CHAPTER

1

Child Health in India

Mukesh Agrawal

Childhood is the formative period in human life, subjected to various intrinsic and extrinsic influences affecting their survival, health and disease. State of child health in a community reflects its overall socioeconomic development and health concerns.

Constitutionally, a child has been defined as an individual <18 years of age, though conventionally, pediatricians in India looks after the health of children till 12–14 years. In some countries, the scope of pediatrics extends up to 19 years, i.e. including the period of adolescence.

From the health perspectives, childhood is not a homogeneous period but includes various phases of growth and development with unique physical, mental and social health dimensions during each phase **(Table 1.1)**.

According to the Sample Registration Survey (SRS) 2022, children constitute ~24.8% of India's population, including 7.5% infants and pre-schoolers (0–4 years) and 17.3% school children (5–14 years). Another 10.2% population is adolescents in the age-group of 15–19 years.

TABLE 1.1: Various periods in childhood

Prenatal (intrauterine life or IUL)	
Ovum	0–14th day of IUL
Embryo	3rd–8th week of IUL
Fetus	9th week of IUL–till birth
Postnatal	
Neonate	0–28 days
Infant	28 days–1 year
Toddler	1–3 years
Preschool	3–5 years
School age	5 years–till onset of puberty
Adolescence	
Early adolescence	12–14 years (10–12 years in females)
Mid adolescence	14–16 years (12–14 years in females)
Late adolescence	16–18 years (14–16 years in females)

Present chapter provides an overview of current status of child health in India and its determinants as well as leading causes of morbidity and mortality and interventional strategies, while more specific aspects have been discussed in Ch 28.

1.1 INDICATORS OF CHILD HEALTH

Status of child health in a country is reflected in various morbidity and mortality indicators and their changes over a period of time.

Morbidity indicators are more reliable pointers of community health than mortality indicators. Although community data regarding patterns of childhood morbidity in India is limited due to poor reporting system, hospital data identifies three major causes of post-neonatal morbidity in Indian children—acute respiratory tract infections (~30%), acute diarrheal diseases (~20%) and other infectious disease including tuberculosis and measles (~20%), with underlying malnutrition in over 25% of these children. Many of these problems are inter-related and co-exist in the same child seeking health care.

NFHS-5 (2021) found that 7.3% and 2.8% of under-five children had history of diarrhea and respiratory infections within 2 weeks before the survey visit. It also reveals that 32.1% and 67.1% of all under-five children were underweight and anemic.

Morbidity profile is not static and keeps on changing with changes in socioeconomic and environmental status as well as health care awareness/facilities in the community. Recent years have seen substantial decline in incidence of infections and nutritional disorders, with simultaneous rise in non-infective illnesses and accidents due to changing lifestyle and other ecological factors.

Mortality indicators are relatively better defined and documented. SRS 2022 reveals that ~11.2% of all deaths in India occur during childhood, including 9.1% in infants, 0.9% in pre-schoolers (1–4 years) and 1.4% in school children (5–14 years), apart from another 1.3%

TABLE 1.2: Current mortality indicators in children	
Perinatal mortality rate (PNR)	18
Stillbirth rate (SBR)	03
Neonatal mortality rate (NMR)	20
Early NMR	15
Late NMR	05
Post-neonatal mortality rate (PNMR)	08
Infant mortality rate (IMR)	28
Under-five mortality rate (U5MR)	32

Source: SRS report 2022.

in adolescents (15–19 years). In brief, ~85% of all childhood deaths occur in first five years, ~80% in infancy, 50% in first month and 30% in first week of life.

Considering variable risk of mortality and causative factors in different age groups, many mortality indicators **(Table 1.2)** are used to assess the status of child health and efficacy of interventional programs, some of which are as follows:

Infant mortality rate (IMR), i.e. total number of deaths during first year of life compared to total number of live births in the given year, expressed as a rate per 1000 live births, is considered as the single best indicator of child health and effectiveness of health care system in a community.

According to SRS 2022, current IMR in India is 28/1000 live births (35.3 as per NFHS-5, 2021), much higher than that in developed countries (<10/1000). Within India too, IMR differs widely in urban *vs* rural population (19 *vs* 31 respectively) and from state to state - being lowest in Puducherry and Kerala, moderate in Maharashtra and highest in Bihar and Chhattisgarh (Table 28.4).

Leading causes of IMR include *neonatal problems* (53%), *pneumonia* (17%), *diarrheal disease* (5%) and other *severe infections* (4%). (SRS-COD report 2017-19)

Infancy includes two crucial phases of human life-neonatal and post-neonatal period, with diverse health problems. Sharp fall in IMR during last century (204 in 2011 to 28 in 2020) is predominantly due to decline in post-neonatal mortality after better control of exogenous factors, e.g. infection and malnutrition.

Perinatal mortality rate (PMR), i.e. total number of late fetal (>28 weeks) and early neonatal (<7 days) deaths compared to total number of live births in given year, expressed as a rate per 1000 live births, is the best indicator of care available to pregnant mother and her newborn in a given community (Ch 12.2).

According to SRS 2022, current PMR in India is 18/1000 live births, with wide geographic variations. Despite the declining trends, it is still much higher than that in most developed countries.

Neonatal mortality rate (NMR), i.e. total number of neonatal deaths <28 days of life, expressed as a rate per 1000 live births in a given year, currently stands at 20 (SRS, 2022). NMR, is mainly related to biological factors, e.g. low birth weight, birth asphyxia and congenital malformations, etc. and continues to be high in most parts of our country. Interestingly, NMR is higher in males (? biologically fragile sex).

Leading causes of NMR in India include prematurity and LBW (46%), birth asphyxia/trauma (15%), and neonatal pneumonia in 13% (SRS-COD report 2017-19).

Under-five mortality rate is a sensitive indicator of the overall development of the community, as majority of its causes, e.g. malnutrition and infection, depend on the socioeconomic status, environmental hygiene and health awareness in population. It is defined as total annual deaths <5 years of age and total live births in the same year, expressed as a rate per 1000 live births.

According to SRS 2022, current under-five mortality rate in India is 32 (41.9 as per NFHS 2021), substantially lower than 242 in 1960, due to overall socioeconomic development, easier access to health care and control of infectious diseases.

Leading causes of childhood mortality beyond infancy include injuries (21.8%), pneumonia (18%), non-communicable diseases (14%) and diarrheal diseases 13% (SRS-COD report 2017-19).

1.2 CHANGING PROFILE OF DISEASES

Etiology of childhood morbidity and mortality varies with age and may be divided into two major groups– **endogenous causes,** e.g. low birth weight, predominantly responsible for neonatal morbidity; and **exogenous causes,** e.g. infections and malnutrition, which usually affect beyond the neonatal period **(Table 1.3)**.

Trends in last three decades (1992-2020) have witnessed a sharp drop of ~67% in post-NMR (22 to 8) as compared to only 32% improvement in NMR (34 to 20). This observation suggests that improvement in these mortality indicators during recent years are largely attributable to better control of exogenous factors (dominant cause of post-NMR) than endogenous causes (dominant in newborns) are more difficult to control and need holistic strengthening of antenatal, intranatal and postnatal services.

With relative control of common illnesses, new causes are emerging as important contributors of childhood morbidity and mortality in India, e.g. congenital malformations, immunological disorders, accidents and mental health problems.

1.3 DETERMINANTS OF CHILD HEALTH

Child health in a community is influenced by various environmental factors, which account for geographic and demographic differences in morbidity and mortality.

TABLE 1.3: Leading causes of childhood morbidity and mortality in India

Prenatal/intranatal	*Neonatal*	*Post-neonatal*	*1–4 years*
Maternal nutrition Maternal illness/infections Obstetric complications Fetal malformations Fetal hypoxia	LBW and prematurity Birth asphyxia/injury Neonatal sepsis Congenital malformations	Acute respiratory infections Acute diarrheal diseases Malnutrition Congenital malformations	Acute respiratory infections Acute diarrheal diseases Malnutrition VPDs—TB, measles Accidents/poisoning
28 weeks ← PNR → 7 days		—	—
—	NMR	PNMR	—
—	← IMR →		—
—	← Under-five mortality rate →		

VPD: Vaccine preventable diseases; **LBW:** Low birth weight; **PNR:** Perinatal mortality rate; **NMR:** Neonatal mortality rate; **PNMR:** Post-neonatal mortality rate; **IMR:** Infant mortality rate.

Important adverse factors for child health in India include:

- *Maternal factors*, e.g. young maternal age, maternal malnutrition and illnesses, repeated pregnancies, short birth spacing, etc.
- *Socioeconomic factors*, e.g. poverty, urbanization, large family size, female illiteracy, girl child, illegitimate pregnancies, etc.
- *Cultural factors*, e.g. early marriage, improper infant feeding practices, e.g. top feeding, harmful child care customs/taboos, etc.
- *Environmental factors*, e.g. overcrowding, unsafe water supply and excreta disposal, poor personal and environmental hygiene, stressful family environment, e.g. broken families, etc.
- *Health care factors*, e.g. inadequate antenatal care, unsafe/untrained deliveries, poor immunization coverage, inadequate access to health services, etc., specially in rural areas.

Table 1.4 depicts status of some important health determinants in India, including perinatal care, early infant feeding, immunization and utilization of health care services in children.

1.4 INTERVENTIONAL STRATEGIES IN CHILD HEALTH

Globally, the needs and rights of children have been recognized since long with celebration of ***Universal children day*** on 14th November every year since 1954. Year 1979 was also celebrated as the ***UN international year of the child***.

Indian constitution has acknowledged the needs and rights of children under following articles:

- Article 24—prohibits employment of children <14 years in factories
- Article 39—prevents abuse of children of tender age
- Article 45—provides free and compulsory education until 14 years of age.

TABLE 1.4: Current status of child health determinants (NFHS-5, 2019-2021)

Antenatal care	
Adequate number (4) of ANC visits	58.1%
Iron-folic supplements for 100 days	44.1%
Tetanus immunization	92.0%
Perinatal care	
Institutional deliveries	88.6%
Unsafe deliveries	10.6%
LSCS deliveries	21.5%
% LBW or low birth weight	18.0%
Infant feeding practices	
Early breastfeeding (within <1 hour)	41.8%
Exclusive breastfeeding till 6 months	63.7%
Initiation of complementary feeds @ 6 months	45.9%
Adequate diet in breastfed (6–23 mo)	11.1%
Adequate diet in non-breastfed (6–23 mo)	12.7%
Immunization coverage	
Complete immunization till 23 months	76.4%
BCG	95.2%
DPT/Penta V (3 doses)	86.7%
OPV (3 doses)	80.5%
Measles 1 and 2	87.9%/31.9%
Rotavirus	36.4%
Vitamin A supplement in last 6 months	71.2%
Health care utilization	
% ARI cases visiting health care facility	69.0%
% Diarrhea visiting health care facility	68.9%
% use of ORS in diarrhea	60.6%
% use of zinc in diarrhea	30.5%

Source: NFHS-5 Fact sheet 2021 (reference 2019-21 data)

To fulfil these constitutional provisions, Government of India adopted a ***national policy for children (1974),*** which affirms that *"It shall be the policy of the state to provide adequate services to children, both before and after birth and through the period of growth, to ensure their full physical, mental and social development. The state shall progressively increase the scope of such services so that, within a reasonable time, all children in the country enjoy optimum conditions for their balanced growth."*

To achieve this objective, Government of India has proposed and revised some health targets to be achieved in a time-bound manner, aligned to global goals, e.g. millennium development goals (MDGs), sustainable development goals (SDGs) and WHO recommendations. *National health policy 2017* has established certain health goals to be achieved in time-bound manner, some of whom are related to child health as enlisted in **Table 1.5**.

Since independence, a plethora of targeted child health programs were launched in India with periodic reviews and modifications (Ch 28.4). While earlier programs were largely unisectorial, inter-sectorial coordination and integration with universal health care is hallmark of current strategies in child health strategies. Some important aspects of these efforts are as follows:

- **General population measures**
  - Socioeconomic development
  - Population control (family planning)
  - Safe water supply
  - Environmental sanitation
  - Promotion of female literacy
- **Reproductive female health measures**
  - Nutritional/health care of reproductive females
  - Adequate birth spacing
- **Antenatal care**
  - Regular antenatal care
  - *'At-risk approach'* for high-risk pregnancies
- **Perinatal care**
  - Safe/clean delivery by trained attendants
  - Essential newborn care
  - Promotion of breastfeeding
- **Postnatal care**
  - Universal immunization
  - Growth monitoring and promotion
  - Early diagnosis and treatment of common illnesses
  - Promotion of low-cost tools, e.g. ORS
- **Strengthening of health care system**
  - Low-cost medical care
  - General health programs, e.g. RCH, ICDS
  - Disease-targeted programs, e.g. NTEP, NVBDCP
  - Group-targeted programs, e.g. street children.

To conclude, child health in India is currently at the crossroads. Despite all efforts, status of Indian child is still far behind than that of a child in developed countries. Country has largely failed to achieve child health targets set time to time.

While lessons have been learnt from the past and strategies are being revised accordingly, achievement of these targets remains a function of political will, community participation, efforts of health workers and above all, acceptance of interventions by recipients.

TABLE 1.5 National Health Policy 2017: Targets with (proposed year of achievement)

Mortality indicators	
IMR	28 (2019)
Under-5 MR	23 (2025)
MMR	100 (2020)
NMR	16 (2025)
SBR	Single digit (2020)
Disease elimination/control	
HIV	90:90:90* (2020)
Malaria (annual incidence)	<1: 1000 (2020)
Leprosy elimination	<1: 10000 (2018)
Kala-azar elimination	<1: 10000 (2017)
Lymphatic filariasis elimination	2017**
TB cure rate/elimination	85% (2025)
Health services	
Antenatal coverage	90% (2025)
Full immunization till 1 yr	90% (2025)
Stunting (under-5 children)	Reduce by 40% (2025)
Safe water and sanitation	100% by 2020

*90% PLHA know their HIV status, 90% receive sustained antiretroviral therapy and 90% on antiretroviral therapy will have viral suppression.
**<1% microfilaria prevalence in all districts.

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