Child health 1

Why Child Health Demands Special Attention[1]

1. High under 5 mortality: In 2017, approximately 5.4 million children under the age of 5 died globally.
2. Preventability: The overwhelming majority of these deaths are preventable. Child deaths are rare in high-income countries, and it is estimated that more than half of child deaths could be avoided through known, simple, and low-cost interventions.
3. Vulnerability: Children are uniquely vulnerable. Their health depends entirely on the care provided by adults (proper breastfeeding, immunization, safe and hygienic conditions), raising important ethical issues about adult responsibility.

Why Child Health Demands Special Attention[1]

4. Link to Poverty: Child health is inseparably linked to poverty. Deaths from diseases like diarrhea are closely tied to lack of access to safe water, sanitation, and education (especially maternal education).

5. Uneven Progress: Despite substantial global progress in reducing under-5 mortality, significant disparities remain, particularly in sub-Saharan Africa and South Asia.

Key terms and Definitions [1]

Infant death and mortality rate — Infant death is defined as a live birth that results in death within the first year of life (<365 days).

The infant mortality rate (IMR) is the number of infant deaths less than one year of age (0 to 365 days of life) during a year, divided by the number of live births reported during the same year, expressed per 1000 live births.

Neonatal death and mortality rate — Neonatal death is defined as an infant death before 28 days of age.

Early neonatal deaths occur before the first seven days from birth, and late neonatal deaths occur between 7 and 27 days of age.

The neonatal mortality rate (NMR) is the number of neonatal deaths during a year, divided by the number of live births during the same year, expressed per 1000 live births.

Post neonatal death — Post neonatal death is defined as an infant death occurring between 28 and 365 days of age.

Perinatal death — Sum of infant deaths that occur at less than 7 days of age and fetal deaths with a gestational age of 28 weeks or more.

The Burden of Mortality: Data and Trends

Globally: 99% of deaths occur in low- and middle-income countries.

Distribution by Age: The risk of dying is highest immediately after birth.

Mortality by Region and Income :

- Sub-Saharan Africa has the highest rates for all mortality indicators (neonatal, infant, under-5).
- South Asia has the second-highest rates.
- There is a strong correlation between low income and high mortality. A child in a low-income country has a 9 times greater risk of neonatal death and a 12 times greater risk of under-5 death than a child in a high-income country.

Disparities Within Countries:

Mortality rates vary significantly within countries by:

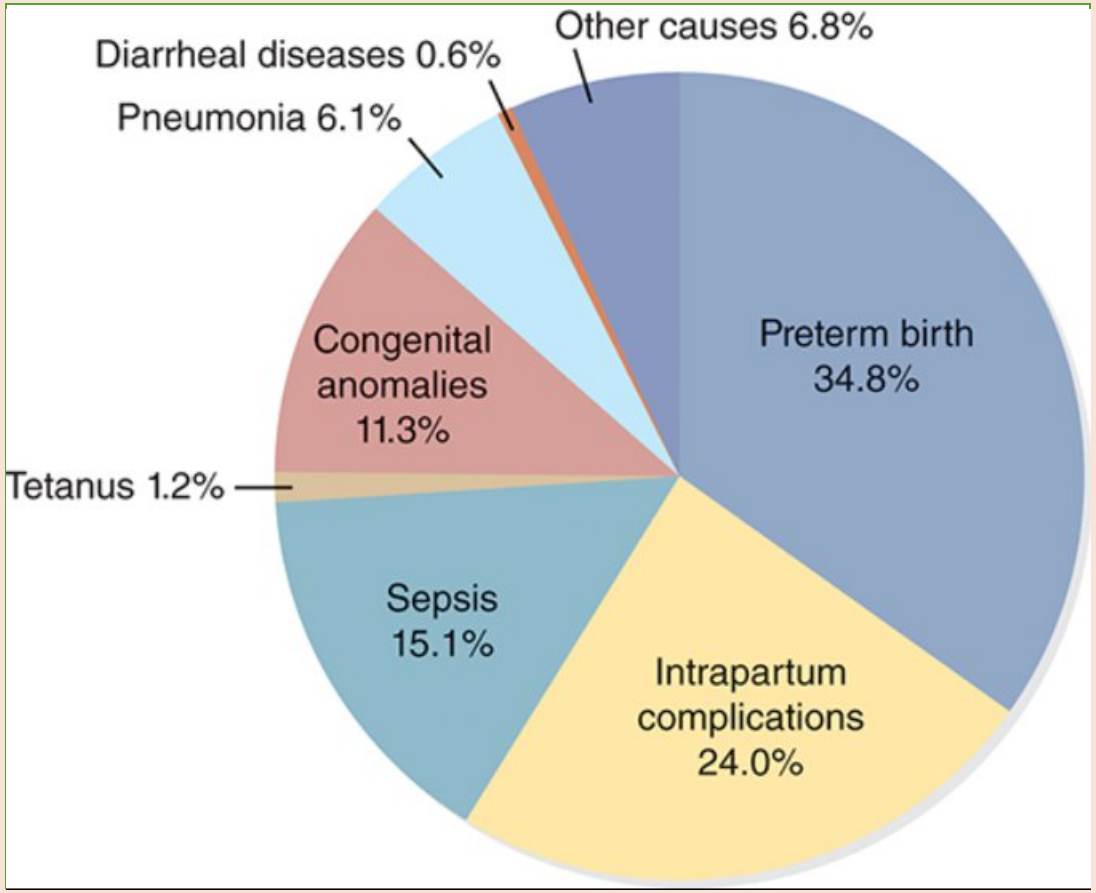
- Income: Poorest children are more likely to die before age 5 than the richest.
- Location: Rural children face higher risks than urban children.
- Maternal Education: Children of mothers with no education are twice as likely to die as those with secondary education.

Leading Causes of Morbidity and Mortality

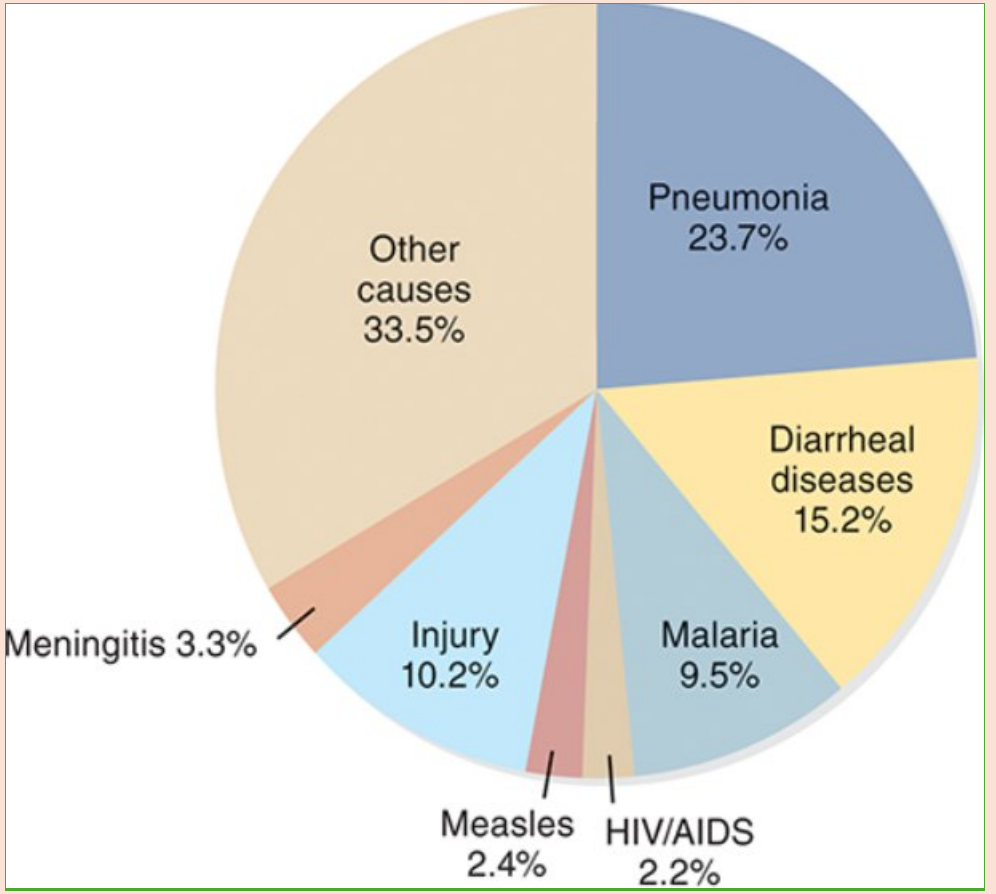
Causes by Age Group:

- Neonatal Period The leading causes are:
  - Preterm birth complications
  - Intrapartum complications (e.g., birth asphyxia)
  - Neonatal sepsis and other infections
  - Congenital anomalies
  - Many of these deaths are preventable with low-cost, community-level interventions.
- Post-Neonatal Period: The leading causes shift to:
  - Communicable diseases: Pneumonia, Diarrhea, Malaria, Meningitis, HIV/AIDS, Measles.
  - Injuries.

Neonatal Period



Post-Neonatal Period



Detailed Comments on Selected Causes:

Pneumonia:

- Leading infectious cause of under-5 death globally.
- Caused by bacteria, viruses, and fungi.
- Risk factors include undernutrition, lack of exclusive breastfeeding, HIV, measles, and indoor air pollution.

- Diarrhea:
  - Second leading infectious cause of child death.
  - Caused by bacteria, viruses, and parasites, transmitted via the fecal-oral route due to unsafe water, poor sanitation, and hygiene (WASH).
  - Leads to fatal dehydration and malnutrition.

- Malaria:
  - Has an "enormous impact" on child mortality and morbidity, with most deaths occurring among young children in sub-Saharan Africa.
  - In endemic areas, children can experience nearly five episodes per year.

Detailed Comments on Selected Causes:

- HIV/AIDS:
  - Transmitted from mother-to-child during birth or breastfeeding.
  - Without antiretroviral therapy (ART), infected children have a very high risk of early death, but starting ART by 12 weeks reduces mortality by 75%.
- Soil-Transmitted Helminths (Worms):
  - Infections like roundworm and hookworm affect hundreds of millions of children.
  - Cause morbidity including anemia and impaired development.

The Critical Challenge of Neonatal Mortality

- Neonatal deaths now represent nearly half of all under-5 deaths, making their reduction essential for further progress.
- Timing is critical: Majority of neonatal deaths occur in the first week of life, and over one-third occur on the first day. This explains cultural practices like delayed naming.
- Majority of neonatal deaths occur in low-birthweight babies, highlighting the crucial link between the mother's health (nutrition, infection) and the baby's survival chances.

Risk Factors for Neonatal, Infant, and Young Child Deaths

Why do so many children get sick and die from preventable causes?

The answer lies in a web of interconnected risk factors, with social determinants at the core.

Social Determinants of Health: The Underlying Causes

- Poverty: Poverty leads to:
  - Inadequate nutrition.
  - Less access to safe water and sanitation.
  - Less access to health services and education.
  - There is a very strong correlation between family income and a child's chance of survival.
- Maternal Education:
  - Child mortality is significantly higher in families where the mother has little or no education, whereas mothers with secondary education or higher have children with substantially lower mortality rates*.

Social Determinants of Health: The Underlying Causes

- Health of the Mother: The mother's health directly impacts the newborn. Risks increase if the mother is:
  - A teenager or an older woman.
  - Has short birth intervals between pregnancies.
  - Is of short stature, poorly nourished, or suffering from infections like malaria.
  - These factors contribute to prematurity and low birthweight, which are key predictors of child survival.

Conditions at Birth

A baby's survival chances increase greatly when:

- The birth takes place in a healthcare setting that can handle obstetric emergencies.
- The delivery is attended by a skilled birth attendant who can resuscitate newborns and counsel on warmth and early breastfeeding.

Environmental Circumstances

- Household air pollution is a key risk factor for respiratory diseases.
- Living in malaria-endemic zones poses a direct threat.
- Lack of clean water and sanitation is linked to diarrhea and worm infections. Risks increase when a child begins eating complementary foods and is no longer exclusively breastfed.

Nutritional Status

Nutrition has a profound impact, both indirectly through the mother and directly on the child.

Key evidence:

- Non-breastfed infants (0-5 months) have an increased risk of death from pneumonia or diarrhea compared to exclusively breastfed infants.
- Vitamin A deficiency increases the risk of dying from diarrhea, measles, and malaria.
- Zinc deficiency increases mortality risk from diarrhea, pneumonia, and malaria.

Conflict and Fragility

- UNICEF estimates that in a typical 5-year war, under-5 mortality increases.
- The highest neonatal death rates often occur in conflict-ridden countries.

Knowledge and Access to Care

- Family knowledge about health-seeking behaviors and the ability to access timely, quality health services are critical to whether children survive.

The Costs and Consequences of Child Morbidity and Mortality

- Short-Term Costs to Families:
  - Direct costs: Families spend a significant portion of their limited income on medical care for frequently sick children.
  - Indirect costs: Caregivers lose time and income from their normal activities when caring for a sick child.
- Medium- and Long-Term Consequences for the Child and Society:
  - Conditions like prematurity can lead to permanent disability.
- Social Consequences:
  - High child mortality leads to high fertility rates, as families have more children to ensure some survive to adulthood.

Immunizations

- Vaccines are a cornerstone of public health, preventing deadly diseases and saving lives. each year, routine immunization prevents between 2 and 3 million deaths and protects up to 100 million people against illness and disability.

What is EPI?

- The Expanded Program on Immunization (EPI), launched by WHO in 1974, ensures equitable vaccine access for all children, regardless of location or socioeconomic status.
- Originally called the Essential Program on Immunization, EPI provides universal access to life-saving vaccines.
- Every country now has a national immunization program—vaccines are among the safest, most cost-effective public health interventions.

IMMUNIZATION BENEFITS

1. Herd Immunity Benefits:

Immunization programs protect not only vaccinated individuals but also unvaccinated members of society

When a large portion of the population is immunized, herd immunity reduces the spread of vaccine-preventable diseases.

2. Reduction in Antibiotic Resistance:

Vaccines prevent illnesses that would otherwise require antibiotic treatment

By reducing antibiotic use, immunization lowers the risk of antibiotic-resistant strains, which are harder and more costly to treat.

IMMUNIZATION BENEFITS

3. Economic and Social Benefits:

- Maintaining population health through immunization supports economic growth.
- It contributes to poverty reduction by preventing costly illnesses and lost productivity.

4. Global Health "Best Buy":

- National immunization programs are high-value investments.
- They benefit individuals, families, communities, and entire countries.

History of EPI

Early Focus (1974)

- Initially targeted 6 childhood diseases:
  - Tuberculosis (BCG)
  - Diphtheria
  - Tetanus
  - Pertussis (whooping cough)
  - Polio
  - Measles
- Current WHO-Recommended Vaccines (13 Universal + Context-Specific)

Critical Challenges to Universal Coverage

- Vaccination programs face several challenges. In some countries, limited health infrastructure, personnel, and funding hinder sustainable immunization. Complacency can also be risky, as lapses in vaccination allow outbreaks to occur. Vaccine hesitancy, fueled by misinformation and social media, further reduces coverage. Additionally, political instability, economic crises, and migration in fragile states create barriers to reaching all populations. Together, these factors threaten the success of vaccination programs.

The National Immunization Program in Jordan [1]

- Since 1979, routine immunization has been mandatory in Jordan.
- Jordan's high vaccine coverage rate (95%) has contributed to a decline rate of deaths and vaccine-preventable disease (VPDs).
- Thanks to the national Polio vaccination program, Jordan has been Polio-free since 1992.

Age	Vaccine(s)	Details
At Birth	BCG Vaccine	Tuberculosis (TB) prevention.
2 Months	Hexavalent Vaccine (1st Dose) Rotavirus (1st Dose)	Hepatitis B Inactivated poliovirus vaccine (IPV) Diphtheria, Tetanus, and Pertussis vaccine (DaPt) Haemophilus influenzae vaccine, type B
4 Months	Hexavalent Vaccine (2nd Dose) Rotavirus (2nd Dose) OPV (Oral Polio Vaccine) (1st Dose)	Second dose of DTP-Hib-Polio-HepB combination.
6 Months	Hexavalent Vaccine (3rd Dose) Rotavirus (3rd Dose) OPV (2nd Dose)	
9 Months	Measles Vaccine OPV (3rd Dose) Vitamin A (100,000 IU)	
12 Months	MMR (1st Dose) Hepatitis A (1st Dose)	Measles, Mumps, Rubella (first dose).
18 Months	DTP Booster OPV Booster MMR (2nd Dose) Hepatitis A (2nd Dose) Vitamin A (200,000 IU)	
School Age	DT (Diphtheria & Tetanus) DT (Diphtheria & Tetanus)	Given in 1st grade. Given in 10th grade.

Tuberculosis[1]

1. Tuberculosis (TB) is caused by a bacterium that most often affects the lungs.
2. It is both preventable and curable but also highly contagious. Without proper treatment, up to two-thirds of people with TB will die.
3. Majority (95%) of cases and deaths from TB occur in low- and middle-income countries in Asia and Africa.
4. Prevention through BCG vaccine

Measles

1. Measles is a highly infectious viral disease that is spread from person to person through sneezing, coughing and close personal contact.
2. The first sign of infection is a high fever lasting one to seven days.
3. A generalized rash develops seven to 18 days after exposure to the virus.
4. Pneumonia is the most common cause of death associated with measles.
5. Severe complications can be avoided through proper case management, including vitamin A supplementation.
6. Measles can be prevented by immunization.
7. All children should receive two doses of measles vaccine. Very high coverage (90–95%) is needed with both doses.

Diphtheria

1. Diphtheria is a disease caused by a bacterium that affects the upper respiratory tract.
2. Diphtheria is spread from person to person in airborne droplets.
3. Symptoms of the disease include sore throat, loss of appetite and mild fever.
4. The most severe complication of diphtheria is respiratory obstruction followed by death.

Swollen glands in the neck

Diphtheria's hallmark feature: The pseudomembrane
A thick, gray coating of dead tissue can build up in the nose and throat. This coating, called a "pseudomembrane," can make it very hard to breathe and swallow.

Tetanus

1. Caused by a bacterium found in the environment.
2. Infection occurs during unclean delivery of babies, when contaminated objects are used to cut the umbilical cord, or whenever tetanus bacteria enter a wound or cut.
3. Most newborns who contract tetanus will die.
4. The best way to prevent maternal and neonatal tetanus is to give the WHO six dose Tetanus toxoid-containing (TTCV) vaccine schedule of infant and booster doses, immunize pregnant women in all areas (and all women of reproductive age in high-risk areas), and ensure clean delivery and cord care practices.

Pertussis, or whooping cough

- Is a disease of the respiratory tract.
- Pertussis is a bacterial infection spread from person to person by sneezing and coughing.
- Infants and young children are most likely to be infected, to have serious complications, and to die from the disease.
- Symptoms: runny nose, watery eyes, sneezing, fever and a mild cough. The cough worsens to many rapid bursts. At the end of these bursts, the typical patient takes in air with a high-pitched whoop.
- Children may turn blue because they do not get enough oxygen during a long burst of coughing.

whooping cough

Poliomyelitis

1. commonly known as polio, is a highly infectious disease that mainly affects children under 5.
2. majority of individuals infected do not have symptoms but can still spread the disease.
3. May result in paralytic poliomyelitis (1% of infections) ; when paralysis occurs, it will lead to death in approximately 5–10% of cases.
4. For countries using OPV only, WHO recommends that they introduce at least one dose of IPV to the routine immunization schedule.

- OPV (oral polio vaccine) and IPV (inactivated polio vaccine)