

# THE IMPACT OF HEALTH CARE SERVICES, INFRASTRUCTURE, AND NUTRITION, ON CHILD MORTALITY RATES IN RURAL INDIA.

- **Presented By –**

Dr. Isha Phadke

Roll no. 1298

MBA – HM 28 batch

- **Under Guidance of –**

Dr. Anoop Khanna

Professor, IIHMR



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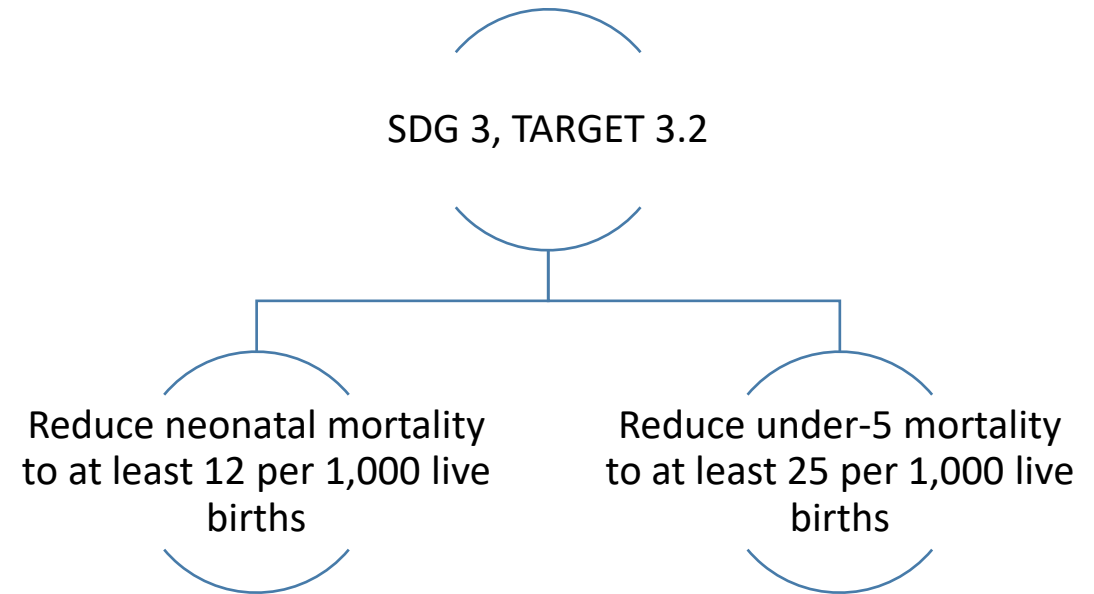
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# INTRODUCTION

Child Mortality Rate, is the number of deaths occurring between birth up to the age of five years, per 1000 live births. It encompasses the Under-five Mortality Rate and Infant Mortality Rates.

Child Mortality Rates have garnered the attention of Policy makers and academicians as they are crucial indicators for country's overall health and development.



# Child Mortality In India

- India has made significant progress in reducing child mortality rates.
- India's Infant Mortality Rate (IMR) is 39 deaths per 1000 live births.
- The Under-five Mortality Rate (U5MR) is reported at 45 deaths per 1000 live births.
- However, the current reduction rate is not sufficient to achieve the SDG target by 2030.
- There is a notable disparity in child mortality rates between rural and urban areas in India.

| <b>Rates</b>              | <b>Annual Decline Rate</b> |
|---------------------------|----------------------------|
| Infant Mortality Rate     | 6.7 %                      |
| Neonatal Mortality Rate   | 9.1 %                      |
| Under-five Mortality Rate | 8.6 %                      |

# Accessibility to Healthcare Services

- Accessibility to healthcare services is influenced by various factors, including financial, organizational, social, and cultural barriers, which can limit utilization even when services are available.
- Rural areas in India face greater challenges in accessing healthcare compared to urban areas, with limited choices and availability of providers.
- Recent data from Rural Health Statistics, Report 2022 reveals a significant shortage of medical professionals in rural community health centers, including surgeons, pediatricians, obstetricians, and gynecologists.
- The decrease in manpower and healthcare infrastructure in rural areas could potentially have a negative impact on child mortality rates.
- This study focuses on analyzing the influence of healthcare services and infrastructure on child mortality rates in rural India.

# Nutritional Status In India

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Undernutrition is a complex issue linked to multiple causes and leads to stunting and wasting in children, increasing the risk of mortality and morbidity.

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In India, the National Family Health Survey (NFHS) has revealed alarming statistics regarding undernutrition among children under five years old. According to NFHS-4 data, 36% of children are underweight, 43.3% are stunted, and 24.5% are wasted.

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The high prevalence of malnutrition in India is a concerning burden that is likely to have an impact on child mortality rates.

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Nutrition plays a crucial role in determining a child's health, and addressing undernutrition is essential to improve child survival and well-being.

### **Research Question –**

- What is the impact of the accessibility of healthcare services and nutrition on child mortality indicators, particularly the infant mortality rate and Under-five Mortality rate, in rural India?

### **Objectives –**

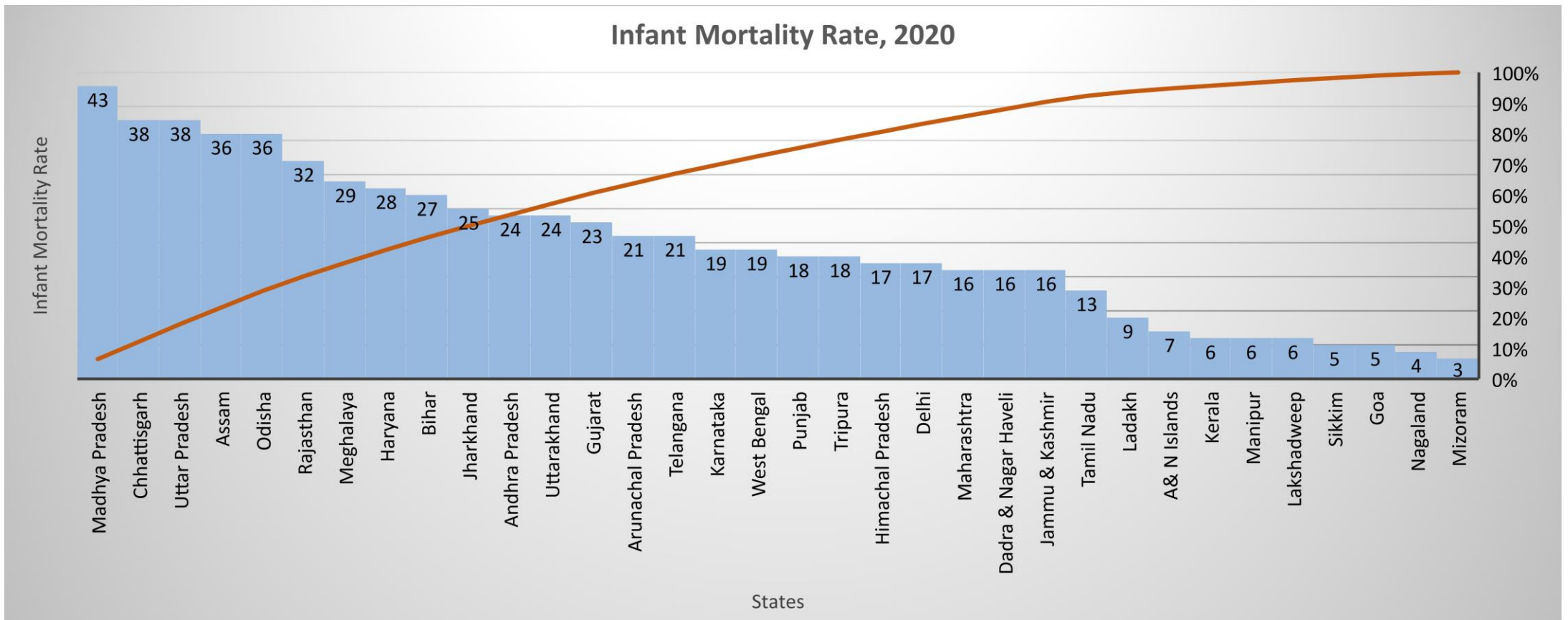
- To evaluate the status of current Infant Mortality rate and Under-five Mortality Rate
- To assess the impact of nutritional status on child mortality rates.
- To determine the extent of correlation between rural healthcare infrastructure and child mortality rates, including, Infant Mortality Rate, and Under 5 Mortality Rate.

# METHODOLOGY

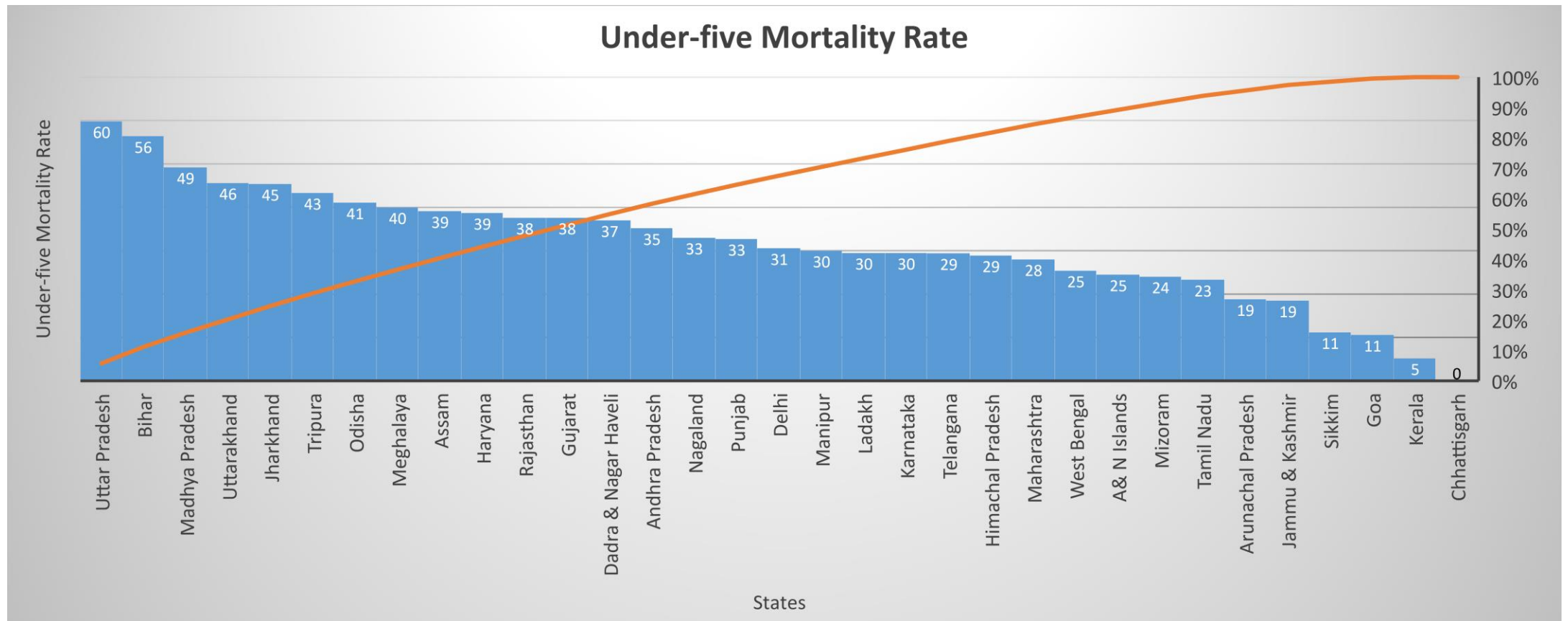
|                    |                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Study Design       | Quantitative Analysis                                                                                                                                                                                                                                                                                                                                           |
| Data Source        | Sample Registration System (SRS) 2020 Volume 55-1 – Infant Mortality Rate<br>National Family Health Survey-5 (2019-2021) – Under-five Mortality Rates<br>Rural Health Statistics 2022                                                                                                                                                                           |
| Data Analysis      | Regression Analysis to find the Pearson's' correlation coefficient and p-value                                                                                                                                                                                                                                                                                  |
| Inclusion Criteria | Articles with the key word – “Child Mortality Rates” AND/OR “Nutritional status” AND/OR “Healthcare infrastructure” AND/OR “Infant mortality rate” AND/OR “access to public healthcare system” AND/OR “healthcare facilities accessibility”<br>In addition, the method of snowball article collection (citations from relevant journal articles) was also used. |
| Exclusion Criteria | Articles dated before 2000 were excluded from the study.<br>Further the search was refined by limiting studies to India.                                                                                                                                                                                                                                        |

# RESULTS

## 1.1 Pareto chart demonstration Infant Mortality Rate, 2020



## 1.2 Pareto chart demonstration Under-five Mortality Rate



## 1.3 Prevalence of Malnutrition with respect to Child Mortality rates in Rural Area

| States with Highest IMR and Under-five Mortality Rates | High Prevalence Of Stunting in the Children aged 0-4 years (37-42%) | High Prevalence Of Wasting in the Children aged 0-4 years (17%) | High Prevalence Of Underweight in the Children aged 0-4 years (17%) |
|--------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Madhya Pradesh</b>                                  |                                                                     |                                                                 |                                                                     |
| Chhattisgarh                                           |                                                                     |                                                                 |                                                                     |
| <b>Bihar</b>                                           |                                                                     |                                                                 |                                                                     |
| <b>Uttar Pradesh</b>                                   |                                                                     |                                                                 |                                                                     |
| Assam                                                  |                                                                     |                                                                 |                                                                     |
| Uttarakhand                                            |                                                                     |                                                                 |                                                                     |
| <b>Jharkhand</b>                                       |                                                                     |                                                                 |                                                                     |
| Odisha                                                 |                                                                     |                                                                 |                                                                     |
| Others                                                 | Rajasthan                                                           | West Bengal, Tamil Nadu                                         |                                                                     |

|                                                          | Infant Mortality Rate<br>(state wise) |         | Under 5 Mortality rate<br>(state wise) |         |
|----------------------------------------------------------|---------------------------------------|---------|----------------------------------------|---------|
| PARAMETERS (as specified in<br>operational definitions)  | Pearson<br>Correlation<br>Coefficient | p-value | Pearson<br>Correlation<br>Coefficient  | p-value |
| Health Worker [Female] / ANM At<br>Sub Centre            | 0.5608                                | 0.0005  | 0.4728                                 | 0.00475 |
| Health Worker [Female] / ANM at<br>PHCs                  | 0.3389                                | 0.00464 | 0.2050                                 | 0.24472 |
| Obstetricians & Gynecologists at<br>CHCs                 | 0.5326                                | 0.0012  | 0.5761                                 | 0.00036 |
| Pediatricians at CHCs                                    | 0.4473                                | 0.0080  | 0.6235                                 | 0.00008 |
| Number of PHCs with labor room                           | 0.5132                                | 0.0019  | 0.4603                                 | 0.00616 |
| PHCs functioning on 24X7 basis                           | 0.5037                                | 0.0024  | 0.6135                                 | 0.00011 |
| PHCs With functioning<br>Stabilization Units for Newborn | 0.4324                                | 0.0107  | 0.6577                                 | 0.00002 |

## 1.4 Correlation between rural healthcare infrastructure and child mortality rates

# KEY FINDINGS

- ↳ The states with the highest Infant Mortality Rate and Under-Five Mortality Rate include Madhya Pradesh, Chhattisgarh, Bihar, Uttar Pradesh, Assam, Uttarakhand, Jharkhand, and Odisha.
- ↳ The prevalence of Malnutrition (stunting and wasting) was noticeably high in these states.
- ↳ There is a strong correlation between the number of ANMs working at subcenters, the number of obstetricians and gynecologists at CHCs, and the number of PHCs with a labor room, with infant mortality rates.
- ↳ There is a strong correlation between the availability of Pediatricians at CHCs, PHCs functioning on a 24X7 basis, PHCs with functioning Stabilization Units for Newborns and Under-five mortality rate.
- ↳ All the correlations were statistically significant except for the association between Health Worker [Female] / ANM at PHCs and Under-five mortality rates.

# CONCLUSION

- Child mortality rates in India, as indicated by the Infant Mortality Rate (IMR) and Under-five Mortality Rate (U5MR), remain a challenge despite efforts to improve child health. While rural areas have experienced a reduction in child mortality, it is insufficient to meet the targets set for 2030 under Goal 3.2 of sustainable development.
- This study revealed a strong positive correlation between healthcare services and infrastructure and child mortality rates. States with the highest IMR and U5MR were identified, and they also exhibited high levels of malnutrition, stunting, and wasting, indicating the link between nutritional status and child mortality rates.
- Therefore, adequate healthcare infrastructure, including the presence of healthcare professionals, plays a vital role in reducing child mortality rates. Accessible and well-equipped healthcare facilities facilitate early detection, timely intervention, and effective management of nutrition-related issues.





THANK YOU