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The Uttar Pradesh technical Support Unit

Rolling Facility Survey
Results of Two Succesive Rounds

January 2017

The Uttar Pradesh Technical Support Unit

Rolling Facility Survey:

Results of Two Successive Rounds

25 High Priority Districts

Uttar Pradesh

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MESSAGE

The Uttar Pradesh Technical Support Unit (UP-TSU) provides an integrated and embedded techno-managerial support to the Govt. of Uttar Pradesh (GoUP) in order to improve planning, implementation and monitoring of health programmes in the 25 High Priority Districts (HPDs) of the state. In order to boost the GoUP's initiatives in upscaling coverage and quality of reproductive, maternal and child health services, the TSU helps in mobilizing the community demand through its structured grass-root level linkages supported by the Community Resource Persons (CRPs)/Block Community Supervisors (BCS), as well as in improving quality of health services provided by the public health facilities through onsite Nurse Mentors. In addition, the TSU also strengthens the state monitoring systems by improving the quality and use of HMIS/MCTS data.

The TSU's intervention in improving quality healthcare during intrapartum and immediate postpartum period (including essential newborn care) in public health facilities through the nurse-mentoring programme aims to help the state reduce maternal and neonatal mortality. The Rolling Facility Survey (RFS) periodically monitors the progress in the knowledge, skills and practices of nurses in the facilities of the intervention area, and helps making mid-course corrections in the nurse-mentoring programme.

The present report brings forth a comparative status of the maternal and newborn healthcare practices in public health facilities in the intervention area. The clinical practices of the nurses from the arrival of pregnant woman (for delivery) in the facility until two hours post-delivery are observed by trained research investigators. In addition, the report also provides the progress in the knowledge and skills of Staff Nurses/Auxiliary Nurse Midwives on the themes related to maternal and newborn healthcare.

We expect that the estimates and analyses based on the RFS data will be used by district and block health officials to develop and implement specific plans for the improvement of knowledge, skills and practices of health personnel in their respective areas.

(Arun Kumar Sinha)

Alok Kumar
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MESSAGE

The Uttar Pradesh Technical Support Unit (UP-TSU) has established concurrent monitoring system to provide periodic facility-based reliable estimates on the maternal and newborn healthcare indicators in 100 Blocks of the 25 High Priority Districts (HPDs) of Uttar Pradesh, in the form of Rolling Facility Survey (RFS). The two rounds of the RFS, which were conducted during the second quarter of 2015 and the first quarter of 2016, have been successfully completed. The key findings are summarised in this brief report, which reflect a comparison of facility-based estimates on key maternal and newborn healthcare practices along with the assessment of knowledge and skills of nurses in the respective clinical areas at two points in time in the intervention area.

The RFS affirms the importance of strengthening the quality of intrapartum, immediate post-partum and newborn healthcare services in public health facilities in order to achieve the desired progress in the reduction of maternal and neonatal mortality in the state.

The findings suggest that the intrapartum and newborn healthcare practices in the public health facilities have considerably improved between the two rounds of the RFS. However, the skills of the nurses in certain domains have not improved uniformly. I hope the TSU team will be working on this aspect, which will be reflected in future facility surveys.

I extend my heartiest compliments to the UP-TSU team for coming up with a time-relevant, scientific and systematic document highlighting the status of knowledge, skills and practices of healthcare providers in the state. Tracking healthcare providers' practices/activities or capabilities is an important exercise which needs to be continued until the accomplishment of desired progress in maternal and newborn health.

(Alok Kumar)

Dr. Neena Gupta
Director General

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MESSAGE

I am happy to extend my support for the first official report published on the estimates of two rounds of the Rolling Facility Survey (RFS), designed and implemented by the Uttar Pradesh Technical Support Unit (UP-TSU). This report provides pertinent information on the status and progress in the maternal and newborn healthcare services being provided by the public health facilities in 100 TSU blocks of 25 High Priority Districts (HPDs) of the state. In addition, it provides a fair assessment of knowledge and skills of the nurses providing services in those health facilities.

During a span of nearly six months, the clinical practices related to maternal and newborn healthcare have shown considerable improvements in the representative health facilities. However, concerted efforts are required to further improve the knowledge and skills of healthcare providers, as well as to improve the availability of essential drugs, equipment, and supplies in public health facilities.

I urge the district and block health officials of the 100 TSU blocks to use this data for improving health outcomes in their respective areas, focusing equally on community health workers, facility improvements, and data supply systems.

My sincere thanks to the UP-TSU for making this data available for further planning and implementation of key RMNCH+A strategies.

(Dr. Neena Gupta)

Vikas Gothalwal
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MESSAGE

The Uttar Pradesh Technical Support Unit (UP TSU) has setup a concurrent monitoring system in the 25 High Priority Districts (HPDs) of the state. The objective is to provide a critical RMNCH+A outcome and output (coverage) level indictors for community and facility level interventions.

The purpose of having a concurrent monitoring system is to fill the gap in the existing data systems (e.g., HMIS & MCTS). This system also provides an opportunity to validate the existing data system. The TSU data provides indicators relating to practices and behaviours of providers and beneficiaries; and helps in reviewing and planning to become more result-oriented rather than process-driven.

The TSU conducts the Community Behaviour Tracking Survey (CBTS) at community level and the Rolling Facility Survey (RFS) at facility level. The CBTS is designed to track critical RMNCH+A behaviours and coverage of health programs at the community level. The RFS helps in tracking the knowledge, skills, and practices of healthcare providers and enable them to deliver critical RMNCH+A services at Community Health Centres (CHCs), Primary Health Centres PHCs), and Sub Centres (SCs).

This report comprises the findings of the first two successive rounds of the RFS conducted during 2015-16 within a span of six months. The report provides comparative and detailed estimates on key intrapartum, immediate post-partum and newborn care practices provided by the nurses along with their knowledge and skills in representative health facilities of 100 TSU blocks.

The report highlights the changes made in the knowledge, skills and practices of Staff Nurses (SNs) and Auxiliary Nurse Midwives (ANMs) through the nurse-mentoring approach across the important phases of labour including the initial assessment of the pregnant woman arrived in the facility, labour monitoring, delivery and active management of the third stage of labour, and the management of the fourth stage of labour, along with the overall infection prevention practices in the facility.

We expect this report to bring attention to the need for much-focused facility level intervention strategies for better provision of maternal and newborn healthcare services to improve the state level performance in a limited time period.

(Vikas Gothalwal)

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At the outset, the UP-TSU is grateful to the Bill & Melinda Gates Foundation (BMGF) for providing financial support to the programme monitoring activities and conducting the RFS in 25 High Priority Districts (HPDs) of Uttar Pradesh. The TSU also extends its sincere gratitude to the Department of Medical, Health and Family Welfare, Government of Uttar Pradesh (GoUP) and National Health Mission (NHM), Uttar Pradesh for extending their support for the successful implementation of the RFS. However, the BMGF and GoUP do not fully endorse all of the contents of this report, nor does the report necessarily represent their views or opinions. The estimates, statements and recommendations contained within this report are primarily of the contributors of this report from the UP-TSU.

The TSU gratefully acknowledges the immense help received from **Dr. Lisa Avery**, **Dr. Maryanne Crockett**, **Dr. Janet Bradley**, and **Dr. Lorine Pelly** from the University of Manitoba (UoM) in developing the different schedules of the RFS. In addition, special thanks are also due to the Monitoring, Learning and Evaluation (MLE) partners of the UP-TSU including SAMBODHI for providing their support for the development and implementation of the RFS.

The TSU acknowledges the guidance and support provided by **Dr. Sanjeev Kumar** (Team Leader, Technical, UP-TSU), **Dr. Seema Tandon** (Team Leader, FRU, UP-TSU), **Dr. Sudha** (Senior Gynecologist, Ram Manohar Lohia Hospital [RMLH], Lucknow), **Dr. Lily Singh** (Chief Medical Superintendent, RMLH), **Dr. Sarita Saxena** (Medical Superintendent, RMLH), **Dr. Savita Bhatt** (Superintendent In-Charge, Virangana Avanti Bai Hospital [VABH], Lucknow), **Dr. Salman Khan** (Senior Pediatrician, VABH), **Dr. Faizan** (Senior Pediatrician, VABH), and **Dr. Santosh Singh** (Technical Specialist, Quality, EngenderHealth) to the Research Investigators (RIs) and Research Coordinators (RCs) of the RFS. The TSU gratefully acknowledges the help and cooperation provided by the administration and the Staffs of the VABH, Lucknow during the three weeks of training programme conducted for RIs and RCs before the both rounds of the RFS.

Thanks are also due to the Medical Officers In-Charge (MOIC) and the Facility Staffs (including Staff Nurses/Auxiliary Nurse Midwives) of the surveyed facilities and onsite Nurse-Mentors, District Technical Specialists, and Zonal Technical Specialists of the UP-TSU for their cooperation and support during both the rounds of the RFS.

The data collection during both the rounds of the RFS was performed using a computer tablet and Open Data Kit (ODK) based programme. The ODK based programme was efficiently designed and developed by the Peeply Technologies Pvt. Ltd. (Social Cops), New Delhi. The TSU highly appreciates the hard work and efficiency shown by the team members of the Social Cops in the management of digital data collection.

This report also went through a systematic technical review by a number of technical experts, specialized in various domains of maternal, newborn and child health including **Dr. Krishnamurthy Jayanna** (Senior Technical Advisor, Technical Team, UP-TSU) from the UoM, Dr. Sanjeev Kumar, Dr. Seema Tandon, Dr. Vikas R. Pandey, and Dr. Surendra Gupta from the UP-TSU. The TSU appreciates their comments and suggestions on the earlier drafts of this report, which immensely helped in further improving its content.

The TSU appreciates and acknowledge the untiring efforts, interest, and initiative taken by all the members of the Monitoring and Evaluation (M & E) Team including Mr. Nirmal Kumar Pradhan, Mr. Bidyadhar Dehury, Mr. Shivendra Singh, Mr. Anand Bhushan Tripathi, Mr. Huzaifa Bilal, Mr. Kartikeyan L., Mr. Gundu Rao Desai, Mr. Mayank Kumar Singh and Ms. Ayushi Srivastava for the successful completion of the two rounds of the RFS. Sincere thanks are also extended to the UP-TSU staffs in various departments, i.e., Human Resource, Administration, and Finance, as well as the Technical Team, Programme Intervention.

Contents

Executive Summary

To meet the data requirements for evidence-based programme planning for improved service delivery system at government health facilities, the Uttar Pradesh Technical Support Unit (UP-TSU) designed a periodic rolling sample survey, the Rolling Facility Survey (RFS), which canvasses knowledge, skills and practices of staff nurses (SNs) and Auxiliary Nurse Midwives (ANMs). The TSU focuses on improving quality of service delivery through onsite nurse mentors, mini-skill-labs at designated facilities and by introducing clinical case sheets (i.e., a job aid for SN/ANM) for strengthening identification and management of complications. The first round of RFS (RFS-1) was implemented during February-August 2015 in selected facilities from the 100 blocks of 25 High Priority Districts (HPDs). The second round of RFS (RFS-2) was conducted after six months during February-April 2016 following the same design.

The RFS includes five critical domains that are relevant for improvement in maternal and newborn care: (1) Initial assessment of critical vital signs and complications; (2) Labour monitoring; (3) Active management of third stage of labour (AMTSL) and essential newborn care; (4) Fourth stage of labour: management and counselling for maternal and newborn care; and (5) Infection prevention. The executive summary provides an overview of key indicators from initial two successive surveys conducted during 2015-16 that are relevant to service delivery mechanisms as far as knowledge, skills and practices of SNs and ANMs in the above-mentioned five critical domains are concerned. The number of facilities covered, along with the number of SNs/ANMs observed and assessed for their clinical practices, skills and knowledge are outlined by RFS round in Table ES-1.

Table ES-1. Facilities and SNs/ANMs observed and assessed

	RFS-1	RFS-2
# of facilities covered	45	46
# of SNs/ANMs assessed	193	178
Observed for practices (%)*	64	85
Assessed for skills (%)*	78	90
Assessed for knowledge (%)*	87	92

*% of SNs/ANMs

Initial Assessment: The practices, knowledge and skills of identifying various complications during the initial assessment and of managing the complications as per protocol are essential for saving the lives of both the mothers and the newborns. Overall, 65% deliveries were attended to for any of the critical vital signs i.e., temperature, BP, pulse, respiratory rate and FHR during RFS-2 —registering a considerable increase from deliveries (30%) attended to for the same during RFS-1. While there is an improvement in measurement of all critical vital signs of deliveries (none in RFS-1 to 5% in RFS-2) by the attending nurses, the level still remained low and needs focus on improving these practices.

When the nurses were assessed for certain clinical skills, around 51% of the nurses during RFS-2 could demonstrate any of the steps/tasks involved in the preparation of loading dose of Magnesium Sulphate, which was estimated only 30% during RFS-1. At the knowledge front, an improvement of 7% points was registered among the nurses who could mention any of the critical danger signs in a pregnant woman arriving at the facility for delivery between the two rounds of the RFS.

Labour Monitoring: The continued monitoring of the second stage of labour, also known as "the pushing stage", using a partograph (a graphic tool) becomes a crucial practice for health practitioners to follow, especially for early identification of complications and their timely management/referral. Partograph filling has not been observed as a consistent practice in public health facilities. However, during the two rounds of the facility survey, a moderate improvement of 5% points was observed in the cases in which the nurse initiated the partograph. Considerable improvements were also observed in the knowledge of the nurses regarding the correct frequency with which the specific parameters should be plotted on the partograph between the two rounds of the survey. An improvement of more than 30% points was observed in the level of knowledge among nurses regarding the plotting of FHR, cervical dilatation, contractions, pulse, BP and temperature in correct frequency between the two rounds of the survey. In addition, verbal abuse of women during labour was observed in 10% of the cases in both the rounds.

AMTSL and Essential Newborn Care: AMTSL is a procedure that prevents postpartum hemorrhage (PPH) and should be done for all deliveries. Survey estimates show an encouraging trend as in 66% of the cases during RFS-2, all the 3 components of AMTSL were performed as per protocol compared to 23% cases during RFS-1. Almost 83% of the nurses were observed correctly demonstrating any of the steps involved in AMTSL during RFS-2 (77% in RFS-1). Similarly, an improvement of 17% points (5% in RFS-1 to 22% in RFS-2) was observed among nurses who could correctly demonstrate critical steps involved in AMTSL between the two rounds of the survey. In addition, the knowledge of the nurses regarding the components, steps, timing and doses involved in AMTSL also improved considerably — a two fold increase was observed in the proportion of nurses who were aware with all the three steps involved in AMTSL between the two rounds of the survey.

The essential newborn care practices also improved considerably between the two rounds of the RFS— an improvement of 46% points (41% in RFS-1 to 87% in RFS-2) was observed in cord clamping practice (as per protocol) among the nurses. Similarly, a few newborn care practices such as skin to skin care, initiation of breastfeeding and weighing of the newborn improved by 38% points (19% in RFS-1 to 57% in RFS-2) , 38% points (27% in RFS-1 to 65% in RFS-2) and 27% points (50% in RFS-1 to 77% in RFS-2) between the two rounds of the survey, respectively. In regard to newborn care skills among the nurses, the desired improvements have yet to be achieved. Although the proportion of the nurses who correctly demonstrated any of the steps involved in the essential newborn care improved from 76% during RFS-1 to 84% during RFS-2; the proportion of the nurses who correctly demonstrated all the steps only improved by 1% points. On the other hand, the proportion of

nurses who correctly demonstrated all clinically critical steps involved in the essential newborn care improved from 29% during RFS-1 to 51% during RFS-2.

Management of Fourth Stage of Labour: The first 2 hours after delivery is an important period of half-hourly assessments, as most maternal and newborn deaths occur during the first few hours. However, the practices related to maternal and newborn observations in the fourth stage of labour were observed to be poor during RFS-1, which slightly improved in RFS-2. Despite a two-fold/three-fold improvement in the practices observed from the initial level (RFS-1), there were still less than 30% of the deliveries in which major vitals (except vaginal examination: 37%) were examined at least once within 2 hours. About one-fifth of the newborns were observed at least once for temperature, heart rate and respiratory rate during RFS-2. There has been a two-fold increase in the proportion of mothers receiving counselling on any of the five topics: maternal and newborn danger signs, family planning, breastfeeding and cord care, between the two rounds of the RFS.

In skills assessment, where none of the SNs/ANMs during RFS-1 could correctly demonstrate all the steps/tasks involved in the management of PPH, it improved by 2% points during RFS-2. About 81% of the nurses during RFS-2 could demonstrate any of the skills involved in family planning counselling, which was estimated nearly 44% in RFS-1. A slight improvement of 5% points was observed among nurses who could correctly demonstrate all the steps/tasks involved in the insertion of PPIUCD between the two rounds of the RFS. In addition, more than two-fold improvements in the proportion of nurses, who were aware of the recommended frequency of measurement of vital signs of the mother and the newborn during the fourth stage, were observed between the two rounds of the RFS.

Infection Prevention: Poor infection prevention practices in labour and delivery units can cause puerperal sepsis, neonatal sepsis and other infections to newborn and mother. It was observed that in majority of the cases (87%) during RFS-2, the nurses wore gloves before pervaginal examination, whereas the level of combined practice of washing hands and wearing gloves before the pervaginal examination was found low. On the other hand, the handwashing practice among SNs/ANMs before delivery improved considerably from 46% in RFS-1 to 76% in RFS-2. About 81% of the nurses could correctly demonstrate any of the recommended steps involved in clinical handwashing during RFS-2. However, nearly 14% of the nurses could correctly demonstrate all the steps of clinical handwashing – registering an improvement of 7% points over the round-1 estimate. Nearly four-fifth of the nurses (an improvement of nearly 16% points over the round-1 estimate) were observed correctly demonstrating any of the steps involved in the preparation of 0.5% Chlorine solution during RFS-2. In addition, although nearly 38% of the SNs/ANMs could correctly demonstrate all the steps involved in the preparation of 0.5% Chlorine solution during RFS-2, it registered a two-fold increase over the round-1 estimate.

Summary and Recommendations: Strengthening the supply side components in the health system is destined to bring a positive change in the health outcomes of any geography. This brief

report presents a summative state of healthcare provided by the public health facilities to prospective mothers and newborns in the state. Comparing the findings of the two rounds of the facility survey in this report also provides an impact assessment of the quality improvement programme being intervened through nurse mentoring. An overview of different indicators of clinical practices performed by SNs/ANMs and their skills and knowledge at different stages of labour and newborn care at two different periods presents a clear indication of improvement in almost all domains of facility provisions. However, there is a wide platform to continuously improve, mentor and monitor the practices and skill/knowledge of healthcare providers in order to help the state achieve its RMNCH+A goals. Although there is need of improvement at all the aspects of facility services, nonetheless the immediate priority areas to focus on includes the initial assessment of the deliveries (especially measuring pulse, respiratory rate, foetal heart rate, and rapid assessment of complications such as severe headache, blurred vision and fits/convulsions), partograph plotting, and newborn care components such as skin to skin care and initiation of breastfeeding within the first hour after birth. In addition, the recommended assessment of mother's vitals and newborn care within 2 hours after delivery (including the basic practices of infection prevention) needs determined efforts too.

The Uttar Pradesh Technical Support Unit

Rolling Facility Survey:

Results of Two Successive Rounds

INTRODUCTION

Background

Concurrent monitoring systems, that are independent of the routine data collected by the service providers, are required to validate the routine data systems as well as to provide population-based indicators for reviewing programme gaps and to take corrective actions. The Uttar Pradesh Technical Support Unit (UP-TSU), the details of which is provided in Annexure A, has established a periodic rolling sample survey, called the Rolling Facility Survey (RFS), to support the Government of Uttar Pradesh (GoUP) in evidence-based service delivery planning. The UP-TSU is supporting the service delivery improvement efforts of GoUP through onsite nurse mentors, mini skill labs at designated facilities and by rolling out clinical case sheets for strengthening identification and management of complications. The RFS provides feedback that assists in guiding that process as it collects information on knowledge, skills and practices of the Staff Nurses (SNs)/Auxiliary Nurse Midwives (ANMs) who are conducting deliveries at facilities throughout the 100 TSU focus blocks of the 25 High Priority Districts (HPDs) in Uttar Pradesh. The RFS is conducted twice a year and facilitates evidence-based quality improvements, tracking outcomes at the facility level, and affecting mid-course corrections in strategies/service delivery mechanisms. The first round of the RFS (RFS-1) was initiated in the 100 TSU focus blocks in April 2015 and was completed in mid-August 2015. The second round of the RFS (RFS-2) followed up the same activities during February-April 2016. The key findings of the last two rounds of the RFS highlighting the trends, patterns and their implications are presented in this brief report.

Sampling

The samples required for direct observation of deliveries determined the selection of facilities. The minimum sample size for delivery observations was calculated to be 387, which is an average of 77 deliveries/zone (the 25 high priority districts are grouped into 5 zones, see Annexure B). The sample size was further increased to 100 deliveries per zone to adequately represent different types of facilities and then adjusted for a 10% non-response rate. Therefore the total required sample size was estimated as 550 delivery observations.

The sampling frame for the study included the facilities conducting deliveries in the 100 focus blocks in 25 HPDs. According to the Health Management Information System (HMIS) reports for the period of April-

December 2014, there were 148 facilities (reporting at least one delivery per day) with an average of 4 deliveries per day. Assuming an average of 4 deliveries per day and planning the delivery observations for 3 days per facility, the number of facilities to get the required number of deliveries for observation was calculated as 46. From the list of 148 facilities that had reported at least one delivery per day, the required 46 facilities were selected using Probability Proportional to Size (PPS) sampling method, as this method allowed for a greater probability of selection of facilities with high delivery-load. In RFS-1, the selected facilities included 35 Community Health Centres (CHCs) or Block Primary Health Centres (BPHCs), 2 Primary Health Centres (PHCs) or Additional PHCs and 8 Sub Centres (SCs). Following the same methodology, 30 CHCs/BPHCs, 8 PHCs/APHCs and 8 SCs were included in RFS-2. Twenty three facilities were kept common in both the rounds of the RFS.

All pregnant women (with >20 weeks gestation) who arrived at selected facilities either during the 1st or the 2nd stage of labour were included for delivery observation, with the goal of observing approximately 12 deliveries per facility. The period of observation was from the arrival of the woman at the facility until 2 hours postpartum or discharge or a referral.

Survey Tools

Five different survey tools were used as mentioned below:

1. Identifiers — details of the facility, staff and the SNs and ANMs who participated in either the skill, knowledge and direct observation sessions
2. Facility observation checklist — to determine the availability of infrastructure, drugs, equipment and supplies in the labour room and newborn care corner
3. Checklist for delivery observation — from arrival of the patient to the discharge or referral or 2 hours after the delivery, whichever is earlier. Checklist included observation of the assessment and management of both the mother and the neonate.
4. Checklists for skill demonstration sessions using mannequins and patient simulation – for 16 clinical examinations and procedures
5. Knowledge questionnaire — includes structured close-ended questions to assess the knowledge of SNs and ANMs

The completed two rounds of the RFS focused on information of knowledge, skills and practices of SNs/ANMs in the following critical domains:

1. Initial assessment: Rapid assessment of critical vital signs and complications on presentation to facility
2. Labour monitoring: Partograph and practices during pushing
3. Delivery and third stage of labour including the essential/routine care of the newborn
4. Fourth stage of labour
5. Maternal and newborn complications
6. Patient discharge/referral

Data Collection

Trained Research Investigator (RI), was provided with a tablet computer for data collection. RIs submitted completed schedules into the web based server directly from the field. The TSU research team based in Lucknow monitored the field work on a daily basis downloading the data. Subsequently, the data was analysed using STATA 13.0 statistical software.

Six teams, each consisting of 2 female RIs and one male supervisor were recruited. These RIs were recruited based on their professional training in nursing from

accredited institutions. They were further trained (specifically for the purpose of making them aware of research objectives and mechanism) for a period of 3 weeks of classroom training including 4 days of observed field practice before initiating the data collection process in both the rounds. RIs were then sent for data collection at each facility and the team worked in 12-hour shifts covering 24 hours of field work-days.

Sample Implementation

As described earlier, 46 facilities were selected to study knowledge, practice and skills of SNs and ANMs. While all of them were covered in RFS-2, one facility (Sub Centre) was not canvassed in RFS-1, because the nurses did not give their consents to the RIs to observe their practices, knowledge and skills.

A total of 193 and 178 nurses were listed in the selected facilities as delivery service providers during RFS-1 and RFS-2 respectively (Table 1). While in RFS-2, about 92% of the nurses were covered for the assessment of knowledge, 90% for skills and 85% for practice, it was about 87%, 78% and 64%, respectively in RFS-1. The reasons for non-response included refusal to participate in the survey, and the non-availability of the staff during the survey days.

Table 1: Distribution of SNs and ANMs covered by facility type, RFS-1 and RFS-2, 2015-16

	RFS-1					RFS-2			
	CHC/BPHC (28)*	PHC/APHC (10)	SC (7)	Total (45)		CHC/BPHC (30)	PHC/APHC (8)	SC (8)	Total (46)
SNs									
# in position	141	7	0	148		111	23	3	137
# covered for practice	95	5	0	100		94	19	2	115
# covered for skill	121	3	0	124		102	23	3	128
# covered for knowledge	128	5	0	133		105	23	3	131
ANMs									
# in position	33	3	9	45		21	9	11	41
# covered for practice	16	2	5	23		16	7	8	31
# covered for skill	27	2	2	31		14	8	10	32
# covered for knowledge	26	2	7	35		15	8	10	35
Total SN/ANM									
# in position	174	10	9	193		132	32	14	178
# covered for practice	111	7	5	123		113	27	11	151
# covered for skill	148	5	2	155		116	31	13	160
# covered for knowledge	154	7	7	168		120	31	13	164

*No. of facilities

A total of 535 and 604 deliveries were observed during RFS-1 and RFS-2 respectively (Table 2). A majority of the deliveries observed were from CHCs/PHCs (89% during RFS-1 and 69% during RFS-2) as majority of the facilities included were CHCs/PHCs (28 in RFS-1 and 30 in RFS-2) and they receive large number of deliveries compared to other types of facilities (PHCs/APHCs and SCs). The share of deliveries observed from

Table 2: Distribution of deliveries observed by facility type, RFS-1 and RFS-2, 2015-16

		CHC/BPHC	PHC/APHC	SC	Total
Total	RFS-1	478 (89.3%)	23 (4.3%)	34 (6.4%)	535 (100%)
	RFS-2	418 (69.2%)	111 (18.4%)	75 (12.4%)	604 (100%)
Arrival in 1st stage of delivery	RFS-1	249 (52.1%)	19 (82.6%)	21 (61.8%)	289 (54.0%)
	RFS-2	196 (46.9%)	83 (74.8%)	48 (64.7%)	327 (54.1%)
Arrival in 2nd stage of delivery	RFS-1	229 (47.9%)	4 (17.4%)	13 (38.2%)	246 (46.0)
	RFS-2	222 (53.1%)	28 (25.2%)	27 (36.0%)	277 (45.9%)
Mean # of deliveries observed per facility	RFS-1	13.7	11.5	4.9	11.9
	RFS-2	13.9	13.9	9.4	13.1

Table 3: Distribution of SNs and ANMs by selected background characteristics, RFS-1 and RFS-2, 2015-16

	RFS-1			RFS-2		
	SN	ANM	Total	SN	ANM	Total
Facility						
CHC/BPHC	96.5	73.8	91.4	81.2	47.1	74.3
PHC/APHC	3.5	4.8	3.8	16.5	23.5	18.0
SC	0	21.4	4.8	2.3	29.4	7.8
Age						
<30 years	42.8	7.3	34.6	42.9	8.8	35.9
30-39 years	36.2	12.2	30.7	40.6	23.5	37.1
≥ 40 years	21.0	80.5	34.6	16.5	67.7	27.0
Median (Mean) age	30 (32)	49 (47)	33 (36)	31 (33)	50 (46)	32 (36)
Experience						
<5 years	52.1	14.3	43.6	55.6	17.7	47.9
5-9 years	27.1	14.3	24.2	21.8	14.7	20.4
≥ 10 years	20.8	71.4	32.3	22.6	67.7	31.7
Average years of experience	7	19	9	7	19	9
Trained in SBA	29.9	42.9	32.8	39.1	44.1	40.1
Trained by NM						
Temperature	63.9	63.6	63.7	92.6	93.1	92.7
Blood pressure	64.5	61.1	63.7	71.1	69.0	70.7
Haemoglobin	28.1	47.2	32.5	47.1	48.3	47.3
Urine for protein	24.0	36.1	26.8	45.5	44.8	45.3
Respiratory rate	14.9	11.1	14.0	60.3	41.4	56.7
Foetal heart rate	43.0	38.9	42.0	66.1	86.2	70.0
Partograph	67.8	44.4	62.4	71.9	69.0	71.3
Abdominal examination	53.7	50	52.9	69.4	69.0	69.3
PV examination	52.9	63.9	55.4	62.0	58.6	61.3
AMTSL	43.0	52.8	45.2	57.9	44.8	55.3
Essential newborn care	46.3	50.0	47.1	57.0	55.2	56.7
Maternal complications	17.4	22.2	18.5	31.4	17.2	28.7
Newborn complications	13.1	16.7	14.7	27.3	17.2	25.3
Not trained by NM	16.0	14.3	15.6	9.0	14.7	10.2
Received any training at the mini-skill lab	47.2	40.5	45.7	85.1	75.9	83.3
N	144	42	186	133	34	167

PHCs/APHCs (4% in RFS-1 and 18% in RFS-2) and SCs (6% in RFS-1 and 12% in RFS-2) were less because of a few number of facilities covered, and less deliveries take place in these facilities.

Profile of SNs and ANMs

Background characteristics of SNs and ANMs, who were contacted and had conducted delivery during the survey period were assessed. Over 90% of the SNs and ANMs in the sample belonged to CHCs/BPHCs in RFS-1, whereas it was 74% in RFS-2. In round 2, PHCs/APHCs contributed about 18% of SNs/ANMs and SCs contributed the rest 8% (Table 3).

On an average, a SN/ANM was found 36 years old in both the rounds, though 73% of the nurses were of age less than 40 years during RFS-2 as compared to 65% during RFS-1. The ANMs were relatively older compared to the SNs (ANMs were 19 years older than SNs). Accordingly, the ANMs (average experience of 19 years) were more experienced than the SNs (average experience of 7 years).

Around 40% of the SNs/ANMs reported having received training in SBA during RFS-2 as compared to 32% during RFS-1, and the proportion of ANMs trained in SBA were higher compared to SNs. An increase of nearly 6% points was observed among SNs/ANMs who received any training/support from the nurse mentors between the two rounds of the RFS, which was already as high as 84% in the first round. Besides, there was a tremendous increase in the proportion of SNs/ANMs who reported having received any training at the mini-skill lab in RFS-2 (83%) compared to RFS-1 (46%). There were 90% of the SNs/ANMs received mentoring in the labour room in both the rounds.

In RFS-1, over 60% of the SNs/ANMs were found trained/supported in measuring temperature, blood pressure, and partograph, while less than 20% were observed trained/supported in measuring respiratory rate and management of maternal and newborn complications. These proportions were found being improved in RFS-2 in all the aspects of mentoring provided to SNs/ANMs. In addition, seven more components of nurse mentoring were observed during RFS-2, in which a substantial proportion of SNs/ANMs was observed having received training in normal delivery (62%), management of PPH (49%) and newborn resuscitation (41%).

It would be worth mentioning that the background profile for 7 SNs/ANMs were not available in RFS-1 since they were absent during the visit of the survey team and none of the SNs from the SCs were covered in the survey.

Organization of the Report

The key findings of the two rounds of the RFS on practices, skills and knowledge of the nurses are organized in four major divisions in this report following important phases of labour. In addition, a separate section is dedicated to infection prevention practices in health facilities and related skills among the nurses. Normal labour is the spontaneous process of expulsion of the fetus and placenta. It consists the following four stages:

- The first stage is from the onset of true labour pains to the full dilatation of cervix (10 cms)
- The second stage is from full dilatation to delivery of the fetus
- The third stage is from expulsion of fetus to delivery of the placenta
- The fourth stage is from delivery of placenta up to 2 hours of delivery

INITIAL ASSESSMENT

It is strongly recommended for a health personnel to have an initial assessment of a woman who is more than 20 weeks pregnant and comes to the facility with pregnancy-related problems or in labour, which includes taking a history, examining the patient (abdominally and vaginally), doing laboratory and other investigations and making an overall assessment of the state of her health. This assessment is undertaken to help distinguish normal pregnancy from pregnancy/labour with complication. Aspects of the initial assessment can help identify complications, or identify women (or fetuses) that might be at risk of developing complications. As the case may be, the initial assessment alerts staff to take immediate action and appropriately manage the woman so that her condition is stabilized before referral to a higher level center for further treatment.

Measurement of vital signs on arrival including temperature, blood pressure, pulse, respiratory rate and FHR are critical to identify complications and taking immediate action without wasting time to manage and refer. Similarly, the knowledge and skills of identifying various complications during the initial assessment and of managing the complications as per protocol are essential for saving the lives of both the mothers and the newborns.

The RFS observed the practices, skills and knowledge of the health provider around initial assessment – whether vitals were measured when the woman in labour arrived at the facility, if the provider SN/ANM has skills of taking these measurements/testing and if the provider has the necessary skills and knowledge of what to do when a complication is identified during the initial assessment.

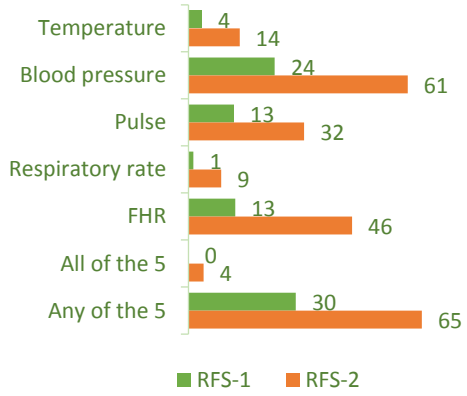
Practices: Initial Assessment

A total of 289 and 327 cases were observed during the initial assessment, where the woman had arrived at the first stage of labour during RFS-1 and RFS-2, respectively. In RFS-1, only for 16% cases, the provider had initiated a case sheet, which increased to be nearly 74% cases in RFS-2.

Practice: Measuring Vital Signs

There has been a considerable improvement in SNs/ANMs practicing/measuring critical vital signs such as temperature, blood pressure (BP), pulse, respiratory rate, foetal heart rate (FHR) of women on arrival for delivery between the two rounds of the RFS (Figure 1).

Figure 1: % of the directly observed stage 1 deliveries where the nurse rapidly assessed for critical vital signs, RFS-1 (N=289) and RFS-2 (N=327), 2015-16



An improvement of nearly 35% points in the proportion of deliveries admitted in the first stage of labour – where the attending nurses measured any of the critical vital signs, e.g., temperature, BP, pulse, respiratory rate and FHR – was observed between the two rounds of the survey. Further, nearly 4% of the deliveries were attended to measure all critical vital signs in RFS-2, compared to none in RFS-1. The initial assessment of the pregnant women for BP (37% points), FHR (33% points) and pulse (19% points) were

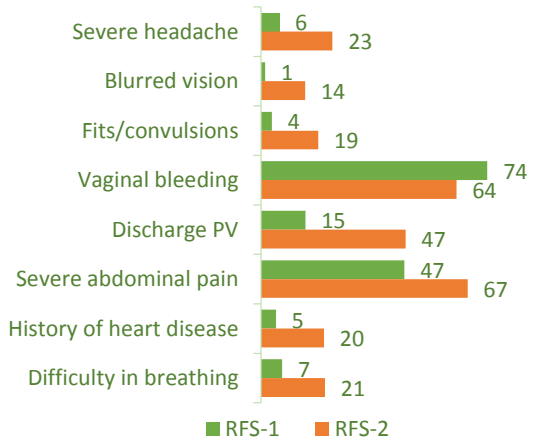
estimated to be improved substantially between the two rounds of the RFS.

Practice: Rapid Assessment for Complications

When a woman arrives at the facility in labour, it is important to ascertain immediately what are her symptoms and presenting complaints, if any. It is important not just to ask an open-ended question, as she might not divulge everything she is feeling. So, nurses need to ask every one about all the symptoms. Presenting complaints can alert the nurse to danger signs and help differentiate normal from risky pregnancy/labour.

In RFS-1, except for assessing vaginal bleeding (74%) and severe abdominal pain (47%) among women arriving for the first stage of labour, a very few women were assessed for complications/obstetric emergencies such as severe headache, blurred vision, fits/convulsions, foul discharge from vagina, history of heart disease or other major illnesses and difficulty in breathing (Figure 2).

Figure 2: % of the directly observed stage 1 deliveries where the nurse rapidly assessed for specific complications, RFS-1 (N=289) and RFS-2 (N=327), 2015-16



In RFS-2, the percent of women arriving at the first stage of labour, who were assessed for various complications/obstetric emergencies, increased from the level observed in RFS-1, except for vaginal bleeding.

Practice: Gestational Age Calculation

Gestational age helps the provider to assess the baby is preterm (<37 weeks), term (37-42 weeks gestation) or post-term (> 42 weeks). When a staff suspects the woman has a gestational age <37 weeks and is in labour or has ruptured membranes, a manual abdominal assessment is suggested. If the provider is not able to assess the gestational age and the woman is in labour or has ruptured membranes through abdominal examination, the woman needs to be referred to a place that can deal with premature babies.

If the provider thinks the gestational age is between 24-34 weeks and the woman is in labour or has ruptured membranes, this is an indication to start corticosteroids. Premature labour might also indicate other problems (such as PIH, twin pregnancy, asphyxia).

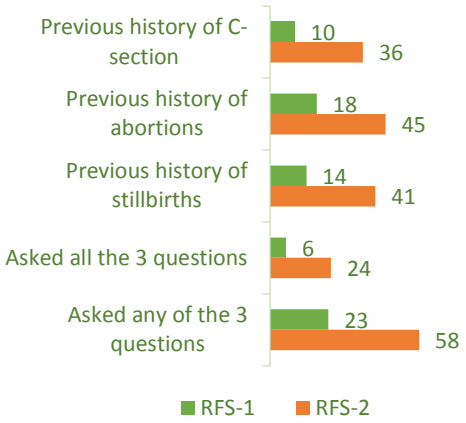
In the surveyed facilities, an improvement of 29% points was observed in the cases for which the gestational age was calculated between the two rounds of the survey. In RFS-1, where only 10% of the cases attended to were calculated for the gestational age, the level improved to 39% in RFS-2.

Practice: Previous Obstetric History Taking

Woman's past history of pregnancies, abortions and deliveries helps health personnel to decide additional treatment/care/referral to a higher level facility for the present pregnancy. Nurses need to know about all the previous

pregnancies of the woman and about their outcomes.

Figure 3: % of the directly observed stage 1 deliveries where the nurse asked specific questions about previous obstetric history, RFS-1 (N=289) and RFS-2 (N=327), 2015-16



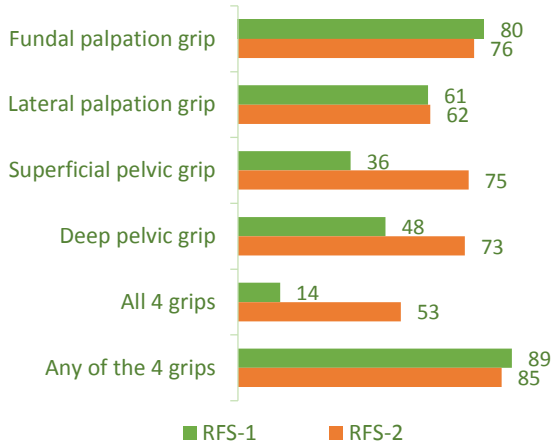
An improvement of nearly 35% points was observed in the cases between the two rounds of the RFS, in which the attending nurses asked any of the three questions related to previous obstetric history: previous history of C-section, abortion and still birth (Figure 3). However, despite registering an improvement of 18% points in the cases for which all three questions related to previous obstetric history were asked, between the two rounds of the RFS, in only one fourth of the cases, all three questions about previous obstetric history were asked in RFS-2.

Practice: Abdominal Examination

The abdominal examination provides important information about fetal growth, fetal wellbeing (by auscultating FHR), number of fetuses and fetal presentation, presence of labour, as well as any previous abdominal surgeries. These information is essential to know if the labour can be managed at the block level facility or requires referral to a higher level facility.

The abdominal examination is done using four specific grips (i.e., fundal palpation, lateral palpation, superficial pelvic and deep pelvic). The estimates show that there was an improvement of 37% points in the cases for which the abdominal examination was performed using all four grips between the two rounds of the RFS (Figure 4). Where in RFS-1, the abdominal examination using all four grips was performed for only 14% of the women, the proportion increased to be 53% in RFS-2. The abdominal examination using superficial pelvic grip (39% points) and deep pelvic grip (25% points) was observed having substantial improvement between the two rounds of the RFS.

Figure 4: % of the directly observed stage 1 deliveries where the nurse performed abdominal examination using specific grips, RFS-1 (N=289) and RFS-2 (N=327), 2015-16



Practice: Vaginal Examination

The vaginal or pelvic examination is key to understand progress of labour, cervical dilatation and complications. Before conducting the internal examination, it is essential to assess for any bleeding (APH) in the vagina, ruptures in the membranes and to ensure the woman is in labour. The vaginal bleeding indicates start of labour and excessive vaginal bleeding i.e. >500 ml or 1

pad soaked in 5 minutes also suggests for not conducting vaginal examination. Such bleeding could take place due to placental abruption (separation of placenta), or placenta Previa (localization of placenta in lower segment of uterus). It is important that the nurse should maintain the woman's privacy during the entire process, wash their hands thoroughly with soap and water and air dry them before starting the process of examination.

An improvement of 8% points was observed in the practice of vaginal examination by the nurses in the surveyed facilities between the two rounds of the RFS. In about 95% of the delivery cases, a vaginal examination was conducted during RFS-2 compared to 87% of the cases during RFS-1. In addition, the improvement was also noticed among providers in wearing gloves (18% points) during vaginal examination and maintaining privacy (15% points) between the two rounds of the RFS. Almost 87% and 76% of the SNs/ANMs were observed wearing gloves during vaginal examination and maintained privacy respectively during RFS-2 compared to 69% and 61% respectively during RFS-1.

Practice: Haemoglobin and Urine Tests

Haemoglobin (Hb) screening detects anemia, which is considered responsible for increasing both maternal and fetal complications. Women with severe anemia can quickly go into shock if they lose even a small amount of blood. Treatment with IFA or blood (depending on severity) could be given to prevent this. Levels less than 7 gms constitute severe anemia and serve as a red flag to refer to a higher center for care. Levels between 7 gms and 11 gms on previous tests serve as an indication to repeat the test, although ideally all women are required to be assessed for their level of Hb during labour irrespective of the case it was done before or not.

The urine test helps diagnose proteinuria which indicates the case of pre-eclampsia or eclampsia. In addition, this helps assess the degree of proteinuria, which is used to determine the severity of pre-eclampsia. Before the urine test, the nurse is supposed to check the patient's BP. Elevated BP and presence of proteinuria indicate pre-eclampsia – the woman must be managed or referred at this point.

Urine/blood for sugar tests are used to screen for development of gestational diabetes. This is done only if the woman has a history of diabetes or is at risk for developing diabetes. Gestational diabetes could increase maternal and fetal complications in some women. If this is found positive, it is a flag to refer to a higher centre for further care. All nurses should be able to administer a urine dipstick test for albumin/sugar without a laboratory.

The estimates indicate that there has been an improvement of 20% points and 11% points in the cases for which Haemoglobin and urine tests were performed, respectively between the two rounds of the RFS. Haemoglobin and urine tests were performed in about 29% (9% during RFS-1) and 14% (3% during RFS-1) of the cases during RFS-2, respectively.

Skills: Initial Assessment

There were 156 and 160 SNs/ANMs assessed for the following 6 skills related to initial assessment during RFS-1 and RFS-2 respectively:

1. Gestational age calculation
2. Measurement of body temperature
3. Measurement of blood pressure
4. Haemoglobin measurement
5. Urine test
6. Abdominal examination

In absence of the Mini Skill Labs at a few facilities, the skill demonstrations were conducted at only 25 facilities during RFS-1,

while this constrain was addressed positively in RFS-2 and the skill demonstration of SNs/ANMs were performed at all 46 facilities. For each skill demonstration, a consent was obtained from the selected SN/ANM.

Skill: Gestational Age Calculation

The SNs/ANMs were asked to calculate the gestational age based on a given date of arrival of the pregnant woman in labour pain at the facility and her last menstrual cycle. The percent of SNs/ANMs, who could correctly calculate the gestational age of the woman slightly increased from 4% during RFS-1 to 6% during RFS-2. Overall, 27% and 15% of the SNs/ANMs reported that they did not know how to calculate the gestational age and hence did not participate in the skill demonstration in RFS-1 and RFS-2, respectively.

Skill: Measurement of Oral Temperature

Measuring body temperature is an important step when the patient arrives at the facility. A high temperature, greater than 38^0C (100.4^0F) indicates the presence of infection or sepsis, which must be managed. Low temperatures could be seen in some cases of shock.

The following equipment and supplies were made available at the skill station for the demonstration on the measurement of oral temperature: glass oral thermometer, cotton swab, spirit, gloves, notepad and pen. The oral temperature was measured either on a simulated patient, a pregnant woman or a relative/friend of a patient. The case was presented as a recently delivered woman with a healthy newborn. The SNs/ANMs were requested to describe the process during demonstration, and were also informed that the observer may put her queries during the demonstration process.

Nearly 36% of the nurses were able to demonstrate the critical steps of temperature measurement in RFS-2 — registering an improvement of 12% points over the estimates of RFS-1 (Table 4). However, the percent of SNs/ANMs who were observed correctly demonstrating all the 13 steps involved in temperature measurement slightly increased from 3% in RFS-1 to 7% in RFS-2.

Table 4: % of SNs/ANMs who performed specific steps/tasks related to temperature measurement in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	24.4	31.3
2	Inform the mother about the procedure	26.3	40.6
3	Clean the thermometer with a spirit cotton swab	59.6	72.5
4	Shake the thermometer to ensure mercury was below normal temperature*	67.3	73.8
5	Place the bulb end of the thermometer under the tongue of the mother*	84.6	89.4
6	Inform the mother to keep her mouth closed	76.3	80.6
7	Inform the mother to keep the thermometer for 3 minutes*	32.1	56.9
8	Remove the thermometer by holding the stem end of thermometer	71.2	77.5
9	Note the reading by holding the thermometer at eye level*	73.7	70.6
10	Wipe the thermometer from stem to bulb	44.2	59.4
11	Inform the mother about the findings	41.7	46.3
12	Write the temperature readings on the notepad	35.3	53.8
13	Wash hands	13.5	27.5
None of the steps/tasks		5.8	6.2
Critical steps/tasks		24.4	35.6
All steps/tasks		3.2	6.9
Number of SNs/ANMs		156	160

*Critical steps/tasks

Overall, 6% of the nurses reported that they did not know how to take oral temperature and hence did not participate in the skill demonstration.

Some of the important steps missed by most of the nurses during skill demonstration included washing hands before and after the procedure (69% and 72%, respectively in RFS-2), informing the mother about the procedure and the findings (59% and 54%, respectively in RFS-2), informing the mother to keep the thermometer for 3 minutes (68% in RFS-1 and 43% in RFS-2), and writing the temperature readings on the notepad (65% in RFS-1 and 46% in RFS-2).

Skill: Measurement of Blood Pressure

Measuring blood pressure (BP) is extremely important, as an elevated BP (> 140/90 mmHg) confirms pregnancy induced hypertension (PIH), while a low BP (< 90/60 mmHg) is suggestive of shock. It is important to do a urine protein test for any woman in labour but essential for a woman with high BP.

The following equipment and supplies were made available at the skill station for the demonstration on the measurement of blood pressure: sphygmomanometer, stethoscope, notepad and pen. The BP was measured either on a simulated patient, a pregnant woman or a relative/friend of a patient. The case was presented as a pregnant woman at 38 weeks of gestation complaining of severe headache, which the provider suspects of pre-eclampsia. The SNs/ANMs were requested to describe the process during demonstration, and were also informed that the observer may put her queries during the process.

Nearly 42% of the nurses were observed correctly demonstrating the critical steps of BP measurement in RFS-2 — registering an improvement of 25% points over the estimate of RFS-1 (Table 5). There was a slight improvement in the percent of SNs/ANMs who could perform all the steps/tasks involved in the BP measurement between RFS-1 (3%) and RFS-2 (9%). Overall, 6% and 9% of the SNs/ANMs in RFS-1 and RFS-2 respectively reported that they did not know how to measure blood pressure and hence did not participate in the skill demonstration.

Table 5: % of SNs/ANMs who performed specific steps/tasks related to BP measurement in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	23.1	26.9
2	Inform the woman about the procedure	29.5	41.3
3	Bare the arm of the woman	61.5	72.5
4	Extend the arm of the woman	82.1	86.3
5	Rest the arm of the woman at level with the heart*	67.3	72.5
6	Loosen the valve on bulb	67.3	77.5
7	Expel the remaining air from the cuff by squeezing	53.2	71.9
8	Locate the brachial artery*	66.7	73.8
9	Wrap the cuff around the upper arm, one inch above the elbow*	53.8	78.8
10	Inflate the cuff 20-30 mm Hg beyond the point where pulse was last felt*	44.9	66.3
11	Place the diaphragm of the stethoscope directly over the brachial artery	81.4	80.6
12	Deflate the cuff at an even rate of 2-4 mm per second by turning valve counter clock wise	54.5	63.1
13	Verbalize change in sound	75	73.1
14	Could tell that the reading when the first sound is heard is systolic reading*	76.3	80.0
15	Could tell that the reading when the sound disappears is diastolic reading*	71.8	73.8
16	Fully open valve to deflate the cuff	82.1	78.1
17	Inform the woman about her BP	49.0	48.8
None of the steps/tasks		5.8	8.7
Critical steps/tasks		17.3	41.9
All steps/tasks		3.2	9.4
Number of SNs/ANMs		156	160

*Critical steps/tasks

The most often missed out steps/tasks during the demonstration of BP measurement by the nurses included washing hands before the procedure (77% in RFS-1 and 73% in RFS-2),

informing the woman about the procedure (70% in RFS-1 and 59% in RFS-2) and about her BP reading (51% in both RFS-1 and RFS-2), expelling the remaining air from the cuff by squeezing (47% in RFS-1 and 28% in RFS-2), inflating the cuff 20-30 mmHg beyond the point where pulse was last felt (55% in RFS-1 and 24% in RFS-2), deflating the cuff at an even rate of 2-4 mm per second by turning valve counter clock wise (45% in RFS-1 and 37% in RFS-2), and wrapping the cuff around the upper arm, one inch above the elbow (46% in RFS-1 and 21% in RFS-2).

Skill: Haemoglobin Measurement

The following equipment and supplies were made available at the skill station for the demonstration of the haemoglobin measurement: Shali's haemoglobinometer, N/10 Hydrochloric acid solution (N/10 HCL), gloves, spirit, lancet, distilled water, pipette, puncture proof container, and 0.5% chlorine solutions.

The haemoglobin was measured either on a simulated patient, a pregnant woman or a relative/friend of a patient. The case was presented as a pregnant woman at 38 weeks of gestation complaining of severe weakness and exhaustion, which the provider suspects of anaemia. The SNs/ANMs were requested to describe the process during demonstration, and were also informed that the observer may put her queries during the process.

Nearly 16% of the nurses were observed correctly demonstrating the critical steps of haemoglobin measurement during RFS-2 — registering an improvement of 13% points over the estimate of RFS-1 (Table 6). However, only 2% of the SNs/ANMs could correctly demonstrate all the steps involved in haemoglobin measurement using Shali's haemoglobinometer during RFS-2, while none was observed performing the same during RFS-1.

Table 6: % of SNs/ANMs who performed specific steps/tasks related to haemoglobin measurement in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	4.5	14.3
2	Inform the woman about the procedure	10.9	21.1
3	Wear gloves	7.1	23.8
4	Clean the tip of the woman's finger with a spirit swab	8.3	29.3
5	Prick the finger with a lancet*	12.2	31.3
6	Allow a blood drop to form on the fingertip*	10.3	28.6
7	Use a pipette to suck the blood drop*	12.2	31.3
8	Could tell to which mark one needs to suck the blood	3.2	23.1
9	Clean the woman's finger	9.6	27.2
10	Wipe the tip of the pipette	5.8	23.8
11	Transfer the blood to the Hb tube*	10.3	24.5
12	Could tell that the solution inside the Hb tube is N/10 HCL	8.3	22.4
13	Wait for 10 minutes*	6.4	23.1
14	Dilute the acid by adding distilled water drop by drop*	9.0	22.4
15	Use a stirrer to mix	7.7	23.1
16	Match the colour of the comparator*	9	27.9
17	Note down the reading in gms%	3.8	67.3
18	Could tell that the lower meniscus should be considered	3.8	14.3
19	Disposed off the used lancet in a puncture proof container	4.5	25.9
20	Discussed results with the woman	7.1	21.1
21	Dispose the gloves as per protocol	3.8	23.1
None of the steps/tasks		85.3	65.3
Critical steps/tasks		3.2	15.7
All steps/tasks		0	2.0
Number of SNs/ANMs		156	147

*Critical steps/tasks

Majority (84%) of the nurses did not even attempt this demonstration during RFS-1, admitting that they did not know the steps involved in haemoglobin measurement, the

proportion of whom reduced (46%) during RFS-2.

Skill: Urine Albumin/Sugar Test

The following equipment and supplies were made available at the skill station for the demonstration of urine test: urine sample, dipsticks (reagent strips), red coloured bin, notepad and pen. The case was presented as a pregnant woman at 38 weeks of gestation complaining of severe headache, which the provider suspects of pre-eclampsia and hence wants to measure albumin and glucose from her urine sample. The SNs/ANMs were requested to describe their steps during demonstration, and were also informed that the observer may put her queries during the process.

Table 7: % of SNs/ANMs who performed specific steps/tasks related to urine albumin test in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	8.3	17.0
2	Wear gloves	25.6	32.7
3	Remove one reagent strip from the bottle	20.5	24.5
4	Immediately recap the bottle	25.6	29.9
5	Immerse the reagent strip in the urine*	26.9	32.0
6	Remove the reagent strip immediately*	26.9	32.7
7	Remove excess urine	18.6	36.1
8	Compare the strip against the chart area on the bottle*	31.4	46.3
9	Wait 30 seconds to read the glucose level*	17.3	30.6
10	Wait 60 seconds to read albumin level*	20.5	25.9
11	Dispose off the used strip in the red bin	16	42.9
12	Noted down the findings	15.4	30.6
None of the steps/tasks		64.7	50.3
Critical steps/tasks		12.2	16.3
All steps/tasks		0.6	1.4
Number of SNs/ANMs		156	147

*Critical steps/tasks

Nearly 16% of the nurses were observed correctly demonstrating the critical steps involved in the urine albumin test during RFS-2, and this has recorded an improvement of 4% points over the estimates of RFS-1 (Table 7). However, only 1% of the SNs/ANMs were found correctly demonstrating all the recommended steps involved in urine albumin test during RFS-2, while the level was even lower during RFS-1.

Half of the nurses were found not able to correctly demonstrate even a single step involved in the urine albumin test during RFS-2.

Skill: Abdominal Examination

The skills of the nurses in abdominal examination was demonstrated using Mama Natalie, a mannequin used for learning and demonstrating different stages of labour, on an examination table.

The case was presented as a pregnant woman at 38 weeks of gestation with labour pains, and who needs to be assessed initially for specific complications. The SNs/ANMs were requested to describe their steps during demonstration, and were also informed that the observer may ask some questions during the process.

An improvement of 10% points was estimated in the proportion of nurses who correctly demonstrated any of the steps/tasks involved in abdominal examination between the two rounds of the RFS. Nearly 10% of the nurses were observed correctly demonstrating clinically critical steps/tasks involved in abdominal examination during RFS-2 – registering an improvement of 5% points over the round 1 estimate (Table 8). However, 3% of the SNs/ANMs could able to correctly demonstrate all the steps/tasks involved in abdominal examination during RFS-2 compared to none during RFS-1.

Table 8: % of SNs/ANMs who performed specific steps/tasks related to abdominal examination in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	10.3	26.9
2	Inform the woman about the procedure	21.8	35.6
3	Ask the woman to flex her knees*	32.1	38.8
4	Ask the woman to relax her abdomen	32.1	43.8
5	Could tell the purpose of abdominal grips is to help assess in presentation	37.8	53.1
6	Could tell that 32 weeks of gestational age is the minimum for assessing the foetal presentation/lie	18.6	45.0
7	Palpate the funds with both hands*	45.5	65.6
8	Could tell that a normal presentation feels hard, globular	46.2	45.0
9	Place one hand on each side of the abdomen*	42.3	62.5
10	Could tell that the foetal back feels continuous hard, flat surface, on palpation	38.5	58.8
11	Could tell that the limbs feel like irregular small knobs, on palpation	36.5	54.4
12	Spread her right hand widely over the symphysis pubis	35.3	56.9
13	Try to approximate the finger and thumbs*	26.9	50.0
14	Apply deep pressure over the lower parts of the uterus*	35.9	58.1
15	Face the foot end of the bed	26.3	41.9
16	Palpate the lower pole of uterus with both hands*	34	60.0
17	Nurse's fingers point downwards and inward	26.3	41.9
18	Could tell that the head fills like firm, round mass, if it's not engaged*	32.1	53.1
19	Could tell that foetal back is the correct place to auscultate for the foetal heart rate	24.6	54.4
None of the steps/tasks		34.0	22.5
Critical steps/tasks		5.1	10.0
All steps/tasks		0	3.1
Number of SNs/ANMs		156	160

*Critical steps/tasks

The skills of the nurses on some of the critical steps of abdominal examination which considerably improved between the two rounds of the RFS are: palpating the lower pole of uterus with both hands (26% points), try to approximate the finger and thumbs (23% points), applying deep pressure over the lower parts of the uterus (22% points), placing one hand on each side of the abdomen (20% points), and palpating the funds with both hands (20% points).

Skill: Loading Dose of Magnesium Sulphate

Women with severe pre-eclampsia are supposed to be at risk of having seizures. Administering magnesium sulphate through intra muscular (IM) can prevent this risk. Magnesium sulphate deep IM in each buttock (a total of 20 ml of magnesium sulphate) is the preferred drug of choice.

The SNs/ANMs were requested to demonstrate the preparation of a loading dose of Magnesium Sulphate and describe the procedure. They were also informed that the observer may ask some questions during the process.

The case was presented as a pregnant woman at 38 weeks of gestation who has convulsions, high blood pressure and proteinuria consistent with eclampsia. Her airway is being maintained and she is receiving oxygen at 6-8 l/min.

An improvement of 21% points was estimated in the proportion of nurses correctly demonstrating any of the steps involved in the preparation of loading dose of Magnesium Sulphate between the two rounds of the RFS (Table 9). In addition, there was an improvement of 18% points in the proportion of SNs/ANMs correctly demonstrating critical steps involved in the preparation of loading dose of Magnesium Sulphate during the same period. Almost one-fourth of the nurses correctly demonstrated the critical steps/tasks and nearly one in every five nurses was found correctly

demonstrating all the recommended steps/tasks during RFS-2.

Table 9: % of SNs/ANMs who performed specific steps/tasks related to the preparation of loading dose of Magnesium Sulphate in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Take two 10 ml sterile syringes*	25.6	47.5
2	Draw 5 ampoules of $MgSO_4$ 50 % into each syringe*	25.6	48.8
3	Could correctly tell how many grams of MgSO4 are in each 2ml ampule	19.2	30.0
4	Added 1 ml of 2% lignocaine to each syringe*	7.1	25.6
5	Could tell the correct route of administration of $MgSO_4$ in this situation*	30.1	50.0
6	Could tell the correct site of injection	29.5	48.8
None of the steps/tasks		69.9	48.8
Critical steps/tasks		6.3	23.8
All steps/tasks		4.5	19.4
Number of SNs/ANMs		156	160

*Critical steps/tasks

Nearly one third of the nurses could tell about the correct dosage of Magnesium Sulphate and about half of the nurses could mention the correct site of injection during RFS-2.

Knowledge: Initial Assessment

Fifteen percent of all pregnancies usually develop a complication. These complications can occur at any stage during pregnancy, labour and postnatal period. Out of all obstetric complications, hemorrhage, eclampsia and infections account for 60% of maternal deaths in India[1]. The health providers must have comprehensive understanding about the symptoms and management of such complications.

Knowledge questionnaire was administered to a total of 168 (during RFS-1) and 164 (during RFS-2) SNs/ANMs in the sample facilities. The questions asked to the SNs/ANMs to assess their knowledge on the initial assessment were as follows:

1. What are the danger signs that should be looked for in a pregnant woman on arrival for delivery?
2. What are the major signs and management for the complications such as obstructed labour, pregnancy induced hypertension (mild and severe pre-eclampsia), antepartum haemorrhage, puerperal sepsis, and rupture of membranes.

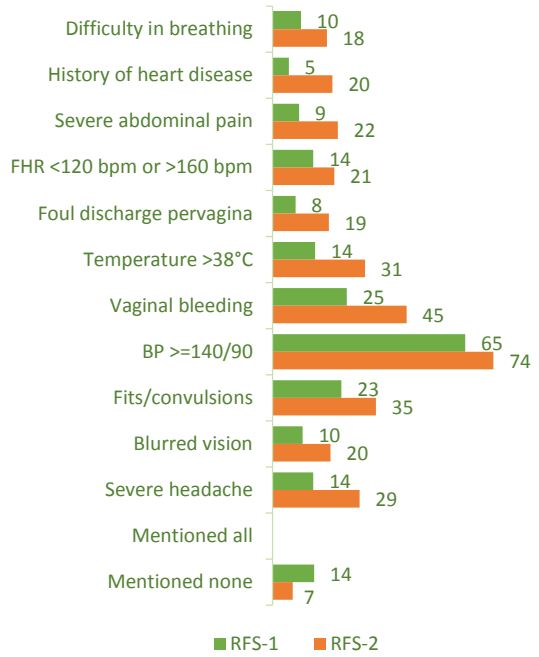
Knowledge: Danger Signs

Almost 93% of the nurses during RFS-2 (86% during RFS-1) correctly mentioned any of the danger signs that should be looked for in a pregnant woman on arrival for delivery. However, none of the SNs/ANMs could correctly mentioned all the danger signs during both the rounds of the RFS. About 74% of the SNs/ANMs interviewed during RFS-2 knew that BP ≥ 140/90 could be a danger sign to look for in women arriving in labour, while it was estimated nearly 65% in RFS-1 (Figure 5).

The specific danger signs about which the knowledge among nurses were estimated to be considerably improved between the two rounds of the RFS included: vaginal bleeding (improvement of 20% points), temperature (improvement of 17% points), severe headache (improvement of 16% points), history of heart disease (improvement of 15% points), severe abdominal pain (improvement of 13%), fits/convulsions (improvement of 12% points), and foul discharge from vagina (improvement of 11% points).

[1] Montgomery AL, Ram U, Kumar R, Jha P, for The Million Death Study Collaborators (2014) Maternal Mortality in India: Causes and Healthcare Service Use Based on a Nationally Representative Survey. PLoS ONE 9(1): e83331.

Figure 5: % of SNs/ANMs who mentioned specific danger signs that should be looked for in a pregnant woman on arrival, RFS-1 (N=168) and RFS-2 (N=164), 2015-16



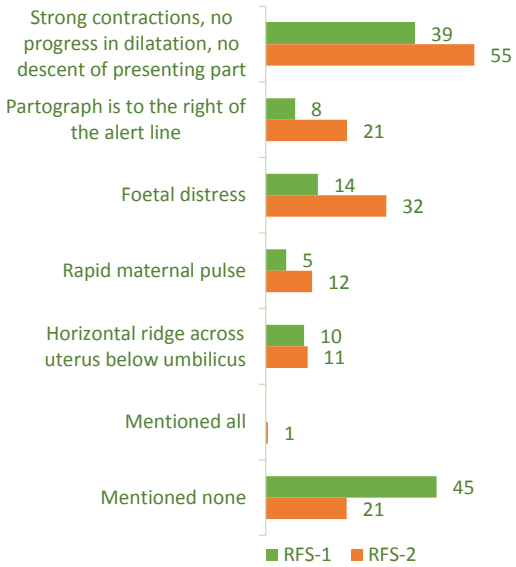
Knowledge: Signs and Management of Obstructed labour

Any two of the following symptoms must be present to diagnose obstructed labour:

- Plotted cervical dilatation line in the partograph is to the right of Line A at the four hour or eight hour assessments
- No cervical change with repeat PV after 4 hours in active phase of labour
- Significant caput and moulding
- Cervix that is not well applied to presenting part
- Swollen, oedematous cervix
- Ballooning lower uterine segment
- Formation of retraction band felt over abdomen
- Fetal or maternal distress
- Active labour that is longer than 24 hours

An improvement of 24% points was estimated in the proportion of SNs/ANMs who could correctly mention any of the major signs of obstructed labour between the two rounds of the RFS. Overall, none of the SNs/ANMs (in RFS-1) or less than one percent SNs/ANMs (in RFS-2) could mention all the major signs of obstructed labour, and 45% (in RFS-1) and 21% (in RFS-2) could not mention even one major sign (Figure 6).

Figure 6: % of SNs/ANMs who knew major signs of obstructed labour, RFS-1 (N=168) and RFS-2 (N=164), 2015-16



Obstructed labour is an obstetric emergency which can lead to foetal death in utero, and thus needs to be managed quickly. All the nurses are required to be aware of all the management initiatives essential for dealing with such emergencies. The key management of obstructed labour includes the following steps:

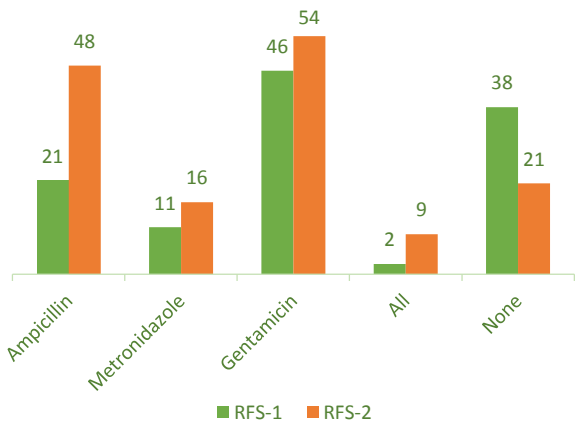
- Keep the mother nil by mouth
- Do not give oxytocin
- Administer the following antibiotics: ampicillin, gentamicin and metronidazole

Obstructed labour can increase the risk of intra-uterine infection. Thus it is important to provide the initial dose of antibiotics to help decrease this risk and/or to begin treating the infection if already present. These three

antibiotics are used because they cover the organisms most likely to be involved in infection.

The percent of SNs/ANMs who mentioned any of the three recommended antibiotics that can be administered for a case of obstructed labour increased from 62% in RFS-1 to 79% in RFS-2 (Figure 7). Nearly 9% of the SNs/ANMs reported to know about all of these antibiotics during RFS-2, which was estimated to be only 2% in RFS-1.

Figure 7: % of SNs/ANMs who specified the major antibiotics that can be administered for a case of obstructed labour, RFS-1 (N=168) and RFS-2 (N=164), 2015-16



Knowledge: Signs and Management of Hypertensive Disorders

Hypertensive disorders of pregnancy include pregnancy induced hypertension (PIH), pre-eclampsia and eclampsia. Their presentation can range from mildly elevated blood pressure without any symptoms to sudden onset of full seizures/fits any time in pregnancy after 20 weeks of gestation, intrapartum and in the first 6 weeks postnatal. This group of syndromes causes serious illness in both the mother and fetus that can lead to increased risk of morbidity (heart failure, placental abruption, renal failure, liver failure, cerebral swelling and bleeding in the mother; intrauterine growth restriction and preterm birth in the fetus) and mortality for both the mother and the fetus.

Early detection is very important for managing pregnancy-induced hypertension and preventing convulsions. So, it is important that a nurse has already observed or checked elements such as BP, presence of proteins in the urine, presence of blurred vision, headaches or seizures, during the initial assessment, during labour, and in the postpartum period. Urine should be checked using the dipstick method: something every nurse should be able to do. As hypertensive disease in pregnancy worsens, the mother begins to leak protein into the urine from the kidneys. The presence of proteins is important to diagnose since it can help to correctly distinguish between different types of hypertensive disorders and determine the severity of disease. For example, the presence of proteinuria changes the diagnosis from pregnancy-induced hypertension to pre-eclampsia. Accurate assessment and correct diagnosis is very important for initial management of pregnancy induced hypertension, pre-eclampsia and eclampsia.

Once a diagnosis has been made, management should follow. Management is different for pregnancy induced hypertension, pre-eclampsia and eclampsia and is also based on how severe is the disease. For severe disease, immediate delivery within 12- 24 hours is the definitive treatment as these are severe obstetric complications that can lead to death. At the time of diagnosis, prior to delivery, there are things a nurse can and must do to help prevent further complications, such as giving antihypertensive and anticonvulsant medication. However, the following are a few general principles need to be followed for managing hypertensive disorders:

- Administer anti-hypertensive when diastolic BP is more than 100 mlts

- Administer anti-convulsants, anti-seizure
- Monitor deep tendon reflexes, urine output, respiratory rate for magnesium sulphate toxicity
- Refer to the FRU

Table 10: % of SNs/ANMs with the correct knowledge of the diagnosis and treatment for hypertensive disorders, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Diagnosis of mild pre-eclampsia		
BP>=140/90 and =<160/110	64.3	74.4
Proteinuria >2	12.5	36.6
Mentioned both	10.7	34.1
Mentioned any	66.1	76.8
Diagnosis of severe pre-eclampsia		
BP>=160/110	59.5	69.5
Proteinuria >3	9.5	31.7
Mentioned both	8.9	28.7
Mentioned any	60.1	72.6
Treatment for pregnancy induced hypertension		
Nifedipin	38.1	41.5
Labetalol	3	14.0
Hydralazine	0	1.8
Mentioned all	0	1.2
Mentioned any	39.9	47.6
Number of SNs/ANMs	168	164

When asked about the diagnosis of mild and severe pre-eclampsia, around 60% of the SNs/ANMs reported correct range of BP readings during RFS-1, which further improved by 10% points in RFS-2 (Table 10). More than 30% of the nurses during RFS-2 mentioned the presence of proteinuria as a diagnosis of mild and severe pre-eclampsia—registering nearly a three-fold increase over the round-1 estimate. Nearly 48% of the nurses reported to be aware about any one of the antihypertensive drugs during RFS-2 (40% during RFS-1).

Knowledge: Signs and Management of Antepartum Haemorrhage

Vaginal bleeding anytime after 20 weeks of pregnancy is called antepartum hemorrhage (APH). The most serious causes are placenta praevia (placenta lying at or near the cervix), abruptio placentae (separation of the placenta before the birth of the fetus) or a ruptured uterus. Since these conditions could be life-threatening for the mother and the fetus, it is important to diagnose the cause of bleeding so as to initiate appropriate initial management. The pre-referral management for all these 3 causes of APH is the same. They are all obstetric emergencies and need to be referred quickly as C-sections and blood transfusion might be required.

The general principles for the management of APH are as follows:

- Assess for shock whether present or not
- Keep the mother nil per oral (NPO)/nil by mouth
- Arrange for a blood donor
- Do not do a vaginal examination
- Administer antibiotics if rupture of uterus has been diagnosed
- Do not give oxytocin
- Refer mother to FRU urgently

An improvement of 12% points was estimated in the proportion of nurses who correctly mentioned any of the symptoms of antepartum haemorrhage (APH) between the two rounds of the RFS (Table 11). Nearly 15% of the SNs/ANMs could mention all the three major types/symptoms of APH during RFS-2, while no one could mention all during RFS-1. Most of the providers during RFS-1 reported to be not aware about abruptio placentae and ruptured uterus as symptoms/diagnosis of APH, while the situation has improved in RFS-2.

On the other hand, an improvement of 8% points was estimated in the proportion of nurses who could correctly mention any of the steps of APH management between the two rounds of the RFS. However, none could list all the steps/procedures involved in the management of APH in both the rounds.

Table 11: % of SNs/ANMs with the correct knowledge of the diagnosis and treatment for antepartum haemorrhage, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Diagnosis		
Abruptio placentae	5.4	31.7
Placenta praevia	54.8	73.2
Ruptured uterus	8.3	26.2
Mentioned all three	0	14.6
Mentioned any	68.5	80.5
Management		
Call and determine nearest facility for C-section	5.4	21.3
Arrange transport	25.6	31.7
Arrange for blood transfusion	3	9.8
Gave oxygen	7.1	8.5
Keep the woman NPO	0	2.4
Record vitals	8.3	8.5
Insert Foley's catheter	0	4.9
Gave antibiotics	29.2	33.5
Start IV fluids	57.1	54.3
Mentioned all	0	0.0
Mentioned any	75.6	83.5
Give oxytocin (wrong answer)	7.1	9.8
Number of SNs/ANMs	168	164

Around 10% of the providers reported a wrong management protocol for APH (to give oxytocin injection) during RFS-2.

Knowledge: Signs and Management of Puerperal Sepsis

Puerperal sepsis (infection of the uterus in the postnatal period) is one of the most common causes of infection with fever. There are four symptoms required to diagnose a woman with puerperal sepsis: (1) fever (temperature ≥ 38^0C/≥100.4^0F) (2) abdominal pain (3) tender uterus and (4) foul smelling or purulent lochia. The management of puerperal sepsis includes administration of ampicillin 1 g orally or IV, metronidazole 400 mg orally or 500 mg IV and gentamicin 80 mg IM or IV. These 3 antibiotics are used because they cover the organisms most likely to be causing the infection. Other antibiotics should not be used unless there is an allergy, as they may not be as effective.

Nearly 83% the SNs/ANMs mentioned any of the four symptoms of puerperal sepsis during RFS-2 — registering an improvement of 12% points over the round-1 estimate (Table 12). On the other hand, only 4% of the nurses could able to mention all the four symptoms of puerperal sepsis during RFS-2. Most failed to mention fever and lower abdominal pain or tenderness as its symptoms.

Table 12: % of SNs/ANMs with the correct knowledge of the diagnosis and treatment for Puerperal sepsis, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Diagnosis		
Fever >38^0 C	31.0	42.1
Lower abdominal pain or tenderness	24.4	38.4
Abdominal lochia	55.4	63.4
Uterus not well contracted	0.6	9.8
Mentioned all 4	0	3.7
Mentioned any	70.8	82.9
Management		
Ampicillin (or Ampicillin+Clozacilin or Ampliox or Ampoxin)	20.8	50.6
Metronidazole	11.3	14.0
Gentamicin	46.4	43.9
Mentioned all 3	3.6	8.5
Mentioned any	60.7	75.0
Number of SNs/ANMs	168	164

Further, an improvement of 14% points was estimated in the proportion of nurses who correctly mentioned any of the drugs for the treatment of the puerperal sepsis between the two rounds of the RFS. The most commonly mentioned drug for the management of puerperal sepsis was Gentamicin (> 40% of the nurses reported during both the rounds of the RFS), while all the three recommended drugs were mentioned by nearly 9% of the nurses during RFS-2 (4% during RFS-1).

Knowledge: Pre-referral Management of Rupture of Membranes

Nearly 69% of the nurses were aware of at least one of the steps (i.e., call and determine a facility for pre-term delivery and special newborn care, arrange transport, and give antibiotics) of pre-referral management of rupture of membranes during RFS-2—registering an improvement of 14% points over the round-1 estimate. However, only 6% of the SNs/ANMs knew all the three steps of pre-referral management of rupture of membranes during RFS-2 (2% during RFS-1).

LABOUR MONITORING

Observation and detailed monitoring of the woman in the first stage of labour, using the partograph (a graphic tool), and support during this crucial period, ensures correct management and identification of complications. Timely responses to complications can save lives.

The partograph helps nurse to monitor the progress of labour, focusing on the condition of the mother and the fetus. It is a graphic recording of 4-hourly pelvic examination findings (cervical dilatation), of the progress of labour (frequency and duration of contractions), of the mother's condition (vital signs) and of the baby's condition (FHR and state of amniotic fluid). It is a tool that helps identify complications (such as obstructed labour, fetal distress) at early stage and guides the need for intervention, management and referral, in a timely way. The information in the partograph is to be recorded at various time intervals in 4 separate graphs.

Practices: Labour Monitoring

A total of 530 and 570 deliveries were directly observed during labour monitoring and pushing during RFS-1 and RFS-2, respectively. The observed practices of the providers during labour monitoring and pushing are presented in Table 13. A slight increase of nearly 5% points was estimated in the proportion of delivery cases for which the nurses initiated the partograph, between the two rounds of the RFS. However, in none of the cases in both the rounds of the survey, the partograph was found completed as per protocol.

Table 13: % of deliveries/live births where the specific labour monitoring practices were observed, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Partograph		
Partograph initiated	3.8	8.8
Partograph completed as per protocol	0.0	0.0
Cleaning the perineal area		
Perineal area cleaned	5.1	33.2
Using antiseptic solution	1.7	16.1
Not using antiseptic solution	3.4	17.0
Pushing		
Women asked to take deep breaths during a contraction	42.8	65.6
Women told when to push	79.1	77.0
Women verbally abused	10.2	9.5
Women physically abused	3.2	7.0
Privacy maintained during delivery	68.9	75.4
# of deliveries directly observed during labour monitoring and pushing	530	570

The cleaning of the perineal area before delivery as a part of part preparation is recommended using antiseptic solution. Overall, an improvement of 28% points was estimated in the proportion of delivery cases for which the perineal area was cleaned between the two rounds of the RFS. However, despite a considerable improvement of nearly 14% points in the cases for which the perineal area was cleaned using antiseptic solution during the same period, the level still remains low. In more than 75% of the cases, the woman was told by the nurse when to push, in both the rounds of the RFS, and the woman was asked to take deep breaths during a contraction in 43% and 66% of cases during RFS-1 and RFS-2, respectively.

Verbal abuse of women during labour was observed in 10% of the cases in each rounds of the RFS, while the physical abuse was observed in 3% and 7% of the cases in RFS-1 and RFS-2, respectively.

Skill: Labour Monitoring

The skills of SNs/ANMs were assessed in the second round of the RFS. They were presented two different case studies and asked to plot the partograph. In the first case study, 55% (out of 29 SNs/ANMs participated) of the nurses could correctly demonstrate all the steps of partograph plotting, while in the second case study, almost 75% (out of 67 SNs/ANMs) of the nurses could perform the same. Similarly, 72% (out of 160 SNs/ANMs) of the nurses could demonstrate all the steps of normal delivery.

Knowledge: Labour Monitoring

More than half of the SNs/ANMs during RFS-1 did not know the correct frequency with which the specific parameters should be plotted on the partograph, which considerably improved in RFS-2 (Table 14).

Table 14: % of SNs/ANMs who knew the specific components of a partograph, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
FHR should be plotted	52.4	85.4
Every half hourly	39.3	77.4
Amniotic fluids to be plotted	3.6	37.2
Every half hourly	35.1	61.0
Cervical dilatation to be plotted every 4 hours	47.6	79.9
Contractions to be plotted every half hour	34.5	67.1
Pulse to be plotted every half hour	25	65.2
BP to be plotted every 4 hours	34.5	72.6
Temperature to be plotted every 4 hours	29.8	68.3
Number of SNs/ANMs	168	164

Table 15: % of SNs/ANMs who could correctly tell the specific indications on partograph of signs of prolonged labour, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Plotted cervical dilatation line crossing the alert line	23.8	46.3
Contractions do not increase in frequency and duration	7.7	24.4
Cervix not dilated >4 cm after 8 hours of regular contraction	17.3	24.4
Cervix not dilating at least 1 cm an hour in active labour	20.2	14.6
No cervical change with repeat PV	14.3	10.4
Full dilation of cervix but no descent of foetal head	0	11.6
Two or less contractions in 10 minutes lasting less than 30 seconds when in active labour	1.2	6.7
Any of the above	48.2	76.8
All of the above	0	0
Number of SNs/ANMs	168	164

When asked, “How do you identify a case of prolonged labour from partograph readings?”, only 48% of the nurses could correctly tell any of the 7 indications of prolonged labour on the partograph during RFS-1, which improved by 29% points during RFS-2. However, none could mention all the 7 indications in both the rounds (Table 15).

Similarly, when the nurses were asked, "How do you identify a case of obstructed labour from partograph readings?", only 38% of them could correctly tell any of the 9 indications of obstructed labour on the partograph, which improved by nearly 31% points during RFS-2 (Table 16). However, a mere improvement of less than 1% was estimated in the proportion of nurses who could mention all the 9 indications of obstructed labour between the two rounds of the RFS.

Table 16: % of SNs/ANMs who could correctly tell the specific indications on partograph of signs of obstructed labour, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Plotted cervical dilatation line crossing the alert line	19.6	40.2
No cervical change with repeat PV after 4 hours in active labour	16.7	30.5
Significant caput and moulding	0.6	7.9
Cervix that not well applied to presenting part	3.6	8.5
Swollen, oedematous cervix	1.2	6.7
Ballooning lower uterine segment	1.2	4.3
Formation of reaction band felt over abdomen	0	3.0
Foetal or maternal distress	4.8	12.8
Active labour for more than 24 hours	0	10.4
Any of the above	38.1	68.9
All of the above	0	0.6
Number of SNs/ANMs	168	164

DELIVERY AND MANAGEMENT OF THIRD STAGE OF LABOUR

Practices: Delivery and Third Stage of Labour

Practice: Active Management of Third Stage of Labour

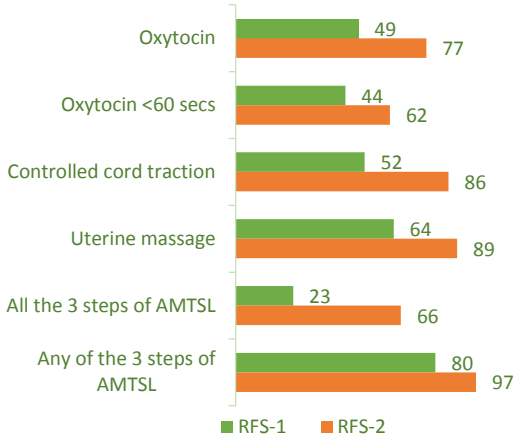
The third stage of labour (delivery of the placenta) takes about 15–30 minutes irrespective of whether the mother is a primigravida or a multigravida. Active management of the third stage of labour (AMTSL) is a procedure that prevents postpartum hemorrhage (PPH) and should be done for all deliveries. The AMTSL involves the following three key steps:

- **Uterotonic drug** injection increases contraction of the uterine muscles. This helps in expulsion of the placenta, reduces bleeding and prevents PPH. Oxytocin is the drug of choice (10 IU IM preferred, or IV), although in its absence Misoprostol can be used (600 mcg rectally or orally). The Oxytocin injection should be administered in the lateral upper quadrant of buttocks (major gluteal muscle), lateral side of upper leg or upper part of arm immediately after delivery of the anterior shoulder.
- **Controlled cord traction (CCT)** also assists in the delivery of the placenta and helps to reduce the chance of a retained placenta and bleeding (PPH). It must be done correctly to avoid complications.
- **Uterine massage** helps the muscles of the uterus contract. The contracting muscles constrict around the blood vessels and help decrease bleeding. If the uterus does not contract, and there is bleeding, this is a sign of uterine atony, a major cause of PPH, which should be managed immediately.

A substantial improvement of nearly 43% points was estimated in the proportion of delivery cases for which all the 3 components of AMTSL were performed as per protocol, between the two rounds of the RFS (Figure 8). In addition, a majority (97%) of the delivery cases was observed during RFS-2, for which any of the 3 major steps of AMTSL was performed. The maximum improvement was observed in the controlled cord traction (34% points) between the two rounds of the RFS, followed by the administration of oxytocin

(28% points), and the uterine massage (25% points).

Figure 8: % of the directly observed deliveries where the nurse performed active management of third stage of labour, RFS-1 (N=516) and RFS-2 (N=540), 2015-16



Practice: Essential Newborn Care

Immediate care of newborn would facilitate in effective transition from intrauterine life to extra-uterine life. A nurse who pays specific attention to the basic components of warmth, breathing, and breastfeeding initiation could help in reducing risks of hypothermia and hypoglycemia. In addition, a quick screening for malformations or birth trauma could assist in getting the right help for the baby at the right time. The basic steps of essential newborn care include:

- Place the baby on mother's abdomen immediately after birth
- Dry and wrap the baby using dry/warm and clean towel; wipe the eyes
- Assess the baby's breathing while drying
- Clamp and cut the umbilical cord in 1-3 minutes
- Leave the baby between the mother's breast to start skin-to-skin care
- Encourage mothers initiate breastfeeding
- Cover the baby's head and feet with a cap and shocks respectively. Cover the mother and baby with a warm cloth
- Place an identity label on the baby

The essential newborn care practices of the nurses who conduct deliveries were generally poor in facilities surveyed during RFS-1. The practices have considerably improved in the second round of the survey. An improvement of nearly 19% points was estimated in the proportion of delivery cases, in which the newborn was immediately placed on the mother's abdomen to provide warmth, between the two rounds of the RFS (Table 17).

Table 17: % of deliveries/live births where the specific essential newborn care practices were observed, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Drying and warmth (observed for 516[1] and 546[2] deliveries)		
Immediately placed on the mother's abdomen	58.7	78.4
Dried using a towel/cloth	85.7	83.3
Dried using a dry and clean towel/cloth	19.8	45.4
Covered with a towel/cloth	83.5	80.4
Covered with a dry and clean towel cloth	19.6	44.3
Cord clamping and cutting (observed for 502[1] and 534[2] live births)		
Clamped the cord as per protocol	41.4	87.0
Cut the cord using sterile scissor	23.5	66.3
Cut the cord using un-sterile scissor	34.1	5.4
Cut the cord using new blade	23.3	25.7
Cut the cord using old blade	17.1	2.3
Other care (observed for 502[1] and 534[2] live births)		
Provided skin to skin care	19.1	57.2
Initiated breastfeeding	26.7	65.1
Weighed the newborn	50.2	77.1
Recorded the weight*	43.0	94.2
Wrong practices (observed for 502[1] and 534[2] live births)		
Wiped off the vernix of the newborn	17.5	16.0[#]
Newborn given pre-lacteal	2.8	5.63

[1]RFS-1; [2]RFS-2

*Out of those who were weighed

[#]In RFS-2, the question was asked as "was oil used for body massage of the newborn?"

In more than 80% of the delivery cases, the baby was dried and wrapped/covered with a towel/cloth in both the rounds of the RFS. A two-fold increase was estimated in the proportion of delivery cases, in which the baby was dried and covered with a dry and clean towel/cloth, between the two rounds of the RFS. In over 16% of the cases, the SNs/ANMs conducting the deliveries also wiped off the vernix of the newborn, which is a wrong practice.

Further, the cord clamping practice (as per protocol) improved by nearly 46% points between the two rounds of the RFS. Similarly a substantive improvement of nearly 45% points was estimated in the proportion of livebirths whose cord was cut using either a sterile scissor or a new blade between the two rounds of the RFS.

The other practices of essential newborn care which substantially improved between the two rounds of the RFS were: initiation of breastfeeding (by 38% points), skin to skin care (by 38% points), and weighing of the newborn (by 27% points). However, in about 3% and 6% of the cases, pre-lacteals were given to the newborn during RFS-1 and RFS-2, respectively.

Practice: Placenta Examination and Disposal

Systematic examination of placenta is essential to determine whether the placenta has completely come out of the woman's body or not, as the retained pieces of placenta or membrane can cause PPH. This is also important to dispose the placenta into a yellow bin in order to prevent infection. It was observed that in 22% of the cases during RFS-2, the nurse conducting the delivery examined the placenta (11% maternal surface and 9% foetal surface of the placenta) before disposing – which was estimated registering an improvement of nearly 19% points over the round-1 estimate. In addition, an improvement of nearly 41% points (16% in RFS-1 and 57% in RFS-2) was estimated in the proportion of delivery cases for which placenta was disposed into a yellow-coloured bin, between the two rounds of the RFS.

Skills: Delivery and Third Stage of Labour

Skill: Active Management of Third Stage of Labour

The SN/ANM was asked to demonstrate AMTSL on a Mama Natalie. The following equipment and supplies were made available at the skill station for the demonstration on AMTSL: Mama Natalie, artery forceps, disposable syringe, needles, oxytocin ampules, spirit and cotton swabs, gloves, mask, cap, gown, Mackintosh, drapes, placenta collection tray and yellow coloured bin.

The case was presented as a woman who had just delivered a normal full term baby, cord has already been clamped, cut and the newborn appropriately dried and wrapped. The SNs/ANMs were requested to describe the procedure, and were also informed that the observer may ask some questions in between.

It was estimated that nearly 83% of the nurses correctly demonstrated any of the steps/tasks involved in AMTSL in RFS-2 (Table 19). About 22% of the nurses correctly demonstrated the critical steps of AMTSL during RFS-2 — registering an improvement of 17% points over the round-1 estimate. However, a mere improvement of about 3% points was estimated in the proportion of SNs/ANMs who could correctly demonstrate all the steps involved in AMTSL.

Table 19: % of SNs/ANMs who performed specific steps/tasks related to active management of third stage of labour in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wash hands	22.5	34.0
2	Wear gloves	57.7	63.9
3	Ruled out any additional babies	20.7	34.7
4	Administered Oxytocin*	55.0	74.1
5	Could tell that Oxytocin should be administered intramuscular*	55.0	71.4
6	Could tell that 10 IU is the appropriate dose of Oxytocin*	52.3	72.1
7	Told the mother that delivering the placenta will not hurt	9.9	27.2
8	Hold the clamped end of the umbilical cord with one hand	60.4	71.4
9	Place the other hand just above the symphysis*	42.3	67.3
10	Could tell that counter traction is the most important reason why she placed her hand just above the symphysis	15.3	38.1
11	Gently pull the cord downwards to deliver the placenta	55.0	72.1
12	Apply counter traction by pushing upwards with the other hand*	51.4	62.6
13	Could tell that she will stop and wait for next strong contraction if the placenta does not descend within 30-40 seconds of CCT	16.2	46.3
14	Hold the placenta in both hands*	17.1	35.4
15	Gently twist the membranes	11.7	46.9
16	Could tell that she twisted the membranes to check if the placenta expelled intact or not	6.3	34.7
17	Place the placenta in the tray	15.3	34.7
18	Place a cupped palm on the uterine fundus*	32.4	53.7
19	Massage the uterine fundus in a circular motion	57.7	72.1
20	Could tell that she will massage the uterine fundus until the uterus is well contracted*	20.7	53.1
None of the steps/tasks		23.4	17.0
Critical steps/tasks		5.4	21.8
All steps/tasks		0	3.4
Number of SNs/ANMs		111	147

*Critical steps/tasks

Out of eight clinically critical steps of AMTSL, the maximum improvement was estimated in the step “Place the other hand just above the symphysis”(by 25% points), which was correctly demonstrated by SNs/ANMs between the two rounds of the RFS, followed by the step “Place a cupped palm on the uterine fundus”(by 21% points). The skill of administering oxytocin and knowledge about appropriate dose of oxytocin among nurses improved by 19% points and 20% points, respectively during the same period.

Skill: Essential Newborn Care

The skill of the nurses in the essential newborn care was assessed using a Neo Natalie. The skill station had the following equipment: Neo Natalie, suction machine, sterile gauze, gloves, and identity label.

In RFS-1, there were two cases presented to the nurses: first, a newborn with no meconium present and crying; second with the meconium present and baby is not crying. However, in RFS-2, the skill demonstration was kept limited to the case when baby was crying normally. The SNs/ANMs were requested to describe the procedure during the demonstration, and were also informed that the observer may ask some questions during the process.

Table 18 presents the estimates on common steps of essential newborn care (when the baby cries normally). More than half of the SNs/ANMs were observed correctly demonstrating the critical steps of essential newborn care in RFS-2 — registering a considerable improvement of nearly 22% points over the round-1 estimate. However, less than 3% of the SNs/ANMs could able to correctly demonstrate all the standard/recommended steps of essential newborn care during RFS-2 (a little progress over the round-1 estimate).

The RFS-2 estimates indicate that more than two-third of the SNs/ANMs could able to correctly demonstrate the important steps of essential newborn care: drying the baby with clean and dry towel, clamp and cut the cord,

skin to skin care, and encouraging mothers to initiate breastfeeding. The least frequently performed tasks included covering the newborn's head with a cap (17% in RFS-1 and 20% in RFS-2) and washing hands before handling the newborn (17% in RFS-1 and 41% in RFS-2).

Table 18: % of SNs/ANMs who performed specific steps/tasks related to essential newborn care when the baby cried, in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Wash hands	17.1	40.8
2	Wear gloves	46.8	67.3
3	Dry the newborn with a clean and dry towel*	66.7	75.5
4	Assess the breathing of the newborn while drying the baby*	49.5	64.6
5	Loosely wrap/cover the newborn	48.6	62.6
6	Clamp and cut the cord*[1]	NA	77.6
7	Wipe the eyes of the newborn with sterile gauze	39.6	53.7
8	Place the baby between mother's breasts for skin to skin care*[1]	NA	66.7
9	Cover the newborn's head with a cap	17.1	20.4
10	Encourage the initiation of breastfeeding*	45.0	65.3
None of the steps/tasks		24.3	16.3
Critical steps/tasks		28.8	51.0
All steps/tasks		1.8	2.7
Number of SNs/ANMs		111	147

*Critical steps/tasks; NA: Not available

[1] Steps not included for summary estimates because of unavailability in RFS-1

Skill: Resuscitation of a Newborn with Asphyxia

The first few minutes soon after birth are crucial for the health of the baby. It is important to ensure that the baby is crying or breathing soon after birth. Approximately 10% newborns require some assistance to begin breathing at birth.

About 1% would need extensive resuscitative measures to survive. It is sometimes hard to predict which babies require resuscitation. Hence the preparation is required for all cases. About half of the newborns who require resuscitation have no identifiable cause or risk factor before birth. An effective resuscitation could help reduce long term morbidity and mortality. It is important that the health care personnel who is assisting in the birth process has the necessary skills for newborn resuscitation.

The skill of the nurses in the resuscitation of a newborn with asphyxia was assessed using a Neo Natalie. The skill station had the following equipment: Neo Natalie, bag and mask, radiant warmer, 3 sets of towels, cord cutting scissors, suction machine, DeeLee's mucus trap, oxygen cylinder, stethoscope and clear visible clock with second hand or timer. The case presented was of a just delivered term baby who is not breathing. The SNs/ANMs were requested to describe the procedure during the demonstration.

There was estimated an improvement of nearly 24% points in the proportion of nurses correctly demonstrating any of the steps involved in the resuscitation of a newborn with asphyxia between the two rounds of the RFS (Table 20).

Similarly, an improvement of 8% points was observed among SNs/ANMs correctly demonstrating the critical steps involved in the resuscitation of a newborn with asphyxia during the same period. However, a mere improvement of nearly 2% points was observed in the proportion of SNs/ANMs correctly demonstrating all the recommended steps involved in the resuscitation process between the two rounds of the RFS.

Table 20: % of SNs/ANMs who performed specific steps/tasks related to resuscitation of a newborn with asphyxia, in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Suction the newborn's mouth	47.7	77.6
2	Suction the newborn's nose	46.8	76.9
3	Suction the mouth before the nose	37.8	76.2
4	Cut the cord*	52.3	66.7
5	Provide a warm environment*	38.7	63.9
6	Position the newborn with its neck slight extended*	31.5	51.7
7	Appropriately stimulate the newborn*	36.9	54.4
8	Reposition the newborn	26.1	42.2
9	Assess breathing*	41.4	63.9
10	If the newborn is not breathing after performing the initial steps of resuscitation, was she able to demonstrate the next steps	36.9	66.7
11	Provide bag and mask ventilation*	51.4	70.1
12	Correctly position herself to visualize chest movement	35.1	53.7
13	Hold the mask on the face with the thumb, index and or middle finger encircling the rim in a 'C" shape*	21.6	40.8
14	Use the ring and fifth finger to bring the chin forward	15.3	34.0
15	Told that slight downward pressure on the rim is a proper seal	8.1	42.2
16	Achieve gentle chest rise with ventilation	28.8	45.6
17	Told that what will she look for to ensure adequacy of ventilation	37.8	62.6
18	If chest movement is inadequate what are the first 2 steps to improve ventilation	17.1	43.5
19	Ventilate at the rate of 40-60 beats per minute*	17.1	42.9
20	Count out loud (breath…2,3)	17.1	42.9
21	Assess the breathing/crying after 30 seconds of bag and mask*	17.1	46.3
22	Assess the heart rate? Either feeling pulse or listening via stethoscope*	18.9	39.5
23	Indicate that oxygen could be added	20.7	34.7
None of the steps/tasks		44.1	20.4
Critical steps/tasks		2.7	10.9
All steps/tasks		0.9	3.4
Number of SNs/ANMs		111	147

*Critical steps/tasks

Knowledge: Delivery and Third Stage of Labour

The knowledge questions related to delivery and third stage of labour included the following:

1. Definition of third stage of labour
2. Steps in the management of third stage of labour
3. Dose, route and storage of Oxytocin
4. Components of essential newborn care
5. Steps to manage the case of a newborn who is not breathing/crying

Knowledge: Third Stage of Labour

It was estimated that nearly 86% of the SNs/ANMs in RFS-2 (66% in RFS-1), knew that the third stage of labour starts from the expulsion of foetus and lasts till the delivery of placenta (Table 21).

Table 21: % of SNs/ANMs who had correct knowledge of various aspects of AMTSL, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Definition of 3rd stage of labour		
Starts from expulsion of foetus	53.6	79.9[1]
Ends after delivery of placenta	63.7	82.9[2]
Knowledge of full definition	66.1	86.0
Steps in AMTSL		
Uterotonics	62.5	78.0
Controlled cord traction	32.7	44.5
Uterine massage	45.2	72.6
Any of the 3 steps	76.2	91.5
All the 3 steps	17.8	36.0
Timing, dose, route and storage of oxytocin		
Should be given within 60 seconds after delivery	42.9	62.8
10 IU is the appropriate dose	53.6	74.4
Should be administered intramuscular	60.7	77.4
Should be stored in temperature between 2^0 and 8^0 C	7.1	23.8
Knows any of the above 4 points	62.5	78.1
Knows all of the above 4 points	6.0	20.7
Number of SNs/ANMs	168	164

[1]In RFS-2, start of the third stage of labour was asked as "from delivery of foetus"; [2]In RFS-2, end of the third stage of labour was asked as "after expulsion of placenta"

However, only 43% in RFS-1 knew all the three steps involved in the active

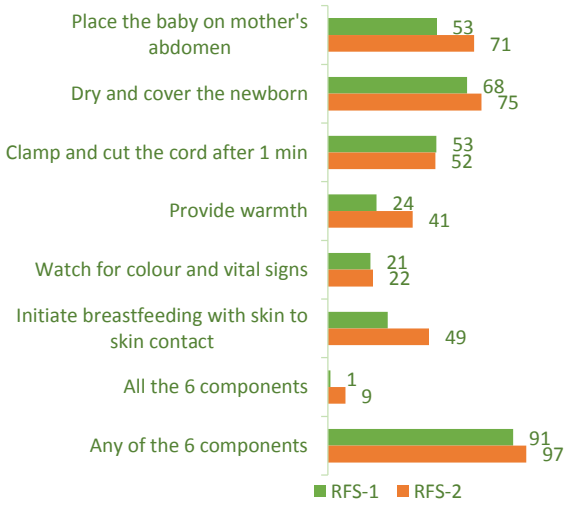
management of 3rd stage of labour, which improved by 20% points in RFS-2. A substantial proportion of the nurses mentioned the correct timing of administering the oxytocin (43% in RFS-1 and 63% in RFS-2), its correct dosage (54% in RFS-1 and 74% in RFS-2) and route (61% in RFS-1 and 77% in RFS-2).

While only 7% of the nurses knew that oxytocin should be stored within a certain temperature during RFS-1, the proportion improved by nearly 17% points in RFS-2.

Knowledge: Essential Newborn Care

When asked about the different components of essential newborn care, majority of the nurses (>90%) correctly mentioned at least one of the components of the essential newborn care in both the rounds of RFS (Figure 9).

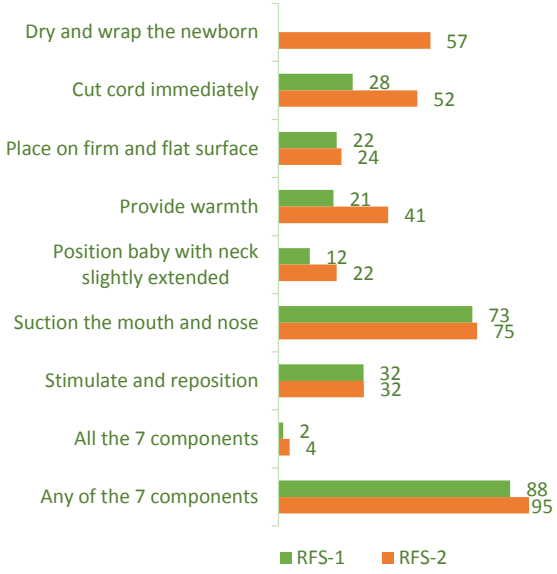
Figure 9: % of SNs/ANMs who knew the specific components of essential newborn care, RFS-1 (N=168) and RFS-2 (N=164), 2015-16



However, only 9% of the SNs/ANMs could list all the 6 components during RFS-2 (1% in RFS-1). The most frequently mentioned item was "dry and cover the newborn" (68% in RFS-1 and 75% in RFS-2), while the least mentioned component was "watch for colour and vital signs" (21% in RFS-1 and 22% in RFS-2).

On the other hand, almost 95% of the nurses during RFS-2 could mention any of the steps to be taken if the newborn is not breathing/crying, which registered an improvement of nearly 7% points over the round-1 estimate (Figure 10). However, only 2% and 4% of the SNs/ANMs could correctly list all the 6 steps during RFS-1 and RFS-2, respectively. The most frequently mentioned step was "suction the mouth and nose" (>73%).

Figure 10: % of SNs/ANMs who knew the specific steps that should be taken if the newborn is not breathing/crying at birth, RFS-1 (N=168) and RFS-2 (N=164), 2015-16



Note: "Dry and wrap the newborn" component was not included in RFS-1

MANAGEMENT OF FOURTH STAGE OF LABOUR

The fourth stage (the first 2 hours after delivery) is an important period of half-hourly assessments. Most maternal and newborn deaths occur during the first few hours after delivery; in particular, severe postpartum hemorrhage (PPH) can occur during this

stage, which could lead to death of the mother if not managed well. This is also the period when the mother is counselled on various topics including the care for the newborn and family planning.

Practices: Fourth Stage of Labour

Practice: Observation of the Mother and the Newborn

There are 5 key maternal parameters that need to be monitored during this time:

- **Maternal temperature**. A high temperature ≥38^{0}C or ≥100.4^{0}F can indicate infection. If she has a high temperature, this is a flag to assess other parameters like blood loss
- **Maternal pulse** should be checked. If her pulse is >110/minute, this is a sign of shock
- **Maternal BP**. It is important to check this for signs of PIH that can still be present after delivery (BP >140/90) or a sign of shock (systolic<90). If BP is high keep a watch for other signs of eclampsia such as seizures
- **Uterus contraction** is important to measure. Examining the uterus tells us if the uterus is remaining contracted or not. If the uterus is not contracted, but soft and flabby, or increasing in size (height above the level of the umbilicus) this is a red flag for uterine atony.
- **Bleeding** should be assessed. If it is increased, this can be a sign of some kind of PPH. In combination with other measures, the PPH diagnosis can be confirmed and managed.

Similarly, the four key newborn parameters to be monitored include: temperature, heart rate, respiratory rate and cord bleeding. In none of the observed deliveries in the RFS-1 was the mother's vitals observed in the recommended frequency within the 2 hours after delivery, while in RFS-2, it was observed in less than one percent cases except

Table 22: % of the mothers who stayed at the facility for at least 2 hours after delivery and the % of the newborns where the SN/ANM performed the specific observations of the mother and the newborn during the 4th stage of labour, RFS-1 and RFS-2, 2015-16

Observation	Expected # frequency of observations	Mean # of actual observations		% of mothers/ newborns who were observed in expected frequency		% of mothers/ newborns who were observed at least once	
		RFS-1	RFS-2	RFS-1	RFS-2	RFS-1	RFS-2
Maternal[1]							
Temperature	2	0.02	0.21	0	0.2	1.5	12.4
BP	8	0.07	0.50	0	0.6	5.5	26.7
Vaginal examination	8	0.41	0.91	0	1.7	28.5	37.0
Abdominal examination	8	0.16	0.54	0	0.8	11.1	25.2
Breast examination	2	0.04	0.35	0	1.2	3.2	16.3
Newborn[2]							
Temperature	5	0.02	0.23	0	0.2	1.5	14.0
Heart rate	5	0.03	0.27	0	0.2	2.8	16.9
Respiratory rate	5	0.04	0.32	0	0.0	3.1	19.2
Cord bleeding	8	0.09	0.52	0	0.0	7.9	26.0

[1]Women who delivered and stayed at least 2 hours (N): 470 in RFS-1 and 484 in RFS-2
[2]Mothers with livebirth and stayed at least 2 hours (N): 458 in RFS-1 and 473 in RFS-2

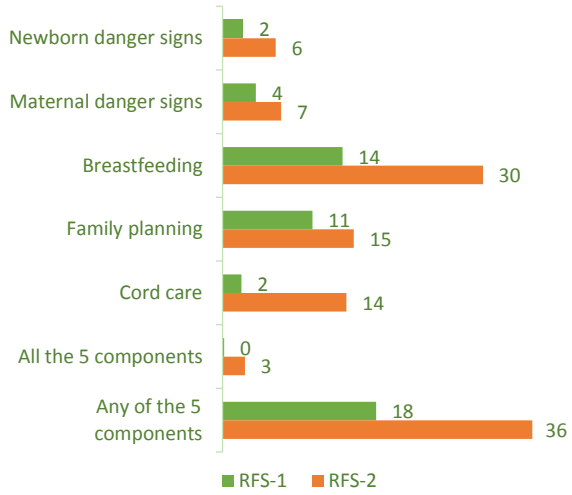
the vaginal and breast examination (Table 22). The improvement in the proportion (%) of cases in which the mother's vitals were examined at least once within 2 hours, between two rounds of the RFS are as follows: temperature (10% points), blood pressure (21% points), vaginal examination (8% points), abdominal examination (14% points), and breast examination (13% points).

The practices related to newborn observation in the fourth stage of labour was poor in RFS-1, which considerably improved in RFS-2. Less than 10% of the newborns in RFS-1 were observed at least once for temperature, heart rate, respiratory rate, and cord bleeding within 2 hours after delivery.

Practice: Counselling during the Fourth Stage of Labour

Counselling of the recently delivered mother in the fourth stage of labour by the SN/ANM has improved, but still at low level (Figure 11).

Figure 11: % of directly observed deliveries where the SN/ANM counselled the mother on specific topics, RFS-1 (N=470) and RFS-2 (N=484), 2015-16



A two-fold increase was observed in the proportion of mothers who were counselled on any of the topics: maternal and newborn danger signs, family planning, breastfeeding and cord care (during the fourth stage of labour), between the two rounds of the RFS. Counselling on breastfeeding during the fourth stage of labour registered the maximum improvement of all during the same period.

Skills: Fourth Stage of Labour

Skill: Management of Postpartum Haemorrhage

Postpartum haemorrhage (PPH) being the most common cause of maternal deaths, the providers to attend during delivery and immediate postpartum care need to have the necessary skills to manage PPH, before the case is referred to a higher facility for a more advanced care.

The skill of the nurses in the management of PPH was measured on a Mama Natalie. The case presented was of a patient who is bleeding profusely immediately after the delivery of placenta, indicating postpartum haemorrhage.

Nearly 82% of the nurses was found correctly demonstrating at least one step/task related to PPH management — registering an improvement of 15% points over the round-1 estimate (Table 23).

An improvement of 6% points was estimated among SNs/ANMs who could correctly demonstrate the critical steps/tasks in the management of PPH between the two rounds of RFS. However, only 2% of the nurses during RFS-2 were found correctly demonstrating all the steps/tasks involved in the management of PPH (none was found to do so during RFS-1).

Table 23: % of SNs/ANMs who performed specific steps/tasks related to the management of postpartum haemorrhage, in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Shout for help	20.7	21.1
2	Measure and record pulse	30.6	40.8
3	Measure and record BP*	41.4	55.8
4	Measure and record respiration rate	23.4	29.9
5	Measure and record temperature	21.6	29.3
6	Establish two I.V lines*	35.1	53.7
7	Could tell the correct size gauge that will be used	29.7	55.8
8	Could tell the correct steps that will be followed if the woman is in hypovolemic shock	21.6	23.1
9	Give IV normal saline or Ringer's lactate or 5% dextrose normal saline*	55.9	72.8
10	Could tell the rate of flow of IV fluids	25.2	71.4
11	Gave Oxytocin*	61.3	74.1
12	Could tell the dose of Oxytocin given via infusion*	46.8	74.8
13	Could tell the rate of flow for next 500ml of IV fluids	15.3	56.5
14	Gave oxygen	13.5	40.8
15	Insert a Foley's catheter*	13.5	25.9
16	Could tell major cause of PPH*	5.4	12.9
None of the steps/tasks		33.3	17.7
Critical steps/tasks		0	6.1
All steps/tasks		0	2.04
Number of SNs/ANMs		111	147[1]

*Critical steps/tasks

[1]Only those SNs/ANMs who were located at CHC or PHC

Skill: Counselling for Family Planning

The SN/ANM was asked to demonstrate counselling a recently delivered mother about family planning using GATHER approach. The case was presented as a woman delivered at the facility without complications, both the mother and the newborn are stable in the postnatal ward.

Overall, an improvement of 37% points was observed among the nurses between RFS-1 (44%) and RFS-2 (81%), who could demonstrate at least one of the skills in counselling on family planning (Table 24).

Table 24: % of SNs/ANMs who performed specific steps/tasks related to counselling on family planning in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Greeted the client	28.2	47.5
2	Showed respect for the client	26.3	63.1
3	Helped the client to feel at ease*	27.6	55.0
4	Encouraged the client to ask questions on family planning services and methods*	21.8	46.9
5	Explored client's knowledge about family planning	29.5	62.5
6	Explored client's knowledge of benefits of spacing of pregnancy*	25.6	67.5
7	Determined if client had used any method of family planning previously*	24.4	51.3
8	Determined any problems with the method*	16.7	35.0
9	Explored partner's/family's knowledge about family planning*	16.7	56.3
10	Determined attitude of family about birth spacing and use of FP to improve health*	23.1	55.0
11	Asked about desired number of children	23.7	62.5
12	Determined if the client had a preference for a specific method based on prior knowledge or the information provided*	17.3	55.0
13	Gave the client additional information that she may need and answered any question*	17.9	51.9
14	Acknowledged what the client has chosen	28.8	51.9
15	Told her what the next steps will be for providing her with her choice of method for family planning*	14.1	45.0
16	Determined if she can safely use the method*	27.6	58.8
17	Asked about her medical and reproductive history*	12.2	30.0
18	Discussed the advantages of selected method*	30.8	53.1
19	Discussed limitations of the selected method*	25.6	53.1
20	Discussed warning signs and explained when to return to the facility*	23.1	61.3
21	Checked that the client understood advantages/ disadvantages of selected methods*	26.9	63.1
22	Addressed any related needs such as protection from sexually transmitted infections including HIV*	7.7	26.3
23	Explained and supported condom use as a method of additional protection*	28.2	55.6
24	Made a notation in the client record about her choice or interest*	7.1	37.5
25	Provided information about when the client should come for the desired procedure/ method*	23.1	50.0
Any of the steps/tasks		44.2	80.6
Critical steps/tasks		0	4.4
All steps/tasks		0	1.9
Number of SNs/ANMs		156	160

*Critical steps/tasks

However, only 2% of the nurses during RFS-2 could correctly follow all the steps involved in counselling (none in RFS-1).

Skill: Postpartum IUCD Insertion

The skill of the nurses in the insertion of postpartum IUCD was measured on a Mama U. The skill station had the following equipment: Mama U, Cu IUCD 380 A or Cu IUCD 375, light source, vaginal speculum, ring forceps or sponge holding forceps, and long placental forceps or Kelly placenta forceps. The skill station also had the following supplies: Povidone Iodine or Chlorhexidine, gloves, 0.5% Chlorine solution, and tray for keeping instruments.

The case presented was of a just delivered mother without complications, who had undergone pre-insertion screening, medical assessment and counselling prior to delivery and had consented to the procedure. She has been confirmed as an appropriate candidate for PPIUCD insertion.

There was estimated an improvement of about 29% points in the proportion of nurses who could correctly demonstrate any of the steps related to insertion of PPIUCD, between the two rounds of the RFS (Table 25).

Nearly 10% of the nurses could correctly demonstrate the critical steps/tasks involved in the insertion of PPIUCD during RFS-2 (5% during RFS-1). However, only 2% and 7% of the SNs/ANMs could demonstrate all the steps/tasks involved in the insertion of PPIUCD during RFS-1 and RFS-2, respectively.

Table 25: % of SNs/ANMs who performed specific steps/tasks related to insertion of postpartum IUCD in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Wash hands*	14.4	34.0
2	Wear sterile gloves*	19.8	46.9
3	Inform the mother about the procedure	16.2	40.8
4	Inspect the perineum, labia and vagina*	18.9	42.9
5	Told one major contraindication for PPIUCD insertion	17.1	40.1
6	Visualize the cervix by gently inserting a speculum into the vagina*	18	49.7
7	Told, if the cervix doesn't come immediately into view what should you do	12.6	32.0
8	Grasp anterior lip of the cervix with the ring forceps up to the first lock*	19.8	44.2
9	Grasp the IUCD with a Kelly placental forceps using the no touch technique*	15.3	44.9
10	Lift the anterior lip of the cervix using the ring forceps	16.2	45.6
11	Insert placental forceps holding the IUCD into lower uterine cavity	19.8	48.3
12	Told that how far she should insert the placental forceps	9	35.4
13	Remove the ring forceps from the cervix	18.9	47.6
14	Place a hand on the lower part of the uterus with the finger towards the fundus*	16.2	42.9
15	Push the uterus upward	13.5	40.8
16	Release the IUCD at the fundus*	18.9	43.5
17	Continue to stabilize the uterus with a hand on the abdomen	15.3	36.7
18	Sweep the placental forceps to the side wall of the uterus	9.9	35.4
19	Keep the forceps slightly open while removing	16.2	42.9
20	Stabilize the uterus until the forceps were completely out of the uterus	13.5	38.1
21	Examine the cervix*	19.8	36.1
22	Told that what will she do if the strings are visible and protruding from the cervix	7.2	34.7
23	Remove all the instruments	20.7	40.1
24	Place the instruments in 0.5% chlorine solutions*	12.6	31.3
25	Told the mother about the successful insertion of the IUCD	17.1	41.5
Any of the steps/tasks		23.4	51.7
Critical steps/tasks		5.4	10.2
All steps/tasks		1.8	6.8
Number of SNs/ANMs		111[1]	147[2]

*Critical steps/tasks

[1]Only those SNs/ANMs who were located at the facility with skill lab

[2]Only those SNs/ANMs who were located at CHC or PHC only

Knowledge: Fourth Stage of Labour

Knowledge: Measurement of Vital Signs of the Mother and the Newborn

As far as the knowledge of the SNs/ANMs about the particulars during the fourth stage is concerned, nearly 76% of the nurses were aware that the fourth stage of labour starts from the delivery of placenta — registering an improvement of 18% points over the round-1 estimate (58%).

Table 26: % of SNs/ANMs who had knowledge about the recommended frequency of measuring vital signs in mothers and newborns during the fourth stage of labour, RFS-1 and RFS-2, 2015-16

Signs/Symptoms	RFS-1	RFS-2
Maternal, during the Fourth stage		
Temperature every hour	25.0	52.4
Pulse every 15 minutes	23.2	59.8
BP every 15 minutes	20.2	59.8
Uterine contractions every 15 minutes	23.2	55.5
PV every 15 minutes	22	54.9
Urination every 15 minutes	13.1	50.6
Newborn, during the first 1 hour		
Breastfeeding every 15 minutes	29.2	59.8
Newborn colour every 15 minutes	20.2	62.8
Nasal flaring every 15 minutes	17.9	56.7
Grunting every 15 minutes	20.2	56.1
Chest reaction every 15 minutes	21.4	59.2
Respiratory rate every 15 minutes	25.6	64.0
Heart rate every 15 minutes	20.8	69.5
Temperature every 15 minutes	20.2	59.8
Cord bleeding every 15 minutes	28.6	65.9
Number of SNs/ANMs	168	164

Majority of the nurses were not aware of the recommended frequency of measurement of vital signs of the mother and the newborn during the fourth stage of labour in RFS-1, which slightly improved in RFS-2 (Table 26). The vital signs of the newborn during the fourth stage, for which majority (> 60%) of the nurses were aware of the correct frequency of assessment during RFS-2 were: heart rate (70%), cord bleeding (66%), respiratory rate (64%), and newborn colour (63%).

INFECTION PREVENTION

Infection prevention refers to procedures/practices used to minimize the risk of spreading infections, especially in hospitals and health care settings. Poor infection prevention practices in labour and delivery units also cause puerperal sepsis, neonatal sepsis and other infections to newborn and mother. The health workers are also at risk of contracting infections in labour and delivery units.

Practices: Infection prevention

Table 27 presents a set of selected infection prevention practices which were recorded while delivery observations in the health facilities.

In 95% of the cases which were observed during the first stage of labour had vaginal examination done in RFS-2 (87% in RFS-1). However, in only 10% of the cases the SNs/ANMs washed their hand before per vaginal examination in RFS-2 (3% in RFS-1), which seems to be compensated by wearing gloves.

Handwash practices by SNs/ANMs before delivery improved from 46% in RFS-1 to 76% in RFS-2. Two out of six biomedical waste management practices listed in Table 27 recorded less than 20% prevalence.

In only 55% of the cases, labour room was disinfected after the delivery in RFS-2, which recorded an improvement of 44% points over the round-1 estimate.

Table 27: % of deliveries for which specific infection prevention practices were observed, RFS-1 and RFS-2, 2015-16

	RFS-1	RFS-2
Handwash/wearing gloves (observed for 250[1] and 309[2] deliveries)		
Handwash before pervaginal examination	2.8	9.7
Wear gloves during pervaginal examination	69.2	87.4
Wash hands and wear gloves during pervaginal examination	2.0	8.4
Handwash before delivery*	45.7	75.8
Biomedical waste management (observed for 516[1] and 542[2] deliveries)		
Placenta disposed in a yellow coloured bin	15.9	56.9
Used needles are burnt before placing them in a puncture container	4.1	20.7
Hub cutter used	15.3	18.6
Syringes are disposed in a puncture proof container	5.8	28.6
Used IV sets cut with scissors before discarding	1.2	16.6
Soiled dressing materials disposed in yellow colour bin	11.8	53.1
Cleaning of labour room (observed for 516[1] and 542[2] deliveries)		
Labour room disinfected after the delivery	11.2	54.8

[1]RFS-1; [2]RFS-2

*Observed for 289 (RFS-1) and 327 (RFS-2) deliveries

Skills: Infection Prevention

Skill: Handwashing

The SN/ANM was asked to demonstrate handwashing skills at a skill station where running water, soap and towels were available. The towel was provided at the skill station to measure if the SNs/ANMs use the towel to dry their hands after the hand wash, which is not recommended.

The SNs/ANMs were requested to demonstrate the recommended steps of handwashing and describe each step when they were washing their hands.

Table 28: % of SNs/ANMs who performed specific steps/tasks related to handwashing in a skill demonstration session, RFS-1 and RFS-2, 2015-16

	Step/task	RFS-1	RFS-2
1	Removed any rings*	32.7	41.9
2	Removed the watch*	30.1	33.1
3	Removed other jewellery below elbow	30.1	39.4
4	Applied enough soap to cover all the surfaces of the hand	73.7	71.9
5	Performed palm to palm action*	81.4	78.1
6	Performed left palm over right dorsum with interlaced fingers*	67.3	76.3
7	Performed palm to palm with fingers interlaced*	60.3	71.9
8	Performed back of finger to opposing palms with fingers interlocked*	59.6	71.3
9	Performed rotational rubbing of left thumb clasped in the right palm*	45.5	65.0
10	Performed rotational rubbing of right thumb clasped in the left palm*	47.4	66.3
11	Performed rotational rubbing backwards and forwards with clasped fingers of the right hand in the left palm*	41.0	64.4
12	Performed rotational rubbing backwards and forwards with clasped fingers of the left hand in the right palm*	42.3	63.8
13	Rinsed hands with water	77.6	75.6
14	Used the towel or elbow to turn off the water faucet*	25.6	45.0
None of the steps/tasks		16.7	19.1
Critical steps/tasks		5.8	13.8
All steps/tasks		5.8	13.8
Number of SNs/ANMs		156	160

*Critical steps/tasks

Nearly 14% of the SNs/ANMs could correctly demonstrate all the steps of clinical handwashing during RFS-2— registering an improvement of 8% points over the round-1 estimate (Table 27). On the other hand, nearly one fifth of the nurses could not demonstrate any of the handwashing steps during RFS-2.

Skill: Preparation of 0.5% Chlorine Solution

The 0.5% chlorine solution, also known as strong chlorine solution includes a higher concentration of HTH* (High Test Hypochlorite) chlorine which is used for disinfecting surfaces, objects, medical equipment, and gloves. Other uses include cleaning of floors, toilets and bathrooms, foot baths, contaminated waste for disposal, and corpses.

The SN/ANM was asked to demonstrate her skill in preparation of 0.5% chlorine solution at a skill station and was requested to describe the procedure. The required supplies and equipment such as gloves, plastic bucket with lid, plastic mug, one litre empty bottle, bleaching powder, and tea spoon were available at the skill station.

Table 29: % of SNs/ANMs who performed specific steps/tasks related to preparation of 0.5% chlorine solution in a skill demonstration session, RFS-1 and RFS-2, 2015-16

Step/task		RFS-1	RFS-2
1	Wore gloves	48.1	64.4
2	Took 1 litre of water in a plastic bucket	60.3	76.3
3	Removed some water from plastic bucket using a plastic mug	52.6	73.1
4	Measured 3 level teaspoons bleaching powder	51.9	75.0
5	Mixed the water and bleaching powder in the plastic mug	56.4	71.9
6	Poured the paste in plastic bucket	53.2	70.6
7	Covered the bucket after preparation of the solution	28.2	49.4
None of the steps/tasks		35.3	19.4
All steps/tasks		19.2	37.5
Number of SNs/ANMs		156	160

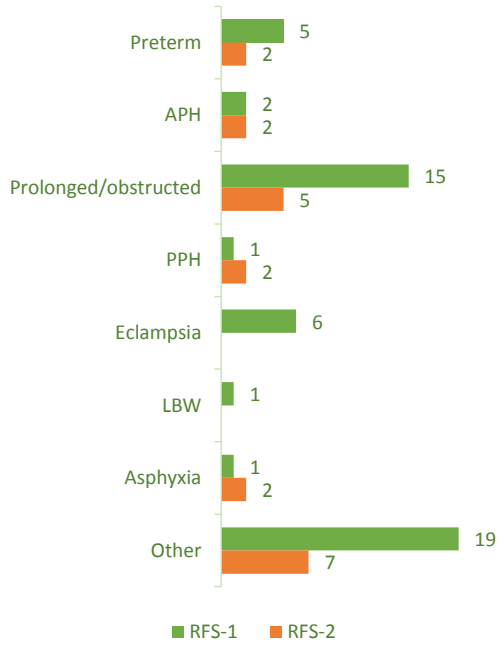
An improvement of 16% points was estimated in the proportion of the nurses who could correctly demonstrate any of the steps involved in the preparation of 0.5% chlorine solution, between the two rounds of the RFS (Table 29). Nearly 38% of the SNs/ANMs could able to correctly demonstrate all the steps involved in preparation of 0.5% chlorine solution during RFS-2 — registering a two-fold improvement over the round-1 estimate.

REFERRALS

It was observed that a total of 50 cases were referred out: 46 due to maternal complications and 4 due to newborn complications. Prolonged/obstructed labour, eclampsia and preterm labour were the most common reasons for referrals (Figure 12).

The majority of the cases (78%) were referred to the District Hospital and in 84% of the cases, the facility to which the patient was referred was given prior information about the referral. Free ambulance services (108 and 102) were used for transporting 60% of the referral cases.

Figure 12: Distribution of out-referrals by reasons, RFS-1 (N=50) and RFS-2 (N=20), 2015-16



ANNEXURE A

ABOUT UTTAR PRADESH TECHNICAL SUPPORT UNIT

The Uttar Pradesh Technical Support Unit (UP-TSU), with a goal to support the government to increase the efficiency, effectiveness and equity in the delivery of RMNCH+A services in the state is established by University of Manitoba in November 2013, with the financial assistance from Bill & Melinda Gates Foundation. To achieve the goal, several key objectives have been established for the TSU, including: supporting leadership to focus more on outcomes; improving the performance of front-line workers (FLW); improving facility performance, coverage and quality of care; enhancing accountability systems [internal and external] to ensure quality of service delivery at scale; and improving overall planning, policy formulation and coordination. The TSU is focused on achieving seven major objectives, five in health and two in agriculture/financial inclusion. They are to:

1. Strengthen FLW skills/capabilities
2. Build skills/capabilities of primary care providers
3. a) Improve health system management capabilities
   b) Support other critical health system level improvements
4. Support better stewardship of the private sector
5. Help improve external accountability
6. Improve agricultural productivity by improving indigenous state capacity to conduct research into critical areas, and support innovations in agricultural extension and dissemination of technologies, leading to enhanced income at smallholding farm level in Eastern UP
7. Enhance financial inclusion by improving government to person payments

About 80% of the TSU's effort is focused on achieving Objectives 1, 2 and 3a, with the goal of "activating" the government system to improve interactions between FLWs and households and communities and improve the quality of care at first level clinics and referral units up to district level. These activities are performed by the state, district and block level staff support. Objective 3b, 4, and 5 are less intensive in nature but can be catalytic – a combination of policy changes, planning, guidelines and coordination activities that could reduce the bottlenecks that contribute to critical HR gaps, infrastructure or supply chain issues; support the government to be a better steward of private provision and kick start NRHM's framework of external accountability. These activities are primarily performed by the state level staff.

Given Uttar Pradesh's large population, the TSU activities are appropriately scaled according to need and geography to ensure the achievement of state-level improvements in health outcomes. Accordingly, the UP-TSU provides both direct and diffused techno-managerial support at various levels of health system. The direct support is delivered in 100 prioritized blocks in the 25 high priority districts of the state. In order to affect change at the block level, the UP-TSU provides techno-managerial support at the higher levels of health system too by providing planning and implementation support at the district and state levels.

The UP TSU is a consortium of several organizations, led by University of Manitoba, Winnipeg, Canada. The consortium members include: BBC Media Action, Centre for Advocacy and Research, Clinton Health Access Initiative, EngenderHealth, India Health Action Trust, Janani, John Snow Inc., King George's Medical University, Marie Stopes India and University of Manitoba.

ANNEXURE B

SURVEY ZONES AND DISTRICTS

Zone	District
Allahabad	Allahabad
	Kaushambi
	Mirzapur
	Sonbhadra
Barabanki	Bahraich
	Barabanki
	Faizabad
	Kheri
	Sitapur
Bareilly	Budaun
	Pilibhit
	Rampur
	Shahjahanpur
	Bareilly
Farrukhabad	Etah
	Farrukhabad
	Hardoi
	Kannauj
	Kasganj
Gonda	Balrampur
	Gonda
	Mahrajganj
	Sant Kabir Nagar
	Shrawasti
	Siddharthnagar

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