ADVANCING THE EVIDENCE-BASE OF THE MINIMUM INITIAL SERVICE PACKAGE (MISP) FOR REPRODUCTIVE HEALTH: USING A QUALITY IMPROVEMENT APPROACH IN THE DEMOCRATIC REPUBLIC OF CONGO

CDC Report of the Baseline Evaluation

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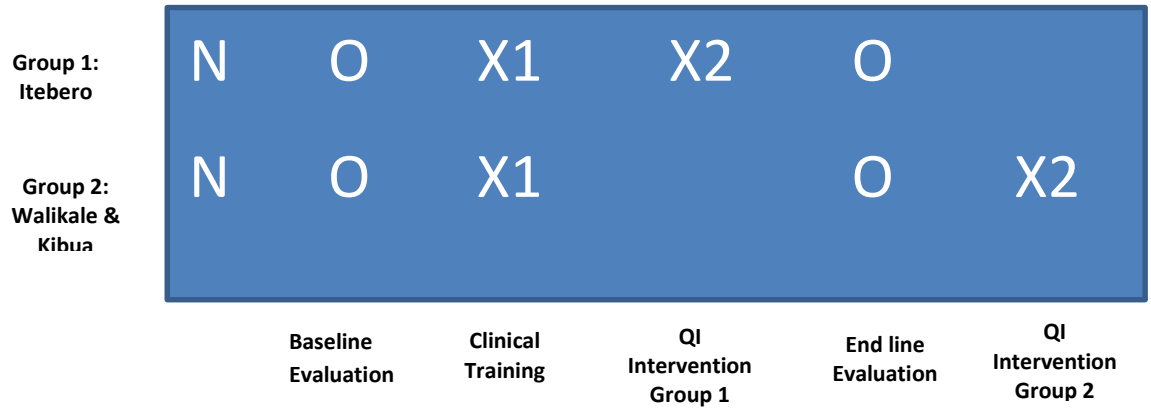
I. PROJECT OVERVIEW

The purpose of conducting this research project is to bridge the gap between evidence and practice by integrating a quality improvement (QI) approach in the implementation of the maternal and newborn health (MNH) components of the MISP and comprehensive sexual and reproductive health in the North Kivu Province, DRC among internally displaced (IDP) and local populations. The study is implementing MNH clinical training in 12 health facilities, 6 of which are receiving QI training and support in year 1 (Group A) and 6 facilities that will act as a control group (Group B) but will receive QI training in year 2 post end line to allow for the comparison of MNH indicators between sites over time (Figure 1).

The research study period is over two years from July 2015 to June 2017. Health facilities supported by IMC in three health zones (Itebero, Walikale & Kibua) in Walikale Territory, North Kivu Province in the Democratic Republic of the Congo (DRC) are participating in the study. A longitudinal, quasi-experimental mixed methods study design was used to evaluate implementation of components of the Minimum Initial Service Package (MISP) and Emergency Obstetric and Neonatal Care (EmONC) using a quality improvement approach.

FIGURE 1. Phased Implementation of QI Approach Intervention



II. METHODOLOGY

A longitudinal, quasi-experimental mixed-methods study was designed to evaluate the intervention. A surveillance evaluation conducted prior to baseline data collection in the study facilities provided background information about maternal and newborn health data availability and quality, as well as qualitative feedback from key informants at the zonal and provincial levels of the MoH. Data from this surveillance evaluation are included in the baseline assessment.

A. Sample size calculations

Our sample size was based on the number of women interviewed for the exit interviews. Because prevalence rates are unknown, the research team assumed the most conservative estimate of 50% prevalence of all study indicators. Assuming power of 80% and an alpha of 0.05, a sample size of 97 per group is needed to detect an absolute difference of 20% between indicators over time. Anticipating a non-response rate of 10%, we planned

to sample 107 women in each group. Based on this target, it was estimated that baseline data collection of the exit interviews would take 5 weeks.

B. Data Collection Methods

Qualitative and quantitative methods were used to assess the availability, utilization, and quality of services. Interview guides and questionnaires were translated into French and Swahili, translated back to English, and pretested. Data collection methods included:

- Patient Exit Interviews (PEI): PEI will be conducted with women exiting the maternity ward following a normal spontaneous vaginal delivery using a questionnaire focused on patient perceptions of care and receipt of essential aspects of care. All women during the data collection period who had vaginal deliveries without complications for the woman or baby were asked to participate.

- Record Abstraction: Data from maternity registers and partographs was reviewed for pertinent delivery care and MNH outcomes, as well as data quality assessments and improvements.

- Patient Care Observations (PCO): PCOs were conducted by clinical observers on all women delivering in the study facilities during a one-week period. The observers used checklists that include essential aspects of care such as quality of delivery care and correct use of the partograph. Observations will be compared to self-reported data from the exit interviews to assess accuracy of self-reporting.

- Focus Group Discussions (FGD): FGDs were carried out with 3 sub-groups: women of reproductive age, men, and study facility health workers. Interview guides focused on topics such as barriers to care, birth practices, referrals, and perceptions of quality of care.

As this is a pilot study, we will not have the statistical power to identify significant change in maternal and neonatal mortality, given that these rare events. Therefore, proxy indicators of MISP and EmONC will be used to measure changes *within* and *between* groups over time (Table 1). Because of the low level of available data, indicators had to be compiled using a mix of data collection methods. For example, the percent of deliveries with active management of the third stage of labor (AMSTL) was measured using self-report from exit interviews for the uterine massage component and data extraction from partographs for the delivery of oxytocin. Data from the convenience sample of patient observations will be compared to the exit interviews to assess accuracy of self-report.

Table 1. Main Study indicators				
Indicator	**Numerator**	**Denominator**	**Data Source(s)**	**Notes**
Proportion of all births in EmOC facilities[1]	No. of women who deliver in EmOC facilities	Expected no. of births in the area during the same time period	All births from register over a 3 month period	National goal is for 60% of births to be attended by trained personnel in facilities
Percent of deliveries in facilities with active management of the third stage of labor (AMSTL)[2]	No. of women in facilities who receive oxytocin and uterine massage after delivery of placenta	No. of women who delivered in the facility in the same time period	Partograph (oxytocin), exit interviews (uterine massage)	Self-report from exit interviews compared with patient observations
Percent of vaginal deliveries in the facilities for which a partograph was completed[2]	No. of vaginal deliveries for which a partograph was completed	No. of deliveries in the facility during the same time period	3 months of vaginal deliveries from register matched with corresponding partographs	Patient observations will assess whether correct actions taken based on partograph
Percent of newborns born in facilities who receive essential newborn care (ENC)[2]	No. of newborns that receive 3 elements of essential newborn care	No. of newborns delivered in the facility during the same time period	Partographs matched to exit interviews	(1) clear cord care; (2) application of antibiotic to eyes; (3) weight; check against observation data

[1]Monitoring emergency obstetric care: a handbook. World Health Organization, 2009

[2]Improving Health Care: The Results and Legacy of the USAID Health Care Improvement Project. USAID, September 2014

C. Training and Data Collection

Training of trainers (TOT) and training took place during the month of October and the first week of November in Goma, Chambucha and Walikali by CDC (Goma only) and the IMC research team. Patient care observation training was conducted over 3 days in Goma by CDC and IMC. Participants were medical professionals with the Ministry of Health. A 3 day TOT for the exit interviews was given by CDC to the IMC research team in Goma who then conducted the training in Chambucha and Walikali over a one week period. Trainees were women from the communities served by the study health centers. Focus group training was conducted by CDC with the assistance of the Ministry of Health. Participants were IMC monitoring and evaluation staff and one additional person from Goma with health and focus group experience. All training had pilot tests after which data collection instruments and procedures were revised as needed.

Baseline data collection began the week of November 9, 2015 and was completed in January 2016, with the exception of some record-based data collection conducted by the IMC research team during the surveillance evaluation in October. Observations were conducted for a one-week period in mid-November. Start and end dates varied by facility due to location and travel time to the health facilities but all observations were conducted about the second week of exit interview data collection. All deliveries during the 1-week period were observed. The observations were discontinued if complications developed or the patient was referred to another facility. All completed observations were linked to a corresponding exit interview by a unique identifier.

III. RESULTS OF SURVEILLANCE EVALUATION

Prior to baseline data collection, a surveillance evaluation was completed on the surveillance tools and system in use at the 12 facilities included in this study. During this evaluation, questions about referrals, staff capacity and equipment were also asked.

D. Referrals

Outgoing referrals: During the surveillance evaluation, staff at study facilities were asked about referral facilities in cases of obstetric complications and compared to MoH designated referral centers. Eleven facilities (91.7%) referred obstetric patients to at least one other facility, either a referral health center or a hospital either because of case severity or complications, or lack of supplies (Table 6). One facility (Chambucha) did not refer elsewhere but is a referral center. Of those 11 facilities, 5 refer to a referral health center only, 3 refer to both referral health centers and hospitals, and 2 refer to hospitals only. Only 6 of the 11 facilities (55%) that refer patients reported that they send *contre-reference* forms with the patient. Seven of the 12 facilities had at least partial agreement between facility staff reported referral locations and referral locations listed by the MoH.

Incoming referrals: Ten facilities (83%) reported that they receive referral patients. Two facilities receive referrals from a Health Post only; two facilities receive referrals from a Health Center only. The remaining six facilities receive referrals from both Health Posts and Health Centers.

Table 2. Referral system as reported by study facility staff and Ministry of Health

Health Facility	Referral destination as reported by health facility staff	Referral destination as reported by the Ministry of Health
Chambucha	Does not refer	HGR Itebero
Hombo Nord	CSR Chambucha	CSR Chambucha
Musenge	CSR Chambucha	HGR Itebero (but at great distance)
Mianga	CSR Karete	CSR Chambucha
Malembe	CSR Karete (because before there was no doctor at Musenge for complications) or CSR Chambucha (for very complicated cases) One part of Malembe (Chamaka) refers to CSR Musenge	CSR Karete or CSR Musenge
Lukaraba	CSR Chambucha	CSR Chambucha
Ndofia	CSR Biruwe (for Cesarean sections) or HGR Walikale (if the doctor is not at the CSR)	CSR Biruwe

Mundindi	CSR Biruwe or HGR Walikale	CSR Biruwe
Biruwe	HGR Walikale	HGR Walikale
Ntoto	HGR Masisi or HGR Walikale	HGR Kibua
Byungu	CSR Ntoto or HGR Walikale	CSR Ntoto
Langira	CSR Machumbi, CSR Ntoto, or HGR Masisi	HGR Kibua

E. Staff Capacity and Training

During the surveillance evaluation, 23 health providers working in maternity wards were interviewed about trainings and facility capacity. All facilities except for one had two staff available to interview.

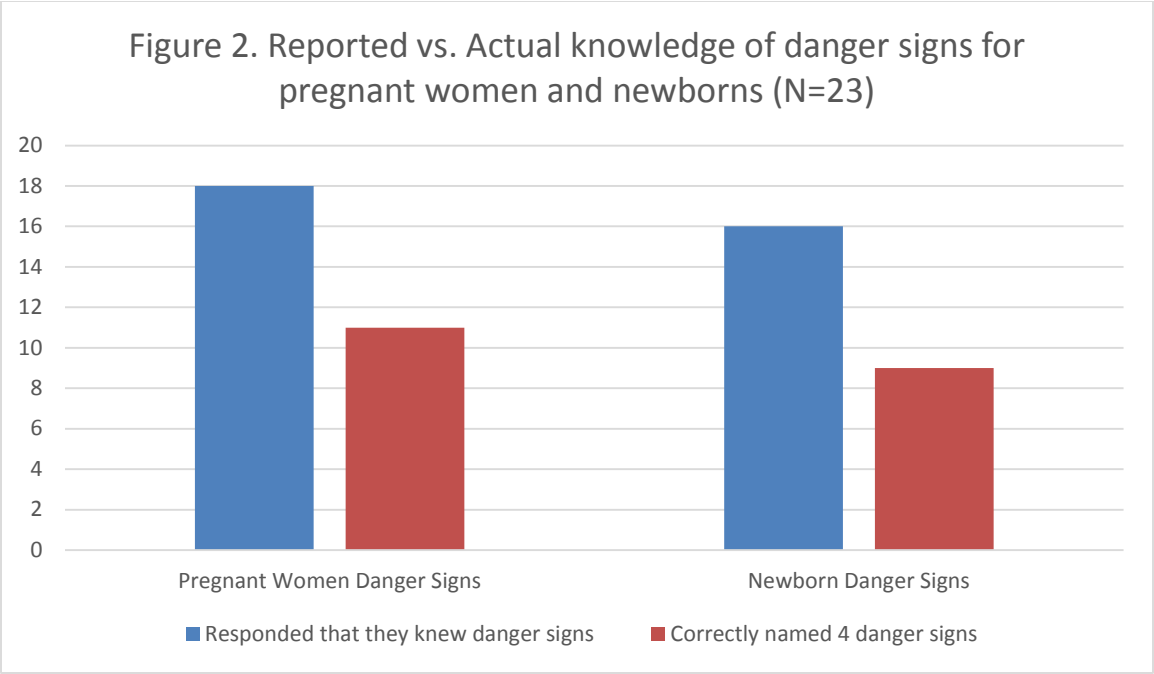
Facilities reported having between 2 and 6 providers that were able to oversee deliveries (mean = 3.5).

13 of the 23 providers (56.5%) interviewed reported that they have received training on reproductive health care. 12 providers (52.1%) had received training on normal deliveries (without complications). All of the trainings had taken place since 2010 and most were provided by IMC. Unfortunately only 6 providers (26.0%) responded that they had received training on AMSTL.

When asked about trainings specific to essential newborn care, 8 providers (34.7%) responded that they had received related training. Again, all the trainings had taken place in the previous 5 years and the majority were provided by IMC. 7 of the 8 providers who had received essential newborn care training also reported having received training on newborn complications. Of note, one provider reported that they had not been trained on essential newborn care but they had received training on newborn complications.

Table 3. Trainings reported by facility staff (n=23)	
Trainings	**N (%)**
Sexual and Reproductive Health	13 (56.5)
Maternal Health	
Normal Deliveries	12 (52.1)
Delivery Complications	10 (43.4)
AMSTL	6 (26.0)
Newborn Care	
Essential Newborn Care	8 (34.7)
Newborn Complications	8 (34.7)

Providers were also about their knowledge of the danger signs for pregnant women and newborns. When asked whether they knew the nine danger signs for pregnant women, 18 providers (78.2%) responded that they did. However, when asked to list four danger signs, only 11 (61.1%) were able to do so. 16 providers (69.5%) responded that they knew the danger signs for newborns, but only 9 (56.2%) were able to correctly name four.



F. Availability of Newborn Resuscitation Kits and Trained Staff

Maternity staff at the study facilities were asked about whether they had neonatal resuscitation kits available. Six of 12 facilities had neonatal kits available, however one of the kits was unusable due to holes, so 41.7% had functioning neonatal kits. Of the 6 facilities with kits, only two (33.3%) had staff that had received training on how to use the neonatal resuscitation kit.

G. Partograph Completion

During the surveillance evaluation, a random sample of nine partographs were selected from each facility (three from each month; June, July, and August). Sixty-eight partographs were available to be reviewed of the 108 (63%) intended. Two of the facilities had completed no partographs during the entire three-month period.

Of the 68 partographs that were reviewed;

- 61 (90%) had at least one section of the partograph completed
- 48/68 (71%) had an identifier (dossier # and/or patient name) filled in on the partograph
- 32/68 (47%) had either, or both, the active labor or delivery sections completed
- Only 1/68 (1%) had the postpartum surveillance section completed

IV. RESULTS OF BASELINE DATA COLLECTION

H. Sample Size

The target sample size for exit interviews at each health facility was proportionate to the average number of expected deliveries per month based on facility records and adjustments made after discussions with facility staff.

All eligible women who delivered at the study facilities were asked to participate in the study. We originally anticipated 5 weeks to reach our sample size. However, the first three weeks of exit interviews indicated that more deliveries at the facilities had complications than had been anticipated based on surveillance data. The research team decided to extend the data collection period to 6.5 weeks through December 22, 2015, to allow the maximum number of exit interviews to be completed.

During the baseline data collection period, 258 interviews were completed (142 in Group 1 and 116 in Group 2) with women who had vaginal births without complications (Table 2). There were no refusals. During the one-week observation period, 61 observations were started with 47 (77.0%) completed and 14 (23.0%) stopped early because of complications.

Table 4. Target and Actual Sample Size by Health Center for Exit Interviews

Facility Name	Health Zone	Referral Center	Target Sample Size	Actual Sample Size
Group 1 (Intervention)				
Chambucha	Chambucha	Yes	19	28
Hombo	Chambucha	No	36	36
Lukaraba	Chambucha	No	12	17
Musenge	Itebero	Yes	11	16
Malembe	Itebero	No	16	26
Mianga	Itebero	No	13	19
Group 1 Subtotal			**107**	**142**
Group 2 (Control)				
Biruwe	Walikale	Yes	17	13
Mundindi	Walikale	No	21	32
Ndofia	Walikale	No	17	29
Ntoto	Kibua	Yes	15	21
Byungu	Kibua	No	27	16
Langira	Kibua	No	9	5
Group 2 Subtotal			**106**	**116**
TOTAL				**258**

I. Characteristics of Respondents

Demographic characteristics of the respondents are listed in Table 3. Women were eligible to participate if they were 18 years of age or older. The majority of women were between 20-29 years old (58.1%) with the oldest women 40 years of age. Age was missing or unknown for 4 women. Most (74.8%) women had primary or secondary school and were married (77.5%). Thirty (11.6%) women were displaced. Of those women, 19 (63.3%) had been displaced for 2 years or less and only 9 (30.0%) women had IDP cards.

Table 5. Demographic characteristics of exit interview respondents (n=258)	
Characteristic	N (%)
Age	
18-19 years	43 (16.7)
20-24 years	85 (32.9)
25-29 years	65 (25.2)
30-34 years	41 (15.9)
35-40 years	20 (7.8)
Missing	4 (1.6)
Education	
No Schooling	62 (24.0)
Primary	100 (38.8)
Secondary	93 (36.0)
College	2 (0.8)
Missing	1 (0.4)
Marriage Status	
Married	200 (77.5)
Single, not cohabitating	35 (13.6)
Single, cohabitating	23 (8.9)
Displaced Status	
Not displaced	224 (86.8)
Displaced	30 (11.6)
Missing	4 (1.6)
Length of displacement	**N=30**
Displaced, 2 years or less	19 (63.3)
Displaced, more than 2 years	11 (36.7)
Missing	2 (6.7)
Have Displacement Documentation	**N=30**
Yes	9 (30.0)
No	20 (66.7)
Missing	1 (3.3)

Table 4 presents characteristics of the respondent's current delivery as well as any prior births. Most (81.8%) women had given birth prior to the current delivery, with the number of prior births ranging from 1 to 13. The number of prior births was missing for 9 women. For the current deliveries, 207 women (80.2%) had arrived to the health facility by foot and slightly more than 18% had arrived by motorcycle. Almost 17% of women stated that they had not wanted to deliver at the health facility. Payment for services was reported by 238 (92.2%) of women. Of 224 (86.8%) women that said they had a family member or friend accompany them to the health facility, only 12 (5.3%) women reported that the family member or friend was in the room during their labor and delivery.

Over half of the respondents had delivered at the study facility for the most recent previous delivery. Of the 211 (81.8%) women who had delivered more than one child, 68.2% had delivered at the current facility, 49.3% had delivered at another facility, and 25.6% had delivered at home.

Table 6. Characteristics of current and prior deliveries among exit interview respondents (n=258)	
Birth Characteristics	**N (%)**
Current delivery	
First birth	47 (18.2)
Had previous births	211 (81.8)
Mode of transport to health facility for current delivery	
By Foot	207 (80.2)
By Motorcycle	48 (18.6)
By Car/Vehicle	0 (0.0)
Missing	4 (1.6)
Birth location preference for current delivery	
Wanted to give birth at this health facility	212 (82.2)
Did not want to give birth at this health facility	43 (16.7)
Don't know	3 (1.1)
Paid for delivery services	
Yes	238 (92.2)
No	9 (3.5)
Don't know	1 (0.4)
Missing	10 (3.9)
Accompanied by friend or family member	
Yes	224 (86.8)
No	31 (12.0)
Missing	3 (1.2)
Friend or family member in room during labor and delivery	**N=224**
Yes	12 (5.3)
No	208 (92.9)
Don't know	2 (0.9)
Missing	2 (0.9)
Location of most recent prior delivery	**N=211**
This facility	115 (54.5)
Another facility	61 (28.9)
Home	14 (6.6)
Missing	3 (1.4)
Location of all prior deliveries*	**N=211**
This facility	144 (68.2)
Another facility	104 (49.3)
Home	54 (25.6)

* Multiple responses allowed

J. Respectful Care

Women were asked about aspects of respectful care at birth (Table 5). About half (51.2%) of women interviewed responded that they had privacy while giving birth, 43.4% were encouraged to eat or drink while laboring, 50.4% were encouraged to get up and walk around during their labor, and 26.0% of women were asked which position they preferred for labor and delivery.

More than two-thirds (69.8%) of women felt they were not allowed to ask questions of the health care worker and 63.6% of women reported that the health care worker did not explain what was happening throughout the labor and delivery.

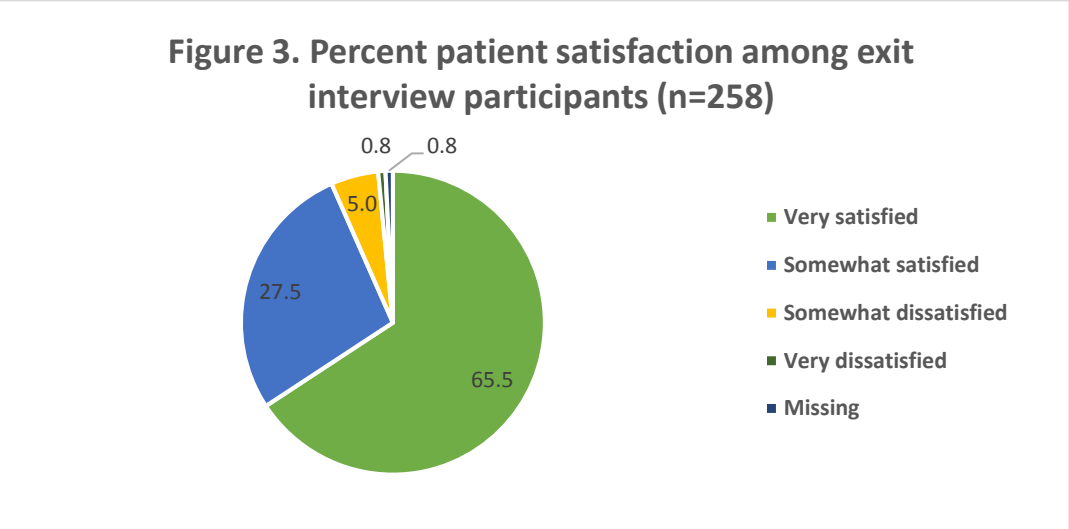
Few respondents reported verbal or physical abuse with 7.8% of women reporting they were shouted at, insulted, or threatened by a staff member while they were in labor or after delivery and 3.9% of women reporting they were slapped, hit, or pinched by a staff member while they were in labor or after delivery.

Table 7. Characteristics of respectful care among exit interview respondents (n=258)	
Characteristics	**N (%)**
Privacy while giving birth	
Yes	132 (51.2)
No	120 (46.5)
Don't know	4 (1.6)
Missing	2 (0.8)
Encouraged to eat or drink while laboring	
Yes	112 (43.4)
No	141 (55.4)
Don't know	2 (0.8)
Missing	3 (1.2)
Encouraged to get up and walk around during labor	
Yes	103 (50.4)
No	147 (57.0)
Don't know	4 (1.6)
Missing	4 (1.6)
Asked which position they preferred for labor and delivery	
Yes	67 (26.0)
No	183 (70.9)
Don't know	4 (1.6)
Missing	4 (1.6)
Allowed to ask questions of the health care worker	
Yes	73 (28.3)
No	180 (69.8)
Don't know	0 (0.0)
Missing	5 (2.0)
Health care worker explained what was happening throughout labor and delivery	
Yes	88 (34.1)
No	164 (63.6)
DK	3 (1.2)
Missing	3 (1.2)

Verbal abuse by health care worker during labor and delivery	
Yes	20 (7.8)
No	233 (90.3)
DK	2 (0.8)
Missing	3 (1.2)
Physical abuse by health care worker during labor and delivery	
Yes	10 (3.9)
No	244 (94.6)
DK	2 (0.8)
Missing	2 (0.8)

K. Patient Satisfaction

When women were asked if they would recommend the health facility to other women giving birth, 233 (90.3%) women interviewed responded yes. When asked about how satisfied they were with their experience at the health facility, the majority of women (93.0%) said they were very satisfied or somewhat satisfied with their experience at their respective health center (Figure 2).



L. Outcomes of Key Indicators

1. Proportion of all births delivered in EmOC facilities

The number of births recorded in the study facilities was obtained for a three month period from June through August 2015. The percent of estimated births delivered at the study EmOC facilities was calculated by dividing the estimated number of births for the catchment population of each facility by the mean number of facility births over the three month period. Two facilities had just two months of births and the average was taken for

the two months. The percent of EmOC facility births ranged from 10.0% to 129.4%. The percent of EmOC facility births for the control group (44.2%) was notably lower than for the intervention group (78.5%). Data should be interpreted with caution as estimates use the national crude birth rate and the births recorded in the registries could vary substantially over the 3 month period.

Table 8. Percent of estimated births in the population delivered at EmOC facilities over a 3-month period					
Facility Name	**Health Zone**	**Population**	**Estimated births per month[a]**	**Average # facility births per month Jun-Aug 2015**	**Percent of estimated births delivered at EmOC facilities**
Group 1 (Intervention)					
Chambucha	Chambucha	15976	53	23	44.0
Hombo Nord	Chambucha	10083	34	44[b]	129.4
Lukaraba	Chambucha	10557	35	15	42.9
Musenge	Itebero	7018	23	14	60.9
Malembe	Itebero	6300	21	20	93.7
Mianga	Itebero	4710	16	16	100.0
Group 1 Subtotal					**78.5**
Group 2 (Control)					
Biruwe	Walikale	6561	22	14	65.2
Mundindi	Walikale	8126	27	17	61.7
Ndofia	Walikale	6040	20	14	70.0
Ntoto	Kibua	10413	35	5[b]	14.3
Byungu	Kibua	6026	20	_	_
Langira	Kibua	6045	20	2	10.0
Group 2 Subtotal					**44.2**

[a] DRC MoH calculates expected number of births per month in the population as 4% of the population (CBR) divided by 12

[b] Only 2 months of data available; average taken of 2 months

2. Percent of deliveries in facilities with Active Management of the Third Stage of Labor

Active Management of the Third Stage of Labor (AMSTL) is defined as completing three elements of care during a women's labor and delivery. These are provision of a uterotonic drug, uterine massage, and controlled cord traction. For the purpose of this study, AMSTL was defined as having two elements complete; delivery of a uterotonic drug (in DRC the recommended drug is oxytocin) and uterine massage. Data was taken from patient exit interviews (uterotonic drug) and partographs (uterine massage).

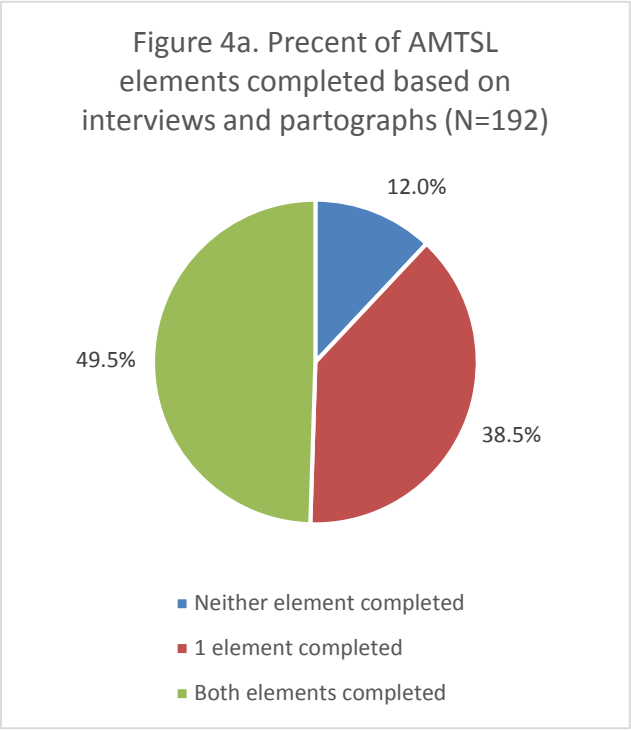
The frequency by which each element was provided to the patients is shown in Table 9.

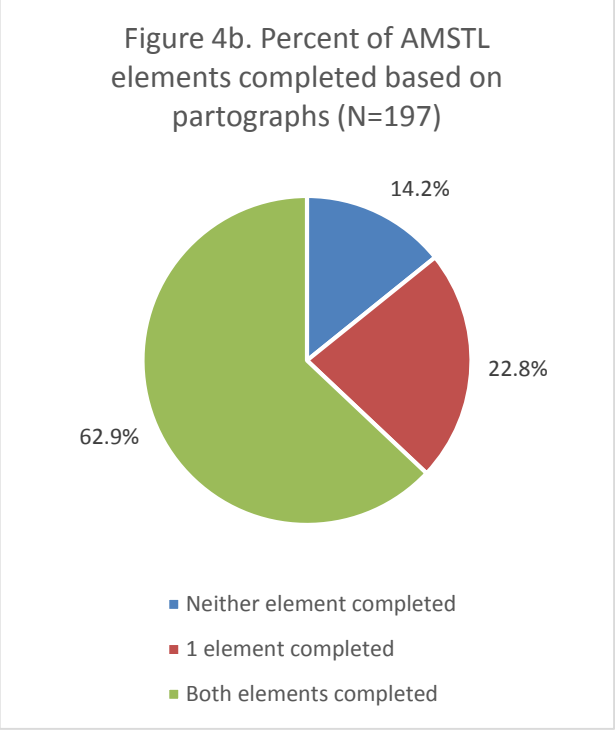
Table 9. Frequency of AMSTL elements (n=258)	
Characteristics	**N (%)**
Uterine Massage (reported by exit interview)	**N=258**
Yes	157 (60.9)
No	91 (35.2)
Don't know	6 (2.3)
Missing	4 (1.6)
Oxytocin (reported by partograph)	**N=247**
Yes	145 (58.7)
No	52 (21.1)
Missing	50 (20.2)

Women were considered to have received AMSTL only if both oxytocin and a uterine massage were provided. Of the 258 interviews that were conducted, 247 were able to be matched with a partograph.

Figure 4a presents the percent of deliveries with AMSTL based on uterine massage reported by interview and oxytocin reported by partograph. 95 women (49.5%) had both elements provided and are considered to have received AMSTL. Figure 4a also shows that 74 women (38.5%) received 1 of the elements and 23 women (12.0%) received neither element.

As a comparison, the percent of deliveries with AMSTL was also calculated based only on the partograph data. This is presented in Figure 4b. 124 women (62.6%) were reported as receiving both AMSTL elements. 45 women (22.7%) were reported as having only one element provided and 29 women (14.6%) were reported as having neither element of AMSTL provided.





Controlled Cord Traction

The third element of AMSTL, controlled cord traction, is only recommended in settings where skilled birth attendants oversee deliveries and have been trained on controlled cord traction. Controlled cord traction is a difficult element for women to report on whether it was provided or not. It was decided that controlled cord traction would not factor into the AMSTL indicator for the purposes of this study however it was included in all study instruments. The frequency by which controlled cord traction was reported to have been provided is listed by study instrument in Table 10. There are discrepancies between the three instruments. 199 women (77.1%) reported that they received controlled cord traction whereas based on matching partographs 151 women (61.1%) were reported to have received controlled cord traction.

Table 10. Controlled Cord Traction as reported by different tools	
Controlled Cord Traction by Interview*	**N=258**
Yes	199 (77.1)
No	20 (7.8)
Placenta delivered without assistance	27 (10.5)
Don't know	10 (3.9)
Missing	2 (0.8)
Controlled Cord Traction by Partograph	**N=247**
Yes	151 (61.1)
No	37 (15.0)
Not applicable	10 (4.0)
Missing	49 (19.8)
Controlled Cord Traction by Observation	**N=61**
Yes	30 (49.1)
No	15 (24.6)
Don't know	1 (1.6)
Missing	15 (24.6)

*Question in the interview was worded as follows: "Did the birth attendant help you deliver the placenta, that is, did he/she place his/her hand firmly on your lower abdomen with one hand and hold the umbilical cord in the other hand?"

3. Percent of vaginal deliveries in the facilities for which a partograph was completed

Of the interviews and observations conducted during the baseline data collection, 208 (77.8%) were matched to a partograph. These partographs were not all the most recent version, which was approved by the Ministry of Health in 2015 but distribution to most health centers was delayed.

4. Essential Newborn Care

There are multiple actions that are essential to quality newborn care. For the purposes of this study, three key actions were assessed to determine whether essential newborn care was provided. The three key actions are; (1) weighing of the newborn, (2) application of tetracycline to the newborn's eyes ("crede"), and (3) clean cord

care. These actions were selected based on their inclusion on partographs and the ability of observers to assess whether the actions had taken place. The frequency of provision of each of these elements of care, as reported by partographs, is listed in Table 11.

Table 11. Frequency of Essential Newborn Care elements (n=247)	
Characteristics	**N (%)**
Weighing of the newborn	
Yes	155 (62.8)
No	44 (17.8)
Missing	48 (19.4)
Crede	
Yes	109 (44.1)
No	88 (35.6)
Missing*	50 (20.2)
Clean Cord Care	
Yes	144 (58.3)
No	53 (21.5)
Missing*	50 (20.2)

*includes 1 "not applicable" response

Newborns were considered to have received essential newborn care if they received all three elements of care, as reported by their mother's partograph. 96 newborns (48.7%) received all three elements. Figure 5 also shows the percentage of newborns that received zero, one, or two elements of essential newborn care. As was the case with the AMSTL indicator, data is missing for 50 women due to incomplete partographs.

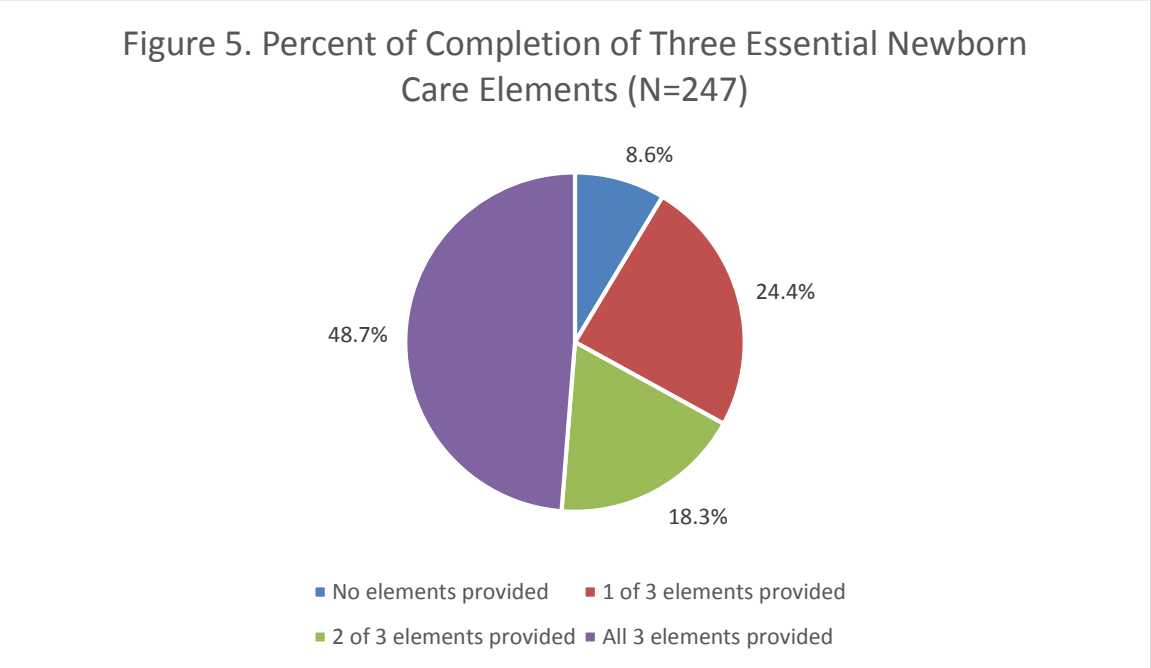


Table 12. Main Study Indicators	
Indicator	**N (%)**
Proportion of all births in EmOC facilities[1]	60.1%
Percent of deliveries in facilities with active management of the third stage of labor (AMSTL)[2]	49.5%
Percent of vaginal deliveries in the facilities for which a partograph was completed[2]	77.8%
Percent of newborns born in facilities who receive essential newborn care (ENC)[2]	48.7%

M. Percent Reporting of Key Indicators by Data Collection Method

Table 13. Comparison of Elements of AMSTL and Essential Newborn Care, by study instrument			
	Exit Interviews	**Partograph**	**Observations**
Indicator	**N=258**	**N=247**	**N=61**
Oxytocin	173 (67.1)	145 (58.7)	43 (70.5)
Uterine Massage	157 (60.9)	143 (57.9)	19 (31.1)
Controlled Cord Traction	199 (77.1)	151 (61.1)	30 (49.1)
Weight Recorded		155 (62.8)	31 (50.8)*
Tetracycline Application		109 (44.1)	21 (34.4)
Clean Cord Care	136 (52.7)	144 (58.3)	38 (62.3)
Breastfeeding within 1 hour of birth	139 (53.9)	123 (49.8)	24 (39.3)

*this was not observed, but checked in the partograph by the observer after the delivery