Changes that improved maternal and neonatal health in Punjab
The 'needle and syringe' represents health service delivery or a health product change ideas.

The 'classroom' icon represents change ideas that were primarily related to classroom or on-the-job trainings, orientation and sensitization sessions.

The 'notice' icon represents change ideas where materials were created for ready reference or as reminders for action.

The 'checklist' icon represents change ideas that improved services by enhancing quality of reporting, recordkeeping and review.

The 'box' icon represents change ideas that improved procurement of products and services.

The 'two bustheads' icon represents change ideas which were either task shifting or was undertaken by introduction of a new health professional.

The USAID ASSIST Project acknowledges the unwavering support of Dr. Rakesh Kumar, Joint Secretary (RCH), Ministry of Health and Family Welfare, Government of India in development of this change package.

The USAID ASSIST Project also acknowledges contribution of facility managers and health service providers who, as members of the quality improvement teams, initiated and implemented change ideas to improve quality of healthcare services in their facilities.
Known as the Land of Five Rivers and as the ‘Bread Basket of India’, the state of Punjab covers 50,362 square kilometers and is home to 27.70 million people\(^1\). The infant mortality rate (IMR) in Punjab was recorded as 26 per 1000 live births in 2013\(^2\), which is a significant reduction from 34 in 2010\(^3\) and from 54 in 2001\(^4\). The neonatal mortality rate in Punjab also declined sharply to 16 in 2013\(^5\) from 24 in 2011\(^6\) and from 29 in 2000\(^7\). The Maternal Mortality Ratio (MMR) saw a marginal drop in the state, from 178 per 100,000 live births in 2001-03 to 155 per 100,000 live births in 2010-12\(^8\). This was the second slowest drop in MMR in the same period among the 15 big states of India. The District Level Household Survey Round 4 (DLHS 4) done in 2012-13 in the state shows that nearly 83% of pregnant women in the state were going for institutional delivery. Of the delivery that happened at home, around 86% had a skilled birth attendant\(^9\) facilitating the childbirth\(^10\). The survey also shows that only 48% of mothers received postnatal care (PNC) within 48 hours of delivering at an institution, with just one-third of all institutional deliveries getting discharged from facility after the minimum 48 hours of stay\(^11\). The survey findings indicate the need for improving quality of intranatal and postnatal services to achieve better success in reducing maternal mortality in the state.

The USAID ASSIST project in Punjab provided technical assistance for quality improvement in identified facilities in five high priority districts. The Quality Improvement (QI) teams\(^12\) from the USAID ASSIST Project, in consultation with stakeholders participating in process improvement in identified health facilities in those five high priority districts, selected a set of catalytic, high impact interventions in antenatal, perinatal, postnatal care of mothers and essential care of newborns that shall contribute to reduction in MMR and IMR.

### Gaps in quality of maternal and newborn health services

The QI teams used a mix of observations techniques and in-depth interviews on the maternal and newborn health interventions being practiced at various public health facilities in the state and identified the following gaps in provision of quality maternal and newborn health services.

#### Gaps in maternal health services during intra-natal period

- Administration of Oxytocin within one minute of delivery was not practiced across the state. Oxytocin IV infusion and Methergin were in use for the prevention of postpartum hemorrhage (PPH), which was not consistent to the Government of India guidelines for active management of third stage of labor (AMTSL).

#### Gaps in maternal health services during post-natal period

- Most health providers in public health facilities were not monitoring vital parameters repeatedly during the immediate postpartum period

#### Gaps in newborn health services

- Vitamin K injection was administered only to high risk newborns than to all newborns.
- Health providers did not consistently use sterile material for cord care.
Delivering change in maternal and newborn health services

**AIM#1** Delivering change in maternal and newborn health services

### Administration of Injection Oxytocin 10 International Units/intramuscularly within one minute of delivery to all the women delivering in labor room for active management of third stage of labor (AMTSL)

#### Change idea
- Early filling of Injection Oxytocin (10 IU) at the time of preparation of delivery.
- On-the-job training in skilled birth attendance for newly recruited staff nurses as well as those nursing staffs deputed to the labor room from other departments.
- Posters, printed on flex, with instructions on Oxytocin administration placed in line of eyesight, like wall in front of the labor table or nursing stations, to act as visual reminders for nursing staffs in the labor room.
- Regular recording and review of administration of Injection Oxytocin in the specified column in the delivery register available in the labor room.

#### Logic for change
- Since most delivery points had only one staff in the labor room to attend to deliveries, the staff, especially those working in either evening or night shifts, was overloaded with care of both mother as well as the newborn, resulting in their inability to administer Oxytocin within one minute of delivery.
- The newly recruited staff nurses lacked confidence to administer Oxytocin intramuscularly within one minute of childbirth, as they had not undergone training in AMTSL and were not aware of the Government of India guidelines.
- Nurses in the labor room at times forgot administering injection Oxytocin within the first minute of childbirth. Staff nurses, who worked in different shifts, were not knowledgeable about the guidelines on Oxytocin administration.
- The labor room staffs were not recording Oxytocin usage in the delivery register for many cases because there was no space provided in the register for doing so.

#### How the change happened
- The labor room staffs were trained to load a syringe with Oxytocin during the preparation for delivery and keep it ready in the delivery tray. The prefilled syringes were also labeled in some facilities to avoid any confusion. They were trained to inject Oxytocin into gluteal muscles or anterior thigh muscles as soon as the child is delivered.
- The gynecologist of the facility and senior staff nurses, who had undergone training in skilled birth attendance and practicing AMTSL, conducted a two-day on-the-job training in batches for the newly recruited staff nurses. The training covered administration, dosage, preparation of prefilled syringes, storage and recording of Oxytocin administration to the mother and included a practical demonstration of the process.
- Details regarding Oxytocin dosage, timing and method of administration were translated into local language, either written on paper or printed on flex and pasted in the labor room and at the nurses’ duty station. This served as a ready reckoner for nurses on duty at the labor room. Sites for placing the reckoner were decided in consultation with the medical officer in-charge (MOIC).
- A column was introduced in the delivery register with header ‘Inj. Oxytocin 10 IU/IM given within 1 minute’. ‘Yes’ or ‘No’ was written by staff nurses under this header to indicate whether or not she had administered Oxytocin to the mother.

#### Change site

<table>
<thead>
<tr>
<th>DH</th>
<th>SDH</th>
<th>CHC</th>
<th>PHC</th>
</tr>
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<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>

#### Percentages

| Proportion of vaginal deliveries for which uterotonic was administered within one minute of birth of baby in CHC Ghuman, July 2013 – November 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |

**Coaching and QI team formation**

**Orientation Learning Session**

**Stamp for record**

**Missing records**

**Shared labor room essentials list**

**ASSIST coaches training members of quality improvement teams**

**Orientation learning session facilitated by quality improvement teams**
## Delivering change in maternal and newborn health services

**AIM#1**
Administration of Injection Oxytocin 10 International Units/intramuscularly within one minute of delivery to all the women delivering in labor room for active management of third stage of labor (AMTSL)

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Ensure recording of administration of Injection Oxytocin by use of rubber stamp on case files of women undergoing C-section with 'Inj. Oxytocin 10 IU IM given within 1 minute of delivery of baby administered' mentioned on it.</td>
<td>Due to high caseload, the medical team was missing recording administration of Injection Oxytocin to women who underwent C-section.</td>
<td>A rubber stamp embossed with ‘Injection Oxytocin 10 IU/IM given within 1 minute of delivery of baby’ was kept in Operation Theatre. OT staff nurses were oriented to put the stamp on the patient files of C-section patients who were administered Injection Oxytocin. The anesthetists/gynecologist verified the records.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Old and new staff nurses were paired in the labor room for each shift to ensure that new staffs are mentored by the old staffs in administration of Injection Oxytocin to the mother within one minute of delivery.</td>
<td>There was a dip in Oxytocin administration whenever new nursing staffs were assigned to the labor room. The new staffs required handholding and mentoring, in addition to skill training and orientation on government guidelines on AMTSL.</td>
<td>The matron assigned two staff per shift, pairing up old and new staff from the available nurses. The old staff nurse provided support to the new staff nurse. The staff nurse in charge of the labor room also guided the new staff nurses by demonstrating the process and orientating them on Oxytocin administration and recording.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>Including OT staff nurse/attendant in QI team to enhance administration of Oxytocin for lower segment Caesarian section (LSCS) cases.</td>
<td>It was observed that administration of Injection Oxytocin for prevention of PPH in LSCS cases was getting missed as OT staff, especially anesthetists, were reluctant to remove sterile drapes in order to give intra gluteal/antero-lateral thigh injections. With around 25-30% of deliveries undergoing LSCS, this was a significant number missing Oxytocin.</td>
<td>An OT staff nurse/attendant was involved in the QI team and oriented on the relevance of administering Injection Oxytocin within the first minute of delivery to prevent PPH. Inclusion of staff from the OT in the QI team ensured Injection Oxytocin is administered in LSCS cases. The syringe was prefilled, kept in the tray and administered IM, intra deltoid (anterior shoulder) by the anesthetist/OT assistant as soon as the baby was delivered which did not require removal of the drapes.</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

### Proportion of vaginal deliveries for which uterotonic was administered within one minute of birth

- IYCF counselor assisting mother's in initiating breastfeeding within 1 hour of birth
- Measuring and recording blood pressure levels during every ANC visit
- A senior staff made responsible to ensure that no service is missed to a pregnant woman
### Delivering change in maternal and newborn health services

**AIM#2**

**Monitoring and documentation of vital parameters (blood pressure and pulse) in the postpartum period to identify and manage complications in mothers**

<table>
<thead>
<tr>
<th>Change idea</th>
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<th>Change site</th>
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</thead>
<tbody>
<tr>
<td>Orientation to labor room staffs on importance of monitoring and recording vital parameters of the woman periodically during the postpartum period.</td>
<td>The staffs used to measure and record the vital parameters only once after delivery as they were not sensitized on the value of repeatedly checking vital signs during the immediate postpartum period. This resulted in their missing many cases of postpartum complications.</td>
<td>The senior medical officer (SMO) of the facility organized a two hour orientation session where a gynecologist oriented all staff nurses on the importance of repeatedly monitoring vital parameters during the postpartum period and how to use the collected data for identifying and managing complications.</td>
<td>DH SDH CHC PHC</td>
</tr>
<tr>
<td>Engaging nursing interns in the facility to repeatedly check vital parameters of the mothers during their postpartum period and use it for identifying complications in time.</td>
<td>Most facilities had only one nursing staff working on a shift. Shortage of staff and resulting increased workload on existing staffs caused them to miss checking vital parameters during the postpartum period at the required frequency (at least five times within the six hours of delivery).</td>
<td>MOICs of the facility deployed nursing trainees who were at the facility for internship to the labor room and postpartum ward. The nursing interns underwent a one-day orientation on the importance of checking vital parameters, how they are to be checked and where the data has to be recorded. The records were signed by the senior staff nurse and SMO. To further facilitate this change, digital apparatus was made available in the labor room and postpartum ward.</td>
<td>DH SDH CHC PHC</td>
</tr>
<tr>
<td>Enabling ASHAs to measure BP using digital BP machines when they are with the mothers at the facility post delivery.</td>
<td>Due to shortage of nursing staffs at the primary healthcare facilities, staffs on duty missed checking vital parameters during the postpartum period at the required frequency (at least five times within the six hours of delivery). The ASHAs, who stayed with mothers post delivery, were additional resources who were not utilized in postpartum period.</td>
<td>The task of measuring BP in cases where ASHAs stayed with mother post delivery was shifted to ASHAs with better skill sets. MOIC of the facility trained the identified ASHAs during their monthly meeting on measuring blood pressure using the digital BP machine in the facilities and shifted the tasks to ASHAs. The records were reviewed and signed by the labor room staff nurse. The first batch consisted of four ASHAs. On experiencing success, the MOIC expanded training, in a phased manner, to all ASHAs.</td>
<td>DH SDH CHC PHC</td>
</tr>
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</table>

### Table: Average number of times vitals (both BP and pulse) checked and recorded within first 6 hours post partum in SDH Sardulgarh, January - November 2014

<table>
<thead>
<tr>
<th>Month</th>
<th>No. of women whose records were reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-14</td>
<td>0</td>
</tr>
<tr>
<td>Feb-14</td>
<td>20</td>
</tr>
<tr>
<td>Mar-14</td>
<td>40</td>
</tr>
<tr>
<td>Apr-14</td>
<td>50</td>
</tr>
<tr>
<td>May-14</td>
<td>60</td>
</tr>
<tr>
<td>Jun-14</td>
<td>70</td>
</tr>
<tr>
<td>Jul-14</td>
<td>80</td>
</tr>
<tr>
<td>Aug-14</td>
<td>90</td>
</tr>
<tr>
<td>Sep-14</td>
<td>100</td>
</tr>
<tr>
<td>Oct-14</td>
<td>110</td>
</tr>
<tr>
<td>Nov-14</td>
<td>120</td>
</tr>
</tbody>
</table>

### Line listing of severely anemic cases in ANC clinics of the maternity homes

- Checking and recording hemoglobin levels during all ANC visits
- Staff were trained on charting and recording haemoglobin level in ARVs for assessing anemia.
- Line listing of severely anemic cases in ANC clinics of the maternity homes.
Delivering change in maternal and newborn health services

**AIM#2**
Monitoring and documentation of vital parameters (blood pressure and pulse) in the postpartum period to identify and manage complications in mothers

<table>
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<tr>
<td>Placement of posters, at locations which are in line of sight for the nursing staffs, like the wall in front of labor table, nursing duty station and post-natal ward, with instructions on monitoring vital signs (blood pressure, pulse and temperature) of the mothers in facility for postpartum care to act as reminder.</td>
<td>The staff nurses conducting deliveries are not conversant with Government of India (GOI) guidelines of monitoring vital parameters of woman post partum 11 times in the first six hours and they monitored vital signs of post-partum cases only once or twice as a routine procedure.</td>
<td>A consultation with the medical and paramedical staff on monitoring postpartum vital parameters as GOI guidelines resulted in a consensus that it is not feasible to check vital parameters 11 times within six hours post-partum for every woman and an agreement was reached to check vital signs five times within six hours postpartum for every woman. The QI team members developed a poster in local language and got it posted on strategic locations in the facility.</td>
<td>✓</td>
</tr>
<tr>
<td>Preparing a schedule showing the timing of monitoring vital parameters for all post partum cases and recording it in the case files.</td>
<td>There was inconsistency in practice of checking and recording vital parameters postpartum. Advance recording of the time for checking the vital signs would inform the nursing staffs of time for next check.</td>
<td>The staff nurse on duty would create a schedule with four columns (headed time, blood pressure, pulse and signature) on the first page of the delivery file stating the time at which the baby was delivered. An hourly schedule for post partum checks was made from the time of birth of the child and given to the staff/nursing intern to follow. Abnormal readings were checked again by a senior nursing staff before proceeding to management.</td>
<td>✓</td>
</tr>
</tbody>
</table>

Proportion of times vitals (both BP and Pulse) were checked within first six hours of delivery.

**Administration of Injection Oxytocin within one minute of delivery**

**Postpartum vitals monitoring by ASHAs using digital BP apparatus**

**QI team members reviewing in Partograph for correctness and providing supervision**
## Delivering change in maternal and newborn health services

### Administration of Injection Vitamin K to all newborns to prevent Vitamin K deficiency bleeding

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Orientation to nursing staff on Government of India’s guidelines of administration of Injection Vitamin K to all neonates.</td>
<td>Vitamin K was being administered only to those newborns that were either pre-term or underweight.</td>
<td>The facility medical officer oriented the nurses to ensure Vitamin K administration to all newborns as per the GOI guidelines.</td>
<td>DH SDH CHC PHC</td>
</tr>
<tr>
<td>Recording of Vitamin K administration by use of space available in the labor room register for recording of administration of Vitamin K to the new born and use of rubber stamp on case sheets with ‘Inj. Vitamin K administered’ mentioned on it.</td>
<td>The staffs in the facility were recording all medicines given to mother or the newborn either in the delivery files or in the case sheets. Whether or not Vitamin K has been administered to a newborn could not be verified in absence of a designated space to record it.</td>
<td>Space (columns) available in labor room register was identified to record the administration of Injection Vitamin K. All nursing staffs agreed to re-label one column with ‘Vit K given’. Staff nurses were asked to write ‘yes’ or ‘no’ under that column. Rubber stamps with ‘Inj. Vitamin K administered’ mentioned on it were also used to facilitate the recording of Vitamin K administration in case sheets.</td>
<td>DH SDH CHC PHC</td>
</tr>
<tr>
<td>Placement of posters with guidelines related to Vitamin K administration was placed in line of sight, like the walls of labor room newborn care corner (NBCC) and newborn stabilization unit (NBSU), as reminder to the health care provider.</td>
<td>Shortage of staff and resulting increased workload on existing staffs caused the nursing staffs to miss the administration of Vitamin K to all newborns.</td>
<td>Key points in the GOI Guidelines mentioning the dosage of Vitamin K for newborns and the type of syringe to be used, were translated to Punjabi and posted on the wall of the labor room, newborn care corner (NBCC) and newborn stabilization unit (NBSU).</td>
<td>DH SDH CHC PHC</td>
</tr>
<tr>
<td>Administration of a Vitamin K injection before the newborn leaves the labor room or the operation theatre (OT).</td>
<td>The more common practice was to administer Vitamin K injections to newborns after they were moved out of the labor room or the OT, resulting in them missing Vitamin K administration to those newborns that are not transferred immediately to the post natal ward.</td>
<td>It was agreed among the nursing staffs of the facility not to transfer newborns out of the labor room or the OT until Injection Vitamin K is administered to them.</td>
<td>DH SDH CHC PHC</td>
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</table>
Delivering change in maternal and newborn health services

**AIM#3**
Administration of Injection Vitamin K to all newborns to prevent Vitamin K deficiency bleeding

<table>
<thead>
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<th>Change site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planned procurement (in time and in adequate quantity) of Injection Vitamin K and Insulin syringes to ensure 24 x 7 availability.</td>
<td>While Injection Vitamin K and Insulin syringes were available at all facilities, they were not procured on the basis of delivery load at the facility.</td>
<td>The staffs involved in procurement were oriented to calculate average delivery load of the facility and keep thirty days of Injection Vitamin K and Insulin syringes supply in stock. Staff nurse was made responsible for indenting the stock from the pharmacist of the facility. The Medical Superintendent was aligned to ensure that Vitamin K is procured locally.</td>
<td>DH</td>
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</table>

**Proportion of newborns given Injection Vitamin K at birth.**

**AIM#4**
Sterile cord clamping to prevent newborn sepsis*

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Use of quality cord clamps.</td>
<td>There was no practice of using sterile, disposable cord clamp. In some cases, threads were used to tie the umbilical cord, increasing risk of infection.</td>
<td>The health facility staff were oriented on the advantages of using disposable cord clamp and trained on sterile cord cutting practices.</td>
<td>DH</td>
</tr>
<tr>
<td>Orientation of labor room staff regarding use of sterile cord clamp.</td>
<td>Labor room staffs were not aware about the effectiveness of cord clamp in preventing infection in newborns.</td>
<td>MOIC of the facility oriented the nursing staffs on importance of using sterile clamps and side effects of using threads. The limitations of existing clamps were also discussed. As a result of which, the MOIC assured procurement of good quality clamps.</td>
<td>DH</td>
</tr>
</tbody>
</table>
## Delivering change in maternal and newborn health services

### Sterile cord clamping to prevent newborn sepsis*

<table>
<thead>
<tr>
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<th>Logic for change</th>
<th>How the change happened</th>
<th>Change site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recording of cutting of umbilical cord and use of clamps for cord clamping by use of space available in the labor room register.</td>
<td>Reviewing delivery files was a challenging task and the staff was not ready to maintain a separate register for this record. Recording and reviewing was easier in the labor room register.</td>
<td>Space available in the labor room register was used for recording cutting of the cord and use of sterile clamp clamping. A blank column of this register was used. The staff nurses wrote 'yes' or 'no' under the specified heading.</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Planned procurement (in time and in adequate quantity) of quality cord clamp to ensure 24 x 7 availability.</td>
<td>The sterile cord clamp was available in the facility were of inferior quality, which was not clamping the umbilical cord properly. This had discouraged the staffs from using the cord clamps and shifted them to sterile threads.</td>
<td>The staffs involved in procurement were oriented to assess the quality of cord clamps and the features they needs to look for to assess quality of cord clamps. In addition, the procurement staffs were trained to use delivery caseload to assess the quantity of clamps needed and keep three months of sterile cord clamp supply in stock.</td>
<td>✓ ✓</td>
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</table>

**Proportion of newborns who were provided sterile cord clamping.**

*This change idea was introduced in only one of the selected facilities in the state, where the cord clamps that were being procured were not reliable or consistent in quality.*
**USAID ASSIST Project**

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) is a USAID-funded project managed by University Research Co., LLC (URC) to support the government and to strengthen and improve the health system so that the quality of maternal & newborn care becomes better and more lives are saved. URC’s global partners for USAID ASSIST include EnCompass LLC, FHI 360; Harvard University School of Public Health; Health Research, Inc.; Institute for Healthcare Improvement; Initiatives Inc.; Johns Hopkins University Center for Communication Programs; and Women Influencing Law and Policy India (WLP). For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

**Approach**

The QI approach used in the USAID ASSIST Project consists of seven steps:
1. Defining the improvement aim
2. Forming the improvement team
3. Understanding the current system
4. Developing a measurement system
5. Developing changes
6. Testing changes
7. Implementing and sustaining changes

**References**

9. The Government of India considers the skilled birth attendant as a person who can handle common and major obstetric and neonatal emergencies as well and recognizes when the situation reaches a point beyond his/her capability and refers the woman or the newborn to a First Referral Unit/appropriate facility without delay. GOI. Handbook for ANMs, LHVs and staff nurses as a skilled birth attendant, New Delhi: Department of Family Welfare, Ministry of Health and Family Welfare, 2006. Accessed http://mhfw.nic.in/NRHM/MH/Facilitators_Guide.pdf on 12 December 2014
11. Ibid 10
12. Quality Improvement team consisted of select medical and paramedical staffs of the participating public health facility.

**Abbreviations**

- AMTSL: Active Management of Third Stage of Labor
- ANM: Auxiliary Nurse Midwife
- ASHA: Accredited Social Health Activist
- ASSIST: Applying Science to Strengthen and Improve Systems
- BP: Blood Pressure
- CHC: Community Health Center
- DH: District Hospital
- DLHS: District Level Household Survey
- GOI: Government of India
- IM: Intramuscular
- IMR: Infant Mortality Rate
- IU: International Units
- IV: Intravenous
- LSCS: Lower Section Caesarian Section
- MMR: Maternal Mortality Ratio
- MOIC: Medical Officer In-Charge
- NBCC: Newborn Care Corner
- NBSU: Newborn Stabilization Unit
- OT: Operation Theater
- PPH: Postpartum Hemorrhage
- QI: Quality Improvement
- SDH: Sub-District Hospital
- USAID: United States Assistance for International Development

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**Model for improvement**

- What are we trying to accomplish?
- What change can we make that will result in improvement?
- How will we know that a change is an improvement?
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Many change ideas mentioned in this change package were context and facility specific. They may not necessarily be applicable across the board in their current form and may require modifications to achieve desired results.