THE CHALLENGE INITIATIVE
HEALTHY CITIES INDIA

SETTING UP AN INTEGRATED PAEDIATRIC UNITS (IPU) IN DISTRICT HOSPITALS

Implementation Framework

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USAID FROM THE AMERICAN PEOPLE
Maternal and Child Survival Program
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Index

List of Abbreviations

CCTV	Close Circuit Television
CMHO	Chief Medical and Health Officer
DEIC	District Early Intervention Centre
DH	District Hospital
DHAP	District Health Action Plan
DHFW	Department of Health and Family Welfare
DPMU	District Programme Management Unit
ETAT	Emergency Triage, Assessment and Treatment
HDU	High Dependency Unit
IAP	Indian Academy of Paediatricians
IMR	Infant Mortality Rate
IPHS	Indian Public Health Standards
IPU	Integrated Paediatric Unit
MCH	Maternal and Child Health
MOHFW	Ministry of Health and Family Welfare
NBCC	New-Born Care Corner
NBSU	New-Born Stabilization Unit
NFHS	National Family Health Survey
NHDU	Neonatal High Dependency Unit
NHM	National Health Mission
NMR	Neonatal Mortality Rate
OPD	Out-Patient Department
PICU	Paediatric Intensive Care Unit
PIP	Programme Implementation Plan
RCH	Reproductive and Child Health
RMNCH+A	Reproductive, Maternal, Newborn, Child, and Adolescent Health
SNCU	Special Newborn Care Unit
U5MR	Under Five Mortality Rate
UN	United Nations
WHO	World Health Organization

Preface

District hospitals and secondary and tertiary health facilities receive newborns, infants, and children under five with a diverse range of clinical conditions, some of whom are in need of emergency lifesaving treatment. The comprehensive healthcare available to these age groups is essentially comprised of outpatient, emergency, and inpatient services at specialized dedicated units. Due to the limited infrastructure and equipment and the unavailability of medical specialists and nursing staff, the Government of Madhya Pradesh has begun implementing Integrated Paediatric Units (IPUs) at the district level.

IPUs are comprised of SNCU, PICU, neonatal HDU, and infectious disease units, infant and paediatric wards, OPD follow up services, as well as other supplementary and ancillary services, such as a comprehensive service delivery package for the optimal utilization of already available resources. IPUs were established in the Indore district hospitals in phase one. The State government plans to initiate IPUs in additional districts that have basic infrastructure and functional SNCU and PICU units.

An implementation framework was developed to provide guidance to policy makers, program managers, and hospital administration to prioritize existing resources to set up IPUs in a standard layout. The framework focuses on the quality of paediatric triage, emergency services, and high dependency care as an inpatient service at district hospitals. The framework outlines the standards for care to facilitate planning, establishment, operationalization, and monitoring of the IPUs. It will guide state and district level managers to allocate adequate resources and provide timely guidance.

The target recipients of this framework are:

- National Health Mission - State Programme Managers
- Department of Health and Family Welfare - Nodal Officer (Child Health) and other officers
- District level: Civil Surgeon, Medical Superintendent, Programme Managers, and DPMU staff
- District hospital: Hospital Managers, Doctors, and Nurses

Introduction

Children are the future of our nation and it is of utmost importance to entrust them with good health and health care. The government of India's 'Reproductive, Maternal, Newborn, Child and Adolescent' (RMNCH+A) Strategy under the aegis of the National Health Mission (NHM) have envisaged a method for health system strengthening and have comprehensively integrated child health interventions to promote the health and nutritional status of children and addressed factors contributing to newborn and under-five mortality and morbidity.

Facility-based healthcare systems have improved community-level interventions decreasing under-five mortality. However, there is significant potential for improving the rate of child survival. The 'continuum of care' approach articulated under the RMNCH+A strategy has revived the focus on referral linkages between different levels of public health service delivery systems. The government of Madhya Pradesh has demonstrated a sustained commitment to strengthening healthcare systems to provide equitable, affordable and quality healthcare services to children.

India contains approximately 17.7% of the world's children-under-five population[1] and is home to the highest number of children in the world. According to the Census of India (2011), the number of children within the 0-4 years age group is 112 million, representing 9.7% of the total population.[2] In Madhya Pradesh, this proportion is 10.6%, slightly higher than the national level. According to National Family Health Survey (NFHS, 4th round, 2015-16), the Infant Mortality Rate (IMR) and Under-Five Mortality Rate (U5MR) in Madhya Pradesh are 51 and 65 per 1,000 live births respectively (national figures for IMR and U5MR are 41 and 50 respectively).[3] Although Madhya Pradesh has made progress towards improving mortality indicators, there is a significant gap to reach the targets within the National Health Policy 2017 and UN Sustainable Development Goals for 2030.

National Health Policy (2017) has targeted to achieve IMR of 28 by 2019, and NMR and U5MR of 16 and 23 respectively by year 2025.

Sustainable Development Goals have targeted towards attainment of NMR <12 and U5MR ≤25 by year 2030

[1] According to UN World Population Prospects – 2019, 0-4-year population in the world (reference date 1 July 2015) is 6,70,674 and that of India is 1,18,983.

[2] According to Census of India (2011), total population of India was 1,21,08,54,977 and children in age group of 0-4-years comprised 9.3%. Population of Madhya Pradesh was 7,26,26,809 and children in this age group comprised 10.3%

[3] National Family Health Survey, India (2015-16); International Institute of Population Sciences, Mumbai

Table 1: Progress made in terms of IMR and U5MR

	India		Madhya Pradesh	
	NFHS 3 (2005-06)	NFHS 4 (2015-16)	NFHS 3 (2005-06)	NFHS 4 (2015-16)
Infant Mortality Rate	57	41	70	51
Under Five Mortality Rate	74	50	94	65

Table 2: Neonatal Mortality Rate and its breakup in age specific mortality rates (2016)[4]

	India	Madhya Pradesh
Neonatal Mortality Rate (per 1,000 live births)	24	32
Early Neonatal Mortality Rate[5]	18	24
Peri Natal Mortality Rate [6]	23	32
Post Neonatal Mortality Rate	12	21[7]
Proportion of deaths in 0-4-year age group to total deaths	12.4%	19.4%
Proportion of early neonatal deaths out of total infant deaths	53.2%	51.2%
Proportion of neonatal deaths out of total infant deaths	68.8%	69.4%

High mortality rates among the children under five is a major concern. Designing and implementing need-based service delivery approaches requires an understanding of the major causes of death. Data in Table 3 highlights the major causes of death among three vulnerable age groups, viz. neonatal period (birth to 28 days), infant (less than one year), and childhood (0-4 years). The major underlying cause of death among these age groups are quite different from each other and require specific and independent strategic action planning. These causes and required actions have been summarized in Table 4.

Table 3: Top Ten Causes of Deaths in Three Vulnerable Age Groups[8]

Cause of Death	Deaths (%)		
	<29 days	< 1 year	1-4 years
Prematurity & low birth weight	48.1	35.9	-
Pneumonia	12.0	16.9	18.2
Birth asphyxia & birth trauma	12.9	9.9	-

[4] Estimates of Mortality Indicators, Sample Registration System, Registrar General & Census Commissioner, India, 2016

[5] Early neo-natal mortality rate: Number of infant deaths less than seven days of life per 1000 live births.

[6] Peri-natal mortality rate: Number of still births and infant deaths of less than 7 days per one thousand live births and still births taken together during any year.

[7] Annual Health Survey, Madhya Pradesh, 2012-2013, Registrar General and Census Commissioner, India

[8] Data source: Causes of deaths statistics (2010-2013), Registrar General and Census Commissioner, India, 2016

Other noncommunicable diseases	7.1	7.9	10.6
Diarrhoeal diseases	3.1	6.7	17.9
Ill-defined or cause unknown	5.0	4.6	3.2
Congenital anomalies	4.0	4.6	3.5
Acute bacterial sepsis and severe infections	5.4	4.2	-
Injuries	0.9	2.1	16.9
Fever of unknown origin	-	1.7	6.3
Tetanus	0.5	-	-
Malaria	-	-	7.0
Other infectious and parasitic diseases	-	-	4.0
Meningitis/encephalitis	-	-	3.5
All other remaining causes	0.9	5.4	8.9
Total	100.0	100.0	100.0

Table 4: Main Causes of Death and Required Interventions

Age group	Three causes of deaths	Required intervention
Newborn	• Prematurity/low birth weight • Birth asphyxia/trauma • Acute respiratory infections	• Early newborn care and resuscitation immediately after birth (NBCC) • Management of prematurity and infections (SNCU) • Prevention of hypothermia (neonatal HDU)
Infant	• Prematurity/low birth weight • Acute respiratory infections • Birth asphyxia/trauma	• Management of prematurity (PICU) • Management of infections (Infectious Diseases Unit and infant ward)
0-4 years	• Acute respiratory infections • Diarrhoea • Injuries	• Management of infections (Infectious Diseases Unit and paediatric ward)

The provision and delivery of comprehensive curative services for newborns and children under five at existing first referral or secondary/tertiary level health facilities are indispensable for achieving targeted decline in neonatal, infant and under five mortality. Health facility-based interventions can reduce neonatal mortality by as much as 25-30%.[9] Newborns and children referred to secondary/tertiary health facilities from communities and primary healthcare

[9] Lancet, Neonatal Survival Series, Volume 365, Issue 9463, P977-988, March 12, 2005

facilities are often seriously ill and at a high risk of dying. Appropriate and timely emergency and in-patient care of these children can decrease the rate of mortality significantly.

Despite adequate infrastructure and trained human resources at referral facilities like district hospitals, the provision of comprehensive services and the application of standards and protocols to children under five remains a challenge. To plan and organize comprehensive and effective childcare service packages at referral facilities, it is essential to synthesize and reorganize the recommended structures at different levels of public healthcare systems to meet challenges effectively.

To fulfil these objectives, the Madhya Pradesh health department developed 'Integrated Paediatric Units' – individual specialized units (SNCU, PICU, etc.) brought together at a focal location. This initiative resulted in the proper utilization of space, equipment and resources. This implementation framework describes the rationale and components of an IPU, and the key steps required for setting up this facility at the district level or other secondary/tertiary care hospitals.

Services for newborns and under 5-year children

Newborn and paediatric care are two critical but distinct pillars in India's healthcare delivery system. Both encompass community level interventions, focusing on disease prevention and health promotion; as well as specialized health facility-based curative services. The benefit of these services is further supported by a mechanism for timely identification and prompt referral of sick newborns and children. The reduction of the rate of morbidity requires a focus on community-based interventions and health system strengthening at the primary care level, while the reduction of newborn and under five mortality depends largely on the strengthening of facility-based curative services.

The Ministry of Health and Family Welfare developed a comprehensive service package for newborns and children under five. These services are delivered through a network of specialized units like NBCC, NBSU, and SNCU for newborns; and PICU, paediatric HDU, and DEIC for under children under five, and are established at all different levels of healthcare. The basic package of health services for children under five at a District Hospital is shown below and brief description of these services is given in annexure. To support the functioning of these specialized units and to ensure the quality of services, operational guidelines and standard case management protocols are disseminated by the health ministry.

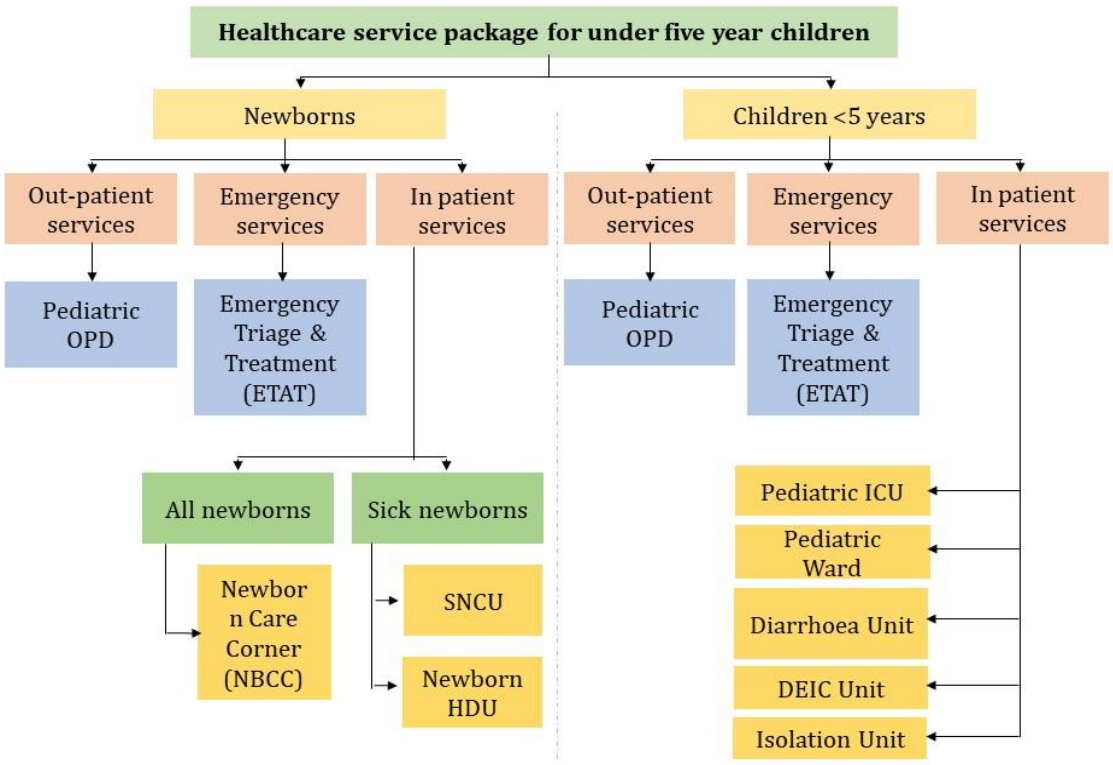
Apart from these specialized units, emergency, outpatient (OPD) and in-patient (wards) services

Nurse providing needed services to a new born child in Newborn care Unit

are also an important component of new-born and paediatric care and are generally provided in integration with the specialized services.

In the current three-tiers structure of India's health care system, the District Hospital (DH) serves at the secondary referral level and provides comprehensive secondary specialist healthcare services. The DH is considered to be a referral hub for effective curative newborn and paediatric care, and therefore requires a capacity to manage and ensure quality of care for sick children. According to "Indian Public Health Standards Guidelines for District Hospitals" (2012) the services a District Hospital should aspire to achieve are categorized as 'Essential' or 'Minimum Assured Services'; and 'Desirable'.

Service package for newborns and children under five at district hospitals



Gaps and challenges

Saving a child's life requires both an effective healthcare intervention and a stringent delivery mechanism to those in need. The Government of Madhya Pradesh has historically been a forerunner in the implementation of efforts towards strengthening facility-based services for newborns and children under five. The Department of Health and Family Welfare (DHFW) strives to establish well-organized, specialized healthcare units, and to provide adequate human resources, drugs, equipment and logistics to ensure functional quality of care consistent with the clinical standards.

Deficiencies in the service provision and quality of newborn and paediatric care at district hospitals are major factors limiting a reduction in newborn and under five mortality. Despite the commitment of the national and state government, strong political will to achieve the goals, improved effectiveness of interventions, and an increase in overall resources, the gap between what can be done to reduce mortality and what is being done in is increasing.

Trained human resources is a major challenge in Madhya Pradesh, especially for newborn and paediatric care. Medical specialists deployed to the district level are often either overburdened with high workloads or they are sub-optimally utilized at facilities with low patient numbers. This is specifically pertinent for paediatricians and nursing staff trained to manage neonates.

Another noteworthy challenge is the overcrowding of paediatric. Currently, the bed quantity at the SNCUs is not enough to meet the requirements of respective districts. According to guidelines, newborns should be kept under observation once they are out of critical stage. It is not

Children been taken care in IPU

recommended to place newborns in the general ward due to the lack of facilities such as nursing corners or trained staff. As a result, SNCUs are overcrowded and discharge newborns early to

accommodate the needs of new admissions, increasing their complication vulnerability. The challenge of overcrowding also applies to Paediatric Intensive Care Units.

Madhya Pradesh has pioneered the establishment of facility-based newborn care, but still faces the challenge of fragmented service provision and the disorganization of existing resources. For

Parents with children visiting facilities for health services for their children

example, newborn and paediatric staff work in separate silos for these two areas of service delivery. Newborn and paediatric services should be organized systematically under one umbrella to ensure the optimal utilization of space, equipment and even the specialized cadre of paediatricians and nursing staff available on need-based basis.

The inadequate infrastructure and equipment, minimal mentoring and supportive supervision, poor follow-up of discharged patients, lack of synthesized comprehensive and quality services for easy access and utilization, referral linkages with community and primary healthcare levels, and data management and its use for decision making are the main service delivery challenges in Madhya Pradesh.

Concept and rationale

Newborns and children under five approaching a secondary/tertiary health facility are generally referred by the community or primary healthcare facilities. These beneficiaries are typically severely sick and at high risk of dying. They need prompt management and healthcare by a specialized team of service providers without further delay.

An imperative query in these cases is to question the delay in treatment. Public health experts have identified four causes for delay in instituting healthcare. These are referred to as "'Social Delays' and include:

1. Delay in identification of problem or adverse health conditions
2. Delay in decision to approach an appropriate health facility
3. Delay in transportation
4. Delay at the health facility in providing correct treatment

Out of these, the first three are community level factors and can be rectified by community level interventions and through timely counselling by the frontline functionaries. The fourth cause is due to delay in starting the appropriate treatment, often resulting from issues like crowding or disorganized administrative procedures; lack of understanding of the seriousness of the health problem; time needed to transfer the patient to specialized units from the receiving area, which are generally located at considerable distances; the unavailability of trained staff at time of arrival; or due to the unavailability of supplies.

An IPU has been envisaged as a dedicated wing in district hospital to provide emergency and specialized healthcare services to sick newborns and under five-year children.

IPU comprise of SNCU, PICU, neonatal and paediatric HDU, infectious disease unit, infant and paediatric wards, and follow up OPD along with other supplementary and ancillary services as a comprehensive service delivery package for optimal utilization of available resources.

A practical solution is to bring together all specialized units, resources, and ancillary services necessary for instituting treatment and follow up, within one designated area inside the hospital. This is the concept behind the IPUs at district hospitals.

IPUs bring together three specialized units for newborns and children under five: SNCU, PICU, and neonatal HDU, along with an 'Emergency Triage, Assessment and Treatment' (ETAT) unit; an

isolation unit for the management of infectious diseases, in-patient facilities (infant and paediatric wards), and other supplementary services to a dedicated area in the facility, preferably on the same floor and with one common entry.

Inside an IPU, emphasis is on the initiation of emergency triage and the institution of required treatments at one of the specialized units to reduce delays. For the most effective use of available resources and facilities at the DH level, IPUs implement horizontal integration across general and specialized units; and vertical integration with outpatient and other services available.

The overall organization of IPUs are based on the IPHS Guidelines for District Hospitals (revised 2012) and build further upon innovating how various aspects of paediatric care can be organised.

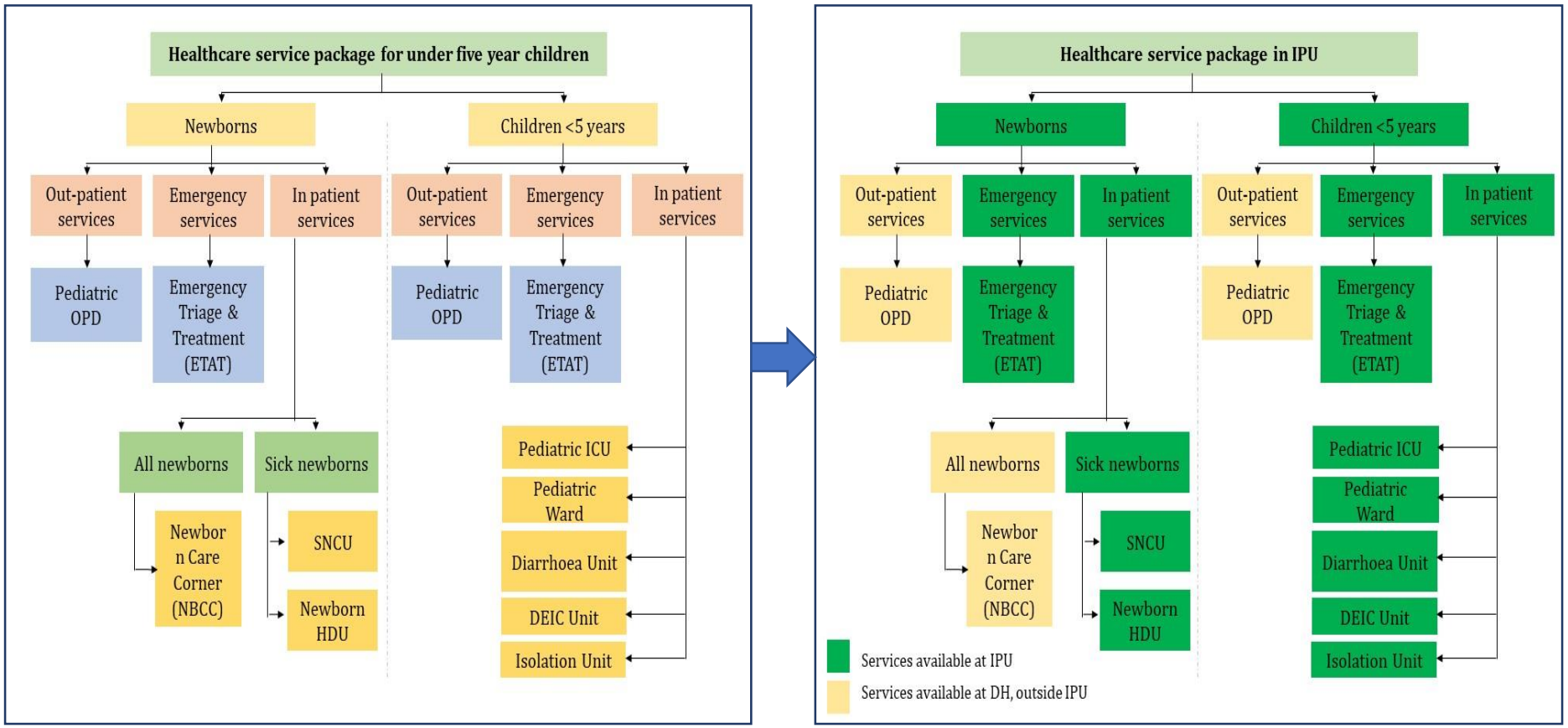
Front view of the Integrated Paediatric Unit

Guiding principles

- Respecting the rights of every child (and mother) to stay safe and with dignity
- Child friendly environment
- Providing integrated newborn and child health services in accordance with standard protocols and with required competence
- Designing the infrastructure for easy mobility and comfortable stay
- Training the service providers for necessary behavioural and technical skills
- Due compliance to infection prevention and bio-medical waste management guidelines
- Establishing assured referral linkages at the community and different levels of health facilities
- Monitoring quality of service delivery and quality improvement
- Ensuring functional grievance redressal system both for client and service providers
- Assessing client satisfaction periodically

A glimpse of an Integrated Paediatric Unit

Bringing different newborn and child health services together into an IPU



Layout of an IPU

IPUs are a comprehensive unit providing specialized healthcare to sick newborns and children under five. The sections and units that are included in an IPU are listed below with a brief description in the subsequent section. More details about the infrastructure, human resources, equipment and supplies at each of these units have been described in national and state level operational guidelines. A list of relevant resource material is given at the end of this document in annexure.

1. Registration area
2. Waiting area
3. ETAT facility: Receiving room for rapid triage of all children presenting at the facility
4. Newborn care area (from birth to 28 days)
    a. Special Newborn Care Unit (SNCU) – 20 bedded
    b. Neonatal High Dependency Unit – 6-10 bedded, with waiting/dining area
    c. Follow up OPD
5. Under five-year care area (from one month to five years)
    a. Paediatric Intensive Care Unit (PICU) – 8-10 bedded
    b. Infant ward for mother and infant (1 month to 12 months) - 8-10 bedded, with waiting/dining area
    c. Paediatric ward (1-5 years), 15 bedded, with waiting, dining, and play area
    d. Infectious disease unit – either as a separate 4-bedded isolation ward or a section of infant/paediatric ward that can be segregated from the remaining ward to prevent spread of infection
    e. Neurodevelopmental Assessment Unit
6. Auxiliary units and services
    a. Nursing station
    b. Duty doctor's room
    c. Storeroom
    d. Wash area and autoclave room

Registration Area

- Ideally, there should be only one entrance for the IPU which must be closely guarded by security staff. The entrance area should have an easy to follow signage system and display of the IPU layout, citizen charter, and available services, with user charges if applicable.
- Only sick newborns and children and their attendants/parents should be allowed to enter. Other visitors should not get entry into the IPU. To ensure security and maintenance of the IPU, it is recommended to install Close Circuit Television (CCTV) at the entrance and selected locations inside the IPU with centralized monitoring system.
- Well demarcated registration area should be located close to the entrance of the IPU.
- Staff available at the registration area should be well behaved, fluent in local language, and well versed with the IPU layout and processes.
- Posting of senior staff nurses at the registration area should be discouraged. Rather, clerical staff, trainee nurses, or other suitable personnel should be deployed in shifts. Preferably registration system should be computerized with electronic display to systematize the processes.

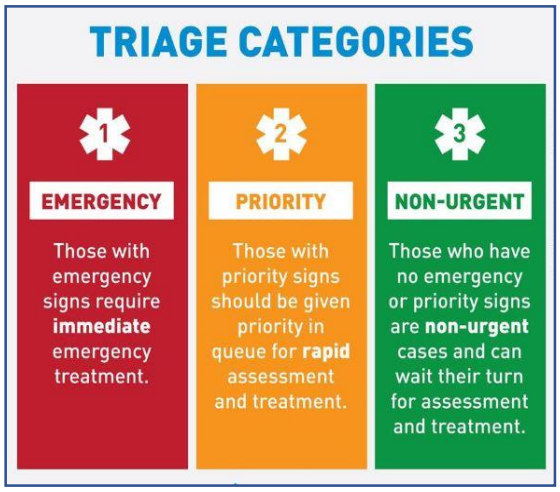
Waiting Area

- Adequate seating arrangement should be provided both outside the IPU for visitors and inside near the registration area for attendants. According to IPHS, one square foot per average daily patient is the recommended space for waiting area.
- There should be provision of wheelchairs and stretchers for the sick children and facilities for air-cooling, drinking water (water cooler), television, and functional and clean toilets with running water.

Emergency Triage Assessment and Treatment (ETAT) facility

Many deaths among under five-year children can be averted via quick identification of the health problem and treatment without delay. At the ETAT facility, triage is done by examining children when they first arrive in hospital to place them in any of the following three categories.

- Those with **Emergency** signs require immediate treatment
- Those with **Priority** signs should be given priority in instituting treatment
- Those with no emergency or priority signs will be **Non-urgent** cases and these children can wait for their turn in getting treatment, in situations when specialized units or wards are already fully occupied.



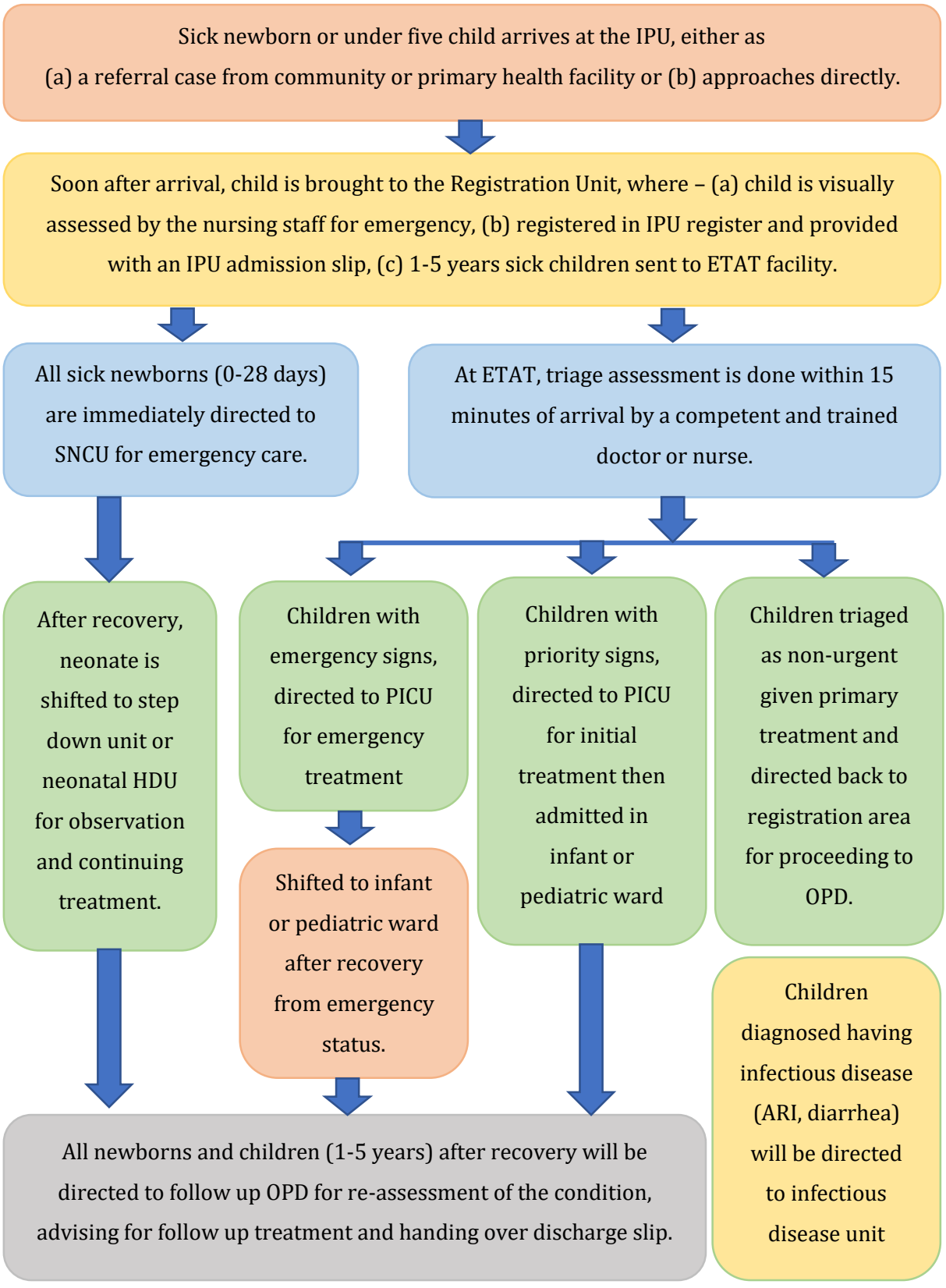
Paediatric triage is an EPN (Emergency, Priority, and Non-urgent) system. All children approaching the IPU should be visually assessed immediately upon arrival and receive an initial triage assessment within 15 minutes of arrival or registration by a competent and appropriately trained nurse or doctor.

According to WHO ETAT Guidelines, children presenting with the following signs should be treated as emergencies:

- Obstructed or absent breathing,
- Severe respiratory distress,
- Central cyanosis,
- Signs of shock (cold extremities with capillary refill time > 3 seconds and weak and fast pulse),
- Coma (or seriously reduced level of consciousness),
- Seizures or,
- In a child with diarrhea, any two signs of severe dehydration signs: lethargy or unconsciousness, sunken eyes, very slow return of skin after pinching.

[Source: Pediatric emergency triage, assessment and treatment; updated guidelines; World Health Organization; 2016]

Movement of sick newborns and children under 5 in IPUs



Special Newborn Care Unit (SNCU)

SNCUs are specialized units to provide comprehensive life-saving services to sick newborns. SNCUs are equipped to manage all sick and low birth weight newborns except those requiring mechanical ventilation and major surgical interventions.

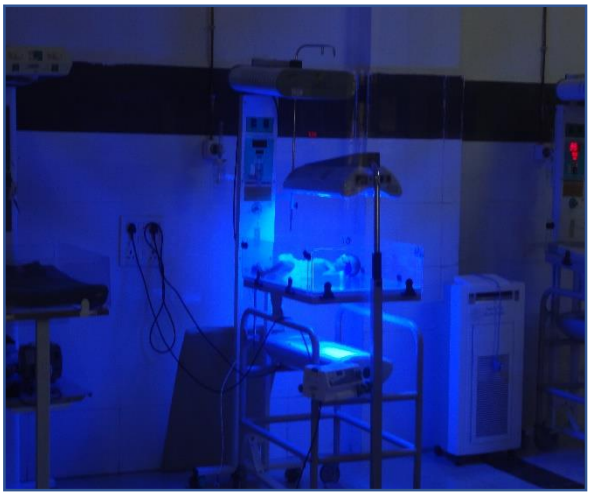
In an IPU, the SNCU shall be a 20 bedded facility, 10-beds each in two separate inter-connected rooms – one per in-born and out-born newborn. Each bed requires a 50 sq. ft. patient area and an additional 50 sq. ft. of ancillary area. The main equipment required in the SNCU are those for thermoregulation (radiant warmer), resuscitation, and phototherapy.

SNCU entrance

The recommended human resources for an SNCU are two full time paediatricians or trained doctors in 8 hourly shifts (6 doctors per SNCU); 4 nurses in each shift (12 nurses per SNCU); two support staff; and one part time lab technician. One paediatrician should be trained in neonatology and supported by other doctors trained in facility based newborn care.


Nurse station close to entrance and at location from where both in-born and out-born units can be monitored.

Well organized, properly spaced and lighted SNCU unit with 24X7 availability of trained nursing staff for monitoring.



Facility for phototherapy inside SNCU for every sick newborn.

Right location of Doctors Room overlooking SNCU.

Neonatal High Dependency Unit (NHDU)

Per the national SNCU guidelines, IPUs include neonatal HDUs as step-down, progressive and intermediate care units for newborns who need more intensive observation, treatment and nursing care, but slightly less than that offered in an SNCU.

Inside the IPU, an NHDU is comprised of a 6-10 bedded facility, with room for the mother to stay with their newborn, and a dedicated waiting/dining area where mothers eat and attend other relatives. This arrangement will ensure the appropriate monitoring of the newborn's health status, participation of mothers in feeding and caregiving, and proper aseptic conditions to prevent infection.

NHDU entrance

The NHDU shall be located in close proximity to the SNCU with 24-hour availability of a trained doctor, nursing staff, and support staff. The NHDU swill be equipped with radiant warmers, phototherapy units, oxygen concentrators, and centralized oxygen supply, besides other amenities and medicines.

Layout of NHDU

Attached waiting and dining area adjacent to NHDU

Paediatric Intensive Care Unit (PICU)

The PICU is a designated section inside secondary and tertiary level hospitals that provides the highest level of medical care to sick children under five. It differs from other parts of the hospital, in that it allows intensive nursing care and continuous monitoring of heart rate, breathing, and blood pressure. Thus, like the SNCU, the PICU is another facility-based specialized care unit that can further help reduce child mortality.

In an IPU, the IPCU will be an 8-10 bedded separate unit with availability of all lifesaving equipment, centralized oxygen supply, and a nursing station to closely monitor the health status of young children. Considering the nature of care required in an IPCU, there is higher number of staff members, including doctors, specialists and nurses deployed at this unit. Mothers of admitted children can stay inside the unit for timely feeding and caregiving of their children. Otherwise, strict steps shall be taken for asepsis and other attendants/visitors will not be permitted to enter the unit.

PICU entrance with proper signage

Well organized PICU with all necessary facilities

Separate nursing station inside PICU with doctors and nursing staff for proper care

Infant ward

IPUs will contain a separate 8-10 bedded step-down unit or infant ward where infants within one month to one year of age can remain after discharge from the PICU. These infants are at a high risk of infection need to be monitored. In the infant ward, the patient will stay with their mother who will not only participate in taking care of and feeding, but also help in monitoring of the child.

The infant ward will also have a facility for Kangaroo Mother Care for low birth weight infants to prevent hypo-thermia by skin to skin contact and exclusive breast feeding. Nursing staff within the infant ward will ensure counselling and appropriate privacy to mothers.

Well organized and equipped infant ward.

A waiting and dining area will be installed adjacent to the ward where mothers can eat and interact with family members and other visitors.

Paediatric ward

In addition to infant ward, IPUs will also contain a 15-bedded ward for admitting children between the age of 2-5 years. This ward will be designed so that mothers can remain with their children to ensure care and feeding. These wards will also have an adjacent dining and waiting area for use by mothers and attendants. Additionally, this ward should have a small play area, which should be safe, comfortable, well ventilated, have adequate natural lighting, and toys, games, crafts, and other activities for children of different ages.

The play area will be located adjacent to or near the paediatric ward depending on the availability of adequate space, but not inside the ward. A caretaker should be assigned to this area for maintenance, ensuring cleanliness and taking care of children. Additionally, the area should be under constant supervision of designated IPU nursing staff. It must be ensured that no medical procedures are performed in play area.

Separate partitioned section inside IPU to accommodate infant and pediatric wards with dining and waiting areas. All steps must be ensured for proper aseptic conditions in wards.

Infectious Disease Unit

According to national guidelines, all paediatric care facilities should have an isolation unit to manage children suffering from communicable diseases to prevent spread of infection to otherwise uninfected children. Depending on the available space, IPUs shall have a separate 4-6 bedded infectious disease unit to accommodate and manage children suffering from diarrhoea, pneumonia, or other communicable respiratory diseases.

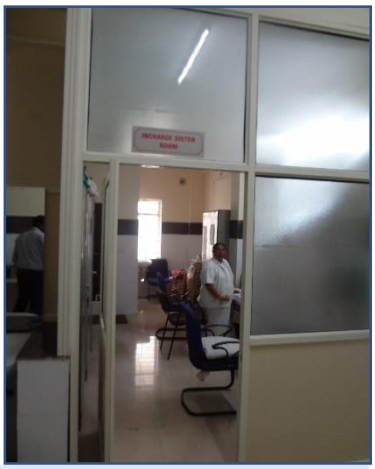
If adequate space is not available inside the IPU, a section from the infant and paediatric wards should be reorganized to accommodate space for the 4-6 beds to be isolated from the remaining ward. This will help ensure that infection does not spread to other infants and children admitted inside the infant and paediatric wards. Following standard operating procedures for sterilization and containment of infectious waste in this section of the facility is essential.

Ancillary Services

In addition to the specialized units and in-patient wards described above, IPUs will be equipped with the ancillary infrastructure required for daily maintenance and operations inside the facility. Dedicated space allocated for these ancillary units should be constructed as per the guideline. The ancillary units include:

1. Nursing Staff Room
2. Duty Doctors Room
3. Storeroom
4. Wash area and autoclave room
5. Neurodevelopmental assessment unit
6. Follow up OPD room

Additionally, district hospital administration should also plan to establish a 'Skill Lab' inside or in any area adjacent to the IPUs as a centre for skill development of the nursing staff and field workers in basic newborn and childcare skills.



Nursing staff room

Breast feeding room

Wash area

Doctor Duty Room

Neurodevelopmental Assessment Clinic

Record Room / Store

Follow up OPD

Corner inside wards with supplies

Toilets adjacent to each ward

Steps in setting up an IPU

Under NHM, adequate flexibility has been given to the State and District Health Societies to innovate and plan evidence-based and high-impact interventions to improve mortality and disease outcome indicators, especially those related to child health. Every state and district, where IPUs exist or are planned, should identify measures to utilize existing institutional structures and policy framework.

The stepwise approach required at different levels for establishing and operationalizing IPUs at tertiary care hospitals in high focus districts is described in the following section.

1) State level activities

1.1. Constitution of a State Nodal Team:

First step towards operationalization of IPUs at tertiary level hospitals in a state is constitution of a State Nodal Team. The team shall be constituted under government letter with specified composition (designation of team members) and terms of reference. Suggested composition and roles and responsibilities of the team are as follows. States shall make necessary modifications and additions as per their requirements.

Membership:

- Chairperson: Mission Director (NHM)
- Convenor/Secretary: Nodal Officer (Child Health), NHM State Health Society
- Members: officials from health department
- Subject matter experts from medical colleges and professional associations
- Development partners
- Nominated representatives from the national level and other states

Functions:

- State Nodal Team shall provide overall support to the State Health Department and administration of selected district hospitals to plan and operationalize IPU.
- Extend technical expertise and mentoring support to establish, operationalize, and manage the facility.
- Facilitation of capacity building and skill building of IPU staff.

- Monitoring performance and quality of services delivered at the IPU. Team members shall organize periodic supervisory visits to IPU facilities to get an overview of functionality and recommend measures for improvement.

1.2. Organization of State Planning Meeting:

Organization of a one-day state level planning meeting is the second key step to ensure an organized approach and leverage required political, administrative, and financial support. Expected outcome of this meeting is to discuss the relevance of establishing IPUs and developing an agreed plan for operationalization of the various components required for establishing IPUs, the phasing of activities, and financial requirements for IPUs.

If required, a one or twodays consultative workshop must be organized with the participation of related health divisions, departments, and other stakeholders to finalize plans for establishing IPUs, taking into consideration state specific context and policy framework.

1.3. Prioritization of districts:

IPUs must be operationalized in districts using a phased approach. Efforts must be focused on operationalizing IPUs in districts with a high mortality rate and a high delivery case load. High mortality rate districts are those with neonatal, infant, and under five mortality higher than the state average. This will ensure the utilization of limited resources in high focus districts and will reduce mortality among children under five at a higher rate. Availability of required resources, especially infrastructure and human resources, are also a factor while considering districts for establishing IPUs.

Functional IPUs require good infrastructure and civil work, including power supply, water supply and drainage, and waste management. Districts with little or no infrastructure should be left for later phases when basic infrastructural requirements are fulfilled. It is important to involve district level health managers in listing out the priority districts. This will ensure open discussion on availability of adequate space, infrastructure, human resources, and other limiting factors for successful functioning of IPUs.

1.4. Expression of interests from high focus districts:

The prioritization of districts must be distributed by issue of official letter to head of the district health department, and copied to chairperson of district health society, to submit expression of interest to the state health society with a district specific plan of action to establish an IPU, available resources (infrastructure, building, human resource especially paediatricians) and account heads (FMR codes) from which required budgetary provisions will be met; detailed

'Shifting Plan' for relocating existing facilities into a comprehensive IPU; and the support required from the state level (including budget). The projected budget requirement must be included with concept note and rationale in the district's annual NHM Programme Implementation Plan (PIP) or District Health Action Plans (DHAP).

1.5. Planning under NHM Programme Implementation Plan:

The Child Health Division under State Health Society should review the IPU related details in District Health Action Plans; compile the budgetary requirement; and include it in the state PIP with proper rationale, expected outcome, and the monitoring indicators. After approval, SHS should develop a 'Roll Out Plan' with the involvement of state level programme managers and District Programme Management Units (DPMU). The roll out plan should include the following details: fund release to districts, physical establishment, and the recruitment and training of required human resources. SHS should also issue guidelines to districts for fund utilization released for establishing IPU in respective districts.

1.6. Supervisory visits and review meetings:

To ensure the operationalization and optimal performance of IPU, periodic supervisory visits by state officials or nominated members by the state government are critical to capture ground level challenges and constraints. These visits can be combined with other visits or delegations, e.g. State Review Missions, to get a holistic view of healthcare delivery system in districts.

During the initial months, a three-monthly review meeting and subsequently six-monthly review meeting at the state level is required to monitor the performance of IPUs in selected districts, to identify gaps and decide on required corrective actions. These meetings can be organized jointly with review of other programmes and state specific schemes related to child health.

Feedback from the supervisory visits; and the discussion points and decisions taken during review meetings must be documented and disseminated to the districts for required action.

2) District level activities

The District Nodal Officer (Child Health) shall bear the primary responsibility pertaining to establishment and functioning of IPU at the District Hospital. The Nodal Officer shall coordinate the activities to be undertaken at the district level. Specific activities for district level are as follows:

2.1. Gap assessment of District Hospital:

The initial step is an in-depth assessment of different newborn and paediatric units and service delivery. The assessment will be based on the review of ongoing practices; up-keep of infrastructure and equipment; availability of medicines and supplies; availability and skills of service providers; and record of maintenance at these units. The assessment will be complemented with monthly reports submitted to district health department, and other evaluation surveys such as the RMNCH+A facility assessment and Annual Health Survey.

The findings will be discussed at district level during review meeting organized under the chairmanship of CMHO to identify action areas and guide further steps towards establishing IPUs at the District Hospital.

2.2. Setting up a multi-disciplinary team:

After approval and/or instructions from the state level, the first step at the district level is to constitute a multi-disciplinary committee comprising of doctors, civil works (from the Public Works Department), bio-medical engineers, and DPMU to oversee the overall assessment, civil work, shifting, and refurbishment activities at the tertiary level health facility identified for developing an IPU. Secondly, the committee will identify and rectify any underlying issue as early as possible; and ensure compliance to prevent any delay or compromise in functioning of IPU.

On a daily basis, the head of the paediatrics department of the district hospitals (or other selected health facility) will guide, coordinate, and monitor the activities of this committee. Weekly progress appraisal will be done by Civil Surgeon or Superintendent.

2.3. Developing and disseminating guidelines to District Hospital:

The District Nodal Officer (Child Health) will work with the Child Health Division to adapt the instructions and guidelines received from state level as per the district specific context and requirements. The guidelines will be disseminated through the formal letter to the Civil Surgeon of the District Hospital to initiate activities for establishing an IPU and for other required compliance. The guidelines will also be disseminated to other stakeholders such as the District Collector, Nodal Officer (RCH), local bodies of professional associations (IAP) and representatives of development partners for their support.

3) Hospital level activities

3.1. Sharing the guidelines and instructions:

After receiving instructions and guidelines from the district level, the Civil Surgeon will initiate activities at the hospital level. The first step will be to share the guidelines with the key staff

members of the different units providing newborn and paediatric health care services. All units should be instructed to update their inventory and records and be prepared to provide required support in shifting the respective units to an IPU structure.

3.2. Developing detailed plan for the DH:

The Civil Surgeon or administrator in charge of the DH will initiate a consultative process to develop a detailed plan describing various activities to be undertaken for shifting ongoing units with equipment and amenities to the IPU; identify services that need strengthening in terms of infrastructure, trained human resources, supplies and equipment, and ancillary facilities; and specify the services/units that are currently unavailable. The different sections of the detailed plan are:

a. Description of unutilized and under-utilized space within the hospital premises; factoring out other infrastructure under construction like, MCH wing etc.; and rationalization of structures for better utilization.
b. Shifting plan is an important aspect of IPU planning. Shifting plan describes human resource, equipment, and other amenities that are required according to the guidelines, those that are currently available at different units, the gap that need to be addressed to fulfil the requirement, and the resources required for filling the gap. A recommended template for preparation of 'Shifting Plan' is given in the annexure.
c. A detailed budgeted plan along with the timelines based on the specific plans will be developed and shared with the District Health Society for inclusion of budgetary demand in the NHM District Health Action Plan, and for mobilization of available resources.

3.3. Development of architectural lay out of IPU

A government recognized firm or agency will be contracted for the development of the architectural layout as per the guidelines for the different units within the IPU. The layout will provide a blueprint and a detailed map of each unit, location of each unit in relation to each other, their dimensions, and areas assigned for registration, waiting, and other ancillary services. The layout must be approved by the responsible authority before undertaking civil work in the assigned area. A formal lay out of the IPU is an essential requirement and will guide the entire civil work for operationalizing the IPU. A sample layout of an IPU is given in the annexure.

Important points for considering during operationalization:

- The human resources required for outpatient services and the paediatric ward should be designated from the HR at the District Hospital. Only where there is severe shortfall, contractual hiring should be considered for critical services like the triage, emergency and high dependency care.
- The funds required and projected for addressing gaps should be reflected in the annual district plan and budget.
- Training needs of various cadres should be addressed through Child Health Training Plan developed each year under the annual PIP. In-service training for these providers should be planned in a phased manner, distinguishing between those who require refresher training and those that need to undergo complete training. The recommended packages by the MOHFW must be considered for these trainings. Involving mentoring institutions or State Resource Centres for 'hands on' training on the job or at teaching hospitals is highly recommended.

Annexure 1: Time frame of activities

Activities		Months											
		1	2	3	4	5	6	7	8	9	10	11	12
1	**State level activities**												
1.1	Constitution of a State Nodal Team	√											
1.2	Organization of State Planning Meeting	√	√										
1.3	Prioritization of districts		√										
1.4	Expression of interests from high focus districts		√	√									
1.5	Planning under NHM Programme Implementation Plan			√	√	√							
1.6	Supervisory visits and review meetings				√	√	√	√	√	√	√	√	√
2	**District level activities**												
2.1	Gap assessment of District Hospital			√									
2.2	Setting up a multi-disciplinary team				√								
2.3	Developing and disseminating guidelines to District Hospital					√	√	√					
3	**Hospital level activities**												
3.1	Sharing the guidelines and instructions						√	√					
3.2	Developing detailed plan for the DH						√	√					
3.3	Development of architectural lay out of IPU							√	√				

Annexure 2: Brief outline of health services available at district hospital for newborns and under five-year children

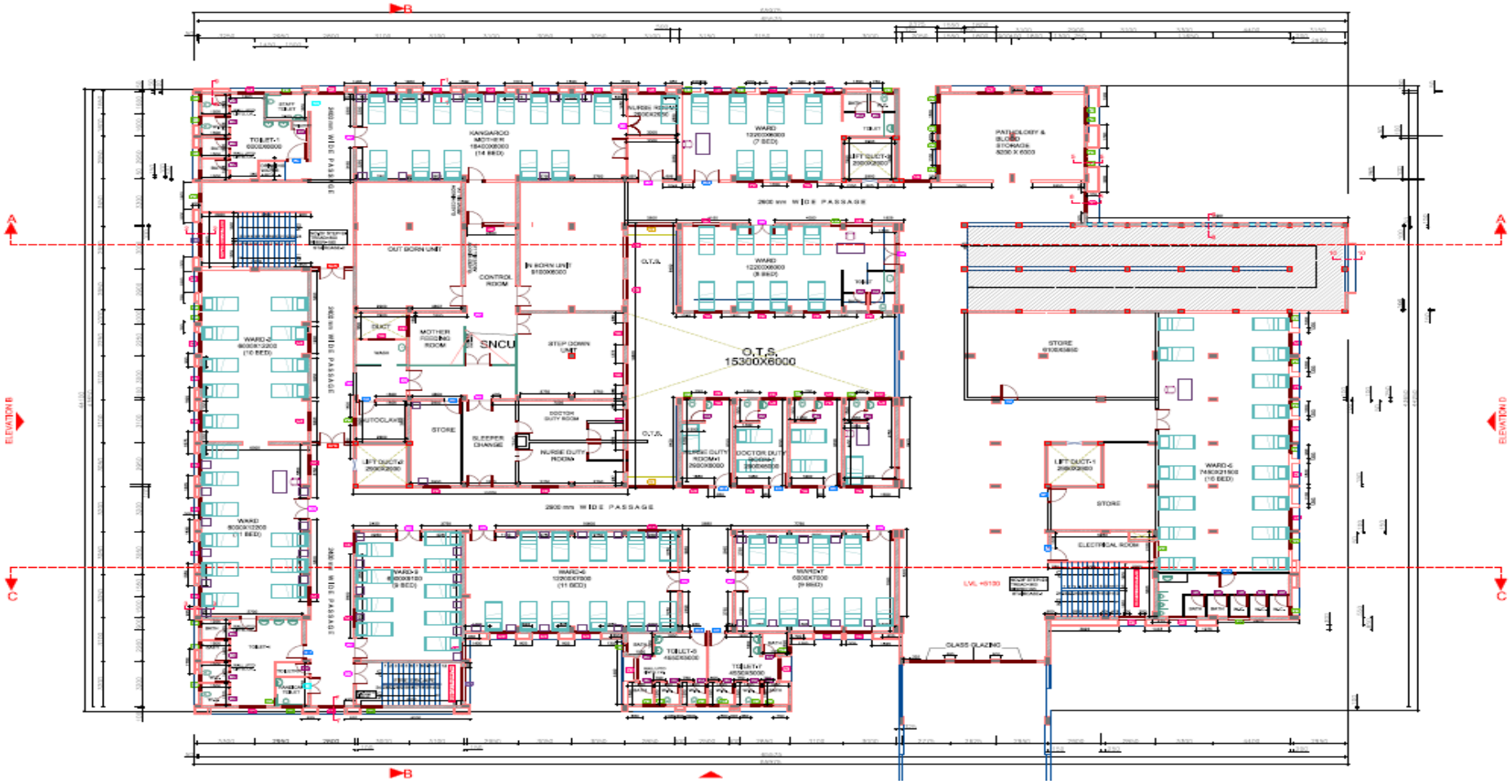
1.	**For Newborns**	
1.1	**Outpatient Services**	• Early diagnosis & curative services on ambulatory basis. • Screening for admission to hospital. • Follow up care and care after discharge • Preventive healthcare services like immunisation, screening, and counselling. • Referral to higher level facilities.
1.2	**Emergency Services**	**Emergency Triage and Treatment (ETAT)** • Assessment of newborn for emergency signs as soon as newborn is brought at the facility. • Triage by qualified health professional, preferably a paediatrician. • Management of emergency conditions like, convulsions, shock, and respiratory distress. • Stabilization of the newborn before shifting/transferring to SNCU, newborn High Dependency Unit (HDU), or for emergency intervention.
1.3.1	**In patient Services: For all newborns**	**Newborn Care Corner (NBCC)** • NBCC in every labour room and operation theatre for providing essential newborn care at birth, including - infection prevention, prevention of hypothermia, resuscitation, early initiation of breastfeeding, weighing, and immunization • Identification and prompt referral of 'at risk' and 'sick' newborns.
1.3.2	**In patient Services: For sick newborns**	**Special Newborn Care Unit (SNCU)** • Management of low birth weight infants (< 1800 gm) • Management of all sick newborns except those requiring mechanical ventilation and major surgical interventions • Follow up of newborns discharged from the unit and other high risk newborns **Newborn High Dependency Unit** • For close observation, monitoring, and treatment of newborns who are or potentially physiologically unstable.
2.	**For children <5 years**	

2.1	**Outpatient Services**	**Paediatric OPD** • Early diagnosis and curative services on ambulatory basis for common childhood ailments • Screening for admission to hospital and/or referral to higher level facilities • Follow up care and care after discharge from hospital • Provision of preventive healthcare services like, immunisation, screening, health education, and counselling
2.2	**Emergency Services**	**Emergency Triage and Treatment (ETAT)** • Assessment of children for emergency signs immediately after admission in the facility. • Triage by qualified health professional, preferably a paediatrician. • Management of emergency conditions like, convulsions, neurological deficits, shock, and respiratory distress. • Stabilization of children before shifting/transferring to paediatric ward or for emergency intervention.
2.3	**In-patient services**	**Paediatric Intensive Care Unit (PICU) or Paediatric High Dependency Unit** • In patient facility for close observation, monitoring, and treatment of children who are, or have potential to be physiologically unstable. • Management of children requiring constant oxygen therapy, cardio-respiratory monitoring, and inotropic support. **Paediatric ward** • Provision of required diagnostic and curative services to sick children admitted at the facility. • Monitoring and supportive care to sick children. • Identification of danger signs and referral to higher level facilities. **Diarrhoea treatment unit** • Specialized section adjacent to paediatric ward for assessment of dehydration among sick children, management based on degree of dehydration, and curative services through rational use of medicines for children suffering from diarrhoea or dysentery. • Counselling services on danger signs, prevention and feeding during diarrhoea.

		District Early Intervention Centre (DEIC):[10] • DEIC is established at district hospital under the aegis of Rashtriya Bal Swasthya Karyakram (RBSK) for screening, referral, and follow-up of children for selected health conditions including, defects at birth, deficiencies, diseases and developmental delays including disabilities. • DEIC envisages facility namely 'Neurodevelopmental Assessment Unit' meant for early identification and referral of children facing neurodevelopmental delays for appropriate therapeutic interventions. **Isolation room** • Separate closed facility for segregation and management of children suffering from infectious disease (source isolation). • To prevent susceptible paediatric patients, like those with poor immunity, from being infected (protective isolation).

[10] Operational Guidelines for Setting up District Early Intervention Centres; Rashtriya Bal Swasthya Karyakram; Ministry of Health and Family Welfare, Government of India; May 2014

Annexure 3: Sample architectural lay out of an IPU



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