Chapter-5
Maternity Services

Chapter

5 Maternity Services

Maternal Mortality Rate (MMR), Neonatal Mortality Rate (NMR), Infant Mortality Rate (IMR) and Under 5 Mortality Rate (U5MR) are significant indicators of the quality of maternity services available. According to the Report "Healthy States, Progressive India" on Health Index brought out (June 2019) by Niti Aayog, NMR (per 1,000 live births) was 30 for Uttarakhand during 2016. It was ranked 13[1] out of 21 larger States with just Uttar Pradesh, Madhya Pradesh and Odisha behind. The IMR (per 1,000 live births) and U5MR (per 1,000 live births) were 38 and 41 in 2016 compared to the All India Average of 34 and 39 respectively. The MMR (per lakh live births) was 201 in 2014-16 compared to the All India average of 130.

As adequacy of human and material resources and diagnostic services, along with clinical effectiveness of both medical and para-medical staff, are the major drivers of maternity services, norms for provisioning of various maternal health services and resources have been specified in Maternal and Neonatal Health Toolkit 2013 (MNH Toolkit) and Guidelines of *Janani Shishu Suraksha Karyakram* (JSSK) prescribed by Government of India.

Components of maternity services

Antenatal care (ANC), Intra-partum care or delivery care (IPC) and Post Natal Care (PNC) are the major components of facility based maternity services. ANC is the systemic supervision of women during pregnancy to monitor the progress of foetal growth and to ascertain the well-being of the mother and the foetus. Under IPC, interventions for safe delivery in labour room and operation theatre are performed. PNC includes medical care of mother and the newborn especially during the 48 hours post-delivery, which are considered critical.

5.1 Antenatal Care

Under ANC component of maternity care, pregnant women are provided at least four antenatal check-ups during pregnancy period which include physical examination and laboratory investigations to monitor pregnancies for signs of complications for prompt management.

In the test checked DFHs/JHs; scrutiny of ANC registers revealed that the first ANC was being given at the stage of registration. Whenever the registered pregnant ladies turned up

[1] Some of the states shared the same rank.

for 2nd or 3rd ANC, a new number was given to the concerned pregnant women by the hospital. No mechanism was in place to track the pregnant ladies who had been given ANC and, therefore, it could not be ascertained due to poor record maintenance and non-operationalisation of MCT System[2] as to whether all of them had received all essential ANCs.

5.1.1 Non-availability of IFA tablets

ANC Guidelines 2010 envisage that all pregnant women need to be given one tablet of Iron Folic Acid (IFA: 100 mg elemental iron and 0.5 mg folic acid) every day for at least 100 days, starting after the first trimester, at 14-16 weeks of gestation. IFA dose is given to prevent anaemia (prophylactic dose) and this dosage regimen is to be repeated for three months post-partum. During audit it was noticed that IFA tablets were available in all the test checked DFHs/JHs except in JH Chamoli where availability of IFA tablets was not ensured. The IFA tablets were not available during the period 2014-17 and were out of stock for 223 days during the year 2018-19.

5.1.2 Pathological investigations

ANC Guidelines 2010 prescribe conducting six pathological investigations[3], depending upon the condition of pregnancy during ANC visits to identify pregnancy related complications. It was found that out of prescribed six pathological investigations, human immunodeficiency virus (HIV) and hepatitis B surface antigen (HBsAg) test in DH Almora[4] and malaria test in DFH Haridwar were not done to identify pregnancy related complications.

Positive feature

JH Udham Singh Nagar and JH Chamoli were conducting all six pathological investigations.

5.2 Intra-Partum Care

Intra-partum Care (IPC) includes care of pregnant woman during intra-partum period (the time period spanning from the onset of labour to childbirth). Proper care during labour saves not only mothers and their newborn babies, but also prevents stillbirths, neonatal deaths and other complications.

The quality of IPC is largely affected by availability of essential resources and clinical efficiency of the medical and paramedical staff dealing with the maternity cases. Specific audit observations on IPC are discussed below:

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2 An initiative under NHM to track every pregnant woman right from conception up to 42 days' post-partum and all new born up to five years of age through **Mother Child Track System (MCTS)** to ensure that the pregnant woman and children receive 'full' set of medical services.

3 Blood group including Rh factor, Venereal disease research laboratory (VDRL)/Rapid Plasma Reagin (RPR), HIV testing, Rapid Malaria test, Blood Sugar testing, Hepatitis B surface Antigen (HBsAg).

4 No laboratory investigation facility was available in DFH Almora; the service was availed from DH Almora.

5.2.1 Availability of resources

5.2.1.1 Essential drugs

To ascertain the availability of essential drugs in the maternity wing of selected hospitals, audit examined the availability of 21 types of essential drugs[5] prescribed in MNH Toolkit during the sampled period[6]. The details are summarised in **Table-33** below:

Table-33: Availability of essential drugs

Name of hospital	Number of drugs available during total sampled period	Details of shortfall of Essential Drugs		
		Number of drugs		Stock out (in days)
		Not available	Stock out	
DFH-Almora	08	01	12	(21-121)
DFH-Haridwar	04	04	13	(4 -118)
JH-Chamoli	06	05	10	(28 - 62)
JH-Udham Singh Nagar	11	06	04	(31-120)

Source: Stock register Maternity wing of test checked hospitals.

It was observed that one to six essential drugs were not available during the sampled period. Besides, four to 13 types of essential drugs remained out of stock for up to four months during the sampled period.

Even the essential drugs for maternity care, such as Injection Diazepam, Injection Carboprost, Injection Gentamycin, Tablet Metronidazole 400 mg, Ringer Lactate, Normal Saline, Calcium Gluconate, Injection Hydrazaline, and Tablet Methyldopa were out of stock in test checked DFHs/JHs ranging from 17 to 75 *per cent* of the duration of the sampled period.

Uses of medicines:

Diazepam: to treat anxiety and seizures; relieve muscle spasms; and to provide sedation before medical procedures.
Carboprost: to treat severe bleeding after childbirth and to produce an abortion by causing uterine contractions.
Gentamycin and Hydrazaline: to prevent or treat a wide variety of bacterial infections and to treat the high blood pressure respectively.
Ringer Lactate solution is used for fluid replenishment after blood loss.
Normal Saline: for clean out an IV Catheter
Calcium Gluconate: to treat conditions arising from calcium deficiency in pregnancy.

Shortages in critical drugs during majority of the sampled period compromised the ability of the hospitals to provide emergency and critical care in maternity cases, besides putting the patients at risk in case of non-availability of drugs outside.

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[5] Adrenaline, Ampicillin, Betamethasone/Dexamethasone, B-Complex, Calcium Gluconate, Carboprost, Diazepam, Gentamycin, Hydrazaline, Hydrocortisone Succinate, Ibuprofen, Lignocaine, Misoprostol, Methyldopa, Tablet Metronidazole, Injection Metronidazole, Normal Saline, Oxytocin, Oxytocin 10 IU, Paracetamol and Ringer Lactate.

[6] May 2014, August 2015, November 2016, February 2018 and May 2018.

5.2.1.2 Essential consumables

MNH Toolkit prescribes 20 types of essential consumables such as draw sheet, cord clamp, baby wrapping sheets, disposable mucus extractor, sanitary pad, disposable nasogastric tube, cetrimide solution (500 ml), sterile urinary catheter, *etc*. for providing clean and safe environment for mother and newborn in the labour room and wards.

Scrutiny of records in the test checked DFHs/JHs for ascertaining the availability of essential consumables on sampled days[7] disclosed that.

- Baby wrapping sheets were not available in any of test checked DFHs/JHs except JH Udham Singh Nagar.
- Disposable nasogastric tubes (used for feeding and administering drugs and other oral agents) were available only in JH Chamoli and in JH Udham Singh Nagar.
- Cetrimide solution (antiseptic and disinfectant used topically for wound cleansing and the treatment of some skin disorders) and thread for suture (used to hold body tissues together after an injury or surgery) were not available in any of test checked DFHs/JHs.
- Sanitary pads and gowns for labouring woman were not available in DFH Haridwar and JH Chamoli.

Non-availability of essential consumables in test checked DFHs/JHs adversely impacted the achievement of the objective of providing a clean and safe environment for mother and newborn in labour room and wards.

5.2.1.3 Essential human resource

As per MNH Toolkit, "An adequate human resource is required for providing best possible care during pregnancy, delivery and postpartum period with dignity and privacy to client." Human Resource requirement should be based on deliveries per month for a maternity wing. Details of requirement of human resources for maternity services as per MNH Toolkit are as per the **Table-34** given below:

Table-34: Human resources as per MNH Toolkit

Number of deliveries/months	Human resources required
Up to 100 deliveries	Medical Officers: 1-2 (available during routine hrs and on call during emergency) and ANM/Staff nurse: 4
100 to 200 deliveries	Medical Officers: 4 (for round the clock duty), Staff nurse: 4, ANM: 4 and LT: 2(for round the clock service).
200 to 500 deliveries	Obstetric (OBG): 1 (Mandatory), Obstetric/Emergency Obstetric Care (EmOC): 4 (for round the clock service), Anaesthetist: 1 (Mandatory) exclusive for maternity case, Medical Officer: 4 (trained in BEmOC, FIMNCI, NSSK), Paediatrician: 1, Staff Nurse: 8, ANM: 4 and LT: 4 (for round the clock service).

Audit noticed that sanctioned human resource was not in consonance with the provisions of MNH Toolkit in any of test checked DFHs/JHs. The details of availability of human

[7] Examination of records of the availability of consumables on particular day during audit.

resource against sanctioned posts in the test checked DFHs/JHs shown in the **Table-35** given below:

Table-35: Details of availability of human resource against sanctioned post as on date of audit

	DFH Almora		DFH Haridwar		JH Chamoli		JH Udham Singh Nagar	
Average delivery per month	**92**		**323**		**57**		**309**	
Post	**S**	**A**	**S**	**A**	**S**	**A**	**S**	**A**
Gynaecologist	5	3	3	2	1	-	1	-
Lady Medical Officer (LMO)	2	2	3	3	2	2	4	2
Anaesthetist	1	1	1	1	1*	1	2*	2
Paediatrician	1	1	1	1	1*	1	2*	1
Staff Nurse	11	8	11	11	28*	17	24*	16
Auxiliary Nursing Midwife (ANM)	2	2	1	1	2	2	1	1
Lab Technician	-	-	1	1	05*	01	5*	3
Total	***22***	***17***	***21***	***20***	***40***	***24***	***39***	***25***

Source: Information provided by test checked DFHs/JHs.
S: Sanction A: Available.
****sanctioned strength for hospital as a whole.***

- Ideal Human Resource requirement based on deliveries per month for maternity wing was not as per MNH tool kit. DFH Almora had more sanctioned posts of Gynaecologists than DFH Haridwar and JH Udham Singh Nagar despite the delivery load of DFH Almora being less than 100 per month.

Audit further noticed that:

- No Gynaecologist was posted in JH Chamoli and JH Udham Singh Nagar during 2014-19 against the sanctioned post whereas a Gynaecologist was posted as Principal Medical Superintendent (PMS) in DH Haridwar during the period 25 June 2016 to 13 December 2018 despite this service not offered by the hospital.
- No Anaesthetist was deployed between 28 June 2017 and 22 December 2017 in DFH Haridwar whereas 246 C-Section deliveries were conducted during the aforesaid period in the hospital. The DFH intimated that private Anaesthetist was hired as and when required.
- In DFH Almora, JH Chamoli and JH Udham Singh Nagar, nurses were not available as per sanctioned strength.

The deployment of nurses was not according to Nursing Council of India (NCI) which recommends one nurse per six beds in the general ward. The details of bed to nurse ratio in maternity wing of test checked DFHs/JHs in sampled months are given in the **Table-36** given below:

Table-36: Shift wise availability of nurses in IPD (maternity wing) of the test checked DFHs/JHs

Sampled Period	DFH Almora			DFH Haridwar			JH Udham Singh Nagar			JH Chamoli		
Ratio bed Nurse	Bed/Nurse			Bed/Nurse			Bed/Nurse			Bed/Nurse		
	Shift-1	Shift-2	Shift-3	Shift-1	Shift-2	Shift-3	Shift-1	Shift-2	Shift-3	Shift-1	Shift-2	Shift-3
May 2014	2	7	7	9	13	13	7	11	11	3	7	7
August 2015	1	5	5	11	17	17	7	13	13	3	5	5
November 2016	2	6	12	8	11	11	9	13	13	2	3	3
February 2018	1	9	9	11	14	14	7	10	10	2	4	4
May 2018	1	5	5	13	13	13	7	11	11	2	4	4

Source: Information provided by the test checked DHs/JHs.

The bed to nurse ratio in Shift-2 and Shift-3 was much higher than the NCI norm in DFH Haridwar and JH Udham Singh Nagar in sampled months during the period 2014-19.

Shortage of key resources in the hospitals was indicative of impaired functioning of the hospitals to manage the pregnancy related complications, ensure satisfactory new-born care and manage efficiently maternal health emergencies.

5.2.1.4 Availability of essential equipment

IPHS prescribes 28 types[8] of essential equipment for labour ward, neonatal and special newborn care unit.

Scrutiny of records in test checked DFHs/JHs for ascertaining the availability of essential equipment disclosed that 25 to 39 *per cent* of equipment were not available in the test checked DFHs/JHs. Important equipment like **Craniotomy instrument** (the surgical instrument for removal of part of the bone from the skull to expose the brain for surgery); **Silastic vacuum extractor** (used in second stage of labour if it has not progressed adequately) and **CPAP machine** (used for mild air pressure to keep the airways open in case of breathing problems during sleep) were not available in any of the test checked DFHs/JHs. Further, **Cardiotocography instrument** (used for recording the fetal heartbeat and the uterine contractions during pregnancy) and **Hemoglobinometer** (used for measuring hemoglobin blood concentration) were available only in DFH Haridwar.

5.3 Clinical efficiency

5.3.1 Preparation of Partographs

A partograph consists of a graphic representation of the progress of labour. It enables the birth attendant to identify and manage complications of labour promptly or to take a decision to refer the patient to a higher medical facility, if required. Overall quality of care as provided by the health centers during labour is also

Partograph is a composite graphical record of key data (maternal and foetal) during labour against time on a single sheet of paper. Relevant measurements might include statistics such as cervical dilation, foetal heart rate, duration of labour and other vital signs. It is intended to provide an accurate record of the progress in labour, so that any delay or deviation from normal may be detected quickly and treated accordingly.

[8] Baby Incubators, Phototherapy Unit, Emergency Resuscitation Kit-Baby, Standard weighing scale, Newborn Care equipment, Double–outlet Oxygen Concentrator, Radiant Warmer, Room Warmer, Foetal Doppler, Cardio Toco Graphy Monitor, Delivery Kit, Episiotomy kit, Forceps Delivery Kit, Craniotomy, Vacuum extractor metal, Silastic vacuum extractor, Pulse Oximeter baby & adult, Cardiac monitor baby & adult, Nebulizer baby, Weighing machine adult, Weighing machine infant, CPAP Machine, Head box for oxygen, Haemoglobinometer, Glucometer, Public Address System, Wall Clock, BP Apparatus & Stethoscope.

monitored through the partograph.

Scrutiny of records of sampled days[9] of the sampled months revealed that partographs were not prepared for all occupants/patients in the test checked DFHs/JHs as detailed in the **Table-37** given below:

Table-37: Preparation of Partograph

Hospital	Test checked sampled days (1-7) of sampled month									
	May 2014		Aug 2015		Nov 2016		Feb 2018		May 2018	
	D	P	D	P	D	P	D	P	D	P
DFH Almora	13	Nil	16	Nil	24	Nil	27	09	16	09
DFH Haridwar	50	Nil	82	03	60	Nil	78	Nil	92	Nil
JH Chamoli	17	Nil	15	Nil	08	Nil	12	07	18	06
JH Udham Singh Nagar	69	Nil	62	Nil	66	Nil	56	Nil	54	Nil

Source: Information collected from test checked DFHs/JHs.
D-Total Deliveries & P- Partograph prepared.

- In JH Udham Singh Nagar, no partograph was prepared in any of the sampled months during audit.
- In DFH Haridwar, no partograph was prepared in any of the sampled months during 2014-15 and 2016-17 to 2018-19. Further, during 2015-16, partographs were prepared only in three against 82 deliveries in the sampled period.
- In DFH Almora, no partograph was prepared in the sampled months during 2014-15 to 2016-17 and only 18 partographs were prepared against 43 deliveries in the sampled period during 2017-18 and 2018-19.
- In JH Chamoli, no partograph was prepared in the sampled months during 2014-15 to 2016-17 and during 2017-18 and 2018-19 only 13 partographs against 30 deliveries were prepared.

Non-preparation or insufficient preparation of partograph during labour impaired the ability of the hospital to monitor and ensure the required quality of service in the labour room to reduce the chances of adverse pregnancy outcomes.

During the Exit Conference, the Government stated that directions would be issued to the hospitals for preparation of partographs in the required cases.

5.3.2 Management of preterm labour

A preterm baby is defined as a baby who is born alive before completion of 37 weeks of pregnancy. As per Government of India[10], *India has the highest number of preterm births as well as neonatal deaths due to prematurity. Every year, out of all preterm births around*

Antenatal corticosteroids are used for accelerating foetal lung maturation for women at risk of preterm birth which results in decrease of neonatal morbidity and mortality. Antenatal corticosteroids are effective in reducing respiratory distress syndrome and other complications of premature deliveries.

[9] First seven days of the selected months.
[10] Operational guidelines for use of Antenatal Corticosteroids in preterm labour.

10 per cent die due to complications of preterm births. Several survivors face a lifetime of disability including learning, hearing and visual disabilities. Preterm birth is a risk factor in at least 50 per cent of all neonatal deaths and is the second most common cause of death (after pneumonia) among children under the age of five.

As per NHM Guidelines, complications can be largely prevented by administering injection of Corticosteroids (Betamethasone Phosphate/Dexamethasone) and, therefore, a single course (four doses of 4 mg each) of Corticosteroids should be administered to a woman as soon as she is diagnosed with preterm labour.

Scrutiny of labour room records pertaining to five sampled months during 2014-19 disclosed that 253 out of 4,105 deliveries were recorded as preterm deliveries based on the gestation period and thus the women were to be administered Corticosteroid injection for safe delivery. Audit noticed that the required injection was not administered to 204 women before deliveries despite availability of the required drug in three out of four DFHs/JHs. Details are given in the **Table-38** below:

Table-38: Administration of Betamethasone in pre-term delivery cases

DFH/JH	No. of test checked delivery cases	Preterm deliveries	No. of cases in which Corticosteroid not administered	Stillbirths
DFH Almora	467	13	06	04
DFH Haridwar	1,816	124	96	16
JH Chamoli	302	03	02	00
JH Udham Singh Nagar	1,520	113	100	00
Total	***4,105***	***253***	***204***	***20***

Source: information collected from test checked DFHs/JHs.

It was also observed that in DFH Haridwar and DFH Almora, 16[11] and four women respectively, who delivered stillbirth, were not administered injection Betamethasone/ Dexamethasone before deliveries. Besides, a newborn baby, delivered through pre-term labour, remained at risk of serious postnatal complications apart from neonatal deaths due to non-administration of Corticosteroid to the mother.

During the Exit Conference, the Government stated that the reasons for not administering Corticosteroid injection would be called for from the concerned district hospitals.

5.3.3 Caesarean deliveries (C-Section)

MNH Toolkit designated all DFHs/JHs as centre for providing surgical (C-Section) services with the provision of specialised human resources (gynaecologist/obstetrician and anaesthetist) and equipped operation theatre to provide Emergency Obstetric Care (EmOC) to pregnant women. The *Janani Shishu Suraksha Karyakram*[12] (JSSK) entitles all pregnant women to C-Section services with a provision for free drugs, consumables, diagnostics, *etc.* The details of C-Section deliveries in test checked DFHs/JHs in sampled months are detailed in the **Table-39** given below:

[11] Of preterm delivery.
[12] A GoI-sponsored programme for maternal and child health care under NHM.

Table-39: C-Section deliveries

Category of hospital	Total delivery	Normal	C-Section	*Per cent*
DFH Haridwar	1,816	1,555	261	*14.37*
DFH Almora	467	399	68	*14.56*
JH Chamoli	302	289	13	*4.30*
JH Udham Singh Nagar	1,520	1,467	53	*3.49*

Source: information collected from test checked DFHs/JHs.

The percentage of C-Section deliveries in JH Udham Singh Nagar and JH Chamoli remained very low as compared to DFH Almora and DFH Haridwar due to non-availability of Gynaecologists in these hospitals in sampled months during the period 2014-19.

Further, JSSK Guidelines itemised 16 types[13] of drugs for performing C-Section deliveries and these drugs were to be provided to women free of cost under NHM. The health facility is empowered to procure drugs and consumables to prevent stock outs and ensure uninterrupted supply and availability of drugs and consumables at health institutions.

To assess whether the availability of drugs related to C-Section deliveries was ensured, the issue was examined in DFH, Haridwar and JH, Chamoli and it was found that:

- Out of prescribed 16 types of essential drugs, four to six types of drugs in DFH Haridwar and three to five types of drugs in JH Chamoli were not available during the period 2014-19.
- Out of available drugs, three to seven and four to seven drugs were out of stock in DFH Haridwar and JH Chamoli and stock out ranged between 13 to 343 days and 19 to 344 days respectively.

The patients, therefore, were deprived of free drug facility under JSSK guidelines during the above period, thereby defeating the objective of the scheme.

5.3.4 C-Section medical records

NHM Assessor's Guidebook stipulates that patient evaluation before surgery, use of surgical safety check-list and writing of post-operative notes during surgery and post-operative monitoring before discharging the patient to ward, should be done and recorded. This provides assurance towards observance of all procedures and care required for surgeries of the requisite quality.

Test check of C-Section surgery cases in DFHs/JHs in sampled days disclosed that the records related to surgical safety checklist, pre surgery evaluation and post-operative evaluations were not maintained. In the absence of documentation, there was no assurance that the doctors and other support staff took sufficient measures to deliver quality C-Section surgery services.

[13] Injection Metronidazole/Metrogyl 100 ml, Injection Gentamycin 80 mg, Injection Cefotaxime, Injection Cloxacillin, Injection Oxytocin, Injection Sensorcain, Injection Lignocaine Hydrochloride IP 5 *per cent*, Injection Lignocaine 2 *per cent*, Injection Phenergan/Promethazine, Injection Diclofenac Sodium, Ringer Lactate, Sodium Chloride, Injection Dextrose, Injection Sodium bicarbonate, Injection Menadione (Vitamin K3), Injection Fortwin/Pentazocine.

5.3.5 Special Newborn Care Unit/Newborn Stabilisation Unit

As per MNH Toolkit, 12 bedded Special Newborn Care Unit (SNCU)[14] is essential to treat critically ill newborns in a district hospital.

It was observed that SNCU was available only in DFH Haridwar. The other three DFH/JHs had merely the facility of Newborn Stabilisation Unit[15].

Test check of records related to SNCU/NBSU of selected DFHs/JHs revealed that the average referral out rate, LAMA rate, absconding rate and neonatal death rate during the period 2014-19 were as per **Table-40** given below:

Table-40: Average rate

Name of DFHs/JHs	Total Admission	Referral out Rate (Referred cases)	LAMA Rate (LAMA cases)	Absconding Rate (Absconding cases)	Neonatal death Rate (Neonatal death cases)
DFH Almora	1,320	4.92 *(65)*	00	00	0.68 *(09)*
DFH Haridwar	4,193	11.80 *(495)*	4.79 *(201)*	0.05 *(02)*	1.62 *(68)*
JH Chamoli	320	32.50 *(104)*	6.25 *(20)*	00	10.31 *(33)*
JH Udham Singh Nagar	2,220	29.55 *(656)*	00	00	1.49 *(33)*

Source: Information collected from test checked DFHs/JHs.

- Referral out rate of neonates from NBSU in JH Chamoli and JH Udham Singh Nagar was extremely high as compared to DFH Almora and DFH Haridwar during 2014-19. These hospitals did not have SNCU facility, except in DFH Haridwar.
- LAMA rate of neonates in JH Chamoli and DFH Haridwar remained comparatively high during the period 2014-19, which indicates that service quality of these hospitals was well below the desired level.
- Neonatal death rate in JH, Chamoli was too high as compared to other test checked DFHs and JH during the period 2014-19.
- Absconding cases of neonates from SNCU of DFH Haridwar indicated lack of security in DFH Haridwar.

5.3.6 Non-follow-up of referred Neonates from SNCU/NBSU

The quality assurance guidelines prescribe that when a patient is referred to higher level hospital, the hospital authorities are required to inform in advance about the referral of the patients to the higher hospital in order to enable them avail better medical care. Further, the hospital authorities should follow-up the treatment of the referred patient. As seen in above **Table-40**, 1,320 neonates were referred to higher centres. However, hospital authorities neither informed the higher facilities in advance about the referral of the patients nor they followed-up with the treatment of the referred neonates during the period 2014-19.

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[14] SNCU is meant to reduce the case of fatality and provide care for sick newborns except assisted ventilation and major surgeries.

[15] It helps in stabilizing sick newborns before referring to higher centres.

During the Exit Conference, the Government stated that directions would be issued for following up the treatment of referred neonates.

5.4 Death Review

As per IPHS all the mortality that occurs in the hospital shall be, reviewed on fortnightly basis. Details of maternal and neonatal death reviews conducted during 2014-19 are in the **Table-41** given below:

Table-41: Death Reviews

Name of hospital	No. of maternal deaths	No. of maternal death reviews conducted	No. of neonatal deaths	No. of neonatal death reviews conducted
DFH, Almora	02	00	09	00
DFH, Haridwar	04	04	68	00
JH, Chamoli	01	00	33	00
JH, Udham Singh Nagar	02	01	33	00
Total	***09***	***05***	***143***	***00***

Source: Information collected from test checked DFHs/JHs.

- Neonatal death reviews were not conducted in any hospitals though there were 143 neonatal deaths during 2014-19.
- In DFH Almora and JH Chamoli, no maternal death review was conducted during the period 2014-19.
- In JH Udham Singh Nagar against two maternal deaths, one maternal death review had been conducted during the period 2014-19. Death review report disclosed that the maternal death occurred due to post-partum haemorrhage.

In DFH Haridwar, however, maternal death reviews were conducted in all four cases that occurred during the period 2014-19. A perusal of the death review reports disclosed that reasons of death in three cases were post-partum haemorrhage/anaemia and cardiogenic shock and one death occurred due to myocardial infraction. Death Review Committee had suggested[16] to ensure availability of ICU/Obstetric ICU; ultrasonography facility; physician/cardiologist/surgeon; anaesthetist/nursing staff; and 24x7 pathology services in DFH Haridwar. It was also noticed that even after suggestions made by Death Review Committee, ICU/Obstetric ICU; ultrasonography facility; and 24x7 pathology services were not made available in DFH Haridwar. It was stated by the hospital that due to shortage of manpower and specialised services; and lack of space, the said facilities could not be made available in DFH Haridwar. The reply of the hospital is not justifiable as compliance of suggestions made by the death review committees was not done.

In the Exit Conference, the Government informed that death reviews were being conducted on a regular basis since 2019-20 and for previous cases, the matter would be looked into.

[16] 05 June 2014; 02 July 2017; 06 January 2018; and 26 June 2018.

5.5 Postnatal maternal and newborn care

5.5.1 Postnatal care

Prompt Post Natal Care (PNC) is important for early detection and management of any kind of possible post-delivery complications the in mother and infant. Most of the major complications in mothers such as post-partum haemorrhage and eclampsia, which can lead to maternal death, occur during this period. ANC Guidelines and MNH Toolkit specify that the health check-ups of mother and infant should be monitored and recorded in the PNC register. As per Guidelines, newborns should be administered doses of three vaccines Oral Polio Vaccine (OPV), Bacillus Calmette Guerin (BCG), Hepatitis 'B'; and Vitamin 'K' on the day of birth to protect them from the diseases.

- Audit examination of labour room records disclosed that immunisation records were not maintained. It was further noticed that the newborns were immunised at Post-Partum Cell (PPC), established in DFHs/JHs, which were also catering to the vaccination for the entire district. No separate records were maintained for vaccination to newborns of DFHs/JHs by PPC. However, in DFH Almora, mother child protection card was attached with Janani Suraksha Yojana (JSY) payment vouchers. Audit examined 60 such cases. It was found that only 27 newborns (45 *per cent*) were administered the three vaccines timely. Due to non-availability of mother child protection card in other test checked DFHs/JHs; audit could not ascertain whether all newborns of DFHs/JHs where fully immunised timely. Further, audit noticed shortage of vaccines in PPCs as detailed in the **Table-42** below:

Table-42: Details of stock out of vaccines

Vaccine Name	Stock out period					
	BCG		OPV		Hepatitis-B	
DFHs/JHs	From	To	From	To	From	To
DFH Almora	13-10-2015	20-10-2015	15-05-2016	19-05-2016	01-12-2018	05-12-2018
	24-11-2015	27-11-2015	07-12-2017	11-12-2017	05-01-2019	31-01-2019
	10-08-2017	16-08-2017	-	-	08-02-2019	14-03-2019
	-	-	-	-	22-03-2019	26-03-2019
DFH Haridwar	-	-	-	-	18-02-2016	23-02-2016
	-	-	-	-	01-11-2016	30-11-2016
JH Chamoli	21-04-2016	24-04-2016	-	-	15-04-2014	22-04-2014
	27-04-2017	04-05-2017	-	-	07-01-2016	19-01-2016
	07-09-2017	19-09-2017	-	-	10-03-2016	14-03-2016
	13-10-2017	22-10-2017	-	-	-	-

Source: Vaccine stock register.

Positive feature

No stock out of vaccines was found in JH Udham Singh Nagar during the period 2014-19.

The authorities of DFH Almora stated that newborns were vaccinated in the sub-district hospital during that period but no records were provided in support of reply. The authorities of DFH Haridwar accepted that Hepatitis-B was not administrated to newborns during the stock out period in which 62 and 362 deliveries had been conducted.

It was also noticed that Vitamin K was available in one out of the two[17] hospitals where this aspect was examined. Audit observed that in JH Chamoli, Vitamin K was out of stock for a period ranging between two to 32 days during the period 2014-19. During the stock out period, 434 infants were born.

Inadequacy in administering required vaccinations to newborns indicated that the implementation of immunisation programme may not have been fully ensured.

In the Exit Conference, the Government informed that availability of vaccine was now being ensured. It was also assured that a column would be inserted in the maternity register for including vaccination details of newborns.

5.5.2 Cash Assistance for Institutional Delivery

Under Janani Suraksha Yojana (JSY), the cash incentive is given to the mother for antenatal care during the pregnancy period, institutional care during delivery and immediate post-partum period in a health centre. As the financial assistance to the mother is mainly to meet the cost of delivery, it should be disbursed effectively at the institution itself.

Records of the test checked DFHs/JHs revealed that cash assistance to all the JSY beneficiaries were not provided as detailed in the **Table-43** given below:

Table-43: Details of cash assistance not provided to JSY beneficiaries

Name of the DH	Year	Institutional deliveries	No. of cases in which cash assistance not provided (*per cent*)
DFH Almora	2017-18	1,120	132 (*11*)
	2018-19	1,278	205 (*16*)
DFH, Haridwar	2016-17	4,491	966 (*22*)
	2017-18	4,561	1,431 (*31*)
	2018-19	5,400	2,772 (*51*)
JH Chamoli	2017-18	643	332 (*52*)
	2018-19	653	152 (*23*)
JH Udham Singh Nagar	2017-18	3,836	635 (*17*)
	2018-19	3,866	1,034 (*27*)

Source: Records of test checked DFHs/JHs.

In JH Chamoli and in DFH Haridwar, percentage of cash assistance not provided was comparatively very high during the years 2017-18 and 2018-19 respectively.

To verify timely payment to JSY beneficiaries, 50 sampled[18] JSY cases in all the DFHs/JHs were selected. It was noticed that payments were delayed in sampled cases which ranged from 15 days to more than 180 days. Details are in the **Table-44** given below:

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[17] JH Chamoli and DFH Haridwar.

[18] First 10 JSY payment cases of each financial year were selected for test check from each financial year 2014-15 to 2018-19.

Table-44: Details of delayed payment to JSY beneficiaries

Name of the Hospital	Total test checked cases	Delay payment in days						Non-payment
		On time	1-15 days	16-30 days	31-60 days	61-180 days	More than 180 days	
DFH Almora	50	NIL	40	NIL	NIL	NIL	10	NIL
DFH Haridwar[19]	30	03	10	04	05	03	NIL	04
JH Chamoli	50	23	07	08	08	02	NIL	02
JH US Nagar	50	02	43	05	NIL	NIL	NIL	NIL

Source: JSY payment of records of test checked DFHs/JHs.

Cash assistances under JSY scheme were, therefore, not being provided to the mothers timely despite availability of funds during the period 2016-19. It was stated by the authorities of the test checked hospitals that cash assistances could not be made timely due to want of beneficiary account and other required documents. Reply is not justifiable as these documents are to be completed by the ASHA well before the expected date of delivery of the beneficiary as per guidelines.

In the Exit Conference, it was stated by the Government that opening of separate bank accounts of the beneficiaries would be ensured at first ANC and concerned ASHAs would be made liable to facilitate the beneficiaries.

5.6 Other Issues

5.6.1 Availability of kits, drugs and equipment for management of STI/RTI

As per Operational Guidelines for Strengthening STI/RTI[20] services, all clinics should maintain adequate stocks of STI/RTI pre-packed kits of seven types and essential drugs of 14 types[21] at all times. A record-keeping and storage system should be in place to ensure an adequate stock of drugs and supplies. A minimum of a 3-month stock of all kits, drugs and supplies should be maintained at all times. It has also been suggested that STI/RTI service facilities should provide STI/RTI kits based on diagnosis.

Test check of records related to STI/RTI Clinic in JH Chamoli and DH Haridwar, from where DFH Haridwar was availing the services, revealed that adequate stock of the seven prescribed kits for diagnosis of STI/RTI was not maintained. It was found that:

- Only 57 *per cent* kits were available in DH Haridwar during 2014-17 and in JH Chamoli, 29 *per cent* to 100 *per cent* kits were not available during 2014-19.
- Out of prescribed 14 types of essential drugs, six to ten types of drugs in DH Haridwar and 9 to 14 types of drugs[22] in JH Chamoli were not available during the period 2014-19.

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19 JSY records related to 2014-16 were not produced.

20 Sexually Transmitted Infection/Reproductive Tract Infection.

21 Tablet Azithromycin, Tablet Cefixime, Benzyl benzoate, Clotrimazole, Tablet Erythromycin, Injection Benzathine Penicillin, Injection Distilled water ampoules/glass phials 10 ml, Capsule Amoxicillin, Tablet Secnidazole, Tablet Acyclovir, Tablet/Capsule, Fluconazole, Tablet Metronidazole, Podophyllin tincture, Capsule Doxycycline.

22 None of the prescribed drugs was available in 2018-19.

- Out of the available drugs, one to three and two to three types of drugs were out of stock in DH Haridwar and JH Chamoli and stock out ranged between 99 and 218 days and 30 and 181 days respectively.
- As against 35 prescribed items of accessories, equipment and medical supplies, only 49 *per cent* and 51 *per cent* items were available in DH Haridwar and JH Chamoli.

The absence of essential drugs including kits for the management of STI/RTI was indicative of poor management of STI/RTI cases.

During the Exit Conference, the Government stated that adequate stock of the prescribed kits and medicines for diagnosis of STI/RTI was now being maintained.

5.6.2 Comprehensive Abortion Care

Unsafe abortions due to pregnancy complications also contribute to maternal morbidity and mortality. Availability of safe, effective and acceptable abortion care services is one of the most important aspects of maternity services. MNH Toolkit prescribes for availability of Comprehensive Abortion Care (CAC) services at DFHs with deployment of MTP-trained[23] medical officer and availability of 16 essential drugs. Further, every head of the hospital shall maintain a register in 'Form III-Admission Register[24] for case records for recording therein the details of the admissions of women for the termination of their pregnancies and keep such register for a period of five years from the end of the calendar year it relates to. MNH Toolkit prescribes that each facility must maintain MTP register.

5.6.2.1 Non-maintenance of register

As per Handbook for Safe Abortion-2016, it is mandatory to fill and record information for abortion cases performed by the hospital.

Audit examined the records of DFH Haridwar and JH Chamoli and it was observed that Form III as well as MTP register had not been maintained in DFH Haridwar during 2014-19; in JH Chamoli, the said records were maintained for the period 2016-19.

5.6.2.2 Shortage and stock out of essential drugs

The availability of 16 essential drugs[25] in DFH Haridwar and JH Chamoli was examined and it was observed that full range of 16 essential drugs was not available. Besides, stock

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[23] MTP–Medical Termination of Pregnancy.

[24] As per Comprehensive Abortion Care (CAC) Training and Service Delivery Guidelines (2010 & 2018).

[25] Injection Adrenaline, Injection Aminophyline, Injection Ampicillin 500 mg, Injection Atropine Sulphate, Injection Calcium gluconate, IV Fluids- Injection Dextrose 5 *per cent*, 10 *per cent*, 25 *per cent* & Injection DNS, Injection Diazepam, Injection Fortwin/Pentazocine/Tablet Paracetamol 500 mg, Injection Hydrocortisone Succinate, Injection Lignocaine 2 *per cent*, Injection Metclopramide, Injection Oxytocin 10 IU, Injection Phenergen/Promethazine, Injection Frusemide, Injection Sodium Bicarbonate 7.5 *per cent*, Injection Dopamine.

out of essential drugs was also noticed in these hospitals which ranged between nine and 355 days; and 11 and 348 days respectively as detailed in the **Table-45** given below:

Table-45: Abortion cases in DFH/JH during 2014-19

Name of DFH/JH	No. of stock out medicines (range)	No. of medicines not available for whole year	No. of abortion cases treated
DFH Haridwar	5 (9-355 days)	1	738
JH Chamoli	5 (11-348 days)	1	148

Source: Information collected from test checked DFH/JH.

Without full availability of essential drugs, the required quality of CAC services may not have been ensured as the patients were either compelled to buy the required drugs from outside or forgo the benefit of usage of the drugs.

5.7 Pregnancy outcomes

With a view to gauge the quality of maternity care provided by the test checked DFHs/JHs, Audit ascertained the pregnancy outcomes in terms of live births, stillbirths and neonatal deaths pertaining to five selected months of 2014-19.

5.7.1 Stillbirths

The stillbirth rate is a key indicator of quality of care during pregnancy and childbirth. Stillbirth or intrauterine foetal death is an unfavourable pregnancy outcome and is defined as complete expulsion or extraction of baby from its mother with no signs of life. As per NFHS-4 (2015-16), average stillbirth rate of Uttarakhand was 0.9 per 100 pregnancy outcomes.

Audit observed that average stillbirth rate in sampled months during the period 2014-19 was between 1.32 and 2.53 *per cent* in the test checked DFHs/JHs as given in the **Table-46** below:

Table-46: Average stillbirths during 2014-19

Name of hospital	Total no. of deliveries	Total no. of live birth	Total no. of still birth	Still birth rate
DFH Almora	467	463	12	2.53
DFH Haridwar	1,816	1,802	33	1.80
JH Chamoli	302	298	04	1.32
JH Udham Singh Nagar	1,520	1,499	27	1.77

Source: Information collected from the test checked DFHs/JHs.

The average stillbirth rate in all the test checked hospitals was higher than the average stillbirth rate of Uttarakhand. The stillbirth rate in DFH Almora was higher in comparison to other test checked hospitals and close to three times the stillbirth rate of Uttarakhand indicating unsatisfactory quality of pregnancy care. The test checked hospitals attributed the reasons for stillbirth to pregnant ladies coming to hospital from remote areas; critical condition of the foetus; non-availability of specialist doctors; and shortage of supporting staff, *etc*.

5.7.2 Neonatal deaths

Neonatal death rate is also an indicator of quality of maternity and newborn care services. MNH Toolkit requires hospitals to record the number of neonatal deaths per month with causes of such deaths in the labour room register.

Audit observed that neonatal deaths were recorded in the prescribed labour room register during 2014-19. In test checked DFHs/JHs, the average neonatal deaths rate in sampled months during the period 2014-19 was between 0.07 and 0.47 *per cent* in the test checked hospitals as given in the **Table-47** below:

Table-47: Neonatal death rate during 2014-19

Name of hospital	Total no. of deliveries in DFH/JH	Total no. of live birth	Deliveries outside DFH/JH but admitted in SNCU/NBSU	Total neonates (3+4)	Neonatal death	Death rate
1	2	3	4	5	6	7
DFH Almora	467	463	0	463	02	0.43
DFH Haridwar	1,816	1,802	96	1,898	9	0.47
JH Chamoli	302	298	08	306	01	0.33
JH Udham Singh Nagar	1,520	1,499	14	1,513	01	0.07

Source: Information collected from the test checked DFHs/JH).

5.8 Outcome of Patient Satisfaction Survey conducted by Audit

Patient Satisfaction Survey of IPD patients in the test checked DFHs was carried out by the audit team. The satisfaction score on different services provided by hospitals is summarised in the **Table-48** given below:

Table-48: Patient satisfaction Score in test checked DFHs

(in percentage)

Services provided by the Hospitals	DFH Almora	DFH Haridwar
Nursing care	48	91
Availability of water facility	100	94
Availability of clean toilets	100	81
Availability of specific diets	3	30
Availability of clean linen	16	51
Availability of clean house coat/pyjama	0	2

The patients were highly satisfied with availability of water facility and clean toilets. However, they were extremely dissatisfied with non-availability of specific diets, clean linen and clean house coat/pyjama. Besides, it was found that eight *per cent* patients paid out of their pockets for medicines, consumables for surgeries and diagnostic services in DFH Haridwar.

5.9 Performance of the test checked hospitals

5.9.1 Outcomes vis-à-vis availability of resources

The relative performance of the test checked DFHs/JHs on outcome indicators evaluated by audit and the corresponding availability of resources was as shown in the **Table-49** given below:

Table-49: Outcomes *vis-à-vis* availability of resources in DFHs/JHs

DFHs/JHs	Productivity	Efficiency		Clinical Care	Service Quality	C-Section Rate (*per cent*)	Availability of resources		
	BOR (*per cent*)	Discharge Rate (*per cent*)	ROR (*per cent*)	ALOS (in days)	LAMA Rate (*per cent*)		Human Resource (*per cent*)	Drug	Equipment
DFH Almora	*29.61*	*72.45*	*6.60*	2.08	*10.55*	*14.56*	*76*	38	71
DFH Haridwar	*61.74*	*91.36*	*3.04*	2.21	*4.23*	*14.37*	*95*	19	75
JH Chamoli	*26.13*	*78.14*	*11.92*	2.08	*3.19*	*4.30*	*59*	29	68
JH Udham Singh Nagar	*52.98*	*83.90*	*2.36*	1.81	*13.48*	*3.49*	*65*	52	61
Weighted Average[26]	*80*	*85.06*	*4.05*	2.05	*8.04*	*10.25*	*100*	34.50	68.75

Source: Test checked DFHs/JHs.

As seen from above, that due to inadequate availability of resources,

- All the DFHs/JHs underperformed with regard to productivity outcome as average BOR remained well below the benchmark. JH Chamoli and DFH Almora underperformed even when compared to the other two hospitals.
- Efficiency outcome of DFH Almora, JH Chamoli and JH Udham Singh Nagar was not satisfactory as discharge rate was low while ROR was high in JH Chamoli and DFH Almora against the weighted average in test checked months during 2014-19.
- Clinical care outcome of JH Udham Singh Nagar was not satisfactory as average ALOS was low as compared to other three DFHs/JHs as well as weighted average of all the test checked hospitals in test checked months during 2014-19.
- Service quality of DFH Almora and JH Udham Singh Nagar was also not satisfactory as both hospitals had a very high LAMA rate as compared to DFH Haridwar and JH Chamoli during test checked period.
- JH Chamoli and JH Udham Singh Nagar underperformed with regard to C-Section rate as compared to other two selected DFHs due to inadequacy of human resource in test checked months during the period 2014-19.
- Availability of drugs in DFH Haridwar and JH Chamoli was also inadequate as compared to JH Udham Singh Nagar and DFH Almora in test checked months during the period 2014-19.

To sum up, *proper record maintenance and operationalisation of MCT system with essential human resource, drugs and pathological investigation facilities were lacking which impaired the ability of the hospitals to monitor the health of mothers and newborns, potentially impacting maternal and infant mortality rates. Newborns delivered through pre-term labour remained at risk of serious postnatal complications and neonatal deaths due to non-administration of Corticosteroid to the mother. Management of complications during delivery in hospitals was also lacking as in most of the cases, the partographs were not prepared. Timely cash assistances to the mothers under JSY scheme was also not ensured by the hospital authorities defeating the envisaged objectives of the scheme.*

[26] Benchmarks: BOR–80 *per cent* as per IPHS, weighted average for rest of the outcome indicators with average IPD patients in sampled months as the respective weight for each hospital, 100 *per cent* (sanctioned strength) for availability of human resource, and simple mean for drugs and equipment.