Quality and Humanization of Care Assessment (QHCA)

A Study of the Quality of Maternal and Newborn Care Delivered in Mozambique's Model Maternities

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Abbreviations and Acronyms

AMTSL	Active management of the third stage of labor
ANC	Antenatal care
BP	Blood pressure
BEmONC	Basic emergency obstetric and newborn care
CEmONC	Comprehensive emergency obstetric and newborn care
D5NS	Dextrose 5% in normal saline
EmONC	Emergency obstetric and newborn care
ENC	Essential newborn care
FANC	Focused antenatal care
FIGO	International Federation of Gynecology and Obstetrics
HMIS	Health Management Information System
HW	Health worker
ICM	International Conference of Midwives
IM	Intramuscular
IMPAC	Integrated Management of Pregnancy and Childbirth
IP	Infection prevention
IPTp	Intermittent preventive treatment for malaria
ITNs	Insecticide-treated nets
IU	International units
IV	Intravenous
L&D	Labor and delivery
M&E	Monitoring and evaluation
MCH	Maternal and child health
MCHIP	Maternal and Child Health Integrated Program
MNH	Maternal and newborn health
MISAU	Ministerio de Saude (Ministry of Health)
NS	Normal saline
PE/E	Pre-eclampsia/eclampsia
PMTCT	Prevention of mother-to-child transmission of HIV
PPH	Postpartum hemorrhage
QHCA	Quality and Humanization of Care Assessment
SBA	Skilled birth attendant
TBA	Traditional birth attendant
TT	Tetanus toxoid
USAID	United States Agency for International Development
WHO	World Health Organization

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Executive Summary

BACKGROUND AND METHODS

The Model Maternities Initiative (MMI) is designed to improve the quality of care from the client's perspective ("humanization of care") and also the technical aspects of maternity care. The initiative focuses on routine preventive practices and emergency management practices related to key maternal and newborn complications (postpartum hemorrhage, eclampsia, obstructed labor, sepsis, newborn asphyxia, and hypothermia). Accurate and reliable data are needed in order to better plan the focus of training, supervision, and other implementation support, as well as to guide expansion of the initiative to new sites. With support from the United States Agency for International Development (USAID), the Maternal and Child Health Integrated Program (MCHIP) assisted Mozambique's Ministry of Health (MISAU) with an assessment of the quality of care delivered in current and planned expansion facilities from September to November 2011. The study assessed the care received by mothers and newborns during antenatal and delivery care.

The primary objective of the Quality and Humanization of Care Assessment (QHCA) was to determine the coverage and quality of interventions that address direct causes of maternal and neonatal deaths. Comparisons were made between model and non-model facilities. The results of the assessment are meant to guide the need for, and content of, quality of care improvement activities for maternal and newborn care in these present and future model maternities, which account for more than 50% of all institutional births in the country. The results of the survey will be used to inform and guide the national program and policies responsible for quality improvement in key interventions in antenatal care (ANC), labor, and delivery. The results will also provide baseline estimates of the quality of these interventions in the facilities in the expansion plan for the MMI. Because a similar assessment was done in maternities in five other sub-Saharan African countries, the results in this group of maternities could be compared to this reference group.

The assessment was implemented in a representative sample of both current model maternities and future model maternities—facilities in MISAU´s expansion plan, which were used as a comparison group to the current model maternities in the assessment. Nineteen of the current 34 model maternities were assessed. Of the 88 facilities in MISAU's 2011–2014 MMI expansion plan, 24 were not included in the sampling frame because of low delivery volume (<2 deliveries/day). Of the remaining 64 facilities, 28 were sampled in order to include sufficient facilities so that 480 deliveries could be observed during the observation period of two to three days per facility.

Four tools were used to gather data during health facility visits:

1. A facility inventory, which recorded the availability of critical drugs, supplies, equipment, and infrastructure
2. A structured clinical observation checklist for ANC consultations
3. A structured clinical observation checklist for labor and delivery (L&D) and obstetric and newborn complications
4. A structured health worker interview guide and knowledge tests on L&D practices, including management of labor complications such as postpartum hemorrhage (PPH), pre-eclampsia/eclampsia (PE/E), obstructed labor, and essential newborn care and resuscitation

A fifth national policy and drug review tool was also employed.

FINDINGS AND CONCLUSIONS

The study involved observations of 525 deliveries and 303 ANC consults in 46 health facilities (17 model and 29 non-model), as well as interviews with 186 health workers. Findings are highlighted in the table below.

Table ES.1 Findings from the Assessment of 46 Maternities in Mozambique

GENERAL AREA	FINDINGS
Policies	▪ Policies/practice guidelines, which cover all the key areas assessed, are in place: PPH, PE/E, obstructed labor, essential newborn care, newborn resuscitation.
Human resources	▪ Designated skilled attendants (mid- and basic-level nurses) attended more than 82% of deliveries observed. ▪ The level of staffing is inadequate in many maternities.
Supervision	▪ Most of the health workers (> 73%) reported being supervised in the six months before they were interviewed.
Drug and supply logistics	▪ Life-saving medicines (oxytocin, magnesium sulfate) were almost universally available. ▪ Other needed supplies/equipment for implementation of signal functions were widely available. ▪ Some important supplies were much less available—e.g., soap (69%), calcium gluconate (12%).
Health worker knowledge	▪ Knowledge scores for routine L&D care were high but mean scores for recognizing and managing specific complications, newborn care, and newborn sepsis were generally less than 40%.
Antenatal care practice	▪ Provider performance on first ANC visits was generally good with weaker areas being asking about client's last menstrual period and about the medications she is taking. ▪ Coverage of ANC preventive interventions was also good with a mean score of more than 60%. ▪ Several areas of client counseling such as for antimalarials, use of insecticide treated nets, deworming, and prevention of mother-to-child transmission of HIV (PMTCT) were performed quite well, but counseling on nutrition, birth preparation, danger signs, breast feeding, and postpartum family planning was poorly addressed. Staff at non-model facilities performed less well than their counterparts at model facilities on the ANC counseling topics.
SPECIFIC CONDITION/ COMPLICATION	**FINDINGS**
Postpartum hemorrhage	▪ Oxytocin for active management of the third stage of labor (AMTSL) is almost universally available; however, it was often not refrigerated, which may affect potency. ▪ Provision of oxytocin 10 units intramuscular (IM) was given in 88% of births, and it was given within three minutes of birth 64% of the time. ▪ Provision of other components of AMTSL: controlled cord traction in 54% of cases; uterine massage in 71% of cases. ▪ If the timing of administration of oxytocin is relaxed to three minutes, then all three components of AMTSL were implemented in 33% of deliveries. ▪ Knowledge scores for diagnosis and management of PPH were low (33% overall). Approximately 35% knew how to diagnose and treat bleeding associated with an atonic uterus and 34% knew how to diagnose and treat a retained placenta. Knowledge scores for health workers in non-model facilities were generally lower than in model facilities.
Pre-eclampsia/eclampsia	▪ Screening for PE/E during ANC and L&D by taking blood pressure (BP) was performed 60% of the time. A major constraint in non-model facilities was the lack of a functioning blood pressure cuff. ▪ Few providers asked clients about a history of PE/E danger signs, either in the ANC clinic or in the L&D ward. There was little variation between model and non-model facilities in this regard. ▪ The primary drug used for prevention of eclampsia is magnesium sulfate. ▪ Magnesium sulfate was available in all of the facilities.

SPECIFIC CONDITION/ COMPLICATION	FINDINGS
Obstructed labor	▪ All facilities had partographs in stock. ▪ Availability of all essential supplies and equipment for EmONC functions was high across all facilities. ▪ Correct initiation of the partograph occurred 38% of the time. Partographs were often filled out, but were incomplete, and were often filled out after delivery. ▪ Cesarean section appears to be underutilized; only 56% of sampled model maternities, which are comprehensive emergency obstetric and newborn care (CEmONC) facilities, reported performing a cesarean section in the last three months.
Sepsis prevention (infection prevention)	▪ Performance of infection prevention (IP) practices in L&D was generally good, but performance was lacking on some specific IP practices (e.g., hand washing before delivery and use of protective clothing). ▪ Non-indicated use of manual exploration of the uterus, which is a risk factor for maternal puerperal sepsis, was done for 10% of deliveries.
Newborn care/newborn asphyxia	▪ Several aspects of immediate newborn care need significant improvement, especially skin-to-skin contact and initiation of breastfeeding. ▪ Equipment needed for immediate newborn care was available in almost all facilities. ▪ Of the initial six steps of newborn resuscitation, on average about 3.7 of the steps were done in the cases observed. There were not enough cases to make judgments about the variation in practice between model and non-model facilities.

RECOMMENDATIONS

Policies

- Most of the key policies for identification, prevention, and management of the key causes of maternal and newborn death are in now place. It is now a question of policy implementation.

Human Resources/Training

- Clearly, inadequate staffing is a major issue in many of these maternities. Improvement will be difficult without addressing this issue. In the busiest maternities, nurses were delivering four or even six women per shift, with additional responsibilities as well. MISAU ought to consider the addition of at least a few more L&D personnel in the most understaffed facilities.
- Focusing efforts on a few maternities closest to being recognized as models could help make the concept of a model maternity more tangible and make it seem more attainable to personnel in other nearby maternities.
- Although many personnel across the assessed facilities had received training in most of the key topics within the last three years, the level of skills and knowledge was below standard. While competency-based training currently in place is an improvement over traditional classroom training, further innovation is called for: use of the new integrated training packages to give more focused modular trainings, and on-the-job training associated with supportive supervision.
- Some basic skills need to be emphasized in training:
  - Birth preparation counseling
  - The initial assessment of the client in L&D

Supervision

- Quantity of traditional supervision is barely adequate. This can be increased by provincial-level nurse supervisors whose focus would be to improve the functioning of model maternities.
- More important than infrequent, intense supervisory visits, is to increase the frequency and focus of supervisory contacts (“high frequency, low dose”).

Drug and Supply Logistics/Infrastructure

- Key drugs, commodities, supplies are available, which is encouraging.
- Blood pressure cuffs and stethoscopes need to be universally available in ANC and L&D.
- Some simple infrastructure improvements could reduce the barriers to client privacy—curtains, screens, re-engineering of space.

Monitoring and Evaluation

- The new integrated ANC and L&D registers that MISAU has rolled out at the beginning of 2012 are an exciting change. All development partners should support this effort, which promises to give comprehensive and timely information for managing the key processes for quality improvement.

COMPLICATION-SPECIFIC RECOMMENDATIONS

Postpartum Hemorrhage

- Recent evidence has shown that administration of IM oxytocin is the most important component of AMTSL; this is the component with the highest coverage, by far.
- Given the importance of this lifesaving drug, proper care ought to be taken in the storage of oxytocin. Many facilities were observed not to refrigerate oxytocin. While this may not present a problem in the cooler months, this almost certainly causes some loss of potency in the warmer months. MISAU should issue a clear directive to refrigerate oxytocin. If there is doubt as to the need for this, MISAU ought to consider conducting an oxytocin potency study, as was done in Ghana in 2010, to test the potency of its unrefrigerated product in maternities.
- Evidence on the timing (within one minute or within three minutes) for the administration of a uterotonic drug is currently weak. If a single provider is attending a woman at delivery, delivering the newborn, and providing essential newborn care—all of which are necessary before oxytocin is administered—injection of oxytocin within one minute is quite challenging. Therefore, the ability to adhere to this requirement in the guidelines (uterotonic within one minute) is severely constrained in a setting such as Mozambique, unless there is more than one birth attendant. Almost 80% of the observed births in this assessment were managed by only one health provider. Measuring performance based on an unrealistic goal could demoralize both providers and policymakers. Research on the timing of uterotonic administration would help to clarify the guidelines.

Pre-eclampsia/Eclampsia

- On aggregate, only 12% of the women observed during ANC were informed of how to recognize signs of pre-eclampsia and there was only minimal difference between model and non-model facilities. Education on early warning signs must be improved to decrease undue delays in detecting pre-eclampsia before it becomes dangerous.
- Observed practice of PE/E screening in both ANC and L&D were low, indicating many missed opportunities to prevent this deadly disease. Logistical constraints (i.e., presence of blood pressure apparatus) and health worker knowledge about PE/E identification, screening, and treatment were the largest gaps contributing to low rates of screening.
- Correct use of magnesium sulfate and anti-hypertensives was almost universal, but the implementation of additional clinical assessments needed for eclampsia management was not as universal. There should be a focused effort through supervision to improve this practice.

Obstructed Labor

- Low and incomplete usage of the partograph is not a problem unique to Mozambique, even after years of advocacy, training, and supervision. Qualitative research might help to reveal how partograph use can be better promoted and supported. Creative solutions will need to be found, which may need to include piloting the use of new technologies, such as the e-partograph.

Sepsis Prevention/Infection Prevention

- Handwashing before patient care needs to be reinforced.

Immediate Newborn Care and Birth Asphyxia

- Preparation for the possible need for newborn resuscitation for all births must be emphasized. Protocols that make this easier should be implemented and should be a focus of supervision—immediate cleaning of bag and mask apparatus after use; storage of all needed equipment in a single container; resuscitation container near at hand for all births.
- The new newborn resuscitation protocol (Helping Babies Breathe) developed by the American Academy of Pediatrics and endorsed by the World Health Organization (WHO) is simple and focuses attention on the first critical steps of resuscitation. Training on this could help catalyze rapid, needed improvement.

Background

GLOBAL AND LOCAL CONTEXT

A short list of causes accounts for the majority of maternal and newborn deaths worldwide. According to the World Health Organization (WHO), postpartum hemorrhage is the most frequent cause of maternal deaths globally, accounting for 25% of maternal deaths, followed by hypertensive disorders in pregnancy pre-eclampsia/eclampsia (PE/E) at 15%, sepsis at 8%, and obstructed labor at 7%. Every year, nearly 40% of all deaths in children under-five years of age are among infants who die in the neonatal period (0–28 days). Fully 19–34% of these neonatal deaths occur within the first 24 hours.[1] Globally, the main causes of newborn deaths are prematurity and low birth weight, infections, asphyxia, and birth trauma. These causes account for nearly 80% of deaths in this age group. In Mozambique, the 2009 mortality survey found a similar cause of death profile. This points to the fact that the peripartum period (labor, delivery, and the immediate post-natal/postpartum period) and the quality of care delivered during this time—preventing and managing a limited number of key conditions—is especially critical to maternal and child survival.

Table 1 Mozambique—Key Health Indicators

Total population	20.5 million	2007 Census
Life expectancy at birth	47.9 years	2010 INE*
Maternal mortality ratio	408/100,000 live births	2003 DHS**
Neonatal mortality rate	48/1,000 live births	2008 MICS+
Adult HIV seroprevalence	11.2%	2009 INSIDA++

* Instituto Nacional de Estatística
**Demographic and Health Survey
+Multi Indicator Cluster Survey
++ National Survey on Prevalence, Behavioral Risks and Information about HIV and AIDS in Mozambique

Effective interventions for screening, prevention, and treatment of obstetric and newborn complications exist and can be readily delivered in facilities by skilled providers during ANC and in the peripartum period. Currently available data on the quality and coverage of most of these interventions, such as active management of the third stage of labor (AMTSL), comes from self-reported data from facilities. Data on other interventions, such as screening for pre-eclampsia, do not exist at all.

Mozambique has a population of more than 20.5 million, with about 75% of the population living in rural areas (Table 1). The average life expectancy is 47.9 years. Maternal, newborn, and child mortality are all improving; however, there are several challenges in the effort to reach Millennium Development Goals (MDGs) 4 and 5 (reduce child mortality and improve maternal health). Access to quality health services is severely limited, not only by the low population density and large distances to health facilities in rural areas, but also by the scarcity of trained and qualified human resources. Since 2001, expansion of emergency obstetric and newborn care (EmONC) has been one of the main national strategies to reduce maternal and newborn mortality. Currently, just over half of births in Mozambique occur in facilities, but this percentage appears to be on the rise: the 2003 Demographic and Health Survey 2003 put the number at 48%; the 2008 Multiple Indicator Cluster Survey estimated it to be 55%, and the 2010 service statistics from MISAU give a coverage estimate of 62%. However, the quality of those services has not been verified externally on a consistent basis. In 2009, the Government of Mozambique launched the Model Maternities Initiative (MMI) in 34 of the nation's largest maternities, covering 21% of institutional births. This program has focused on making health care client centered (i.e., humanized care) and improving the quality of care. Self-reported data from 17 of these facilities with complete reporting in the year 2010 showed an increase in

[1] http://www.who.int/mediacentre/factsheets/fs333/en/index.html

coverage of key targeted MCH (maternal and child health) practices (e.g., partograph use, AMTSL use). MMI is being expanded over the next four years so that it will cover facilities accounting for over half of all institutional births nationwide by 2014.

MEASURING QUALITY AND HUMANIZATION OF CARE INDICATORS

The Mozambique Model Maternities Quality and Humanization of Care Assessment (QHCA) builds on the successful model of the multi-country postpartum hemorrhage (PPH)/AMTSL survey implemented by the Prevention of Postpartum Hemorrhage Initiative (POPPHI).[2,3] In the ten countries where the POPPHI survey was conducted, the results proved highly successful in motivating policy and programmatic change efforts to increase AMTSL and reduce PPH.

Two major ongoing health facility survey efforts to assess aspects of maternal and newborn quality of care have been implemented in multiple countries in sub-Saharan Africa. The Averting Maternal Deaths and Disabilities (AMDD) Program, in partnership with the United Nations, developed an emergency obstetric and newborn care facility assessment and ICF Macro developed the service provision assessment (SPA). These both assess facility readiness to provide maternal and newborn care, including number and type of health care providers in the facility and availability of equipment and medical supplies, but neither includes direct observation of labor and delivery (L&D) care. The service provision assessment does include direct observation of ANC services. The current study has filled an information gap in a set of sub-Saharan African countries where it has been applied by including assessment of quality of care through provider knowledge tests and direct observation of normal births and obstetric and newborn complications, compared against standard care checklists.

The QHCA was adapted from the Quality of Care for Prevention and Management of Maternal and Newborn Complications (QoC-MNC) assessment, which was conducted in five other countries in sub-Saharan Africa in 2010 (Ethiopia, Kenya, Rwanda, Madagascar, and Tanzania/Zanzibar) and in Zimbabwe immediately after being implemented in Mozambique in 2011. This has allowed the creation of a database of information on the quality of care against which other countries can be compared. When making comparisons, one must account for the fact that the sample of facilities in which the study was conducted was not the same in all countries (for instance in Ethiopia, it was only conducted in the largest facilities). Nevertheless, this begins to provide comparable data on quality of care for facility-based maternal and newborn health (MNH) services in a set of countries in sub-Saharan Africa, and can allow sharing of lessons and experiences.

[2] http://www.pphprevention.org/Surveytools.php
[3] Stanton C, Armbruster D, Knight R et al. 2009. Use of Active Management of the third stage of labour in seven developing countries. Bull World Health Organ. 87:207-15.

Study Objectives

The primary objective of the QHCA was to assess the quality and humanization of care in the MMI. The assessment was centered on the observation of clinical care, examining the performance of key preventive, screening, and treatment interventions during facility-based maternal and newborn care. Current MMI facilities account for 30% of all institutional births in the country. A sampling of 88 facilities in the Government of Mozambique's expansion plan acted as a comparison group and provided a baseline for the assessment. This group of facilities accounts for another 25% of institutional deliveries. The sampling of these expansion facilities, however, excluded the smallest 24 facilities because of a low volume of births, which makes direct observation of care expensive and logistically difficult. Twenty-eight of the 64 eligible expansion facilities were sampled for the assessment.

The QHCA includes all facilities studied, which collectively cover over half of all facility-based births and allows for evaluations of the current state of affairs in MMI facilities and comparisons between these model facilities and non-model facilities that are part of the 2011-2014 expansion plan. The definition of "quality" as applied to the practices assessed is that they are correctly carried out per national standards in Mozambique, which conform with globally accepted evidence-based guidelines, as outlined in the WHO's Integrated Management of Pregnancy & Childbirth (IMPAC) manuals, including "Managing Complications in Pregnancy and Childbirth." The study also aims to supply rigorous evaluations of maternal and newborn care and to give information on barriers to and facilitators of the quality improvement process.

The content of the assessment focused on the main interventions on which the model maternities focus: namely,

- Screening for and treatment of severe PE/E
- Prevention of PPH through the use of AMTSL
- Detection and management of prolonged/obstructed labor through the use of the partograph
- Prevention of puerperal sepsis through infection prevention practices (IP)
- Immediate essential newborn care (ENC), including skin-to-skin contact and immediate breastfeeding.

The observers also assessed the extent to which respectful maternity care was practiced, which in Mozambique is termed "humanized care." The assessment included of the presence of a labor/birth companion, use of alternative client-chosen birth positions, and the quality of provider interactions with the client. In addition, the assessment provided in-depth qualitative data from observations of the management of the cases of selected maternal and newborn complications—PE/E, PPH, and newborn asphyxia.

KEY ASSESSMENT QUESTIONS

Overall assessment objectives:

- Are the selected key interventions being correctly implemented in the maternities of assessed facilities for the prevention and management of common, serious maternal and newborn complications (PE/E management, partograph use, AMTSL, IP, ENC, and newborn resuscitation)?
- Is there a difference in quality of care provided in MMI facilities versus non-model maternities in terms of the indicators on which the MMI has focused its efforts?

Specific assessment questions:

- What is the level of knowledge and clinical decision-making skills of maternity personnel about key maternal and newborn care practices?
- What are the barriers and facilitators to the use of key MNH practices by health workers?
- Are key MNH supplies, drugs, equipment, and infrastructure available?
- Are ANC clients appropriately screened for pre-eclampsia?
- Are women in L&D appropriately screened for PE/E and managed?
- Is AMTSL being properly implemented by L&D providers?
- Is the partograph being properly used to assess and manage labor?
- Are infection control practices being implemented?
- Are ENC practices being routinely and correctly delivered to all newborns?
- Are common, serious peripartum complications (PE/E, PPH, and newborn asphyxia) being appropriately managed?
- Are national policies, standards, and guidelines supportive of selected evidence-based elements of maternal and newborn care (IP, PE/E management, AMTSL use, partograph use, ENC, and newborn resuscitation)?

Methodology

ASSESSMENT DESIGN AND DATA COLLECTION TOOLS

The QHCA study serves as the baseline assessment for a stepped wedge evaluation of the quality of antenatal care and L&D services and included clients who presented at the chosen facilities in the prescribed period of time (two or three days, depending on the facility). The assessments were conducted in October–November 2011. In order to assess change over time, this assessment will be repeated in 2013 and again at the end of MISAU´s expansion plan in 2014. As in all stepped wedge studies, those facilities that are currently controls will enter as intervened facilities in subsequent evaluations.

The study tools can be grouped into the following types of instruments:

Observation of clinical practice for ANC and deliveries
Provider practice during ANC and vaginal deliveries was observed and documented by study staff in the selected facilities. A set of structured clinical observation checklists was completed, which documented:

- Adherence to international (WHO-approved) protocol for screening for PE/E in ANC
- Management of PE/E and PPH in L&D
- Implementation of other L&D interventions:
  - Routine and correct use of partograph
  - Routine and correct use of AMTSL
  - Infection prevention behaviors
  - Provider-client interaction/communication
- Performance of correct ENC and newborn resuscitation
- Recording of age, gravidity, and parity of the client
- Qualification of the provider and level of care provided by the health facility (tertiary care, hospital, health center, etc.).

The forms were adapted from the Jhpiego ACCESS Program's Learning Resource Package on Best Practices in Essential and Basic Emergency Maternal and Newborn Care. The routine L&D clinical observation checklist was adapted from the instrument used by Stanton et al. in their international survey on AMTSL. Data was collected by skilled providers whose clinical observation skills were standardized during the data collector training workshop.

Facility inventory
Verification of availability and storage conditions of medications, supplies, and equipment necessary for essential obstetric and newborn care and emergency obstetric and newborn care.

Health worker interviews and knowledge tests
The goal is to collect information about the constraints and the factors that facilitate the delivery of quality and humanized care. Clinical case studies were also presented to the same skilled providers whose L&D practices were observed, to assess knowledge and clinical decision-making pertaining to management of severe PE/E, PPH, essential newborn care, and newborn resuscitation.

National-level information

A short, standardized questionnaire was completed by a member of the study staff to identify the presence of:

- Relevant, evidence-based practice guidelines in national policy,
- Relevant medications on the national essential drug list or formularies
- Evidence-based content about L&D care, including PE/E treatment, in pre-service and in-service medical curricula/syllabus from the year preceding the study.

The staff member also compiled background statistics on maternal and newborn health (mortality, etc.) from existing sources, such as DHS surveys and the health management information system (HMIS).

SAMPLES

Participants in the assessment

The study participants included national MISAU staff; facility-based health care providers who provide antenatal, L&D, newborn, and postpartum care; and pregnant and postpartum women and their newborns. Facilities in which the assessment was conducted involved public health facilities run by the MISAU, including health centers, district hospitals, general hospitals, and central hospitals.

Inclusion and exclusion criteria

The primary sample size calculation was based on the labors and births to be observed. This sample included women admitted to the Maternity Ward in the selected maternities in active labor. All women in selected facilities who entered the maternity ward during the period of observation (7 AM to 11 PM) were eligible for inclusion. This included women whose labor ended in a cesarean section or whose outcome was a maternal death and/or whose delivery ended in a stillbirth or newborn death in those facilities.

Facilities where the labors and births were observed were current model maternities and those in MISAU's 2011–2014 expansion plan. In order to limit the costs and time required for the assessment, facilities were excluded where the expected number of births was fewer than four during the observation period. Twenty-four facilities were excluded on this basis—three of the current 34 model maternities and 21 of the 88 maternities in the expansion plan. This left 98 eligible facilities.

In all facilities included in the sample, ANC consultations were observed if the facility saw low-risk ANC consults (i.e., non-referrals).

Health workers who had been observed while providing maternity care were eligible for knowledge tests and interviews and were included in the sample. Those health workers not present during the period of observation were excluded. Strictly speaking, this was a convenience sample, but given that there was no systematic biasing toward observation of one cadre of worker or time of observations (observations were made days and evening as well as during weekends), the sample approximated a random sample and was treated as such.

Sample size calculation and sampling plan

The QHCA was designed to assist MISAU planners identify the most pressing concerns in terms of facility-based quality of care in the current model maternities (n=34) and expansion model maternities (n=88). It was meant to determine the values of key indicators in current model maternities; determine baseline values of these key indicators in expansion facilities; and allow before-after comparisons in all facilities through subsequent assessments. Reasonable, but

not very precise, estimates were needed for current programmatic prioritization, as only relatively large changes in indicator values are considered programmatically significant. The main sample was births, clustered by facilities, with variable cluster size. To be conservative, the design effect was assumed to be 2.0.

- For point estimates, the sample size calculation was keyed to 95% confidence intervals of ± 12% for key indicators. Since there are multiple key indicators, the most conservative assumption was used (i.e., baseline value = 50%)
- For before-after comparisons, the sample size was keyed to the ability to detect a difference of at least 25% with 80% power.

Since the MMI focuses its main efforts on L&D care, the sample size determination was keyed to the number of labor/delivery care observations needed. The other samples were accommodated to this primary consideration. Since several of the facilities chosen for the sample did not attend to low-risk (i.e., non-referral) ANC clients eligible for assessment, this lowered the expected number of ANC consultations to be observed.

The facilities were divided into the following groups:

- **Group 1:** Those already included in the MMI for improvement of quality and humanization of care (n=34). Three were excluded because it was expected that they would have fewer than four deliveries in the planned observation period, leaving 31 eligible for the sample.
- **Group 2:** Those included in the 2011–2014 MMI expansion plan. This group was further sub-divided:
  - **Group 2a:** A sub-group of facilities entering the initiative before a possible re-assessment in 2013 (n=44). Eight were excluded because they had fewer than four deliveries in the planned observation period, leaving 36 eligible for the sample.
  - **Group 2b:** Those facilities to be included in the MMI after 2013 (n=44). Thirteen were excluded because they had fewer than four deliveries in the planned observation period, leaving 31 eligible for the sample.

Each eligible facility was placed in a line list ordered by level of utilization (i.e., volume of births), with the number of deliveries for the 12 months of 2009 compiled using data from MISAU's Basic Module (*Modulo Basico*). A systematic random sample was drawn from the list, with a random start and a sampling fraction of ½. The number of births expected to be observed in the assessment period was calculated within each of the chosen facilities. In each of the three groups of facilities, the cumulative number of births expected to be observed was calculated.

As stated above, the size of the sample of observed births was designed to give point estimates of indicator values with a 95% confidence interval of ± 12%. Since multiple interventions were to be observed, the most conservative assumption was made for the sample size calculation (i.e., a baseline value of 50%). This meant that the smallest of the three groups of facilities had to have at least 96 deliveries observed. An additional consideration for the sample was that it needed to serve the purposes of another study (the Maternal Recall Validation Study) that needed 520 birth observations. The expected number of births in each of the groups is shown in the following table. The initial calculation of the expected number of births in the observation period is shown, using only the assumptions of the QHCA. But in order to make the sample size adequate for the linked Maternal Recall Validation Study, the five largest facilities in Group 1 were oversampled (by adding a third day of observation). This gave the sample size shown in the far right column on the table and this is what was used for the study.

Table 3.1 Description of Planned Samples

GROUP	DESCRIPTION	NUMBER OF BIRTH OBSERVATIONS EXPECTED	NUMBER OF BIRTH OBSERVATIONS EXPECTED *(W/OVERSAMPLING)*
1	Current Model Maternities	228	268
2a	Models by end of 2012	149	149
2b	Models in 2013 and 2014	101	101
Total		**478**	**518**

The number of ANC visits and health workers sampled follows logically from the primary sample size calculation based on the number of births to be observed. The various samples are summarized in the table below.

Table 3.2 Description of Sampling Rules Used to Draw Samples

SAMPLE	RULE	SAMPLE
Facilities	Sampling fraction = 1/2	49
Births	Observe all births in 2-day period (i.e., number of births observed in each facilities is proportional to birth volume in that facility)	518 (by oversampling 5 larger facilities)
ANC consults	6 per facility with normal ANC (i.e., non-referral)	314 (20% of sampled facilities do not do non-referral ANC consults)
Health workers	4–5 per facility	220

Several weeks into the data collection period for the QHCA, it was noted that the volume of births observed was only 70% of the expected number. Since there was no chance of extending the data collection period, a decision was made at that point to purposively eliminate six smaller facilities in the sample (in Groups 2a and 2b) and substitute three higher volume facilities from Group 1. The list of facilities in the sample and expected number of births in the planned observation period is shown in Annex 1. The table is arranged by group and shows the substitutions made.

ASSESSMENT PROCEDURES

Data collectors were trained in a three-week training course, which included refreshment of their skills in essential and basic emergency obstetric and newborn care (BEmONC); training as clinical observers with testing of observational skills in various inter-rater reliability exercises; review of data collection tools and use of the Samsung Galaxy tablets for data collection. The data collection tools were pretested in two facilities in Maputo as part of the data collector training.

Fieldwork was conducted over a six-week period from September 27 to November 11, 2011. Once the facilities were identified in the sample, the hospital or health center director was informed in a letter from central-level MISAU to ask for his/her cooperation in the study. The purpose of the study was explained to him/her. Written authorization was then obtained by the supervisor of the assessment team upon arrival and before proceeding with data collection.

Data collectors worked in four teams, each with three members. One member of the team (the supervisor) collected facility inventory information. All three team members rotated responsibilities for observing labors and births and ANC consultations. Observers were mid-level or advanced maternal and child health nurses. One observer was expected to observe six ANC consultations—the first three consults of the day and another three consecutive cases later the same morning. This observer then assisted the second observer with L&D observations. The two observers took shifts on the L&D ward so that observations were made continuously from 7:00 AM until 11:00 PM. L&D observations were continued for a second day, also from 7:00 AM until 11:00 PM, for a total of at least 32 hours of observation in each facility. There was an additional third day of observations in

smaller facilities in Group 2a with the lowest birth volume. There also was a third day of observation in the five largest facilities, in order to observe enough births for the sample size requirements of the Maternal Recall Validation Study. It was deemed that the maximum number of births that one observer could feasibly observe with quality was four in an eight-hour shift. This meant that in the busiest facilities, not all births were observed; in all others, all labors/deliveries were observed that occurred during the assessment period.

Health workers whose attendance of labors and deliveries were observed were also interviewed and given a knowledge test. The aim was to interview four to five health care providers per facility. If there were fewer providers than this in a facility, all were interviewed. If there were four, but not all were observed, then additional unobserved providers were interviewed. And if more than five providers were observed, then only the first five were interviewed.

Data collectors recorded data on Samsung Galaxy tablet PCs using customized data entry programs developed with a package called PocketPC Creations running on the Android mobile platform. The data entry programs were developed on a desktop using a package and runtime versions of the survey tools were downloaded to each handset. Skip and consistency checks were built in to the programs. Each device had a secure digital (SD) card for backing up the data at the end of each day. Data collectors were trained to review records for missing or inconsistent answers before submission. When a telephone connection was available, the data from each tablet PC were transmitted at the end of each day to a central database maintained on a server in Maputo. When no connection was available, data collectors waited until they were in a location with connection to transmit several days of data.

DATA ANALYSIS

The raw data in the database was fed to a set of web tables that calculated the indicator values to generate a standard set of online tables and graphs using custom-designed Cold Fusion backend. This data was checked daily by Maputo and Washington-based staff and the bulk of data cleaning was done simultaneously with data collection. Data cleaning was completed and all data tables finalized. The complete tables are included in a separate report and were generated within two weeks of the completion of the data collection phase.

Quantitative analyses included frequencies, cross tabulations, and t-tests and the reporting of percentages, percent distributions, means, and medians. All data is presented in aggregated form at the facility level or groups of facilities (all facilities, model facilities, non-model facilities). Individual clients and health workers are not identified. Depending on the research question, the unit of analysis was births, ANC visits, health workers, or facilities. A description of the samples of health facilities, health workers, ANC consults, and labors/deliveries observed is presented in Table 3.3.

Table 3.3 Summary of Actual Samples

SAMPLE	PLANNED SAMPLE	ACTUAL SAMPLE	DESIGN EFFECT	SAMPLING ERRORS OF ESTIMATES IN OVERALL SAMPLE (ASSUME BASELINE VALUE OF 50%)	SAMPLING ERRORS OF ESTIMATES IN SMALLEST SUB-SAMPLE (ASSUME BASELINE VALUE OF 50%)
Health facility inventories	49	46	2.0		
Labors/deliveries observed	518	525	2.0	± 6 baseline ± 12 change from baseline	± 14 baseline ± 28 change from baseline
ANC consults observed	328	303	2.0	± 8 baseline ± 16 change from baseline	± 14 baseline ± 28 change from baseline
Health worker interviews	220	186	1.5	± 9 baseline ± 18 change from baseline	± 16 baseline ± 32 change from baseline

Descriptive statistics, including means and percentage distributions, were calculated. Corrective weights were used to adjust the results from L&D observations when the number of cases during the observation period at a given facility differed from the expected caseload. The expected number of observations per day for each facility was calculated based on monthly estimates for all months of 2009, using data from MISAU's *Modulo Basico*. Data for all other aspects of the assessment—ANC observations, health worker interviews, and health facility inventory data—are not weighted unless otherwise noted. Observations of maternal and newborn complications (PE/E, PPH, newborn asphyxia) were also not weighted because data are only used qualitatively. Key characteristics of these facilities are summarized in Table 3.4.

Table 3.4 Selected Characteristics of Sampled Health Facilities

CHARACTERISTIC	NUMBER OF HEALTH FACILITIES	PERCENT OF HEALTH FACILITIES
Level of Health System		
Central hospital	1	2%
Provincial hospital	7	15%
District hospital	1	2%
Rural hospital	9	20%
General hospital	3	7%
Urban health center	14	30%
Rural health center	11	24%
Model/Non-Model		
Model	19	41%
Non-Model	27	59%
Province	**Number of Observed L&D Cases**	**Percent of Observed L&D Cases**
Maputo City	53	10%
Maputo Province	25	5%
Gaza	35	7%
Inhambane	11	2%
Sofala	46	9%
Manica	62	12%
Tete	73	14%
Zambezia	82	16%
Nampula	74	14%
Niassa	44	8%
Cabo Delgado	20	4%

The distribution of the types of providers observed is presented in Table 3.5. Most of the observed ANC consultations were performed by nurses (77%) and none by doctors. Residents or doctors in training were categorized as students and 6% of ANC consults were provided by this category of health worker. The majority of the observed labors and deliveries (83%) were attended by nurses but no advanced level nurses and one physician; 10% of deliveries were handled by Basic Midwives. Three percent of births were attended by "others" (often, this was non-professional staff). This was a consequence of the fact that the nurse on duty was too busy to attend the birth so any available person attended the birth.

Table 3.5 Cadres of Health Workers—ANC Consults Observed, Deliveries Observed, and Health Workers Interviewed

HEALTH WORKER QUALIFICATION	PERCENT OF ANC CONSULTS (N=303)	PERCENT OF DELIVERIES (N=525*)	PERCENT OF HEALTH WORKER INTERVIEWS (N=186)
Doctor	0%	0.2%	0.5%
Advanced-level nurse	0%	0%	1%
Mid-level MCH nurse	27%	14%	18%
Basic-level MCH nurse	50%	69%	67%
Basic midwives	0%	10%	10%
Students/residents	6%	4%	0%
Others (others, data missing, etc.)	17%	3%	4%

The characteristics of the health workers interviewed are shown in Table 3.6. Essentially all (99.5%) were female, with the highest percentage between 30–39 years of age (44%). Just under half (48%) had fewer than five years of experience and 28% had five to nine years of experience. The mix of health workers interviewed for the study matches quite closely the mix of observed deliveries by cadre of health workers.

Table 3.6 Selected Characteristics of Health Workers Interviewed

CHARACTERISTIC	PERCENT OF HEALTH WORKERS (N=186)
Years Since Completion of Basic Training	
0–4	48%
5–9	28%
10–20	9%
>20	16%
Age	
<25	8%
25–29	24%
30–39	44%
40–49	21%
≥50	3%
Sex	
Male	1%
Female	99%

It was not possible in some cases, nor practical in others, to observe all labors/deliveries from early in the first stage/initial client assessment, through the immediate postpartum period. The observed number of cases for each component of labor and delivery is shown in Table 3.7.

Table 3.7 Components of Labors and Deliveries Observed

COMPONENTS OF L&D	NUMBER OF CASES OBSERVED
Initial client assessment	378
First stage of labor	455
Second and third stages of labor	507
Immediate postpartum/newborn care	508
Total number of L&D observations	525

If a woman or newborn experienced a complication (PE/E, PPH, or newborn asphyxia) while the team was observing L&D, the assigned observer was to follow the case either until it was resolved (discharge, transfer to another department or another facility, or death) or as long as the team remained in the facility. A total of 42 complications were observed (see Table 3.8).

Table 3.8 Types of Complications Observed

COMPLICATIONS	NUMBER
Postpartum hemorrhage	6
Pre-eclampsia/eclampsia	8
Newborn asphyxia	28

Table 3.9 highlights some general characteristics of the observed births. Ninety-seven percent of the observed labors ended in spontaneous vaginal births with 18% being pre-term. There were six fresh still births plus four macerated stillbirths. Two of the observed mothers' labors ended in maternal death. As had been agreed in the protocol, the observers enlisted the support of supervisors to assist maternity personnel in cases where there was a life threatening complication and inadequate care was being provided.

Table 3.9 General Characteristics of Births Observed

CHARACTERISTIC	PERCENT
Low birth weight infants	13%
Preterm births	18%
Stillbirths	2%
Newborn deaths	1.5%
Spontaneous vaginal deliveries	97%
Caesarian section	3%
Assisted delivery	<1%
Death of mother	<1%
Mother referred to other facility	1%

Table 3.10 shows the health workers observed and interviewed compared to the entire universe of health workers on the roster for provision of maternity and antenatal care in these same health facilities. Compared to the overall roster, the sample of observations was skewed toward lower-level providers (the majority are basic-level nurses); however, basic- and mid-level nurses in fact deliver the majority of routine care, while advanced nurses and doctors attend complicated cases. So, this is likely a fairly representative sampling of care delivered in these facilities. Table 3.10 shows selected key characteristics of the sampled health workers.

Table 3.10 Comparison of Health Workers Observed Performing ANC and L&D Care with All Health Workers in the Sampled Facilities

HEALTH WORKER CADRE	HEALTH WORKERS WHO PROVIDE ANC		HEALTH WORKERS WHO ATTEND DELIVERIES	
	In the observed sample of ANC cases (n=231)	In the sampled facilities	In the observed sample of L&D cases (n=525)	In the sampled facilities
Doctor	0%	16%	0.2%	9%
Advanced-level nurse	0%	3%	0%	10%
Mid-level MCH nurse	27%	19%	14%	22%
Basic-level MCH nurse	50%	39%	69%	38%
Basic midwife (*Parteira elementar*)	1%	13%	13%	12%
Student/resident	6%	11%	4%	9%
Other (TBA, non-medical personnel)	15%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**

ETHICAL CONSIDERATIONS

The study protocol was submitted to and approved by the ethical review board of the Mozambican National Ethics Committee in the National Institute of Health and the institutional review board of the Johns Hopkins Bloomberg School of Public Health, which ruled the protocol exempt from review under 45 *CFR* 46.101(b)(5).

Written informed authorization was asked of the facility director and verbal informed consent from other participants in this assessment—health care workers and patients whose care was being observed; their consent was recorded. Some women arrived with obstetric complications or were too ill, such that they are mentally incapacitated or unconscious, and therefore, were not asked for consent. Because these cases were very important for the assessment of quality of care, the next of kin was asked to give consent for their kin's care to be observed. Consent forms were embedded on the front page of the data collection forms. See Annex 2 for the data collection tools.

LIMITATIONS

Although, for the sake of the validity of the conclusions, the study was centered around direct observation of care, rather than record review, as with quality of care assessments done in other countries, it was meant to give actionable data in a programmatically useful timeframe. Most of the study limitations are consequences of the sacrifices made to keep the assessment rapid.

- The clinical observers were not "gold standard observers" as has been done, for instance, in some evaluations of Integrated Management of Childhood Illness (IMCI) programs. Rather, the observers were maternal and child health nurse trainers. They were experienced in carrying out and training others in the procedures being observed and evaluated. They also were trained over a two-week period and, including simulating the clinical conditions of the study, had their observations standardized against gold standard observers for several sections of the observations. However, it is likely that there were some deviations from accurate assessment.
- The sample size of the study was limited. It was based on the number of births to be observed and was designed to be able to detect inter-group differences (either non-model versus model or before/after comparisons) of 15–25%, depending on the baseline value. Although this is not very precise, it was felt that smaller differences were not programmatically significant. The small sample size also has the consequence that sub-

group analysis is not possible. Nothing meaningful, for instance, can be said about the difference in practice between different provinces.

- In terms of a comparison between model and non-model facilities, the non-model facilities are not completely equivalent to the model facilities.
  - First, the current model facilities are the largest maternities in the country being central, general, provincial hospitals, with many district hospitals, and only a few of the largest health centers. Non-model facilities in the expansion plan are all health centers.
  - The non-model facilities were also "contaminated" in their role as controls. That is, some of their personnel attended trainings at model maternities, as provincial medical chiefs desired personnel in non-model facilities to improve their skills; some model personnel have been transferred to non-model facilities; and EmONC trainings, financed by WHO and provided to non-model personnel, covered some of the same subject areas that are covered in the MMI trainings.
- Two of the tablet computers that were used for data collection were stolen. This resulted in the loss of data from 23 observed deliveries (4% of the sample) and four facility inventories (9% of the sample). This resulted in a slightly smaller sample size than planned in the case of the facilities and therefore, larger non-sampling error. But the non-sampling error (bias) is likely to have been negligible.

Facility Readiness

CONTENT OF POLICIES AND GUIDELINES

Antenatal care guidelines were observed to be present in the ANC service area in 59% of health facilities, while PE/E guidelines were found in 15% of facilities. In the L&D service area, 54% of all sampled facilities were observed to have guidelines for normal birth, and 76% had emergency obstetric guidelines.

The team reviewed the national guidelines. The national guidelines reflect internationally accepted, evidence-based practices in all key areas examined. The findings from the review are summarized in Table 4.1.

Table 4.1 Maternal and Newborn Care Practices Promoted in National Standard Treatment Guidelines

CONTENT AREA	FINDINGS
Postpartum hemorrhage	The national guidelines recommend using AMTSL for all vaginal deliveries. AMTSL components included: ▪ Within one minute of the delivery of the baby, palpate the abdomen to rule out the presence of an additional fetus(s) and give oxytocin 10 units intramuscularly (IM). ▪ Apply controlled cord traction. ▪ Immediately massage the fundus of the uterus until well contracted. Palpate for a contracted uterus every 15 minutes and repeat uterine massage as needed during the first 2 hours postpartum. Oxytocin is the preferred drug for AMTSL and the first-line drug for PPH caused by uterine atony. Oxytocin is registered for use in prevention and treatment of PPH; is included in national essential drug list; and is in the list of vital medicines in the kits used in the "push system" to ensure that the most essential medicines are available. Steps for treatment of PPH included in the guideline are in line with WHO guidelines. National HMIS and monitoring and evaluation (M&E) system: AMTSL use is recorded in a separate register in model maternities, but is not recorded in non-model facilities. There were plans to roll out new integrated registers in all the nation's maternities in early 2012 In fact they did roll out and include AMTSL use.
Severe pre-eclampsia/ eclampsia	Guidelines for screening for PE/E during ANC include the following: ▪ Check blood pressure at all ANC visits. ▪ Test for proteinuria at all ANC visits. ▪ Note and/or ask about abnormal changes in body features (e.g., peripheral swelling). ▪ Check for generalized edema. Steps in management of severe PE/E: ▪ Provide supportive measures (ABC: airway, breathing, circulation). ▪ Prevent convulsion with magnesium sulfate. ▪ Control hypertension with Apresoline as first-line therapy. ▪ Deliver as soon as possible. Magnesium sulfate is the drug of choice for preventing and treating convulsions in severe PE/E. Magnesium sulfate loading and maintenance doses are consistent with WHO guidelines. Magnesium sulfate is included in the national and essential drug lists. HMIS and M&E system: Magnesium sulfate use in cases of severe PE/E is recorded in a separate register in model maternities, but is not recorded in non-model facilities. There are plans to roll out new integrated registers in all the nation's maternities in early 2012. These registers will include magnesium sulfate use.

CONTENT AREA	FINDINGS
Partograph	The national guidelines recommend the use of partograph for all laboring women, using the new WHO partograph. HMIS and M&E: "Partograph completely filled out" is recorded in a separate register in model maternities, but is not recorded in non-model facilities. There are plans to roll out new integrated registers in all the nation's maternities in early 2012. These registers will include "partograph completely filled out."
Immediate and essential newborn care	The national guidelines include WHO recommended thermal care and immediate breastfeeding (dry baby's body with dry towel; remove wet towel, and wrap the baby with dry towel; place the baby in skin-to-skin contact and on the breast to initiate breastfeeding). *The only national guideline not in keeping with WHO standard is that national guidelines call for immediate cord clamping rather than delayed clamping.* HMIS and M&E system: Skin-to-skin contact and immediate breastfeeding are recorded in a separate register in model maternities, but are not recorded in non-model facilities. There are plans to roll out new integrated registers in all the nation's maternities in early 2012. These registers will include both these indicators.

AVAILABILITY OF SKILLED PERSONNEL

As outlined in Section 3 (Sampling), the proportion of deliveries performed by type of provider was skewed toward lower-level providers. Almost 70% of the observed births were performed by basic-level nurses. This is almost twice their percentage in terms of proportion of personnel on the L&D roster, which was 38%. Almost no doctors or advanced-level nurses were observed attending deliveries, whereas these cadres make up 9% and 10% of the L&D rosters, respectively. The percentage of mid-level nurses observed in the study was also lower than the percentage performing deliveries in these institutions. It should be noted that TBAs accompanied women in a number of observed labors. When the health care provider was not present at the time of the delivery, it was the TBA who attended the delivery. This was noted by the observer. So overall, the observed deliveries were skewed toward less skilled providers than the distribution of cadres in the L&D personnel rosters would have led one to assume.

The ratios of monthly births to staff are shown for the 29 health facilities for which the staffing ratio data was complete enough to analyze (Table 4.2). (Monthly births were calculated by analyzing 2009 data reported in the *Modulo Basico*.) The ratio is calculated for all L&D personnel and also for mid- and basic-level nurses who are expected to do the majority of care on L&D. The ratios are quite high for many of the facilities. Given that an average month of work has 20 shifts, one-third (9 of 29) of these facilities have staffing ratios for basic- and mid-level nurse that imply more than an average of two deliveries per shift and the top three facilities in the table have ratios that approach or exceed four or more births per shift ($\geq$ 80/month) worked by mid/basic-level nurses. Clearly, inadequate staffing is a major issue in many of these maternities. Given the other responsibilities that a nurse has, more than three deliveries in an eight-hour shift is probably excessive. But this calculation also underestimates the extent of work overload in some of the facilities on the top of the list, because even though several nurses may be assigned to the maternity on the personnel list, oftentimes several of them, in fact, have other duties, and most or all of the work on the maternity ward falls on a smaller number of nurses.

Table 4.2 Ratios of Monthly Births to all L&D Personnel and to Mid/Basic-level L&D Nursing Personnel (all health facilities for which data available)

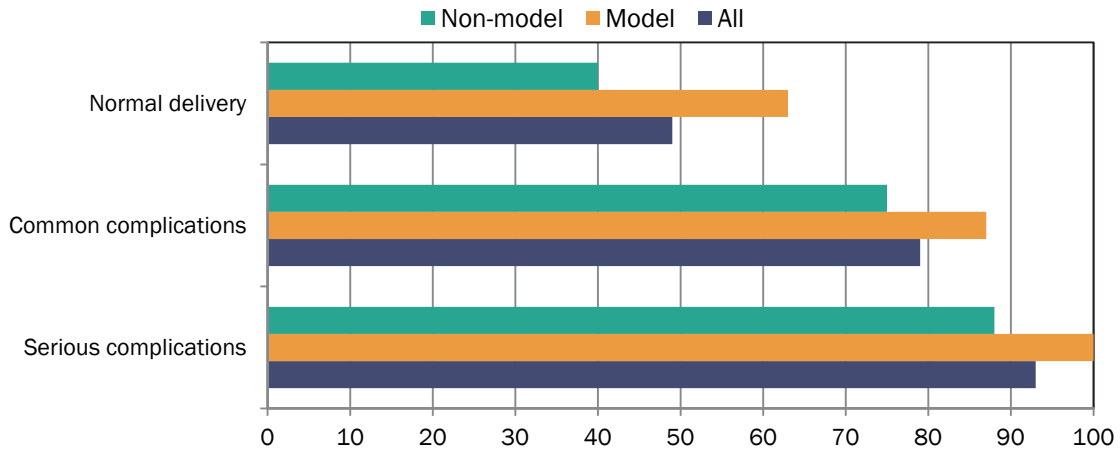
Health Facility	Mid-level MCH nurse	Mid-level general nurse	Basic-level MCH nurse	Basic-level general nurse	Total L&D personnel	Births/month (*Modulo Basico*, 2009)	Ratio of monthly births to all L&D personnel	Ratio of monthly births to mid- and basic-level nurses
CS Machava II	1	0	1	0	7	225.0	32.1	112.5
CS 1º Maio	2	0	1	0	7	237.0	33.9	79.0
CS 1º Junho	1	0	3	0	5	315.0	63.0	78.8
HR Vilanculos	1	0	2	0	9	174.0	19.3	58.0
CS Licuare	1	0	1	0	3	105.0	35.0	52.5
CS Munhava	3	0	2	0	7	249.0	35.6	49.8
CS Coalane	0	0	3	0	6	147.0	24.5	49.0
HP Tete	1	0	5	0	8	288.0	36.0	48.0
CS Nº2(Matundo)	1	0	4	0	5	204.0	40.8	40.8
HR Ulongue	1	0	5	0	9	234.0	26.0	39.0
HR Nhamatanda	1	0	4	0	11	195.0	17.7	39.0
HP Xai-Xai	4	0	5	0	11	327.0	29.7	36.3
HC Maputo	3	0	16	0	57	687.0	12.1	36.2
HR Chókwé	2	0	4	0	8	213.0	26.6	35.5
CS Moatize	1	0	4	0	6	171.0	28.5	34.2
HD Maganga da Costa	2	0	2	0	5	123.0	24.6	30.8
CS Macia	1	0	5	0	7	159.0	22.7	26.5
HR Marromeu	2	1	3	2	13	210.0	16.2	26.3
HP Chimoio	7	0	13	0	42	498.0	11.9	24.9
CS Matola II	1	0	12	0	20	294.0	14.7	22.6
CS Macurungo	3	0	1	0	5	90.0	18.0	22.5
HP Inhambane	2	0	9	0	14	222.0	15.9	20.2
HP Quelimane	6	0	14	0	42	330.0	7.9	16.5
CS Lugela	1	0	3	0	6	63.0	10.5	15.8
CS Sussundenga	2	0	5	0	8	102.0	12.8	14.6
CS nº4 Muthemba	0	0	2	5	10	102.0	10.2	14.6
CS Guru-Sede	3	0	3	1	14	96.0	6.9	13.7
CS Inhassunge	4	0	3	0	9	72.0	8.0	10.3
HR Chicumbane	4	1	5	1	25	111.0	4.4	10.1

AVAILABILITY OF MEDICINES AND SUPPLIES

Figure 4.1 shows the availability of essential medicines and supplies in the L&D service area. To facilitate comparison with other countries, we grouped supplies and medicines into the three main categories used in ICF Macro's service provision assessments.[4] It should be noted that data on facilities inventories were lost for four facilities because two tablet computers were stolen with data not yet downloaded. A fifth facility is missing the L&D inventory section, therefore the denominator is 41 (rather than 46) for these indicators. The categories correspond closely to the supplies needed for newborn resuscitation, prevention and initial management of PPH, and management of eclampsia and/or sepsis. Of the facilities in the study assessed for this indicator, 49% were observed to have all the medicines and supplies needed for normal delivery; 80% had everything needed for common complications; and 93% of facilities had everything needed for serious complications.

[4] See, for instance, the 2004 Kenya service provision assessment survey, Table 6.8 (http://www.measuredhs.com/pubs/pdf/SPA8/06Chapter6.pdf)

Figure 4.1 Percent of facilities with essential medicines and supplies for normal deliveries[1] and common[2] and serious complications[3]



[1] Sterile scissors or blade, disposable cord ties or clamps, suction apparatus for use with catheter, skin antiseptic
[2] Syringes and needles, injectable oxytocin, intravenous infusion set, suture material with needle
[3] Injectable anticonvulsant (magnesium sulfate or diazepam), injectable antibiotic (ampicillin or gentamicin)

Notably, although non-model maternities had lower scores than model maternities for normal delivery supplies (40% vs. 65%), there were no statistically significant differences for supplies for common complications and for serious complications. So ironically, it was a general finding that facilities were better equipped for emergencies than they were for normal deliveries.

HEALTH WORKER KNOWLEDGE OF OBSTETRIC AND NEWBORN CARE

The QHCA assessed health care provider knowledge using multiple-choice questions and two clinical decision-making case study questionnaires related to PE/E and newborn resuscitation. It is usually assumed, but not always correctly, that health worker knowledge is strongly associated with or predictive of correct performance of clinical skills (Harvey et al. 2007). The QHCA examined health worker performance and so does not depend on health worker knowledge as a proxy, but rather as a critical determinant of that behavior (along with appropriate policies, effective supervision, and adequate infrastructure/medicines/supplies).

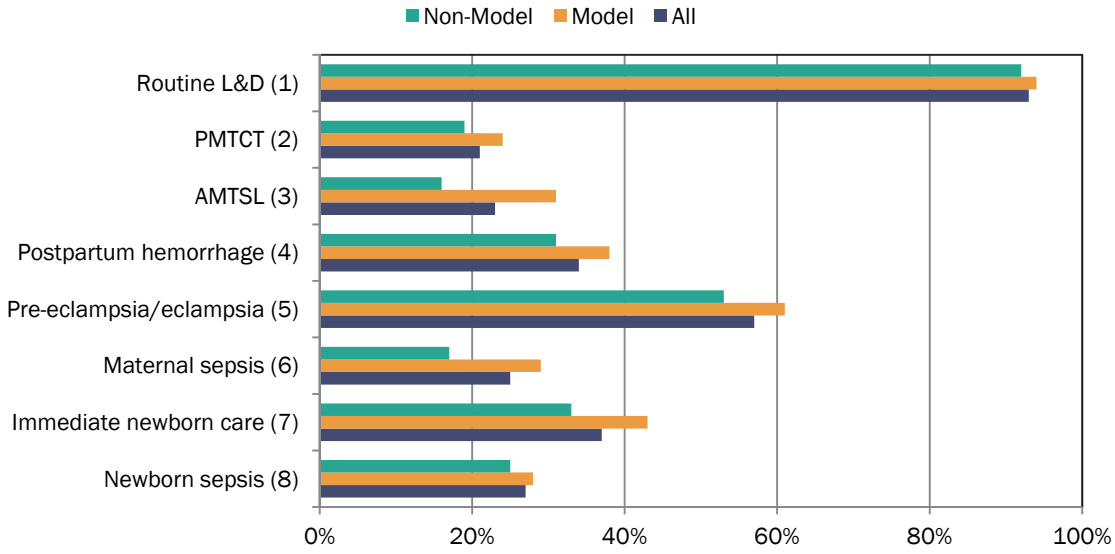
The majority of health workers whose practices had been observed in the maternity ward also participated in the case study questionnaire; these were supplemented with additional health workers in situations where fewer than four health workers were observed and were available for interview. The cadres of interviewed health workers ranged from doctors to traditional birth attendants, but were heavily weighted toward basic-level nurses, as these do the bulk of the deliveries in both model and non-model facilities, and therefore were the cadre most likely to be observed. Table 4.3 on the following page shows the cadres of health workers interviewed.

Table 4.3 Cadres of Health Workers Responding to the Maternal and Newborn Knowledge Test in Model, Non-Model, and All Facilities (n=183)

HEALTH WORKER CADRE	TYPE OF FACILITY		
	Model	Non-Model	All
Doctor	0%	1%	1%
Advanced-level nurse	1%	1%	1%
Mid-level nurse	22%	13%	18%
Basic-level nurse	66%	68%	67%
Basic midwife	7%	12%	10%
Resident/student	0%	0%	0%
Other	4%	4%	4%

In both types of facilities, the majority of respondents were basic-level nurses followed by mid-level nurses. The percentage of mid-level nurse respondents in the model facilities was nine percentage points higher than the percentage in non-model maternities. The difference was made up mainly with more basic level midwives (*parteiras elementares*) and some basic-level nurses) in the non-model facilities. It should be noted that TBAs accompanied women in a number of observed labors. When the health care provider was not present at the time of the delivery, it was often non-health professionals ("other") who attended the delivery. This was noted by the observer.

Figure 4.2 Health Workers' Knowledge of Routine L&D Care and Prevention, Identification, and Management of Complications



[1] Mean of scores for knowledge of routine procedures during L&D
[2] Mean of scores for knowing actions for the prevention of mother-to-child transmission of HIV (PMTCT) during L&D
[3] Mean of scores for knowing the three steps for AMTSL
[4] Mean of scores for knowing actions and interventions for PPH
[5] Mean of scores for knowing diagnosis and actions to take for PE/E
[6] Mean of scores for knowing correct measures for sepsis prevention, evaluation for malaise, and antibiotics for sepsis
[7] Mean of scores for knowing basic supplies and steps for newborn care
[8] Mean of scores for knowing signs of sepsis in newborn

Because of the small sample sizes, only differences ≥ 15% are significant in Tables 4.3 and 4.3a. There were no statistically significant differences between model and non-model facilities, except for knowledge of the three steps of AMTSL (31% vs. 16%). On the other hand, the amount of training that both model and non-model personnel had received in the previous three years was almost identical, so it is not surprising that they scored similarly across almost all the subject areas. The training in the areas assessed is shown in Table 4.3a. The amount of training on management of PE/E was the only area in which personnel in model facilities received more training. Their scores were better in this area, but not statistically significantly better.

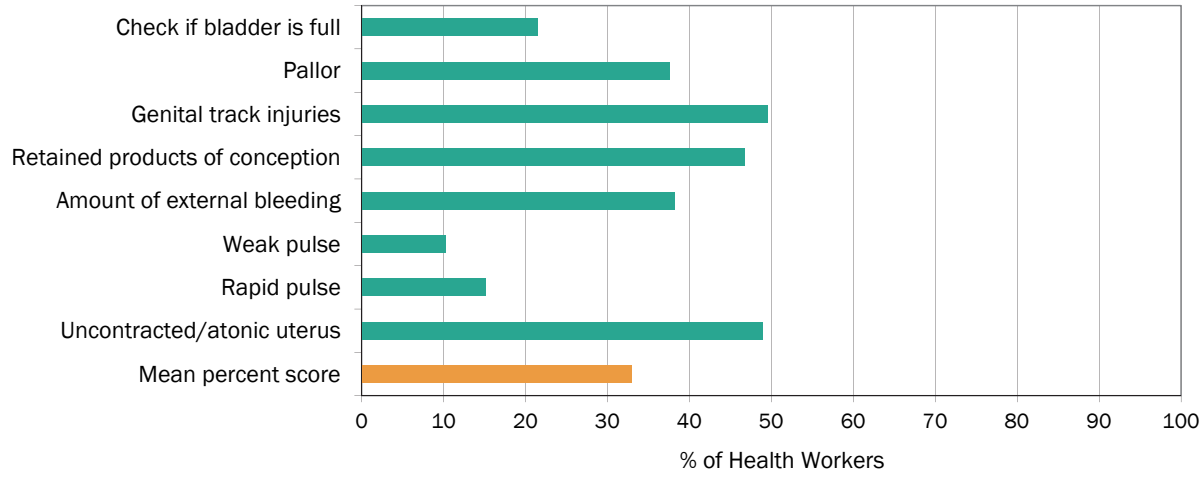
The highest complication knowledge scores were for identifying and managing PE/E (57% for all facilities). However, knowledge of prevention, identification, and management of maternal complications was poor overall, with only 21% of the providers giving correct responses for PMTCT during labor and delivery. Only 34% knew the signs to assess heavy postpartum bleeding and 23% knew the three actions required for (AMTSL). While knowledge of immediate newborn care was slightly better (37%), health workers' knowledge scores for recognizing signs of newborn sepsis (27%) were low.

Figures 4.3 through 4.11 show the scores on individual questions related to maternal and newborn complications. Figures 4.3, 4.4, and 4.5 show the scores on questions related to postpartum hemorrhage.

Table 4.3a Health Worker (HW) Training and Work Conditions (significant difference highlighted)

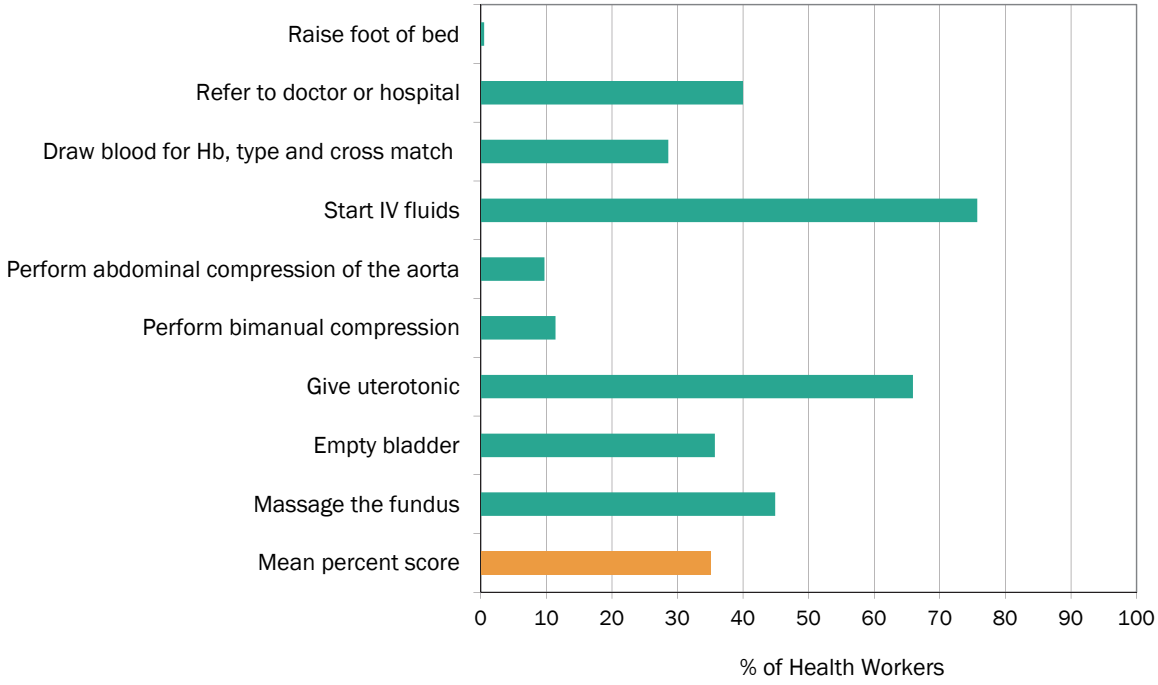
	MODEL	NON-MODEL
Training & Services Provided	**% HW**	**% HW**
Do you personally provide any antenatal services?	33%	73%
Do you personally provide any delivery services?	92%	90%
Pre- or In-Service Training on Antenatal Care		
Received any training in past 3 years on subjects related to antenatal care	31%	47%
ANC screening	69%	60%
Counseling	92%	75%
EmONC	85%	77%
Management of PE/E	**92%**	**57%**
PMTCT or other HIV/AIDS related	92%	94%
Pre- or In-Service Training on Delivery Care		
Received any training in past 3 years on subjects related to delivery care	62%	52%
Routine care for labor and normal vaginal delivery	96%	98%
Use of partograph	94%	92%
AMSTL	91%	83%
EmONC	91%	87%
Sepsis management, including parenteral antibiotics	74%	77%
Administer magnesium sulfate for severe PE/E	**98%**	**79%**
PPH management	93%	85%
Removal of placenta/retained products of conception	89%	87%
Manual removal of placenta	96%	87%
Special delivery care practices for PMTCT or HIV/AIDS	91%	96%
Assisted vaginal delivery	81%	79%
Newborn resuscitation with bag and mask	93%	85%
Maternal death or near miss audit	**40%**	**58%**
Quality improvement approaches	43%	46%
Pre- or In-Service Training on Newborn Care		
Received any training in past 3 years on subjects related to newborn care	66%	49%
Essential newborn care	0%	0%
Newborn resuscitation with bag and mask	0%	0%

Figure 4.3 Knowledge of Signs to Assess in a Woman with Heavy Postpartum Bleeding



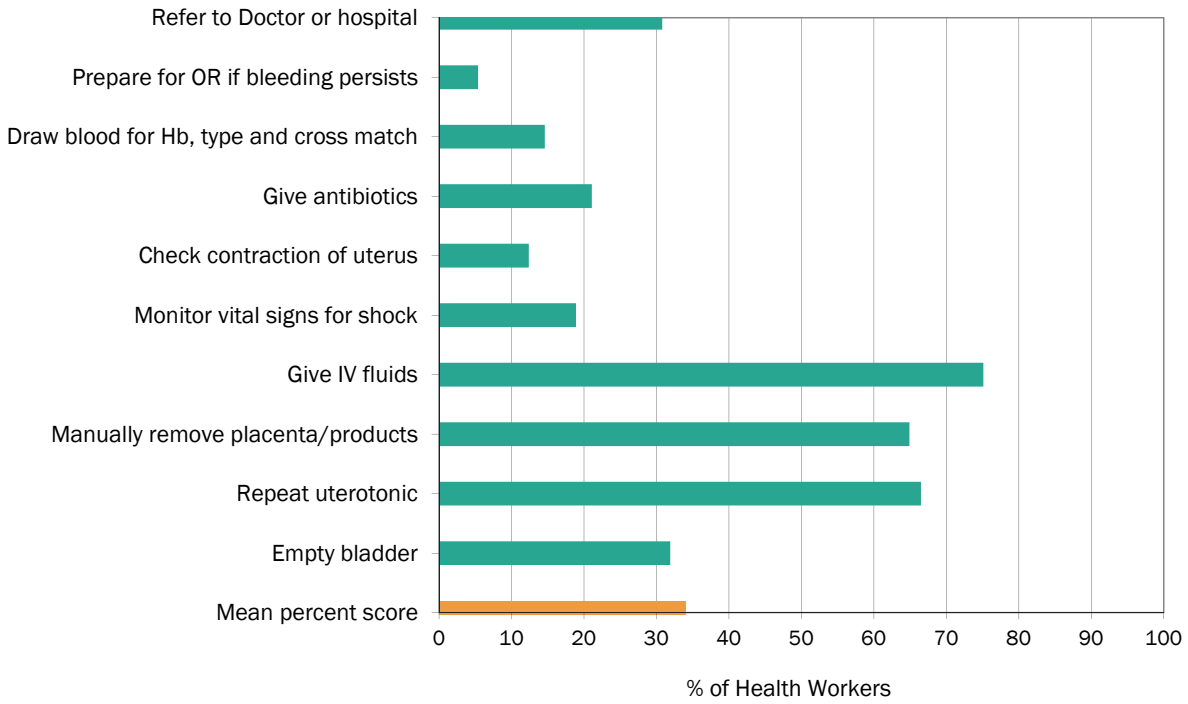
The mean percentage score for knowledge of signs to assess in a woman with heavy postpartum bleeding was 33%. Providers scored lowest on the most basic tasks such as checking the pulse rate and quality of the pulse. They scored higher on checking for an atonic uterus (49%), checking for retained products of conception (47%), and checking on the amount of bleeding from genital tract injury (50%) although none of these areas scored over 50%.

Figure 4.4 Knowledge of Actions to Take for a Woman with Heavy Bleeding from Atonic Uterus



The mean percentage score for knowledge of actions for a woman with heavy bleeding from an atonic uterus was 35% of health workers. Providers scored very poorly on simple measure, such as raising the foot of the bed. Scores were also very low for bimanual compression of the uterus (11%) and aortic compression (10%), but most scored well on giving uterotonics (66%) and starting intravenous (IV) fluids (76%).

Figure 4.5 Knowledge of Actions to Take for a Woman with Retained Placenta/Products of Conception



Scores for individual actions ranged widely. Providers were knowledgeable about manual removal of placenta (65%) as a treatment for retained placenta/products of conception, repeat dose of uterotonic (67%), and giving IV fluids (75%), but they scored poorly on other important steps for managing a retained placenta, including checking for contraction of the uterus and very basic actions such as monitoring vital signs.

Figures 4.6 and 4.7 show providers' scores on questions about newborn care. The mean percentage score for questions about immediate newborn care was 36% with very low scores for dry cord care (12%) and the need to examine the newborn within the first hour (15%). However, 61% knew the importance of thermal protection and just under 60% knew to wipe the face after the birth of the head. The mean percentage score for questions about newborn sepsis was even lower, at 27%. More than 80% of health workers knew that hyperthermia was a sign of newborn sepsis but many of the other common signs of newborn sepsis such as rapid respirations, lethargy, hypothermia, and convulsions scored very low.

Figure 4.6 Knowledge of Immediate Newborn Care

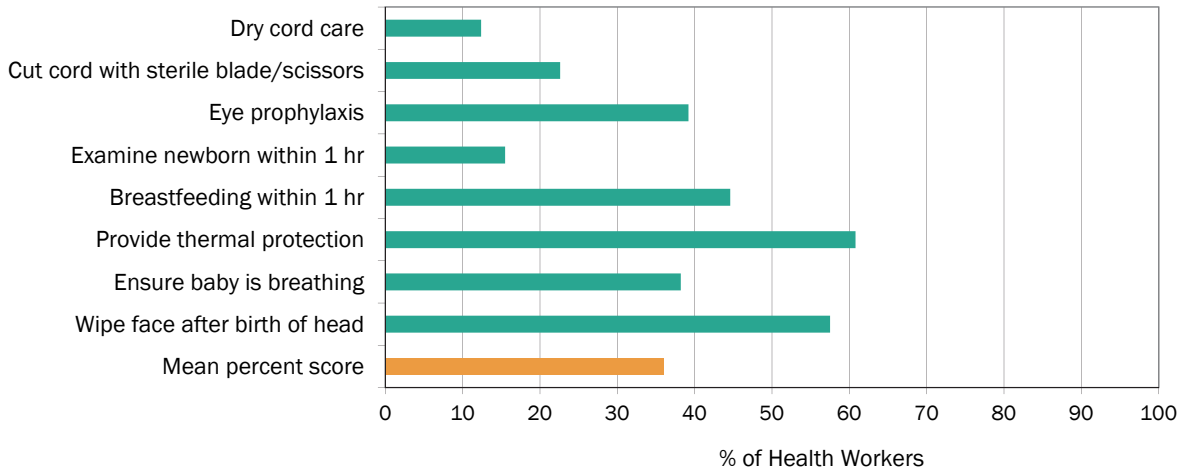
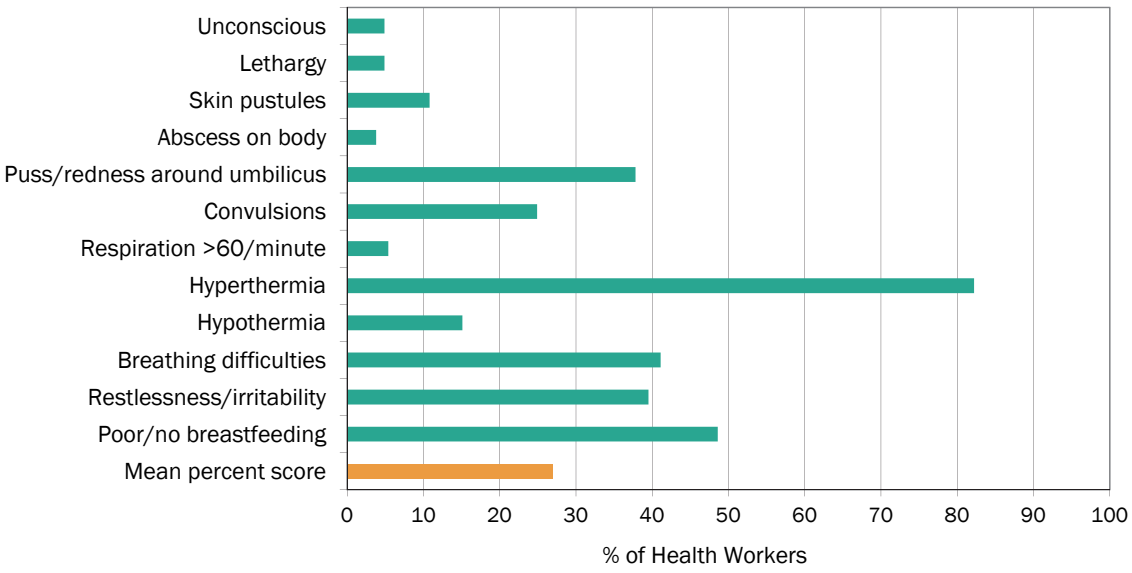
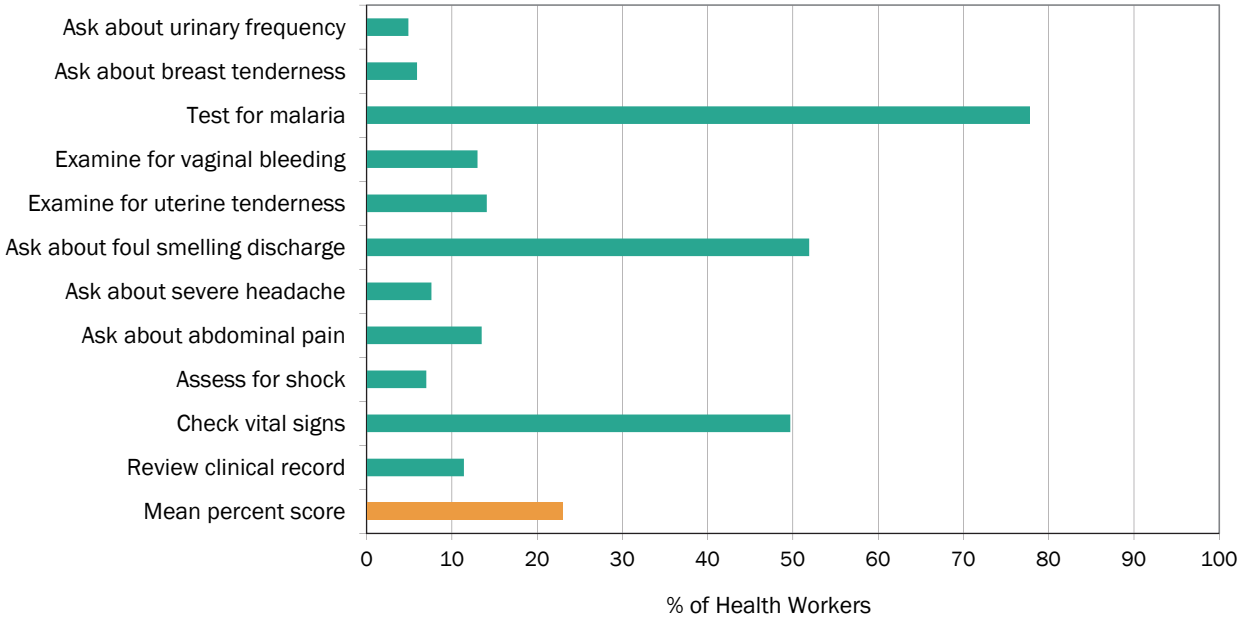


Figure 4.7 Knowledge of Signs of Newborn Sepsis



Finally, health workers' knowledge was assessed on the steps needed to assess and treat a woman with possible postpartum sepsis (Figures 4.8 and 4.9).

Figure 4.8 Knowledge of Evaluation of a Woman with Possible Postpartum Sepsis (General Malaise 72 Hours Postpartum)

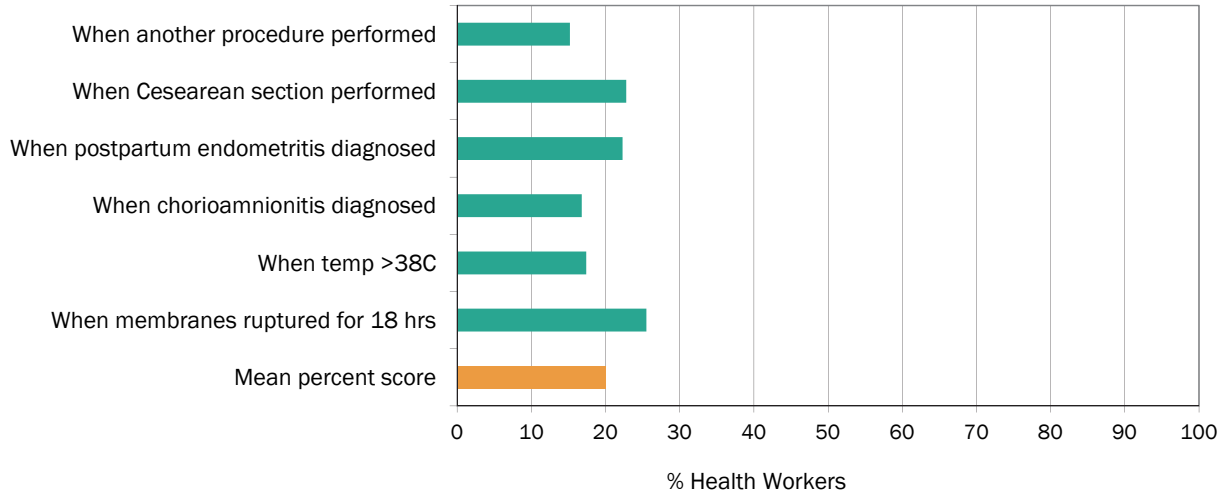


Health workers showed high levels of knowledge of the need to check for malaria (78%), as well as vaginal discharge (52%) and fever (50%), but they did not score as well on assessing most other areas, including checking for vaginal bleeding, lower abdominal pain, breast tenderness, urinary frequency, or severe headache.

The mean score for health workers' knowledge of the causes of postpartum infection was low overall, at 21%. Model sites (25%) did not score statistically better than non-model sites (18%). Overall, health workers' knowledge was better for questions that centered on improper cleaning of instruments (50%), excessive vaginal exams during labor (44%), not washing hands (30%), and unclean delivery rooms (24%). Overall scores for knowledge of the indications for the use of antibiotics was low. Model site staff had a mean score of 26% whereas non-model sites' mean

score was only 15%. The highest score for knowledge of correct use of antibiotics was for when a woman's membranes had been ruptured for 18 hours, however, only 25% of health workers answered this question correctly. All other scores for appropriate use of antibiotics were lower.

Figure 4.9 Health Worker Knowledge of Use of Antibiotics



SUPERVISION AND MANAGEMENT

Approximately 73% of the health workers interviewed (n=186) reported that they had been supervised in the last six months. There was no difference between model and non-model facilities (72% and 74%, respectively). The definition of a supervision visit followed the standard definitions used by the service provision assessments (SPA) and WHO's service availability and readiness assessment (SARA), namely that a supervisor does more than deliver supplies. They must also have provided at least one of the following: checked records, observed the health care provider's work, given verbal feedback, provided written comments, provided updates on administrative or technical issues, or discussed problems. Those health workers who had been supervised were asked whether their supervisor had performed specific actions (Table 4.4).

Table 4.4 Reported Supervisor Actions in the Previous Six Months

SUPERVISOR ACTIONS	PERCENT OF CASES
Check your records	84%
Observe your work	94%
Give you verbal feedback	82%
Provide any written comments	67%
Provide updates on administrative or technical issues	66%
Discuss problems you encountered	77%
Participate in quality of care improvement activities	46%

Routine Antenatal and Delivery Care

FOCUSED ANTENATAL CARE

ANC consults were observed in those facilities that predominantly cared for non-referral cases. Table 5.1 shows a summary of the ANC consults observed: 96% were, in fact, routine cases; 79% of observed antenatal visits were first ANC visits; 30% were primigravida cases. The mean length of a routine first visit was 18 minutes and the mean length of a routine follow-up visit was 11 minutes.

Table 5.1 Summary of ANC Visits Observed (n=303)

PARITY	PERCENT
Primigravida	30%
Multigravida	70%
Type of visit	
First visits	79%
Follow-up visits	21%
Routine care	96%
Referral	4%
Mean length of visit	
First visit	18 minutes
Follow-up visit	11 minutes

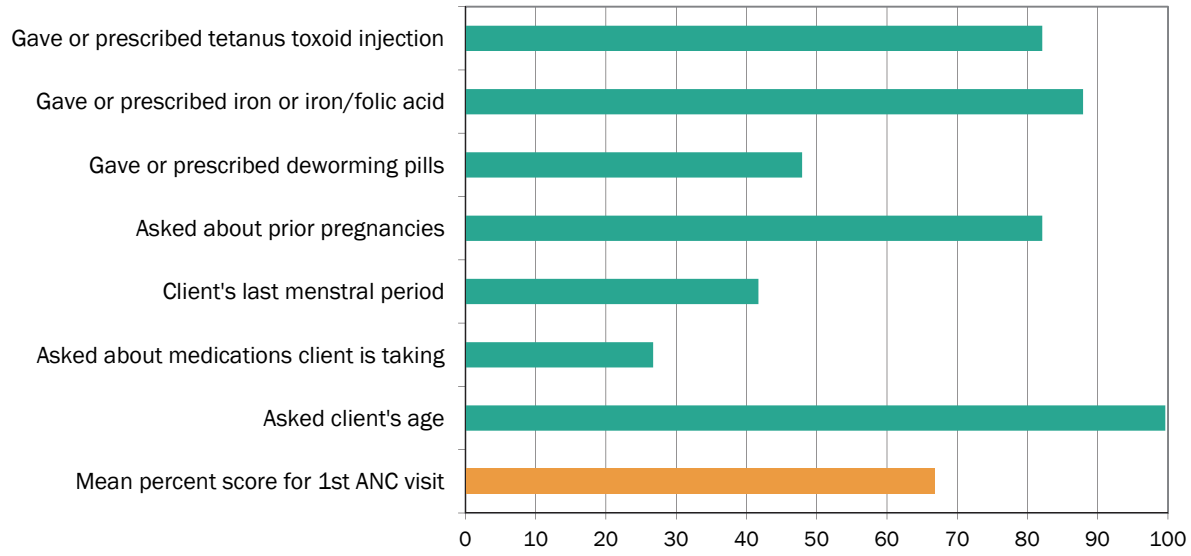
Table 5.2 shows the cadres of health workers involved in ANC care in the sampled facilities. The majority (73%) of ANC visits were observed in health centers, and care was delivered by basic-level nurses in 50% of observed consults. No physicians or advanced-level nurses were observed performing ANC care in any of the sites.

Table 5.2 Cadres of Health Workers Delivering ANC in Sampled Facilities

CADRE	PERCENT ANC VISITS OBSERVED (N=303)	MODEL (N=74)	NON-MODEL (N=229)
Doctor	0%	0%	0%
Advanced-level nurse	0%	0%	0%
Mid-level nurse	27%	12%	32%
Basic-level nurse	50%	55%	48%
Basic midwife (*Parteira elementar*)	1%	5%	0%
Trainee	6%	16%	3%
Other	15%	11%	16%

Figure 5.3 shows the observed providers' performance of history taking and preventive treatment for first ANC visits. The content and quality of history taking during the first visit varied quite widely with almost 100% of providers asking the client's age and 82% asked about the number of prior pregnancies. However, only 42% asked about the client's last menstrual period and only 27% asked about medications the client was taking—the most frequently missed item. The mean score for this area in all facilities was 67% with no statistical difference between model and non-model facilities (66% and 67%, respectively).

Figure 5.1 Provider Performance During First ANC Visits



Additional provider history taking skills were observed when the client was multigravida. Figure 5.2 shows that the mean score for history taking for all of these observed ANC visits was 50% (Model and non-Model scored the same—51% and 50%, respectively). When results are combined for appropriate preventive interventions first and repeat visits and primi/multigravida clients, health workers performed quite well (62%) in terms of preventive treatments prescribed or given to ANC clients (Figure 5.3).

Figure 5.2 Health Worker Performance in 1st ANC Visit History Taking for Multigravida Pregnancies

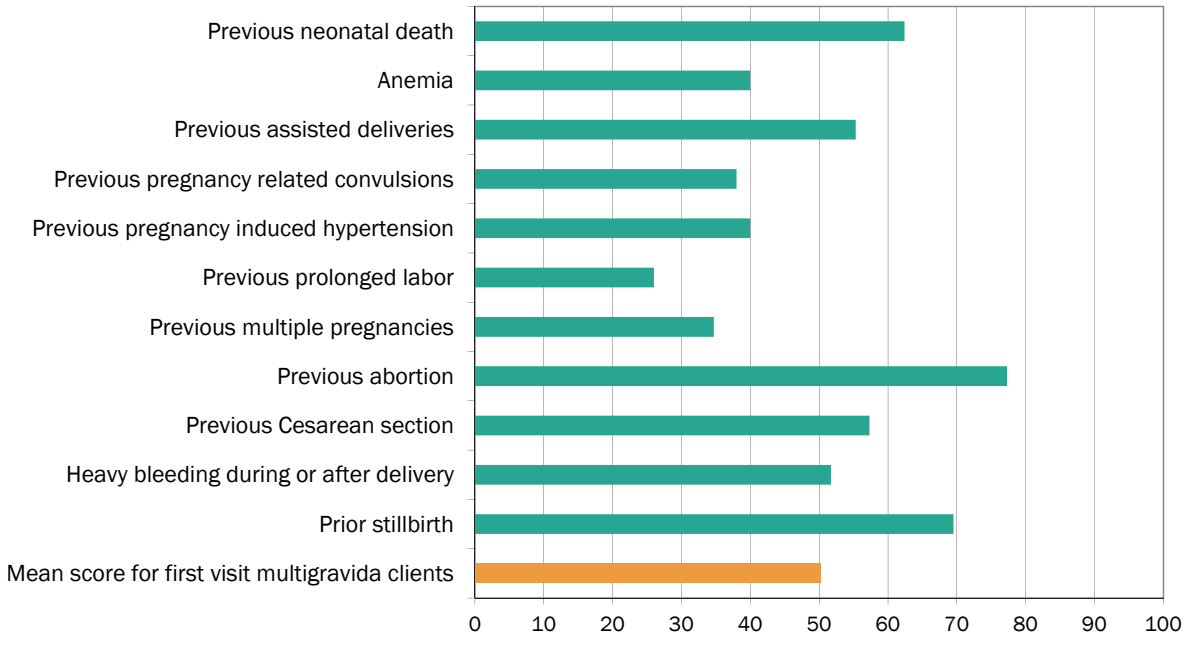
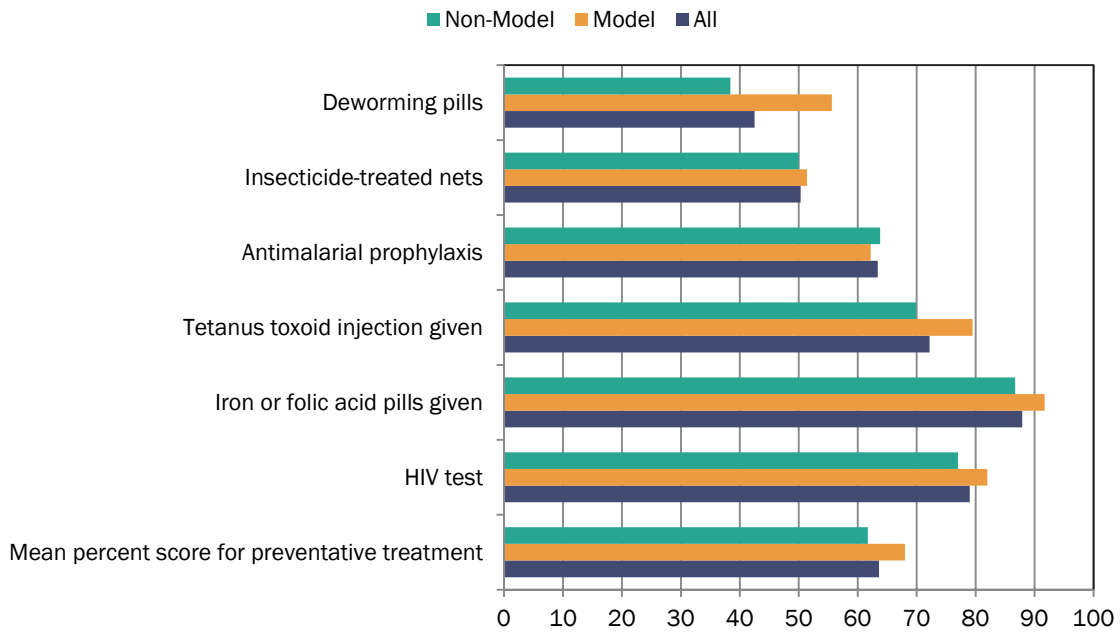


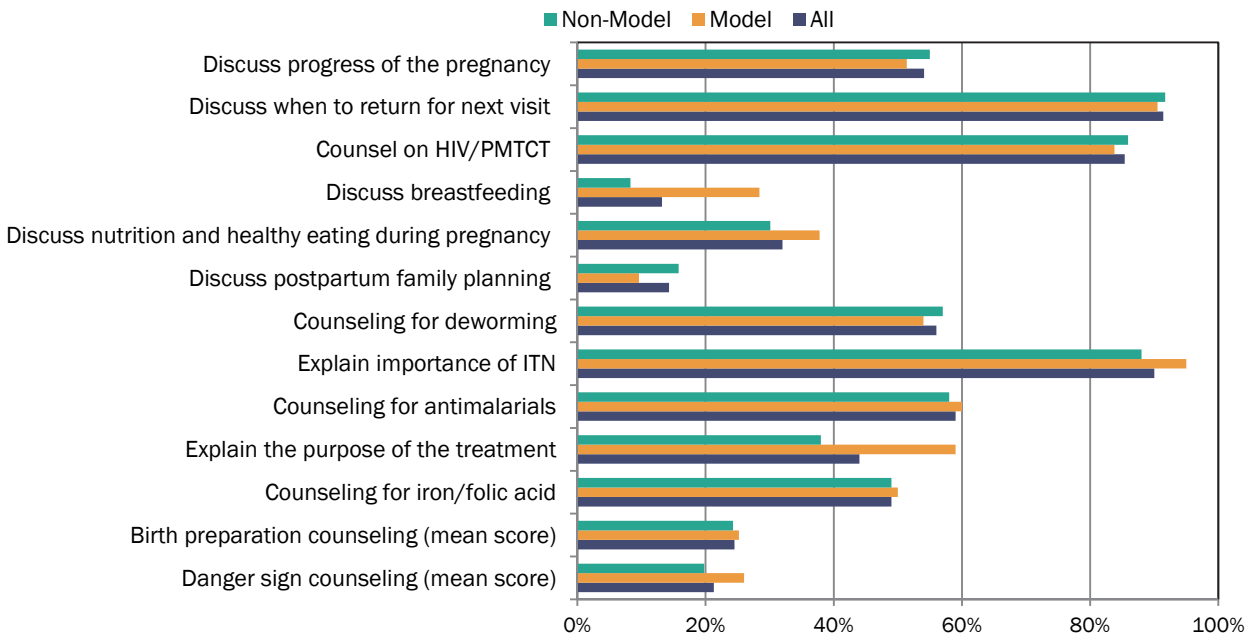
Figure 5.3 Coverage of Key Preventive Interventions for ANC Clients during First Visits



Provider compliance with preventive treatments is quite high across most interventions and is shown in Figure 5.3. Only differences greater than 10% are statistically significant, and so only deworming medication provision shows a significant difference between model and non-model facilities. This also was the standard with the lowest compliance (average of all facilities = 38%). Insecticide-treated net (ITN) distribution also showed low compliance, with only about 50% compliance. The low level of compliance was associated with commodity availability problems. The indicator used for malaria prophylaxis compliance is not the same as intermittent preventive treatment for pregnant women (IPTp), but related to it. It is the percent of women who were observed to take the first dose of IPTp on the initial ANC visit. Hence, it slightly underestimates the coverage of the first dose of IPTp because those who did not receive IPTp on this visit could receive it on a subsequent visit. Tetanus toxoid given on initial ANC visit, iron and folic acid (IFA) pills given and HIV testing done (or asked about results) all showed levels of compliance between 70–90%.

Health worker counseling skills during ANC were also assessed. The data are shown in Figure 5.3a. On certain key topics, counseling performance was quite good—HIV/PMTCT (85%), importance of ITNs (90%), and when to return for next visit (92%). The percentage of visits was lower for counseling on the importance of tetanus toxoid (45%), importance of iron and folic acid (49%), antimalarial use (59%), and deworming (56%). Importantly, counseling for birth preparation (24%), danger signs during pregnancy (20%), nutrition during pregnancy (30%), breast feeding (8%), and postpartum family planning (1%) also scored lower. There were significant differences between model and non-model facilities for counseling on breastfeeding and tetanus toxoid.

Figure 5.3a Counseling on Key Topics during ANC Consults



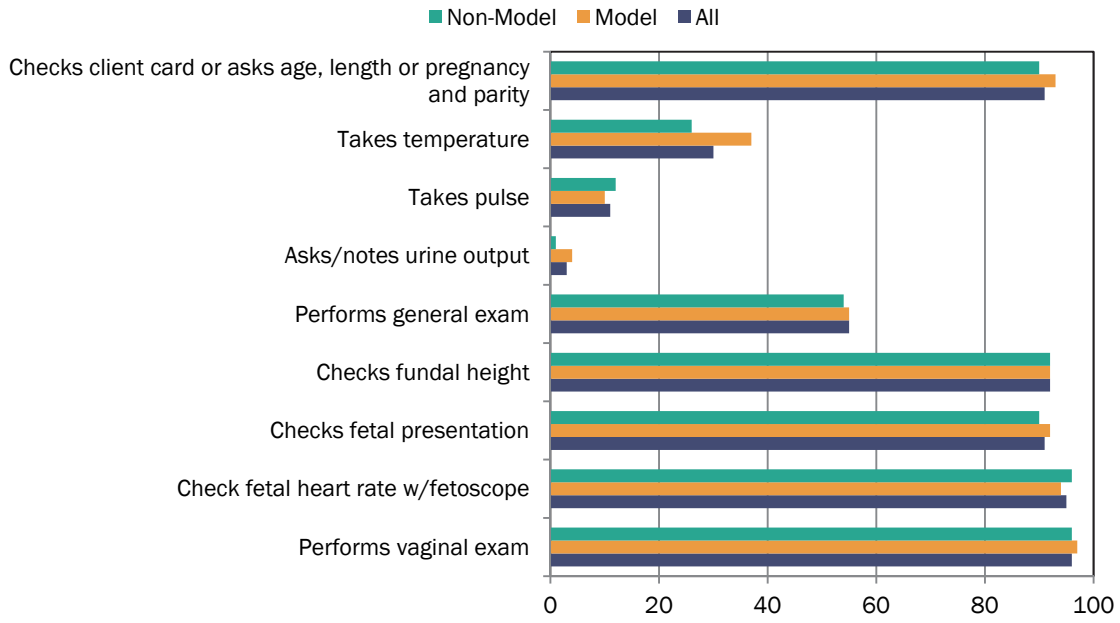
Danger signs: headaches, fever, discharge, swelling of hands and face, convulsions/loss of consciousness, vaginal bleeding
Complications: high blood pressure, convulsion, postpartum hemorrhage, previous cesarean section, still birth, prolonged labor

ROUTINE LABOR AND DELIVERY CARE

Initial Client Assessment

Routine L&D care encompasses activities from initial assessment of the client to care during the first, second, third, and fourth stages of labor. This section presents findings for initial assessment tasks (see Figure 5.4). Other tasks are discussed in other sections as appropriate.

Figure 5.4 Performance of Initial Client Assessment Tasks for Labor



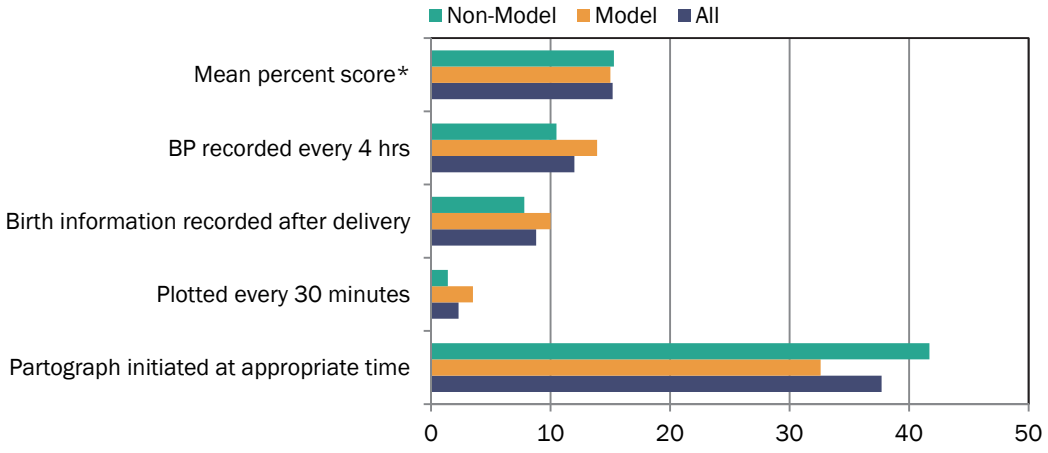
The quality of general initial client assessment on the maternity wards was found to be adequate in the following areas: determination of age, parity, and length of gestation; determination of fetal presentation; assessment of fetal heart; and vaginal examination. In both model and non-model facilities, providers performed these tasks in over 90% of the labors observed. On the other hand, tasks like measuring pulse, taking temperature, and checking urine output were performed much less frequently.

The initial evaluation of a client in labor should be comprehensive and must provide detailed information on the status of the mother, fetus, and labor. A substantial proportion of clients were evaluated adequately in terms of some of the assessment tasks (e.g., asking the client about her age and parity or performing an obstetric examination) but not others (e.g., the measurement-oriented examination tasks such as taking pulse and temperature, or asking about danger signs). The initial assessment becomes the basis for further management. A complete assessment provides health workers with information as to whether or not a client needs extra care (risk classification) and helps them to determine the level at which the laboring mother should be managed. Therefore, the overall low performance on initial assessment tasks is of concern. Checklists could be used as job aides to focus attention on these items. In addition, use of quantitative measures of a physical exam, such as heart rate, temperature, may be aided by improved use of the partograph with its need for quantitative client data.

Performance of Prevention Practices for Obstructed Labor (Partograph Use)

WHO and other authorities recommend using a partograph to help birth attendants make better decisions for the diagnosis and management of prolonged and obstructed labor as well as to help detect fetal distress and severe pre-eclampsia. Blank partograph forms were available in all but one facility. Based on chart review, we found that the partograph was used in 53% of labors (n=512) and of labors without a partograph, 47% of those women arrived in the second stage of labor. However, when appropriate use of the partograph was examined—including plotting frequency and duration of contractions, fetal heart tones, and maternal pulse every half hour—partographs were completed appropriately in only 5% of the cases. Partographs were initiated at the appropriate time 38% of the time. Additional chart review of partograph use showed that the birth time was entered in 81% of cases, delivery method in 83%, and estimated blood loss in 17% of cases. However, in a quarter (24%) of the deliveries cases, the partograph was completed after delivery, which means it was not used as a decision tool for managing obstructed or complicated labor.

Figure 5.5 Quality of Partograph Use for Births Observed



*Plotted at least every half-hour; birth info and blood pressure (BP) recorded at least every four hours

Figure 5.5 shows the completeness of the partograph for both types of facilities assessed using selected variables. During labor, the partograph was filled out at least every half-hour only 2% of the time. On the other hand, correct initiation of partograph occurred more frequently (38%). Both model and non-model facility health workers had low partograph completeness rates. The concern is that when information on the partograph is incomplete, misinterpretation is more likely and may lead to delayed diagnosis and inappropriate or no action, with the consequent development of serious complications.

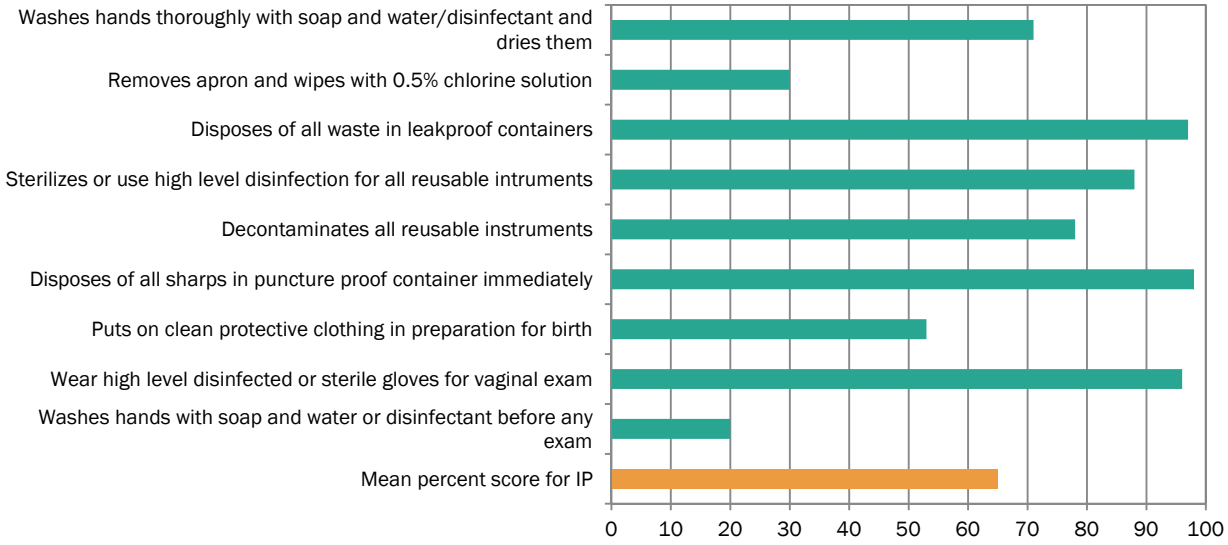
Understanding the possible barriers to, as well as facilitators of, partograph use is important because underuse or misuse is a likely contributor to continued maternal and neonatal morbidity and mortality from prolonged labor, including fistula. When comparing partograph usage to other countries, Mozambique data are similar to usage data reported from Uganda (70%, n=1,170), Zambia (61%, n=84), China (39%, n=48) and in the 2009 MCHIP Quality of Care survey in Kenya, which was conducted as part of the Kenya service provision assessment survey. Low and incomplete usage of the partograph is not a problem unique to Mozambique, even after years of advocacy, training, and supervision on its use. Qualitative research might help to reveal how partograph use can be better promoted and supported. Creative solutions will need to be found, which may need to include piloting the use of new technologies like the e-partograph that Jhpiego is developing.

Performance of Infection Prevention Practices (Prevention of Puerperal Sepsis)

Sepsis is one of the five most common causes of maternal death in Mozambique. It can be controlled if aseptic techniques are respected during labor, prophylactic treatment is given when indicated for obstetric procedures, and if early signs of infection are recognized and treated in a timely manner.

Practices to prevent and manage sepsis in the mother or newborn were not examined in depth. For instance, no data were collected on frequency of vaginal examinations or the management of cases of maternal or newborn sepsis. Use of standard infection prevention and hygiene measures is, of course, a core concept for the prevention of infection transmission in health care settings (Gamer 1996) and this was observed and recorded. These results are shown in Figure 5.6. Recommended infection prevention practices during delivery care are aimed at preventing infections not only in the mother and neonate, but also in health workers. Adherence to standard infection prevention practices was assessed against a set of standard measures that have proven effective, including hand-washing practices, use of protective barriers, decontamination of reusable items in chlorine solution, and disposal of contaminated items in appropriate containers during routine L&D care.

Figure 5.6 Provider Adherence to Infection Prevention Standards during Labor and Delivery Care



A safe water source for handwashing (either piped or bucket with tap) was available in the delivery units of almost all of the facilities (83%), however, supplies such as soap (68%) and hand disinfectant (56%), which are essential to infection prevention, were less frequently available. Seventy-six percent of facilities had either a safe water source and soap or hand disinfectant available. The aggregate mean score for all facilities for adherence to standard infection prevention practices was 65% (model facilities 67%, non-model 63%). However, this aggregate score masks important differences in key infection prevention practices. Use of protective gloves for vaginal exams was near universal, whereas protective gear was used in only 53% of deliveries. Correct disposal of sharps and disposal of contaminated waste were above 95%; however, hand washing, one of the most fundamental infection prevention practices, was done after about 70% of deliveries and just under 20% before initial or subsequent patient assessments.

The U.S. Centers for Disease Control and Prevention (2002) recommends hand washing with plain soap and water before and after client contact, at a minimum. Failure to take this simple measure increases the risk of maternal sepsis and the possibility of cross infections of serious diseases like HIV and hepatitis B. The finding that routine hand washing after examination (71%) was much more common than hand washing before examination (20%) suggests that health care workers might place greater emphasis on self-protection than on protecting clients from cross infection.

Use of personal protective gear: In a high proportion of labors, health care workers wore high-level disinfected or sterile gloves for vaginal examinations during the initial assessment (96%), but clean protective clothing was worn in only 53% of the births observed. The adherence to use of protective gloves may indicate a strong belief among health workers that gloves are an effective means of preventing infection transmission. It is difficult to know from the study whether providers did not use protective aprons and other protective gear because these were not clean or just not available in the facility. However, current national policy mandates universal use of personal protective equipment, so there is still room for improvement in this component of infection prevention.

Decontamination of reusable items: The fairly high rate (88%) of compliance with decontamination of reusable instruments in 0.5% chlorine solution indicates that providers and managers alike are attentive to the need for disinfection. However, the other decontamination-related practice (making aprons safer for subsequent use) was observed only 30% of deliveries. The failure to reliably clean aprons is cause for concern for two reasons: first, it could hinder the consistent use of aprons; second, soiled aprons are a vehicle for infection transmission and could undermine other infection prevention practices.

Disposal practices: International infection control guidelines stipulate that used sharps and contaminated waste must be placed in puncture-resistant and leakproof containers. The findings for observed deliveries indicate adequate compliance with this recommendation (98% for sharps, 97% for contaminated waste). Furthermore, the universal availability of sharps containers in all surveyed facilities is commendable; it is a clear indication of management support for this infection prevention practice.

Respectful Maternity Care during Labor and Delivery

Quality of care during L&D is measured in part by the extent to which women are treated with respect, have appropriate communication with and emotional support from a health care provider, and are provided with a degree of privacy. Lack of respect for women and their birthing preferences and abusive care have been shown to deter women from seeking facility-based care (Bowser and Hill 2010). Care that responds not only to the physical needs of women in labor, but also to their emotional needs and right to privacy is referred to in this report as "respectful maternity care."

Table 5.3 presents interpersonal communication and emotional support measures observed during initial assessment and the first stage of labor for all facilities and disaggregated by model and non-model facilities.

Table 5.3 Performance of Respectful Maternity Care Tasks

COMMUNICATION AND SUPPORT TASKS FOR INITIAL ASSESSMENT	PERCENT OF CASES IN ALL FACILITIES (N=381-383)	PERCENT OF CASES IN MODEL FACILITIES (N=140)	PERCENT OF CASES IN NON-MODEL FACILITIES (N=243)
Respectfully greets pregnant woman	54%	53%	56%
Encourages woman to have support person present through labor & birth	37%	52%	26%
Asks woman (and support person, if present) if she has any questions	32%	38%	28%
Explains procedures to woman (support person) before proceeding	41%	32%	47%
Informs the pregnant woman of findings	55%	54%	56%
COMMUNICATION AND SUPPORT TASKS FOR FIRST STAGE OF LABOR	**PERCENT OF CASES IN ALL FACILITIES (N=453–455)**	**PERCENT OF CASES IN MODEL FACILITIES (N=192)**	**PERCENT OF CASES IN NON-MODEL FACILITIES (N=263)**
At least once, explains what will happen in labor	52%	54%	50%
At least once, encourages woman to consume fluids/food throughout labor	38%	44%	33%
At least once, encourages/assists woman to ambulate, assume different positions during labor	52%	55%	48%
Supports the woman during labor in a friendly way	81%	80%	83%
Drapes woman	26%	34%	20%
Mean percent score intrapartum interpersonal communication tasks	**46%**	**48%**	**44%**

Over half of the women in labor were greeted respectfully by the provider, but only a third of women were asked by the provider if they had any questions. Explanations of procedures and what would happen during labor were offered in about half of the labors observed. Over half of the women were encouraged to move around and assume different positions during labor, and a third were told by the provider that they could have some food and drink during labor; however, only 26% of the women were draped to protect their privacy. Model facility staff performed better on this aspect of respectful care.

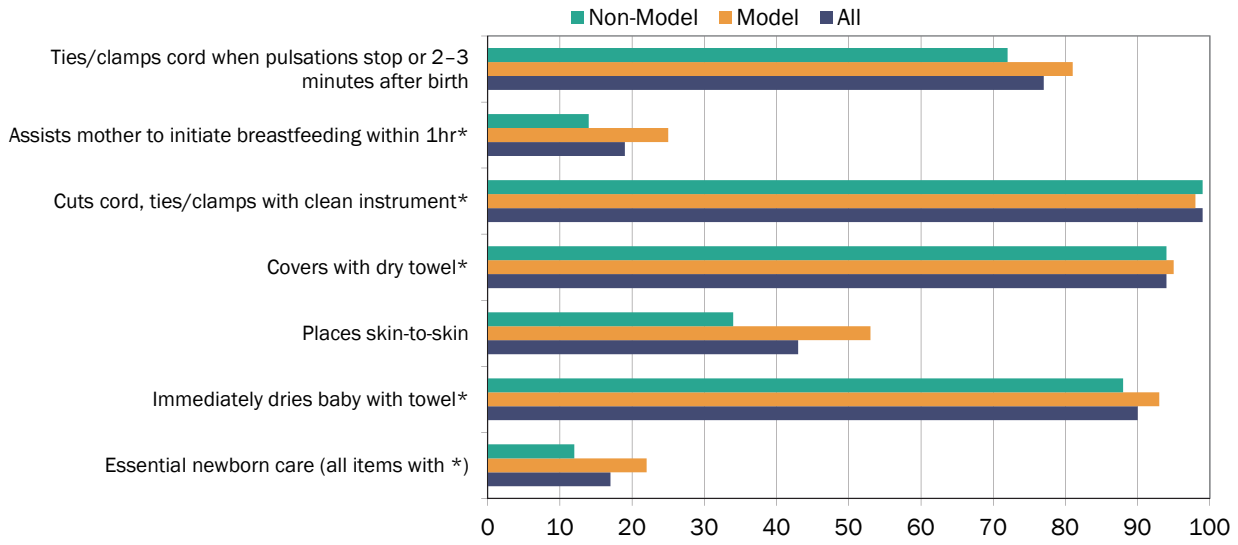
More than 80% of women were supported by the provider during labor in a friendly manner. Although the majority of providers were friendly to the women, only a third encouraged the woman to have a support person present with her during labor. When this item is disaggregated by facility type, model facility staff encouraged the presence of a support person half of the time whereas non-model facility staff did this only 26% of the time. This might have been due to lack of training on this issue in non-model facilities. However, women in model facilities were accompanied by a support person in 33% of observed labors and 26% of deliveries, compared to 22% and 15% respectively for women in non-model facilities (not shown in figure). This simple intervention has been shown to have a significant impact on reducing maternal complications during labor and delivery. The overall mean score of 46% for interpersonal communication suggests that there is substantial room for improvement in how providers treat their clients. Providers need more encouragement during basic and in-service training, and by their supervisors, to ensure that they communicate with women about what is happening during labor and birth and offer friendly and respectful support to promote a quality birth experience. The recognition of several model sites that practice this type of care could allow their use for

visits and on-the-job training, which could accelerate the improvement of this aspect of care by making its use more visible and concrete.

Performance of Immediate and Essential Newborn Care

Figure 5.7 shows the results of observations of newborn care provided until the first hour after birth. The large majority of newborns were dried with a towel immediately after birth, and 94% were covered with another dry towel after the first wet towel was discarded. Forty-three percent of newborns were placed skin-to-skin on the mother's chest or abdomen at birth but only 33% were left skin-to-skin for an hour. This important aspect of newborn care was performed much less frequently in non-model facilities (34%). In less than 20% of cases, health workers helped the mother initiate breastfeeding within the first hour of delivery and this aspect of care was also much lower in non-model facilities (14%). Delayed cord clamping/tying until the pulsations had stopped or at least two to three minutes after birth was observed in over 70% of cases and the cord was cut with a clean implement in 99% of cases. However, only 17% of newborns received all elements of essential newborn care (elements denoted with an asterisk in Figure 5.7) although model facility staff (22%) performed almost twice as well as non-model facility staff (12%). This overall score was lowered mainly due to health workers not checking the baby's skin color and temperature within 15 minutes of birth.

Figure 5.7 Performance of Immediate Newborn Care Tasks



*Essential newborn care task

Table 5.4 Performance of Thermal Care Tasks for Newborns

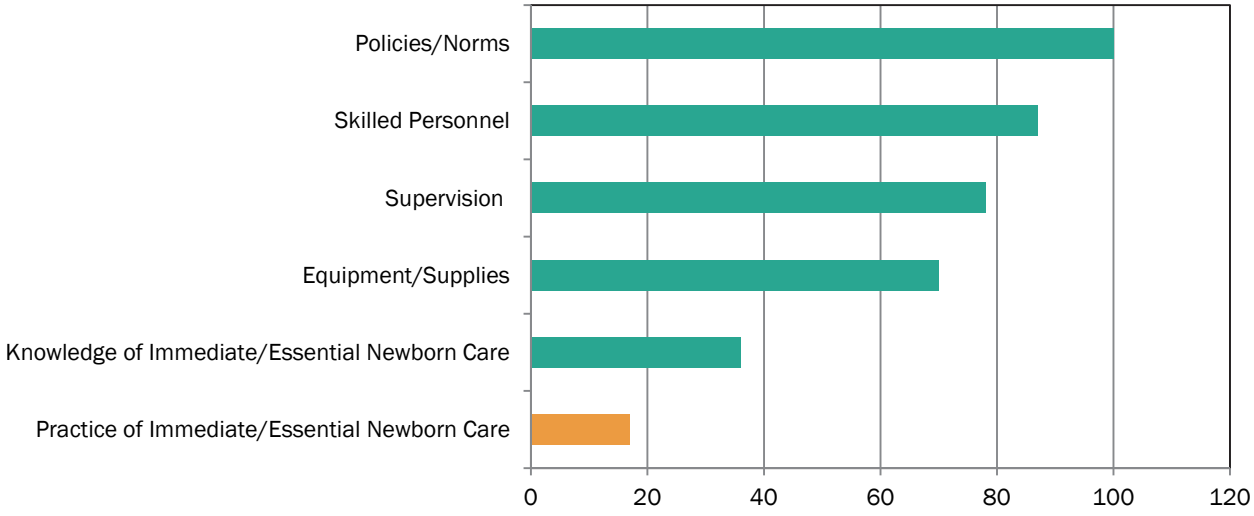
NEWBORN CARE TASK	PERCENT OF CASES (N=506–509)
Immediately dries newborn with towel/cloth	89%
Discards wet towel and wraps/covers newborn with dry towel	88%
Places newborn on the mother's abdomen skin-to-skin	43%
Score for all thermal care steps done (dry and wrap with clean towel)	38%

Although most newborns were immediately dried with a towel/cloth, the aggregate score for the three key newborn care standards that aim at preventing the occurrence of hypothermia was found to be low (38%). Failure to place the newborn in skin-to-skin contact with the mother was the major contributor to the low aggregate score and, as mentioned above, this simple intervention was performed much less frequently in non-model facilities (34%). This simple intervention does not require any equipment and can effectively promote warmth and bonding

between mother and newborn (Puig et al., 2007). The low level of adherence to thermal care standards is a major concern. Hypothermia, apart from being a major cause of death on its own, is the most important contributing factor in neonatal deaths related to asphyxia (the most common cause of neonatal mortality), especially among low birth weight babies. According to the Mozambique 2003 DHS, 14% of neonates in Mozambique were reported to be low birth weight. Given the poor adherence to this practice in the observed facilities, it is clear that several barriers exist to achieving the desired standard of care.

Early initiation of breastfeeding is encouraged by WHO and UNICEF because the first breast milk contains colostrum, which is highly nutritious and has antibodies that protect newborns from diseases. In addition, breastfeeding fosters bonding between mother and child. Helping mothers initiate breastfeeding within the first hour, especially when combined with antenatal education, increases the breastfeeding initiation rate and prolongs exclusive breastfeeding (Fairbank et al. 2005; Stockley 2004). Yet breastfeeding was only initiated immediately with 19% of postnatal mothers and even lower percentage of postnatal mothers in non-model facilities (14%). According to the Mozambique 2003 DHS, only 38% of children less than six months old are exclusively breastfed. The strong relationship between the earlier initiation of breastfeeding and the duration of exclusive breastfeeding indicates that starting earlier is important.

Figure 5.8 From Policy to Practice: Constraints Analysis for Immediate/Essential Newborn Care



Policies/Norms: Percent of elements for essential newborn care (immediate breastfeeding, clean cord care, thermal care) included in national policies
Skilled Personnel: Percent of observed births by skilled birth attendant
Supervision: Percent of observed births in which personnel attending received supervision in previous three months
Equipment/Supplies: Percent observed births with towel or cloth, cord ties, sterile blade or scissors
Knowledge: Mean percent score for knowledge of essential/immediate newborn care for personnel attending observed births
Practice: Mean score for essential/immediate newborn care (immediate breastfeeding, clean cord care, thermal care) in observed births

Performance of Non-Beneficial and Non-Indicated Practices

Non-beneficial practices are practices that are not indicated under any circumstance, whereas *non-indicated* practices may be useful under specific circumstances but are not indicated for the particular cases observed, according to the opinion of the observer. The frequency of non-beneficial and non-indicated obstetric practices was assessed using 11 indicators, seven for non-beneficial practices and four for non-indicated practices. Non-beneficial and non-indicated practices were both found to be infrequent, with 87% of deliveries in which there were no observed non-beneficial practices. Non-indicated practices were also infrequent and 81% of observed deliveries were free of these practices (Table 5.5). Seventy-three percent of all observed deliveries were free of both of these types of practices.

Table 5.5 Non-Beneficial and Non-Indicated Practices

NON-BENEFICIAL PRACTICES	PERCENT OF CASES (N=516)
Use of enema	0%
Pubic shaving	0.4%
Applying fundal pressure*	5%
Lavage of the uterus after delivery*	0.3%
Slapping newborn*	0.4%
Holding newborn upside down	2%
Milking newborn's chest*	0%
Stretching the perineum	8%
Shout, insult or threaten the woman	2%
Slap, hit, or pinch the woman	1%
No non-beneficial practices	86%
NON-INDICATED PRACTICES	
Manual exploration of the uterus after delivery	11%
Use of episiotomy	0.5%
Aspiration of newborn mouth and nose at birth	10%
Restricting food and fluids in labor	0%
No non-indicated practices	81%
No non-beneficial or non-indicated practices	73%

* Not only are these practices are non-beneficial, but they can also be harmful.

While infrequent, the most common non-beneficial practices included holding the newborn upside down (2%), applying fundal pressure (5%), and stretching the perineum (8%). These are all considered harmful. Lavage of the uterus, also a harmful practice, was observed in only two of the deliveries. Routine use of enema and milking of the newborn's chest were not observed in any of the labor and delivery cases. There was very little difference in the overall rates of non-beneficial and non-indicated practices between model and non-model facilities.

The use of non-indicated practices—those that can sometimes be beneficial but which the study observers judged to be inappropriate for the particular client being observed—included some that were used infrequently, such as aspiration of the newborn's mouth and nose at birth (10%) and manual exploration of the uterus after delivery (11%). No one was restricted from taking food and fluids in labor and non-indicated use of episiotomy was observed in only three cases.

Although the use of any non-beneficial or non-indicated practice is a cause for concern, some practices, irrespective of their prevalence, need more attention because they pose a risk of serious harm. These include applying fundal pressure, non-indicated (routine) use of episiotomy, manual exploration of the uterus after delivery, and lavage of the uterus. Fortunately, none of these practices was observed with great frequency, but those practices that do occur should be addressed. Routine or non-indicated use of episiotomy is discouraged because various studies, including systemic reviews, have shown that it does not confer benefits and that it exposes women to risks such as perineal injury, which in turn increases the likelihood of fecal or gas incontinence, dyspareunia, and other conditions (Hartmann et al 2005). The rate of non-indicated use of manual exploration of the uterus (11%) among the observed deliveries also raises concern because manual exploration of the uterus is associated with puerperal infections/sepsis. Manual exploration of the uterus is beneficial when it is clearly indicated, as in cases where retained fragments of conception are suspected and in the evaluation of PPH following vaginal birth after a previous cesarean section. However, these conditions did not exist in any of the cases of manual exploration observed. Applying fundal pressure was observed in 5% of the cases. This practice is a risk factor for fatal maternal complications—namely, hemorrhage secondary to iatrogenic injury to the uterus.

Prevention and Management of Key MNH Complications

PROVISION OF EMERGENCY OBSTETRIC CARE SIGNAL FUNCTIONS

The assessed facilities were hospitals and health centers with the highest volume of deliveries in Mozambique. All should have the capacity to provide basic emergency obstetric and newborn care (BEmONC), and all hospitals (n=24) should provide comprehensive emergency obstetric and newborn care (CEmONC). The facilities' reported performance of the signal functions for both basic and comprehensive EmONC over the three months before the survey is shown in Table 6.1.

Table 6.1 Reported Provision of the EmONC Signal Functions in Previous Three Months

EMONC SIGNAL FUNCTION	PERCENT OF FACILITIES PERFORMING FUNCTION (N=41)	PERCENT OF MODEL FACILITIES PERFORMING FUNCTION (N=16)	PERCENT OF NON-MODEL FACILITIES PERFORMING FUNCTION (N=25)
Assisted delivery	66%	69%	64%
Removal of retained products of conception	63%	56%	67%
Use of parenteral oxytocic drugs	73%	75%	72%
Use of parenteral anticonvulsants for PE/E	63%	69%	60%
Parenteral antibiotics for pregnancy-related infections	66%	69%	64%
Manual removal of placenta	51%	69%	40%
Newborn resuscitation	78%	94%	68%
Blood transfusion	61%	63%	60%
Cesarean section	39%	56%	28%
All 7 BEmONC functions	20%	38%	8%
All 9 EmONC functions	13%	25%	4%

All signal functions were reported in a majority of facilities (both model and non-model), with only two exceptions, namely that in non-model facilities a minority had performed manual removal of the placenta (40%) and cesarean section (28%). The latter is understandable as many non-model facilities are not CEmONC centers. On the other hand, a minority of facilities was performing *all* signal functions (and almost none of the non-model facilities). Differences of less than 20 percentage points in the table are not significant. Other than the two signal functions mentioned above, the only other difference between the model and non-model facilities examined is in newborn resuscitation, which was much more likely to have been performed in model facilities (94% vs. 68%). Table 6.2 shows the results of the assessment of the health facilities' physical capacity for performance of the signal functions.

Table 6.2 Availability of Supplies and Equipment to Perform EmONC Signal Functions

SIGNAL FUNCTION	PERCENT OF FACILITIES WITH NEEDED SUPPLIES/EQUIPMENT (N=41)	PERCENT OF MODEL FACILITIES WITH NEEDED SUPPLIES/EQUIPMENT (N=16)	PERCENT OF NON-MODEL FACILITIES WITH NEEDED SUPPLIES/EQUIPMENT (N=25)
Assisted delivery[1]	91% (n=33)	83% (n=12)	95% (n=21)
Removal of retained products of conception[2]	94%	94%	94%
Administering parenteral antibiotics for infection[3]	95%	96%	95%
Administering parenteral oxytocics[4]	96%	96%	96%
Administering parenteral anticonvulsants[5]	97%	96%	97%
Manual removal of placenta[6]	91%	91%	92%
Newborn resuscitation[7]	83%	89%	80%
Cesarean section[8]	72% (n=14–16)	80% (n=7–9)	63% (n=7)

[1] Forceps or ventouse
[2] Manual vacuum aspiration or dilation and curettage kit, injectable oxytocin, syringes and needles, and IV solution (ringer's lactate, dextrose 5% in normal saline (D5NS) or normal saline (NS) infusion)
[3] Injectable ampicillin or gentamycin, syringes and needles, and ringer's lactate, D5NS or NS infusion
[4] Injectable oxytocin, syringes and needles, and ringer's lactate, D5NS or NS infusion
[5] Injectable magnesium sulfate, diazepam or phenytoin, syringes and needles, and ringer's lactate, D5NS or NS infusion
[6] Injectable ampicillin, injectable oxytocin, syringes and needles, and ringer's lactate, D5NS or NS infusion
[7] Bag and mask (infant size), suction bulb, suction apparatus for use with catheter, and resuscitation table for newborn
[8] Operating table, operating light, anesthesia-giving set, scrub area adjacent to or in operating room, tray/drum/package with sterilized instruments ready to use, halothane or ketamine, health worker who can perform cesarean section present or on call 24 hours/day, anesthetist present or on call 24 hours/day

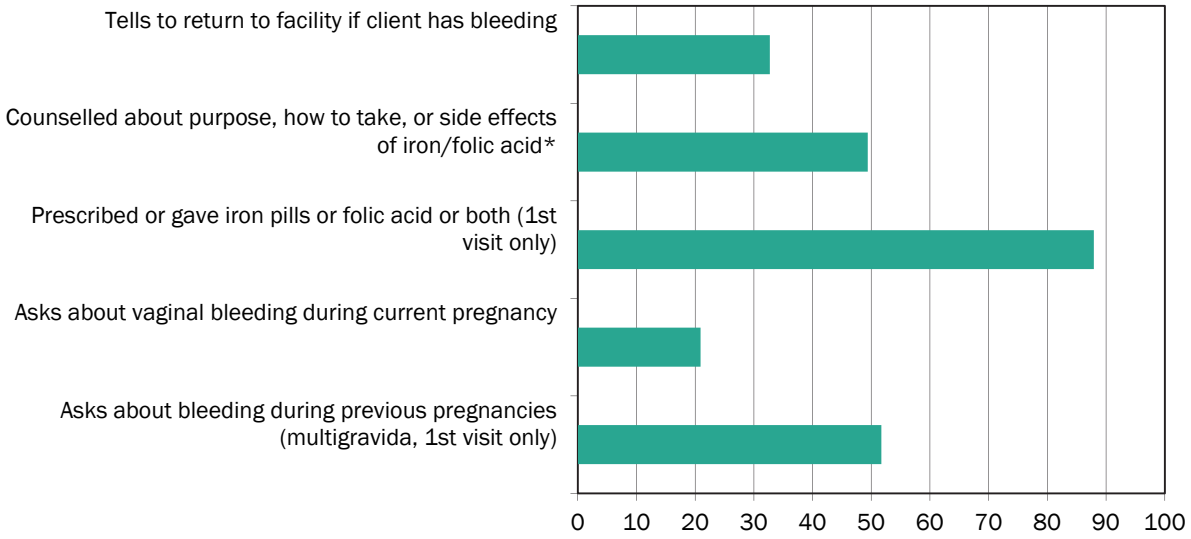
Some cases in which a signal function was not performed can be explained by a lack of needed supplies and equipment, but this is clearly not the entire story. For cesarean sections, 72% of facilities reported availability of necessary supplies, but only 39% reported performing the procedure in the last three months. It seems unlikely that no clients needed cesarean delivery in the preceding three months. Staffing appears to be a barrier in some instances as 82% of facilities had a health worker who could perform cesarean sections and was available 24 hours per day and fewer (70%) had an anesthetist on call 24 hours. The reasons why this life-saving procedure is underused must be identified and addressed. Given that staff were generally available at the facilities observed, the lack of comfort with the procedure may play a role or the need for support from other staff to cover clients during surgery. The recent drive to train surgical technicians to perform cesarean sections, as well as graduation and deployment of more advanced-level nurses with these skills may improve the situation.

PREVENTION AND MANAGEMENT OF POSTPARTUM HEMORRHAGE

Adherence to PPH Prevention Standards

Antenatal care offers opportunities to reduce the risk of severe PPH by asking about bleeding in previous pregnancies and the current pregnancy, by providing iron/folic acid and counseling clients on their use to prevent the exacerbating factor of anemia, and by counseling clients to return if any vaginal bleeding occurs. Figure 6.1 presents the observed performance of these tasks during ANC.

Figure 6.1 Performance of ANC Tasks to Prevent/Mitigate PPH (no significant differences between model and non-model)



* Only for clients who were prescribed or given iron/folic acid pills

Other than prescribing or giving iron or folic acid pills, hemorrhage-related interventions were not frequently performed during observed ANC cases. Clients were counseled to return if bleeding occurred in 33% of the observed visits. About 20% of women were asked about bleeding during their current pregnancy, although a higher number (52%) of multigravida clients were asked at their first ANC consult whether they had a history of bleeding. A high percentage (88%) of women was given iron/folate at their first ANC visit but fewer (49%) were counseled on the purpose, how to take, and side effects. This is an important prevention intervention as anemia is associated with higher risk of hemorrhage, especially severe hemorrhage (Christian, Khatry, and LeClerq, 2009).

AMTSL is an effective intervention to reduce the risk of PPH and the dangerous side effects of maternal anemia (Begley et al. 2010). Assessment of correct AMTSL practice in the survey was based on the then-current International Federation of Gynecology and Obstetrics/International Confederation of Midwives (FIGO/ICM) definition:

- Administration of an uterotonic drug within one minute of delivery (preferably oxytocin 10 units IM)
- Delivery of the placenta with controlled cord traction
- Immediate massage of the fundus of the uterus until the uterus is contracted

Although the new 2012 WHO guidelines don't recommend routine uterine massage, this was considered standard practice when the survey was conducted.

Figure 6.2 Percent of Deliveries with Correctly Completed AMTSL Tasks

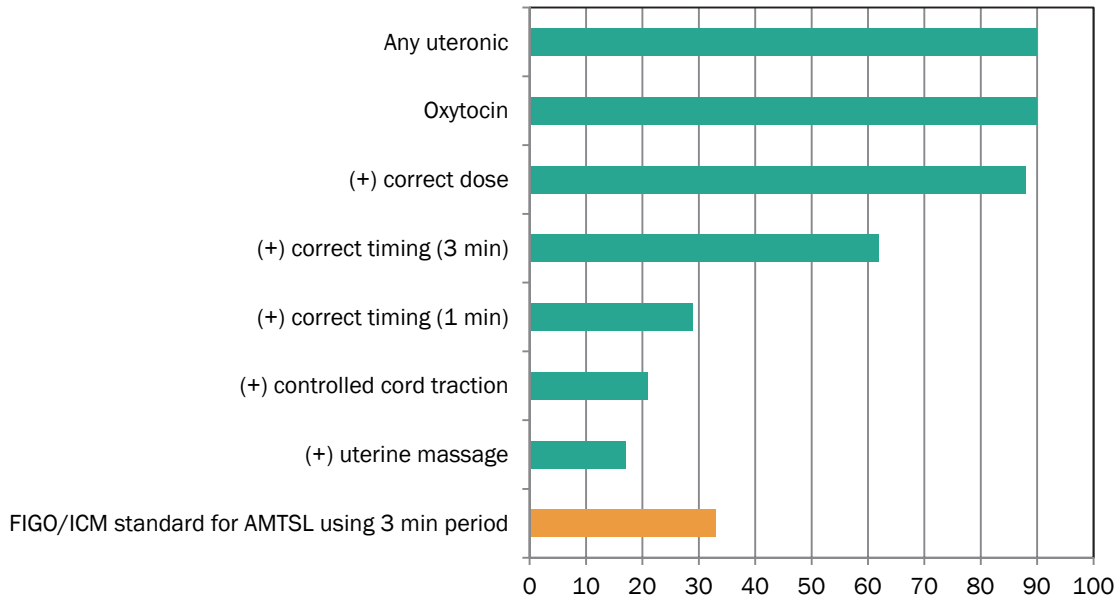


Figure 6.2 shows compliance with the FIGO/ICM definition of AMTSL. In this assessment, the use of oxytocin during the third stage of labor was almost universal in these facilities. It should be noted that due to time constraints, uterine massage was monitored only immediately after delivery of placenta and not until the uterus was contracted, so the compliance with this recommendation, although low, might actually be an overestimate. The percentage of clients who received the necessary elements of AMTSL drops with the addition of each task or requirement:

- 90% received a uterotonic, with little difference between model and non-model (91% and 88%, respectively)
- 88% received the uterotonic by the correct route (intramuscular)
- 62% received the drug with correct timing (using a more relaxed definition of 3 minutes); note that when the proportion of women given a uterotonic within one minute was examined, the score decreased to 29%.
- 21% additionally received controlled cord traction
- 17% additionally received uterine massage

So, by the strict FIGO/ICM definition (oxytocin administered within 1 minute), only 14% of women received all three components of AMTSL. However, when the "relaxed" or three minute definition of AMTSL is used, the rate of administration of all three components of AMTSL rises to 33%. The component of AMTSL most commonly missing was applying controlled cord traction, which was performed correctly in 54% of observed deliveries. Immediate massage of the uterus following delivery of the placenta was performed in 71% of cases.

Although only a third of women received all elements of AMTSL performed according to guidelines, including oxytocin within three minutes, it is important to note that more recent evidence has shown that administration of IM oxytocin is the most important of the components, and this is the component with by far the highest coverage. Evidence on the timing (within one minute or within three minutes) for the administration of a uterotonic drug is currently weak. If a single provider is attending a woman at delivery, delivering the newborn, and providing essential newborn care—all of which are necessary before oxytocin is administered—injection of oxytocin within one minute is

quite challenging. Therefore, the ability to adhere to this requirement in the guidelines (uterotonic within one minute) is severely constrained in a setting such as Mozambique, unless there is more than one birth attendant. Almost 80% of the observed births in this assessment were managed by only one health care provider. Measuring performance based on an unrealistic goal could demoralize both providers and policymakers. Research on the timing of uterotonic administration would help to clarify the guidelines.

Figure 6.3 From Policy to Practice: Constraints Analysis for AMTSL Use

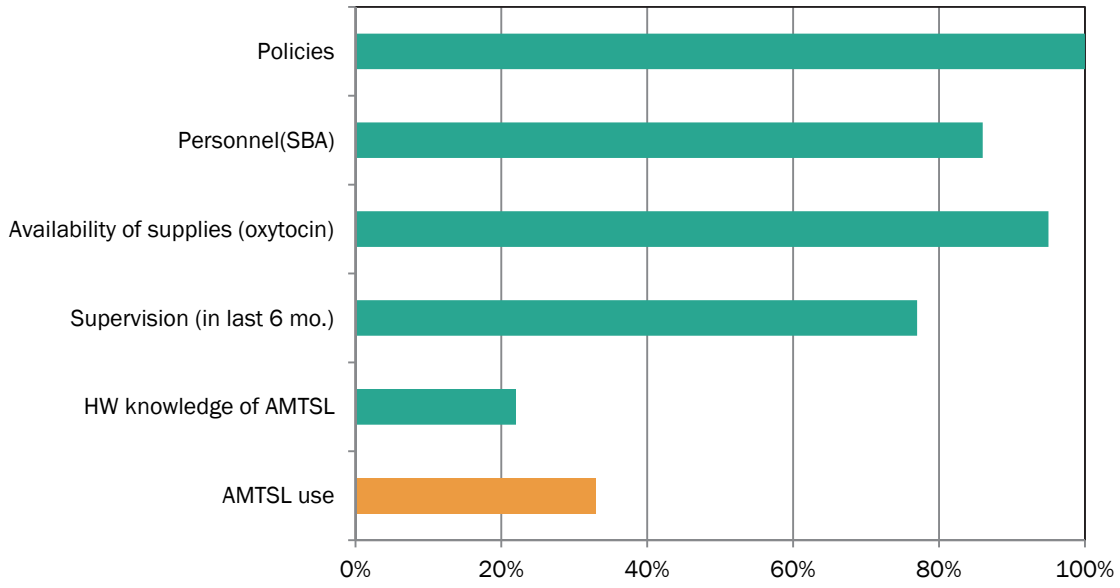


Figure 6.3 shows summarized data to show the largest constraints contributing to the observed AMTSL usage rates. All policies important for the support of AMTSL use are now in place in Mozambique. WHO/FIGO/ICM guidelines for the use of AMTSL are included in the country's pre-service curriculum and practice guidelines. Skilled birth attendants were present at almost all observed births, and an adequate supply of oxytocin was found in nearly all facilities (95%). However, health workers' aggregate knowledge score on the three components of AMTSL (22%) indicates that lack of knowledge among providers is one of the most important barriers to the use of AMTSL. In addition, only 77% of health workers reported that they had had some sort of external supervision at least once in the previous six months. Although the supervision data are not specific to AMTSL review, they refer generally to the level of supervision and thus are indicative of a supportive environment.

While health care providers' knowledge levels about the three components of AMTSL appeared quite low (22%), provision of oxytocin by the correct route (88%) and correct timing within three minutes (62%) were high to moderate. So the performance gap under the new WHO guidance is not as critical as it appears when looking at all three components. Future activity in this area would be best spent on reinforcing the timing (i.e., before the placenta is delivered), as those health workers trained in the remote past were taught expectant management and administration of the uterotonic only after the placenta delivered.

Management of Postpartum Hemorrhage

Six cases of PPH were observed. Cause-specific diagnoses included three cases of uterine atony and three cases of vaginal laceration. In all cases, the woman's condition improved and the woman was transferred to the postpartum ward. The mode of delivery was not indicated. Analysis of provider performance on several key steps in the initial management of PPH (calling for help, uterine massage, uterotonic administration, and initiation of IV fluids if bleeding continued) showed that providers performed the practices correctly in a majority of the cases.

Beyond the initial steps, providers were less consistent in following the standard protocol for management of PPH.

SCREENING AND MANAGEMENT OF PRE-ECLAMPSIA/ECLAMPSIA

Pre-eclampsia and eclampsia are among the most dangerous complications of pregnancy. Eclampsia, the advanced stage of this disorder, is a major cause of maternal deaths.

Adherence to Screening Standards for Pre-Eclampsia

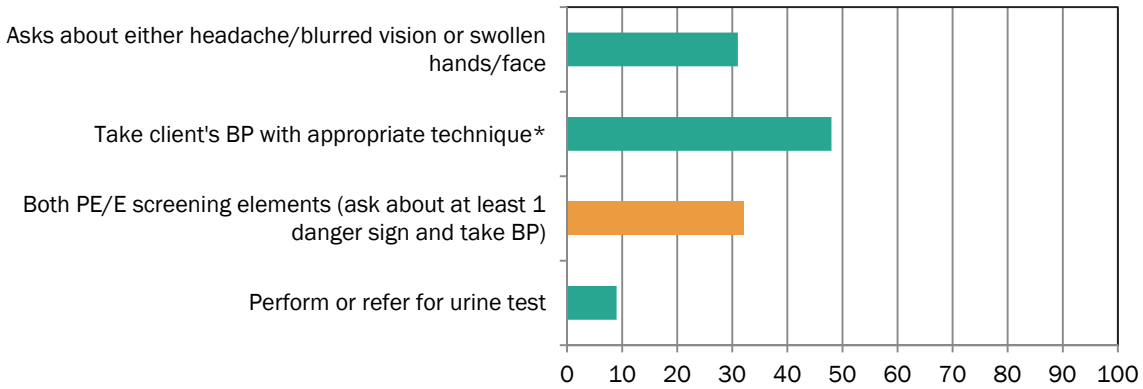
To date there are no accepted routine methods to prevent the occurrence of pre-eclampsia, although both calcium and aspirin supplementation appear promising. Nevertheless, clinical experience suggests that early detection and treatment of PE is beneficial to the woman and fetus because they enable clinical monitoring and prompt therapeutic intervention for severe PE/E. Studies to date have indicated an inverse relationship between the quality of prenatal care and the incidence of eclampsia, strengthening the evidence for the value of early detection (WHO 2003).

Adherence to three screening steps for pre-eclampsia was assessed:

- History taking to assess danger signs (headache, blurred vision, severe edema)
- Blood pressure measurement with correct technique
- Urine test for proteinuria

These criteria were selected based on the available evidence on effectiveness and are in line with recommendations in the WHO IMPAC manual for ANC (WHO 2006a). Results of the assessment for these components are shown in Figures 6.4 for ANC consults and 6.5 for assessment during labor. There was no significant difference between model and non-model facilities and so they are aggregated in the figure.

Figure 6.4 Completion of Pre-Eclampsia Screening Tasks during ANC Consultations



* Sitting or left lateral position and arm at heart level.

While performance was fair (48%) on taking the client's blood pressure correctly, history taking (31%) for signs of PE/E was less frequently performed, and both elements were performed in 32% of consults. Examination of the urine for protein (9%) was very low. Functioning blood pressure equipment was available in only two-thirds of the facilities, which may have contributed to the low rates of performance of this essential assessment step. The importance of recording blood pressure during every antenatal visit and during labor is undisputed.

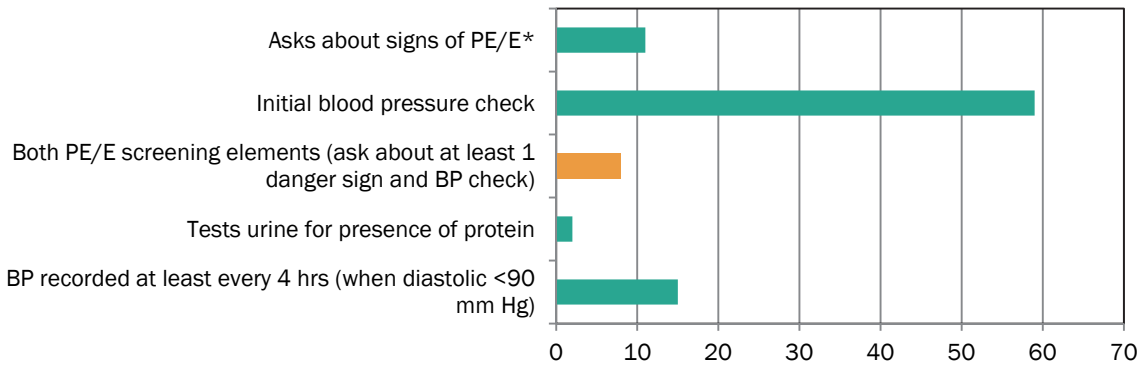
Because there has not been international consensus regarding whether urine testing should be performed routinely or only in the case of elevated blood pressure, this task is shown separately

on the graph. Routine testing is not recommended in the WHO IMPAC series, but it remains an important screening test for pre-eclampsia. Recommendations have been made for universal testing at each ANC visit (National Collaborating Centre for Women's and Children's Health 2005). Although national guidelines recommend routine urine testing for protein for all first visit ANC clients and in subsequent visits if the woman is nulliparous or if she has a history of hypertension, PE/E in a previous pregnancy, the test for albumin in urine was carried out in very few of the observed ANC consults.

For multigravida women, observers also noted whether health workers asked women if they had experienced PE/E or PE/E danger signs in a previous pregnancy (data not shown). Although they asked about women's past history of stillbirth relatively often (70%), only 40% of clients were asked whether their previous pregnancy was complicated with pregnancy-induced hypertension, and 38% of mothers were asked about a history of convulsions. The substandard practice of these measures has serious implications, because although more common in primigravida women, PE/E is more likely to occur in subsequent pregnancies of women who have experienced it already. Thus, an opportunity for detection and/or early management is lost. A past history of PE/E should prompt providers to look actively for PE/E in the current pregnancy, detect it before serious complications occur, and/or institute timely management.

Pre-eclampsia can appear at any time during pregnancy, including labor. Thus, the initial evaluation of mothers in labor should be thorough and provide detailed information on maternal, fetal, and labor status. Figure 6.5 below shows that intrapartum PE/E screening tasks were not routinely performed.

Figure 6.5 Completion of Pre-Eclampsia Screening Tasks during Labor



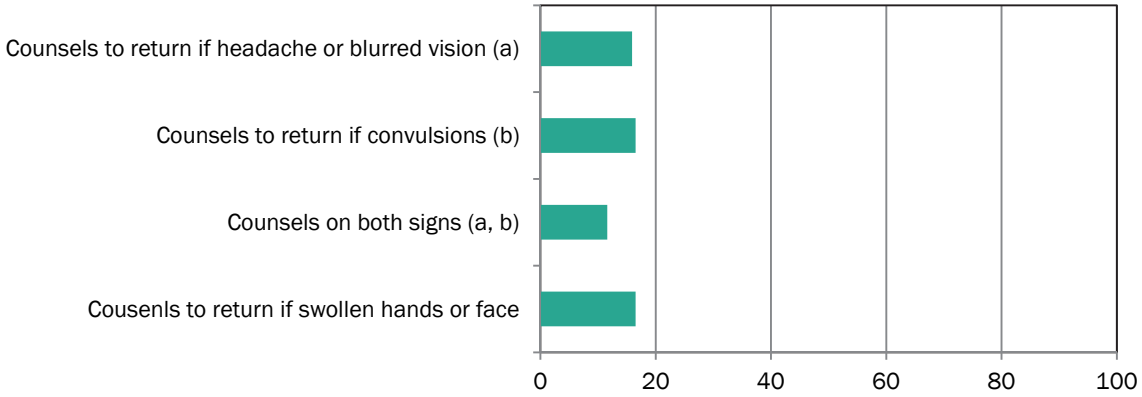
*At least 1 danger sign: headache/blurred vision, swollen hands/ face, convulsions/loss of consciousness

Completion of PE screening tasks were similar during L&D to those found in ANC. Close to 60% of women had their blood pressure checked on initial assessment. But the percentage of deliveries with both intrapartum screening tasks of PE/E (asking about at least one danger sign for PE/E and checking blood pressure) was found to be very low (8%). Regular blood pressure recording at least every four hours during intrapartum care was done only 15% of the time. Given the fairly low use of the partograph in the facilities assessed (53% of cases), it is not surprising that follow-up blood pressure measurements recorded at least every four hours on the partograph was observed in only 15% of the cases. Other tasks, such as measurement of protein in the urine and inquiries about PE/E-related signs, were not assessed for the majority of laboring mothers.

Pregnant women should be informed of the danger signs of PE/E, because these signs may be associated with poorer pregnancy outcomes, and early recognition of symptoms helps improve the woman's chances of timely treatment and survival. In view of this, providers' adherence to

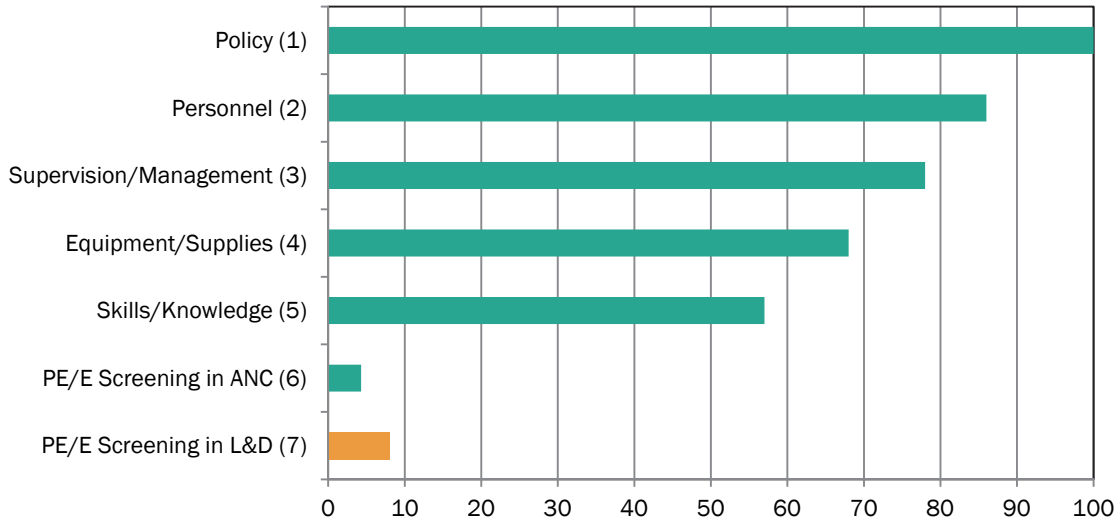
PE/E-related pregnancy counseling protocols was evaluated using two symptoms that might indicate the occurrence of PE.

Figure 6.6 Provision of ANC Counseling on Danger Signs of Pre-Eclampsia



In aggregate, only 12% of the women observed during ANC were informed of how to recognize signs of pre-eclampsia and there was only minimal difference between model and non-model facilities. Just over 16% of women were counseled on how to recognize edema. Given that edema is often the only clinical sign of PE that women can easily identify, the observed lack of counseling on this danger sign is a cause for concern. In addition, given that headache is a common symptom of many illnesses, mothers might overlook headaches as a danger sign. Education on these important early warning signs must be improved to decrease undue delays in detecting pre-eclampsia before it becomes dangerous.

Figure 6.7 From Policy to Practice: Constraints Analysis for Pre-Eclampsia/Eclampsia Screening



[1] Mean percent score: magnesium sulfate registered, on Essential Drug List, PE/E screening in Service Delivery Guidelines (SDGs), magnesium sulfate first line in SDGs. All L&D health workers eligible to give magnesium sulfate
[2] Percent of births attended by skilled birth attendant
[3] Percent of personnel received supervision in previous three months
[4] Availability of blood pressure apparatus on L&D
[5] Score for knowledge of PE/E
[6] See Figure 6.4
[7] See Figure 6.5

Observed practice of PE/E screening in both ANC and L&D were low, indicating many missed opportunities to prevent this deadly disease. An analysis of the constraints to screening for PE in ANC is shown in Figure 6.7. All critical national policies are in place to support the use of screening for PE/E and use of magnesium sulfate as a first-line drug in the treatment of PE/E. Skilled personnel were in place. Logistical constraints (i.e., presence of blood pressure apparatus) and health worker knowledge about PE/E identification, screening, and treatment were the largest gaps contributing to low rates of screening. Health worker knowledge on the PE/E case studies was generally higher (57%) than the scores for PPH knowledge (23%), but there was still a large knowledge gap.

Management of Severe Pre-Eclampsia and Eclampsia

Data collectors observed the quality and adequacy of initial treatment of severe PE/E for eight cases. Because of the small number of cases, this analysis is qualitative. The reasons for limited data are that PE/E is a rare event and the observers stayed for only two days in each facility. However, the observations of these cases did give some important insights. Six of the eight cases were diagnosed as eclampsia and two as severe pre-eclampsia. In one of the eclampsia cases, the patient was unconscious and had eclampsia related convulsions.

In Mozambique, magnesium sulfate is the primary drug used as an anticonvulsant for treatment of severe PE/E, which is codified in national treatment guidelines. Both magnesium sulfate and anti-hypertensives were found to be almost universally stocked and almost all facilities (98%, including both model and non-model) had magnesium sulfate available in the L&D room. This is particularly remarkable, given that the logistical system in Mozambique generally been a severe constraint on quality service provision in family planning, HIV/AIDS, and MCH services. However, there seems to have been a positive effect from MISAU'S decision to put both oxytocin and magnesium sulfate in the kits for "vital medicines" that is in the central medical store's "push system" and does not depend on forecasting at the local level. On the other hand, calcium gluconate for the treatment of excessive magnesium sulfate dosing, was only found in 11% of facilities inventoried.

Magnesium sulfate was given in six of the eight cases and an anti-hypertensive in seven. Both drugs were correctly given in five of the cases. However, in none of the eight cases were any of the basic clinical follow-up steps taken—i.e., taking blood pressure, checking reflexes and respirations four or more times in the first hour. In conclusion, the correct use of magnesium sulfate and anti-hypertensives was almost universal, but the implementation of additional clinical assessments needed for eclampsia management did not seem to be as universally applied and should be emphasized for strengthening of health workers' response to PE/E.

MANAGEMENT OF BIRTH ASPHYXIA (NEWBORN RESUSCITATION)

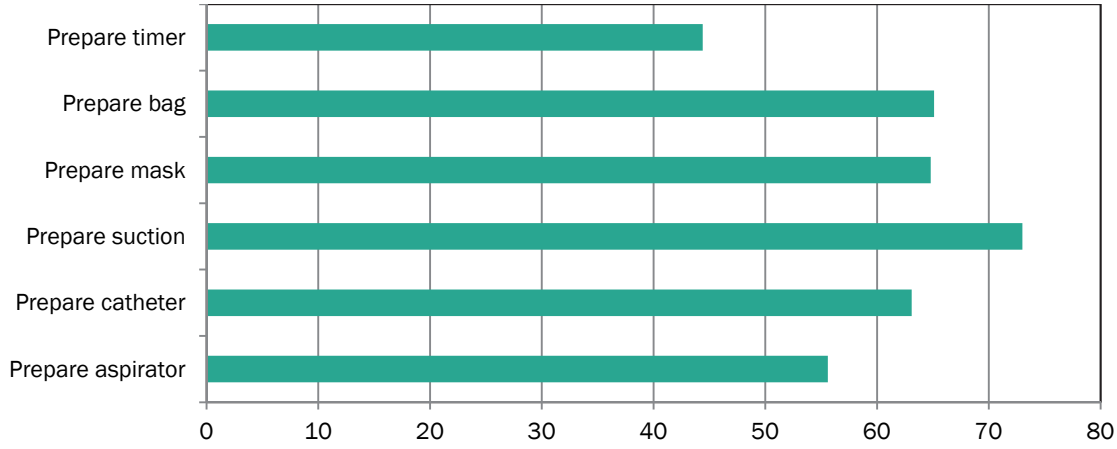
Neonatal deaths account for more than two-thirds of infant deaths globally. Neonatal asphyxia accounts for 29% of those deaths (Lawn, Cousens, and Zupan 2005). The adoption of simple, low-cost resuscitation practices improves the outlook for asphyxiated newborns, even in low resource facility settings. Data collectors recorded the management of 28 cases of neonatal asphyxia. Of the 28 observed cases, eight newborns died, 16 survived, and data on the remaining four cases are missing. Three of the neonates' presentations were non-cephalic, although it is not clear from the data if this was only determined by the health worker at birth. Comments from data collectors suggest that prolonged or obstructed labor was a contributing factor in about one-third of the cases. Given that partographs were not used during labor in these cases, this could have contributed to poor outcomes in a sizeable fraction of these cases. All but one of the 24 cases were spontaneous vaginal deliveries and one was an assisted vaginal delivery.

Health worker preparation for delivery of essential newborn care (i.e., clean delivery and prevention of hypothermia) was assessed. This should have been done either before or during the second stage of labor. Preparation of the following was assessed: a cover or towel (31%), cord ties

(96%) and scissors (97%), and a cap for the baby (3%). It is encouraging that preparation for clean cord care was almost universal. It is also not surprising that caps were not generally prepared as these are not standard commodities in most maternities. However, the lack of preparation of a clean cover or towel (including a *capulana*) is more problematic. In some cases, the mother had brought a *capulana* for this purpose. In those cases where she had not, commodity supply was a severe constraint—as it was for all linen items, including bed covers and drapes.

The preparation for possible neonatal asphyxia was also assessed by observing the preparation of six essential items needed to administer immediate treatment (Figure 6.8). Readiness ranged from just over 40% to 73% for the different items, but overall, health workers had prepared an average of only 3.7 of the 6 items needed.

Figure 6.8 Health Worker Preparation for Performance of Neonatal Asphyxia Management



The majority of newborns with asphyxia respond to simple measures and the initial steps of the resuscitation protocol. The quality of implementation of these initial steps is shown in Table 6.3. Initial drying of the asphyxiated newborn and suctioning were done in most cases. There was some drop-off in performance in terms of aspirating the nasopharynx, cleaning secretions, and putting the newborn in an appropriate position. The providers' ventilation technique was observed to be adequate in approximately half of the cases in which ventilation was observed. The case report outlined below gives an indication of the consequences of a lack of preparation of the items needed for essential newborn care and newborn resuscitation.

In this case, an infant in need of resuscitation died in a situation in which preparation might well have saved him. Simple measures to promote preparation could go a long way toward improvement of practice (encouragement of practice protocols to immediately clean resuscitation

Case Report—Unsuccessful Newborn Resuscitation

The client, an 18-year-old G_2P_1 woman (two previous pregnancies and one birth), reached the health center of a non-model maternity at term, in active labor, and four centimeters dilated. The client stated that labor pains had started one hour previously. She was attended by a basic-level MCH nurse with 26 years of experience. After three and a half hours, she was fully dilated. Her water broke and demonstrated thick meconium. The nurse did not prepare materials for essential newborn care or for resuscitation. After a second stage of ten minutes, a male child weighing 3,700 grams was born. He was limp, cyanotic, and had faint respirations. The nurse cut the cord, but did not dry or cover the baby, did not aspirate the nose or mouth, and did not give stimulation.

The study team intervened, telling the nurse that the baby was clearly at risk of dying. A study team member stimulated the child, rubbing his back, but he did not improve. A team member then suctioned the baby. The baby began to exhibit weak respirations. The team asked for a bag and mask. When the nurse found some of the needed items, they showed signs of disuse. A pediatric bag and mask were found, but the rubber seal was missing on the mask. The team put the baby in skin-to-skin contact with his mother and covered him with a dry cloth. His mouth and nose were covered with gauze and a study team member administered mouth-to-mouth resuscitation. He did not respond. He was pronounced dead 30 minutes after birth. Ten minutes later the nurse returned with the missing piece of the mask.

equipment after use, store in a bag or box together, and keep the bag/box at hand when women enter second stage labor).

Table 6.3 Quality of Care in Neonatal Asphyxia Case Management (n=28)

ANALYSIS OF PERFORMANCE OF INITIAL STEPS OF NEWBORN RESUSCITATION	CORRECT	INCORRECT	MISSING*	% CORRECT
Stimulate baby by drying vigorously	21	6	1	78%
Clean secretions	14	9	5	61%
Aspirate nose and mouth with catheter	19	9	0	68%
Place neck in correct position of mild extension	14	9	5	61%
Apply mask in correct mask position over nose and mouth	12	10	6	55%
Give two trial breaths	10	12	6	45%
Average Index Score for Initial Steps of Newborn Resuscitation				**57%**

* Either the task not done because newborn was breathing or the task was not recorded

Discussion and Conclusions

Although the quality of service provided to ANC and L&D clients in terms of prevention, early detection, and treatment of common maternal and newborn complications appears to be mixed, ranging from poor in some aspects to up-to-standard in others, the quality of care overall falls well below WHO's recommended standards. There were some differences between model and non-model maternities, but in general, the quality of care provided in each was quite similar across the spectrum of routine maternal and newborn care, as well as management of the most common serious complications. The majority of the observed care was delivered by basic- and mid-level nurses so it is not possible to say whether other health worker cadres deliver higher quality care, as this study does not reflect the care given by advanced-level nurses or physicians. However, evaluating the care delivered by basic- and mid-level nurses affords a realistic picture of the care received by women who attend ANC or deliver in these facilities, as the large majority of care is, in fact, delivered by these cadres of workers, both in model and non-model maternities.

Some practices do have a high level of adherence. These practices include:

- Preventive treatments during ANC
- Some aspects of respectful maternity case, like health worker support of clients during labor
- Availability and correct timing and use of uterotonics during the third stage of labor (part of AMTSL)
- Availability of magnesium sulfate in almost all facilities and administration of magnesium sulfate as first-line treatment for eclampsia
- Thermal care for newborns as a component of essential newborn care
- Adherence to several key infection prevention standards such as wearing gloves, correct sharps disposal, disposal of waste is leakproof containers, and decontamination of used medical instruments

On the other hand, broad areas of care were delivered with inadequate quality. Although Mozambique's difficulties with commodity supply are well-known, this was not the major constraint in any of the three main focus areas of the assessment (i.e., identification/management PE/E, prevention/management of PPH, prevention/management of obstruction and birth asphyxia). Essential MNH equipment and supplies appear to be widely available, which suggests that this is unlikely to be the *major* factor responsible for the overall very low use of recommended practices. However, a few essential items were missing from facilities and this needs to be addressed—of most importance are blood pressure equipment and protective aprons for use during deliveries. On the other hand, 80% of assessed facilities had all of the essential supplies for normal delivery and over 95% of facilities had all of the elements for managing serious complications. As a specific example, although partographs were universally available in the facilities, they were used during labor (rather than being filled out afterwards) in only about half of births observed. The reasons for the observed low quality of care in various areas are multiple and systemic:

- Inadequate staffing, causing work overload in many of the facilities assessed. One-third of assessed facilities had excessively high birth/personnel ratios.
- A continued lack of knowledge of high-impact, evidence-based interventions (or skills to perform them) for a health worker working alone in an often pressured and stressful environment.
- These finding, especially on non-use of partographs, also point to other less tangible barriers such as beliefs or attitude. That is, health care workers or their supervisors may not be convinced of the advantage of a particular standard of care or the organization of care.

MISAU has recognized the general outlines of the deficits delineated in this study—the Model Maternities Initiative is one response to these problems. Specifically, the emphasis on improving the work conditions for health workers is crucial. The initiative emphasizes several key conditions that are the largest contributors to mortality: postpartum hemorrhage, pre-eclampsia/eclampsia, obstructed labor, sepsis, and newborn asphyxia. Preventive measures (such as essential newborn care, use of uterotonic in the third stage) are also covered, and not just management of complications. However, to accelerate progress, additional emphasis is needed to reduce the observed deficits in care and increase the quality and availability of high-impact interventions. Improvements are needed not only in complication management, but in the implementation of several basic tasks, including initial evaluations such as taking pulse, blood pressure, and temperature and asking clients about danger signs. In terms of promoting respectful care, there was no previous evaluation for comparison, but it seems that the MMI may well have had a positive effect. Health workers generally greeted women and interacted positively with them. However, the overall mean score for respectful maternity care was lowered to 46%, in large part because of inconsistent draping, which was often an issue of inadequate supplies of clean linens. Further progress on respectful care will be difficult without at least minor infrastructure improvements for privacy.

A summary of key findings and conclusions is presented below by subject area. In the next section, recommendations are outlined to emphasize actions to take as the MMI expands and matures.

FINDINGS AND CONCLUSIONS

Policies

- Policies/practice guidelines, which cover all the key areas assessed, are in place: PPH, PE/E, obstructed labor, essential newborn care, newborn resuscitation.

Human Resources

- Designated skilled attendants (mid- and basic-level nurses) attended more than 82% of deliveries observed.
- The level of staffing is inadequate in many maternities.

Supervision

- Most of the health workers (> 73%) reported being supervised in the six months before they were interviewed.

Drug and Supply Logistics

- Life-saving medicines (oxytocin, magnesium sulfate) were almost universally available.
- Other needed supplies/equipment for implementation of signal functions were widely available.
- Some important supplies were much less available—e.g., soap (69%), calcium gluconate (12%).

Health Worker Knowledge and Training

- Knowledge scores for routine L&D care were high, but mean scores for recognizing and managing specific complications, newborn care, and newborn sepsis were generally less than 40%.

Antenatal Care

- Provider performance on first ANC visits was generally good with weaker areas being asking client about her last menstrual period and about the medications she is taking.
- Coverage of ANC preventive interventions was also good with a mean score of more than 60%.
- Several areas of client counseling such as for antimalarials, use of insecticide treated nets, deworming, and PMTCT were performed quite well, but counseling on nutrition, birth preparation, danger signs, breast feeding, and postpartum family planning were poorly addressed. Staff at non-model facilities performed less well than their counterparts at model facilities on the ANC counseling topics.

Postpartum Hemorrhage

- Oxytocin for AMTSL is almost universally available; however, it was often not refrigerated, which may affect potency.
- Provision of oxytocin 10 units IM—the correct dose—was observed in 88% of births, and it was given within three minutes of birth in 61% of births.
- Provision of other components of AMTSL was also observed: controlled cord traction in 54%; uterine massage in 71% of cases.
- If the timing of administration of oxytocin is relaxed to 3 minutes, then all three components of AMTSL were implemented in 33% of deliveries.
- Knowledge scores for diagnosis and management of PPH were low (33% overall). Approximately 35% knew how to diagnose and treat bleeding associated with an atonic uterus and 34% knew how to diagnose and treat a retained placenta. Knowledge scores for health workers in non-model facilities were generally lower than in model facilities.

Pre-Eclampsia/Eclampsia

- Screening for PE/E during ANC and L&D by taking blood pressure was performed 50-60% of the time. The lack of a functioning blood pressure cuff is a major constraint in non-model facilities.
- Few providers asked clients about a history of PE/E danger signs, either in the ANC clinic or in the L&D ward. There was little variation between model and non-model facilities in this regard.
- The primary drug used for prevention of eclampsia is magnesium sulphate.
- Magnesium sulfate was available in all of the facilities.

Obstructed Labor

- All facilities had partographs in stock.
- Availability of all essential supplies and equipment for EmONC functions was high across all facilities.
- Correct initiation of the partograph occurred 38% of the time. Partographs were often incompletely filled out and often done after delivery.
- Cesarean section appears to be underutilized; only 56% of sampled model maternities, which are CEmONC facilities, reported performing a cesarean section in the last three months.

Sepsis

- Performance of infection prevention practices in L&D was generally good, but performance was lacking on some specific practices (e.g., hand washing before delivery and use of protective clothing).
- Non-indicated use of manual exploration of the uterus, which is a risk factor for maternal puerperal sepsis, was done for 10% of deliveries.

Immediate Newborn Care and Birth Asphyxia

- Several aspects of immediate newborn care need significant improvement, especially skin-to-skin contact and initiation of breastfeeding.
- Equipment needed for immediate newborn care was available in almost all facilities.
- Of the initial six steps of newborn resuscitation, a little more than half were done in the cases observed. There were not enough cases to make judgments about the variation in practice between model and non-model facilities.

Recommendations

GENERAL RECOMMENDATIONS

Policies

- Most of the key policies for identification, prevention, and management of the key causes of maternal and newborn death are in now place. It is now a question of policy implementation.

Human Resources/Training

- Clearly, inadequate staffing is a major issue in many of these maternities. MISAU ought to consider the addition of at least a few more L&D personnel in the most understaffed facilities. Improvement will be difficult without addressing this issue.
- Focusing efforts on a few maternities closest to being recognized as models could help make the concept of a model maternity more tangible and make it seem more attainable to personnel in nearby maternities.
- Although many personnel across the assessed facilities had received training in most of the key topics within the last three years, the level of skills and knowledge was below standard. While competency-based training currently in place is an improvement over traditional classroom training, further innovation is called for, including use of the new integrated training packages to give more focused modular trainings and on-the-job training associated with supportive supervision.
- Some basic skills need to be emphasized in training:
  - Birth preparation counseling
  - Initial assessment of the client on L&D

Supervision

- Quantity of traditional supervision is barely adequate. Supervision can be increased by provincial-level nurse supervisors, whose focus would be to improve the functioning of model maternities.
- More important than having infrequent, intense supervisory visits, is to increase the frequency and focus of supervisory contacts ("high frequency, low dose").

Drug and Supply Logistics/Infrastructure

- Key drugs, commodities, supplies are available, which is encouraging.
- Blood pressure cuffs and stethoscopes need to be universally available in ANC and L&D.
- Some simple infrastructure improvements could reduce the barriers to client privacy—curtains, screens, re-engineering of space.

Monitoring and Evaluation

- The new integrated ANC and L&D registers that MISAU rolled out at the beginning of 2012 are an exciting change. All development partners should support this effort, which promises to give comprehensive and timely information for managing the key processes for quality improvement.

COMPLICATION-SPECIFIC RECOMMENDATIONS

Postpartum Hemorrhage

- Recent evidence has shown that administration of IM oxytocin is the most important component of AMTSL, and this is the component with the highest coverage, by far.

- Given the importance of this life-saving drug, proper care ought to be taken in the storage of oxytocin. Many facilities were observed not to refrigerate oxytocin. While this may not present a problem in the cooler months, this almost certainly causes some loss of potency in the warmer months. MISAU should issue a clear directive to refrigerate oxytocin. If there is doubt as to the need for this, MISAU ought to consider conducting an oxytocin potency study to test the potency of unrefrigerated products in maternities.
- Currently, there is only weak evidence on the timing (within one minute or within three minutes) for the administration of a uterotonic drug. If a single provider is attending a woman at delivery, delivering the newborn, and providing essential newborn care—all of which are necessary before oxytocin is administered—injection of oxytocin within one minute is quite challenging. Therefore, the ability to adhere to this requirement in the guidelines (uterotonic within one minute) is severely constrained in a setting such as Mozambique, unless there is more than one birth attendant. Almost 80% of the observed births in this assessment were managed by only one health care provider. Measuring performance based on an unrealistic goal could demoralize both providers and policymakers. Further international research on the timing of uterotonic administration is needed.

Pre-Eclampsia/Eclampsia

- On aggregate, only 12% of the women observed during ANC were informed on how to recognize signs of pre-eclampsia and there was only minimal difference between model and non-model facilities. Education on early warning signs must be improved to decrease undue delays in detecting pre-eclampsia before it becomes dangerous.
- Observed practice of PE/E screening in both ANC and L&D were low, indicating many missed opportunities to prevent this deadly disease. Logistical constraints (i.e., presence of blood pressure apparatus) and low levels of health worker knowledge about PE/E identification, screening, and treatment were the largest contributors to low rates of screening.
- Correct use of magnesium sulfate and anti-hypertensives was almost universal, but the implementation of additional clinical assessments needed for eclampsia management were not as universal. There should be a focused effort through supervision to improve this practice.

Obstructed Labor

- Low and incomplete usage of the partograph is not a problem unique to Mozambique, even after years of advocacy, training, and supervision. Qualitative research might help to reveal how partograph use can be better promoted and supported. Creative solutions will need to be found, which may need to include piloting the use of new technologies like the e-partograph.

Sepsis Prevention/Infection Prevention

- Hand washing before patient care needs to be reinforced.

Immediate Newborn Care and Birth Asphyxia

- Preparation for the possible need for newborn resuscitation for all births must be emphasized. Protocols that make this easier should be implemented and should be a focus of supervision—immediate cleaning of bag and mask apparatus after use; storage of all needed equipment in a single container; resuscitation container near at hand for all births.
- The new newborn resuscitation protocol (Helping Babies Breathe) developed by the American Academy of Pediatrics and endorsed by WHO is simple and would focus attention on the first critical steps of resuscitation. This could help catalyze rapid, needed improvements.

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Annex 1: Description of Planned Delivery Observation Sample by Facility

GROUP	HEALTH FACILITY NAME	HEALTH FACILITY TYPE	PROVINCE	DISTRICT	MEAN NO. BIRTHS PER DAY DISTRICT	EXPECTED BIRTH IN 2D OR 3D OBSERVATION PERIOD (16H/D)	IN PLANNED SAMPLE?	IN FINAL ADJUSTED SAMPLE?	NUMBER OF EXPECTED OBSERVATIONS*
1	HC Nampula	Central Hospital	Nampula	City of Nampula	33.3	66.7	X	X	24.0
1	HG José Macamo	General Hospital	City of Maputo	City of Maputo	32.0	42.6			
1	HC Maputo	Central Hospital	City of Maputo	City of Maputo	22.9	45.9	X	X	24.0
1	HG Mavalane	General Hospital	City of Maputo	City of Maputo	20.5	27.2			
1	HP Chimoio	Provincial Hospital	Manica	City of Chimoio	16.6	33.3	X	X	24.0
1	HG Chamanculo	General Hospital	City of Maputo	City of Maputo	14.4	19.2		X	16.0
1	HG Nacala	General Hospital	Nampula	Nacala-Porto	13.1	26.3	X	X	24.0
1	HR Mocuba	Rural Hospital	Zambézia	Mocuba	12.8	17.0			
1	HP Lichinga	Provincial Hospital	Niassa	City of Lichinga	12.1	24.3	X	X	24.0
1	HC Beira	Central Hospital	Sofala	City of Beira	11.7	15.5			
1	HP Quelimane	Provincial Hospital	Zambézia	City of Quelimane	11.0	14.7	X	X	14.7
1	HP Xaixai	Provincial Hospital	Gaza	City of Xai-Xai	10.9	14.6		X	14.6
1	HR Cuamba	Rural Hospital	Niassa	Cuamba	10.0	13.3	X	X	13.3
1	CS Matola II	Health Center	Maputo Prov	City of Matola	9.8	19.7		X	19.7
1	HP Tete	Provincial Hospital	Tete	City of Tete	9.6	12.8	X	X	12.8
1	HR Montepuez	Rural Hospital	Cabo Delgado	Montrepuez	8.6	11.4			
1	HP Inhambane	Provincial Hospital	Inhambane	City of Inhambane	7.4	9.8	X	X	9.8
1	HR Chicuque	Rural Hospital	Inhambane	Maxixe	6.9	9.1			
1	CS nº2 (Matundo)	Health Center	Tete	City of Tete	6.8	9.0	X	X	9.0
1	HD Gurue	District Hospital	Zambézia	Gurue	6.5	8.7			
1	HR Catandica	Rural Hospital	Manica	Bárue	6.5	8.7	X	X	8.7
1	HP Pemba	Provincial Hospital	Cabo Delgado	City of Pemba	6.5	8.6			
1	CS 1º de Maio	Health Center	Manica	City of Chimoio	6.3	8.4	X	X	8.4
1	CS Manhiça	Health Center	Maputo Prov	Manhiça	5.5	7.3			
1	HR Monapo	Rural Hospital	Nampula	Monapo	4.7	6.3	X	X	6.3

GROUP	HEALTH FACILITY NAME	HEALTH FACILITY TYPE	PROVINCE	DISTRICT	MEAN NO. BIRTHS PER DAY DISTRICT	EXPECTED BIRTH IN 2D OR 3D OBSERVATION PERIOD (16H/D)	IN PLANNED SAMPLE?	IN FINAL ADJUSTED SAMPLE?	NUMBER OF EXPECTED OBSERVATIONS*
1	CS Chiuaula	Health Center	Niassa	City of Lichinga	4.3	5.8			
1	CS Natite	Health Center	Cabo Delgado	City of Pemba	4.3	5.7	X	X	5.7
1	HR Manjacaze	Rural Hospital	Gaza	Manjacaze	3.8	5.0			
1	HR Chicumbane	Rural Hospital	Gaza	Xai-Xai	3.7	5.0	X	X	5.0
1	CS Boane	Health Center	Maputo Prov	Boane	3.3	4.4			
1	CS Macurungo	Health Center	Sofala	City of Beira	3.0	4.0	X	X	4.0
GROUP 1 FACILITIES NOT INCLUDED IN SAMPLING FRAME BECAUSE OF LOW DELIVERY VOLUME									
1	HR Buzi	Rural Hospital	Sofala	Buzi	2.9	3.9			
1	CS Homoine	Health Center	Inhambane	Homoine	2.7	3.6			
1	HR Songo	Rural Hospital	Tete	Cahora Bassa	2.7	3.6			
2a	CS 25 Setembro	Health Center	Nampula	City of Nampula	21.5	28.6	X	X	16.0
2a	CS Chingussura	Health Center	Sofala	City of Beira	11.2	14.9			
2a	CS 1º Junho	Health Center	City of Maputo	City of Maputo	10.5	14.0	X	X	14.0
2a	HR Angoche	Rural Hospital	Nampula	Angoche	10.3	13.7			
2a	CS Bagamoio	Health Center	City of Maputo	City of Maputo	9.1	12.2	X	X	12.2
2a	CS 1ºMaio	Health Center	City of Maputo	City of Maputo	7.9	10.5			
2a	HR Ulóngue	Rural Hospital	Tete	Angónia	7.8	10.4	X	X	10.4
2a	CS 17 Setembro	Health Center	Zambézia	City of Quelimane	7.6	10.1			
2a	CS Machava II	Health Center	Maputo Provi	City of Matola	7.5	10.0	X	X	10.0
2a	HR Alto Molocue	Rural Hospital	Zambézia	Alto Molucue	7.3	9.7			
2a	HR Chókwè	Rural Hospital	Gaza	Chòkwè	7.1	9.5	X	X	9.5
2a	CS Manica	Health Center	Manica	Manica	7.1	9.5			
2a	HR Marromeu	Rural Hospital	Sofala	Marromeu	7.0	9.3	X	X	9.3
2a	HR Gondola	Rural Hospital	Manica	Gondola	6.7	8.9			
2a	HR Nhamatanda	Rural Hospital	Sofala	Nhamatanda	6.5	8.7	X	X	8.7
2a	HR Chibuto	Health Center	Gaza	Chibuto	6.2	8.3			
2a	HR Vilanculos	Rural Hospital	Inhambane	Vilanculos	5.8	7.8	X	X	7.8
2a	HR Mueda	Rural Hospital	Cabo Delgado	Mueda	5.8	7.7			
2a	CS Moatize	Health Center	Tete	Moatize	5.7	7.6	X	X	7.6
2a	HD Nicoadala	District Hospital	Zambézia	Nicoadala	5.7	7.6			
2a	CS Mocimboa da Praia	Prov. Hospital	Cabo Delgado	City of Pemba	5.4	7.1	X	X	7.1

GROUP	HEALTH FACILITY NAME	HEALTH FACILITY TYPE	PROVINCE	DISTRICT	MEAN NO. BIRTHS PER DAY DISTRICT	EXPECTED BIRTH IN 2D OR 3D OBSERVATION PERIOD (16H/D)	IN PLANNED SAMPLE?	IN FINAL ADJUSTED SAMPLE?	NUMBER OF EXPECTED OBSERVATIONS*
2a	CS Vanduzi	Health Center	Maniva	Manica	5.3	7.0			
2a	CS Macia	Health Center	Gaza	Bilene-Macia	5.3	7.0	X	X	7.0
2a	HD Massinga	District Hospital	Inhambane	Massinga	5.0	6.7			
2a	CS Chiure	Health Center	Cabo Delgado	Chiure	4.5	6.0	X	X	6.0
2a	CS Ponta Gêa	Health Center	Sofala	City of Beira	4.3	5.8			
2a	HD Maganja da Costa	District Hospital	Zambézia	Maganja da Costa	4.1	5.5	X	X	5.5
2a	CS Mecanhelas	Health Center	Niassa	Mecanhelas	3.9	5.2			
2a	HR Xinavane	Health Center	Maputo Prov	Manhiça	3.8	5.1	X		5.1
2a	HD Namacurra	District Hospital	Zambézia	Namacurra	3.8	5.0			
2a	CS N°4 Muthemba	Health Center	Tete	City of Tete	3.4	4.6	X	X	4.6
2a	HG Marere	General Hospital	Nampula	City of Nampula	3.4	4.5			
2a	HR Mutarara	Rural Hospital	Tete	Mutarara	3.3	4.4	X		4.4
2a	CS Maxixe	Health Center	Inhambane	Maxixe	3.1	4.2			
2a	HR Ribaue	Rural Hospital	Nampula	Ribaue	3.1	4.1	X		4.1
2a	HD Espungabeira	District Hospital	Manica	Mossurize	3.0	4.0			
GROUP 2A FACILITIES NOT INCLUDED IN SAMPLING FRAME BECAUSE OF LOW DELIVERY VOLUME									
2a	CS Morrumbene	Health Center	Inhambane	Morrumbene	2.9	3.9			
2a	CS Marracuene	Health Center	Maputo Prov	Marracuene	2.4	3.2			
2a	CS Ilha de Moçambique	Health Center	Nampula	Ilha de Moçambique	2.2	3.0			
2a	HR Alua	Rural Hospital	Nampula	Erati-Namaoa	2.2	2.9			
2a	CS Metangula	Provincial Hospital	Niassa	Metangula	2.0	2.7			
2a	HR Muxúnguè	Rural Hospital	Sofala	Chibabava	2.0	2.6			
2a	HD Milange	District Hospital	Zambézia	Milange	1.8	2.4			
2a	CS Namaacha	Rural Health Center	Maputo Prov	Marracuene	1.2	1.7			
2b	CS Catandica	Health Center	Manica	Barue	?	?			
2b	CS Munhava	Health Center	Sofala	City of Beira	8.3	16.6	X	X	16.6
2b	CS Dondo Sede	Health Center	Sofala	Dondo	6.8	13.7			
2b	CS Nhamahomba	Health Center	Manica	City of Chimoio	6.6	13.2	X	X	13.2
2b	CS Muhala Expansão	Health Center	Nampula	City of Nampula	5.9	11.7			
2b	CS Gorongosa	Health Center	Sofala	Gorongosa	5.2	10.4	X	X	10.4
2b	CS Caia	Health Center	Sofala	Caia	5.2	10.3			

GROUP	HEALTH FACILITY NAME	HEALTH FACILITY TYPE	PROVINCE	DISTRICT	MEAN NO. BIRTHS PER DAY DISTRICT	EXPECTED BIRTH IN 2D OR 3D OBSERVATION PERIOD (16H/D)	IN PLANNED SAMPLE?	IN FINAL ADJUSTED SAMPLE?	NUMBER OF EXPECTED OBSERVATIONS*
2b	CS Coalane	Health Center	Zambézia	City of Quelimane	4.9	9.7	X	X	9.7
2b	CS Mafambisse	Health Center	Sofala	Dondo	4.2	8.4			
2b	CS Lifitzi	Health Center	Tete	Angónia	3.8	7.7	X	X	7.7
2b	CS Anchilo	Health Center	Nampula	District of Nampula	3.8	7.6			
2b	CS Licuare	Health Center	Zambézia	Nicoadala	3.5	7.0	X	X	7.0
2b	CS Inharrime	Health Center	Inhambane	Inharrime	3.4	6.8			
2b	CS Sussundenga	Health Center	Manica	Sussundenga	3.4	6.8	X	X	6.8
2b	CS Bedene	Health Center	Maputo Prov	City of Matola	3.3	6.7			
2b	CS Guro-Sede	Health Center	Manica	Guro	3.2	6.3	X	X	6.3
2b	CS Tica	Health Center	Sofala	Nhamatanda	3.0	6.0			
2b	CS Quissico	Health Center	Inhambane	Zavala	2.9	5.8	X		
2b	CS Chitima	Health Center	Tete	Chitima	2.8	5.5			
2b	CS Balama	Health Center	Cabo Delgado	Balama	2.7	5.5	X	X	5.5
2b	CS Namuno	Health Center	Cabo Delgado	Namuno	2.6	5.1			
2b	CS Magude	Health Center	Maputo Prov	Magude	2.5	5.0	X		
2b	CS Palma	Health Center	Cabo Delgado	Palma	2.5	4.9			
2b	CS Inhassunge	Health Center	Zambézia	Inhassunge	2.4	4.7	X	X	4.7
2b	CS Macanga	Health Center	Tete	Macanga	2.3	4.7			
2b	CS Iapala	Health Center	Nampula	Ribaue	2.2	4.3	X		4.3
2b	CS Meconta	Health Center	Nampula	Meconta	2.2	4.3			
2b	CS Lugela	Health Center	Zambézia	Lugela	2.1	4.2	X	X	4.2
2b	CS Marrupa	Health Center	Niassa	Marrupa	2.1	4.2			
2b	CS Maúa	Health Center	Niassa	Maúa	2.1	4.1	X	X	4.1
2b	CS Massangulo	Health Center	Niassa	Ngauma	2.0	4.0			

GROUP	HEALTH FACILITY NAME	HEALTH FACILITY TYPE	PROVINCE	DISTRICT	MEAN NO. BIRTHS PER DAY DISTRICT	EXPECTED BIRTH IN 2D OR 3D OBSERVATION PERIOD (16H/D)	IN PLANNED SAMPLE?	IN FINAL ADJUSTED SAMPLE?	NUMBER OF EXPECTED OBSERVATIONS*
GROUP 2B FACILITIES NOT INCLUDED IN SAMPLING FRAME BECAUSE OF LOW DELIVERY VOLUME									
2b	CS Changara	Health Center	Tete	Changara	1.9	3.9			
2b	CS Mabalane	Health Center	Gaza	Mabalane	1.8	3.7			
2b	CS Marera	Health Center	Manica	Gondola	1.8	3.6			
2b	CS Guijá	Health Center	Gaza	Guijá	1.7	3.5			
2b	CS Pemba Metuge	Health Center	Cabo Delgado	Pemba-Metuge	1.7	3.4			
2b	CS Inhassoro	Health Center	Inhambane	Inhassoro	1.7	3.4			
2b	CS Metarica	Health Center	Niassa	Metarica	1.4	2.9			
2b	CS Moamba	Health Center	Maputo Prov	Moamba	1.3	2.6			
2b	CS Panda	Health Center	Inhambane	Panda	1.2	2.3			
2b	CS Mossuril	Health Center	Nampula	Mossuril	1.1	2.2			
2b	CS Catembe	Health Center	City of Maputo	City of Maputo	1.1	2.2			
2b	CS Maciene	Health Center	Gaza	District of Xai-Xai	0.8	1.6			
2b	CS Ressano Garcia	Health Center	Maputo Prov	Moamba	0.7	1.4			

* Takes account of maximum number of observations in large facilities

Annex 2: Data Collection Tools

The data collection tools used included:

- Inventory of ANC and Labor and Delivery Ward
- ANC Observation Checklist
- Labor and Delivery Observation Checklist
- Health Worker Interview and Knowledge Test

These were all programmed on Samsung Galaxy tablet computers.
All data collection forms are also available at: http://www.mchip.net/QoCsurveys

ANC INVENTORY					
	Section 1 Cover Page				
	FIND THE PERSON IN CHARGE OF THE ANC INVENTORY AND CONTINUE WITH THE ANC INVENTORY				
NUMBER	**QUESTION**	**CODING**			
fac_name_f	Facility Name				
fac_id_f	Facility Number				
F_Int_Num	Observer Number				
TodaysDate	Today's Date				
	For smartphones: Tap to set				
HW_id_ANC	HW ID (From Staff Listing)				
	CONTINUE TO ANC INVENTORY				
	Section 2				
		CODING			**GO TO**
NUMBER	**QUESTION**	**YES**	**NO**	**DK**	
f301	F301: Does this facility offer antenatal services?				
f302	F302: Are antenatal-care services being provided at the facility today?				
f303	F303: Does this facility have a system whereby measurements or procedures for ANC clients are routinely carried out before the consultation?				
	ASK TO SEE THE PLACE WHERE ANTENATAL CLIENTS ARE SEEN BEFORE THEY HAVE THEIR MEDICAL CONSULTATION AND INDICATE WHICH OF THE FOLLOWING ACTIVITIES ARE ROUTINELY CARRIED OUT THERE				
Number	**Question**	**CODING**			
f304	OBSERVE IF THE BELOW ACTIVITIES ARE BEING CONDUCTED ROUTINELY. IF NOT SEEN ASK: Is [READ ACTIVITY YOU DO NOT SEE] routinely conducted for all antenatal care clients?	**Observed**	**Reported, not seen**	**Not routinely conducted**	**DK**
f304_1	1) Weighing Clients				
f304_2	2) Taking blood pressure				
f304_3	3) Urine test for protein				
f304_4	4) Blood test for anemia				
f304_5	5) Conducting group health education sessions				
f304_6	6) Other				
f304_6_Oth	Specify Other				
NUMBER	**QUESTION**	**CODING**			**GO TO**
f305	Are the following activities performed as part of routine services, that is, each client has this test at least once.	**YES**	**NO**	**DK**	
f305_1	1) Blood test for anemia				
f305_2	2) Blood test for syphilis				
f305_3	3) Blood group				
f305_4	4) Test for RH factor				
f305_5	5) Urine test for protein				
f305_6	6) Urine test for glucose				
f306	Which of the following types of treatment and services are routinely offered to antenatal clients?				
f306_1	1) SP for Intermittent Preventive Therapy for malaria				
f306_2	2) Counseling about family planning				
f306_3	3) Counseling about HIV/AIDS - delete voluntary				
f306_4	4) Testing for HIV/AIDS - delete voluntary				
f306_5	5) Deworming treatment with albendazole or other medication				
f307	F307: Is tetanus toxoid vaccination available all days that antenatal care services are offered?	YES	NOT ALL ANC DAYS	TT NEVER OFFERED	TT never offered -> f310
F308	F308: How many days each week are tetanus toxoid vaccinations offered at this facility? (write in number of days; don't know write 8)			DK	
	Smartphone: TAP arrows for Number of Days, Don't Know tap to 8				
f309	F309: Is tetanus toxoid immunization available today?	YES	NO		
	ASK TO SEE THE ROOM WHERE EXAMINATIONS FOR ANTENATAL OR POSTPARTUM CLIENTS ARE CONDUCTED.				

f310	F310: DESCRIBE THE SETTING OF THE EXAMINATION ROOM.	private room with visual and auditory privacy			
		non-private room with visual and auditory privacy			
		visual privacy only			
		no privacy			
	FOR EACH OF THE FOLLOWING ITEMS, CHECK TO SEE WHETHER ITEM IS EITHER IN THE ROOM WHERE THE EXAMINATION IS CONDUCTED OR IN AN ADJACENT ROOM.				
NUMBER	**QUESTION**	**CODING**			**GO TO**
f311	EQUIPMENT,DRUGS AND VACCINES REQUIRED FOR ANTENATAL CARE SERVICES	**YES**	**NO**	**DK**	
f311_a1	1A) Spotlight, flashlight/torch or exam light for pelvic exam				no/dk -> f311_2
f311_b1	1B) Functioning?				
f311_2	2) Table or bed for gynecological exam				
f311_3	3) Clean (or sterile) gloves				
f311_5	5) Sharps container				
f311_6	6) At least five or more 2-ml or 3 ml syringes (with 21 gauge needles)				
f311_7	7) Already mixed decontaminating solution				
f311_17	17) Hand disinfectant				
f311_9	9) Waste receptacle with lid and plastic liner				
f311_10	10) Handwashing soap				
f311_11	11) Single-use hand drying towel				
f311_12	12) Water for handwashing				no/dk -> f311_13
f312	F312: How is water being made available for use in the antenatal care service area today?	PIPED	BUCKET	TAP	
f311_13	13) Iron				
f311_14	14) Tetanus toxoid vaccine				
f311_15	15) SP (Fansidar)				
f311_16	16) Mebendazole or other deworming medication				
	NOTE THE AVAILABILITY AND CONDITION OF OTHER EQUIPMENT. EQUIPMENT MAY BE IN EXAMINATION ROOM, AN ADJACENT ROOM, OR ROOM WHERE MEASURE IS TAKEN.				
f313	AVAILABILITY OF OTHER EQUIPMENT				
f313_a1	1A) Blood pressure apparatus				no/dk -> f313_a2
f313_b1	1B) Functioning?				
f313_a2	2A) Stethoscope				no/dk -> f313_a3
f313_b2	2B) Functioning?				
f313_a3	3A) Fetal stethoscope (Fetoscope)				no/dk -> f313_a4
f313_b3	3B) Functioning?				
f313_a4	4A) Thermometer				no/dk -> f313_a5
f313_b4	4B) Functioning?				
f313_a6	6A) Adult weighing scale				no/dk -> f313_a7
f313_b6	6B) Functioning?				
f313_a7	7) Vaginal spectrum				
f313_a8	8) Urine Test Strip for Protein				
f313_a9	9) Ability to do boiled urine test				
f313_a10	10) RPR Kit (Syphilis Test)				
f313_a11	11) HIV rapid test				
f314	AVAILABILITY OF PROTOCOLS AND TEACHING MATERIALS				
f314_1	1) Guidelines or protocols for antenatal care				
f314_2	2) Guidelines or protocol for management of PE/E				
f314_3	3) Guidelines or protocols for STIs				
f314_4	4) Visual aids for client education on subjects related to pregnancy or antenatal care				
		Private car/bus			
		Public car/bus			
		Motorcycle			
		Bicycle			
		People carry/push or pull patient			
		Animals carry/pull patient			
f315_Oth		Other (specify_____)			
		Never receive emergency			

NUMBER	QUESTION	CODING			GO TO
	Accept reported response	YES	NO	DK	
f316	F316: Does this facility have a functional ambulance or other vehicle for emergency obstetric transportation?				
f317	F317: Is fuel available today?				
f318	Please tell me if this facility has any of the following systems to support emergency obstetric referrals:				
f318_1	01) Are there any funds set aside to help clients with emergency transportation ?				
f318_2	02) Does the facility hire a vehicle locally to provide emergency obstetric transportation?				
f318_3	03) Is there a community health insurance scheme that provides support for emergency obstetric referrals?				
f318_4	04) Is fuel set aside for emergency obstetric referrals?				
f318_5	05) Is there a revolving fund system for transportation for emergency obstetric referrals?				
f318_6	06) Does the facility radio or phone another facility to send transportation for emergency obstetric referrals?				
f318_7	07) Is there any other system?				
f318_7_Oth	Specify Other System				
F319_1	F319 (1) - Dry Season: How long does it take to get to the nearest referral facility in the DRY season?				
F319_2	F319 (2) - Wet Season: How long does it take to get to the nearest referral facility in the WET season?				
	END OF ANC INVENTORY				
	For smartphones: Tap MENU and then FINISH SESSION				

	Section 1 Cover Page								
	FIND THE LABOR & DELIVERY INVENTORY MANAGER AND CONTINUE WITH THE L&D INVENTORY								
NUMBER	**QUESTION**	**CODING**							
fac_name_f	Facility Name								
	For smartphones: Select district; Select Facility								
fac_id_f	Facility Number								
F_Int_Num	Observer Number								
TodaysDate	Today's Date								
	For smartphones: Tap to set								
hw_id_LD	HW ID (From Staff Listing)								
	CONTINUE TO L&D INVENTORY								
	Section 2								
NUMBER	**QUESTION**	**CODING**				**GO TO**			
f201	F201: Does the facility provide 24 hour coverage for delivery services?	Yes							
		No				no -> f204			
f202	F202: Is a person skilled in conducting deliveries present at the facility or on call 24 hours a day, including weekends, to provide delivery care?	Yes, present, schedule observed							
		Yes, present, schedule reported, not seen							
		Yes, on-call schedule observed							
		Yes, on-call, schedule reported, not seen							
		No				no -> f204			
f203	F203: At night, what level of provider is most commonly on duty to conduct deliveries?								
f204	F204: During normal working hours, what level of provider is most commonly available to conduct complicated deliveries?								
f205	F205: Please tell me the total number of beds in the maternity ward/unit in this facility								
	ASK TO SEE THE ROOM WHERE NORMAL DELIVERIES ARE CONDUCTED								
f206	F206: DESCRIBE THE SETTING OF THE DELIVERY ROOM	private room with visual and auditory privacy							
		non-private room with visual and auditory privacy							
		visual privacy only							
		no privacy							
	NOTE THE AVAILABILITY AND CONDITION OF SUPPLIES AND EQUIPMENT REQUIRED FOR DELIVERY SERVICES. EQUIPMENT MAY BE IN DELIVERY ROOM OR AN ADJACENT ROOM.								
NUMBER	**QUESTION**	**CODING**				**GO TO**			
		AVAILABILITY				**FUNCTIONING (if observed only)**			
f207	EQUIPMENT REQUIRED FOR DELIVERY SERVICES (Available)	**Observed**	**Reported, not seen**	**Not available**	**DK**		**YES**	**NO**	**DK**
f207_1_a	01A) Spotlight for pelvic exam, flashlight/torch or exam light acceptable					observed -> functioning f207_1_b	1	2	8
f207_2	02) Table or bed for delivery								
f207_3	03) Clean or sterile gloves								
f207_5	05) Sharps container								
f207_6	06) At least five or more 2-ml or 3-ml syringes (with 21 gauge needles)								
f207_7	07) Already mixed decontaminating solution								
f207_8	08) Hand disinfectant								
f207_9	09) Waste receptacle with lid and plastic liner								
f207_10	10) Soap for handwashing								
f207_11	11) Single-use hand-drying towel								
f207_12	12) Water for handwashing					no/dk -> f209_1_a			
f208	F208: How is water being made available for use in the delivery service area today?	PIPED	BUCKET	TAP					
	NOTE THE AVAILABILITY AND CONDITION OF OTHER SUPPLIES AND EQUIPMENT								
NUMBER	**QUESTION**	**CODING**							
		AVAILABILITY				**GO TO**	**NG (if observed only)**		
f209	OTHER SUPPLIES AND EQUIPMENT (Available)	**Observed**	**Reported, not seen**	**Not available**	**DK**		**YES**	**NO**	**DK**
f209_1_a	01A) 24-hour functioning light source (lantern acceptable)					observed -> functioning f209_1_b			
f209_2	02) Skin antiseptic (such as Chlorhexidine, Savlon, or Dettol)								
f209_3	03) Intravenous infusion set								
f209_4	04) Syringes and Needles								
f209_5	05) Suture material with needle								
f209_6	06) Sterile scissors or blade								
f209_7	07) Needle Holder								

NUMBER	QUESTION	CODING				GO TO			
f210	MEDICATIONS IN DELIVERY SERVICE AREA	Observed, at least 1 valid	Reported, not seen	Not available	DK				
f210_1	1) Intravenous solutions: either Ringers lactate, D5NS, or NS infusion								
f210_2	2) Injectable ergometrine/methergine								
f210_3	3) Injectable oxytocin/syntocin								
f210_4	4) Misoprostol								
f210_5	5) Injectable diazepam								
f210_6	6) Injectable magnesium sulfate								
f210_7	7) Injectable phenobarbital								
f210_8	8) Injectable phenytoin								
f210_9	9) Injectable Hydralazine or Apresoline								
f210_10	10) Methyldopa/Aldomet								
f210_11	11) Labetalol								
f210_12	12) Nifedipine								
f210_13	13) Injectable amoxicillin or ampicillin								
f210_14	14) Injectable gentamicin								
f210_15	15) Calcium gluconate								
f210_16	16) Lidocaine (lignocaine)								
NUMBER	QUESTION		CODING			GO TO			
f210a	F210A: Does this facility perform newborn resuscitation?	YES							
		NO				no -> f212			
F210b	F210B: Has this facility performed newborn resuscitation in the last 3 months with bag and mask?	YES							
		NO							
		DK							
NUMBER	QUESTION		CODING			GO TO			
		AVAILABILITY				FUNCTIONING (if observed only)			
f211	EQUIPMENT AND SUPPLIES FOR NEWBORN CARE	Observed	Reported, not seen	Not available	DK		YES	NO	DK
f211_a1	1A) Bag and mask (infant size) for resuscitation					observed -> functioning f211_b1			
f211_a2	2A) Tube and mask (infant size) for resuscitation					observed -> functioning f211_b2			
f211_a3	3A) Incubator					observed -> functioning f211_b3			
f211_a4	4A) Other source of heat for premature infant					observed -> functioning f211_b4			
f211_a5	5A) Infant scale					observed -> functioning f211_b5			
f211_a6	6A) Suction bulb for mucus extraction					observed -> functioning f211_b6			
f211_a7	7A) Suction apparatus for use with catheter					observed -> functioning f211_b7			
f211_a8	8) Resuscitation table for baby								
f211_a9	9) Disposable cord ties or clamps								
f211_a10	10) Towel or blanket to wrap baby								
f212	GUIDELINES/PROTOCOLS								
f212_1	1) Guidelines for normal delivery								
f212_2	2) Guidelines for emergency obstetric care								
f212_3	3) Blank partographs								

NUMBER	QUESTION		CODING			GO TO			
f214	F214: Does the facility participate in regular reviews of maternal or newborn deaths or "near-misses"?	Yes, for mothers							
		Yes, for newborns							
		Yes, for both							
		No, does not participate				no -> f216			
f215	F215: How often are reviews of maternal and/or infant deaths and/or near misses carried out?	Once a week or more							
		Once a month							
		Between 1–3 months							
		When case occurs							
		DK							
f216	F216: Does this facility handle assisted deliveries—that is, use forceps or ventouse (vacuum extractor)? IF YES, ASK TO SEE THE EQUIPMENT USED.	YES							
		NO				no -> f219			
	CHECK WHETHER THE EQUIPMENT IS IN THE DELIVERY ROOM OR AN ADJACENT ROOM.								

NUMBER	QUESTION		CODING			GO TO			
		AVAILABILITY				FUNCTIONING (If observed only)			
f217	EQUIPMENT	Observed	Reported, not seen	Not available	DK		YES	NO	DK
f217_a1	1A) Forceps					observed -> functioning f217_b1			
f217_a2	2A) Ventouse (vacuum extractor)					observed -> functioning f217_b2			

NUMBER	QUESTION		CODING			GO TO			
f218	F218: Has an assisted delivery been conducted in this facility within the past 3 months?	YES							
		NO							
		DK							
f219	F219: Is this facility able to extract retained products of conception when necessary? IF YES, ASK TO SEE THE EQUIPMENT USED.	YES							
		NO				no -> f222			
	CHECK WHETHER THE EQUIPMENT IS IN THE DELIVERY ROOM OR AN ADJACENT ROOM.								

NUMBER	QUESTION		CODING			GO TO			
		AVAILABILITY				FUNCTIONING (If observed only)			
f220	EQUIPMENT	Observed	Reported, not seen	Not available	DK		YES	NO	DK
f220_a1	1A) Manual vacuum aspirator					observed -> functioning f220_b1			
f220_a2	2A) Dilatation and curettage (D&C) kit					observed -> functioning f220_b2			
f220_a3	4A) Electric vacuum aspirator					functioning f220_b4			
f221	F221: Has manual vacuum aspiration or D&C been used to remove retained products of conception by this facility during the past 3 months?	YES							
		NO							
		DK							

NUMBER	QUESTION	CODING				GO TO			
f222	Now I am going to ask you about other medical interventions for management of complications during labor or delivery. For each intervention, please tell me if this is ever provided at this facility, and if yes, if it has been conducted in this facility within the past 3 months.	YES	NO	DK					
f222_a1	1A) EVER PROVIDE:					no/dk -> f222_a2			
f222_b1	1B) PROVIDED IN PAST 3 M								
f222_a2	1A) EVER PROVIDE:					no/dk -> f222_a3			
f222_b2	1B) PROVIDED IN PAST 3 M								
f222_a3	1A) EVER PROVIDE:					no/dk -> f222_a4			
f222_b3	1B) PROVIDED IN PAST 3 M								
f222_a4	1A) EVER PROVIDE:					no/dk -> f223			
f222_b4	1B) PROVIDED IN PAST 3 M								
f223	F223: Does this facility perform blood transfusions? (IF YES, Is there a blood bank or are there transfusion services only)	Yes, blood bank							
		Yes, transfusion, no blood bank							
		No blood transfusion				no -> f225			
f224	F224: Has blood transfusion been performed for maternity care by this facility during the past 3 months?	YES							
		NO							
		DK							
f225	F225: Does this facility ever perform caesarean sections?	YES							
		NO				no -> f230			
f225a	F225A: Has a caeserian section been performed in the last 3 months?	YES							
		NO							
		DK							

NUMBER	QUESTION	CODING				GO TO			
		AVAILABILITY				FUNCTIONING (if observed only)			
f222	EQUIPMENT	Observed	Reported, not seen	Not available	DK		YES	NO	DK
f226_a1	1A) Operating Table					observed -> functioning f226_b1			
f226_a2	2A) Operating light					observed -> functioning f226_b2			
f226_a3	3A) Anesthesia giving set					observed -> functioning f226_b3			
f226_a4	4A) Scrub area adjacent to or in the operating room								
f226_a5	5A) Tray, drum, or package with sterilized instruments ready for use								

NUMBER	QUESTION	CODING							
f227	MEDICATIONS IN DELIVERY SERVICE AREA	Observed, at least 1 valid	Reported, not seen	Not available	DK				
f227_a1	1) Halothane								
f227_a2	2) Ketamine								
f228	F228: Does this facility have a health worker who can perform a caesarean section present in the facility or on call 24 hours a day (including weekends)?	Yes, present, schedule observed							
		Yes, present, schedule reported, not seen							
		Yes, on-call schedule observed							
		Yes, on-call, schedule reported, not seen							
		No							
f229	F229: Does this facility have an anesthetist present in the facility or on call 24 hours a day (including weekends)?	Yes, present, schedule observed							
		Yes, present, schedule reported, not seen							
		Yes, on-call schedule observed							
		Yes, on-call, schedule reported, not seen							
		No							
f230	After completing a delivery, what procedures does this service follow for initial handling of contaminated equipment (such as speculums, scalpel handles, etc.) that will be reused another time?	Disinfectant, then soap & water scrub							
	If the unit processes some equipment and sends other equipment elsewhere, indicate the procedure for equipment processed in this service delivery unit	Soap & water scrub, then disinfectant soak							
	If vaginal deliveries are conducted in a different room than caesarean section deliveries, assess the processing equipment for vaginal deliveries.	Soap & water brush scrub only							
		Disinfectant soak, not scrubbed							
		Soap & water, not brush scrubbed							
		Other							
		None							
		DK							

Antenatal Care Observation Checklist

ANC OBSERVATION
Sections 2 and 3

SECTION 2: BEGINNING OF ANC OBSERVATION

NO.	QUESTION	CODING			GO TO
ANC_Obs_ Start_Time	Record the time that ANC consultation started				
		Yes	No	DK	
	A104: DID THE HEALTH WORKER ASK ABOUT OR THE CLIENT MENTION ANY OF THE FOLLOWING FACTS?				
a104_1	01 Clients Age				
a104_2	02 Medications the client is taking				
a104_3	03 Date client's last menstrual period began				
a104_4	04 Has client had prior pregnancies?				no/dk -> a106
a104_5	05 Number of Prior Pregnancies				
	A105: DID THE HEALTH WORKER OR CLIENT DISCUSS ANY OF THE FOLLOWING ASPECTS OF THE CLIENT'S PRIOR PREGNANCIES?				
a105_1	01 Prior stillbirth(s)				
a105_2	02 Heavy bleeding, during or after delivery/hemorrhage				
a105_3	03 Previous C-Sections				
a105_4	04 Previous abortions				
a105_5	05 Previous Multiple Pregnancies				
a105_6	06 Previous prolonged labor				
a105_7	07 Previous pregnancy induced hypertension/high blood pressure				
a105_8	08 Previous convulsions				
a105_9	09 Previous assisted deliveries (forceps, ventouse)				
a105_10	10 Anemia				
a105_11	11 Prior neonatal death(s)				
	A106: DID THE HEALTH WORKER ASK ABOUT OR THE CLIENT MENTION ANY OF THE FOLLOWING FOR CURRENT PREGNANCY?				
a106_1	01) Vaginal Bleeding				
a106_2	02) Fever				
a106_3	03) Headache or blurred vision				
a106_4	04) Swollen face or hands				
a106_5	05) Severe Difficulty Breathing				
a106_6	06) Convulsions or loss of consciousness				
a106_7	07) Foul smelling discharge				
a106_7a	07a) Severe abdominal pain				
a106_7b	07b) Frequent or painful urination				
a106_8	08) Whether the client has felt the baby move				
a106_9	09) Persistent cough for 2 weeks or longer				
a106_10	10) Client's knowledge of her HIV status				
a106_11	11) If there are any other problems the client is concerned about				
	A107: DID THE HEALTH WORKER PERFORM ANY OF THE FOLLOWING PROCEDURES?				
a107_1	01) Take the client's blood pressure				
a107_1A	01a) Take client's blood pressure in sitting or left lateral position				
a107_1B	01b) Take blood pressure with arm at heart level				
a107_2	02) Weigh the client				
a107_2a	02a) Check for signs of anaemia				
a107_3	03) Examine hands for oedema				
a107_4	04) Palpate the client's abdomen for uterine height				
a107_5	05) Listen to the client's abdomen for fetal heartbeat				
a107_06	06) Perform or refer for anaemia test				
a107_07	07) Perform or refer for urine test for proteinuria				
a107_07a	07a) Perform or refer for urine test for bacteriuria				
a107_07b	07b) Perform or refer for urine test for glucose				
a107_08	08) Perform or refer for a syphilis test				
a107_08a	08a) Provide counseling on HIV/PMTCT				
a107_09	09) Perform, inquire about, or refer for an HIV test				
a107_10A	10a) Provide counseling related to HIV test				
a107_10B	10b) Refer for counseling related to HIV test				
a107_11	11) Is client HIV positive?				no/dk -> a107_20
a107_12	12) Explains the purpose of ARV prophylaxis				
a107_13	13) Explains when to collect NVP				
a107_14	14) Explains how to take NVP at the onset of labour				
a107_15	15) Explains how to take AZT at 28 weeks				
a107_16	16) Explains the advantages and side effects of ART				
a107_17	17) Explains feeding options for exposed babies				
a107_18	18) Explains about importance of bringing exposed infant back for testing				
a107_19	19) Refers to CTC				
a107_20	20) Look at the client's health card/booklet (either before beginning the consultation or while collecting information or examining the client)				

	Go to Section 3 (ANC obs. continued)				
SECTION 3: ANC OBSERVATION CONTINUED					
NO.	**QUESTION**	**CODING**			**GO TO**
		Yes	**No**	**DK**	
	A108: DID THE HEALTH WORKER GIVE THE CLIENT ANY OF THE FOLLOWING TREATMENTS ?				
a108_1a	01a) Prescribed iron or folic acid (IFA) or both				
a108_1b	01) Gave supply of iron or folic acid (IFA) or both				a108_1a = 1 AND a108_1b =1 --> a108_5
a108_2	02) Explained the purpose of iron or folic acid				
a108_3	03) Explained how to take iron or folic-acid pills/syrup				
a108_4	04) Explained side effects of iron or folic acid				
a108_5	05) Prescribed or gave a tetanus toxoid (TT) injection				no/dk -> a108_9
a108_6	06) Explained the purpose of the TT injection				
a108_9	09) Prescribed or gave anti-malarial prophylaxis				no/dk -> a108_15
a108_10	10) Explained the purpose of the preventive treatment with anti-malaria medications				
a108_11	11) Explained how to take the anti-malarial medications				
a108_12	12) Explained possible side effects of malaria pills				
a108_15	15) Importance of using ITN explained explicitly				
a108_16	16) Given voucher for ITN/given free ITN/ITN already purchased by client				
a108_17	17) Prescribed or gave deworming pills (albendazole or other)				no/dk -> a109
a108_18	18) Explained the purpose of deworming pills				
a108_19	19) Explained how to take the deworming pills				
a108_20	20) Explained possible side effects of deworming pills				
	A109: DID THE HEALTH WORKER COUNSEL THE CLIENT ABOUT ANY OF THE FOLLOWING PREGNACY RELATED ISSUES?				
a109_1	01) Inform the client about the progress of the pregnancy				
a109_2	02) Return to facility if she has vaginal bleeding				
a109_3	03) Return if she has swollen hands or face				
a109_4	04) Return if she has severe headache or blurred vision				
a109_5	05) Return if she has difficult or fast breathing				
a109_6	06) Return if severe abdominal pain				
a109_7	07) Return if convulsions				
a109_8	08) Discuss nutrition and healthy eating during pregnancy				
	A110: DID THE HEALTH WORKER COUNSEL THE CLIENT IN ANY OF THE FOLLOWING WAYS ABOUT BIRTH PREPARATION?				
a110_1	01) Asked the client where she will deliver				
a110_2	02) Advised the client to prepare for delivery (e.g., set aside money, arrange for emergency transportation)				
a110_3	03) Advised the client to use a skilled health worker during delivery				
a110_4	04) Discussed with client what items to have on hand at home for emergencies (e.g., sterile blade)				
a118	A118: DID THE HEALTH WORKER COUNSEL ON WHEN TO RETURN FOR NEXT VISIT?				
a119	A119: DID THE HEALTH WORKER DISCUSS BREASTFEEDING?				
a120	A120: DID THE HEALTH WORKER DISCUSS FAMILY PLANNING FOR USE AFTER DELIVERY?				
a121	A121: DID THE HEALTH WORKER ASK WHETHER THE CLIENT HAD ANY QUESTIONS?				
a122	A122: DID THE HEALTH WORKER USE ANY VISUAL AIDS FOR HEALTH EDUCATION OR COUNSELLING DURING THE CONSULTATION?				
a123	A123: DID THE HEALTH WORKER WRITE ON THE CLIENT'S HEALTH CARD?	Yes			
		No			
		Not used			
		Don't Know			
	At the end of the consultation, ask the health worker the following questions:				
a124	A124: ASK THE HEALTH WORKER HOW MANY WEEKS PREGNANT THE CLIENT IS. (98 for DON'T KNOW)				

Antenatal Care Observation Checklist

a125	A125: ASK THE HEALTH WORKER WHETHER THIS IS THE CLIENT'S 1ST, 2ND, 3RD, 4TH OR 5TH VISIT FOR ANTENATAL CARE AT THIS FACILITY FOR THIS PREGNANCY.	first visit ..... second visit ..... third visit ..... fourth visit ..... fifth or more visit.....
a125a	A125a: ASK THE HEALTH WORKER WHETHER THIS IS A REFERRAL VISIT OR A ROUTINE ANC VISIT	Referral visit ..... Routine visit .....
a126	A126: ASK THE HEALTH WORKER WHETHER THIS IS THE CLIENT'S FIRST PREGNANCY.	Yes, first pregnancy..... No.....
a127	A127: RECORD THE OUTCOME OF THE CONSULTATION [WHAT HAPPENED AT THE TIME THE OBSERVATION CONCLUDED]	Client goes home..... Client referred (same facility)..... Client admitted (same facility)..... Client referred to other facility..... Don't Know.....
ANC_Obs_En	Record the time ANC consultation ended	
Comments	Comments	

END OF ANC OBSERVATION

Tap Finish Button to Save Observation.
Remember to reload this observation and change any actions not observed from 'Blank' to 'No'

OBSERVATION OF LABOR AND DELIVERY AND NEWBORN CARE

Data collector can skip out of this part of L&D Obs form anytime that PE/E develops, then should skip back & complete sections observed.

SECTIONS 1, 2, 3, 7, 8: ESSENTIAL OBSTETRIC AND NEWBORN CARE

NO.	QUESTION/TASK	CODING			GO TO
100	RECORD THE TIME THE OBSERVATION STARTED (Use 24 hour clock)	[ ][ ] : [ ][ ]			
SECTION 1: OBSERVATION OF INITIAL CLIENT ASSESSMENT					
102	WAS THIS SECTION OBSERVED	YES ..... NO ..... IF NO: skip to first stage of labor section			→ 200
	RECORD WHETHER THE PROVIDER CARRIED OUT THE FOLLOWING STEPS AND/OR EXAMINATIONS: (SOME OF THE FOLLOWING STEPS MAY BE PERFORMED SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)	YES	NO	Don't Know (DK)	
103	Respectfully greets the pregnant woman				
104	Encourages the woman to have a support person present throughout labor and birth				
105	Asks woman (and support person, if present) if she has any questions				
106	Checks client card OR asks client her age, length of pregnancy, & parity				
107	Asks whether she has experienced any of the following danger signs				
01	Fever				
02	Foul smelling discharge				
03	Headaches or blurred vision				
04	Swollen face or hands				
05	Convulsions or loss of consciousness				
06	Shortness of breath				
07	Vaginal bleeding				
108A	Checks woman's HIV status (checks chart or asks woman)?	YES ..... NO ..... DK			→ 109A
108B	Is woman HIV positive?	YES ..... NO ..... DK			→ 109A → 108C
108B.1	Asks if client is currently taking ARVs	YES ..... NO			→ 108D.1
108B.2	Asks client when she took last dose of ARVs	YES ..... NO			→ 108D.1 → 108D.1
108C	Offers woman HIV test	YES ..... NO			→ 109A
108D	Is woman HIV positive?	YES ..... NO ..... DK			→ 109A → 109A
108D.1	Explains why the mother should take an ARV(s)				
108D.2	Explains when and how the mother should take ARV(s)				
108D.3	Administers ARV(s) to mother				
108E	Explains why the newborn should take an ARV(s)				
108F	Explains when and how newborn should take ARV(s)				
109A	Client has any previous pregnancies	YES ..... NO ..... DK			→ 110 → 110
109	Asks about complications during previous pregnancies				
01	High blood pressure				
02	Convulsions				
03	Heavy bleeding during or after delivery/hemorrhage				
04	Previous C sections				
05	Prior stillbirths				
06	Prolonged labor				
07	Prior neonatal death				
08	Abortion				
09	Prior assisted delivery				
110	Washes his/her hands with soap and water or uses antiseptic before any initial examination				

NO.	QUESTION/TASK	CODING			GO TO
111	Explains procedures to woman (support person) before proceeding				
112	Takes temperature				
113	Takes pulse				
114	Takes blood pressure				
115	Asks/notes amount of urine output				
116	Tests urine for presence of protein				
117	Performs general examination (e.g., for anemia, oedema)				
118	Performs abdominal examination:				
01	Checks fundal height with measuring tape				
02	Checks fetal presentation by palpation of abdomen				
03	Checks fetal heart rates with fetoscope/Doppler/ultrasound				
119	Performs vaginal examination				
119A	Wears high-level disinfected or sterile gloves for vaginal examination				
120	Informs the pregnant woman of findings				
SECTION 2: INTERMITTENT OBSERVATION OF 1st STAGE OF LABOUR (UPDATE AT EACH OBSERVATION, EVERY 15–30 MIN DURING ACTIVE LABOR)					
200	WAS THIS SECTION OBSERVED	YES ..... NO ..... IF NO: skip to 2nd & 3rd stage of labor			→ 300
	RECORD WHETHER THE PROVIDER CARRIED OUT THE FOLLOWING STEPS AND/OR EXAMINATIONS: (SOME OF THE FOLLOWING STEPS MAY BE PERFORMED SIMULTANEOUSLY OR BY MORE THAN ONE HEALTH WORKER)	YES	NO	DK	
200a	Augments labor with oxytocin				
200a1	If yes, route of administration	IV	IM		
200b	Performs artificial rupture of the membranes				
200c	Partograph used to monitor labor?	YES ..... NO ..... DK			→ 205 → 205
201	Action line on partograph reached?	YES ..... NO			→ 205
202	OBSERVER: If "action" line reached on partograph, record time (use 24 hour clock)	. .			
202a	If action line reached on partograph, was any definitive action taken?	YES ..... NO ..... DK			→ 205 → 205
203	OBSERVER: Record time that DEFINITIVE action taken (use 24 hour clock)	. .			
204	What DEFINITIVE action was taken?				
	Consult with specialist	CONSULT			
	Referred to facility for specialist care	REFER			
	Prepare assisted delivery	ASSISTED DELIVERY			
	Prepare for C-section	C-SECTION			
204_0th	Other action (specify) _____	OTHER			
205	At least once, explains what will happen in labor to the woman and her support person				
206	At least once, encourages woman to consume fluids/food throughout labor				
207	At least once, encourages/assists the woman to ambulate and assume different positions during labor				
208	Supports the mother during labour in a friendly way				
208a	A support person is present at some point during labor				
209	Drapes woman (one drape under buttocks, one over abdomen)				
209a	Administers antibiotics?	YES ..... NO			→ 210
209b	Why were antibiotics administered?				
	treatment for chorioamionitis	CHORIOAMNIONITIS			
	management of premature rupture of membranes	PROM			
	preparation for C-section	C-SECTION			
	routine/prophylactic	ROUTINE			
	Don't know	DON'T KNOW			
209c	Which antibiotic was administered? CHECK ALL THAT APPLY	penicillin ampicillin gentamicin metronidazole cephalosporin other Don't know			

NO.	QUESTION/TASK	CODING			GO TO
210	Washes his/her hands with soap and water or uses antiseptic before examination of the woman.				
211	Wears high-level disinfected or sterile gloves.				

NO.	QUESTION/TASK	CODING			GO TO
212	Puts on clean protective clothing in preparation for birth that protects face, hands and body from contact with body fluids (gloves, gown or apron, goggles)				
	CHECK TO SEE IF THE FOLLOWING EQUIPMENT AND SUPPLIES ARE LAID OUT IN PREPARATION FOR THIRD STAGE OF LABOR.				
213	Prepares uterotonic drug to use for AMTSL				
01	Oxytocin				
02	Ergometrine				
03	Syntometrine				
04	Prostaglandins				
	CHECK TO SEE IF FOLLOWING EQUIPMENT AND SUPPLIES ARE LAID OUT & READY FOR USE FOR IMMEDIATE NEWBORN CARE AND NEONATAL RESUSCITATION:	YES	NO	DK	
214	Timer (clock or watch with seconds hand)				
215	Self-inflating ventilation bag (250 or 500 mL)				
216a	Newborn face mask size 0				
216b	Newborn face mask size 1				
218a	Suction bulb				
218b	Catheter				
219	Suction machine				
221	At least two cloths/blankets (1 to dry baby; 1 to cover baby)				
222	Cap/hat for the newborn				
223	Disposable cord ties or clamp				
224	Sterile scissors or blade				
214b	HAS THE WOMAN COMPLETED THE FIRST STAGE OF LABOR ?	YES NO			→ 300
	IF NO: Click MENU - Save Progress so Far and then ask the questions in this section again 15–30 minutes later				
SECTION 3: CONTINUOUS OBSERVATION OF SECOND & THIRD STAGE OF LABOUR					
300	WAS THIS SECTION OBSERVED	YES ..... NO ..... IF NO: skip to immediate newborn and postpartum care			→ 700A
300A	Was an episiotomy done?	1	2		
300B	Presentation of the baby	Cephalic	Non-cephalic		
	RECORD WHETHER THE PROVIDER CARRIED OUT THE FOLLOWING STEPS AND/OR EXAMINATIONS: (SOME OF THE FOLLOWING STEPS MAY BE PERFORMED SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)	YES	NO	DK	
301	As baby's head is delivered, supports perineum				
302	OBSERVER: Note time of the delivery of the baby (use 24-hour clock)				
302B	Second baby present?	Yes (twin)	No (singleton)		
302C	Administers uterotonic?	YES ..... NO			→ 305
302A	Checks for another baby prior to giving the uterotonic				
303	OBSERVER: Note time uterotonic given (use 24-hour clock)				
306	Timing of administration of uterotonic				
	a) at delivery of the anterior shoulder	ANTERIOR SHOULDER			
	b) within 1 minute of delivery of baby	WITHIN 1 MINUTE OF BABY			
	c) within 3 minutes of delivery of baby	WITHIN 3 MINUTES OF BABY			
	d) more than 3 minutes of delivery of baby AND before delivery of the placenta	3+ MIN AND BEFORE PLACENTA			
	e) more than 3 minutes o delivery of baby AND after delivery of placenta	3+ MIN AND AFTER PLACENTA			
307	Which uterotonic given?	Oxytocin Ergometrine Syntometrine Prostaglandins			

NO.	QUESTION/TASK	CODING			GO TO
308	Dose of uterotonic given and type of units of medication (e.g., IU, mg) (IF NECESSARY, ASK AFTERWARDS)	D) DOSE ☐☐ U) UNITS IU ..... mg ..... ML ..... mcg			
309	Route uterotonic given	IM ..... IV push (bolus) ..... IV drip ..... IV drip plus IM ..... ORAL ..... VAGINAL ..... SUBLINGUAL ..... RECTAL			
305	OBSERVER: Note time the cord was clamped (use 24-hour clock)	☐☐ . ☐☐			
		YES	NO	DK	
310	Applies traction to cord while applying suprapubic counter traction				
311	Performs uterine massage immediately following delivery of the placenta				
312	Assesses completeness of the placenta and membranes				
313	Assesses for perineal and vaginal lacerations				
314	Did more than one health worker assist with the birth?	Yes ..... No			
315	What was the position of the mother at birth?	On back (lithotomy) ..... Other			
SECTION 7: OBSERVATION OF IMMEDIATE NEWBORN, POSTNATAL AND POSTPARTUM CARE					
700A	WAS THIS SECTION OBSERVED	YES ..... NO ..... IF NO: skip to cleanup & documentation review			→ 801
	RECORD WHETHER THE PROVIDER CARRIED OUT THE FOLLOWING STEPS: (SOME OF THE FOLLOWING STEPS MAY BE PERFORMED SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)	YES	NO	DK	
700B	A support person (companion) for mother is present during the birth.				
701	Immediately dries baby with towel/cloth				
702A	Discards wet towel				
702B	Is the baby breathing/crying?				no → 608A
	IF NO, SKIP TO RESUSCITATION CHECKLIST				
704a	Places newborn on the mother's abdomen "skin to skin"				
704b	Covers baby with dry towel.				
704c	If not placed skin to skin, wraps baby in dry towel				
703	Ties or clamps cord when pulsations stop or by 2–3 minutes after birth (not immediately after birth)				
704	Cuts cord, using clean blade or clean scissors				
705a	Breastfeeding initiated within the first hour after birth				
706	Provides tetracycline eye ointment prophylaxis				
706a	Mother and newborn put in same room after delivery (rooming-in)				
706b	Baby bathed within the first hour after birth				
706c	Checks baby's temperature 15 minutes after birth				
706d	Checks baby's skin color 15 minutes after birth				
706e	Baby kept skin to skin with mother for first hour after birth.				
707A	Is the mother HIV positive				No, ~~DK~~ → 707B
707	Administers ARV(s) to newborn				
707b	Provider administers antibiotics to the mother postpartum?	YES ..... NO			→ 708
707c	Why were antibiotics administered? treatment for chorioamionitis procedure routine/prophylactic other don't know	 CHORIOAMNIONITIS PROCEDURE ROUTINE OTHER DON'T KNOW			

NO.	QUESTION/TASK	CODING			GO TO
707d	Which antibiotic was administered? (check all that apply)				
01	penicillin	PENICILLIN			
02	ampicillin	AMPICILLIN			
03	gentamicin	GENTAMICIN			
04	metronidazole	METRONIDAZOLE			
05	cephalosporin	CEPHALOSPORIN			
06	other	Other			
08	don't know	DON'T KNOW			
708	Takes mother's vital signs 15 minutes after birth				
709	Palpates uterus 15 minutes after delivery of placenta				
	CONTINUE TO CLEAN UP AND DOCUMENTATION REVIEW				
SECTION 8: CLEAN UP (INFECTION PREVENTION) AND REVIEW OF DOCUMENTATION					
	Cleanup after birth (infection prevention)				
	RECORD WHETHER THE PROVIDER CARRIED OUT THE FOLLOWING STEPS: (SOME OF THE FOLLOWING STEPS MAY BE PERFORMED SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)	YES	NO	DK	
801	Disposes of all sharps in puncture-proof container immediately after use				
802	Decontaminates all reusable instruments in 0.5% chlorine solution				
802A	Sterilizes or uses high-level disinfection for all reusable instruments.				
803	Disposes of all contaminated waste in leakproof containers				
804	Removes apron and wipe with chlorine solution				
805	Washes hands thoroughly with soap and water or uses antiseptic				
805_NB	WAS THERE A NEWBORN RESUSCITATION?	Yes			
		No			→ 806
	CLEAN UP from NEWBORN RESUSCITATION if resuscitation performed				
805a	Disposes of disposable suction catheters and mucus extractors in a leak proof container or plastic bag.				
805b	Takes the bag and mask apart and inspects for cracks and tears.				
805c	Decontaminates the bag and mask in 0.5% chlorine solution.				
805f	Sterilizes or uses high-level disinfection for bag, valve, and mask.				
805p	Decontaminates reusable suction devices in 0.5% chlorine solution.				
805q	Sterilizes or uses high-level disinfection for reusable suction devices				
805g	Washes hands with soap and water or uses antiseptic				
	REVIEW OF DOCUMENTATION OF RESUSCITATION PROCEDURES (if resuscitation performed)				
	EXAMINE CHART TO DETERMINE IF HEALTH WORKER RECORDED THE FOLLOWING INFORMATION:				
805l	Condition of the newborn at birth				
805J	Procedures necessary to initiate breathing				
805K	Time from birth to spontaneous breathing or time of death if unsuccessful				
805L	Any clinical observations during resuscitation, including baby vital signs				
805M	Final outcome of resuscitation measures				
806	Completes maternity register/birth log				
	REVIEW OF DOCUMENTATION ON THE PARTOGRAPH (IF PARTOGRAPH USED)				
807	Used Partograph	YES			
		NO			→ 807B
807A	Partograph not used because woman arrived in second stage of labor	YES			→ 818
		NO			→ 818
		DK			→ 818
807B	OBSERVER: did you see provider fill out partograph after delivery (with information that should be entered during labor)	YES ..... NO ..... DK			
808	Which partograph used?				
	Used WHO partograph (with latent phase)	OLD WHO PARTOGRAPH			
	Used new WHO partograph (at 4 cm dilatation)	NEW WHO PARTOGRAPH			
	Used other partograph	OTHER PARTOGRAPH			
	IF APPLICABLE: TAKE PICTURE OF PARTOGRAPH (click to attach image)				
809	Initiated use of partograph at the appropriate time (according to partograph used. New WHO partograph starts at 4 cm; old version starts at 3 cm).				
810	Completes partograph with:				
01	Birth time				
02	Delivery method				
03	Estimated blood loss				
811	Partograph plotted at least every half hour during labor with:				
01	Frequency & duration of contractions				
02	Fetal heart tones				
03	Maternal pulse				
812	BP recorded on partograph at least every four hours during labor				

NO.	QUESTION/TASK	CODING	GO TO
	REVIEW OF DOCUMENTATION ON THE PARTOGRAPH AND/OR PATIENT CHART		
q818	Q818: Time of admission to labor ward (use 24-hour clock)	[ ][ ] . [ ][ ]	
q819	Q819: Centimeters dilated upon admission to labor ward	_____ centimeters	
q820	Q820: Time membranes ruptured (use 24-hour clock)	[ ][ ] . [ ][ ]	
q821	Q821: How did the membranes rupture?	Spontaneous Artificial Don't Know	
q822	Q822: Time of birth (use 24-hour clock)	[ ][ ] . [ ][ ]	
q823	Q823: Time of discharge from facility, if available (use 24-hour clock)	[ ][ ] . [ ][ ]	
q824	Q824: Birthweight (in grams); enter 9999 if not available	_____ grams	
q825	Q825: Was woman referred from another facility?	Yes No Don't know	
812A	Was any recorded diastolic BP measure greater than 110?	Yes ..... No ..... → 832 Don't know → 832	
830	Was severe PE/E diagnosed?	[ ] [ ] [ ]	No,DK –>812B
830_t	Time PE/E diagnosed (Use 24 hour clock)	[ ][ ] . [ ][ ]	
812C	Was baby delivered within 24 hours of time of diagnosis of SEVERE PE/E?	[ ] [ ] [ ]	
812B	Was $MgSO_4$ started?	[ ] [ ] [ ]	No, DK–>832
831	Time $MgSO_4$ started (Use 24-hour clock)	[ ][ ] . [ ][ ] DK 8	
832	Did the mother develop a fever of 38°C or higher during labor?		
833	Was chorioamnionitis diagnosed during labor?		
834	Were antibiotics administered to the mother during labor?	YES ..... NO ..... → 813A DK ..... → 813A	
835	When were antibiotics administered (check all that apply)?	1ST STAGE ..... 2ND STAGE ..... 3RD STAGE .... POSTPARTUM	
836	Why were antibiotics administered?		
	treatment for chorioamionitis	CHORIOAMNIONITIS	
	after prelabor rupture of membranes	PROM	
	preparation for C-section	C-SECTION	
	3rd stage/postpartum procedure	OTHER PROCEDURE	
	routine/prophylactic	ROUTINE	
	don't know	DON'T KNOW	
837	Which antibiotic was administered? (check all that apply)		
	penicillin	PENICILLIN	
	ampicillin	AMPICILLIN	
	gentamicin	GENTAMICIN	
	metronidazole	METRONIDAZOLE	
	cephalosporin	CEPHALOSPORIN	
	other	OTHER	
	don't know	DON'T KNOW	
813A	RECORD THE OUTCOME FOR THE MOTHER:		
	Goes to recuperation ward	RECUPERATION WARD	
	Referred to specialist, same facility	SPECIALIST, SAME FACILITY	
	Goes to surgery, same facility	SURGERY, SAME FACILITY	
	Referred, other facility	REFERRED, OTHER FACILITY	
	Death of mothers	DEATH	
	Don't know	DON'T KNOW	

NO.	QUESTION/TASK	CODING	GO TO
813B	RECORD THE OUTCOME FOR THE NEWBORN or FETUS		
	Goes to normal nursery	NORMAL NURSERY	
	Referred to specialist, same facility	SPECIALIST SAME FACILITY	
	Referred, other facility	OUTSIDE FACILITY	
	Goes to ward with mother	WARD WITH MOTHER	
	Newborn death	NEWBORN DEATH	
	Fresh stillbirth	FRESH STILLBIRTH	
	Macerated stillbirth	MACERATED STILLBIRTH	
	Don't know	DON'T KNOW	
813C	RECORD THE GRAVIDITY OF THE WOMAN	GRAVIDITY:	
813D	RECORD THE PARITY OF THE WOMAN PRIOR TO THIS DELIVERY	PARITY:	
813D1	RECORD AGE OF WOMAN	AGE:	
813D2	RECORD GESTATIONAL AGE AT BIRTH (IN WEEKS)	GESTATIONAL AGE:	
813E	RECORD HIV STATUS OF MOTHER	HIV POSITIVE	
		HIV NEGATIVE	→ 813G
		UNKNOWN	→ 813G
813F	RECORD TYPE OF ARV(S) GIVEN TO NEWBORN	NVP	
		AZT	
		3TC	
		NONE	
813G	RECORD THE TYPE OF DELIVERY	SPONTANEOUS VAGINAL	
		ASSISTED (INSTRUMENTED)	
		CESAREAN	
		DON'T KNOW	
814	DID YOU SEE ANY OF THE FOLLOWING PRACTICES BY HEALTH WORKERS THAT ARE NEVER INDICATED? (CHECK ALL THAT APPLY)		
	USE OF ENEMA	ENEMA	
	PUBIC SHAVING	PUBIC SHAVING	
	APPLY FUNDAL PRESSURE TO HASTEN DELIVERY OF BABY OR PLACENTA	FUNDAL PRESSURE	
	LAVAGE OF THE UTERUS AFTER DELIVERY	LAVAGE UTERUS	
	SLAP NEWBORN	SLAP NEWBORN	
	HOLD NEWBORN UPSIDE DOWN	HOLD NEWBORN DOWN	
	MILKING THE NEWBORN'S CHEST	MILK NEWBORN	
	EXCESSIVE STRETCHING OF THE PERINEUM	STRETCHING OF PERINEUM	
	SHOUT, INSULT OR THREATEN THE WOMAN DURING LABOR OR AFTER	SHOUT, INSULT OR THREATEN	
	SLAP, HIT OR PINCH THE WOMAN DURING LABOR OR AFTER DELIVERY OR OTHER PHYSICALLY ABUSIVE BEHAVIOR	SLAP, HIT OR PINCH	
	NONE OF THE ABOVE	NONE OF ABOVE	
815	DID YOU SEE ANY OF THE FOLLOWING PRACTICES WHICH SHOULD HAVE ONLY BEEN DONE IF THERE WAS AN APPROPRIATE INDICATION? (CHECK ALL THAT APPLY)		
	MANUAL EXPLORATION OF THE UTERUS AFTER DELIVERY	MANUAL EXPLORATION	
	USE OF EPISIOTOMY	EPISIOTOMY	
	ASPIRATION OF NEWBORN MOUTH AND NOSE AS SOON AS HEAD IS BORN	ASPIRATE NEWBORN	
	RESTRICT FOOD & FLUIDS IN LABOR	RESTRICT FOOD&FLUIDS	
	NONE OF THE ABOVE	NONE OF ABOVE	
	RECORD TIME L&D OBSERVATION ENDED (use 24-hour clock)	[ ][ ] : [ ][ ]	
816	**OBSERVER WRITTEN NOTES. In particular, comment about the following:** Was mother treated respectfully? Informed of procedures to herself and her baby? Was the situation chaotic or calm and ordered? Were there any major delays in needed treatment? If so, for what procedures (mother or baby) and why? Were multiple health workers involved? Who? If baby died, was mother counseled?		

SECTION 4: CHECKLIST FOR MANAGEMENT OF POSTPARTUM HEMORRHAGE			
NO.	**QUESTION**	**RESPONSE CODES**	**SKIP TO**
Q900	Date complication detected	Date:	
Q901	State time of complication (time on 24-hour clock)	Time: |___|___|:|___|___|	
	RECORD WHETHER THE HEALTH WORKER CARRIED OUT THE FOLLOWING STEPS AND/OR EXAMINATIONS: *(SOME OF THE FOLLOWING STEPS MAY HAVE BEEN PERFORMED BEFORE, OTHERS MAY BE DONE SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)*		
	DIAGNOSIS		
Q902	CHECK ALL THAT APPLY Atonic uterus Laceration Incomplete expulsion of placenta Placenta accrete/percreta/increta Coagulopathy	 Atonic uterus..... Laceration..... Incom. expulsion of placenta... Placenta attached..... Coagulopathy.....	
	IMMEDIATE CARE (time on 24 hour clock)		
Q903 Q903a	Controlled cord traction done? If yes, record time traction was done.	Yes..... No..... Time: |___|___|:|___|___|	
QXXX QXXX	Was bleeding monitored If yes, how much bleeding	Yes..... No..... _____mL	
Q904 Q904a	Uterine massage performed? If yes, record time massage was performed.	Yes..... No..... Time: |___|___|:|___|___|	
Q905 Q905a	Was oxytocin given? If yes, record time oxytocin was given.	Yes..... No..... Time: |___|___|:|___|___|	
Q906 Q906a	Was another uterotonic(s) given? Does this need to allow for multiple responses? Or an "other"/DK response? If ergo or miso was administered, record time.	Ergo..... Miso..... None..... Time: |___|___|:|___|___|	
Q907 Q907a	Was there an abdominal exam done for uterine consistency and massage? If yes, record time exam was done.	Yes..... No..... Time: |___|___|:|___|___|	
Q908 Q908a	Did the health workers examine the vagina and perineum for lacerations? If yes, record time.	Yes..... No..... Time: |___|___|:|___|___|	
Q909 Q909a	Did the health worker examine the placenta for completeness? If yes, record time.	Yes..... No..... Time: |___|___|:|___|___|	

Q910	Were IV fluids started?	Yes..... No.....	
Q910a	If yes, record time.	Time: |___|___|:|___|___|	
	FOLLOW UP CARE		
Q911	Was a uterine exploration performed?	Yes..... No.....	
Q911a	If yes, time performed.	Time: |___|___|:|___|___|	
Q912	Was a uterine mechanical evacuation performed?	Yes..... No.....	
Q912a	If yes, time performed.	Time: |___|___|:|___|___|	
Q913	Was a manual removal of the placenta performed?	Yes..... No.....	
Q913a	If yes, time performed.	Time: |___|___|:|___|___|	
Q914	Was a bimanual compression of the uterus performed?	Yes..... No.....	
Q914a	If yes, time administered.	Time:|___|___|:|___|___|	
Q915	Was aortic compression performed?	Yes..... No.....	
Q915a	If yes, time performed.	Time:|___|___|:|___|___|	
Q916	Were clotting studies performed?	Yes..... No.....	
Q916a	If yes, time performed.	Time:|___|___|:|___|___|	
Q917	Was hemoglobin/hemocrit checked?	Yes..... No.....	
Q917a	If yes, time checked.	Time:|___|___|:|___|___|	
Q918	Was the woman typed and crossmatched for blood?	Yes..... No.....	
Q918a	If yes, time procedure performed.	Time:|___|___|:|___|___|	
Q919	Were blood products given?	Yes..... No.....	
Q919a	If yes, how many units?	# of units: _____	
Q919b	If yes, time given.	Time:|___|___|:|___|___|	
Q920	Were antibiotics given?	Yes..... No.....	
Q920a	If yes, time given.	Time:|___|___|:|___|___|	
Q921	Was balloon tampanade used?	Yes..... No.....	
Q921a	If yes, time used.	Time:|___|___|:|___|___|	

CHECKLIST FOR MANAGEMENT OF POSTPARTUM HEMORRHAGE

Q922 Q922a	Was cardiac resuscitation required? If yes, time resuscitation was performed.	Yes..... No..... Time:|___|___|:|___|___|	
Q923 Q923a	Was a hysterectomy performed? If yes, time procedure was performed.	Yes..... No..... Time:|___|___|:|___|___|	
Q924 Q924a	Were uterine sutures/B-lynch used? If yes, time sutures were used.	Yes..... No..... Time:|___|___|:|___|___|	
QXXX QXXX	Was additional dose of oxytocin given? If yes, record time oxytocin was given.	Yes..... No..... Time: |___|___|:|___|___|	
Q906 Q906a	Was additional dose of another uterotonic(s) given? Does this need to allow for multiple responses? Or an "other"/DK response? If ergo or miso was administered, record time.	Ergo..... Miso..... None..... Time: |___|___|:|___|___|	
Q902	CHECK ALL THAT APPLY Atonic uterus Laceration Incomplete expulsion of placenta Placenta accrete/percreta/increta Coagulopathy Other	 Atonic uterus..... Laceration..... Incom. expulsion of placenta... Placenta attached..... Coagulopathy..... Other (Specify_____)	
QXXX	At what stage of labor and delivery did the complication occur? During labor At delivery Postpartum After discharge from facility	 During labor..... At delivery..... Postpartum..... After discharge.....	
QXXX	End time of observation	Time: |___|___|:|___|___|	
QXXX	Condition of woman at end of observation		

CHECKLIST FOR MANAGEMENT OF POSTPARTUM HEMORRHAGE

QXXX	**DESCRIPTION OF CASE**		
QXXX	*COMMENTS:* *IN PARTICULAR, COMMENT ABOUT THE FOLLOWING:* *- WAS THE WOMAN LEFT ALONE AT ANY POINT EVEN IF THERE WAS A DANGER OF CONVULSIONS?* *- WAS SHE TREATED RESPECTFULLY? INFORMED OF PROCEDURES?* *- WAS THE SITUATION CHAOTIC OR CALM AND ORDERED?* *- WERE THERE ANY MAJOR DELAYS IN NEEDED TREATMENT? IF SO, FOR WHAT DRUGS/PROCEDURES AND WHY?* *- WERE MULTIPLE HEALTH WORKERS INVOLVED? WHO?*		
	OUTCOMES		
Q925	Outcome for mother	Normal PP..... ICU..... Transfer..... Dead.....	
Q926	Outcome for newborn	With mother..... NICU..... Transfer..... Dead.....	
	DESCRIPTION OF CASE (write in responses)		
Q927	Was the client treated respectfully? Informed of procedure?		
Q928	Was the client left alone at any point?		
Q929	Was the situation chaotic or calm? Were there any major delays in needed treatment?		
Q930	Was the lack of drugs or supplies an issue? If yes, what was missing?		
Q931	Were multiple health workers involved? Who?		

SECTION 5: CHECKLIST FOR SEVERE PRE-ECLAMPSIA AND ECLAMPSIA			
NO.	**QUESTION**	**RESPONSE CODES**	**SKIP TO**
Q550	Date complication detected	Date:	
Q551	State time of complication (time on 24-hour clock)	Time: |___|___|:|___|___|	
	RECORD WHETHER THE HEALTH WORKER CARRIED OUT THE FOLLOWING STEPS AND/OR EXAMINATIONS: *(SOME OF THE FOLLOWING STEPS MAY HAVE BEEN PERFORMED BEFORE, OTHERS MAY BE DONE SIMULTANEOUSLY OR BY MORE THAN ONE PROVIDER)*		
	DIAGNOSIS		
	IMMEDIATE CARE (time on 24-hour clock)		
Q553	Blood pressure taken?	Yes..... No.....	
Q553a	If yes, record blood pressure.	If yes, BP: _____	
Q553b	If yes, record time blood pressure was taken.	Time: |___|___|:|___|___|	
Q554	Urine checked for protein?	Yes..... No.....	
Q554a	If yes, record result.	If yes, result: _____	
Q554b	If yes, record time urine was checked.	Time: |___|___|:|___|___|	
Q555	$MgSO_4$ given?	Yes..... No.....	
Q555a	If yes, record dose.	If yes, dose: _____	
Q555b	If yes, record route of transmission.	Route: _____	
Q555c	If yes, record time $MgSO_4$ was given.	Time: |___|___|:|___|___|	
Q556	Diazepam given?	Yes..... No.....	
Q556a	If yes, record dose.	If yes, dose: _____	
Q556b	If yes, record route of transmission.	Route: _____	
Q556c	If yes, record time urine was checked.	Time: |___|___|:|___|___|	
Q557	Antihypertensive given?	Yes..... No.....	If no, skip to Q558
Q557a	If yes, record time antihypertensive was given.	Time: |___|___|:|___|___|	
Q557b	Which antihypertensive was given? Hydralzaine/Apresoline Nifedipine Methyldopa/Aldomet Other	 Hydralzaine/Apresoline..... Nifedipine..... Methyldopa/Aldomet..... Other.....	

CHECKLIST FOR SEVERE PRE-ECLAMPSIA AND ECLAMPSIA

	FOLLOW UP CARE		
Q558	Urinary catheter placed?	Yes..... No.....	
Q558a	If yes, time placed.	Time: |___|___|:|___|___|	
Q559	Labor induced or augmented (include AROM)?	Yes..... No.....	
Q559a	If yes, time induced.	Time: |___|___|:|___|___|	
Q560	Calcium gluconate given?	Yes..... No.....	
Q560a	If yes, time given.	Time: |___|___|:|___|___|	
Q561	Further dose of initial medicine given?	Yes..... No.....	
Q561a	If yes, dose given.	If yes, dose: _____	
Q561b	If yes, route used for administration.	Route: _____	
Q561c	If yes, time administered.	Time: |___|___|:|___|___|	
Q562	BP monitored at what times in first hour? RECORD ALL. Not sure how you want to code all of these responses for the database. We want to be able to sum the number of times the BP was taken.	Time 1: |___|___|:|___|___| Time 2: |___|___|:|___|___| Time 3: |___|___|:|___|___| Time 4: |___|___|:|___|___| Time 5: |___|___|:|___|___| Time 6: |___|___|:|___|___|	
Q563	Reflexes checked at what times in the first hour? RECORD ALL. Not sure how you want to code all of these responses for the database. We want to be able to sum the number of times the BP was taken.	Time 1: |___|___|:|___|___| Time 2: |___|___|:|___|___| Time 3: |___|___|:|___|___| Time 4: |___|___|:|___|___| Time 5: |___|___|:|___|___| Time 6: |___|___|:|___|___|	
Q564	Respirations checked at what times in first hour? RECORD ALL. Not sure how you want to code all of these responses for the database. We want to be able to sum the number of times the BP was taken.	Time 1: |___|___|:|___|___| Time 2: |___|___|:|___|___| Time 3: |___|___|:|___|___| Time 4: |___|___|:|___|___| Time 5: |___|___|:|___|___| Time 6: |___|___|:|___|___|	

CHECKLIST FOR SEVERE PRE-ECLAMPSIA AND ECLAMPSIA

QXXX	What is your diagnosis Severe PE Eclampsia Other	 Severe PE..... Eclampsia..... Other (Specify____).....	
QXXX	Was the woman ever unconscious	Yes..... No.....	
QXXX	Did the woman experience convulsions	Yes..... No.....	
QXXX	At what stage of labor and delivery did the complication occur? During labor At delivery Postpartum After discharge from facility	 During labor..... At delivery..... Postpartum..... After discharge.....	
QXXX	End time of observation	Time: |___|___|:|___|___|	
QXXX	Condition of woman at end of observation		

Q568	**DESCRIPTION OF CASE**		
Q569	*COMMENTS:* *IN PARTICULAR, COMMENT ABOUT THE FOLLOWING:* *- WAS THE WOMAN LEFT ALONE AT ANY POINT EVEN IF THERE WAS A DANGER OF CONVULSIONS?* *-WAS SHE TREATED RESPECTFULLY? INFORMED OF PROCEDURES?* *- WAS THE SITUATION CHAOTIC OR CALM AND ORDERED?* *- WERE THERE ANY MAJOR DELAYS IN NEEDED TREATMENT? IF SO, FOR WHAT DRUGS/PROCEDURES AND WHY?* *- WERE MULTIPLE HEALTH WORKERS INVOLVED? WHO?*		
	Was the client treated respectfully? Informed of procedure?		
	Was the client left alone at any point?		
Q570	Was the situation chaotic or calm? Were there any major delays in needed treatment?		
Q571	Was the lack of drugs or supplies an issue? If yes, what was missing?		
Q572	Were multiple health workers involved? Who?		

SECTION 6: NEWBORN RESUSCITATION CHECKLIST
To be used in conjunction with the Labor and Delivery Observation Checklist

NO.	QUESTION		CODING		GO TO
q608A	Time Resuscitation Started (24-hour clock)				
		YES	NO	DK	
q613	Clears the airway by suctioning the mouth first and then the nose:				
q613a	Stimulates baby with back rubbing				
q616	**NEWBORN STARTS TO BREATHE OR CRY SPONTANEOUSLY**				Yes->q629b
q617	Calls for help				
q703	Ties or clamps cord immediately				
q704	Cuts cord with clean blade or clean scissors				
q617a	Places the newborn on his/her back on a clean, warm surface or towel				
q612	Places the head in a slightly extended position to open the airway				
q611	Tells the woman (and her support person) what is going to be done				
q611A	Listens to woman and provides support and reassurance.				
q617b	Checks the mouth and back of the throat and nose for secretions, and clears if necessary				
q618a	Places the correct-sized mask on the newborn's face so that it covers the chin, mouth and nose (but not eyes).				
q618c	Checks the seal by ventilating two times and observing the rise of the chest.				
q619	**NEWBORN'S CHEST IS RISING**				
q620	Quickly rechecks the position of the newborn's head to make sure that the neck is in a slightly extended position (not blocking the airway)				
q620b	Checks the mouth and back of the throat and nose for secretions, and clears if necessary				
q621	Checks the seal by ventilating two times and observing the rise of the chest.				
q622	**NEWBORN'S CHEST IS RISING?**				Yes --> Q626B
q623	Checks the position of the head again to make sure the neck is slightly extended.				
q624	Repeats suction of mouth and nose to remove mucus, blood or meconium from the airway				
q625a	Checks the seal by ventilating two times and observing the rise of the chest.				
q625b	**NEWBORN'S CHEST IS RISING?**				Yes --> Q626B
	IF NEWBORN'S CHEST IS NOT RISING AFTER TWO ATTEMPTS TO READJUST, OBSERVER SHOULD CALL FOR SUPERVISOR TO INTERVENE. IF SUPERVISOR IS NOT AVAILABLE, OBSERVER MAY CHOOSE TO INTERVENE.				
q626b	Ventilates at a rate of 30 to 50 breaths/minute				
q627a	ASSESSMENT OF NEWBORN BREATHING AFTER 1 MINUTE OF RESUSCITATION Respiration rate 30–50 breaths/minute and no chest indrawing Respiration rate <30 breaths/minute with severe indrawing No spontaneous breathing No assessment done		Rate 30–50, no indrawing Rate <30, severe indrawing No spontaneous breathing No assessment		SKIP TO Q629b
q627b	Continues Ventilation				No ->q629b
q628	REASSESSMENT OF NEWBORN BREATHING AFTER PROLONGED RESUSCITATION (AFTER 10 MINUTES) Respiration rate 30–50 breaths/minute and no chest indrawing Respiration rate <30 breaths/minute with severe indrawing No spontaneous breathing No assessment done		Rate 30–50, no indrawing Rate <30, severe indrawing No spontaneous breathing No assessment		SKIP TO Q629b
q629	Continues Ventilation				
q630	ARRANGES TRANSFER TO SPECIAL CARE EITHER IN FACILITY OR TO OUTSIDE FACILITY				
q629b	Outcome of resuscitation Resuscitation successful—newborn alive Resuscitation not successful—newborn died		Newborn alive Newborn died		
q631_t	Record the time that resuscitation ended (or time of death if baby died)				
q632	Explains to the mother (and her support person if available) what happened				
q632A	Listens to mother and responds attentively to her questions and concerns				
q633	**Observer written notes** *PLEASE COMMENT ON THE FOLLOWING: WAS MOTHER TREATED RESPECTFULLY? INFORMED OF PROCEDURES TO HER BABY? WAS THE SITUATION CHAOTIC OR CALM? WERE THERE ANY MAJOR DELAYS IN NEEDED TREATMENT? IF SO, FOR WHAT PROCEDURES AND WHY? WERE MULTIPLE HEALTH WORKERS INVOLVED?*				
	Return to IMMEDIATE NEWBORN & POSTPARTUM CARE				

Health Worker Interview Knowledge Test

Cover Page					
NUMBER	**QUESTION**	**CODING**			**GO TO**
fac_name_f	Facility Name				
	For smartphones: Select district; Select Facility				
fac_id_f	Facility Number				
obs_ID	Observer Number				
Today's Date	Today's Date				
	EXPLAIN TO THE HEALTH WORKER THAT HIS/HER NAME WAS PROVIDED AS A KNOWLEDGEABLE MATERNAL AND/OR NEONATAL HEALTH PROVIDER AVAILABLE ON THAT DAY. VALIDATE WITH THE HEALTH WORKER THAT HE/SHE DOES PROVIDE SOME MATERNAL AND/OR NEONATAL HEALTH SERVICES IN THIS FACILITY.				
hwi_Consent	Have you Answered the Health Worker Consent Form?	Yes			
		No			no -> READ
	IF ANSWERS NO: READ CONSENT SCRIPT TO PROVIDER AND ANSWER ANY QUESTIONS.				
hwi_Proceed	Do I have your agreement to proceed?	Yes			
		No			no -> END
	IF PERMISSION WAS NOT RECEIVED, OBSERVATION MUST END				
HW_ID	Health Worker Line No. (From Staff Listing)				
Sex_HW	Sex of Health Worker	Male			
		Female			
	For smartphones: Tap MENU and then FINISH				
	Go to EDUCATION & EXPERIENCE section				
	Section 1: Education & Experience				
NUMBER	**QUESTION**	**CODING**			**GO TO**
h102	What is your current professional/technical/medical qualification?	OBSTETRICIAN			
		GENERAL PRACTITIONER			
		RESIDENT			
		SUPERIOR NURSE			
		MIDLEVEL NURSE			
		BASIC NURSE			
		ELEMENTARY NURSE			
		ENROLLED NURSE			
		STUDENT			
		OTHER			
h103	H103: What year did you graduate (or complete) with this qualification? OR, What year did you complete any basic training for your current position?				
h104	H104: In what year did you start working in this facility?				
h105	H105: In what year did you start working in your current position in this facility? (If year not known, probe and make best estimate)				
h106	H106: What is your age?				
	Section 2: Training & Services Provided				
		CODING			**GO TO**
NUMBER	**QUESTION**	**Yes**	**No**		
h203	H203: In your current position, and as a part of your work for this facility, do you personally provide any antenatal services ?				no -> h205
h204	H204: How many years in total have you provided such services? (service may have been in another facility). (00 if less than 1 year)				
h205	H205: During the past 3 years have you received any pre- or in-service training on subjects related to antenatal care?				no -> h207
	H206: In the last 3 years did you receive the training in any topic related to:				
h206_1	01) ANC screening (e.g., blood pressure, urine glucose and protein)?				
h206_2	02) Counselling for ANC (e.g., nutrition, FP and newborn care)?				
h206_3	03) Emergency obstetric and newborn care (EmONC)				
h206_4	04) Management of eclampsia/pre-eclampsia				
h206_5	05) Any topic related to pregnancy and HIV/AIDS or PMTCT?				
h207	H207: In your current position, and as a part of your work for this facility, do you personally provide delivery services? By that I mean conducting the actual delivery of newborns?				no -> h212
h208	H208: How many years in total have you provided such services? (Service may have been in another facility)? (IF LESS THAN 1 YEAR, ENTER 00)				

h210a	H210A: How often do you use a partograph?	Never			
		Always			
		Most of the time			
		Sometimes			
		Rarely			
h211a	H211A: How often do you use Active Management of the Third stage of Labor (AMTSL) during normal vaginal births?	Never			
		Always			
		Most of the time			
		Sometimes			
		Rarely			
NUMBER	**QUESTION**	**CODING**			**GO TO**
		Yes	**No**		
h212	H212: During the past three years have you received any pre- or in-service training on subjects related to delivery care?				no -> h214
	H213: In the last 3 years did you receive training in any topic related to:				
h213_01	01) Routine care for labour and normal vaginal delivery?				
h213_02	02) Use of partograph?				
h213_03	03) Active Management of Third Stage of Labour (AMTSL)?				
h213_04	04) Emergency obstetric care (EmOC)/Life saving skills (LSS) - in general?				
h213_05	05) Management of sepsis, including use of parenteral antibiotics				
h213_06	06) Administer Magnesium Sulfate for the treatment of severe pre-eclampsia or eclampsia				
h213_07	07) Management of postpartum hemorrhage?				
h213_08	08) Removal of placenta or products of conception? (CAN MENTION D&C, VACUUM ASPIRATION, etc.)				
h213_09	09) Manual removal of placenta				
h213_10	10) Special delivery care practices for preventing mother-to-child transmission (PMTCT) of HIV/AIDS?				
h213_11	11) Assisted vaginal delivery (apply vacuum or forceps)				
h213_12	12) Resuscitate a newborn with bag and mask				
h213_13	13) Maternal death or near miss reviews/audits?				
h213_14	14) Quality improvement approaches such as standards based management?				
NUMBER	**QUESTION**	**CODING**			**GO TO**
		Yes	**No**		
h214	H214: In your current position, and as a part of your work for this facility, do you personally provide care for the newborn?				no -> h216
h215	H215: How many years in total have you provided such services? (Service may have been in another facility)? (IF LESS THAN 1 YEAR, ENTER 00)				
h216	H216: During the past three years have you received any pre- or in-service training on subjects related to newborn care?				no -. H301
	H217: In the last 3 years have you received training in any topic related to:				
h217_1	01) Essential newborn care (e.g., cord care, warming, early and exclusive breastfeeding)?				
h217_2	02) Newborn resuscitation with bag and mask?				
	Section 3: Working Conditions in Facility				
NUMBER	**QUESTION**	**CODING**			**GO TO**
		Yes	**No**		
	Now I would like to ask you some questions about supervision you have personally received. This supervision may have been from a supervisor either in this facility, or from outside the facility. Do you receive technical support or supervision in your work at this facility?				
h301	H301: When was the Most Recent Time	Yes, in the past 3 months			
		Yes, in the past 4–6 months			
		Yes, in the past 7–12 months			-> h304
		Yes, more than 12 months ago			-> h304
		Never			-> h304
		Yes, in the past 6 months			
		Yes, more than 6 months ago			-> h304

Health Worker Interview Knowledge Test

NUMBER	QUESTION	CODING			GO TO
		Yes	No	DK	
	H302: The last time you were personally supervised, did your supervisor do any of the following:				
h302_1	01) Deliver Supplies				
h302_2	02) Check your records or reports?				
h302_3	03) Observe your work?				
h302_4	04) Gave you verbal feedback about how you were doing your job?				
h302_5	05) Provide any written comment about how you were doing your job?				
h302_6	06) Provided updates on administrative or technical issues related to your work?				
h302_7	07) Discussed problems you have encountered?				
h302_8	08) Participated in quality of care improvement activities?				
	FOR THE FOLLOWING 2 QUESTIONS, H308 AND H309, CHECK ONLY THREE ITEMS FOR EACH QUESTION. IF THE HEALTH WORKER MENTIONS MORE, ASK TO PRIORITIZE TO ONLY THREE (IF THREE ARE NOT MENTIONED PROBE FOR OTHER ANSWERS TO GET A TOTAL OF THREE FOR EACH QUESTION)				
h308	H308: Among the various things related to your working situation that you would like to see improved, can you tell me the three that you think would most improve your ability to provide good quality of care services?				
	More support from supervisor	More support from supervisor			
	More knowledge/updates/training	More knowledge/updates/training			
	More supplies/drugs	More supplies/drugs			
	Better quality equipment/supplies	Better quality equipment/supplies			
	Less workload (i.e. more staff)	Less workload (more staff)			
	Better working hours/flexible times	Better working hours/flexible times			
	More incentives (salary, promotion, holidays)	More incentives (salary, promotion, holidays)			
	Increased security	Increased security			
	Better facility infrastructure	Better facility infrastructure			
	More autonomy/independence	More autonomy/independence			
	Emotional support for staff	Emotional support for staff			
	More/better supervision	More/better supervision			
	More job aids/guidelines/standards	More job aids/guidelines/standards			
	FOR QUESTIONS H315, H316, H317 PLEASE WRITE DOWN THE ANSWER IN THE SPACE PROVIDED.				
	For smartphones: Audio Comments (maximum 1 minute); Speak slowly and clearly. Click red button to record.				
	H315: What do you think constitutes good quality maternal and newborn care? PROBE: How do you know if your center/hospital is or is not providing good obstetric care?				
h315					
	ON MON, WED, FRI - ASK ABOUT ACTIVE MANAGEMENT OF 3RD STAGE; ON TUES, THUR, OR SAT, ASK ABOUT LABOR/BIRTH COMPANION)				
	H316: I want to ask you about _____. Can you tell me, what are the most important factors that help you to implement this practice? PROBE: training, supervision, job aids, anything else?				
h316					
	For this same practice, can you please tell me, what are the most important factors that hinder your implementation of this practice? PROBE: training, supervision, job aids, anything else?				
h317					
	Continue to MATERNAL HEALTH KNOWLEDGE section				

Health Worker Interview Knowledge Test

	Section 4: Maternal Health Knowledge Questions				
NUMBER	QUESTION	CODING			GO TO
		YES	NO	DK	GO TO
	H407: Of the list of procedures I am going to read you, please tell me which procedures are carried out routinely during labor and delivery at your facility				
h407_1	01) Artificial Rupture of Membranes				
h407_2	02) Episiotomies				
h407_3	03) Perineal Shavings				
h407_4	04) Suctioning nose and mouth of newborn				
h407_5	05) Enema				
h407_5	07) Active management of third stage of labor				
h407_5	08) Maternal BP monitoring				
h407_5	09) Administration of prophylactic antibiotics to women in labor				
h407_5	10) Fetal heart rate monitoring				
NUMBER	QUESTION	ANSWERS			CODING
h408	H408: What actions during labour and delivery would you take in an HIV+ woman to prevent/reduce mother-to-child transmission of the virus? (PROBE for any other actions)	PMTCT COUNSELLING			
		PROV ARV PROPHYLX IN EARLY LABOUR			
		WIPE NOSE, MOUTH, EYES OF NEWBORN WITH GAUZE, AVOIDING SUCTION			
		NO ROUTINE EPISIOTOMY			
		MINIMIZE INSTRUMENT DELIVERY			
		HIBITANE VAGINAL CLEANSING			
		MINIMIZE VAGINAL EXAM			
		MINIMIZE ARTIFICIAL RUPTURE OF MEMBRANES			
		AVOID MILKING CORD/IMMEDIATE CLAMP CORD			
		APPROPRIATE USE OF PARTOGRAPH			
		ACTIVE MGT OF 3RD STAGE LABOUR			
		PROVIDE ARV PROPHYLAXIS TO INFANT			
		DON'T KNOW			
h408a	H408A: What are the key steps for performing active management of the third stage of labor?	Administration of a uterotonic immediately/ within 1 min			
	PROBE FOR WHEN UTEROTONIC SHOULD BE GIVEN	Controlled cord traction			
		Uterine massage			
		Don't know			
h409	H409: Please tell me, when a woman presents with or develops heavy bleeding after birth (postpartum),what signs do you look for to assess the level of risk to the woman? (PROBE for any other signs or symptoms)	UNCONTRACTED/ATONIC UTERUS			
		RAPID PULSE			
		FAINT/WEAK PULSE			
		AMOUNT OF EXTERNAL BLEEDING			
		RETAINED PRODUCTS/PLACENT			
		GENITAL TRACT INJURIES			
		PALLOR			
		CHECK IF BLADDER IS FULL			
		DON'T KNOW			
h411	H411: What actions, diagnostic test or interventions are appropriate for a woman who presents with, or develops heavy bleeding postpartum from atonic/uncontracted uterus? (PROBE: Any other actions or interventions)				
		MASSAGE THE FUNDUS			
		EMPTY URINARY BLADDER			
		GIVE UTEROTONICS IM OR IV			
		PERFORM BIMANUAL COMPRESSION OF UTERUS			
		PERFORM ABDOMINAL COMPRESSION OF AORTA			
		START IV FLUIDS			
		TAKE BLOOD FOR Hb, GROUPING AND X-MATCHING			
		REFER TO DOCTOR OR HOSPITAL			
		RAISE FOOT OF BED			
		DON'T KNOW			
h412	H412: What actions, diagnostic test or interventions are appropriate for a woman with retained placenta/products of conception after delivery? (PROBE: Any other actions or interventions)				
		EMPTY URINARY BLADDER			
		REPEAT UTEROTONIC			
		MANUALLY REMOVE PLACENTA/PRODUCTS			
		GIVE IV FLUIDS			
		MONITOR VITAL SIGNS FOR SHOCK			

Health Worker Interview Knowledge Test

		CHECK CONTRACTION OF UTERUS	
		MASSAGE FUNDUS AFTER REMOVAL	
		GIVE ANTIBIOTICS	
		TAKE BLOOD FOR GROUPING & X-MATCHING	
		PREPARE FOR THEATER IF BLEEDING DOES NOT STOP	
		REFER TO DOCTOR OR HOSPITAL	
		DON'T KNOW	
	READ ALOUD TO THE HEALTH WORKER:		
	For smartphones: give card to health worker and ask them to read section 1		
	Section One: Mrs. C. is brought to the emergency department of the district hospital by her husband after she complained of a severe headache this morning. The following information is available from Mrs. C.'s antenatal record: - She is 20 years old - This is her first pregnancy - She had two antenatal care visits during this pregnancy at 20 and 33 weeks gestation and there was nothing that indicated a problem		
h418	H418: Given the clinical information above, which information MUST be obtained IMMEDIATELY in order to initiate emergency management on her condition?	TIME OF ONSET OF PRESENT SYMPTOMS	
		LEVEL OF CONSCIOUSNESS	
		ANY CONVULSIONS	
		CHECK VITAL SIGNS (TEMP, BP, PULSE, RESPIRATIONS)	
		LISTEN TO/ASSESS FETAL HEART TONES	
		CHECK URINE PROTEIN	
		DON'T KNOW	
	READ ALOUD TO THE HEALTH WORKER:		
	For smartphones: give card to health worker and ask them to read section 2		
	Section Two: Mrs. C. reports onset of severe headache and blurred vision six hours prior to coming to the clinic. She denies upper abdominal pain or increased urine output, and fetal movement is normal. Further information: - BP [160/120 mm Hg] - Pulse [84/minute] - Temp C227[37.2°C] - Respirations C278[18/minute] - Fetal Heart Tones [140 beats per minute] - Fundal Height [Appropriate for gestational age] - Abdomen [Non-tender] - Patellar reflexes [Normal] - Urine [3+ protein] - Contractions [Two in ten minutes lasting 20 seconds by palpation]		
h420	H420: Given the information presented above, what is your working diagnosis?	Kidney infection	
		Severe pre-eclampsia	
		Malaria	
		Eclampsia	
		In labor	
h421	H421: What action do you believe is appropriate in managing the MOST urgent presenting condition?		
		Provide magnesium sulfate	
		Provide diazepam	
		Provide anti-hypertensives	
		Prepare to deliver within 48 hours	
		DON'T KNOW	

Health Worker Interview Knowledge Test

h422	H422: If Mrs. C. had been having a convulsion at the time she came to the clinic, what IMMEDIATE actions SHOULD be taken? (PROBE: Anything Else?)				
		GIVE INTRAVENOUS DIAZEPAM			
		ADMINISTER OXYGEN AT 4–6 L PER MINUTE IF AVAILABLE			
		ACTIVELY RESTRAIN			
		PLACE IN SIDE LYING POSITION			
		PROTECT FROM INJURY			
		GIVE MAGNESIUM SULFATE			
		PROVIDE ANTIHYPERTENSIVES (NIFEDIPINE OR APRESOLINE)			
		DON'T KNOW			
h430	H430: Please tell me how a woman should be evaluated who develops a high fever more than 24 hours following a vaginal delivery? (PROBE: Any other actions or interventions)	Review clinical record of labor and birth			
		Check vitals (BP, temp, pulse, respiratory rate)			
		Assess for shock			
		Ask about abdominal pain			
		Ask about severe headache			
		Ask about foul/bad smelling lochia			
		Examine for uterine tenderness			
		Examine for continued vaginal bleeding			
		Test for malaria			
		Ask about breast pain/tenderness			
		Ask about increased frequency/urgency of urination			
		DON'T KNOW			
h431	H431: Please tell me which antibiotics to give to a women who is diagnosed with postpartum endometritis following a vaginal delivery? (PROBE: Anything Else?)	Ampicillin			
		Gentamicin			
		Metronidazole			
		DON'T KNOW			
h432	H432: When should membranes be ruptured artificially by the provider? (PROBE: Any other times)	At start of second stage			
		Immediately prior to delivery when they are seen to be bulging in vagina			
		Routinely during active phase of labor			
		As part of augmentation of labor			
		Upon admission for all women			
		To check the color of the fluid/liquor when fetal distress noted			
		Not to be ruptured			
		DON'T KNOW			
h433	H433: When should antibiotics be administered in labor, delivery and postpartum? (PROBE: Any other times?)	Upon admission to the labor unit, for all women			
		Routinely to all postpartum women			
		Immediately when membranes are ruptured artificially			
		Immediately when membranes are ruptured spontaneously			
		When membranes have been ruptured for 12 hours			
		When membranes have been ruptured for 18 hours			
		When the woman has fever (temp of >38C)			
		When chorioamnionitis is diagnosed			
		When postpartum endometritis is diagnosed			
		When a cesarean section is performed			
		When a woman has an episiotomy or tear repaired			
		When another procedure (manual removal of placenta postpartum curettage, etc.) is performed			
		DON'T KNOW			

h434	H434: What are the most important factors that contribute to puerperal/postpartum infections? (PROBE: Any other actions or interventions?)	Women come late to the hospital	
		Women have poor hygiene	
		Women deliver at home with unskilled providers or family members or family members	
		Women are dehydrated	
		Family members are present in the hospital	
		Hospitals/delivery room settings are not clean	
		Instruments are not clean	
		Providers don't wash their hands	
		Providers do too many vaginal exams during labor	
		Providers do not use the right type of gloves/use gloves incorrectly	
		Providers don't give antibiotics routinely	
		Membranes are ruptured for too long a period of time before delivery (more than 12 hours)	
		Labor lasts a long time (more than 12 hours)	
		Providers do a manual exploration of uterus after delivery	
		Providers routinely catheterize women in labor or postpartum	
		DON'T KNOW	
h425	Time at End of Maternal Health Knowledge Questions		
	Continue to NEWBORN HEALTH KNOWLEDGE section		
	Section 5: Newborn Health Knowledge Questions		
NUMBER	**QUESTION**	**CODING**	**GO TO**
h508	H508: What BASIC equipment and supplies must be available to ensure the baby receives appropriate IMMEDIATE CARE after birth? (PROBE: Anything Else ?)		
		2 DRY WARM TOWELS OR CLOTHS	
		SELF-INFLATING VENTILATION BAG	
		MUCUS EXTRACTOR/SUCTION/BULB SYRINGE	
		FLAT SURFACE WITH WARM CLOTH	
		CLOCK OR WATCH WITH SECONDS	
		SOURCE OF WARMTH: HEATING LAMP	
		CAP FOR BABY	
		STERILE BLADE OR SCISSORS	
		STERILE OR DISPOSABLE CORD TIES/CLAMPS	
		NEWBORN SIZE FACE MASK	
		DON'T KNOW	
h505	H505: Please tell me, when a baby is delivered and there is no complication, what care is important to give them immediately after birth and in the first few hours thereafter? (PROBE: Anything Else?)	WIPED FACE AFTER BIRTH OF HEAD	
		ENSURED BABY WAS BREATHING/CRYING	
		PROVIDED THERMAL PROTECTION	
		BATHED NEWBORN SHORTLY AFTER BIRTH	
		SUCTIONED NEWBORN WITH BULB	
		INITIATED BREAST FEEDING WITHIN 1 HOUR	
		ASSESSED/EXAMINED NEWBORN WITHIN 1 HOUR	
		WEIGHED NEWBORN	
		PROVIDED EYE PROPHYLAXIS/ANTIBIOTIC OINTMENT	
		GAVE PRELACTEAL FEEDS	
		CUT CORD WITH STERILE BLADE/SCISSORS	
		DRY CORD CARE (NOTHING APPLIED TO STUMP)	
		DON'T KNOW	
h520	H520: Please tell me, when a baby is delivered and there is no complication, what care is important to give them AFTER the first 30 minutes after birth? (PROBE: Anything Else?)		
		Thermal Protection (Wrap baby or skin-to-skin)	
		BREAST FEEDING WITHIN 1st HOUR	
		ADMINISTER VACCINES	
		MONITOR TEMPERATURE	
		MONITOR BREATHING	
		MONITOR SKIN COLOR	
		KEEP UMBILICAL CORD CLEAN AND DRY	
		DON'T KNOW	

Health Worker Interview Knowledge Test

h506	H506: Can you please tell me the signs and symptoms of severe infection (sepsis) in a newborn? (PROBE: Anything Else)	POOR/NO BREASTFEEDING			
		RESTLESSNESS/IRRITABILITY			
		BREATHING DIFFICULTIES			
		HYPOTHERMIA			
		HYPERTHERMIA			
		BREATHING RATING >60/MINUTE			
		CONVULSIONS			
		PUS/REDNESS AROUND UMBILICUS			
		ABCESS ON ANY PART OF BODY			
		SKIN PUSTULES			
		LETHARGY/NO MOVEMENT (CONSCIOUS)			
		UNCONSCIOUS			
		DON'T KNOW			
	Continue to CLINICAL SIMULATION section				