

**ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG EASTERN REGION,**

**GHANA**

**Analysis of pregnancy-associated surgical interventions at the Volta**

**River Authority Hospital in Akosombo, Ghana**

**2011-2015**

**By**

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**in partial fulfilment of the requirements for the degree**

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## DEFINITION OF TERMS

**Incompetence cervix** - inability of the uterine cervix to retain a pregnancy in the second trimester, in the absence of uterine contractions.

**Abortion** - pregnancy termination prior to 20 weeks' gestation or a fetus born weighing less than 500g.

**Caesarean section** - is a surgical procedure used to deliver a baby through incisions in the mother's abdomen and uterus.

**Eclampsia** - is the onset of seizures (convulsions) in a woman with pre-eclampsia.

**Pre-eclampsia** is a disorder of pregnancy in which there is high blood pressure and either large amounts of protein in the urine or other organ dysfunction.

**Fetal distress** – are signs before and during childbirth indicating that the fetus is not well.

**Cephalopelvic Disproportion** - when the capacity of the pelvis is inadequate to allow the fetus to negotiate the birth canal.

**Major surgery** – penetrates and exposes a body cavity; any procedure that has the potential for inducing permanent anatomic (physical) or physiologic impairment.

**Minor surgery** – Is a procedure that neither penetrates or exposes a body cavity, nor induces permanent impairment of physical or physiologic function.

**Houseman** - A **doctor** who is the most junior member of the medical staff of a hospital

**Resident** - Medical school graduate undergoing on the job training.

**Obstetrician & gynaecologist** - A doctor who specializes in pregnancy, childbirth, and a woman's reproductive system.

**Antepartum Haemorrhage** - Bleeding from or in to the genital tract, occurring from 24+0 weeks of pregnancy and prior to the birth of the baby.

**Postartum Haemorrhage** - Blood loss of 500 ml or more within 24 hours after birth.

**Breech Presentation** - Fetus in a longitudinal lie with the buttocks or feet closest to the cervix.

## **ABBREVIATION/ ACRONYMS**

BOH – Bad Obstetric History

C/S – Caesarean Section

ERPC - Evacuation of Retained Product of Conception

GA – General Anaesthesia

HICs – High Income Countries

LMICs – Low to Middle Income Countries

MDG – Millennium Development Goal

MMR – Maternal Mortality Ratio

NHIS – National Health Insurance Scheme

PA – Physician Assistant

PIH – Pregnancy Induced Hypertension

SA – Spinal Anaesthesia

SDG – Sustainable Development Goal

UN – United Nation

VRAH – Volta River Authority Hospital

WHO – World Health Organization

ICD – International Classification of Disease

## ABSTRACT

**Background:** There is increasing recognition of the role of surgery in public health. The provision of Emergency and Essential Surgical Care is now a global health priority. To develop such care in low and middle-income settings, there is the need to systematically document the role of surgery in various aspects of essential care. This study is a systematic extraction of data and analysis of pregnancy-associated surgical interventions at the Volta River Authority Hospital (VRAH) in Akosombo from 2011 to 2015.

**Method:** The study is a descriptive, retrospective review of records on pregnancy-related surgical interventions. A data extraction tool was developed which was used to collect the data. Analysis was largely descriptive. Relations were explored for some specific parameters of interest.

**Results:** Data was extracted for 3221 cases. About a third (61%) constituted emergency surgeries with 40% coming from outside of the district where VRAH is located. The leading procedures performed were evacuation of retained products of conception due to incomplete abortions (75% of abortion-related cases), and caesarean sections. The major indications in abortion-related conditions were incomplete abortions (75%) while the leading indications for caesarean sections were previous uterine surgery (30.6% of caesarean sections), hypertensive diseases in pregnancy (14.2%) and cephalopelvic disproportion (11.6%). The majority of cases were performed by teams led by residents (28.2%) and housemen (24.2%). The mean duration of stay in the hospital post- surgery were 3.4 (SD  $\pm$  1.9) days respectively. Duration of stay was significantly influenced by the age of patients (P-value=0.004) with younger (<20yrs) tending to stay beyond three days. Satisfactory state was recorded as at day 3 post-surgery in 99.8% of cases. Less than 1% of cases were referral to higher level facilities.



**Conclusion:** A database of five years of pregnancy-associated surgical interventions at VRAH has been established. The analysis generates parameters important for monitoring and promoting the role the VRAH plays in improved maternal care and surgical training in Ghana. The diversity in the indications and procedures performed make the VRAH a candidate facility for the training of undergraduate and postgraduate medical students

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## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.0 Background Information**

Surgery is the specialty of medicine that treats diseases and disorders by cutting, removing or changing the body with an operative procedure which may include suturing, incision, excision, manipulation or other invasive procedure requiring anesthesia (Whitlock 2016) and maternal health refers to the health of women during pregnancy, childbirth and the postpartum period.

Pregnancy and childbirth are all too often a cruel and harsh lived experience for Africa's women, particularly the poor and women in rural areas. Almost 75 per cent of women who die in childbirth would be alive if they had access to the interventions for preventing pregnancy and birth complications (Panel & Brief 2010). These maternal deaths are caused by a wide range of complications in pregnancy, childbirth or the postpartum period. Most of these complications develop because of the pregnancy itself, and some occur where pregnancy has aggravated an existing disease.

The major causes of maternal death include severe bleeding (mostly bleeding postpartum), infections (also mostly soon after delivery), hypertensive disorders in pregnancy (eclampsia), obstructed labour and complications after unsafe abortion. Maternal health care including family planning and delivery with the help of a skilled health professional plays an important role in reducing maternal and neonatal mortality but provision of essential surgical prevents chronic disabilities and both maternal and prenatal death. Surgical services is not a luxury, but a critical component of the "highest attainable standard of health." Yet while access to select basic health care interventions has increasingly been discussed as part of the human right to health, essential surgical services have generally not been part of this discussion. Despite the substantial global burden of surgical conditions

in low- and middle-income countries, extreme global disparities in access to surgical care, and the fact that relatively simple, cost-effective, and curative surgical procedures can avert disability and premature death from many life-threatening emergencies and other conditions. Many barriers, both in supply and demand-related, such as constraints in human resources, infrastructure, and access to care, have limited the ability of health systems to deliver surgical services.

Large gaps in access to essential surgical care in LMICs result in considerable morbidity and mortality. The aim of this study is to provide a baseline overview of essential surgical and anesthetic capacity at district-level health facilities in multiple LMICs (Kushner et al. 2010). Strengthening the world surgical systems will be an important step toward achieving target for many of the SDGs. Achieving the SDGs requires a robust hospital systems offering comprehensive health care including emergency obstetric surgery as the success achieved in Millennium Development Goals 4, 5, and 6.

The current emergence of the role of basic essential surgery is an opportunity to place the role it plays in improving maternal health in perspective. There is an opportunity to mobilize global, national, and at community-level commitment to establish an agenda for surgery for women's health. Comprehensive women's health requires strong, resilient surgical systems that treat surgical disease in women across all diagnostic categories (Faught et al. 2015).

## **1.1 Problem Statement**

Emergency and essential surgical care at district hospitals is increasingly being recognized as a critical but woefully inadequate element of health systems in developing countries, especially in Africa. Health systems strengthening are now emerging as a priority for global health. District hospitals in developing countries such as Ghana serve as the first level of referral care for patients who are presenting with conditions that require treatment with surgical procedures. District hospitals tend to be more accessible than regional hospitals.

A five-year review of how theatre services are utilized for maternal health care will bring to bear the most frequently occurring conditions requiring surgery. This will help facility and other stakeholders to map up to render the needed services by providing needed skills, infrastructure and logistics required in keeping the UN Global Strategy for Women's, Children's and Adolescents' Health.

The Hospital of the Volta River Authority in Akosombo is generally perceived in Ghana to be a well-run health facility at the district level (Hospital n.d.). The lessons in how this facility has used its surgical services to contribute to improved maternal health care will be reference documentation as the Ministry of Health in Ghana joins the global initiative to make surgical care an essential part of primary health care in the country.

## **1.2 Rationale of Study**

Women's surgical needs form an essential part of any package of basic health services due to their physical and physiological vulnerability. Improved maternal care through the provision of obstetrical surgical interventions at district level within low income countries is essential components of health care delivery in reducing maternal mortality. With the use of data, women's health can be argued for a strong comprehensive surgical care. Hence the study in VRA Hospital, as there exist no such data on obstetric surgical interventions.

## **1.3 Hypothesis/Conceptual framework**

This research seeks to look at how surgery can be used to improve maternal health and prevent maternal mortality in general. It will focus on the indication that warrants surgery in all pregnancy related problems, the types of surgery that is required to improve the health of mother and baby. In addition, it looks at other skill such as the anaesthesia to be given prior to the surgery. To determine the specialty need to perform such procedures. It will further look at the decision time for surgery, the time spent at the hospital after surgery. Lastly to look at how surgical wound are assessed.

## **1.4 General Objective(s)**

- To describe how surgical interventions have been applied in maternal health delivery at VRA hospital in Akosombo.

### **1.4.1 Specific Objectives**

- To describe the socio-demographic characteristics of patients.
- To identify the leading indication for pregnancy related surgeries.
- To determine the types of surgical interventions made.
- To analyze the types of surgical intervention.
- To describe the forms of anesthesia used in the surgeries.
- To provide for VRA hospital an analyzable database of pregnancy related surgical intervention.

## **1.5 Profile of Study Area**

### **Volta River Authority (VRA) Hospital**

VRA Health Services department formerly a subsidiary of the VRA, with its facilities has been converted into Limited Liability Company. It was established primarily to see to the health care needs of employees and dependents of the VRA and population impaired by the creation of the Dam. Additionally, the company works to mitigate the environmental, health and other challenges that arise from the operations of the Authority.

VRA Health Services department is currently headed by a Medical Director who is assisted by an administrative unit. VRA Health Services department reports to the Management and Board of VRA and received funds from the authority. The VRA Health Services department is responsible for administering the running of all the health facilities of the VRA. These are currently made up of the Akosombo /Akuse Hospital, the Accra Hospital and the Aboadze Hospital. For purposes of this study, Akosombo hospital was selected as the study site. This is on account of its proximity.

The VRA Hospital is located in Akosombo, on a Land allocated to the Volta River Authority enactment under the Volta River Development Act, Act 46 of the Republic of Ghana. It is situated in the Asuogyaman District in the Eastern Region of the Republic of Ghana. It is a licensed, registered and regulated by the Health Facilities Regulatory Authority. The Hospital is also a designated NHIS service provider. It is the only hospital in the Asuogyaman District in the Eastern Region of the Republic of Ghana operating as district hospital. VRA hospital also comes under the regulatory and supervisory umbrella of the Ghana Health Services. The hospital is there referred to as a quasi-facility.

The hospital currently has 64 beds and offers the following services; Out and in patient services, Eye Clinic, Obstetrics and Gynecology; Dental Clinic, General Surgery, Orthopedic, General Medicine, Laboratory, X-ray, Pharmacy, Theater, Mortuary, Laundry and Catering services. In addition, VRA Hospital provides free specialist and general medical care to communities along the Volta Lake accessible only by boat, through its medical boat christened MV ONIPA NUA.

The hospital has two resident surgeons, visiting orthopaedic surgeons (one local and the other from the UK with his team of surgical specialties). It also has two resident obstetrician gynaecologists who provide both obstetric and gynaecological care to the client. A physician specialist leads the medical team in providing medical care to the client. The hospital has a dentist, an ophthalmologist, 3 nurse

anaesthetists, perioperative nurses and other utility staff who assist with work in the theatre. The hospital has two main and one minor operating theater that operates with three (3) anaesthetic machine. The operating theatre works in collaboration with the emergency and obstetrics and gynaecology unit to provide maternal health care to its clients. Obstetrics and gynaecology operation day falls on Mondays and Wednesdays while emergency surgical services are provided to clients as and when needed. On average about 88 obstetric surgical interventions (both major and minor) are undertaken each month.

### **1.6 Scope of Study**

This study will look into pregnancy related surgical interventions from 1st January 2011 to 31st December, 2015. As defined by WHO maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. Improving maternal health through appropriate timely intervention of both surgical and non-surgical care. This includes antenatal care, labour and delivery methods and postpartum care. For the purpose of this study, this study will strictly look into only the surgical interventions in pregnancy care. This will exclude other forms of nonsurgical care given to pregnant women.

### **1.7 Organization of Report**

This research work is organized chronologically from chapter one to chapter six. Chapter 1 will introduce the topic, discusses the background, states the problem and define the objectives as well as describing the study site. Chapter 2 presents the review of literature. Chapter 3 will identify the methodology and the data collection procedure. Chapter 4 will present the analysis of data and the

results of the study. Chapter 5 discusses the findings and its implication. Chapter 6 will summarize the key findings and outline recommendation to stakeholders.



## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.0.1 Introduction**

Globally over five billion people do not have access to the simplest surgical procedures. There is now a global initiative to make access to surgical services a part of essential primary care in low and middle-income countries. (Alkire et al 2015, Dare et al 2015) A major objective of primary health care likely to benefit from this initiative is improved maternal care, including the prevention of maternal deaths. Early surgical intervention is critical to the prevention of maternal deaths from haemorrhage, abortion complications and hypertensive diseases in pregnancy etc.

Global health initiatives are fueled by the extent of the associated public health need, the severity of the problem involved and the availability of feasible solutions to that problem. The need for a healthy universal population had globally remained prominent over the past couple of decades on the global agenda. After the era of “Health for All” by the year 2000, came the adoption of the Millennium Development Goals (MDGs) at the UN Summit in 2000, with goal 5 focusing on improving maternal health of which significant successes were made by meeting the target nearly half way through, that is 45% gains globally. The MDG reduced maternal mortality ratio by three- quarters, between 1990 and 2015, and at the end of 2015 about half of pregnant women had universal access to reproductive health. Available literature suggests that some progress may have been made in reducing child mortality, improving maternal health and combating HIV/AIDS, Malaria and other diseases, although there exists more room for improvement. The progress made was identified to be uneven across region and countries. As the MDGs end, the world has the opportunity to build on the successes and gather momentum to embrace new ambitions for the future with the new global strategy Sustainable Development Goals (SDGs) (United Nations 2015). Goal 3 of the current Sustainable Development Goals (SDGs) is “Good health and well- being” and seeks to ensure healthy

lives and to promote the well-being of all at all ages which is essential to sustainable development". It is expected that by 2030 global maternal mortality ratio will be reduced to less than 70 per 100,000 live births (Loewe & Rippin 2015). The SDG calls for an accelerated progress in order to achieve the global target of maternal mortality ratio 70/ 100000 live birth or less by 2030. Achieving this global goal will require countries to reduce their MMR by at least 7.5% each year between 2016 and 2030. By every country is expected to reduce its MMR by at least two thirds from 2010 baseline and no country should have a baseline MMR more than 140 deaths per 100 000 live births. An original condition for the attainment of health for all and equity in the provision of health services is that all patients should be able to realistically access basic health care. Access to essential surgery is a basic part of any modern health delivery system and every patient has the right to be treated using the safest technology available in health facilities (Damien et al. 2011).

Surgery is the specialty of medicine that treats diseases and disorders by cutting, removing or changing the body with an operative procedure which may include suturing, incision, excision, manipulation or other invasive procedure requiring anesthesia (Whitlock 2016). Surgery remains part of the curative medical model and was until recently neglected in public health globally in spite of the benefits it offered. Farmer and Kim (2008) attempted the following explanation as possibly accounting for this;

First, international health had been dominated for decades by those concerned with communicable disease, from small pox to AIDS. This is not surprising because until the advent of non-communicable diseases most mortality was as a result of infectious diseases and so more efforts may have been geared towards their prevention, treatment and or possible eradication.

Second most pathologies requiring surgical interventions are not transmissible from one person to another and thus do not rank as a public problem necessitating public support. Persons requiring

surgery more often than not therefore have to raise the needed resources for the procedure through their own efforts failing which they may have to live with the dire consequences.

The third is that only recently have surgeons decided to talk about the importance of surgery in public health. In times past surgeons have been silent on the topic and played a passive role while other not too technical persons take center stage in championing the course of surgery as a public health intervention. This unfortunate posture has not augured well for the course of surgery.

The world's burden of surgical diseases is large and increasing. It is estimated that 11% of the Global Burden of Disease can be treated with surgery. (Ozgediz et al. 2008). Over 234 million surgical procedures are performed globally each year for a wide range of common conditions affecting all age groups. Unfortunately, <5 % of all surgical procedures are performed in countries ranked within the lowest one-third in terms of per-capita health expenditures. The unmet need for surgical care results in unacceptable morbidity/mortality rates associated with a host of conditions such as pregnancy-related complications, other emergencies. (Spiegel & Price 2013) According to WHO, more than 500,000 women die every year in childbirth due largely to the absence of surgical services and other means of stopping obstructed labour and post- partum haemorrhage. Estimates of the disease burden addressable by vaccination are coincidentally similar to current estimates for surgery. Quantification of the burden of disease avertable by surgery may allow for comparison with other priority health interventions in LMICs.

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. While motherhood is often a positive and fulfilling experience, for too many women it is associated with suffering, ill health and even death. Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from

accidental or incidental causes (WHO). The major direct causes of maternal morbidity and mortality include haemorrhage, infection, high blood pressure, unsafe abortion, and obstructed labour. (Simkhada 2010). Maternal mortality is unacceptably high. About 830 women die from pregnancy or childbirth related complications around the world every day. By the end of 2015, roughly 303 000 women will have died during and following pregnancy and childbirth (Organization 2015). In sub-Saharan Africa, only 46% of births are attended by skilled personnel, compared to 96% in Europe (according to data for the African Region of the World Health Organization [WHO] from 2000 to 2008) (Luboga et al. 2009). In 2005, slightly over one quarter of a million women died from complications of childbirth; most of these deaths could have been avoided by providing women with access to basic obstetric care and obstetric surgical care. In LMICs, a woman has a 1:150 lifetime risk, on average, of dying from complications of pregnancy and childbirth (WHO 2012). In some areas of Sub-Saharan Africa, this risk is as high as 1:16; a woman who survives until childbearing years has a 6.25 percent chance that her life will be ended prematurely from the complications of pregnancy (Debas et al. 2015). These burdens are even higher in the underdeveloped regions of countries with high maternal morbidity and mortality rates. In Ghana, about 3100 women died in 2013 due to reasons related to pregnancy or childbirth according to UN. Considerable investment in health care in Ghana decreased maternal mortality from 760 to 380 maternal deaths per 100,000 live births from 1990 to 2013. As at 2014, Ghana was not on track to reach the 75% reduction in the MMR required by the MDG5. If the current trend continues the maternal mortality in Ghana in 2015 will be at 358 per 100,000 live births; considerably higher than the MDG 5 goal of a MMR of 190. In this scenario Ghana will attain its 2015 MDG target in 2037 (MOH 2014). At the end of the MDG era, the MMR stood at 319 deaths/100,000 live births (2015 est.) as against the projection made by MOH in 2014(WHO 2013). Maternal morbidity and mortality are significantly increased by conditions that can be prevented by access to safe obstetric surgery. Obstructed labor, which can lead

to fistula formation, uterine perforation, hemorrhage, sepsis, or death, can be avoided by observing labor for deviations from normal and providing access to nearby safe cesarean delivery (Debas et al. 2015).

The tremendous disparity in MMRs between HICs on one hand and LMICs on the other indicates the potential to reduce maternal morbidity and mortality on a worldwide scale. WHO's key priority is to improve maternal health. Increasing research evidence, providing evidence-based clinical and programmatic guidance, setting global standards, and providing technical support to Member States is the strategies to reduce MMR. WHO advocates for more affordable and effective treatments such as obstetric surgery, designs training materials and guidelines for health workers, and supports countries to implement policies and programmes and monitor progress. In 2015, United Nations General Assembly launched the Global Strategy for Women's, Children's and Adolescents' Health, 2016-2030. The Strategy is a road map for the post-2015 agenda as described by the Sustainable Development Goals. The strategy seeks to end all preventable deaths of women, children and adolescents and create an environment in which these groups not only survive, but also thrive, and see their environments, health and wellbeing transformed.

As part of the Global Strategy and goal of Ending Preventable Maternal Mortality, WHO is working with partners towards the following?

- Addressing inequalities in access to and quality of reproductive, maternal, and new born health care services;
- Ensuring universal health coverage for comprehensive reproductive, maternal, and new born health care;
- Addressing all causes of maternal mortality, reproductive and maternal morbidities, and related disabilities;

- Strengthening health systems to respond to the needs and priorities of women and girls;
- Ensuring accountability in order to improve quality of care and equity.

Within the emerging context of the digitization of health care, electronic health records (EHRs) constitute a significant technological advance in the way medical information is stored, communicated, and processed by the multiple parties involved in health care delivery (Angst 2009). It is therefore important to keep good records of health information. This will help track data over time, give a quick access to patient records from inpatient for more coordinated, efficient care to enhanced decision support, clinical alerts, reminders, and medical information.

## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Research Methods and Design**

The study is a descriptive, retrospective review of records on surgical interventions associated with pregnancy at the VRAH from 2011 – 2015.

#### **3.2 Data Collection Techniques and Tools**

A standard questionnaire was developed and used to extract the data from the theatre and ward logbooks. The data extracted was verified from the VRA hospital Health Information Management System (HIMS) and patient medical records when the need arose. All data were systematically collected and reviewed from 1st January 2011 to 31 December 2015.

#### **3.3 Study Population**

All pregnant women who underwent any form of surgical procedure associated with pregnancy at the hospital within the reference years.

#### **3.4 Study Variables**

The data parameters extracted from the records included demographic data, indications for surgical interventions, procedure performed, duration of stay and clinical condition post-surgery.

#### **3.5 Data Handling**

The data was handled by the principal investigator and the professional data entry officer. An automated error check was used during the data entry and errors were quickly highlighted and dealt with immediately before proceeding to the next.

### **3.6 Data Analysis**

Data was entered into computer using a platform created in Epi info software. It was cleaned and analyzed with Excel 2016 and Stata version 13 software.

### **3.7 Ethical Consideration**

All data access and extraction was performed by the investigator. No patient identifiers (such as names) were used. Patients were tracked through the records using IDs. The data obtained was strictly kept confidential and made available to only authorized personnel who has the interest of the work. Ethical clearance was sought from the Institutional Review Board of the Ensign College of Public Health. Administrative permission was obtained from the management of VRA Health Service Limited and approval given before the data collection began. The investigator is a staff of the VRA Hospital.

### **3.8 Limitations of Study**

The following were the limitation encountered during data collection

- i. Incomplete data in the log books: Data was not completed of readily obtainable form the sources indicated.
- ii. Inconsistency in recordings: In the absence of a consistent and standard format for recording, information and terminologies, non-standard use of abbreviation as well as spelling errors were common.
- iii. Non-use of ICD system of classification of disease conditions.
- iv. Large data to be analyzed.



v. Limited financial resources.

vi. Illegible hand-writing.

Some of the limitation are discussed as part of discussions and recommendation in the later chapters.

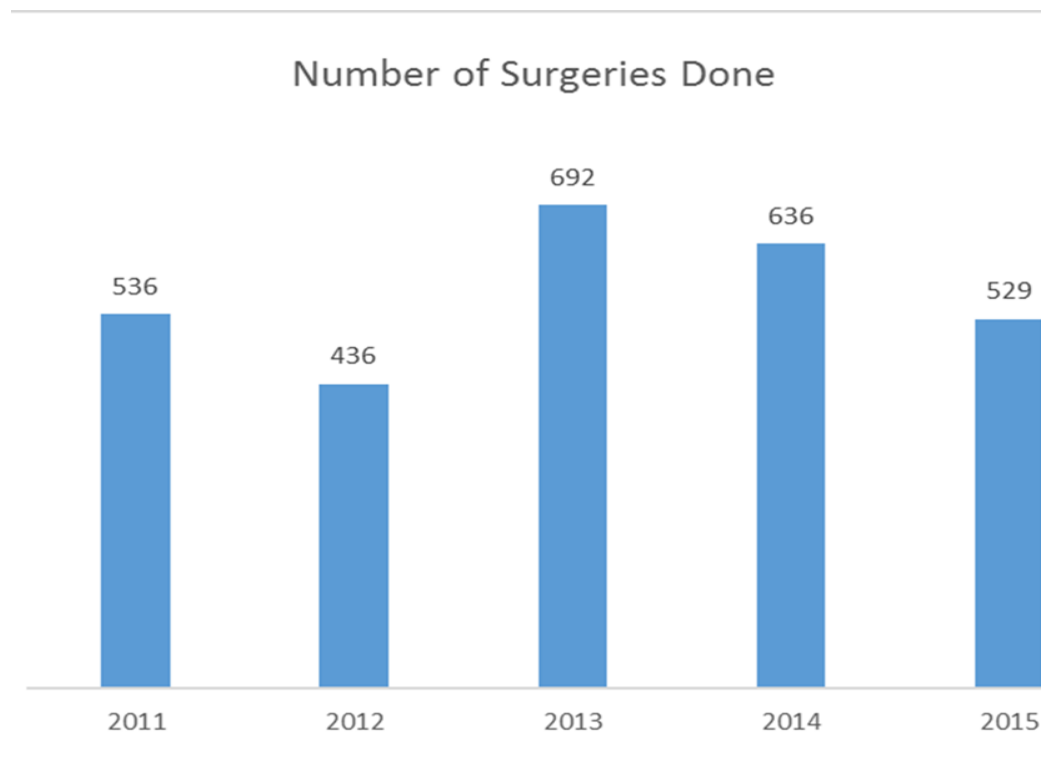
## CHAPTER FOUR

### 4.0 RESULTS

This chapter presents findings of the analysis of the data extracted from records at the hospital. The findings are presented in graphs, tables and charts. The chapter also presents data on the completeness of the data obtained.

#### 4.1 Number of cases and demographic characteristics

The records of a total of 3,221 cases of pregnancy-related surgical interventions at the hospital from 2011 to 2015 were extracted. The number of cases performed per year ranged from 536 in 2011 to 529 in 2015 (**Figure 4.1**).



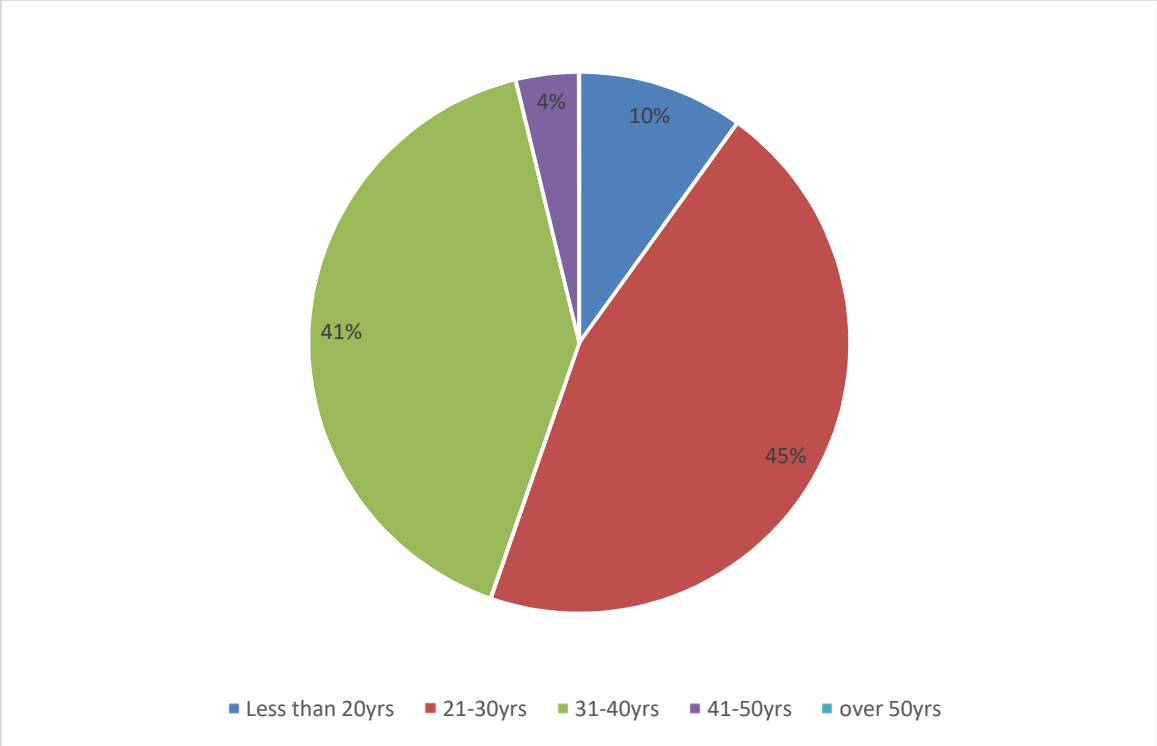
**Figure 4.1 Trend of obstetric surgical intervention 2011-2015**

## 4.2 Ages of patients

The ages of patients ranged from 11 - 51 years, with the majority between the ages of 21 to 30 years. The average age was 29.5 (Standard deviation of 6.5) yrs. While the median was 30 years (Interquartile Range 25-34). They represented 45.30% of the all women. This was followed 40.8% in the age range 31-40 years. Women between the ages 10-20 and 41-50 years constituted 10.10% and 3.75% respectively. (Table 4. 2), (Figure 4.2)

Age category (Years)	Percentage
Less than 20yrs	10
21-30	45
31-40	41
Over 41	4

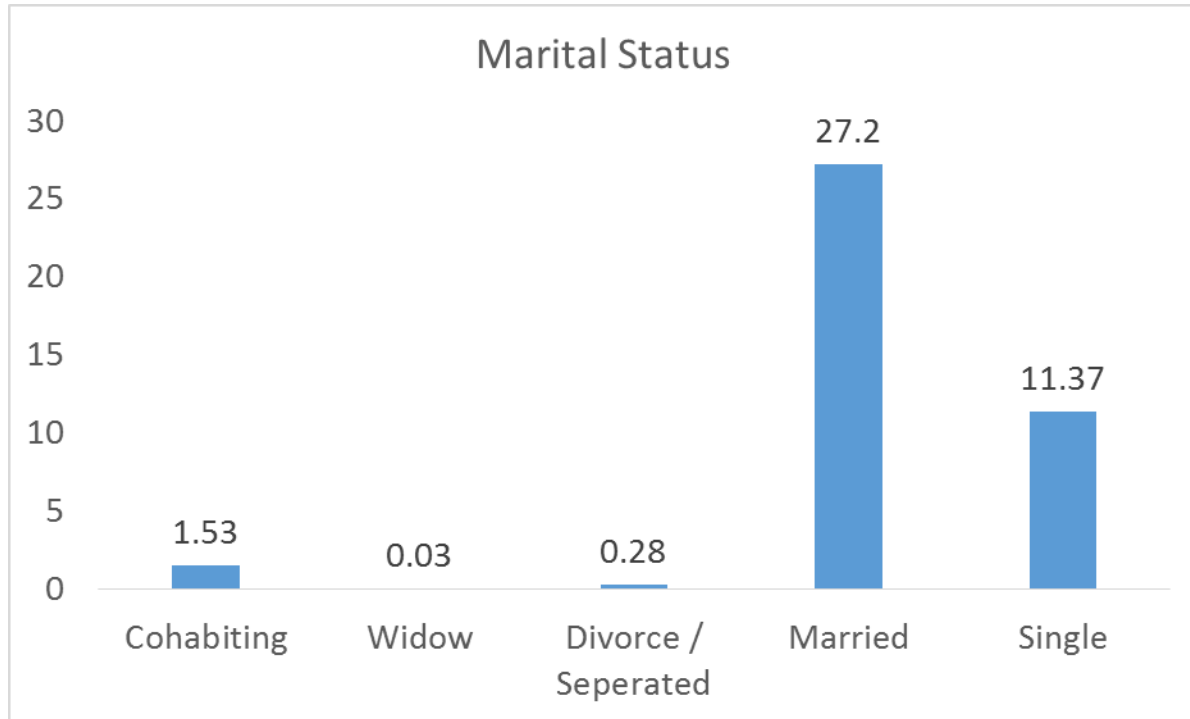
**Table 4. 2 Age category of Patients**



**Figure 4.2** The category of ages of patients

### 4.3 Marital Status

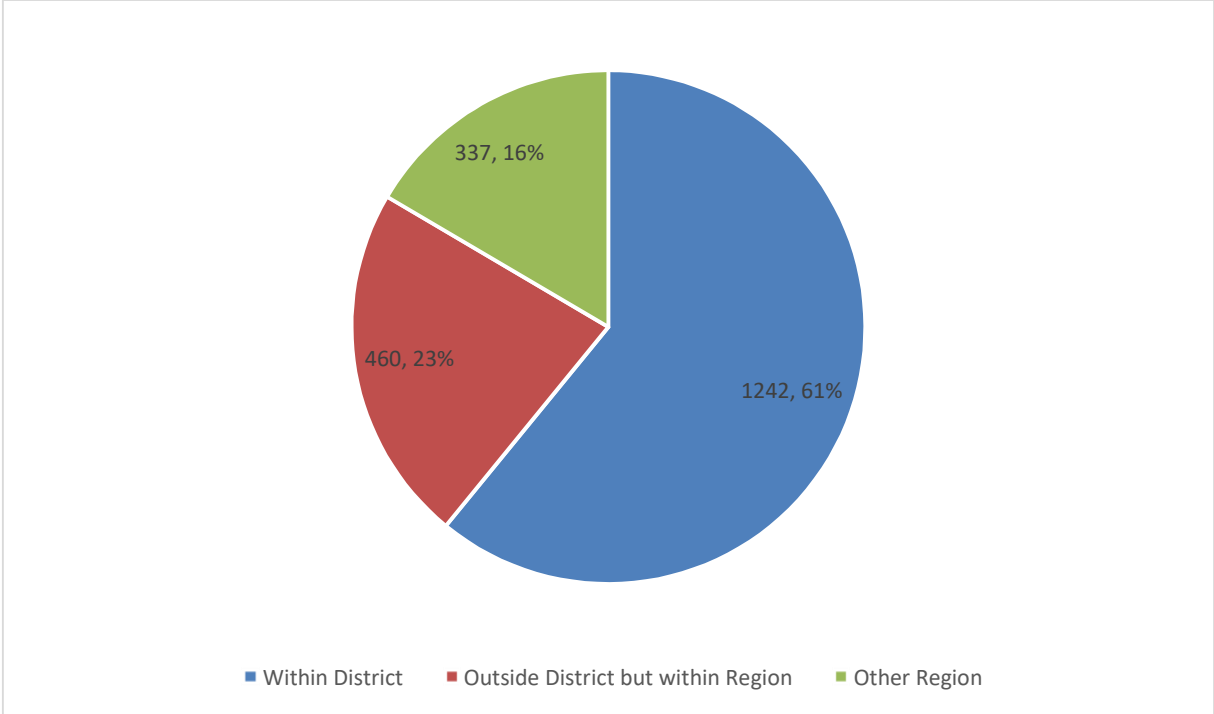
The records showed 873 representing 27.20% of the client to be married, 365 representing 11.4% to be single, 10 representing 0.31% were either divorced or separated or a widow.



**Figure 4.3** Marital status of patients

### 4.4 Place of Residence

The majority (61%) of patients came from communities within the Asuogyaman district. Patients coming from outside of the Eastern Region constituted 16% of patients. **(Figure 4.4)**



**Figure 4.4** Areas of residence of patients

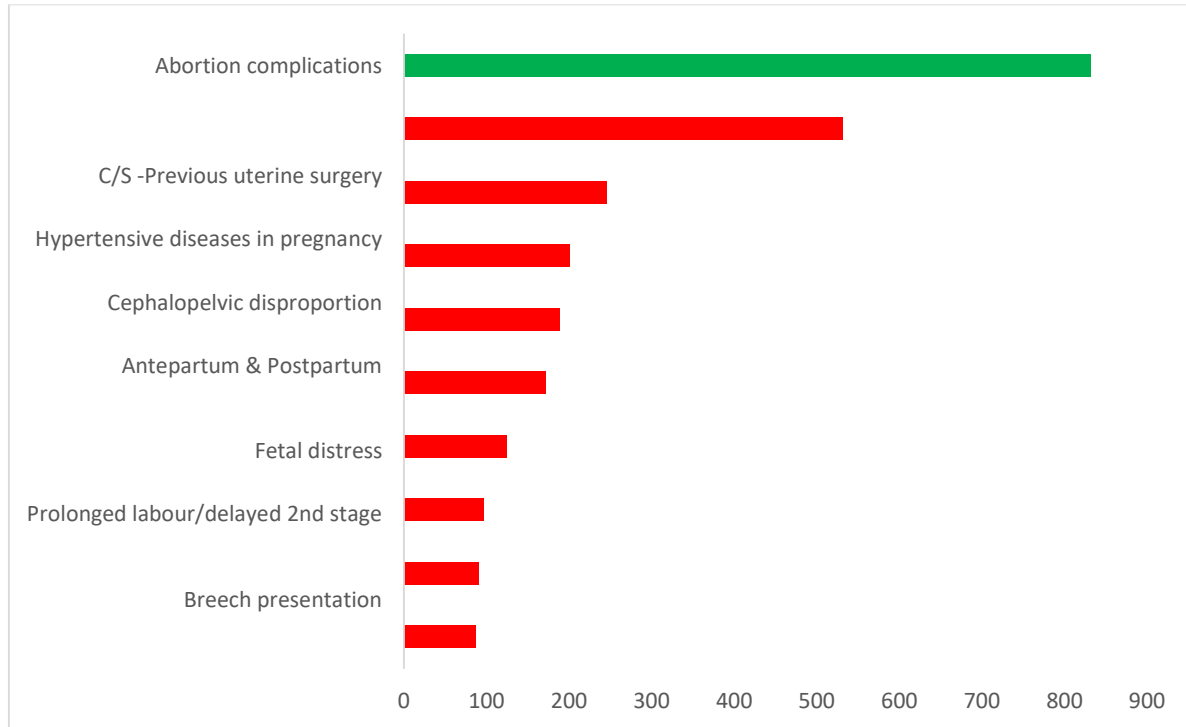
**4.5 Mode of payment**

The overwhelming majority (97.6%) of patients paid for services using the National Health Insurance Scheme (NHIS). Only 78 patients representing 2.4% were none NHIS cardholders and had to pay out-of-pocket.

**4.6 Indications for surgical interventions**

The leading indications for surgical interventions were abortion-related complications (21.8%), previous uterine surgeries (16.6%) and hypertensive diseases in pregnancy (7.6%). Broadly

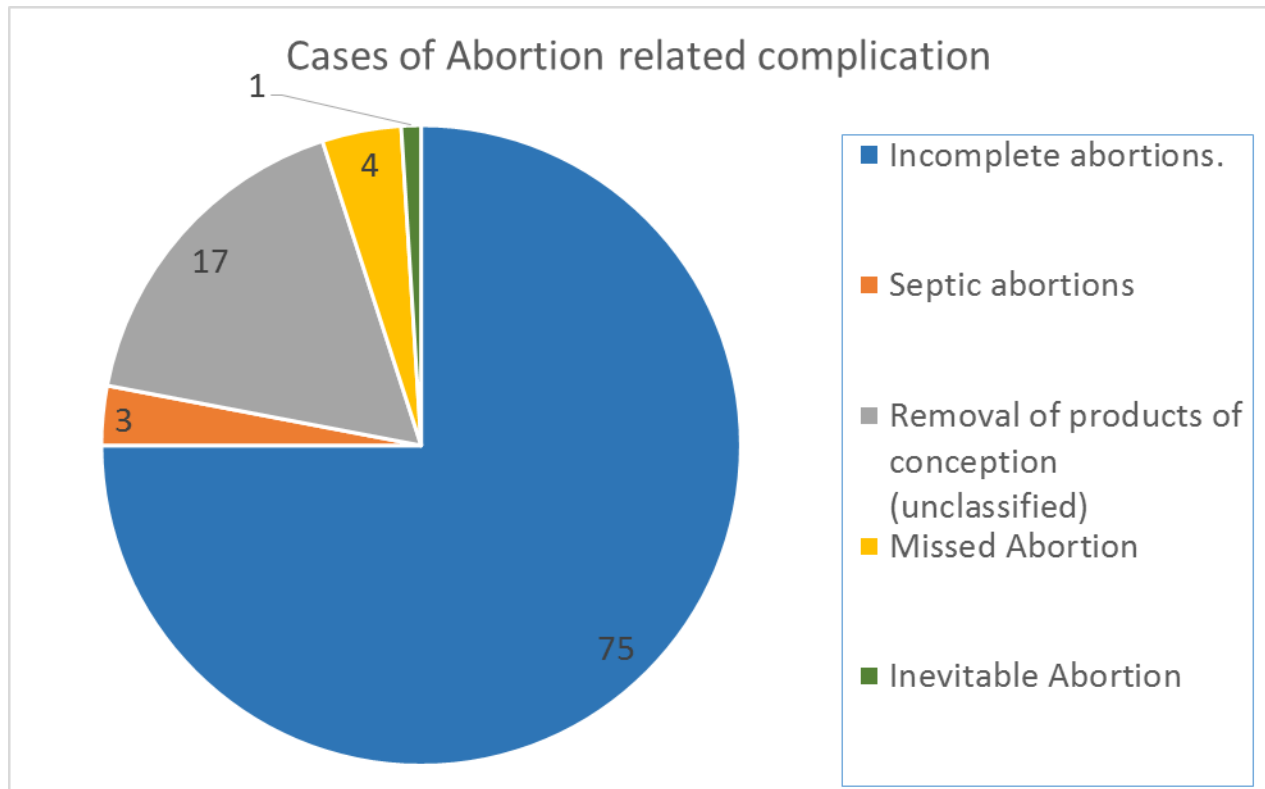
considered, the indications fell into two categories. They are abortion and delivery-related interventions.



**Figure 4.6** Ten top indications for pregnancy-related surgical interventions

#### **4.6.1 Abortion-related interventions**

About 75% of abortion-related complications related to incomplete abortions. Septic abortions constituted 3% of cases. About 17% of cases were unclassified and only at “removal of products of conception”.



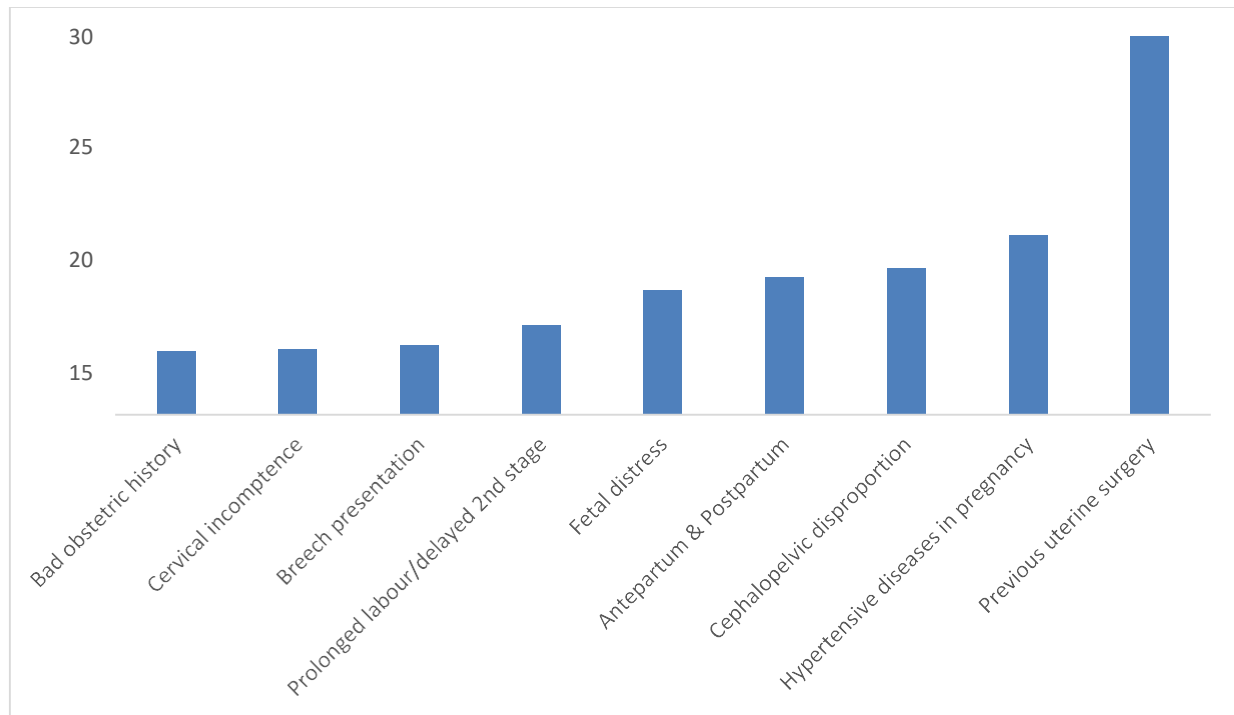
**Figure (4.6.1)** Cases of abortion-related complications

#### 4.6.2 Previous uterine surgeries

Nearly (99%) of cases of surgery with the indication of previous uterine surgeries were on account of previous Caesarean sections. As a proportion of all cesarean section performed at the hospital, those performed on account of previous cesarean section constituted 30.6%. Hypertensive diseases in pregnancy, cephalopelvic disproportion and antepartum hemorrhage constituted 14.2%, 11.6% and 10.9% respectively. **(Figure 4.6.2)**

Apart from previous uterine surgery and hypertensive diseases in pregnancy, the other specific indication for surgical interventions at the time of delivery were cephalopelvic disproportion, antepartum hemorrhage and fetal distress.

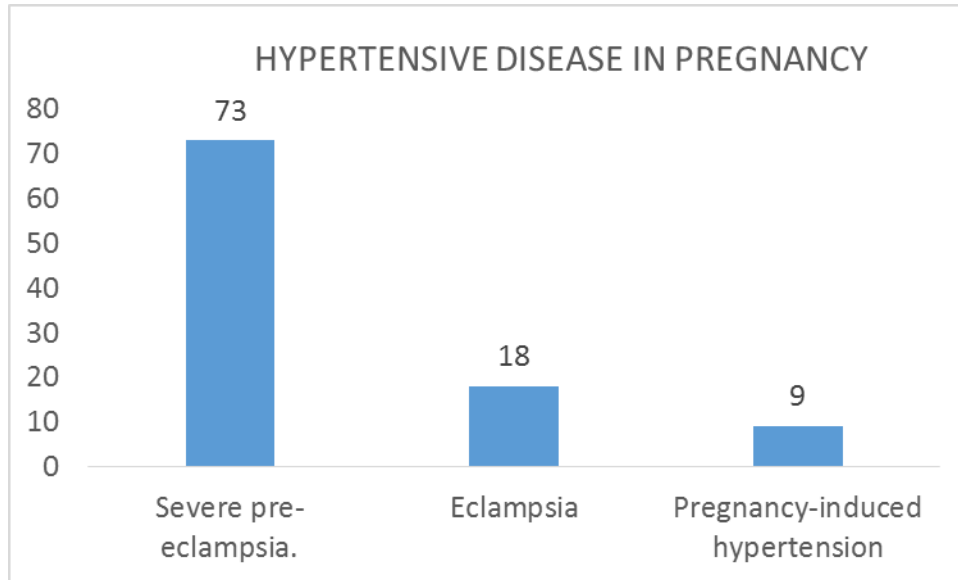




**Figure (4.6.2)** Leading indications for Caesarean sections

### 4.6.3 Hypertensive diseases in pregnancy

The types of hypertensive diseases in pregnancy that patients presented with were: severe Preeclampsia (73%), Eclampsia (18%) and pregnancy-induced hypertension (9%).



**Figure (4.6.3)** Number of cases of hypertensive diseases in pregnancy

#### **4.7 Leading indications by age**

The average age of patients who underwent surgery on account of abortion-related complications was 28.8 (SD=7.1) years. This contrasted with the mean age of patients who underwent cesarean section on account of previous uterine surgery which was 31.2 (SD=5.0) years. This difference in means was statistically significant. (**Table 4.7**)

**Table 4.7** Two-tailed t-test of difference in means in ages of women presenting with abortion- related complications and previous uterine surgery

Group	Number of observations	Mean Age	Standard Error	Standard deviation	Confidence intervals	P-value for the difference
Abortion-related complication	805	28.8	0.25	7.12	28.32 - 29.30	
C/S- Previous uterine surgery	524	31.2	0.22	4.98	30.81 - 31.66	
Combined	1,329	29.8	0.18	6.47	29.4169 30.1	
Difference		-2.42	0.36		-3.12 - -1.72	<b>&lt;0.01</b>

Two-tailed t-test of difference in means

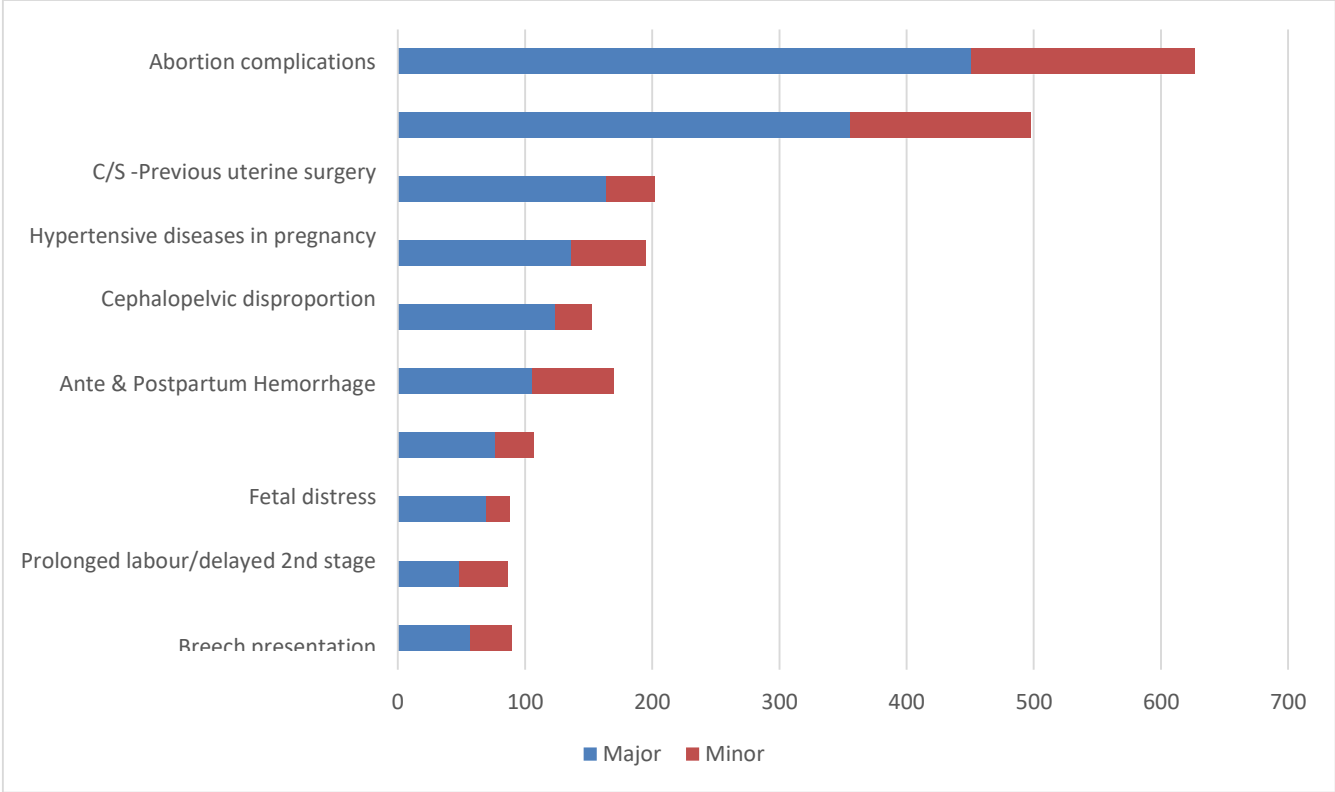
Overall, the mean ages of women who underwent surgery among the top ten indications ranged from 27.6 in the case of women with cephalopelvic disproportion to 31.5 in the case of women with bad obstetric history. (**Table 4.7.1**)

**Table 4.7.2 Age parameters for patients with the ten leading indications**

INDICATIONS	No. of observations	Mean	Standard Deviation	Minimum	Maximum
Cephalopelvic disproportion	199	27.6	6.4	14	44
Prolonged labour	123	27.7	5.9	16	41
Fetal distress	168	27.9	5.6	15	43
Ante and Postpartum hemorrhage	181	28.7	6.3	14	43
Abortion-related complications	805	28.8	7.1	12	48
Breech presentation	96	29.7	6.3	16	44
Hypertensive diseases in pregnancy	240	29.9	6.9	15	49
Previous uterine complications	524	31.2	5	11	46
Cervical incompetence	89	31.4	5	20	46
Bad Obstetric History	85	31.5	5.2	20	44

#### **4.8 Leading indications by nature of surgery**

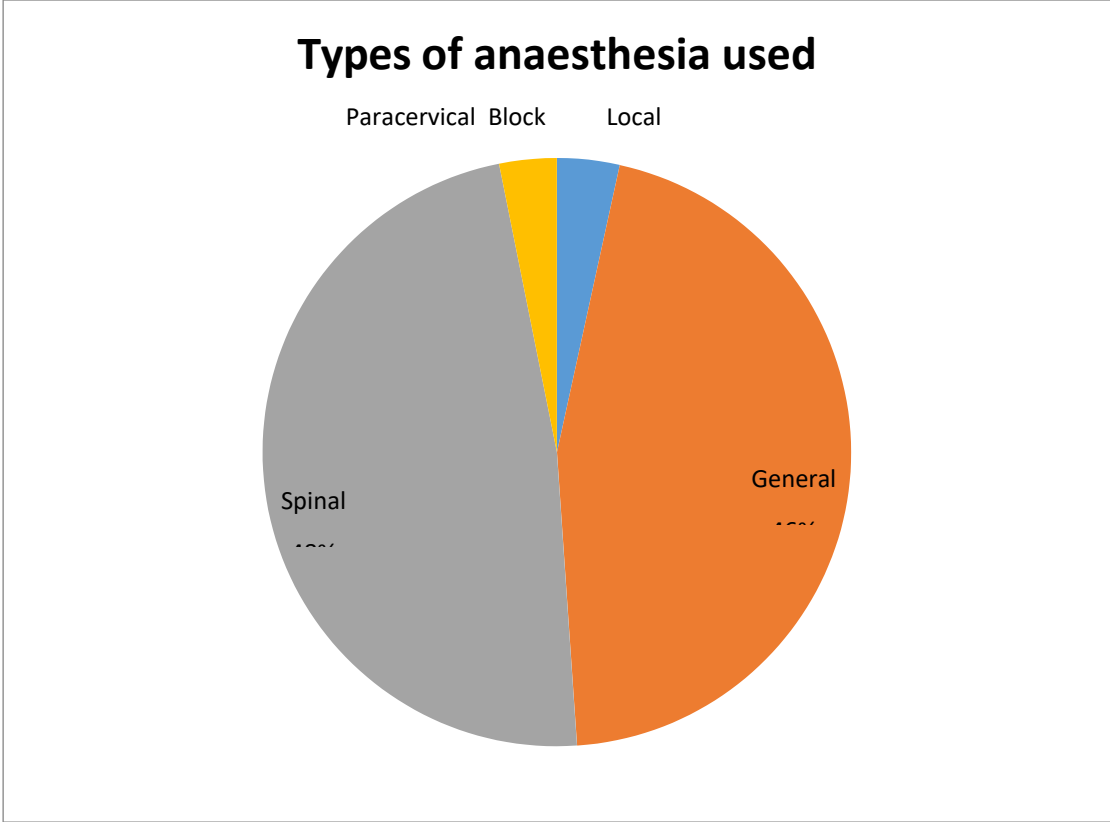
The majority (62.0%) of surgeries were classified as major interventions. While 24.0% were classified as minor, the remaining set of interventions were unclassified. There was fairly equal proportion of major and minor surgeries among the top ten indications. Similarly, 62% emergency surgical interventions were carried out against 24% elective. The similarity between a case being major/minor or emergency/elective is statistically significant (P-value<0.000). **Figure 4.8**



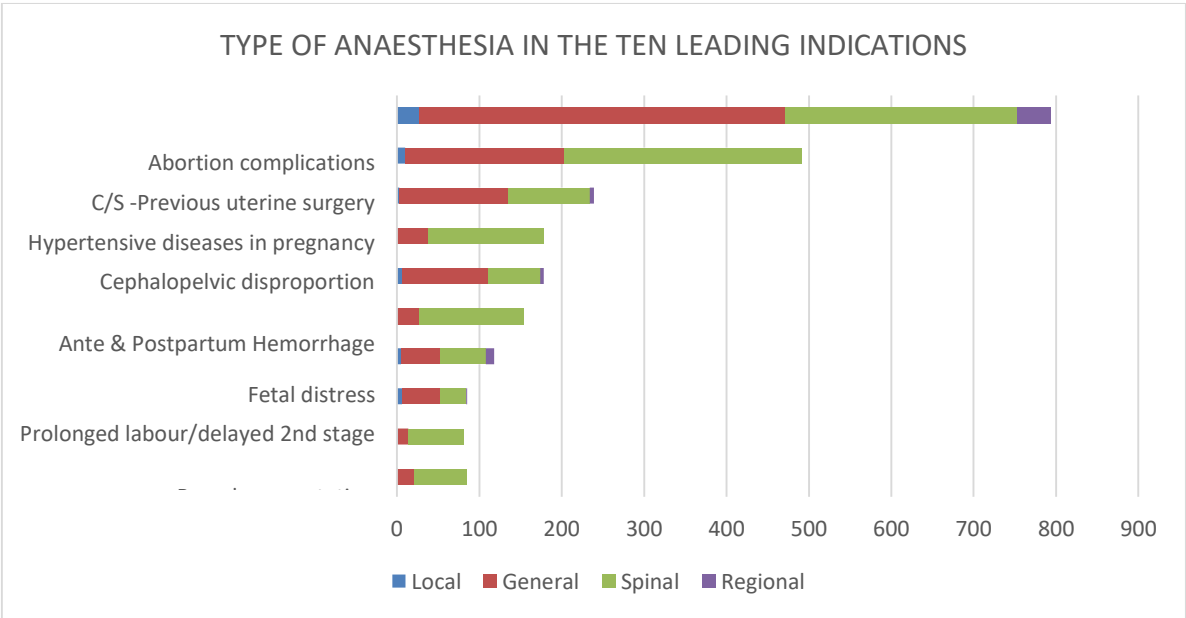
**Figure 4.8: Indications per type of intervention**

**4.9 Leading indications by types of anesthesia**

The anaesthesia type given before surgery over the study period were local, paracervical block, spinal, and general anesthesia. 48% of Spinal anaesthesia given, 46% of general anesthesia, 3% each of local and paracervical block were given. About 56.0% and 35.6% respectively of interventions for abortion-related complications were undertaken under general and spinal anesthesia. **(Figure 4.9.1)**



**Figure 4.9.1: Type of anaesthesia used**

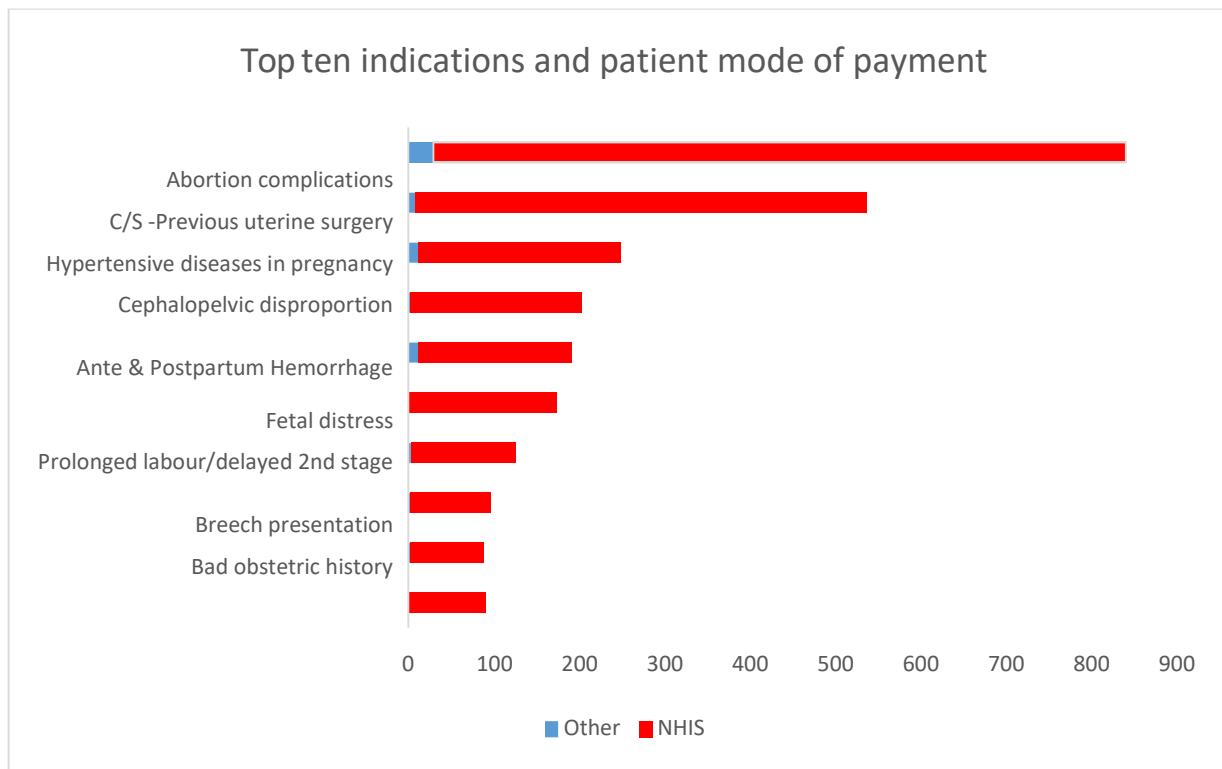


**Figure 4.9.2: Type of anaesthesia in the ten leading indication**

#### 4.10 Leading indications by mode of payment

There was almost universal payment with NHIS among patients with the ten top indications

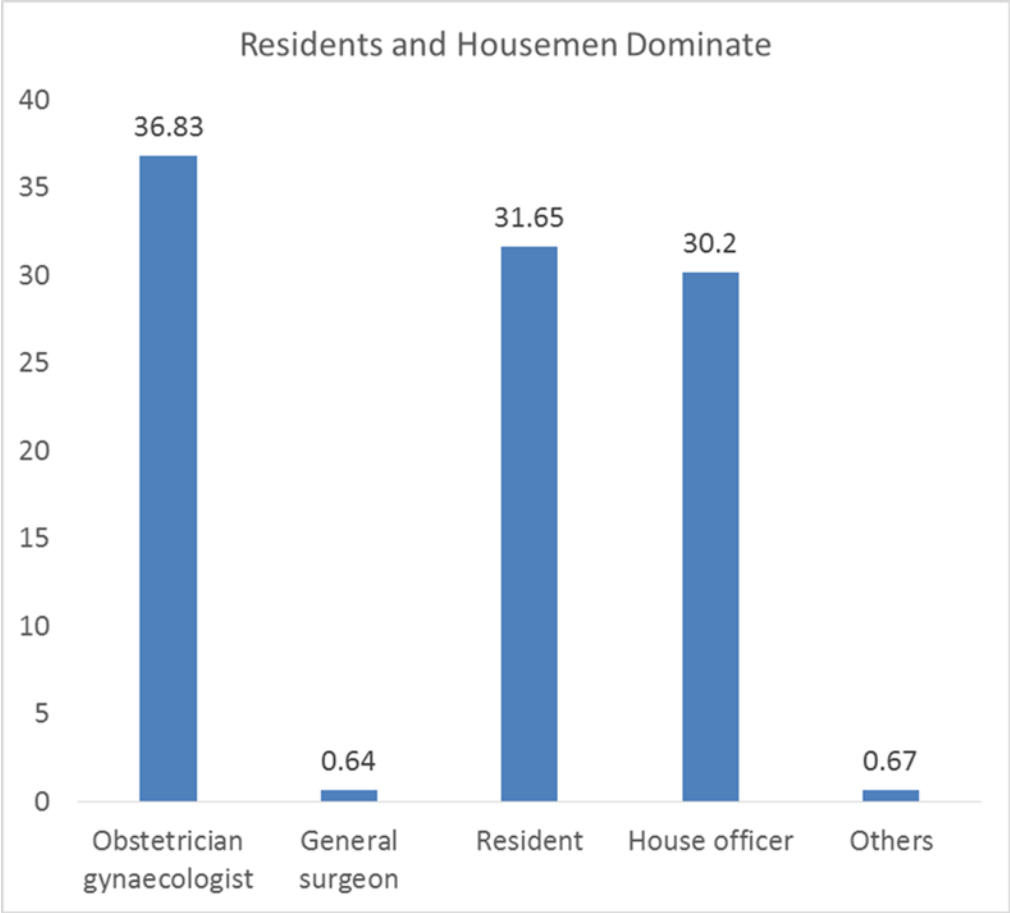
(Figure 4.10)



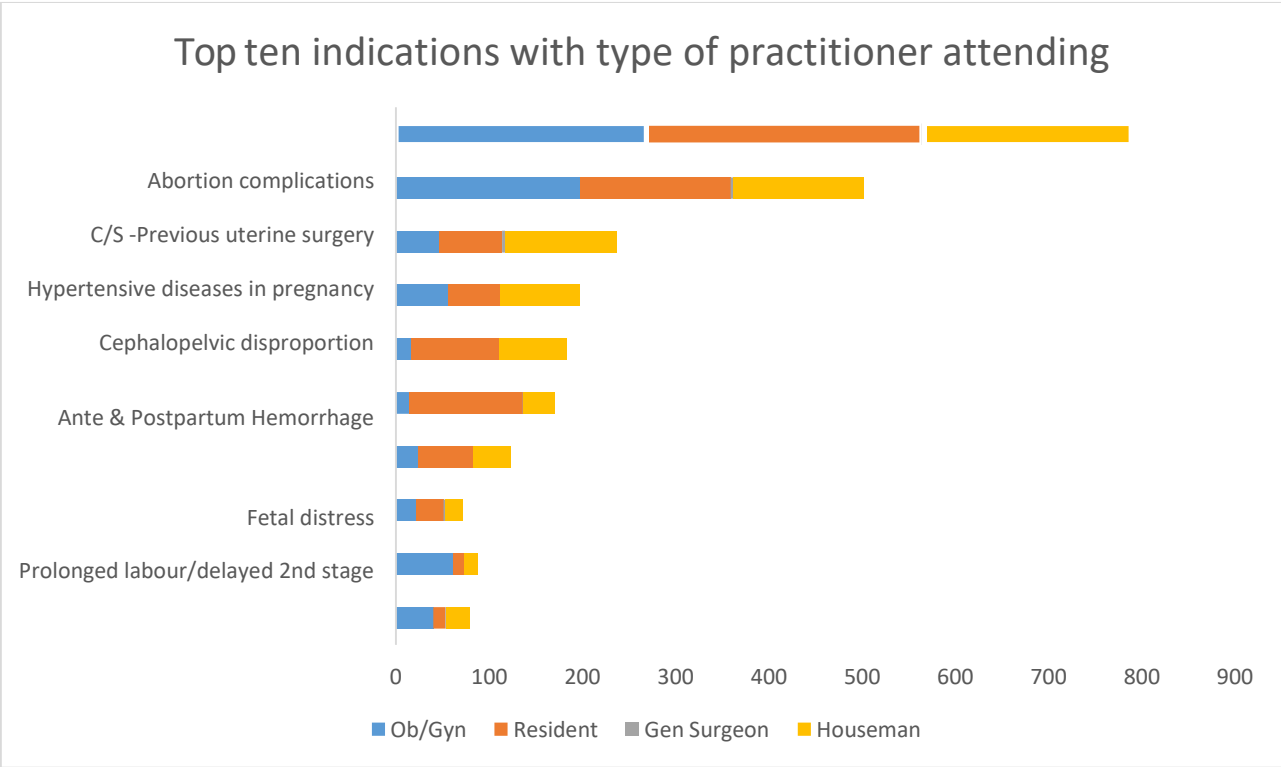
#### 4.11 Leading indications by attending practitioner

The majority of surgeries were performed by residents (31.65%), house officers (30.2%) and specialist obstetrician gynecologists (36.83). (Figure 4.11.1) This pattern persist across the leading indicators.





**Figure (4.11.1): Surgical procedure by practitioner**



**Figure (4.11.2). Top ten indications with type of practitioner attending**

#### **4.12 Factors influencing length of stay post-surgery**

The mean and median length of stay in the hospital post-surgery were 3.4 (SD  $\pm$  1.9) and 3 days respectively. There was no statistically significant difference in length of stay depending on the cadre of practitioner performing the surgery (P-value = 0.681). However length of stay was significantly influenced by the age of patients (P-value=0.004) as follows: About 31.3%, 26.6%, 21.5% and 34.2% of patients aged older than 40yrs, between 31-40yrs, 21-30yrs and less than 20years respectively stayed in the hospital beyond three days. Compared with patients aged 21-30yrs, all other patients were significantly likely to stay in hospital beyond three days. This was statistically significant in the case patients aged less than 20yrs (OR=1.91, 95%CI 1.30-2.80, P-value<0.001) and those aged between 31-40yrs (OR=1.33, 95%CI 1.03-1.71, P- value<0.001).

#### **4.13 Condition after surgery**

The state of condition after surgery showed that majority of the client 99.88% recovered satisfactorily. Less than 1% were either referred (0.06%) to other hospitals or died (0.06%).

#### **4.14 Completeness of data**

The finding from the study showed that the hospital keeps record of patients both in hard and soft copies but the records were incomplete, unreadable and inconsistent in both the hard and soft copy respectively. (Table 4.14)

**Table 4.14 Extent of missing data on various parameters of extracted data**

Variables	Frequency	Percentage
Marital status	1,913	59.6
Place of residence	1,170	36.5
Nature of surgery (Major/ Minor)	1	0.03
Nature of Surgery (Emergency/Elective)	447	14
Sample size	73	2.3
Surgeon Assistant	482	13.9

## CHAPTER FIVE

### 5.0 DISCUSSION

This study aimed at identify indications for pregnancy related surgical interventions and describe the types of surgical intervention performed as well as the outcome such interventions at VRA Hospital in the eastern region of Ghana. VRA Hospital the only district in the Asuogyaman district of the eastern region play an important role as the primary health care center and a referral hospital for the surrounding district and other region as a whole in Ghana in providing obstetric surgical interventions and other serous obstetric complications. There were a lot of indication that warranted surgery but these indications were hierarchically grouped to get the top ten indications for such interventions. Among the top ten, the most commonly diagnosed condition was abortion complications, previous uterine surgery, and hypertensive disease in pregnancy. Abortion complication accounted for 21.4% of the indications, 75% of the abortion complication were incomplete abortion, 3.4% septic abortion and 17% unspecified abortion. A safe motherhood survey in four regions (Central, Eastern, Volta and Greater Accra) of Ghana postulates a figure of 27 induced abortions per 100 live births. From literature, 90% of all pregnancy losses were due to abortions (Health Sector Advisory Office 2008). The mean age for abortion complication of the study was 28.8 years with a mid-range of 12-48 years which about take the three age categories combined. This implies that abortion complication were not associated to a particular age group but runs through all especially those between 21-30 years age group which forms the majority. This age group are vulnerable and are faced with the challenge of unwanted pregnancy and subsequently resort to unsafe abortion making them face the dire consequence of it on the

individual and the society at large. It is therefore important that, public health society creates abortion awareness and its implication among the populace.

Obstetric surgical intervention is an essential tool in preventing disease, promoting health and prolonging life. The fact sheet of WHO confirms that about one third of pregnancy related death can be treated with surgery (WHO, 2012). This can be seen in the numerous surgical interventions that are performed in VRA. From the analysis it was realized that a number of surgical interventions were carried out and out of them Caesarean section and ERPC accounted to 61.7% and 24% respectively. This confirms similar findings that were made in studies from Tanzania and Uganda, suggesting that the provision of surgical services in district hospitals constituted an important intervention for ensuring access to comprehensive essential obstetric services in the rural areas of low-income countries (Damien et al. 2011). The finding of the study indicates that the WHO policy on Comprehensive essential obstetric care are implemented. The findings of the study revealed that surgical interventions that were carried were either major or minor and also classified as emergency or elective. From the studies almost all the surgical interventions carried out among the top ten indication were either major or minor. About 61% of the surgical intervention performed were emergency, this points toward the fact that VRA hospital the only hospital serving the Asuogyaman district and also serving as referral center for other district within eastern region and other regions as large has its cooperative responsibilities fulfilled. The above findings of the study disprove the fact that, most low- and middle- income countries (LMICs) lack the capacity to provide access to nearby hospitals, where safe and timely cesarean deliveries can be undertaken (Debas et al. 2015) The cases that were thought to be major or minor were not the case E.g. Abortion complication. This could be as a result of the severity of the condition such as an incomplete abortion being septic or ending up with perforation of the uterus or urinary bladder.

The finding also showed how the surgical team's response to emergency case. On the other hand, this case can be due to a misclassification in the record keeping process.

The teaching and learning process that exist between a specialist and resident and housemen is motivating since both residents and interns are actively involved in patient care. As seen in the finding both the resident and houseman performed the pregnancy related surgical intervention. Active participation of residents and housemen in obstetric surgical interventions and with high quality of care better position VRA Hospital to a teaching hospital status. This is because residents, housemen, PA interns, medical students and nursing students are almost regularly on clinical internship, attachment etc. In the facility learning new skills and updates in their various field of practice. Teaching hospitals are defined, according to the Medical Care Act of Taiwan, as hospitals with teaching, researching and training facilities for the purposes of training physicians, paramedics, and medical and paramedical students that have passed the teaching hospital accreditation (Huang et al. 2009)

Almost all forms of anaesthesia were given, indicating that there are qualified personnel given the anaesthesia. There was nearly an equal distribution of anaesthesia given between the spinal and general anaesthesia accounting for 48% and 46% respectively. This implies that though they are nearly equal, general is given a lot considering its side effect. The drive for safer anaesthesia means that general anaesthesia (GA) is seldom administered due to its long hours of anaesthesia recovery and other effect. Relatively high general anaesthesia usage is associated to the rate of emergency surgical interventions performed.

The condition after the surgical intervention indicated 99.88% satisfaction, this implies that the surgical intervention in the facility is of high quality and standard. Considering the hospital being a referral center and this large number of cases that underwent surgery, the satisfaction rate

indicated a concern for safety for both patient and staff safety. This satisfaction is depicted in the 3.3 days mean length of stay after the surgical intervention. Also, 0.06% referral implies that hospital has a low referral rate to a higher facility and also means the hospital has the requisite capacity to handle more complex cases. On the contrary, it could also mean that the hospital do not have the system of referral hence client are kept or not referred at all. Furthermore, 0.06% maternal death confirms the quality of care and safety measures implemented in getting such a low death rate.

District hospitals in developing countries serve as the first level of referral care for patients who are presenting with conditions that require treatment with surgical procedures. VRA hospital tend to be more accessible than regional hospitals, which occur in lower frequency in the country and, thus, are generally located further from the population.

In this regard the trend of surgical service over the five year period (2011 to 2015) confirms the accessibility of surgical interventions for pregnancy related complication to have dropped in 2012 due low attendance and unavailability of a specialist. From 2013 to 2015 it had recorded a steady decline. This sharp drop in the number of surgery can be linked to availability of a specialist and the attendance of client to the facility. The sharp increase is also linked to the availability of a resident specialist and the increase in the attendance. The steady decline from 2013 is also associated to the closure of the Adomi Bridge where people have to cross over the Volta River or either be in the pantoon for hours before getting to the hospital. This geographical barrier resulted in people seeking health care elsewhere probably the Volta regional hospital.

The finding from the study showed that the hospital keeps record of patients both in hard and soft copies but the records were incomplete, unreadable and inconsistent in both the hard and soft copy respectively. With the emerging context of digitization of health care, electronic health records



(EHRs) that constitute a significant technological advance in the way that medical information is recorded, stored, communicated, and processed by the multiple parties involved in health care delivery to track data over time and give quick access to patient records(Angst 2009). This is partially true in the cases of this study due to the incompleteness, illegibility and inconsistency of data available in the records keeping. Proper health records keeping when implemented and well-coordinated will support decision making, give clinical alerts, reminders, and medical information. A particular case in point, which in follow-up discussions with health professionals at the hospital was admitted as error was misclassifications in the types of surgery e.g. caesarean section recorded as minor surgeries. (**Figure 4.8**). The move by the hospital to move towards electronic data entry can be a way out to improve consistency, accuracy and completeness in data entry.

## CHAPTER SIX

### 6.0 CONCLUSION AND RECOMMENDATION

#### 6.1 Conclusion

Surgical intervention provides significant return in health for the population. Increasing obstetric surgical interventions significantly reduces the global burden of disease especially in LMIC and this is one of the instrument public health use to measure health.

In conclusion this study aimed to describe how surgery have improve maternal health. The result showed that abortion complication (21.4 %) topped the top ten indication for pregnancy related surgery next to previous uterine surgery. It also showed that emergency surgeries were more than the elective cases and among them caesarean section (61.7%) was the surgery that was frequently done due previous uterine surgery. It became obvious that obstetric health care especially is more accessible financially. Surprisingly the hospital even though small in terms of geographical area actively train specialist (resident), housemen and interns to prepare them to tackle complex challenges in their chosen profession through hands on participation. Data entries were incomplete, illegible and inconsistent. This accounted to 59.6% incompleteness in marital status, 14% in nature of surgery as to whether it emergency or elective etc.

The study therefore conclude that pregnancy related surgical intervention are effective in preventing maternal mortality.

Other area that can be research into include review of surgical services in gynecology, general surgery, wound care and the surgical team.

## **6.2 Recommendation**

Based on the findings of the study especially with the challenges, the following recommendations are made:

### **6.2.1 Adoption of comprehensive abortion care**

Unsafe abortion is a major public health problem in Ghana; despite its liberal abortion law, access to safe, legal abortion in public health facilities is limited. The public health unit at VRA should liaise with Asuogyaman District health directorate to design and adopt appropriate preventive interventions such as comprehensive abortion care.

### **6.2.2 Creation of maternity operation theatre**

Due to the number of pregnancy related surgical interventions and the number of emergency surgeries performed, it will be ideal that Volta River Authority build a maternity operating theatre for its hospital to better handle pregnancy related surgeries.

### **6.2.3 Completeness of Data**

Staffs especially record keepers and clinicians at VRAH are to be trained on the essence of good record keeping. VRAH health information management system unit should add on to its existing software checkers that prompt users or that do not allow to users to move the next step of work until data entry is complete. Additionally, data entered into clients antenatal record book should be double entered into VRA hospital database. There should be re-indexing of hard copy database.

### **6.2.4 Accreditation**

Management of VRA hospital should create a research unit in the hospital that will assess their performance and also better position VRA hospital to a teaching hospital status.

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## APPENDICES

### Appendix 1: Research Questions

#### DATA COLLECTION TOOLFOLDER NO:

##### DEMOGRAPHIC CHARACTERISTICS OF PATIENT

Age of client \_\_\_\_\_yrs.

3. Marital status      1-Single      2-Married      3- Divorced/separated      4-Widow     

5-Cohabiting

---

5. Place of residence      1- Within this district

2- Out of district but within this region

3- Other region

4- Out of Ghana Sp. country:

---

6. Occupation

---

2-NHIS holder      1- Yes       No

7. Mode of payment      1-NHIS      2-Private insurance      Employee      4-Out of pocket

5-Other, specify:

---

---

**DETAILS OF SURGICAL PROCEDURES**

---

Diagnosis (Indication)\_\_\_\_\_yrs.

---

1. Surgery done \_\_\_\_\_

---

2. Nature of surgery 1 **1-Major**  **2-Minor**

---

3. Type of anaesthesia **1-Local** **2-General** **3-Spinal**   
administered  
Please specify

---

4. Nature of surgery 2 **1-Emergency**  **2-Elective**

---

5. Practitioner performing the surgery

- 1. General practitioner**
- 2. Obstetrician gynaecologist**
- 3. Resident**
- 4. General surgeon**
- 5. House Officer**

---



---

8. Surgical assistant    1-Medical Officer

2-Nurse

3-House officer   

4-Resident

5-Other support staff. Specify:

---

10.    Condition    after

surgery    \_\_\_\_\_

---

11. Date of admission    (dd/mm/yy)\_\_\_\_\_/\_\_\_\_\_/   

---

12. Date of surgery    (dd/mm/yy)\_\_\_\_\_/\_\_\_\_\_/   

---

13. Date of discharge    (dd/mm/yy)\_\_\_\_\_/\_\_\_\_\_/   

---

14. Total cost as per :\_\_\_\_\_GHC

Accounts/folder records

---

---

15.    Re    operation    Yes / No

Indication-----

---

16. Re-admission within 3 months of above surgery?  Yes / No

---

Put "9" if data is not available in the folder or other records

**C. FOLLOW-UP VISIT AND WOUND CARE MANAGEMENT**

/ \_\_\_\_ / \_\_\_\_ (1) Favourable comment (2) Unfavourable comment (3) No comment

/ \_\_\_\_ / \_\_\_\_ (1) Favourable comment (2) Unfavourable comment (3) No comment

/ \_\_\_\_ / \_\_\_\_ (1) Favourable comment (2) Unfavourable comment (3) No comment

/ \_\_\_\_ / \_\_\_\_ (1) Favourable comment (2) Unfavourable comment (3) No comment

/ \_\_\_\_ / \_\_\_\_ (1) Favourable comment (2) Unfavourable comment (3) No comment

**Date of visit Comment on wound condition**

**D. DATE OF LAST FOLLOW-UP (DD/MM/YYYY):** \_\_ / \_\_\_\_ /

## Appendix 2: Ethical Approval Letter

### ENSIGN COLLEGE OF PUBLIC HEALTH - KPONG

OUR REF: ENSIGN/IRB/M2  
YOUR REF:  
Tel: +233 245762229  
Email: irb@ensign.edu.gh  
Website: www.ensign.edu.gh



P. O. Box AK 136  
Akosombo  
Ghana

21<sup>st</sup> November, 2016.

#### INSTITUTIONAL REVIEW BOARD SECRETARIAT

Edith Appiah  
Ensign College of Public Health.

Dear Miss Appiah

#### OUTCOME OF IRB REVIEW OF YOUR THESIS PROPOSAL

At a meeting of the INSTITUTIONAL REVIEW BOARD (IRB) of Ensign College of Public Health held on 16<sup>th</sup> and 17<sup>th</sup> November 2016, your proposal entitled "A REVIEW OF SURGICAL INTERVENTIONS IN MATERNAL HEALTH CARE AT THE VOLTA RIVER AUTHORITY HOSPITAL IN AKOSOMBO IN THE EASTERN REGION OF GHANA (2011-2015)" was considered.

You have been granted approval to proceed with your project.

We wish you all the best.

Sincerely,

Dr (Mrs) Acquah-Arhin  
(Chairperson)

Cc. Dean of Ensign College.

Cc: Ag. Academic Registrar, Ensign College.

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