

## Bottleneck Analysis of Implementation of Safe Childbirth Checklist in Alwar district of Rajasthan

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### Abstract

WHO developed Safe Childbirth Checklist, a 29 item checklist for addressing the major causes of deaths in low income countries, tool that reminds and help staff adherence to essential childbirth practices. India is a low Income country where resources and population are always critical issues in achieving health goals. Rajasthan has poor MMR and IMR, even lesser than national average for India.

The objective of the study was to identify the bottlenecks in the implementation of Safe Childbirth Checklist across the 6Health System Building Blocks of WHO. With mix-method approach, a cross sectional qualitative facility based study was conducted in 13 facilities (12 CHCs and 1 District Hospital) of Alwar. Among these facilities, 30 providers were interviewed using semi structured questionnaire.

After data analysis, it was found that at most of the health facilities, there was lack of supervision and feedback to service providers on the checklists filled by them. Shortage of Health Staffs and skills on Partograph, Labor services were the key points under Health Workforce. Essential medical supplies were not available. For effective scale-up of the program, recruitment of new service providers, induction training to new and refresher training to old, sensitization on data demand and use, proper drug and supply management and a regular monitoring and feedback system is required.

**KEYWORDS:** Safe Childbirth Checklist, Bottleneck analysis, Maternal Health, Child Health

### Introduction

The risk of maternal and perinatal complication is well understood; mostly the maternal and perinatal mortality burden is clustered around the time of birth.

In 2010, 0.3 million women died during pregnancy and childbirth, some 2.6 million stillbirths occurred worldwide, and nearly 3 million newborns died within their first month of life. The majority of these deaths occurred in low-resource settings and most could have been prevented. In response to this unacceptable situation, WHO has

developed the **Pilot Edition of the Safe Childbirth Checklist** to support the delivery of essential maternal and perinatal care practices.<sup>1</sup>

In India, women are encouraged and incentivized to deliver at public health facilities. However, in practice, poor quality care is observed in public health facilities. Though minimum standards for healthcare practice at public health facilities have been established but well recognized gaps in newborn and maternal care practices still exist.

The objective of the WHO checklist - based quality improvement program was to assist health-care workers in reducing the number of adverse events that occur around the time of childbirth and to reduce maternal and newborn morbidity and mortality. It has synthesized core sets of best practices into practical recommendations to be used by health care workers at the time of delivery. WHO has developed the checklist based quality improvement program to enhance frontline health care worker capacity to deliver high quality care.<sup>2</sup>

WHO Safe Childbirth Checklist is a 29 items checklist addressing the major causes of maternal deaths (namely, haemorrhage, sepsis, obstructed labour and hypertensive disorders), intrapartum-related stillbirths (namely, inadequate intrapartum care), and neonatal deaths (namely birth asphyxia, infection and low birth weight, etc) in low-income countries, tool that reminds and help staff adherence to essential childbirth practice.<sup>1</sup> Each action is important and critical, if missed can lead to complication or death. Each safety check has been developed according to evidence based recommendation and it is expected that each action listed will reduce the likelihood of avoidable harm and that adherence to them is unlikely to introduce adverse events or unnecessary cost.

The aim of the checklist-based approach is to translate known best practices found in existing evidence-based guidance into practice at the bedside. The Safe Childbirth Checklist was developed from October 2008 to June 2010 through the following systematic process of comprehensive review, consultation with stakeholders, field testing and pilot study. A pilot study to evaluate the Checklist programme's impact on process measures was conducted over a period of six months in a tertiary facility in India, which produced promising results.<sup>2</sup>

Millennium Development Goals are to be achieved by 2015. India has to achieve the target of 109 MMR, and 28 IMR, while it has achieved 212 MMR and 53 IMR in 2009<sup>3</sup>. For Rajasthan, IMR was 57 and MMR was 264 in 2011-2012. Rajasthan has higher IMR

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<sup>1</sup>Spector JM, Agrawal P, Kodkany B, et al. Improving quality of care for maternal and newborn health: Prospective pilot study of the WHO safe childbirth checklist program. *PLoS One*. 2012;7(5):e35151

<sup>2</sup>SAFE CHILDBIRTH CHECKLIST PROGRAMME - background\_document.pdf.[http://who.int/patientsafety/implementation/checklists/background\\_document.pdf](http://who.int/patientsafety/implementation/checklists/background_document.pdf). Accessed 7/10/2014, 2014

<sup>3</sup>MMR\_release\_070711.pdf.[http://censusindia.gov.in/vital\\_statistics/SRS\\_Bulletins/MMR\\_release\\_070711.pdf](http://censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR_release_070711.pdf). Accessed 7/10/2014, 2014

and MMR compared to national average<sup>4</sup>. Thus more efforts are needed by Rajasthan Government to be at par with national average in terms of health indicators.

The objective of the study conducted is to identify the bottlenecks in the implementation of safe childbirth checklist. The study will help in identifying the gaps in the implementation of the program and bring solution to improve the program and its effectiveness.

The gaps identified will help us analyze the health system bottlenecks and challenges preventing the scale up of high-impact, cost-effective interventions for newborns, identifying potential solutions, including innovative strategies to overcome the barriers, bottlenecks and challenges identified. The tool is organized to facilitate the identification of bottlenecks across the 7 WHO Health System Building Blocks 1.Leadership and governance 2.Health financing 3.Health work force 4.Essential medical products and technologies 5.Health services 6.Health information systems<sup>5</sup>

### **Literature Review**

Lots of researches have been conducted on maternal and child mortality and ways to prevent them. When doctors, nurses and other staff follow a written safety checklist to respond when a patient experiences cardiac arrest, severe allergic reaction, or other crisis during surgery, they are nearly 75 percent less likely to miss a critical clinical step, according to a new study (randomized controlled trial) funded by the U.S. Department of Health and Human Services' Agency for Healthcare Research and Quality (AHRQ). Under above mentioned randomized controlled trial, investigators simulated multiple operating room crises and assessed the ability of 17 operating room teams from three Boston area hospitals—one teaching hospital and two community hospitals—to adhere to life-saving steps for each simulated crisis.

In half of the crisis scenarios, operating room teams were provided with evidence-based, written checklists. In the other half of crisis scenarios, the teams worked from memory alone. When a checklist was used during a surgical crisis, teams were able to reduce the chances of missing a life-saving step by nearly 75 percent.

Hospital staff who participated in the study said the checklists were easy to use, helped them feel more prepared. In addition, 97 percent of participants said they would want checklists to be used for them if a crisis occurred during their own surgery.

Labor room and Neonatal ICU in public health facilities are the similar settings as compared to Surgery or Operation Theatre. Thus similar checklist can be implemented in public health facilities to cover the Missing of Critical Steps during any operation or surgery.<sup>6</sup>

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4Rajasthan\_Bulletin 2011-12 - Rajasthan\_Bulletin 2011-

12.pdf.[http://www.censusindia.gov.in/vital\\_statistics/AHSBulletins/files2012/Rajasthan\\_Bulletin2011-12.pdf](http://www.censusindia.gov.in/vital_statistics/AHSBulletins/files2012/Rajasthan_Bulletin2011-12.pdf). Accessed 7/10/2014, 2014

5Every-newborn-tools.pdf. <http://www.mhtf.org/wp-content/uploads/sites/17/2013/09/Every-Newborn-tools.pdf>. Accessed 7/13/2014, 2014

6Arriaga AF, Bader AM, Wong JM, et al. Simulation-based trial of surgical-crisis checklists. *N Engl J Med*. 2013;368(3):246-253

Implementation of the checklist was associated with concomitant reductions in the rates of death and complications among patients at least 16 years of age who were undergoing non-cardiac surgery in a diverse group of hospitals.<sup>7</sup>

The checklist identified and reduced a surprisingly large number of missing items required in a standard induction protocol.<sup>8</sup>

Spector, Agrawal, et. al. through the Checklist based interventions into clinical practice have shown to reduce deaths and complications in field of medicine and surgery. Most maternal and newborn deaths and many stillbirths are avoidable. In 2008, World Health Organization (WHO) established a checklist-based childbirth safety program with a goal of determining whether a simple, low cost, scalable intervention could be devised. The team conducted a prospective, pre-post intervention study observing childbirth practices of health workers at a sub-district level hospital in Karnataka, India with a sample size of 499 birth events during baseline period and 795 birth events after introduction of checklist program.

The implementation of the safe childbirth checklist led to improved quality of care delivered by health workers attending to institutional deliveries.

A research study presented an overview of challenges and lessons learned through bottle neck analysis across the six sub-Saharan Africa countries which were part of the Catalytic Initiative (CI/IHSS) - Ethiopia, Ghana, Malawi, Mali, Mozambique, and Niger<sup>9</sup>. Drawing from review and analysis of over 50 programme documents, as well as correspondence with a range of programme key informants, it highlighted important multi-country experience on the common challenges to implement intervention packages for child survival, in particular the delivery approach of integrated Community Case Management (iCCM). The study was concluded by demonstrating the importance of bottleneck analysis that will be critical for informing iCCM progress moving forward, as well as contributing to the growing body of knowledge on implementation of iCCM programmes.<sup>10</sup>

## Material & Methodology

Study revolves around its main research question - What are the bottlenecks identified in the implementation of Safe Childbirth Check list program in Alwar District of Rajasthan?

<sup>7</sup>Thomassen O, Brattebo G, Softeland E, Lossius HM, Heltne JK. The effect of a simple checklist on frequent pre-induction deficiencies. *Acta Anaesthesiol Scand*. 2010;54(10):1179-1184

<sup>8</sup>A surgical safety checklist to reduce morbidity... [N engl J med. 2009] - PubMed -

NCBI. <http://www.ncbi.nlm.nih.gov/pubmed/19144931?dopt=Abstract&holding=f1000.f1000m.isrctn>. Accessed 7/13/2014, 2014

<sup>9</sup>Scale-up of Integrated Community Case Management Catalytic Initiative-2012.pdf. [http://www.unicef.org/health/files/Scale-up\\_of\\_Integrated\\_Community\\_Case\\_Management\\_Catalytic\\_Initiative-2012.pdf](http://www.unicef.org/health/files/Scale-up_of_Integrated_Community_Case_Management_Catalytic_Initiative-2012.pdf). Accessed 7/13/2014, 2014

<sup>10</sup>Every-newborn-tools.pdf. <http://www.mhtf.org/wp-content/uploads/sites/17/2013/09/Every-Newborn-tools.pdf>. Accessed 7/13/2014, 2014

Mix-method cross section qualitative facility based study was conducted to identify bottlenecks in the implementation of Safe Childbirth Checklist. It was conducted in Alwar district of Rajasthan from June 2014 to August 2014. It was conducted in District Hospital and Community Health Centers (CHC). Service providers were the primary respondents.

Alwar district has 1 district hospital and 29 Community Health Centers where the Safe Childbirth Checklist has been implemented. As per the delivery load per month per health facility, the facilities were classified into three categories: High Load, Medium Load, Low Load delivery facilities. Four facilities from each category were selected with addition to district hospital. Thus a total of 13 facilities (12 CHCs and 1 District Hospital) were visited during the study.

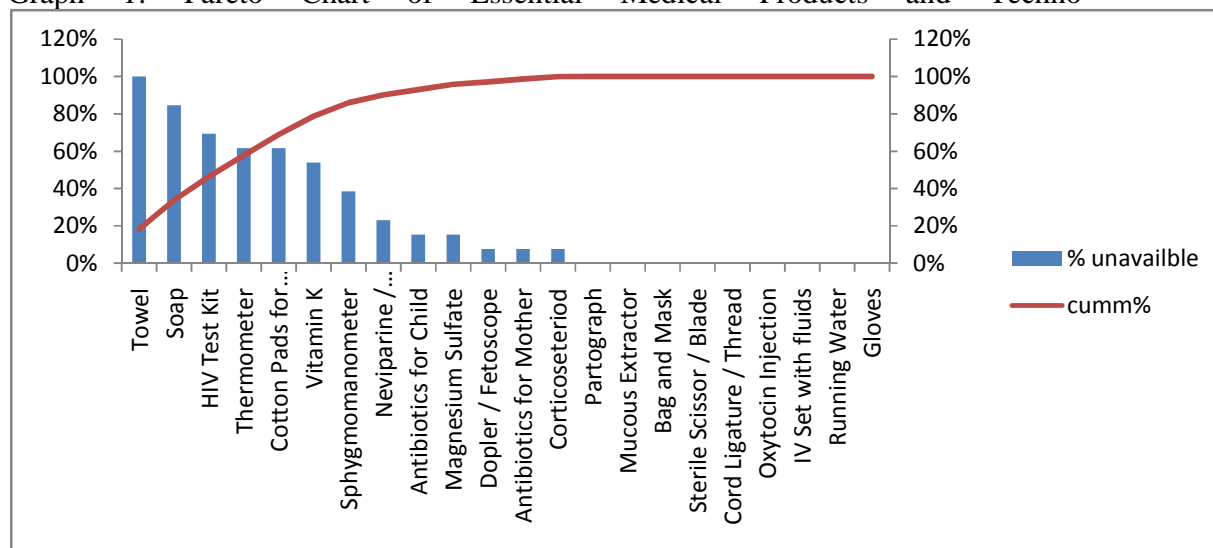
Service providers: 30 providers were picked from selected facilities. The selection criteria for the service providers were that they have received the training on the safe child birth checklist. Then by simple random sampling method 30 providers were picked from the facilities for interview.

A semi-structured questionnaire was used for data collection. It was based on the bottle neck analysis tool on the basis of the building blocks of Health system by WHO. The tool was pretested in field to find out the reliability of the tool.

**Result:**

Based on the observations and interviews conducted, the following result is drawn which is analyzed with respect to building blocks of health care defined by WHO.

Graph 1: Pareto Chart of Essential Medical Products and Techno



Analyzing the Pareto chart for the equipment list essential for safe childbirth checklist tool, it was observed that 80 percent of unavailable or non-functional equipment's are Towel, Soap , HIV test Kit, Thermometer, Cotton pads, Vitamin K and Sphygmomanometer. Therefore, initial focus should be given to these equipment

lists. Thermometer and sphygmomanometer are essential vital reading of mother and child and help in assessing the conditions of both the mother and child, tracking the risk and danger. Towel and Soap are essential for maintaining hygiene process during the delivery; it reduces the risk of infection to mother, child and the service provider itself. HIV kit should be kept in the Labor Room for the pregnant women coming directly in active stages of Labor so that the HIV test could be done in emergency. Vitamin K was injected to newborns within four hour of delivery. In many health facilities like Naraynpur CHC, the service providers were not aware of quantity of Vitamin K to be given and process to inject to the new borne which may be due to the difference in the concentration of the vitamin K vial. There was no supervision from higher officials to check the usage and supply of the vitamin K stock. At facility level, there was no designated officials who can technically advise them about the concentration and method of injecting the vitamin K.

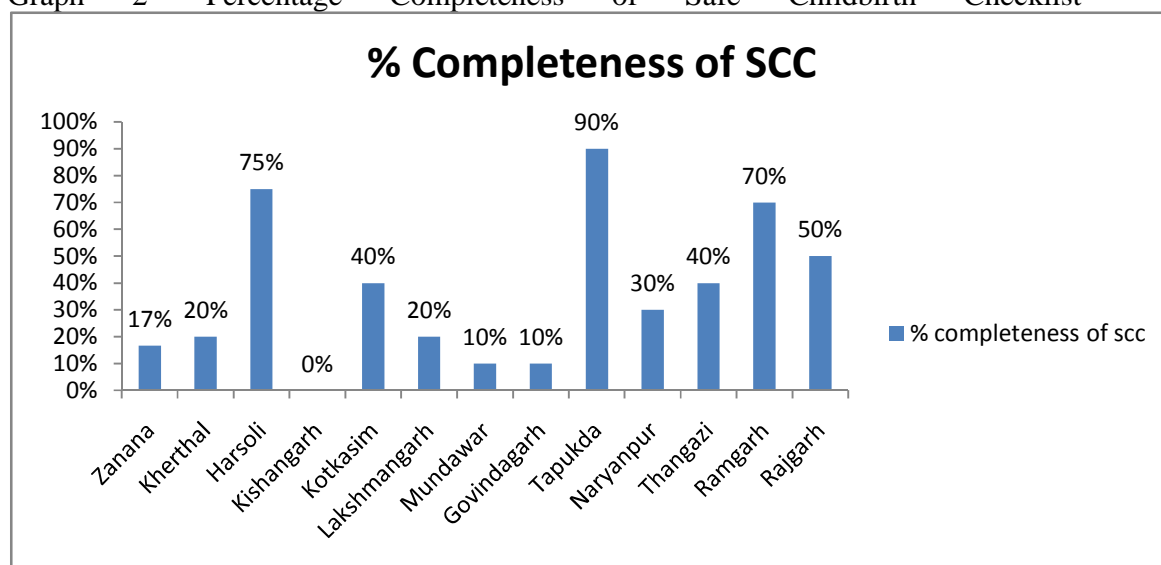
### Procurement of checklist tool

During discussion with service providers at health facilities, it was found that there was no proper procurement system for the Safe Childbirth Checklist in any of the health facility. It was being directly supervised by the development partner officials during their visit to the facility. There was no mechanism to decide number of checklist to be procured. When the checklist went out of stock, development partner officials were informed to make it available. At few facilities like district hospital, safe child birth check list was kept in labour room; while at most places, the indenting was done by registration counter in charge as it was kept there. There was lack of systematic procurement process and placement of safe childbirth checklist.

#### 1) Health Information system

Completeness of Safe Childbirth Checklist is an important indicator for ensuring how effectively the safe child birth checklist was followed during delivery.

Graph 2- Percentage Completeness of Safe Childbirth Checklist



It can be clearly deduced from the graph that none of the facility had 100 percent completely filled checklist. Few facilities were filling the checklist more than 70% while others were filling the vital information on checklist around 20-30%.

All the checklists filled for the deliveries at facility were submitted to the computer operator for online data entry. At some CHCs, checklists were submitted patient wise where as in some CHCs, these were not as per any schedule and were submitted to operator on weekly or fortnightly basis. As per the knowledge of staff, the only purpose of these checklists was to enter data online and do reporting. They have never received any feedback from higher officials on the checklist filled.

At some CHCs, Partographs were not at all filled and if filled were not correctly done. At some CHCs, checklists were not even attached with the admission ticket of the pregnant women. Staff at these CHCs said that due to lack of time and high workload, they were unable to fill checklists for each pregnant woman.

## 2) Leadership and Governance

Leadership and governance was lacking in all the health facilities.

**Table 1: Leadership and Governance**

Indicators	Number of Health Facilities
Policy on Safe Childbirth Checklist at health facility	13
Target given to health workers on filling of Checklists	0
Appointment of Official responsible for verification of quality of checklists	0
Frequency of verifications by Officials	0
Feedback given to health workers on checklist filled by them	0
Last visit done by senior health officials to monitor the SCC	0
Actions taken by higher officials based on SCC filled by service provider	0

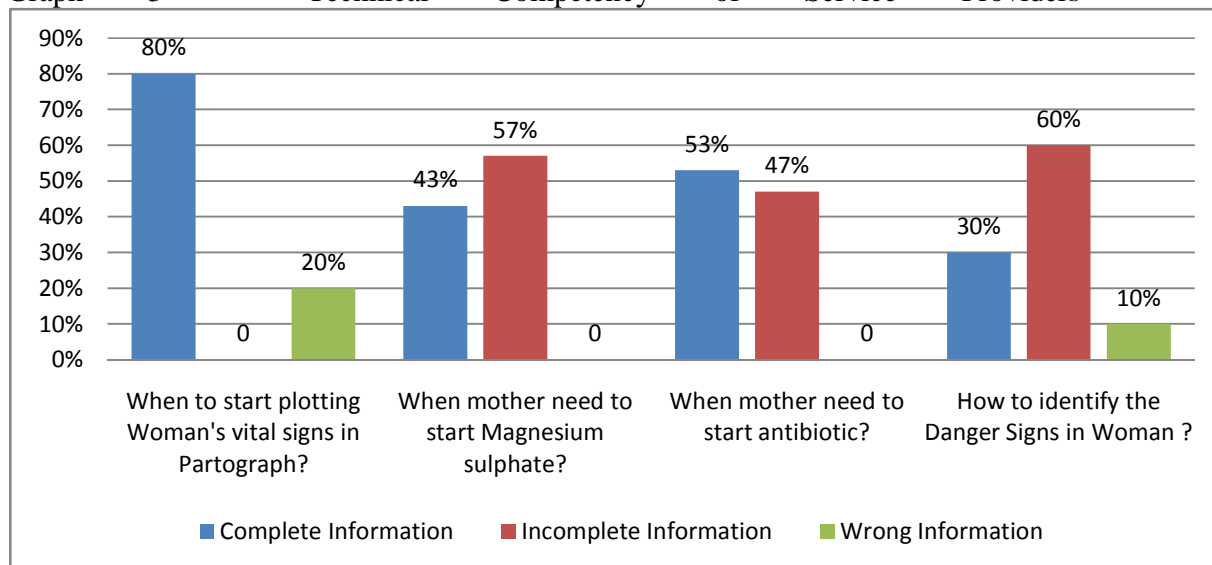
All the facilities had policy on safe childbirth checklist. But there was no one to supervise the implementation of the program within the facility. No target was given for the staff to fill the checklists against the deliveries conducted. Staff was also not motivated as they were given no feedback on their work. Thus, it led to complete failure of supervision and governance of the safe child birth checklist program implementation.

## 3) Health service delivery

### Technical Competence of the Staff

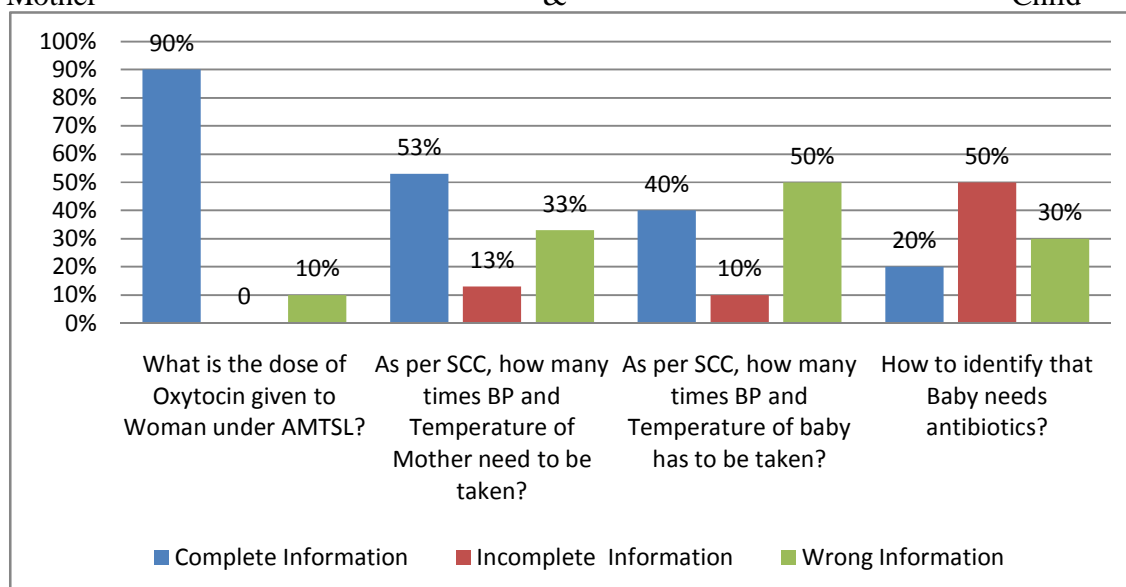
Technical competence is an important factor for the proper implementation of the program. Based on the staff knowledge about the safe child birth practice and checklist guidelines, we can assess their competence level.

Graph 3 – Technical Competency of Service Providers



Measured on basis of level of information staff had on Safe Childbirth Checklist, about 80% participants had the correct information about to when to start the Partograph. More than 50% had incomplete knowledge about when magnesium sulphate is given to pregnant woman. Approximately 50 percent had incomplete knowledge about signs when pregnant woman need to start antibiotics. 60 percent of participants had incomplete knowledge about danger signs and symptoms of the pregnant women.

Graph 4 – Technical Competency of Service Providers regarding Vital Statistics of Mother & Child

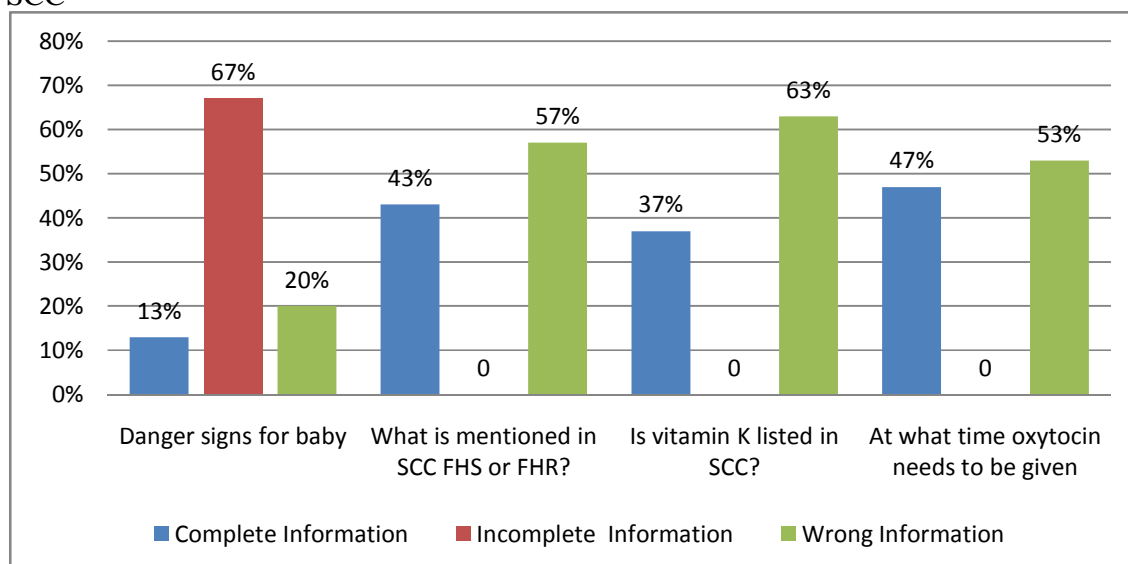


Almost 90% participants knew what dose of oxytocin to be given to pregnant woman under AMTSL. Knowledge about the number of time BP and temperature need to be



measured a was 33% for wrong information, despite of training given to all of them. 50% of them had wrong information about number of temperature and FHR to be measured of the baby. 57% of them had no idea about what has to be listed in checklist between FHR (fetal heart rate) or FHS (fetal heart sound).

Graph 5 – Technical Competency of Service Providers on Danger signs for Baby in SCC



Therefore 63 percent said that vitamin k is not listed in the safe childbirth checklist. The optimum time of injecting oxytocin during delivery was known by 50 percent of the staff and 50 percent didn't had correct knowledge about it. Therefore there was not optimum required competence for the safe child birth procedure. Knowledge was found to be below average among all staff working at labour room.

According to all the respondents, Safe Childbirth Checklist helped them in governing the vitals of both mother and child. They also said that it helped them in determining the danger signs and critical condition of pregnant women with the help of Partograph, few said that it helped them in identifying PPH and thus preventing PPH with the help of oxytocin. Most of them agreed that checklist tool is relevant. They didn't want any component to be deleted or inserted more in the checklist. Few of them said we have never gone through it thoroughly so can't suggest any deletion or addition of component in the checklist.

All of the staff filled the checklist daily. According to them, fully filled checklist gave the view of vitals of mother and new born and helps them follow patients. They didn't get any incentive for filling the checklist, but when asked few of them said they would like to have monetary incentive for filling to do proper implementation and filling of checklist is required, while other didn't demand for any incentives. They seem satisfied and committed to their work.

Therefore staff should be motivated more on Safe Childbirth Checklist as their responses demonstrated their negligence and unwillingness towards implementation

of the program. Few of the staff was really dedicated, following and having knowledge on all the procedures, ready for more training and learn things for the improvement for safe child birth.

#### **4) Health Workforce**

Most Community Health Centers didn't have Gynecologist and Pediatrician. These were posted only at Tapukda CHC and District hospital Alwar. No Anesthetist was available at any CHC except at the District Hospital (Zanana). There was also shortage of ANM, Staff Nurse, Lady Health volunteers (LHV's) and Yashoda in all CHCs.

District hospital had exceptionally high load of delivery with average 1200 deliveries per month. Ramgarh CHC, Rajgarh CHC, Tapukda CHC and Govindgarh CHC were high load CHC at the block with average of 200-300 deliveries per month. Kishangarh CHC, Thangazi CHC, Kotkasim CHC and Mundawar CHC were medium load health facilities with average 70- 120 deliveries per month. Kherthal CHC, Harsoli CHC, Laxmangarh CHC and Narayanpur CHC were the low load health facilities with average 30-50 deliveries per month. More deliveries were conducted in night with comparison to day. Generally deliveries were conducted by Staff Nurses, Auxiliary Nurse Midwives (ANM), or Lady Health Visitors (LHV). All CHCs have shortage of staff in their labor room and it was such deep that only one staff could be available on duty at a time in labor room. Only at district hospital, there was optimum number of staff but high overload of number delivery was burden on the staff. These staff were assisted by Doctors only during complicated deliveries, and in most of the health facilities, there were no gynecologists or pediatricians. So, most of the complicated deliveries were referred to the district (higher facility level).

#### **5) Health financing**

To implement the Safe Childbirth Checklist program, no extra manpower or equipment or facility is required at any health facility. This program supports the maternal health in government health setting and is not based on parallel system with government. It is based on capacity building of the present health workforce and strengthening the existing government health facilities. Only extra requirement is of procuring safe childbirth checklist which is to be attached to admission tickets. Presently the checklists are supplied by the JHPEIGO working at Rajasthan. Presently, Program Managers at block or district under government health system have no role in procuring and supplying the checklist. Availability and supply of checklist is not an issue at all in a long run of the program as government is enough competent to provide the availability of printed checklist tool.

#### **Conclusion and suggested recommendations**

In order to compile the findings and deduce the bottlenecks in each health system building blocks, each health facility is categorized into the degree of improvement needed in the program under each building block. Four categories are used to

classify each health facility: Good, Need Minor Improvement, Need Major Improvement and Inadequate. This classification will help in identifying the broader area in which major efforts are required and also the present status of health facility in the light of Safe Childbirth Checklist implementation in Alwar District.

Table 2 – Bottlenecks distributed among Health System Building Blocks

	District Hospital (Zanana)	CHC Ramgarh	CHC Rajgarh	CHC Naryanpur	CHC Jaxmangarh	CHC Kishangarh	CHC Kotkasim	CHC Tapukda	CHC Thanagazi	CHC Harsoli	CHC Kherthal	CHC Govindgarh	CHC Mundawar
Essential medical products and technology	Good	Good	Need minor improvement	Need minor improvement	Need minor improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement
Leadership and Governance	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate	Inadequate
Health Information system	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Good	Need major improvement	Need major improvement	Inadequate	Inadequate	Need major improvement
Health service delivery	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement	Need major improvement
Health workforce	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement	Need minor improvement
Health finance	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Indicators:

Good	Good
Need minor improvement	Need minor improvement
Need major improvement	Need major improvement
Inadequate	Inadequate

As per the classification of health facilities on the WHO Health System building blocks, Leadership and Governance is the area which is inadequate at all the health facilities. Thus the foremost step in improvement of the program should be developing Leadership and Governance at facility level. Health Information System at some facilities are either inadequate or require major improvement. Health workforce needs some improvement by recruitment of the vacant posts of all cadres at all the facilities. The essential medical equipment and products improvement varied in different health facilities. Similarly health information system varied in improvement range within facilities and can still be managed with proper supervision and coordination. Service delivery needs major improvements in few facilities and some improvement in others remaining.

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