

Obstetrical routines and interventions in a  
delivery unit in Jimma, Ethiopia

# The WANT study

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Student Thesis at the Faculty of Medicine

UNIVERSITY OF OSLO

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**The Women And Newborn CohorT study**

**Student thesis at the Faculty of Medicine**

**University of Oslo**

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2015

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# Abstract

**Motivation:** Collaboration between Oslo University and Jimma University include plans for interventional studies to improve maternal and perinatal health in the Jimma area according to WHO recommendations on health care during labour and childbirth. No written documentation existed on the obstetrical routines in the maternity ward at Jimma University Specialized Hospital (JUSH). In order to be able to conduct interventional studies, baseline data on the obstetrical routines was needed.

**Problem statement:** The main aim of the WANT study was to observe how the maternity ward at JUSH was organized, and to gather data regarding clinical routines and practices just before, during and after childbirth. In this thesis we have assessed the clinical routines and procedures performed in the maternity ward at JUSH, and compared them to the WHO Guidelines for maternal and newborn care.

**Approach:** We were 5 medical students who spent three weeks in the maternity ward at Jimma University Hospital to conduct an observational study. The data was collected on case report forms that consisted of four modules shadowing different aspects of delivery and newborn care. The modules were transferred into Excel documents, where the data was analysed.

**Results:** 87 women were included in the WANT study. We have background information on the women and information regarding the admission examination. Observations on 56 deliveries were recorded, and 59 children were born. We have solid information on the 56 deliveries regarding procedures, examination and newborn care. Although some of the modules were not completed for every woman and child, we believe that the data material fairly reflects the clinical routines in the maternity ward at JUSH.

**Conclusion:** We found that the admission procedures for women in labour are in accordance with the WHO guidelines for integrated management of Pregnancy and Childbirth. The maternity ward at JUSH also has good routines regarding prevention of postpartum haemorrhage. Jimma University Specialized Hospital has several challenges that can be dealt with at low cost.

## Preface

We would like to thank the Medical Faculty at the University of Oslo for supporting our trip to Jimma, Ethiopia. A special thanks to Professor Ingrid Os and Jeanette Magnus, Director of Institute of Health and Society, for their enthusiasm and support. We would like to express our gratitude to advisor Tolesa Tilahun Hafte for teaching us about the culture of Ethiopia. We are very grateful to our fellow student researchers Fanny Andersson, Kine Lunde Frydenberg and Fredrik Hjortaas for great cooperation throughout the study.

We would also like to thank the staff at the Jimma University Specialized Hospital, especially doctor Workneh and doctor Amenu, for welcoming us to Jimma.

Our supervisors Katariina Laine and Thor Willy Ruud Hansen have been of great importance to us. Thank you for your support and guidance, both academically and emotionally, during our stay in Jimma and while working on this thesis. At last we would like to extend a special thanks to our main supervisor Katariina Laine for providing us with the knowledge on how to plan a field study. Her presence and guidance in the maternity ward during our first week of field work was crucial to this study.

We hope the WANT study will contribute to further research and collaboration between Jimma University Specialized Hospital and The University of Oslo.

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# 1.0 Introduction

The WANT study is part of a collaboration between Jimma University, the University of Oslo and Oslo University Hospital. In the past years there has been bilateral exchange of work force, educational programmes and research resources between the institutions.

Representatives from the University of Oslo have been in Jimma on several occasions and in 2013 the Dean and other staff members of the medical faculty of Jimma University visited their colleagues in Oslo.

In winter 2014 we were 5 medical students, one paediatrician, one obstetrician and one coordinator from the medical faculty in Oslo who went to Jimma, Ethiopia. The aim of the study was to gather data on routines and practices at the maternity ward at Jimma University Specialized Hospital, bearing in mind the possibility of interventional studies performed by other students to follow us. The Case Report Forms we used to gather data were made through a series of discussions prior to our journey. The CRFs were also discussed by email with two of the head doctors at JUSH prior to our arrival. We would like to thank Dr Workneh and Dr. Amenu at respectively the Paediatric department and the Obstetric department for their cooperation and useful comments.

The five students who participated in the data collection have chosen to focus on different topics in this study. The present student thesis will explore the routines and practices we observed in the maternity ward and compare them to the WHO guidelines for maternal and newborn care.

## 1.1 Background

The country of Ethiopia is situated in East-central Africa. It is bordered by Sudan in the west, Somalia and Djibouti in the east, Kenya in the south and Eritrea in the northeast. The capital is Addis Abeba. The population of Ethiopia is approximately 84 million inhabitants, with a growth rate of 2,6% per year. [1] Of the Ethiopian population 47% is under 15 years of age. It is a country with a diverse population, which includes a variety of nationalities, people and language groups. The population consists of more than 80 different ethnic groups. The Oromo and the Amhara make up the two largest population groups. The main religions are Christianity and Islam, and about 3% are followers of traditional religions. [2]



Ethiopia is one of the few African countries which have maintained its independence throughout history. Historically, the country has been ruled by successive emperors and kings, with a feudal system of government. In 1974 the military took the power by force, and ruled the country until May 1991. Ethiopia currently has a federal system of government, and the political leaders are elected every five years.

Ethiopia is one of the least urbanized countries in the world, and only 16% of the population lives in urban areas. Agriculture accounts for almost half of the country's gross domestic product, and coffee has been one of the main export items for a long time. About half of the women and 33% of the men have no formal education. [2] 64% of the population are illiterate, and amongst the women the illiteracy rate is 77%. The general literacy has been on the rise since 2005. [1]

### **1.1.1 The City of Jimma**

Jimma is situated about 350 km southwest of Addis Abeba, and it is the largest city in the southwestern Ethiopia. It is a special zone of the Oromia region and is surrounded by Jimma Zone. According to a census conducted by the Central Statistical Agency (CSA) of Ethiopia in 2007, the Zone of Jimma had a population of 120,960 people, 60,136 women and 60,824 men. There has been a lot of migration since 2007, and the numbers are not solid. The population number is believed to be much higher. According to the CSA there is a new census going on at the moment, and the results will be finalized in 2017. The three main ethnic groups are Oromo, to which approximately 46,7 % of the population belong. 17,1 % are Amharic, and 10,1 % consider themselves Dawro. The remaining 26,1 % of the population belong to other ethnic groups. [3]

In 2007 Amharic was the first language for 41,6 % of the population in the area. 40,0 % speak Afan Oromo, and the remaining speak other local languages. According to the 2007 census 46,9 % of the population practiced Ethiopian Orthodox Christianity, while 39,0 % of the population practiced Islam. [3]

Through the months of April until the end of September the region experiences heavy rainfall. As there is a minimum of paved roads in the city, the rainy months causes a significant strain on the infrastructure in the area. The temperature usually remains above 20 degrees Celsius

during daytime. In November to February the average night temperature is 8 degrees Celsius, and it rises to an average of 12 degrees Celsius in the months from March to October. [4]

### **1.1.2 Jimma University and Jimma University Specialized Hospital (JUSH)**

Jimma University is a leading university in Ethiopia, and has been ranked first for four consecutive years by the Federal Ministry of Education. The university was established in 1983, and it is renowned in Africa. Almost 40 000 students are enrolled in a number of different programmes. Jimma University Specialized Hospital (JUSH) is located on campus.

Jimma University Specialized Hospital (JUSH) is one of the oldest public hospitals in Ethiopia. It was established in 1930 by Italian invaders for the service of their soldiers. Currently it is the only teaching and referral hospital in the southwestern part of the country. It provides services for approximately 15 000 inpatients, 160 000 outpatients, 11 000 emergency cases and approximately 4 500-5000 deliveries a year, coming to the hospital from the catchment population of about 15 million people. The total number of the staff at the hospital is 1448 people, including all technical and supporting staff. The number of gynaecologists and obstetricians employed at the hospital is 8. There are 45 midwives. In addition to the employees there are numerous medical-, nursing- and midwifery students doing their mandatory training in the maternity ward. [5]

### **1.1.3 Maternal health and child mortality**

Ethiopia has a fairly low average life expectancy, estimated at 62 years for males and 65 years for females [6]. The life expectancy differs in rural and urban areas, as the life expectancy is lower in the rural areas compared to the cities. Infant mortality rates are high, as over 8% of infants die during or shortly after birth. However, the infant mortality rate declined by 39% over a 15-year period between the 2000 Ethiopia Demographic and Health Survey (EDHS) and the 2011 EDHS. The EDHS was conducted by the Central Statistical Agency in Ethiopia. Childhood mortality is higher in rural areas than in urban areas. According to the EDHS 2011 only 10% of the country's births are attended by skilled health personnel. The survey also states that the maternal mortality rate is 676 deaths per 100.000 deliveries. [2]

In 1997 the government implemented the first phase of its Health Sector Development Programme (HSDP), which is a 20-year health development strategy planned through four

consecutive 5-year investment programmes. The HSDP is a means to realize the objectives of the government's health policy. The programme has a series of core objectives, grouped into four different stages. The HSDP is currently in its fourth phase, which is designed to improve the provision of quality health services, including prioritizing maternal and newborn care, improving child health and reverse the spread of HIV/AIDS, tuberculosis and malaria. Only 1.5% of the population age 15-49 is HIV-positive. [2]

In 2015 the total fertility rate is estimated to 5,15 children per women [7]. The rural and urban population differ in that the rural women have twice as many children as urban women. Women start giving birth at a young age, as more than one-third of the women age 20-49 had given birth by the age of 18, and more than half by age 20. [2] Women reported in the EDHS 2011 that the most important barrier to access health services is obtaining transport to a facility, followed by lack of money and distance to the nearest healthcare facility. More than half of the women felt that it was not necessary to give birth in a health care facility. Frequent antenatal visits are unusual. Thus, only one woman in every five made four or more antenatal care visits during the course of her pregnancy. The median duration of pregnancy at the time of the first antenatal visit is 5.2 months. [2]

#### **1.1.4 The health care system in Ethiopia**

The Health Ministry of Ethiopia has introduced a health care system consisting of three different levels. Level one is a woreda (district) health system, which consists of a primary hospital, health centres and their satellite health posts. These units are connected to each other by a referral system. Together they form a primary health care unit. Level two is a general hospital for 1-1.5 million people, and level three is a specialized hospital for 3.5-5 million people. [8]

The expansion of local health care facilities has improved physical access to health services. Meanwhile, the health care utilization remains low, with a 0.36% utilization rate. The lack of use of health care facilities is owed to economic, sociocultural and geographical factors. [8]

Ethiopia suffers from a severe shortage of healthcare workers. Per 10.000 individuals there are <0.5 physicians, 2 nursing and midwifery workers, <0.5 dentistry workers, <0.5 pharmaceutical personnel, <0.5 environmental and public health workers, 3 community health

workers and 2 hospital beds. There is also a shortage of medicines, as the availability of essential medicines is only 52% in the public sector. [8]

### **1.1.5 Millennium Development Goals**

The United Nations Development Goals are eight goals that all 191 UN Member States have agreed to try to achieve by the year 2015. The MDGs all have specific targets and indicators. The MDG 4 has the goal of reducing child mortality. According to target 4.A it is a goal to reduce the under-five mortality rate by two-thirds between the years of 1990 to 2015. In 1990 the under-five mortality rate in Ethiopia was 205 deaths per 1000 live births. In 2013 the number had been reduced to 64. The MDG target for 2015 was a reduction to 68 deaths per 1000 live births. Accordingly, Ethiopia has reached Target 4.A of the Millennium Development Goals, which is a significant achievement. [1]

The MDG 5 concerns improving maternal health. According to target 5.A the goal is to reduce the maternal mortality rate by three quarters between the years of 1990 to 2015. In 1990 the maternal mortality rate in Ethiopia was 1 400 per 100 000 live births. In 2013 the number was reduced to 420. The MDG target for 2015 was set to 350 deaths per 100 000 live births. As seen by the numbers, Ethiopia is making progress in this matter as well, although the goal has not yet been fully achieved. [1] Target 5.B concerns the need to achieve universal access to reproductive health by 2015. The target consists of three parts, the first concerning the attendance of skilled health personnel at births. In the years between 2006 and 2013 only 10% of deliveries in Ethiopia met this goal. The second part of target 5.B deals with antenatal care coverage, at least one visit during the pregnancy. In the years from 2006 to 2013 only 34% of pregnancies in Ethiopia met this criterium. The MDG goal for 2015 is a 100 % coverage of attendance of skilled health personnel during delivery and antenatal visits. The WHO states that there has been insufficient progress in both fields. As for the third part, which concerns the need for family planning, there has been no progress in Ethiopia according to the WHO. [1]

### **1.1.6 WHO guidelines on pregnancy, childbirth, postpartum and newborn care**

The WHO has created a guide for essential practice covering pregnancy, childbirth, postpartum and newborn care. The guidelines were published for the first time in 2003, and have been revised three times since, last in 2015. The guide was created by the contribution of

over 100 individuals and organizations in the field of maternal and newborn health. The contributors came from 35 different countries. The document is based on evidence-based norms and standards in maternal and newborn care, and was created to contribute to a reduction of maternal mortality and perinatal deaths. The foreword specifically notes that a widely shared misconception is that improvements in newborn health care require sophisticated and expensive measures. As a matter of fact the essential care during pregnancy, the assistance of skilled personnel and a few critical interventions for the newborn during the first days of life is what is needed to achieve a reduction of perinatal mortality. [9] In this thesis we have compared the practice and routines in the maternity ward in Jimma with the WHO Guidelines mentioned above.

## **1.2 Aims of the WANT study**

Collaboration between Oslo University and Jimma University includes plans of interventional studies to improve maternal and perinatal health in the Jimma area according to WHO recommendations on health care during labour and childbirth. To conduct such studies baseline data from the obstetrical routines are needed. Therefore, the main aim of this study was to explore the clinical routines used on the labour ward in the Jimma University Specialized Hospital, and to compare the observed routines with the WHO recommendations on childbirth and newborn care.

Specifically, to observe and record:

1. Routines when the mother was admitted to hospital in labour or due to pregnancy complications
2. Clinical routines during the first, second and third stages of labour
3. Postpartum treatment and hospital stay after delivery
4. The organization and logistics on the labour ward

## **2.0 Material and Methods**

### **2.1 Setting**

The WANT study is part of the collaboration between the Jimma University, the University of Oslo and Oslo University Hospital. We stayed in Jimma and did our data collection from the 30<sup>th</sup> of January until the 11<sup>th</sup> of February 2014.

The maternity ward consists of several rooms and sections. The WANT study focuses on the women who were in labour or had complications in late pregnancy. These women were attended to in two separate rooms: the first stage room, where the women in first stage were examined and attended to; and the second/third stage room, where the women who were in active labour gave birth.

### **2.2 Study design**

The WANT study is an observational study. Data on clinical routines and practices was collected in the maternity ward at JUSH by observing the medical staff during their shift on the labour ward. We were 5 medical students, one obstetrician and one paediatrician who worked together.

Observational research involves the direct observation of individuals in their natural setting. We did not want to influence or affect the hospital routines in any way, and the study design was set up as a pure observation study. We had five data collectors, the students, working in shifts from 08:30h till 20:00h. We arranged a rotation schedule, so that 2 or 3 data collectors together were present at the maternity ward. Due to unsafe travel home at night, the observation period was limited to these hours. The data collectors did not contribute in the work at the labour ward. Their main task was to observe and gather information.

The focus area of the observation study was set in advance. We used Case Report Forms (CRFs) which were constructed and evaluated through a series of meetings and discussions within the group in Oslo in the months before departure to Ethiopia. The group consisted of Katariina Laine, Thor Willy Ruud Hansen and the 5 students. The registration forms were then sent to colleagues in Jimma prior to our arrival, as we wanted to make sure we shared the same opinion on the relevance of the different parameters we wanted to investigate. As there was little information on how the Obstetric- and Paediatric Department were organized, we decided to make a broad CRF that would cover both the care of the mother, care of the

newborn and also how the maternity ward was organized. We wanted the CRF to be both copious and comprehensive, as our main goal was to gather as much relevant information as possible. At the same time, we had in mind that we probably would not be able to map every piece of information in the CRF. The parameters that turned out not to apply, or which were not in use in the ward, were discarded as part of a running evaluation of the data forms during the actual collection period. The collected data was plotted in a case report form, which is attached as appendix 1. Each data collector received a specific case report number. Thus, Fanny Andersson had CRF 100-199, Kine Lunde Frydenberg had CRF 200-299, Fredrik Hjortaas had 300-399, Kaja Langeland had CRF 400-499 and Linn Oftenes Lie had 500-599.

The data collectors wrote directly on the CRF forms while they were in the study field. The CRF forms were designed in such a way that it was easy for the data collector to plot the information while they were observing. Each data collector recorded data on a woman from the moment she entered the first stage room of the maternity ward, through the delivery of the newborn, until she left the second and third stage room of the maternity ward with her newborn child. In some situations there were a lot of procedures happening to both the mother and the newborn child at the same time. In these cases two data collectors worked together; one stayed with the mother and observed the routines after the delivery, another observed the routines regarding the newborn. The information from the woman and her child were tied together with the same CRF number.

We had several different variables we wanted to study; who were the women admitted to the labour ward at The University Hospital of Jimma; what treatment did they get; how were they treated; what measurements did the hospital staff focus on; which health personnel did what procedures; how long did they stay at the hospital; what happened to the newborns; how many of the newborns survived? Some variables we managed to observe objectively while the hospital staff were working. Other variables, like the women's background information, were collected in cooperation with the staff and the woman. The health professional often interpreted for the woman as very few women spoke fluent English.

### **2.3 Inclusion and exclusion criteria**

We included the women who were attended to either due to labour or to pregnancy complications in the first stage room of the maternity ward during the hours 08:30h and

20:00h during the study period of dates. Most of the women gave birth during the observation period. In these cases we have data on the background of the mother, the practices and procedures in first, second and third stage of delivery, and also routines regarding the newborn child. In some cases the mother did not give birth before 20:00h. In these cases we have background data on the mother and some information on the delivery. However, unfortunately, we do not always have data on the newborn, as the actual delivery sometimes took place after 20:00h. The study also includes some women who entered and stayed in the second stage room for some time, and for various reasons were sent back to the waiting area.

The main focus area of the WANT study was to observe how the maternity ward was organized and to gather data regarding routines and practices just before, during and after the delivery of a child. Therefore, women who were not in active labour were excluded. In addition to the first stage room and the room for active labour there were several other rooms in the maternity ward. In this study we did not include the women who were admitted in the septic room or the high risk room. Nor did we include the women who were in the post delivery room if the data collectors did not witness or attend the delivery. Due to limited resources and safety issues as mentioned before, The WANT study did not continue the observations at night. Deliveries that took place in the hours from 20:00h till 08:30h were therefore excluded from the study. Women who entered the second stage room, received a quick examination from a physician and were then immediately sent back to the waiting area are also excluded from the study.

## **2.4 Data Analysis**

The Case Report Forms (CRFs) were the foundation of the data collection. The CRF consisted of different modules shadowing different aspects of the delivery.

- Module 1 had the main focus on the mother, her background, how she was attended to and the clinical routines at admission. The module had 13 different aspects and covered the time when the woman entered room 5, the maternal demographics, her obstetrical history, which data concerning the mother's health and the pregnancy the staff collected, and which measurements were prioritized regarding her vital parameters.



- Module 2 focused on active labour. The module covered 26 different aspects divided in three sections: first stage, second stage and third stage of delivery. The module registered who was present at the delivery, which measurements were performed during the delivery, monitoring and interventions during delivery, medications given during delivery, how the newborn was handled immediately after delivery, what routines were used regarding cord cutting and placental assessment, and what routines the department had regarding obstetrical emergencies such as excessive bleeding or slow progression.
- Module 3 had the main focus on the newborn and how he/she was attended to. The module had 18 aspects and included what kind of health personnel that took care of the newborn, date of birth, weight, drying, wrapping, measurements regarding vital parameters, medications, examination and at what time the newborn was handed over to the mother.
- Module 4 focused on newborn resuscitation. This module was used when resuscitation of the newborn was needed. It consists of 11 factors which are often used in resuscitation, like tactile stimulation, suction, ventilation, chest compression, drug administration etc.
- Module 5 was intended as a follow-up of the woman and the newborn at home. It covers whether the child is alive one week and one month after birth, and if the mother has had any contact with a health service after being discharged from the hospital.
- Module 6 focused on how the labour ward was organized. It is a descriptive observation of how the maternity ward was organized and how the hygienic and sanitary facilities were. This module is not attached to any participant in the study, it is a general observation of the ward.

The CRF modules 1, 2 and 3 had in total 68 different observations areas. These modules were consistently used for every woman who entered the WANT study. Module 4 was used when necessary. Module 5 was left with our Ethiopian colleagues for them to complete if they had the resources available. Module 6 was filled out throughout the observation period.

After the fieldwork was done the students sorted the CRFs by modules. One student was responsible for one module. The hand written modules were transferred to Excel documents. We had one Excel document for every module. The same CRF number was attached to one woman and her newborn in every Excel document / module.

We analysed the data in Excel. We used Excel formulas to calculate how many women we had included in the study, how many deliveries, what the mean age was, what the mean parity was and so on. Not every item of the CRF modules was analysed. Some areas had very little data. This was due to a number of reasons. Some of the parameters in the study were difficult to observe without interfering with the natural course of the work done in the ward. Some information was either not available, or was difficult to obtain due to lack of a common language.

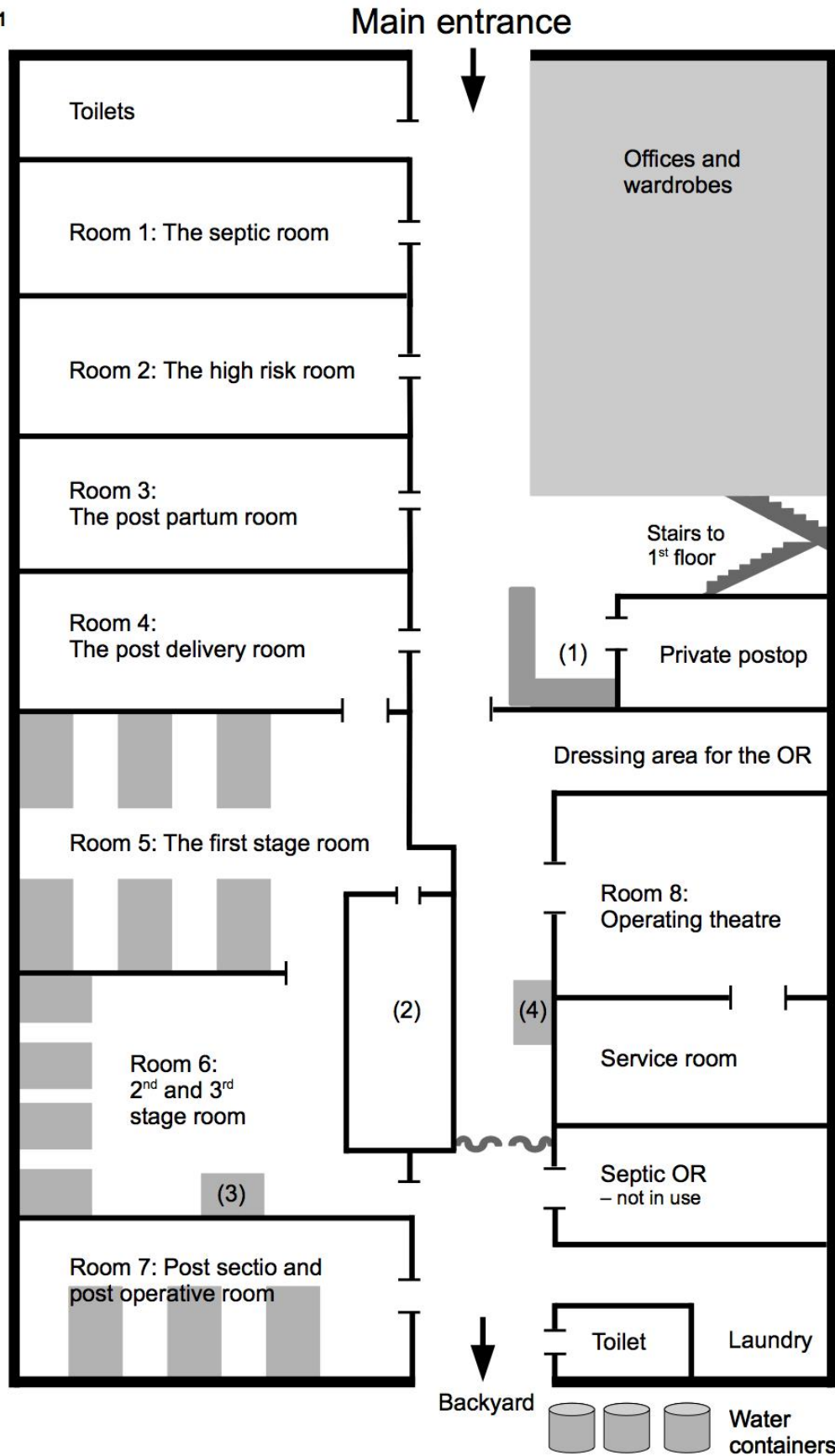
## **3.0 Results**

In total 87 women were included in the WANT study. We have recorded 56 deliveries. 59 children were born, as there were 3 women with multiple births. We have background information and information regarding the admission examination on almost all of the women. We have solid information on the deliveries regarding procedures, examination and newborn care.

### **3.1 The infrastructure of the maternity ward**

The Jimma University Specialized Hospital is located at the University campus, and the departments are located in different buildings. The maternity ward at the Obstetric and Gynaecological department was in the same building as the Paediatric department and the Newborn Intensive Care Unit (NICU). The maternity ward was situated on the ground floor of the building, and was connected to the Paediatric department by an indoor staircase. The buildings are old, as the hospital was established in 1930. The federal government has granted economic support and resources to construct a brand new hospital with 600 inpatient beds on campus. The new hospital was under construction during our stay. According to the construction plan, the new hospital will be opened in September 2015.

Figure 3.1



1: Reception 2: Storage and sanitary 3: Table for the newborns 4: Resuscitation station for neonates

### **Figure 3.1 – The Maternity ward**

As the ward was overpopulated and had limited amount of space, we observed that several of the rooms were used in a different manner than the intention for use that was explained to us. For instance, several women who did not suffer from any infection were placed in the septic room. Also it seemed quite random which women were placed in room 3 and 4.

#### **Room 1 / «The septic room»**

The room had 10 beds. Patients with serious infections were admitted to this room. This was not a strict policy, as both regular post-partum and other gynaecological patients were admitted to room 1 in addition to the patients with postpartum infections.

#### **Room 2 / «The high risk room»**

The room served as an observation ward for high-risk pregnancies. The room had 10 beds.

#### **Room 3 / «The postpartum room »**

Women who had gone through a caesarean section and some of the regular postpartum patients stayed in this room.

#### **Room 4 / «The post-delivery room»**

The room served as a post-delivery ward. The women spent up to 6 hours here before returning home

#### **Room 5 / «The first stage room»**

The room had 6 beds, and was reserved for women who were in the first stage of delivery. When the women entered this room, they were admitted to the ward and went through a medical examination. They stayed in this room until they entered the second stage of delivery.

#### **Room 6 / «The second- and third stage room»**

The room had four beds, and it was in this room that most of the women gave birth. They were taken into the room when they entered the 2<sup>nd</sup> stage of delivery. If more than four women were giving birth at the same time, some of the deliveries took place in room 5 as well. Room 6 also had a table where the newborns were put after birth. The table also served as an examination area for the newborns.

#### **Room 7 / «The post-operative room»**

This was the post-operative room. The room had 3-4 beds. Women who had undergone caesarean section stayed here for recovery for the first 6 hours after the surgery.

#### **Room 8 / «The operating theatre»**

The operating theatre had room for one patient at a time. In connection with the OR there was a service room in which the sterile equipment was stored, and the preparations in advance of surgery took place.

### **3.1.1 Sanitary conditions**

There was no running water at the maternity ward. Water was tapped into several big plastic containers in the backyard. The maintenance personnel fetched water from these containers, and swept the floor with water and chlorine several times during the day, although not regularly. The floors were often covered with blood, amniotic fluid and urine. It was constantly crowded in the maternity ward, as many medical and midwifery students were doing their mandatory training. In combination with the lack of running water, this made satisfactory cleaning of the floors difficult. Also, as a consequence of the lack of running water, we did not observe hand wash taking place before engaging in patient contact. Some of the health personnel carried small bottles of sanitary alcohol in their pockets, but our observations suggest that these were mostly used after contact with the patients. The ward received latex-gloves sporadically, and these were commonly used during deliveries for as long as the stock lasted.

Room 5 consisted of 6 full sized beds, with mattresses dressed in plastic. The mattresses were wiped with chlorine and water sporadically. We did not identify any defined routines for cleaning of the beds in between the different patients. The patients had buckets beside the beds which were used for urination and defecation. There were no partitioning walls or other shielding between the beds. Yellow boxes for needles and sharps were placed at several different locations in room 5. The health workers often had to walk in between crowds of staff to get to the yellow boxes, this entailed risk of accidentally stabbing each other with contaminated needles. When the boxes were filled to the brim with sharps, they were disposed of in a regular trash bin.

In room 6 there were four half-sized maternity beds, and some of the beds did not have stirrups. Plastic sheets were placed underneath the lower part of the women's body during delivery. The plastic sheets were changed in between each patient. As in room 5, there was no shielding between patient beds. The mattresses were washed with water and chlorine after each delivery. The medical and surgical instruments used in room 6 were placed on a non-sterile table. After use, the instruments were washed by hand in soap water at the maternity ward. They were then put in chlorine water for some time, before they were put out to dry. The instruments were then sent in containers to a different location at the hospital, where they were decontaminated before being returned to the ward.

### **3.1.2 Material resources**

The Maternity ward had a limited quantity of the material resources often considered necessary. For example, the ward possessed only one electrical extension cord. This was used for both the ultrasound, in the operating theatre and during resuscitation of newborns.

Naturally, situations arose where the electrical cord was needed in multiple situations at the same time. We witnessed that the extension cord was taken away during resuscitation of a newborn because it was needed elsewhere, thus suction of the newborn could no longer be performed. It was also time consuming in emergency situations, for someone to go looking for the extension cord and find a suitable electrical outlet, before necessary interventions could be initiated. The extension cord was occasionally dragged along the contaminated floor, and was handled without any sanitary protection by the health personnel.

The electricity supply was unstable, causing difficult working conditions for the surgeons, especially during night time. Luckily, many among the staff had cell phones, which were frequently used as a light source during operations when electricity was out. The maternity ward had only one ultrasound machine. There was a limited supply of ultrasound gel, so water was used as medium instead. We did not observe the probe being cleaned between patients. Of note, the ultrasound was only performed on the abdomen, no transvaginal ultrasound examinations were performed. When the ward ran out of material resources that could be obtained at the pharmacy, the next-of-kin were given a prescription with a list of necessary equipment and medication. This could include latex gloves, needles and medicines. The families were then responsible for obtaining this material, so that their relative could get the care that she needed. This represented a large expense for the families, and some were not able to manage the cost. Also, the local pharmacy ran out of stocks of medicines and other materials that were frequently used, which sometimes made it difficult to get the necessary equipment.

### **3.1.3 Information and numbers from the maternity ward protocol**

After giving birth, it was reported that the usual time spent in the ward before leaving for home was 6 hours. When a caesarean section had been performed, the time spent in the ward varied from 24 hours up to several days. The main factor for time spent as an in-patient, was the distance from the hospital to their home. The operation protocol book reported a median of 3 caesarean sections a day, for a total of approximately 1000 caesareans a year. According

to sources among the staff, there are approximately 5-6000 deliveries a year at the maternity ward in Jimma, although the hospital reports 4500 deliveries a year on their homepage. Although there is some uncertainty about these numbers, they translate into a rate of roughly 16 - 22 % caesarean sections annually.

### 3.2 Module 1 - Admission

The women who were admitted to JUSH came from the zone of Jimma. Most of them came from the city of Jimma, some from the more peripheral suburbs of the city, while others had been referred from their local health care facility farther away. Almost every women came by foot; walking alone or with family members. The women spoke Oromo, Amharic and also other local languages/dialects. The youngest woman was 17 years and the oldest was 37 years. The mean age of the 87 women in the WANT study was 26,2 years. Thirty of the women gave birth for the first time (table 3.1).

**Table 3.1 Maternal age, parity, and recorded birth term definition**

<b>Maternal age (mean, n=74)</b>		26,2 years
<b>Parity, n=72</b>	Para 0	30 (42%)
	Para 1	11 (15%)
	>Para 1	31 (43%)
<b>Known term date, n=38</b>	Last menstrual period	28 (74%)
	Ultrasound	3 (8%)
	Unknown method	7 (18%)

#### 3.2.1 Health card and background

When a woman enters a maternity ward it is important for the health personnel to get an update on her obstetrical status. In that way you can focus your medical care and assess if the woman is in need of any emergency treatment. In the WANT study we wanted to observe those parameters which were of interest for the personnel on arrival at the maternity ward at JUSH. Module 1 of the CRFs covered this area.

Only about 47 % of the women who were admitted to the maternity ward at JUSH had attended antenatal visits at their local health facilities. These women carried a health card with vital obstetrical information (table 3.1). Most of the women were in week 40. Nine women



were in week 38 or less, and only two women were past week 42. It was challenging to figure out the reason why the women came to the hospital. We managed to track down a referral reason for 30 women (table 3.2).

**Table 3.2 Reasons for referral to hospital, in percent**

Referral reason	Observations	%
Preeclampsia	5	6
Fetal distress	3	3
Post term	2	2
Rupture of membrane	12	14
Vaginal bleeding	8	9
Unknown	57	66
<b>Total, n=87</b>	<b>87</b>	<b>100</b>

### 3.2.2 Admission into the first stage room

As soon as the pregnant woman entered the first stage room she was examined by a resident in obstetrics. If the woman was in active labour she remained in the first stage room until she was ready to move into the second/third stage room. If the woman was not in active labour at that time she was sent to a provisional waiting area in front of the maternity ward building. While she was waiting outside she usually had family members gathered around her. Sometimes the women were accompanied by their husbands, and sometimes the pregnant women were accompanied by other female family members like their mother, grandmother, sister or aunt. None of the family members were permitted to enter the maternity ward while the women were in active labour.

### 3.2.3 Obstetrical status

There were three main parameters on which the health personnel focused when the woman first entered the maternity ward: cervical assessment, fetal heart rate and frequency of contractions (table 3.3). The obstetrical resident did a vaginal examination and assessed the cervical opening. The Leopold's Manoeuvre was only done in special circumstances, when the physicians found it necessary. The position of the presenting part was examined on 11 women. During the observation period of the WANT study we never observed an examination to evaluate the sutures and fontanelles.

**Table 3.3 Performed procedures concerning obstetrical status on admission (%/n)**

Procedure	Performed/Observations	% (n)
Assessment of cervical opening	62/62	100 (62)
Fetal heart rate	63/64	98 (64)
Frequency of contractions	47/48	98 (48)
Blood pressure	76/76	100 (76)
Body temperature	58/59	98 (59)
Urine analysis	19/41	46 (41)

The table shows the procedures that were being performed on admission to the maternity ward at JUSH. It demonstrates how many times specific procedures were being performed, out of the observations that were recorded.

### 3.2.4 The Partogram

After her first examination the woman stayed in the first stage room until she reached the second stage. During her time in this room she had a medical intern or medical student observing her labour progress continuously. The woman was placed in a single bed, and stayed in this bed until she was asked to move. The medical intern sat next to the woman, observing the progress of labour. The maternity ward at JUSH generally did not use printed partograms. The medical interns and medical students often wrote down the vital parameters on a blank piece of paper. The parameters they focused on were blood pressure, pulse, temperature, fetal heart rate and frequency of contractions. We recorded whether a partogram was used in 53 cases. In 31 of the observed deliveries a hand written partogram was used. In only one case was a printed partogram used, and in 21 of the observed deliveries no kind of partogram was observed to be used while in the maternity ward. We noted that in the most complicated deliveries the personnel did not prioritize recording information on partograms. This was natural as emergency procedures were activated fast, and with scarce personnel resources there was little time to record the partogram. Fetal heart rate recording by CTGs was not available at JUSH. The frequency of contractions was observed by the medical interns with manual palpation of the uterus. The interns had their hand constantly on the woman's abdomen, palpating the progress of contractions. There appeared to be no routine as far as how often the medical interns recorded the woman's progress in labour. However, we observed that it was common to document the contractions 4 to 5 times per hour. When the interns found it necessary for another assessment of the cervical opening they usually contacted a resident who did the vaginal examination.

### 3.3 Module 2 - Active labour

When the woman entered active labour she was moved from the first stage room into the second stage room. Unfortunately, we did not manage to clarify the specific criteria for definition of active labour at the maternity ward at JUSH. However, before the woman was transferred to the second/third stage room an assessment of the cervical opening was always performed. The woman had to walk in to the second stage room on her own. If needed, she was supported by a few of the hospital staff. Once arriving in the new room, which was separated from the first stage room by an open door, she was put in a delivery bed.

#### 3.3.1 Delivery

During the WANT study 59 babies were born in 56 deliveries. The delivery method was recorded in all 56 deliveries 57% of the deliveries were spontaneous vaginal deliveries. (table 3.4). In addition to the spontaneous vaginal deliveries we observed forceps deliveries, vacuum extraction, breech deliveries, and craniotomies. Of the 56 deliveries 16 were caesarean sections (29%). As far as we observed, all of the caesarean sections except one were emergency procedures. In many of the caesarean sections the indications were unclear and not specified, even though we actively tried to seek out the cause. In 5 cases the indication was slow progress in the first stage and two other births had slow progress in the second stage. However, in the remaining 9 caesarean sections the indications were unclear (table 3.5).

**Table 3.4 Observed delivery methods, in percent**

Mode of delivery	Observations	%
Spontaneous delivery	32	57
Forceps	3	5
Vacuum extractor	1	2
Cesarean	16	29
Craniotomy	2	3.5
Breech	2	3.5
<b>Total</b>	<b>56</b>	<b>100</b>

Of 56 deliveries 39 were vaginal, either normal or with complicating factors. During active labour the medical interns and students continued to check the woman's vital parameters. The blood pressure was measured in every delivery. The mother's body temperature was checked in 22 of the deliveries. Frequency of contractions was monitored closely during active labour

in 36 of the 39 vaginal deliveries. We managed to track down the fetal presentation for 42 of the babies. Thirty-two were cephalic normal, 3 were cephalic abnormal, there were 3 breech presentations, 2 footlings and 2 face presentations.

**Table 3.5 Indication for caesarian section, in percent**

Indication	Observations	%
Slow progression of 1 <sup>st</sup> stage	5	31
Slow progression of 2 <sup>nd</sup> stage	2	13
Other/unknown	9	56
<b>Total</b>	<b>16</b>	<b>100</b>

### 3.3.2 Pain relief and perineal protection

The health personnel informed us that the use of analgesia during labour was rare at this maternity ward. In all of the deliveries we observed, only two women were given intravenous pethidine as pain relief. The indication for pethidine in both cases was intrauterine fetal demise. Perineal protection was rarely done at the maternity ward in Jimma (table 3.6). In contrast, episiotomy was frequently performed. We recorded whether episiotomy was performed in 44 different deliveries. The use of episiotomy was observed in 50 % of these deliveries. A lateral episiotomy was used in 21 deliveries and one episiotomy was a mediolateral cut.

**Table 3.6 Perineal protection technique**

Technique	Observations	%
Hands-off	24	70
Ritgens	8	24
Other	2	6
<b>Total</b>	<b>34</b>	<b>100</b>

### 3.3.3 Umbilical cord and placenta

Cutting of the umbilical cord happened very quickly in the maternity ward at JUSH. Of the 56 deliveries in the WANT study we managed to record the time from delivery of the newborn until the cutting of the umbilical cord in 51. The mean time was 8.9 seconds. There were several deliveries where the cutting of the umbilical cord happened after one second. The longest interval was 35 seconds. When the umbilical cord was cut there appeared to be no

routine as far as how the newborn was positioned. Thus, the newborn was placed below the placenta during cutting of the umbilical cord in 22 cases, and above the placenta in 18 cases. Only nine times did we observe that the newborn was put on the mother's chest, and in the last two deliveries the newborn was handled in another way which has not been specified. The placenta was not routinely inspected and examined after delivery. However, in 15 of 45 deliveries the placenta was visually assessed. The placenta was never once weighed, nor was the cord length ever measured.

### 3.4 Module 3 - Newborn care

During the observation period we recorded data on the care of 59 newborns. Regrettably, the module is not complete for all of the newborns. This is due to several reasons. For instance, some of the newborns were immediately taken to the NICU, while others were stillborn. Also, some were lost from sight for periods of time by the data collector. The distribution of the baby gender was 67 % girls and 33 % boys. The module has recorded 52 live born and 7 stillborn babies.

#### 3.4.1 Drying and wrapping of the newborn

We made 40 observations regarding the professions involved in the care of the newborns immediately after birth. At times there was more than one person involved in the newborn care. There was a majority of midwives and medical students represented in the care of the newborn, respectively 22 and 19. On three occasions obstetric residents were responsible for the immediate care. In five instances nurses were in charge of newborn care.

**Table 3.7 Performed procedures in newborn care (%/n)**

Procedure	Performed/Observations	% (n)
Drying	50/53	94 (53)
Wrapping	51/54	94 (54)
Body temperature	3/47	6 (47)
Birthweight measured	53/57	93 (57)
ID-tag	3/59	5 (59)
Vitamin K	0/46	0 (46)
Tetracycline eye ointment	12/59	20 (59)

The table show procedures observed being performed the first hour after birth. It demonstrates how many times specific procedures were being performed, out of the observations that were recorded.

Immediately after birth, the babies were taken to a common examination table for newborns. The newborns were left on this table until they were reunited with their mother. The number of newborns on the table could be up to 3 and 4 at the same time. Only 3 out of the 59 newborns received an ID-tag (table 3.7). The newborns were usually dried with a towel after birth. This was done with nearly all of the newborns, as only in 3 cases there was no attempt made to dry the newborn. Almost all newborns were wrapped in a towel or other garment after drying. Although, approximately half of the newborns were swaddled in a dry towel or garment, only two of them received a preheated towel. Out of 51 observations, 20 were swaddled in a wet towel, often the same that had been used to wipe them dry. Out of 49 observations 11 newborns received a hat. Six of these hats were put on by the data collectors in the WANT study.

It was not common to place the newborn skin-to-skin with the mother after swaddling. The newborn was usually left alone on the table while the mother recovered on the birthing bed. According to the local health personnel this practice was based on the traditional belief that the mother needed to control any postpartum bleeding before being reunited with her newborn. The mean time before the newborns were handed to their mother was 40.2 minutes (table 3.8). The longest interval we observed was 90 minutes and in only two cases the newborn was united with the mother immediately after wrapping.

**Table 3.8 Newborn data**

<b>Birthweight (mean, n= 53)</b>		3108 grams
<b>Time before handed to mother (mean, n= 31)</b>		40.2 minutes
<b>Time before handed to mother (n=31)</b>	1-30 min	16
	31-60 min	10
	61-90 min	5

### 3.4.2 Measurements and examination of the newborn

Body temperatures were seldom measured in the maternity ward in Jimma. The few times we observed the procedure done, the temperature was measured in the axilla. The ward had only one warming lamp, which was placed over the resuscitation table. This was not in use except for during resuscitation situations. Instead, a regular oil radiator was placed directly on the examination table for the neonates, being tied to the table with plastic strings. Although it

worked well as a heating source for the newborns it was in precariously close proximity to the babies.

Birthweight was routinely measured. Weight measurements were not performed on four newborns. Three out of these four were stillborn. The fourth baby was taken to the NICU immediately after delivery. The mean birthweight was 3108 grams (table 3.8). The lowest birthweight we recorded was 900 grams, and the highest 4500 grams. Newborns who had a weight under 1000 grams were considered spontaneous abortions, and no actions were taken to try to save these babies. According to health personnel, this was because the hospital did not have the resources to manage further treatment for such preterm and small newborns. Only two out of 37 newborns were seen to receive a newborn examination. One of the examinations was performed by a midwife, the other by a medical intern. We observed the Apgar-score being used five times.

None of the newborns received an injection with vitamin K. We were told that this was due to lack of access to the drug. The hospital had recently run out of stores of the vitamin K which they had received as a donation from visiting American health care workers, and they had not been able to obtain it again. Sporadically, the newborns received tetracycline eye ointment, this also varied with the availability of the product. (table 3.7)

### **3.4.3 Handling of stillborn babies and their mothers**

During our observation period, seven of the 59 newborns recorded were stillborn. In one of the cases the stillborn was placed on the examination table for the newborns. The mother was given a choice of whether she wanted to bring the baby home, or let the hospital take care of it. In all of the other cases the stillborn was placed in a regular garbage bin, several times next to the delivery bed. We observed that disposables like used gloves etc. were being thrown in the same garbage bin. On occasion the stillborns were left in the garbage for several hours. Meanwhile, the mother was left to herself in the delivery bed next to other women giving birth. We did not observe any follow-up of the mother after the birth of a stillborn.

## **3.5 Module 4 - Resuscitation of the newborns**

We made 15 observations of procedures relating to resuscitation of the newborn. No attempts

were made to resuscitate the 7 stillborn babies. The maternity ward had only one resuscitation table that was placed outside the operating theatre. This station had a warming lamp and suction, and in addition the oxygen tank was usually close by this station. As mentioned earlier, the ward only had one electric extension cord. The resuscitation station was dependent on this for full functionality. Some of the newborns were rushed to the Newborn Intensive Care Unit (NICU) without any attempts at initial resuscitation in the maternity ward. The mean duration of resuscitation was 7.7 minutes. The longest duration was 32 minutes, and the shortest was 1 minute. As soon as the newborn made a sound or was breathing on its own, the procedures were stopped, and the newborn was often left without any further supervision. Of note, this observation applies specifically to the newborns that were resuscitated in the maternity ward. We do not have any data regarding observation of the newborns after resuscitation in the NICU.

### **3.5.1 Procedures**

Tactile stimulation was used on all of the newborns in need of resuscitation. In all but one of the cases the newborns were dried with a towel. Other stimulation like rubbing of the back, stimulation of the sole of the foot and stimulation of sternum were frequently used.

Suction of meconium was performed in 12 of the 15 resuscitation situations. Securing open airways was mainly done by positioning of the head. Only one of the newborns had a towel placed beneath the shoulders. Ventilation with mask and bag was performed in 11 of the 15 cases. Ventilation with oxygen was more frequently used than room air. Only one of the newborns received CPAP-treatment in the NICU. In 4 of the 11 situations where ventilation was performed, we noted difficulties with the procedure. Specifically, too much force was being used and the safety valve was triggered repeatedly. Also, the mask was not placed correctly over the newborn's face, or the mask was not the right size.

Assessment of heart rate was performed only in 4 cases, this was done by auscultation. In one of these cases, additional assessment was done by palpating the pulse in the brachial artery. This resuscitation was done by a paediatric doctor in the NICU. Chest compressions were performed in 3 of the 15 cases. None of the newborns received any infusion of fluid or administration of drugs. No blood samples were taken from the umbilical cord.

Two of the 15 newborns died after 5 and 12 minutes of resuscitation respectively. We have sparse data on the mother and the pregnancy, except that it was a multiple pregnancy, and that one of the twins had a birthweight of 1000 grams. The newborn that was given 5 minutes of



resuscitation only received tactile stimulation as a resuscitating measure. The other twin was taken to the NICU, without any interventions being performed in the delivery ward.

Resuscitation was initiated 5 minutes after arrival at the NICU, and procedures included tactile stimulation, suction of airways, bagging, assessment of pulse, and chest compressions.

A paediatric doctor was working on the newborn for 12 minutes before terminating the attempts to resuscitate. The newborn died shortly afterwards.

## 4.0 Discussion

According to the Ethiopia Demographic and Health Survey from 2011 approximately 90 percent of births in Ethiopia happen at home [2]. The 10 percent who actually give birth attended by skilled health personnel, either in a hospital or in the peripheral health stations, usually live in close proximity to the hospital or are referred to the hospital because of problems with the pregnancy and/or the delivery. As a result of this, many of the women in the WANT study presented with high risk pregnancies or complicating factors such as prolonged labour. This is a factor that possibly might contribute to the number of caesarean sections and outcomes for the newborns in this study.

### 4.1 Admission

According to the WHO guidelines for Childbirth a health professional should always perform a Quick Check when a woman enters a labour ward. The Quick Check assesses the woman's condition on arrival, why she came to the hospital and what her concerns are. Once referral reason and the general condition of the woman are established, there should be done a Rapid Assessment and Management (RAM) of the woman. The RAM chart in the WHO guidelines focuses on assessing airway and breathing, circulation, pregnancy status, vaginal bleeding and emergency signs such as convulsions, severe abdominal pain, dangerous fever and paleness. Once obstetrical or medical emergencies are ruled out the health personnel should continue with labour care. [9]

The person who attends to the woman should go through her medical and obstetrical history and do a thorough examination of the woman. Fetal heart rate (FHR), maternal blood pressure and temperature, signs of dehydration and the woman's response to contraction should be examined first. After the initial examination the stage of labour should be defined by doing a vaginal examination and determine cervical dilatation, feel for presenting part and feel for membranes and cord. [9]

At JUSH the women who entered the maternity ward received a rapid examination by a medical intern immediately after entering the first stage room. There was no written routine on how to perform a Quick Check or RAM at JUSH. However, the WANT study observed that women who presented with an obstetrical emergency received immediate care by skilled

obstetrical staff. In these cases the woman's need was assessed in just a few minutes, the need for more experienced staff was recognized and management of the specific problem was handled quite fast. There was rarely any delay in the treatment.

If the woman presented to JUSH with a normal progress of labour she would be attended by the medical intern. The intern, or in some cases the medical student, would check and observe her vital parameters and record the FHR and contractions, as is recommended in the WHO Guidelines. Furthermore an obstetrical resident would always do a vaginal examination, and primarily determine cervical dilatation and thereby the woman's stage of labour. The progress of labour was recorded as recommended by the WHO guidelines, often several times per hour. A new vaginal examination was done only when necessary, in accordance with the WHO Guidelines. [9]

The initial admission of a woman in labour at JUSH was in accordance with the WHO guidelines. Considering the great demand of patients and accordingly shortage of staff in the maternity ward, the admission procedures were performed in an impressively efficient and thorough manner.

## **4.2 Privacy and supportive care throughout labour**

As long as the woman was in the first stage of labour she stayed in her bed in the first stage room. None of the women were encouraged to move around. The only observation the WANT study did on mobility was when the women had the need to urinate or defecate. They would then use the buckets that were placed in between the beds for their needs. As stated in the WHO Guidelines on supportive care throughout labour, the woman should be encouraged to walk around freely during the first stage of labour. [9] This was not practiced at the maternity ward in Jimma. It can be argued that the facilities made it difficult to abide by this rule, as there was little space to move around. In addition to the medical residents, nurses and midwives, there were numerous medical students and midwifery students present at the maternity ward, observing different medical procedures. This contributed to the limited possibilities of mobility for the women, as the ward was constantly crowded.

There was no privacy for the woman while she was in the first stage room. She shared the room with at least 5 other women. There was no partitioning wall or shielding between the

beds. All examinations were performed in full view of both the patients and the health personnel that were present in the room at the time. None of the women in labour were allowed to bring a companion in to the first stage room. The WHO guidelines on supportive care through labour recommend that a birth companion should be encouraged, so that the women have physical and mental support during labour. [9] None of the women in the WANT study had such a companion, however, all of the women were under the supervision of a medical student or intern, who recorded the progress of labour. These members of staff were constantly by the woman's bedside, and it could be argued that they filled some of the functions of a birth companion. In addition, the limited physical space of the ward would have made it difficult to have such a companion present with so many women in active labour in the same room.

### **4.3 Second stage of labour**

When the woman was in the second stage of labour, the frequency and quality of the contractions, the FHR and the woman's vital parameters were monitored by the intern while the resident was in charge of delivering the baby. The resident was monitoring the perineum's distention and the descent of the fetal head during contractions. Prior to delivery the WHO guidelines recommend that the woman's bladder should be emptied. This was rarely done at JUSH. Also, the woman should be in a comfortable position of her choice during delivery, preferably as upright as possible. [9] At JUSH the woman laid on her back during delivery. She was not given any choice regarding her position. If she tried to change position she would be instructed to go back to lying flat on her back. Some of the delivery beds had no stirrups, resulting in an unpleasant birth position for the women without any possibility to rest their legs other than on the short bed.

According to WHO guidelines the birth attendant should ensure controlled delivery of the head by keeping one hand gently on the head and support the perineum with the other hand. [9] In the majority of the deliveries at JUSH, it was practiced a hands-off delivery. However, Ritgen's manoeuvre was performed in a quarter of the observed deliveries. Recent research support that manual perineal protection reduces the risk of perineal tear and anal sphincter injuries. [10] It is also emphasized in the WHO guidelines that episiotomy should only be performed if there is obvious obstruction to progress and not as a routine procedure. [9]

At JUSH episiotomy was used in 50 % of the deliveries, and the indications for most of the episiotomies were uncertain. It can be argued that the high rates of episiotomies at JUSH were done to prevent anal sphincter injuries, and the following complications, such as anal incontinence. Just under 50 % of the women who came to JUSH had antenatal follow ups. It is not likely that many women would go to postpartum controls at a health centre. An anal sphincter injury with no follow up could lead to serious complications for the woman. At JUSH there were only 2 perineal tears registered during the WANT study's observation period, a fairly low number that could be due to insufficient recording by the data collectors. Even though the numbers are not significant, a hypothesis is that the low rate of perineal tears could be due to the frequent use of episiotomies.

As soon as the baby is delivered it is recommended by the WHO Guidelines that the newborn should be put on the mother's abdomen or chest to achieve early skin-to-skin contact. [11] If this is not possible the newborn should be put in a clean, warm and safe place close to the mother. [9]. Early skin-to-skin contact prevents postpartum bleeding and enhances milk production [11]. At JUSH early skin-to-skin contact was not practiced. The newborn was put on an examination table several meters away from the mother, and was not united with the mother before up to 90 minutes (table 3.8).

#### **4.4 Third stage of labour**

At JUSH an intramuscular injection of oxytocin was routinely given to the mother immediately after delivery. This is in accordance with the WHO guidelines to prevent postpartum haemorrhage. [9] Postpartum haemorrhage is one of the main causes for maternal mortality, especially in developing countries. [12] We observed that the staff was stressing the importance of preventing postpartum haemorrhage. As the women only spent approximately six hours in the hospital after delivery, this was a highly prioritized issue. Furthermore, many of the women lived far away, and did not have easy access to health services if complications should occur. Several measures were taken to prevent postpartum bleeding, in accordance with the WHO guidelines. For instance, the placenta was in almost every case delivered by controlled cord traction. If there was any suspicion of postpartum bleeding the uterus was externally massaged, and the woman was closely monitored by an intern or student in the hours after delivery. However, the placenta and the membranes were not routinely inspected after delivery, and the placenta was not once weighed. It was often thrown directly in a

garbage bin along with other trash. Inspecting the placenta and membranes is an important preventive step for postpartum bleeding. The WHO Guidelines also stress the importance of disposing the placenta in an appropriate manner in a safe container. [9]

#### **4.5 Autonomy of the woman**

It is stated several places in the WHO Guidelines that the woman in labour should be treated with respect and emotional support. Her opinion on matters regarding the delivery should be taken in to consideration and if there is no medical contradiction to her requests the health personnel should do their best to fulfil her wishes. For instance, she should be able to choose her own birth position, she should be able to choose if she wants analgesia, and if she wants a birth companion by her side. [9] At JUSH the women's autonomy was severely limited. The doctors in charge were highly respected, and the women in labour had to do as they were told. If they did otherwise they would receive verbal, and in some cases, physical abuse. The women were encouraged to cooperate throughout delivery. It was considered inappropriate if the women made grunts of pain or moved due to discomfort during delivery. If the women did not cooperate they would risk scolding and reprimands from the residents. The clearly unequal distribution of power in the maternity ward shadows the Ethiopian culture in general. Men are considered to be head of the family and are always in charge. Male doctors are authority figures, and their actions are rarely questioned by the patients.

#### **4.6 Newborn care**

The WHO guidelines recommend thorough drying of the newborn immediately after birth, and then to discard the wet materials. Furthermore, they recommend leaving the newborn on the mother's chest in skin-to-skin contact, and to apply an ID-tag. The guidelines also state that the newborn should be wrapped and the head covered with a hat. [9] Almost all of the newborns at JUSH were dried according to the guidelines, but 39% of them were then swaddled in wet clothing, often the same used to dry them. The ward had recently received a donation of hats for newborns. Most of the newborns did not receive these. There are some uncertainties as regards these data as the data collectors recorded the data differently. One of the data collectors marked as if the newborn did not receive a hat when the student herself provided the newborn with this. The data we have regarding this issue will, however, reflect whether the staff provided the newborn with hats. It is unclear whether the lack of use of these

hats reflected that the staff did not have any routine regarding this measure, or if it was neglect of the importance of heat preservation for the newborns. None of the babies delivered during our observation period were bathed after birth. This is in accordance with the WHO guidelines. In our data collection we only recorded three newborns who received an ID-tag. On occasions there were several newborns who were lying on the examination table at the same time, and often the mothers had not yet seen their newborn before it was placed there. A possible outcome of this practice could be a mix-up of the newborns.

#### **4.7 Stillborn or neonatal death**

According to the WHO's guidelines for stillborn and neonatal death, it is important to give supportive care to the parents as soon as possible. [9] Emotional support help the parents express and identify their feelings, which can involve a broad spectre of emotions. An appropriate response in the case of stillbirths or loss of newborns, should involve an honest and empathetic communication between the hospital staff and the parents. [13] In the WHO guidelines the significance of showing the baby to the mother and offer the parents and family to be with the dead newborn in privacy for as long as they need is specifically highlighted. [9] At the maternity ward in Jimma, the facilities made little room for privacy for the women in general. This also applied to the mothers who lost their newborns, either in stillbirths or the ones that died shortly after birth. We only witnessed one woman who was given a choice of whether to bring the dead newborn home with her, or leave it at the hospital. For all other observations we made of stillborns, they were disposed of in garbage bins, often next to the mother's bed. As far as we observed, none of the women were given any opportunity to spend time with the dead newborn. The fact that the women who had lost their child were left for hours in the delivery bed next to other women who were giving birth to healthy babies, gave little room for grieving. Neither did we observe any psychosocial follow-up of the women. As none of the women were allowed to bring a birth companion into the ward, these women had no emotional support during or after delivery, except for the support offered by the staff. We did not observe any such supportive care being offered by the staff in these cases.

#### **4.8 Newborn resuscitation**

The WHO guidelines on newborn resuscitation state that resuscitation measures should be initiated within 1 minute of birth if the newborn is not breathing or is gasping for air. The

newborn should be kept warm and the airway opened by positioning of the head. Suction of the mouth and nose should be the next step in the procedure. If the newborn is still not breathing, the guidelines recommend ventilation with mask and bag. The ventilation should be continued for 20 minutes before terminating the attempt to resuscitate. If the newborn starts breathing, it should be kept under surveillance and is not to be left alone. [9] During our time at JUSH we observed 15 newborn resuscitations. The newborns who were not rushed to the NICU were taken to the resuscitation station which had a warming lamp. Suction was performed according to the guidelines, and securing of the airways by positioning the head was performed on all of the newborns who needed ventilation. The guidelines do not say anything about the preferred use of room air or oxygen, though the last revisions of international resuscitation guidelines recommend starting with room air [14]. Our material does not include enough data to determine which was used the most in Jimma, but we observed both oxygen and room air being used. We did not manage to get information as to whether the choice was random, or if they had a management plan regarding when to use which gas source. On several occasions the newborns were left to themselves immediately after they started breathing, and thus were left unattended. It remains unclear if this practice was due to lack of staff or lack of knowledge. In any case, it is not according to the WHO guidelines.



## 5.0 Conclusion

The Maternity ward at Jimma University Specialized Hospital has several challenges. There is a severe lack of staff and an extremely high turnover of patients. Even though the ward is crowded with staff, many of them are students or interns. The experienced doctors are few in numbers and are constantly under high work pressure. Furthermore, the maternal ward is insufficiently organized, there is a lack of running water, inadequate hygiene routines and electricity is very unstable. These issues may be corrected with the construction of the new hospital facilities. With this in mind it is remarkable that the WANT study reveals that the admission procedures of women in labour are in accordance with the WHO Guidelines for integrated management of Pregnancy and Childbirth. [9] In addition many of the measures the staff took to prevent postpartum haemorrhage are in accordance with the newest research in the field. It is beyond doubt that the health personnel at work at JUSH did their absolute best with the resources they have. However, there are several aspects of the maternity ward that certainly can be improved. One of the main factors is the autonomy of the women in labour. It is of great importance that a woman in labour is treated with respect and is shown emotional support throughout the delivery. Scolding and abuse should not take place. The woman should be able to participate in decisions regarding her delivery. Psycho-social follow up regarding stillbirths and traumatic birth experiences are other aspects that JUSH should look into. Furthermore, it is recommended that the maternity ward practice a hands-on support of the perineum as a routine and only do episiotomy when indicated. This might decrease the risk of perineal tears and anal sphincter injuries.

Regarding newborn care, one of the most important measures is to introduce skin-to-skin contact and kangaroo care immediately after delivery. Skin-to-skin contact, in addition to wrapping in dry fabric and putting a hat on will decrease the risk of developing hypothermia in the newborn. Also, the introduction of ID-tags for the newborns is an initiative that could prevent a possible mix-up of the newborns. These are areas that could be targets for future interventional studies, and should be possible to conduct with a limited amount of financial resources.

## 6.0 Literature/References

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**WANT- study:**  
**Woman And Newborn CohorT**  
**in Jimma, Ethiopia 2014**  
-An observational study

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**Content:**

Module 1. Mother attended

Module 2. Delivery

Module 3. Newborn

Module 4. Newborn emergency

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**Module 1. Mother attended**

Observation of clinical routines at mothers' arrival and during delivery

1. Date and time: \_\_\_\_\_ (dd.mm.yyyy) \_\_\_\_\_ (00:00)
2. Blood pressure  Measured: \_\_\_\_\_  Recorded  No
3. Temperature  Measured: \_\_\_\_\_  Recorded  No
4. Urine dip stix  Yes  No
  - a. Protein  Measured: \_\_\_\_\_  Recorded  No
  - b. Gluc  Measured: \_\_\_\_\_  Recorded  No
  - c. Leuk  Measured: \_\_\_\_\_  Recorded  No
5. Hemoglobin  Measured: \_\_\_\_\_  Recorded  No
6. HIV  Yes  No  Unknown status
7. Hepatitis  Yes  No  Unknown status
8. ABO-blood type  Determined: \_\_\_\_\_  Recorded  No
9. Rh type  Determined: \_\_\_\_\_  Recorded  No
10. Does she have a health card or other paper from health worker  Yes  No

**Status**

11. Examination of the fetal position and presentation
  - a. Leopold maneuver/ abdominal palpation  Performed  Recorded  No
  - b. Position of presenting part in pelvis  Performed  Recorded  No
  - c. Assessment of cervical opening  Performed  Recorded  No
  - d. Assessment of sutures and fontanels  Performed  Recorded  No
  - e. Frequency of contractions  Measured: \_\_\_\_\_  Recorded  No
  - f. Fetal heart rate  Measured: \_\_\_\_\_ /min  Recorded  No
  - g. Measuring fifths over brim  Performed \_\_\_\_\_ /5  Recorded  No

**Other information recorded by interview**

12. Obstetrical variables/history:
  - a. Reason for referral to hospital:  
\_\_\_\_\_  
\_\_\_\_\_
  - b. Recording of illnesses during pregnancy; which illnesses:  
\_\_\_\_\_
  - c. Known term date?  Yes: \_\_\_\_\_  No
  - d. Based on  Ultrasound  LMP
  - e. How is pregnancy duration estimated? \_\_\_\_\_
  - f. Parity; number of previous deliveries: \_\_\_\_\_
  - g. Number of children alive now: \_\_\_\_\_
  - h. Number of stillbirths or newborn death first week (perinatal mortality): \_\_\_\_\_
  - i. Deceased children at the age of 7-28 (neonatal mortality): \_\_\_\_\_
  - j. Deceased children after 28 days of age: \_\_\_\_\_
  - k. At what age? \_\_\_\_\_
  - l. Abortions: \_\_\_\_\_
13. Maternal demographics:
  - a. Maternal age: \_\_\_\_\_ years
  - b. Language spoken:  Oromo  Amharic  Other: \_\_\_\_\_
  - c. Mothers or fathers cell phone number: \_\_\_\_\_
  - d. Residence; distance from hospital: \_\_\_\_\_

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**Module 2. Delivery**

**First and second stage of labour:**

14. Who are present at the delivery

- a. Number of persons: \_\_\_\_\_
- b. Professions:  
 Midwife     Medical student     Nurse     Ob-Gyn doctor  
 Other: \_\_\_\_\_
- c. Spouse     Yes     No
- d. Other relatives  Yes, number? \_\_\_\_\_     No

15. Use of partogram  Yes     No

16. Repeated examinations during delivery:

- a. Blood pressure     Measured \_\_\_\_\_     Recorded     No
- b. Temperature     Measured \_\_\_\_\_     Recorded     No
- c. Position of presenting part in pelvis     Performed     Recorded     No
- d. Assessment of cervical opening     Performed     Recorded     No
- e. Assessment of sutures and fontanels     Performed     Recorded     No
- f. Frequency of contractions     Measured \_\_\_\_\_     Recorded     No
- g. Fetal heart rate     Measured \_\_\_\_\_     Recorded     No

17. Interventions during labour:

- a. Amniotomy if not ruptured membranes  Performed     Recorded     No
- b. Oxytocin use for labour augmentation  Performed     Recorded     No
- c. Duration of rupture of membranes: \_\_\_\_\_ hours
- d. Vaginal exploration after rupture of membranes? How often; once per hour?  
Describe: \_\_\_\_\_  
\_\_\_\_\_

18. Pain relief administered:  Yes     No

19. Type of pain relief

- a.  Morphin injections    b.  Nitrous oxide
- c.  PCB    d.  Pudendal block
- e.  Epidural    f.  Spinal
- g.  Other: \_\_\_\_\_

20. Fetal monitoring during delivery

- a.  CTG    b.  Pinard stethoscope    c.  Other: \_\_\_\_\_    d.  No

21. Duration of second stage of delivery (pushing): \_\_\_\_\_ min

22. Perineal protection by hands

- 1)  One hand slowing the baby's head
- 2)  One hand protecting the perineum
- 3)  Using both hands, 1 + 2
- 4)  Hands-off
- 5)  Other: \_\_\_\_\_

23. Episiotomy     Yes     No

24. Episiotomy type:  Mediolateral     Lateral     Medial (left or right?)

25. Perineal tear:  No - intact perineum    Degree:  1.     2.     3.     4.

26. Mode of delivery

- 1)  Spontaneous vaginal delivery
- 2)  Vacuum extraction
- 3)  Forceps
- 4)  Caesarean section
- 5)  Attempted operative vaginal delivery with following cesarean

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27. Fetal presentation  
 Cephalic normal     Cephalic abnormal: \_\_\_\_\_     Breech
28. Number if babies  
 One     Twins     Triplets
29. Indication for operative delivery or caesarean:  
a.  Slow progression stage 1 (caesarean only)  
b.  Slow progression stage 2  
c.  Fetal asphyxia  
d.  Fetal infection  
e.  Maternal infection  
f.  Maternal seizures (Eclampsia, cerebral malaria)  
g.  Maternal hypertension or preeclampsia  
h.  Other: \_\_\_\_\_

**Third stage of labour:**

30. Time from birth to cutting of umbilical cord in seconds: \_\_\_\_\_
31. Where is the baby when umb cord is cut  
1)  On mothers chest  
2)  Below placenta level  
3)  Over placenta level  
4)  Other, describe: \_\_\_\_\_
32. Postpartum Oxytocin i.m. routinely  Yes     No
33. Estimation of blood loss?  Yes: \_\_\_\_\_ ml     No
34. In case of excessive bleeding:  
a.  Fluid recovery  
b.  Blood transfusion  
c.  Oxytocin  
d.  Methergine (methylergometrine)  
e.  Misoprostol  
f.  External massage of uterus  
g.  Other: \_\_\_\_\_
35. Procedure if placenta delivery is delayed  
a.  External massage of uterus  
b.  Oxytocin  
c.  Methergine (methylergometrine)  
d.  Misoprostol  
e.  Other: \_\_\_\_\_
- If manual removal of placenta:
36.  In labour room     In operation theatre
37.  Without anesthesia/pain relief  
 With pain relief, describe: \_\_\_\_\_
38. Placental assessment  
a. Visual     Performed     Recorded     No  
b. Weight     Measured: \_\_\_\_\_ g     Recorded     No  
c. Cord length     Measured: \_\_\_\_\_ cm     Recorded     No  
Describe: \_\_\_\_\_

39. Mother alive 1 hour after delivery:  Yes     No

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**Module 3. Newborn**

40. Who takes care of the newborn – profession:

- Midwife     Birth attendant     Nurse assistant     Physician

41. Born date: \_\_\_\_\_ (dd.mm.yyy)

42. Born time: \_\_\_\_\_ (00:00)

43. Baby sex:     Girl     Boy

44. The newborn:     Liveborn     Stillbirth     Living after one hour

45. Attempt of drying the newborn     Yes     No

If yes:

46. How many towels were used: \_\_\_\_\_

47. What kind of towels are used

- 1)  Warm  
2)  Not warm  
3)  Fabric mother has from home

48. Bathing of the newborn?  Yes     No

49. Is the baby wrapped?     Yes     No

- 1)  Dry towel  
2)  Dry and warm towel  
3)  Wet towel (the same as the baby was dried with)  
4)  Other: \_\_\_\_\_

50. Use of hat/knit cap  Yes     No

51. When after delivery is the baby given to the mother

- 1)  Immediately on mothers breast (kangaroo)  
2)  After wrapping/bath/measures  
3)  Describe: \_\_\_\_\_

52. Temperature measurement

- 1)  No  
Yes: 2)  Axillary    3)  Rectal    4)  Other: \_\_\_\_\_

53. When temp measured

- 1)  0-5 min  
2)  5-60 min  
3)  1-4 hours  
4)  4-8 hours  
5)  >8 hours, still in the hospital  
6)  At discharge

54. Other temperature precautions

- a.  Incubator  
b.  Warming lamp  
c.  Other: \_\_\_\_\_

55. K vitamin  Yes     No

56. Anti HIV  Yes     No

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**Newborn measurement:**

57. Birthweight  Yes: \_\_\_\_\_ grams  No

58. Length  Yes \_\_\_\_\_ cm  No

59. Head circumference  Yes \_\_\_\_\_ cm  No

60. APGAR score  Yes  No

a.  1 min \_\_\_\_\_

b.  5 min \_\_\_\_\_

c.  10 min \_\_\_\_\_

61. Physical examination of newborn at delivery  Yes  No

62. Describe: \_\_\_\_\_

**Newborn at discharge:**

63. Physical examination of newborn at discharge  Yes  No

64. Describe: \_\_\_\_\_

65. Age of newborn at discharge: \_\_\_\_\_ hours

66. Pulse oximetry (foot) at discharge

Yes  No

67. Estimation of gestational age by Finnström method at discharge (weeks)

1)  Yes

2)  Impossible to assess

68. WHO growth standard

1)  SGA

2)  AGA

3)  LGA



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**Module 4. Newborn emergency**

69. Tactile stimulation:

- a.  Drying with towel
- b.  Rubbing the back
- c.  Stimulation of sole of the foot
- d.  Other
- e.  No

70. Suction meconium  Yes  No

71. Secure open airways

- a.  Positioning of the head
- b.  Placing of towel beneath shoulders
- c.  No

72. Ventilation with mask and bag

- a.  Use of oxygen
- b.  Use of roomair
- c.  Use of CPAP/neopuff
- d.  No

73. Assessment of heart rate

- a.  Auscultation
- b.  Pulse in umbilical cord
- c.  Assessment of pulse in brachialis artery
- d.  Assessment of pulse in femoral artery
- e.  No

74. Chestcompressions performed  Yes  No

75. Administration of drugs

- a.  Epinephrine
- b.  Other
- c.  No

76. Duration of resuscitation measures – minutes: \_\_\_\_\_ min

77. Infusion of fluid; type of fluid: \_\_\_\_\_

78. Blood samples from umbilical cord  Yes  No

79. Other: \_\_\_\_\_

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**Module 5. Follow-up at home**

**Follow up by phone**

Tel number: \_\_\_\_\_

**After 1 week**

80. Child alive?  Yes  No

81. If no, age when deceased: \_\_\_\_\_

82. Signs/symptoms/diagnose prior to death:

---

83. Contact with health service after discharge from hospital  Yes  No attempt

If yes:

- a. Health post
- b. Health centre
- c. Private doctor
- d. Hospital

84. Admitted to hospital  Yes  No

**After 1 month**

85. Child alive?  Yes  No

86. If no, age when deceased: \_\_\_\_\_

87. Signs/symptoms/diagnose prior to death:

---

88. Contact with health service after discharge from hospital  Yes  No attempt

If yes:

- a. Health post
- b. Health centre
- c. Private doctor
- d. Hospital

89. Admitted to hospital  Yes  No

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### Modul 6 Fødestue

90. Dato: \_\_\_\_\_  
91. Klokkeslett: \_\_\_\_\_  
92. Romtemperatur: \_\_\_\_\_  
93. Hvor mange kvinner deler rom under fødselen: \_\_\_\_\_

#### Sanitære tiltak:

Håndvask:

94. Tilgjengelig fasiliteter for håndvask:

- a. Vann i springen  Ja  Nei
- b. Såpe  Ja  Nei
- c. Tøyhåndkle  Ja  Nei
- d. Tørkepapir  Ja  Nei
- e. Sprit  Ja  Nei

95. Bruk av tilgjengelige fasiliteter  Ja  Nei

#### Aseptiske prosedyrer

96. Håndvask/sprit umiddelbart før pasienthåndtering?

Ja  Nei

97. Prosedyreforberedelser på rene overflater (visuelt vurdert)  Ja  Nei

#### Instrumentene:

98. Rene? (Visuelt vurdert)  Ja  Nei

99. Bruk av dekontaminert pakket utstyr?  Ja  Nei

100. Blir instrumentene rengjort mellom hver pasient?  Ja  Nei

Hvis ja:

- a.  Vasket
- b.  Sprit

#### Fødestue

101. Rent og ryddig gulv? (Visuelt vurdert)  Ja  Nei

102. Blodflekker, avføring, annet

- a.  Seng/stol
- b.  Gulv
- c.  Vask
- d.  Utstyrsbord
- e.  Annet