of the interventions aimed at reducing this type of delay.

A study done on obstetric care in southern Tanzania by Jahn A and De Brouwere V, showed that there was a very low rate of intrapartum emergency referrals. Even when assuming that deliveries outside the hospital were mainly low risk, which is usually not the case, a rate of at least 5% of obstetric complication was to be expected (12), WHO report of 1997 showed a rate o 15% of obstetric cases were to be expected for referral even in those women who were found to be of low risk.

Also the proper use of partogramme showed to yield about 10% of deliveries with referral indication of prolonged labour, yet within 2 months period of which the above study was conducted there were only 5 intrapartum referrals constituting 0.3% of the estimated 1543 deliveries taking place outside the district hospital. This therefore showed that despite the high rate of obstetric emergencies requiring referrals to higher levels of care, the rate of referral was still very low (12).

A delay in transfer within the health care system once a patient with complications has reached a facility is also one of the operational factors identified to affect maternal mortality in Tanzania.

A study done by Urassa E, etal showed that there was a delay in transfer from the district hospital to higher levels of care once a woman developed complications and therefore provision of the core resources and supplies for emergency obstetric interventions, as well as clear protocols for management and referral, are absolute necessary for improvement of maternal survival (13).

In Dar-es-Salaam which is the commercial and the largest city in Tanzania, the maternal mortality ratio is not different from other parts of the country. Studies done at Muhimbili National Hospital, between 1993 and 1999 showed a maternal mortality ratio of 591 per 100,000 live birth and between 1999 and 2005 the maternal mortality ratio was 512/100,000 live births. The main causes of death were also not different from other parts of the country with eclampsia and postpartum hemorrhage as the leading causes. In 2003 overall maternal mortality ratio in Dar-es-Salaam was found to be 572/100,000 live births (14).

The persistently high maternal and perinatal mortality rates at Muhimbili National Hospital, which is the referral teaching hospital in Dar-es-Salaam, have been found to be attributed by the poor quality of care within the hospital as well as the surrounding hospitals that refer women to this hospital. Referrals between health institutions in Dar-es-Salaam which can be hindered by many factors such as bad roads and lack of transport were also found to be major factor affecting the state of patient's illness and survival (15).

With this evidence, it is clear that there are gaps that need to be addressed concerning the effectiveness of our referral system in the reduction of maternal mortality.

This study is therefore aimed at assessing the outcome and factors associated with self and institutional maternal referrals in Dar-es-Salaam, with the assumption that the outcome of maternal referrals reflects the effectiveness of maternal referral system in the reduction of maternal mortality.

1.5 Rationale of the Study

Many maternal deaths in Dar-es-Salaam have been found to occur when the patients have already arrived at the health centre, which tend to provide emergency obstetric care. This constitutes the third type of delay in the 3 delay model developed by the prevention on

maternal mortality (PMM) network, which is the delay to actually receive appropriate care after arriving at the facility. This is mentioned as the most critical delay among the three delays.

Despite Dar-es-Salaam being the most developed city in Tanzania with presence of three functioning district hospital providing emergency obstetric care, the rate of maternal mortality in these district hospitals is not very different from other parts of the country.

Studies done at Muhimbili National Hospital in 2000 revealed that most of the maternal death that occurred at the hospitals where patients referred from other hospitals as emergency cases. Out of 118 maternal deaths that occurred in this national hospital in 2002, 83 (70.4%) deaths were referred patients. major causes of death were found to be eclampsia 26.3%, anaemia 19.5%, and postpartum hemorrhage 14.4% (10). This shows that if proper and timely management was available in the first referral level, Most of the above causes of maternal death are treatable and preventable.

Also a study done by Nyamtema S.A, in 2002, showed that the referral rate at Mwananyamala district hospital to Muhimbili National hospital was as high as 59% of all the admitted cases in the maternity unit requiring delivery services. This further shows the high rate of maternal referrals from district hospitals to MNH, despite the fact that most of these referred cases are supposed to be managed at the first referral level (10).

The aim of this study is therefore to assess the main factors associated with maternal referrals in Dar-es-Salaam district hospitals and the outcome of these referrals after the patients arrived at these district hospitals and Muhimbili National Hospital, so that the information can be used as a basis for improving the existing maternal referral system.

1.6 Objectives

1.6.1 Research question

What are the outcomes and factors associated with maternal referrals in Dar-es-Salaam?

1.6.2 Broad objective:

To assess the outcomes and factors associated with self and institutional maternal referrals in Dar-es-Salaam.

1.6.3 Specific objectives:

a. To assess the proportion of referred deliveries in districts hospitals.

b. To determine the main causes of self and institutional maternal referrals.

c. To describe the logic or guideline used to implement referral.

d. To determine factors affecting implementation of referral advise in urban areas.

e. To determine the outcome of these referrals for both mother and baby after they arrived at Muhimbili National Hospital and District hospitals.

f. To assess the appropriateness of maternal referrals in terms of level and time of referral.

CHAPTER 2

2.0 LITERATURE REVIEW

Maternal mortality remains one of the most daunting public health problems in resource poor settings and reduction of maternal mortality has been identified as a prominent component of the United Nations millennium Development Goals. The world Health Organization estimates that 515,000 women die each year from pregnancy related causes, and almost all of these deaths occur in developing countries. The maternal mortality in Africa is approximately 1,000 per 100,000 live births, compared to 8 to 12 per 100,000 live births in North America (16).

The 2004-05 Tanzania Demographic Health Survey (TDHS) report on Adult and Maternal Mortality showed that between 1995-2004, the maternal mortality ratio was estimated at 578 maternal deaths per 100,000 live births. In other words for every 1,000 live births in Tanzania during this period, almost 6 women died of pregnancy related causes. Access therefore to quality care during pregnancy and especially at delivery seems to be crucial factor in explaining the disparity in maternal mortality and morbidity between the developing and the industrialized world (17).

Evidence has shown that access to and utilization of high quality emergence obstetric care is central to efforts aimed at reducing maternal mortality. Since it is not Feasible to Predict or prevent most maternal complications of pregnancy and childbirth, health care workers must assume that all pregnant women are at risk for developing such complications and those women who develop these complications which are usually life threatening must receive treatment within a reasonable period of time to prevent maternal death (18,19).

Effective and timely maternal referral in case of complications that require higher level of care with more specialized emergence obstetric service has been identified as one of the critical steps in preventing unnecessary maternal death. A study in India states of Andhra Pradesh, Maharashtra, and Rajasthan found that 42 % to 52% of maternal deaths occurred at home or on transit to a hospital (16).

A retrospective study done in Bagamoyo District Hospital in Tanzania on maternal deaths and their associated risk factors showed that referrals to higher level of care for pregnant mothers found to have risk factors was low even in the preliminary stages of maternal care such as the antenatal clinics. In this district hospital it was found that 76.4% of the women were found to have at least one or more risk factors, but only 34.6%of them were referred and 44.4% followed through and went to the referral center (20).

The above study also highlighted the importance of improving emergency obstetric services, because most women had contact with a health facility or health personnel before their death, also showed that quality decision making and competence of referral level physicians to deal with the obstetric emergencies need to be markedly improved.

Lack of Know-how and faulty patient management at the referral hospital level play a significant role in treatable causes of maternal death therefore a viable alternative may motivate health workers at the basic levels to detect and refer high risk cases early and motivate mothers to follow through with the referral (21).

A study done on referral in pregnancy and child birth by Jahn A and De Brouwere V showed that only 35% of women using referral obstetric care do need it (12). This shows that there are many women who actually need maternal referral to higher level of care due to the risk factors that they have, but are unable to access the service or follow the referral advice due to many reasons, one of it being the low economic and social position of most women in the society. This study also showed that there was also very low compliance with professional referral advice. Only 25% of the advice is followed.

A study done in Mtwara region in southern Tanzania showed that majority of women opting for referral level care base their decision on general consideration of safety and perceived better survival chances of themselves and their babies regardless of their professionally defined risk pregnancies. There was very low rate (3.4% of antenatal referral in contrast to the expected 20% if there was full implementation of official referral guidelines (22), and most of

these antenatal referrals were self referrals i.e. triggered by symptoms experienced by patients themselves rather than institutional triggered referral.

This study also indicated that there was very low rate of intrapartum emergency referrals of only 0.3% as compared to the expected 10% if there was proper use of partogramme (22), this explains the delay in decision making among healthcare providers or reluctance to change the predecided delivery setting even in case of severe complications. This therefore explain the causes of maternal mortality caused by the third type of delay, of which most of these deaths could be prevented if proper management of these women together with full implementation of referral guidelines was followed during these critical life saving moments.

Another study done in rural northern Tanzania on causes and characteristics of maternal deaths revealed that majority of maternal death found in the in the study (41 out of 45 had occurred at a health facility and for the direct obstetric deaths the majority of death occurred in the intrapartum period (23). This also indicates that the possible causes of these deaths apart from others could be delayed delivery of appropriate and timely emergency obstetric care or delayed decision making on change of the predecided mode of delivery or care.

Staff related maternal deaths have been found to contribute substantially to the high rates of maternal mortality ratios in developing countries. A study done in Kigoma regional hospital in Tanzania by Mbaruku G and Bergstrom S, showed that proper intervention to improve the working conditions, improved availability of necessary equipments and drugs and boosting of staff morale is a positive feedback, reinforcing further attempts improve the quality of maternal care.

Improvement of referral system from the community level to tertiary level of health care is also a critical factor to be looked at in reduction of maternal death, a study done in Gambia and Tanzania have shown that most women actually try to reach health care facilities when an emergency occurs, but failure to receive appropriate treatment in time or delayed in transfer to higher level of care has contributed to majority of preventable deaths in developing countries.

Improvement of referral system is therefore needed at all levels of maternal care if maternal deaths are to be prevented (13, 24).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This was an analytical cross sectional study that used a mixed methods model research design. Mixed methods research is defined as the class of research where the researcher mixes or combines quantitative or qualitative research techniques, methods, approaches, concepts or language into a single study. Philosophically it is the third wave or third research movement (25).

3.1.1 Quantitative approach

The study design used was analytical cross sectional study.

-Recorded data from obstetric registry books and obstetric data base from the district and MNH respectively, for the past one year of 2008 were used to determine the proportion of deliveries, the main causes and the outcome of maternal referrals at the district and National hospital.

-Quantitative interview with mothers was conducted after they had delivered and review of their referral records was done so as to be able to compare with the data obtained from the obstetric databases.

3.1.2 Qualitative approach

Qualitative interviews with health care providers was conducted so as to determine factors affecting implementation of referral advise in urban areas and the logic or guideline used when referring and what can be done to improve the current referral system so as to improve obstetric care services.

3.2 Study Area

This study was conducted in Dar-es-Salaam which is the largest business city in Tanzania. The city is located along the East African coast of the Indian Ocean. This city has three municipalities; Ilala, Temeke and Kinondoni. The city has a population of about 2.5 million people of which 45.9% are women; this is According to 2002 population and census report. 2007 projection on the city's population, Dar-es-Salaam city is estimated to have a total population of 3,070,060 with annual growth rate of 4.3% (26). There are three district hospitals, one in each municipal. The labour wards in each district hospitals have a total of obstetric admissions ranging from 13,633 to 18,429 per year and with total deliveries ranging from 12,771 to 13,064 per year. Delivery rate per day in the district hospitals ranges from 28 to 36 per day. Caesarean section rate is between 0.9% in Temeke district hospital to 3% in Amana Hospital (10).

Apart from these three Government Hospitals there are other voluntary, parastatal and private owned health facilities that provide maternal and child health services. The district hospitals are the first referral level of health care, and since the city has no regional Hospital, Muhimbili National Hospital is the Second referral level for the Government and private owned health facilities in the city. This hospital also receives patients from all over Tanzania who require specialized health care services. The maternity unit, which is under the Department of Obstetrics and Gynecology in the Muhimbili National Health structure, receives mothers referred from district hospitals and other several vicinity hospitals in the city. The unit also receives patients from nearby regional hospitals. About 40 mothers deliver in this unit on average each day (14).

3.3 Study Population

The study population involved:-

-Women who were admitted and had delivered in the three district hospitals and MNH during the study period.

-Maternal Health care providers in the selected Hospitals who were directly or indirectly working with obstetric care service delivery in these hospitals.

3.4 Sample Size Calculation

3.4.1 Quantitative approach

Sample size of women who were admitted and had delivered who were directly interviewed at the time of study conduction was determined based on the following formula of a single proportion,

$$\mathbf{n} = \frac{z^2 p(100-p)}{\varepsilon^2}$$

Where n = the required minimum sample size

p = estimated proportion of women who might need obstetric referrals to 2nd level of care (50%)

ε = margin of error on p (set at 0.05)

z = standard normal deviate corresponding to 95% confidence level (=1.96)

$$\mathbf{n} = \frac{1.96^2\, 50(100-50)}{5^2} \approx \mathbf{385}$$

Previous studies done at Mwananyamala District Hospital in Dar-es-Salaam revealed a prevalence of more than 50% of obstetric referral rate to Muhimbili National hospital (10). Setting the marginal error on p as 5% and considering a 95% confidence level in the estimate of the prevalence of women requiring 2nd level obstetric maternal referral, the above formula yielded a minimum required sample of about 385 women.

3.4.2 Qualitative approach

Sample size of health care workers - Quota sampling method was used. In each district hospital and Muhimbili National hospital four key people were interviewed, The doctor in charge of the hospital, the in charge of maternal health services in the hospital, In charge of labour ward and one nurse working in the labour ward.

3.5 Sampling Techniques

3.5.1 Quantitative approach

385 women who were referred, had delivered and were still admitted at the time of data collection were divided equally among the four hospitals; random selection of women to be interviewed was conducted. First the total number of women to be interviewed in each hospital was determined by dividing the sample size calculated among the four hospitals. Then in each hospital, the total number of women who were admitted and had delivered per day was determined. The total number of women to be interviewed in each hospital was then divided by the set days of field data collection. Each day of data collection a list of names of women who were admitted and had delivered was obtained and selection of women to be interviewed was done using lottery method.

3.5.2 Qualitative approach

Qualitative interviews with open and closed ended questions were conducted to the four selected health care providers in each hospital.

3.6 Data Collection

Letter of permission to be able to conduct the study in the three districts was obtained from Muhimbili University of Health and Allied Sciences (Appendix 8). Before proceeding with

data collection in the district and national hospitals, permission was also obtained from the three municipalities and Muhimbili National Hospital. (Appendix 9, 10, 11, 12)

3.6.1 Quantitative and Qualitative approach

Two data collection techniques were used, which are using available information from the hospital obstetric registry books and obstetric data base and interview technique.
For quantitative approach analysis of data from obstetric data base from the district and National Hospital was done. Questioners were used for the quantitative and qualitative interviews with mothers and health care workers after obtaining individual consent. Recorded data on total maternal obstetric admissions and referrals, total deliveries, major medical causes of maternal obstetric referrals from the district hospital to MNH and delivery outcome (mother and baby), were collected from the District hospital obstetric registry and delivery books and also from Muhimbili National Hospital obstetric data base from 1st January to 31st December 2008.

A total of sixteen selected healthcare workers involved with maternal care delivery were interviewed from the four hospitals regarding their assessment and how to improve the current functioning of maternal referral services in the district and National hospital. In each of the four hospitals hospital, four key respondents were selected, the doctor in charge of the hospital, the in charge of maternal health care services in the hospital, the in charge of labour ward, and a doctor or nurse working in the labour ward.

3.6.2 Tools for data collection

Two research assistants i.e. nursing officers who were working in the labour ward assisted the principal investigator in the process of data collection. These were assigned to interview the referred women who were admitted and had already delivered in the labour ward at the time of study. Short Quantitative interview with closed ended questions was held with the study population (Appendix 1). The respondents were asked questions on their antenatal visits and

were also asked for the antenatal card where the interviewer checked if the women had any risk factors during pregnancy and if she had received any referral documentation/advice from the antenatal clinic.

The principal investigator conducted the in-depth qualitative interviews with the health care providers to determine the reasons or guideline used in the referring women with obstetric complication to a higher level of care, also to determine the factors affecting implementation of referral guideline in the urban areas and what are their opinions on how to improve the referral system in urban settings so as to reduce the preventable maternal death that are caused by delayed referrals at hospital level (Appendix 3).

The principal investigator assisted by one research assistant analyzed the data obtained from hospital obstetric registry books and obstetric data base in the four hospitals for the past one year to determine the proportion of deliveries, the main causes and the outcome of maternal referrals at the district and National hospital. From MNH database, the proportion of deliveries that were referred from the three district hospitals to MNH, the main causes and the outcome of these referrals was determined (Appendix 4 and 5).

3.6.3 Preparation of respondents

The general purpose and usefulness of the findings of the study was clarified and made to be understood by the respondents before the interviews were conducted. Appointments with the healthcare providers were sought in advance. Whenever necessary, a topic and written guidelines for the interview was conducted and provided in advance in order to enable the respondents to explore the enquired information and therefore enable them to respond with evidence based responses.

3.7 Data Analysis and Interpretation

At the end of each interview, the researcher reviewed and completed notes that were taken during the interview with the respondent. The responds given by all respondents in the four hospitals was then compared, summarized and interpreted separately for each hospital. Data from the four hospitals was analyzed separately. Epi-Info software was used for quantitative data analysis. Statistical significance of association was assessed using Chi-square test at a significance level of 0.05. Descriptive summary statistics were first obtained using a univariate analysis. Bivariate analysis was performed to examine the association between referral status and individual factors. A qualitative content analysis method as described by Graneheim and lundman was used for analysis of qualitative data. All Texts from interviewed healthcare workers was analysed to identify patterns of response on general assessment of maternal referral system functioning. Each analysis included thorough reading of the transcribed text to identify points for assessment. The points were then categorized and coded. The codes were categorized according to similarities and differences in content.

3.8 Ethical Considerations

Ethical clearance to conduct the study was obtained from The Directorate of Research and Publication- MUHAS before conducting the research (Appendix 8). Further permission and approval was obtained from the city medical officer's office, the three municipal Medical offices and from the Managing Director of Muhimbili National Hospital (Appendix 9, 10, 11, 12). Informed consent (verbal/written) was also obtained from each participant (Appendix 6). Study objectives, methodology and benefits were explained to those who agreed to participate. Only those who consented were interviewed and were free to withdraw from the study at any point in time. To assure confidentiality participants were assigned numbers instead of names and only the researcher and research team had access to the respondent questioner. The questioners were stored in a safe place by the principal researcher and later on will be destroyed by burning after the study has been published to maintain privacy and

confidentiality. The final report of this research will be disseminated to the respective participatory hospitals without breaching confidentiality.

3.9 Pre-test

This was done in order to test the study instrument for clarity of questions, validity, reliability, feasibility and study logistics. This also assisted the research assistants to exercise for flexibility in the wording of questions and use of the prepared checklist for the Quantitative data collection from hospital obstetric registry books and obstetric data base. This exercise was carried out in one district hospital (Mkuranga district hospital) in the nearby coast region. This hospital was randomly selected from the list of District hospitals present in the region. Result of the pilot study was used to modify content and wording of the questionnaire.

3.10 Limitation of the Study

The sample to be studied included only those women who were admitted and had delivered at the time of study and did not include pregnant women who were admitted but had not delivered at the time of study. Analysis of retrospective data also included those women who were admitted and gave birth in the year 2008 in the four Hospitals.

The risks or threats that affected my data collection included lack of reliable and complete obstetrics data on maternal referrals needed for the study in all four District hospital and incomplete filled antenatal cards from the mothers that were interviewed in the maternity wards.

3.11 Exclusion Criteria

All referred mothers who were lacking antenatal cards and respondents who did not give consent for the interview.

CHAPTER FOUR

4.0 RESULTS

4.1 PATIENT INTERVIEWS.

4.1.1 Description of the study sample

A total of 392 women who were admitted at the labour ward and had just delivered in the four hospitals in Dar-es-Salaam, which included the three district hospitals and the National hospital were recruited during the study period. There were almost equal proportions of women from each hospital who were interviewed with an average of 98(25.0%) women per hospital (**Table 2).**

4.1.2 Demographic and socio-economic characteristics

Data in **Table 1** show a univariate analysis with majority of the women interviewed being those aged 20-24 years (28.6%), followed by those aged between 25-29 years (27%) and 30-34 years (21.9%). Most of the study participants were either married or cohabiting 303(77.3%). Majority of the women 241(61%) had completed primary education and only 75(19.1%) reported to have completed secondary education and beyond. Half of the women, 208(53.1%) had no job and reported as dependants of their partners and only 73(18.6%) of them reported to have permanent jobs. Over half of the women had 2 to 4 children and majority reported to have all their children alive 311(79%).

Table 1: Demographic and socio-economic characteristics of the study population

Characteristic	Number n=392	%
Age		
≤19	46	11.7
20-24	112	28.6
25-29	107	27.3
30-34	86	21.9
≥35	41	10.5
Religion		
Muslim	222	56.6
Christian	170	43.4
Marital status		
Married	303	77.3
Single	78	19.9
Separated/Divorced	7	1.8
Widowed	4	1.0
Educational level		
None	21	5.4
Primary-incomplete	27	6.9
Primary complete	241	61.5
Secondary incomplete	28	7.1
Secondary complete and beyond	75	19.1
Main source of income		
Permanent job	73	18.6
Unstable job	96	24.5
Peasant/Petty trader	15	3.8
Dependant(No job)	208	53.1
Parity		
1	137	35.0
2-4	230	58.7
≥5	25	6.3
All children alive		
Yes	311	79.3
No	81	20.7

4.1.3 Referral status distribution among interviewed women

Almost half of the women interviewed were self referrals 200(51.0%), and those with elective and emergency referral status were 97(24.7%) and 95(24.2%) respectively. Temeke hospital had the largest number of women with self referral 72(70.6%) as compared to other hospitals. Majority of women with emergency referral were those from MNH, 44/97(45.4%), while M/nyamala hospital had a slightly higher proportion of women 37(38.1%) with elective referral compared to the other two district hospitals (**Table 2**). Overall the difference in referral status among the hospitals were statistically significant ($p<0.05$).

Table 2: Distribution of study sample by hospital of admission and referral status.

Referral status	**Hospital name**				
	AMANA	M/NYAMALA	TEMEKE	MNH	Total
Self referral	40(41.7%)	47(48.5%)	72(70.6%)	41(42.3%)	200(51.0%)
Emergency referral	33(34.4%)	13(13.4%)	5(4.9%)	44(45.4%)	95(24.3%)
Elective referral	23(23.9%)	37(38.1%)	25(24.5%)	12(12.3%)	97(24.7%)
TOTAL	96(100%)	97(100%)	102(100%)	97(100%)	392(100%)

4.2 Maternal referral status and associated factors among interviewed women

Maternal referral status by some selected socio demographic characteristics

Table 3 summarizes results of a bivariate analysis that examined the association between socio-demographic characteristics of the study population and referral status. Referral status of the women was found to be independent of age, marital status, parity or number of children alive. However there was statistical significant association between referral status of the women and level of education ($p<0.05$) as well as to the main source of income $p<0.05$). A higher proportion of women who were self referrals had secondary education or beyond 49(65.3%), while 8(30.1%) of those with emergency referral status had no formal education. A higher proportion of women who had elective referral, 11(40.7%) had incomplete primary education. The same applies to the main source of income; a majority of the women who were found to have self referral were those with permanent jobs 43(58.9%). Most women with emergency referral were those with unstable jobs 38(36.6%) and those with elective referral majority 63(61.2%) were those who had no job (dependants), peasants and petty traders.

Table 3: Referral status of interviewed women by some selected background characteristics

Characteristic	Self	Emergency	Elective	Total	significance
	n= 200 (%)	n= 95(%)	n=97(%)	n=392(%)	p-value
Age (years)					**0.298**
≤19	17(37.0)	12(26.0)	17(37.0)	46(11.7)	
20 -24	61(54.5)	27(24.1)	24(21.4)	112(28.6)	
25 -29	60(56.1)	24(22.4)	23(21.5)	107(27.3)	
30-34	46(53.5)	17(19.8)	23(26.7)	86(21.9)	
≥35	16(39.0)	15(36.6)	10(24.4)	41(10.5)	
Marital status					**0.396**
Married/cohabiting	162(53.5)	70(23.1)	71(23.4)	303(77.3)	
Single	33(42.3)	23(29.5)	22(28.2)	78(19.9)	
Separated /divorced/widowed	5(45.5)	2(18.2)	4(36.4)	11(2.8)	
Educational level					**0.001***
None	6(28.6)	8(30.1)	7(33.3)	21 (5.4)	
Primary-incomplete	12(44.4)	4(14.8)	11(40.7)	27 (6.9)	
Primary-complete	117(48.5)	61(25.3)	63(26.1)	241 (61.5)	
Secondary-incomplete	16(57.1)	7(25.0)	5(17.9)	28 (7.1)	
Secondary complete +	49(65.3)	15(20.0)	11(14.7)	75 (19.1)	
Main source of income					**0.018***
Permanent job	43(58.9)	16(21.9)	14(19.2)	73(18.6)	
Unstable job	38(39.6)	38(36.6)	20(20.8)	96(24.5)	
Peasant+ petty trader	8(53.3)	2(13.3)	5(33.4)	15(3.8)	
Dependant (No job)	111(53.4)	39(18.8)	58(27.8)	208(53.1)	
Parity					**0.731**
1	65(47.4)	32(23.4)	40(29.2)	137(34.9)	
2-4	126(54.8)	56(24.3)	48(20.9)	230(58.7)	
≥5	9(36.0)	7(28.0)	9(36.0)	25(6.4)	
All children alive					**0.382**
Yes	169(54.3)	68(21.9)	74(23.8)	311(79.3)	
No	31(38.3)	27(33.3)	23(28.4)	81(20.7)	

***P < 0.05**

4.3 Operational Causes of self and institutional maternal referrals

Operational causes that had an impact on the type of referral, management of mothers after arrival at the hospital of delivery and outcome of delivery (both for mother and baby) were assessed. These factors are those reported by mothers themselves, such as distance to the RCH (ANC) clinic from where the mother lived, reported pregnancy related health problems by women during RCH (ANC) visits, first health facility that women visited after onset of labour and the perceived time that women estimated to reach the hospital by car after onset of labour. Also taking into consideration the referral status of the women, institutional factors that could have an impact on the management and outcome of delivery (mother and baby) were assessed. These factors included the ability of the RCH (ANC) to pick and refer accordingly those women with pregnancy related health problems during ANC visits, method of transport used to reach hospital for delivery, time taken by women to be seen by doctor or nurse after arrival at hospital of delivery, method of delivery and outcome of delivery.

4.3.1 Distance from the RCH (ANC) clinic to where women live

More than half of the mothers interviewed 229/392(58.4%), at the RCH (ANC) clinic they attended during this last pregnancy stayed within 1 km distance by foot from where they lived. Slightly over one third, 142/392(36.2%), lived between 1 and 5 km distance from the clinic and only 21/392(5.4%) stayed more than 5 km distance away. Of those who reported to be living within 1 km, a majority of them were from Temeke district 90(76.9%). The Kinondoni district had more women who reported to attend RCH clinic which was between 1 and 5 km distance from where they lived (Table 4).($p<0.05$)

Table 4: Distance between ANC and home by district of residence

Mothers district of residence	ANC Distance			
	≤ 1km	1 to 5 km	≥5km	Total
Temeke	90(76.9%)	21(18.0%)	6(5.1%)	117(100%)
Ilala	61(56.4%)	42(39.0%)	5(4.6%)	108(100%)
Kinondoni	78(46.7%)	79(47.3%)	10(6.0%)	167(100%)
Total	229(58.4%)	142(36.2%)	21(5.4%)	392(100%)

4.3.2 Women who reported to have pregnancy related health problems

Table 5 shows that regardless of their referral status almost one third 123/392(31.4%) of the surveyed women had pregnancy related health problems.MNH had the highest percentage 46(47.4%) of women who reported to have pregnancy related health problems while Temeke had least proportion of women 19(18.6%) with pregnancy related problems. This difference was statistically significant ($p<0.05$).

Table 5: Reported presence of pregnancy related health problems in last pregnancy by hospital.

Hospital Name	Pregnancy related problems		
	YES	NO	Total
MNH	46(47.4%)	51(52.6%)	97(100%)
AMANA	19(19.8%)	77(80.2%)	96(100%)
M/NYAMALA	39(40.2%)	58(59.8%)	97(100%)
TEMEKE	19(18.6%)	83(81.7%)	102(100%)
Total	123(31.4%)	269(68.6%)	392(100%)

4.3.3 First Health facility attended by women after onset of labour

Regardless of their referral status, most women 330/392(84.2%) attended hospital as their first health facility after onset of labour, whereas only 22/392(5.6%), went to first level of care (dispensary). MNH had highest proportion of women who came from health centres as their first referral point after onset of labour 24(24.7%).This difference was statistically significant **(Table 6).** ($p<0.05$)

Table 6: First Health facility attended by women after onset of labour by hospital

Hospital name	Health facility			
	Dispensary	Health centre	Hospital	Total
MNH	5(5.2%)	24(24.7%)	68(70.1%)	97(100%)
AMANA	7(7.3%)	0(0.0%)	89(92.7%)	96(100%)
M/NYAMALA	2(2.1%)	10(10.3%)	85(87.7%)	97(100%)
TEMEKE	8(7.8%)	6(5.9%)	88(86.3%)	102(100%)
Total	22(5.6%)	40(10.2%)	330(84.2%)	392(100%)

4.3.4 Perceived time by women to reach hospital after onset of labour

When asked about time that women took to reach the hospital for delivery as indicated in **Table 7**, majority 323/392(82.40%) of the interviewed women perceived that they took less than three hours to reach the hospital after onset of labour and only 59(15.1%) reported to have taken between three and eight hours. The difference in hours taken by women to reach the health facility was not statistically different among the four hospitals ($p>0.05$)

7: Perceived time taken to reach the hospital after onset of labour by hospital

Name of hospital	Perceived time to reach hospital			
	< 3 hours	3 to 8 hours	>8 hours	Total
MNH	82(84.5%)	14(14.4%)	1(1.1%)	97(100%)
AMANA	79(82.3%	16(16.6%)	1(1.1%)	96(100%)
M/NYAMALA	80(82.5%)	15(15.5%)	2(2.0%)	97(100%)
TEMEKE	82(80.4%)	14(13.7%)	6(5.9%)	102(100%)
Total	323(82.4%)	59(15.1%)	10(2.5%)	392(100%)

4.3.5 Referral status by identified risk factors picked at RCH clinic

Table 8: Referral status by RCH-card 4 identified risk factors

Risk factor identified	Referral status			
	Self	Emergency	Elective	Total
Group A	6(27.3%)	9(40.9%)	7(31.8%)	22(100%)
Group B	6(54.5%)	5(45.5%)	0(0.00%)	11(100%)
Group C	10(15.6%)	30(46.9%)	24(37.5%)	64(100%)
Total	22(22.7%)	44(45.4%)	31(31.9%)	97(100%)

Table 8 shows that, out of 123 women who reported to have health related problems during this last pregnancy (table 5 above), 97 were picked at RCH(ANC)visits and Majority of those picked had emergency referral status 44(45.4%).

Of those who were self referral, a higher proportion of women 6(54.5%) had Group B ANC identified risk factor. Among those with emergency referral status, there was almost equal proportions of women among the ANC identified risk groups, with a slightly higher percentage 30(46.9%) in those with group C ANC identified risk factors. Among those with elective referral most were those with Group C ANC risk factors. Emergency referral type was equally (homogenously) distributed among the three ANC identified groups.

4.3.6 Method of transport by referral status

Regardless of their referral status, 349/392(89.0%) had used paid transport to reach hospital of delivery **(Table 9).** A slightly higher proportion of women who used paid transport were seen among those with self referral status 190(95.0%), and most of women who used hospital ambulance were those who had emergency referral status 27(28.4%).This shows that there is a significant association between method of transport and referral status. ($P<0.05$)

Table 9: Method of transport by referral status

Referral status	**Method of Transport**			
	Hospital ambulance	Paid transport	By foot	Total
Self referral	0(0.0%)	190(95.0%)	10(5.0%)	200(100.00%)
Emergency referral	27(28.4%)	68(71.6%)	0(0.0%)	95(100.00%)
Elective referral	3(3.1%)	91(93.8%)	3(3.1%)	97(100.00%)
Total	30(7.7%)	349(89.0%)	13(3.3%)	392(100.00%)

4.3.7 Time taken by women to be seen by a doctor or nurse by referral status

We note from **Table 10** that majority of women 348/392(88.8%) reported to be seen in less than 1 hour by a nurse or doctor after arrival to the hospital. Although not statistically significant ($p>0.05$), it was noted that a slightly higher proportion of those who reported to be seen in less than 1 hour are women with emergency referral status 86/348(90.5%), while those who reported more than 1 hour after arrival to hospital 25/44(12.5%), were women who had self referral status. However, in general, we observed that time taken by women to be seen by a health worker after arrival to hospital of delivery did not depend on referral status of women.

Table 10: Time taken by women to be seen by a doctor or nurse by referral status.

Referral status	**Time**		
	<1 hour	>1hour	Total
Self	175(87.5%)	25(12.5%)	200(100%)
Emergency	86(90.5%)	9(9.5%)	95(100%)
Elective	87(89.7%)	10(10.3%)	97(100%)
Total	348(88.8%)	44(11.2%)	392(100%)

4.3.8 Method of delivery by referral status

Regardless of referral status, most of the women delivered by spontaneous vaginal delivery (SVD) 237/392(60.5%). A greater percentage of women who delivered by caesarean section was observed among those who had emergency referral 30(31.6%). Among those who delivered by assisted vaginal delivery, a higher proportion 26(27.4%) were also those women

who had emergency referral **(Table 11)**. The difference in mode of delivery among different referral status was statistically significant ($p<0.05$).

Table 11: Method of delivery by referral status

Referral status	**Method of delivery**			
	Spontaneous vaginal delivery(SVD)	Assisted Vaginal delivery	Caesarean section delivery	Total
Self referral	133(66.5%)	35(17.5%)	32(16.0%)	200(100%)
Emergency referral	39(41.0%)	26(27.4%)	30(31.6%)	95(100%)
Elective referral	65(67.0%)	18(18.6%)	14(14.4%)	97(100%)
Total	237(60.5%)	79(20.2%)	76(19.4%)	392(100%)

4.3.9 Outcome of delivery (baby) by referral status

Table 12 shows a statistically significant association between outcome of delivery (baby) and referral status of the mothers ($p<0.05$). Of all the babies who were reported as dead, most of them 13(13.68%), were from mothers who had received emergency referral from another facility after onset of labour. For those babies who were alive and sick, a higher percentage was seen among women with elective referral 20(20.6%) and those with emergency referral 17(17.9%). Babies who were reported to be alive and well a majority were from mothers who had self referral status 165(82.5%).

Table 12: Outcome of the delivery (baby) by referral status

Referral status	Baby outcome			
	Alive and well	Alive and sick	Dead	Total
Self	165(82.5%)	28(14.0%)	7(3.5%)	200(100%)
Emergency	65(68.4%)	17(17.9%)	13(13.7%)	95(100%)
Elective	68(70.1%)	20(20.6%)	9(9.3%)	97(100%)
Total	298(76.0%)	65(16.6%)	29(7.4%)	392(100%)

4.4 FINDINGS FROM INDEPTH INTERVIEWS OF HEALTHCARE WORKERS.

Sixteen healthcare workers who were involved with maternal care delivery from the four hospitals were interviewed regarding their assessment and how to improve the current functioning of maternal referral services in the district and National hospital. Four key people who were interviewed included, the doctor in charge of the hospital, the in charge of maternal health care services in the hospital, the in charge of labour ward, and a doctor or nurse working in the labour ward. The following were our findings.

4.4.1 Healthcare workers assessment of the current functioning of maternal referral services in hospitals based in Dar-es-Salaam.

A majority of the interviewed healthcare workers 12/16(75%), responded that the current functioning of the maternal referral services in the district and National hospital was poor. Only 4/16(25%) rated the system as good functioning as seen in **Table 14**. When told to give reasons and explain, those who rated the system functioning as poor, considered insufficient or lack of trained human resources to be the major obstacle. This was especially so among those working in the labour ward and obstetric theatres in both the district and National

hospital. When asked if the total health workers needed for obstetric maternal care was adequate or not, all 16 healthcare workers interviewed reported inadequate number of staff especially trained nurses and doctors working in labour wards.

Lack or insufficient non-human resources was also a major factor that most of respondents pointed out as a reason for the poor functioning of the referral system. Lack, insufficient or poorly functioning peripheral health centre and hospital ambulances was mentioned as a factor for bad referral service functioning by almost all respondents. One ambulance driver or presence of only one ambulance for the whole hospital, with no specific ambulance for obstetric emergencies, was pointed out as a major cause of delay for maternal referrals to the next level of care. Insufficient, poorly functioning and old diagnostic equipments both in the labour wards and obstetric theatres was also mentioned as a factor.

All respondents from MNH pointed out that delayed or late referrals of mothers from the district hospital as a reason for most deaths of mothers occurring on the way or soon after arrival to the National hospital, one nurse at MNH said:-,

"It is sometimes unbelievable that mothers requiring emergency referral are kept in the hospital for the whole day until late in the evening that is when you will see ambulances from all the three district hospital bringing patients, when you ask the escorting nurse why patients are brought late they give you many reasons "saying, either there were too many patients requiring caesarean section or the theatre was not working, or blood was unavailable".

Other factors that were emphasized were: Delay in decision making by doctors and nurses on whether or not to refer, lack of baseline management together with poor/incomplete history taking of the referred mothers, lack of follow-up or communication between the referring and receiving hospital, poor antenatal clinic recording on the ANC cards, and referred women from ANC who were not/poorly educated on their problems hence coming late to hospital. Also the presence of many self referral patients in both district and national hospital was mentioned as a reason for poor functioning of the referral system.

When asked if the current maternal referral system functioning contributed to reduce maternal mortality in their hospitals, 9/16(56.2%) of the respondents said NO and 7/16(43.8%) said YES **(Table 13).** One of the respondents in the district hospital who replied "yes" said:-,

"To some extent yes, it has somehow reduced the rate of maternal mortality in our hospital but it is not that significant, in most cases it is the maternal morbidity rather than maternal mortality that is reduced, because in our hospital we provide EMOC services, but due to lack of human and non human resources, we often have too many emergencies that the hospital cannot tackle at a go".

Table13: Response by health care workers on assessment of referral system functioning.

Questions	**Answers**		
What is your assessment of the current functioning of maternal referral services in Dar-es-salaam?	**Good functioning**	**Poorly functioning**	**Total**
	4(25%)	12(75%)	16(100%)
Do you think the current maternal referral system is helping in reducing the rate of maternal mortality in your hospital?	**YES**	**NO**	**Total**
	7(43.8%)	9(56.2%)	16(100%)
Is there any guideline that is used when referring pregnant women to higher level of care?	**YES**	**NO**	**Total**
	12(75%)	4(25%)	16(100%)

4.4.2 Factors affecting the implementation of referral advise

When asked on what the respondents thought were the factors affecting the implementation of the referral advice in their hospital, a majority mentioned the lack of human and non-human resources, such as few or no obstetric specialist at the district hospitals and breakdown of utensils (autoclave, theatre and lack of suture materials). Delay in decision making by nurses and doctors to refer, inadequate knowledge of staff in early detection of women at risk, poor attitude of staff towards patients, and breakdown of communication regarding feedback on the referral cases between the hospitals were among the main reasons mentioned by most of the respondents .One of the doctors working in the district hospital said:-,

"The current referral system has no feedback mechanism. We need to have feedback on all referrals that are taken to MNH from our hospital, I am not sure what has hindered implementation of this, probably policy makers and the ministry of health is to be involved".

4.4.3 Use of guidelines

When asked whether they used any guideline when referring women to a higher level of care, 12/16(75%) of the respondents replied NO to the question and 4(25%) replied YES **(Table 13).** When asked to explain the criteria they use when referring women, a majority of those who replied NO said the decision was based on clinical diagnosis of women. Use of referral forms as guideline was mentioned by two of the respondents who answered YES to the question and use of EmOC guideline was mentioned by the other two.

4.4.4 What should be done to improve the functioning of the current referral system

All respondents stressed the need to employ more trained healthcare workers, especially midwives and obstetric specialist. Also, the need to have continued on-job training of the employed staff was emphasized. Staff motivation in monetary terms and good working conditions was also mentioned as a factor that could improve the commitment of healthcare

workers to their job and therefore improve the services they provide, as one doctor in charge said:-,

"Inadequate manpower is one of the major contributing factors to higher rate of maternal referrals to MNH and maternal mortality here in our hospital, this is because deliveries are so many ranging from 50-80 per day, and nurse to patient ratio is so high, proper care of patients is just next to impossible!"

The provision of a referral guideline to health facilities, was also mentioned as a factor that could improve the referral system, as well as provision of specific ambulances in the district hospital (for the obstetric patients only), quick decision making, early detection of risk pregnancies at ANC visits, empowering the health centers by hiring more staff, and timely availability of equipment and supplies needed for obstetric care. Most doctors in the district hospitals mentioned the need to have a feedback mechanism and continuous communication between hospitals regarding the referred cases, and also the need for the MNH to have meetings with the peripheral hospitals to discuss problems and set objectives on how to improve the referral system as one of them said:-,

"I think first the referral forms should be changed, because the current one is too shallow, you cannot put much detail about the patient, and secondly, this referral system should have a feedback mechanism and communication between hospitals at the time of referring".

4.5 RESULTS FROM HOSPITAL RECORDED MATERNAL OBSTERTRIC DATA.

The following is recorded data on total maternal obstetric admissions and referrals, total deliveries, major medical causes of maternal obstetric referrals from the district hospital to MNH and delivery outcome (mother and baby), from the District hospital obstetric registry

and delivery books and also from MNH obstetric data base from 1st January to 31st December 2008.

4.5.1 District hospitals and MNH maternal admissions, deliveries and referrals

From table 14 below, we note that there is a slight difference in the total number of maternal referrals from the district hospital to MNH (2951) which was recorded from district hospitals obstetric registry books as compared to that found at MNH obstetric data base (3043) for the year 2008. Amana had the highest number of maternal referrals to MNH i.e. 2,308(6.7 %), Temeke and Mwananyamala had 471(2.4%) and 172(1.1%) respectively. Of the total obstetric maternal admissions in 2008 in the three district hospitals, 2,951(4.2%) were referred to MNH. 3034(31.1%) of the total obstetric admissions to MNH were referrals from the three district hospitals.

Table 14: Maternal obstetric admissions, deliveries and referrals by hospital

Name of hospital	**Total obstetric maternal admissions**	**Total deliveries**	**Total referrals to MNH from district hospital**
Amana	34,354(49.1%)	29,194(85.0%)	2,308(6.7 %)
Temeke	19,716(28.2%)	18,793(95.3%)	471(2.4%)
Mwananyamala	15,875(22.7%)	15,643(98.5%)	172(1.1%)
Total	69,945(100%)	63,630(91.0%)	2,951 (4.2%)
	Total obstetric maternal admissions	Total deliveries	Total referrals from district hospital to MNH
*recorded at MNH	9,726	9,722	3,043(31.3%)

*There was a slight difference in the 2008 districts hospitals recorded data on total maternal referrals to MNH (2,951) from that which was recorded at MNH obstetric database (3,043)

4.5.2 Medical causes and outcome of obstetric maternal referrals (self, emergency and elective) from the district hospital managed at MNH in 2008

Table 15 shows that out of the 3043 obstetric maternal referrals received at MNH from the three district hospitals, the big proportion 2085(68.7%) had been referred with no specific cause or as normal delivery although 11 of them died . 401(13.2%) were referred due to previous scar, HIV/AIDS disease 200(6.6%), PIH 176(5.8%), anaemia 86(2.8%), APH 43(1.4%), multiple pregnancy 28(0.9%) and 12(0.4%) were due to PROM. Among the 3,043 referred cases, 29(1.0%) died, i.e. MMR 1,046 per 100,000 live births. And majority of the death were due to anaemia 10(34.5%) and HIV/AIDS disease 4(13.8%). Of the total neonates delivered from the 3043 mothers received at MNH 273(9.0%) i.e. giving a perinatal mortality rate of 90 per 1,000 total birth.

Table 15: Major medical causes and outcome of obstetric maternal referrals from the district hospital managed at MNH in 2008

Medical cause of referral	Total cases referred to MNH	Outcome of mother		Outcome of baby	
		Survived	Died	Survived	Died
For delivery	2085(68.7%)	2074	11	1942	143
Previous scar	401(13.22%)	401	0	393	8
HIV Disease	200(6.57%)	196	4	150	50
PIH	176(5.78%)	174	2	150	26
Anaemia	86(2.83%)	76	10	53	33
APH	43(1.41%)	43	0	37	6
Multiple pregnancy	28(0.92%)	26	2	25	3
PROM	12(0.39%)	12	0	11	1
Unknown/unrecorded	6(0.19%)	6	0	4	2
Malpresentation	3(0.10%)	3	0	2	1
Cardiac disease	2(0.07%)	2	0	2	0
RH-ve	1(0.03%)	1	0	1	0
Total	3043 (100%)	3014 (99.0%)	29 (1.0%)	2770 (91.0%)	273 (9.0%)

CHAPTER FIVE

5.0 DISCUSSION

5.1 Distribution of maternal referral status among delivered women

Our study findings show that there is high percentage of self referrals among mothers delivering in the National and district hospitals in Dar-es-Salaam, despite the fact that these are second and third level referral hospital. This could be a clear testimony of malfunctioning of referral system for obstetric care in the city and this phenomenon is also shared to other rural areas in Tanzania (31). As we have seen in the results, more than half of the women delivering in the district and National hospital in Dar-es-Salaam were self referrals. Complying with full implementation of national referral guideline 30% to more than 50% of all pregnant women are expected to be referred antenatally (elective) or for delivery (emergency) (22).

These finding are similar to an observation from a study done in one rural hospital of Tanzania which showed that self referral for delivery often without specific medical reasons is the commonest mode of referral while institutional referral is less and emergency referral is very rare (12). Another study done in southern Tanzania showed almost the same results with a rate of 55.2% of self obstetric maternal referral (22). This is also supported by the results of our study were we found that regardless of their referral status more than 80% of the interviewed mothers attended hospital as their first health facility after the onset of labour indicating bypass of lower levels of care. These findings signal that there is poor maternal referral system functioning in the country and therefore by pass and less utilization of delivery services in most of the dispensaries and health centers and as a results causing poor maternal delivery service provision in the higher levels of care due to patient congestion and overworked healthcare workers.

5.2 Causes of self and institutional maternal referrals.

5.2.1 Socio-demographic associated causes

This study revealed that the referral status of the women was independent of age, marital status, parity or number of children alive. However there was a strong association between referral status of the women and their level of education and main source of income. The fact that level of education was associated with the type of referral, indicates that majority of women who are self referrals are those who are more educated and therefore most likely to be knowledgeable on health related issues and therefore have the ability to decide on where they would prefer to deliver depending on perceived quality of delivery services provided. To our surprise our results also showed that, a higher percentage of women with emergency referral and those who delivered by caesarean section was observed among the less educated women. This also applies to the source of income, majority of the self referrals were those women who had a reliable and permanent source of income and therefore could afford the costs that could arise by self referring and bypassing the lower levels of care. This is true due to the fact that a higher percentage of women who used paid transport to hospital after onset of labour were self referrals. These results are in agreement with other studies done in other parts of the low income countries such as those done in Nepal and Nigeria which showed that there was a strong association between mother's socio-economic status and choice of place of delivery (17, 19).

Most women who had no formal education and those with unstable jobs, constituted majority of the emergency referrals indicating the probability that these women followed through the normal channel of referral since most of them could not afford the cost of bypassing or due to lack of knowledge on the danger signs of pregnancy. These findings are similar those found in a study done in Morogoro region in Tanzania and that in Osun state of Nigeria which showed that formal education had great impact on the women taking decision on major issues regarding their health and place of delivery even in the absence of their husbands.(27,).

5.2.2 Operational causes of self and institutional maternal referrals

Literature review shows that in most rural parts of Africa and Tanzania in particular, long walking distance to RCH/ANC has been shown to set a big obstacle leading to poor ANC attendance for pregnant mothers and therefore affecting the timely referral of mothers who are found to have pregnancy related risk factors (3, 17, 19). Our study findings however indicate that this is not the case in urban areas such s Dar-es-Salaam, as it is seen in the result chapter with more than 95% of the study participants living less than 5km walking distance from the ANC, indicating that most of the women in urban areas have access to ANC services.

It was also observed that almost one third of study participants reported that they had pregnancy related health problems during pregnancy and 79% of them were picked and there health problems recorded in the antenatal cards. 31.9% received elective (antenatal) referral. These results are different compared to a study done in southern Tanzania which showed there was very low rate of antenatal referral in contrast to the expected 20% if there was full implementation of official referral guidelines (22). Possible explanation for this difference could possibly be the availability of enough skilled healthcare workers who are more willing to work in ANC clinics set in urban rather than rural areas of the country and therefore resulting in proper screening, identification and referring accordingly during ANC visits those mothers with pregnancy risk factors.

The Prevention of Maternal Mortality (PMM) network developed a 3 delay model whereby they identified the points at which delivery of efficient and effective emergency obstetric care is delayed. (9). Based on the model, our study looked on these delay points in order to find out if they had any association with the referral status of the women. We found that regardless of mode of transport or referral status, more than 80% of women used less than 3 hours to reach hospital of delivery by car after onset of labour and almost 90% reported to be seen within less than one hour after arrival to hospital. These results are in contrast to other studies done in Tanzania, Ghana and Zaria Nigeria which showed that the average time taken by patient to be seen by a doctor or nurse after admission was 2.6 hours with a maximum of up to 17 hours (6, 28).

This indicates that in urban areas long distance to hospital is not a factor for high rate of self referrals observed, since most women can actually reach hospital and be seen by health workers within required time. Surprisingly also maternal and perinatal mortality rate was very high among the referred women, therefore questioning the quality of care provided and proper decision making by health workers on timely referral of emergency cases to next level of care.

Our study also found that when referral status was taken into consideration, there was no difference in time taken by women to be seen by health worker, meaning that whether the woman had self, emergency or elective referral status all were seen within less than 1 hour after arrival to hospital, leading to more questions on the priority setting especially for those women with emergency referral status and when doctor/nurse to patient ratio is taken into consideration.

5.2.3 Medical causes of self and institutional maternal referrals

Several studies done on the prevalence of risk factors in pregnant women in general and in those using referral level care, found that the trend of risk factors or health problems that triggered referral from antenatal clinic healthcare workers for majority of women who received the referral advice was the same. Risk factors of previous caesarean section, ante partum haemorrhage, multiple pregnancy, Anaemia, PIH and malpresentation which we categorized as Group C risk factors were the major causes of referral from ANC to district and National hospital, these are in agreement with the results of other studies which showed the same pattern of conditions (22). With the current EMOC guideline such conditions should be managed at the district hospital, but as we have seen due to many reasons such cases are referred to MNH and thus impairing the implementation of an orderly functioning referral system.

5.3 Maternal referral services functioning in district and national hospital

Studies done on maternal referral system functioning in Africa and Tanzania in particular, have shown serious weaknesses which need to be addressed, in order to have an effective functioning system (3, 10, 12, 31).

The 2004-05 Tanzania Demographic Health Survey (TDHS) report on Adult and Maternal Mortality showed that between 1995-2004, the maternal mortality ratio was estimated at 578 maternal deaths per 100,000 live births, Studies done at Muhimbili National Hospital, Between 1993 and 1999 showed a maternal mortality ratio of 591 per 100,000 live birth and between 1999 and 2005 the maternal mortality ratio was 512 per 100,000 live births (14, 17).

The most recent estimates of maternal mortality ratio in Tanzania is 950/100,000 live births (30). This current study results are in agreement with the above findings were we found similar situation with a maternal mortality ratio of 1,046 per 100,000 live births among mothers referred to MNH form the three district hospital. With this high maternal mortality ratio and high prevalence of self referrals among the women interviewed, it is very clear that our maternal referral system is very poorly functioning and needs urgent changes.

5.3.1 Lack of human and non human resources

Among the major factors perceived to affect implementation of a proper functioning referral system in Tanzania is lack of human and non- human resources in our health facilities. Insufficient or lack of trained personnel especially nurses and a doctors working in the obstetric wards can be associated with delayed decision making or proper management of women and especially those requiring emergency referral to higher levels of care. This could be the reason for high rate of self referrals and bypass of lower levels of care, since most women would not take the risk of going through the normal referral channel when there is a great chance of being delayed or improperly managed as a result of few or lack of properly and enough trained personnel in the lower level health facilities (31). This has therefore lead

to over utilization of the delivery services in the district and National hospital and therefore causing congestion of patients and compromising the quality of care provided at these levels.

Few, poorly functioning or no ambulances in the peripheral health centers, could be a major factor leading to the large number of women not following the referral advice and deciding to bypass the lower levels. This is supported by the result of this study were we found that, even those women with emergency referral, more than two thirds of them used paid transport and only one third used hospital ambulance to reach hospital.

According to the ministry of health of Tanzania recommendations in its health planning guidelines that obstetric services in the first referral hospitals must be available regularly and at all times and convenient to the members of the community (29), then for the implementation of this, the above mentioned obstacles need to be addressed first.

5.3.2 Lack of referral guidelines

The absence of referral guidelines in all the four hospitals was a critical observation that could have been associated with poorly functioning referral system. Guidelines for referral are crucial in order to provide proper management and timely referral of patients. The provision of referral guidelines for antenatal and intrapartum care in all health facilities is a cornerstone to an effective orderly functioning referral system (32).

5.4 Maternal referral delivery outcomes in the district and national hospital

Based on the assumption that, the outcome of maternal referrals (mother and baby) reflects the effectiveness of maternal referral system in the reduction of maternal mortality, it is then very clear from our findings that the current referral system functioning in Dar-es-Salaam is not helping to reduce these mortalities. With maternal mortality rate of 1,046 per 100,000 live births among referred mothers and perinatal mortality rate of 90 per 1,000 total births, the current system needs to be reviewed.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

This study has revealed the state of poor and inadequate functioning of the current maternal referral system in Dar-es-Salaam public health institutions leading to high prevalence of self maternal referrals in the district and National hospital. This therefore calls for urgent review of the current health system polices to address underlying causal factors for the poor functioning. A major investment is also needed to improve the current maternal referral system in the city in order to achieve the global millennium Development Goals set for maternal and child survivals by 2015 (2,30,31).

6.2 Recommendations

- Urgent review of the current maternal referral polices in the country.
- Provision of maternal referral guidelines to all health facilities in the country.
- Avoid maternal referral due to bad outcomes and implement emergency obstetric care functions at every facility providing maternal services.
- Empower the district hospital data record keeping especially on maternal referrals.
- Build a regional hospital in Dar-es-Salaam to reduce the congestion of referred patient at the National hospital.
- Empower the health centers and dispensaries so that they provide quality and timely delivery services so that they capture the by passers and hence reduce congestion in the higher levels of care.

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