The Journey of Kerala's Health Progress: Trends in Maternal And Child Health

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ABSTRACT
In terms of healthcare, Kerala stands out for its impressive metrics, which can be credited to an extensive set of policies, state infrastructure, and sociocultural features which improved maternal and child healthcare over the decades. The large network of hospitals and public health offices, which employ skilled manpower, have eased and improved the effectiveness of healthcare provided in the state. In addition, the high level of literacy and social awareness combined with a high social mobilization have facilitated improvement in Kerala's health indicators. Certain policy measures', such as immunization programs and women empowerment initiatives were bound to protect children and mothers from potential health problems. Still with these achievements, greater attention must be offered to the alarming trend of child wasting and underweight prevalence among children under five, which require prompt action to meet the nutrition and health needs of the children. Impulsive state action should be endorsed to ensure inclusive provision of safe, adequate, and culturally sensitive healthcare services to the people.

1. Introduction.

Health is a condition of complete physical, mental, and social well-being rather than the absence of disease or infirmity. It involves many elements of a person's life and indicates their general vitality and capacity to perform properly. A healthy individual usually has strong physical fitness, mental and emotional well-being, positive connections, and engages in constructive activities (WHO, 2006). Physical health encompasses adequate body weight, frequent exercise, healthy eating, enough sleep, general physical vitality, and the lack of disease or injury (Patric et al., 1973). Mental health refers to a person's emotional and psychological well-being, which includes emotional stability, resilience, positive self-esteem, the ability to cope with stress, and the absence of mental disorders. Good mental health enables people to think, make sound decisions, effectively manage emotions, and maintain satisfying relationships (Manwell et al., 2015). Social health refers to the quality of a person's interactions and relationships with others. It includes skills like communicating successfully, making meaningful connections, maintaining a support system, and contributing to society. Positive social health promotes a sense of belonging, social support, and general satisfaction (Larson, 1996). Stitching all these definitions together will help recognize health as a multidimensional concept encompassing physical, mental, and social well-being. It represents a state of overall vitality, functioning, and the ability to lead a fulfilling and productive life (Leonardi, 2018). Article 25 of the Universal Declaration of Human Rights acknowledges the universal understanding of health's critical role in human life. It states that every person has the right to a quality of living that covers necessities like food, clothing, shelter, healthcare, and basic social services, thereby guaranteeing their own and their family's health and well-being. (United Nations, 1948). Every human being, regardless of ethnicity, religion, political beliefs, economic status, or social standing, has the right to the best possible standard of health, according to the World Health Organization's Constitution, which recognizes health as a fundamental human right (Mann, 1998). Many nation-states have integrated the right to health into their constitutions, making them legally responsible for ensuring equitable access to quality health services in a timely, acceptable, and affordable manner while addressing the determinants of health.

India is currently undergoing a triple revolution, which includes economic, demographic, and epidemiological developments that bring both problems and opportunities for the transformation of its health sector. From 1990 to 2019, India's real per capita GDP grew at a steady yearly rate of more than 5%, propelling the country closer to lower-middle-income status. Furthermore, India is undergoing a demographic shift, which has the potential to provide a demographic dividend as its working-age population grows. However, despite these developments, India faces substantial problems due to an increasing burden of no communicable diseases, as well as persistent worries about communicable diseases and reproductive health outcomes (Public Health Foundation of India, 2021). There has been tremendous progress toward attaining the Sustainable Development Goals (SDGs), particularly in terms of mother and newborn mortality rates, as well as increased institutional deliveries. These advances have been attributed to increasing spending on reproductive, maternal, and child health, as well as improved socioeconomic position. However, there are considerable interstate disparities in the fulfillment of these goals, with some states exceeding the SDG targets and others falling short (Saikia & Kulkarni, 2017). India's health system has struggled to cope with the epidemiological change, as continuous government

underfunding and the growth of unregulated private sector providers have resulted in increased healthcare expenditures for households. The accompanying financial load has pushed millions of individuals into poverty each year. (Singh, P & Kumar, 2017). The health workforce is crucial to healthcare delivery, with substantial advances in medical, nursing, and technical education. However, the availability and distribution of healthcare staff remain unbalanced, raising questions about quality and employability. India's mixed healthcare delivery system, which heavily relies on private providers, has advantages in terms of service availability but disadvantages in terms of uneven quality and pricing. Government health services cover a substantial share of health prevention and promotion but suffer from continued underfunding and insufficient regulatory procedures (Kamath et al., 2024). Access to drugs, vaccinations, and diagnostic facilities is a challenge, as public sector underfunding and ineffective procurement systems limit availability in government health facilities. Physical access is easier in the private sector, but it is often more expensive, leaving crucial medicines out of reach for many families. Furthermore, a lack of sufficient regulation makes it difficult for policymakers to properly oversee the manufacture and prescription of drugs. (Bajpai, 2014). In recent years, initiatives like the National Health Mission (NHM) have been implemented to strengthen the healthcare systems of both the Central and State governments. The NHM's initiatives to boost institutional deliveries have yielded favorable outcomes, notably in government health institutions, with a pro-poor distribution of births noted. Nonetheless, there are ongoing worries regarding the quality of public delivery services, such as dealing with birth difficulties, shortages of vital drugs, and deficiencies in emergency obstetric care facilities (Kumar, 2021). In 2018, the PM-JAY national plan superseded preceding schemes to provide an annual benefit package to five hundred million individuals. Although it enhanced access to hospital care, it did not considerably lower household out-of-pocket spending, which was the scheme's major purpose. The underfunding of government health initiatives at both the national and state levels is a big issue. Despite efforts to expand tax devolution to states, there have been no large increases in state-level healthcare funding, as competing objectives sometimes impede resource distribution to the sector (Rao, 2022).

Kerala, India's southernmost state, has often been hailed for its achievements in healthcare. In terms of health indices, the state has regularly rated higher than other Indian states. Kerala has a well-developed healthcare system, including a robust network of hospitals, clinics, and primary care centers. The state boasts a high doctor-to-patient ratio and appropriate healthcare services in both urban and rural communities. Kerala has remarkable health indices, such as a low infant mortality rate, high life expectancy, and a low maternal death rate (Sinimole, 2017). The state has made tremendous headway toward lowering these rates and improving overall health outcomes. Kerala's high literacy rate has played an important role in raising health awareness and improving healthcare access. Educated persons are more inclined to seek healthcare services and take preventive steps, resulting in better health results. The Kerala government has launched many measures to improve healthcare services. (Soman, 2007). Despite these advancements, Kerala still confronts several healthcare difficulties. The state is dealing with concerns such as an aging population, rising non-communicable diseases, and the need for ongoing investment in healthcare infrastructure to satisfy growing demand (Muraleedharan, M., & Chandak, 2022). However, the overall health scenario in Kerala remains commendable compared to many other regions in India. This success has garnered attention from researchers, Policymakers, and global health organizations, as it provides valuable insights into the factors that contribute to improved health outcomes. This study examines the trends and patterns of key health indicators for women's and children's health in Kerala.

2. Data and Methodology

The National Family Health Survey (NFHS) is a comprehensive national survey designed to collect critical information on Indian families. The primary goal of the study is to give statistics that will assist the Ministry of India in developing policies that benefit underprivileged populations. NFHS began with its first round in 1992 and has since performed four further surveys, the most recent being NFHS-5. This research examines critical health indicators, such as infant mortality, maternal mortality, fertility rates, and nutritional status, using data from the National Family Health Survey (NFHS) rounds 1-5 to assess the well-being and healthcare outcomes of women and children in Kerala.

3. Results and Discussion

Kerala's health analysis highlights impressive health indicators, particularly in terms of life expectancy and maternal and infant mortality rates. The state consistently boasts one of the best fertility rates in India and even outperforms several developed countries in this regard. This achievement can be attributed to its proactive approach to preventive healthcare, successful management of infectious diseases, and a strong emphasis on maternal and child health.

Indicator	NFHS 1	NFHS 2	NFHS 3	NFHS 4	NFHS 5
Infant Mortality Rate	23.8	16.3	15.3	5.6	4.4
Neonatal Mortality Rate	15.5	13.8	11.5	4.4	3.4
Under-five mortality Rate	32	18.8	16.3	7.1	5.2
Total Fertility Rate	2	2	1.9	1.6	1.8

Table 3.1: Key Indicators of Women and Child Health in Kerala

The data shows a significant decrease in infant mortality rate over the years. From NFHS 1 to NFHS 2, there was a notable decline, and the trend continued with further decreases in NFHS 3 and NFHS 4. The most significant drop occurred between NFHS 1 and NFHS 5, where the infant mortality rate decreased from 23.8 to 4.4. The decreasing infant mortality rate reflects the success of public health policies and interventions aimed at reducing infant mortality and improving maternal and child health outcomes.

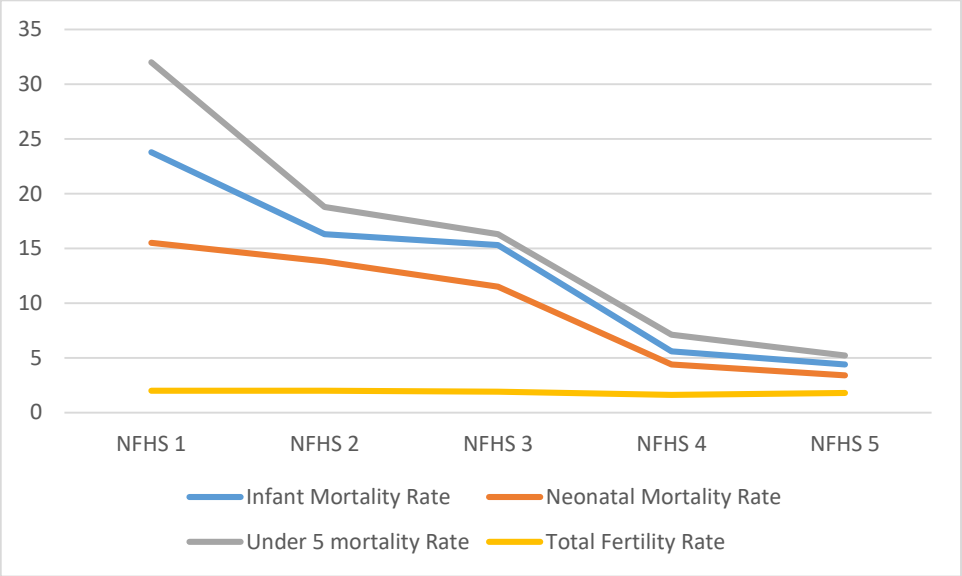

Figure 3.1: Key Indicators of Women and Child Health in Kerala

The global average neonatal mortality rate was approximately 18 deaths per 1,000 live births. In high-income countries, the neonatal mortality rate can be as low as 2 to 3 deaths per 1,000 live births, while in low-income countries, it can be much higher, sometimes exceeding 30 deaths per 1,000 live births. The data shows a consistent decline in the neonatal mortality rate in Kerala over the years. The most significant reduction in neonatal mortality rate occurred between NFHS1 and NFHS5, where the rate dropped from 15.5 to 3.4. Continuous focus on healthcare interventions, access to prenatal care, and appointment of skilled birth attendants, immunizations, and nutrition will be essential to further reduce neonatal mortality and ensure the well-being of newborns in the state. Under 5 Mortality (U5MR) encompasses both neonatal mortality (deaths within the first 28 days of life) and post-neonatal mortality (deaths between 29 days and 59 months of age). It provides a comprehensive measure of child survival and serves as an important benchmark for assessing progress in reducing child mortality. The global average U5MR was approximately 39 deaths per 1,000 live births. Higher-income countries generally have lower U5MRs, often ranging from single-digit to low double-digit rates. In contrast, lower-income countries tend to have higher U5MRs, sometimes exceeding 100 deaths per 1,000 live births. The data shows a substantial decreasing trend in the under-5 mortality rate over the years**.** From NFHS 1 to NFHS 2, there was a notable decline, and the trend continued with further decreases up to NFHS 5. Delving into the fertility rates in the state, a TFR of 2.0 is often considered the replacement level, where each woman, on average, gives birth to two children, replacing herself and her partner in the population. In NFHS 1 and NFHS 2, the TFR was at the replacement level. Starting from NFHS 3, the TFR has been consistently below the replacement level, indicating that, on average, women are having fewer than two children.

Various factors contribute to changes in TFR, including advancements in family planning, increased access to contraception, improvements in women's education and empowerment, changing societal norms, and economic factors. The declining TFR is a reflection of the ongoing demographic transition in the surveyed population.

As societies develop and improve, the TFR tends to decrease due to changes in family planning preferences and other socio-economic factors. A TFR below the replacement level can lead to population stabilization or even decline in the long term. Lower population growth can have implications for social and economic development, including aging population concerns and workforce dynamics. The trend indicates progress in family planning and reproductive health initiatives. The Improvements in healthcare, nutrition, sanitation, education, and access to clean water have contributed to a significant decline in infant and child mortality rates globally over the past few decades. However, there are still significant disparities between different regions and countries. Efforts by governments, international organizations, and NGOs have been made to reduce infant and child mortality rates through various interventions, such as improving access to healthcare services, immunizations, prenatal care, safe childbirth practices, and promoting breastfeeding.

Indicator	NFHS 2	NFHS 3	NFHS 4	NFHS 5
Mothers received ANC in the first tri-semester.	81.1	92.6	95.1	93.6
Mothers whose last birth was protected against neonatal tetanus	85.8	88.2	96.4	95.2

Table 3.2: Antenatal and Neonatal Care

Antenatal care refers to the healthcare services and check-ups provided to pregnant women to monitor their health and the development of the fetus during pregnancy. The specific timing and frequency of antenatal check-ups may vary depending on healthcare practices and guidelines in different countries. Pregnant women need to attend antenatal check-ups regularly throughout their pregnancy to monitor their health and ensure the well-being of both the mother and the developing fetus. The exact number and frequency of antenatal check-ups may vary depending on factors such as the woman's health status, the presence of any complications, and local healthcare guidelines. The trend depicts a consistently high percentage of mothers receiving ANC in the first trimester of their pregnancies across all surveys. Even though there is a slight decrease in the percentage of mothers receiving ANC in the first trimester in NFHS 5 compared to NFHS 4, the decline is relatively small. Over the years, there has been an overall improvement in early prenatal care-seeking behavior, with a higher proportion of women accessing ANC services early in their pregnancies. Early initiation of ANC is essential for ensuring the health and well-being of both the mother and the baby. Early prenatal care allows healthcare providers to identify and address any potential risks or complications early on, leading to improved maternal and child health outcomes. Protecting mothers and newborns against neonatal tetanus is a crucial aspect of maternal and child health. Neonatal tetanus can be prevented through immunization of pregnant women with tetanus toxoid vaccine during antenatal care visits. Efforts to eliminate neonatal tetanus have been underway for many years, and significant progress has been made in reducing the number of cases. The World Health Organization (WHO) and its partner organizations, such as UNICEF and the Vaccine Alliance, have been working together to increase immunization coverage and ensure that pregnant women receive the necessary tetanus vaccinations.

The immunization schedule for tetanus toxoid vaccine during pregnancy typically involves a series of doses, usually starting in the second trimester. The number of doses may vary depending on the immunization guidelines of each country. The data reflects a consistently high percentage of mothers whose last birth was protected against neonatal tetanus across all surveys. This indicates a positive trend toward increasing protection against neonatal tetanus during childbirth. Neonatal tetanus protection is crucial to prevent life-threatening infections in newborns.

Indicator	NFHS 1	NFHS 2	NFHS 3	NFHS 4	NFHS 5
Measles Containing Vaccine at First and Second Age for Children	60.5	84.6	82.1	89.4	88.3

Table 3.3: Children given measles-containing vaccines

Typically, a combination vaccine protects against both measles and rubella. This combination vaccine is commonly referred to as the Measles-Rubella (MR) vaccine. The MR vaccine is administered to children as part of the routine immunization schedule in India.

1. First dose: The first dose of the MR vaccine is typically administered at 9-12 months of age.
2. Second dose: The second dose of the MR vaccine is usually given at the age of 16- 24 months. This dose serves as a booster to enhance the child's immunity and provide long-term protection against measles and rubella.

The MR vaccine is provided free of cost by the Government of India under the Universal Immunization Program (UIP). The government has conducted nationwide MR vaccination campaigns to ensure widespread coverage and protection against measles and rubella. The data shows an overall increasing trend in MCV coverage for the first dose over the surveyed periods. This indicates successful efforts to improve the uptake of the first dose of the measles-containing vaccine among children. The data for MCV coverage for the second dose is not provided for any of the NFHS surveys. It is important to have data on the second dose coverage, as full vaccination with both doses is crucial for providing optimal protection against measles. Vaccination against measles is essential to prevent outbreaks and protect children from severe complications of the disease. Various factors can influence MCV coverage, including access to healthcare services, awareness about vaccination benefits, the availability of vaccines, and the effectiveness of immunization programs. The increase in MCV coverage for the first dose is a positive sign of progress in vaccination efforts. However, the lack of data on the second dose highlights a potential data gap and the need for comprehensive and accurate vaccination data to assess the success of immunization programs fully. Ensuring high and equitable MCV coverage for both doses is essential to achieve measles elimination and protect vulnerable populations from the disease.

Indicator	NFHS 1	NFHS 2	NFHS 3	NFHS 4	NFHS 5
Children Under the Age of 5 Who are Stunted	32.8	28	26.5	19.7	23.4
Children Under the Age 5 Who are Wasted	13.7	13	15.6	15.7	15.8
Children Under the Age of 5 who are Under Weight	22.1	21.7	21.2	16.1	19.7
Children in the Age 6-59 Months Who are Anaemic	Nil	43.9	56.1	35.7	39.4

Table 3.4: Nutritional Status of Children

Exploring the nutritional status of Children, stunting is a term used to describe impaired growth and development in children, typically resulting in low height-for-age. It is an indicator of chronic malnutrition and is often used as a measure of long-term nutritional deprivation and inadequate healthcare. The data shows a fluctuating trend in the percentage of children who are stunted (low height-for-age) over the surveyed periods. The prevalence of stunting has varied over time, with some slight increases and decreases. Despite fluctuations, there has been a notable decline in stunting prevalence from NFHS 1 to NFHS 4. Wasting is a term used to describe acute malnutrition in children, characterized by low weight for height. It is an indicator of recent and severe weight loss and can be caused by inadequate food intake, poor nutrient absorption, or illnesses that affect nutritional status. The data shows a relatively stagnant trend in the percentage of children who are wasted (low weight-for-height) over the surveyed periods. The prevalence of wasting has remained relatively constant, with only slight fluctuations. Wasting is an important indicator of acute malnutrition and reflects recent and severe food shortages or illnesses that lead to rapid weight loss. The relatively constant prevalence of wasting over time may indicate challenges in addressing acute malnutrition among children. Rapid responses and interventions are needed to prevent wasting and its associated health consequences. Wasting is influenced by a combination of factors, including food insecurity, inadequate nutrition, limited access to healthcare, and exposure to infectious diseases. Early identification and timely interventions are crucial to prevent and treat wasting. Immediate access to therapeutic feeding and medical care can save the lives of severely wasted children.

Underweight in children under the age of 5 refers to a condition where a child has a low weight-for-age, indicating a possible overall deficit in nutritional intake and/or other underlying health issues. It is a measure

of chronic malnutrition and can be influenced by factors such as inadequate food intake, poor nutrient absorption, recurrent infections, and socio-economic conditions. The prevalence of underweight among children under 5 varies across countries and regions, and the data is subject to change over time. The data shows a fluctuating trend in the percentage of underweight children (low weight for age) over the surveyed periods. The prevalence of underweight children has varied, with slight increases and decreases. The data indicates progress in reducing underweight prevalence from NFHS 1 to NFHS 4, with a decrease from 22.1% to 16.1%. Underweight prevalence is influenced by a combination of factors, including food insecurity, inadequate nutrition, limited access to healthcare, poor sanitation, and exposure to infectious diseases. The slight increase in underweight prevalence in NFHS 5 raises concerns and highlights the need for continued efforts to address chronic malnutrition among children.

Anemia is a condition characterized by a deficiency of red blood cells or hemoglobin in the blood, leading to reduced oxygen-carrying capacity. The prevalence of Anemia among children aged 6-59 months can vary across countries and regions, and specific data on the prevalence of Anemia would require up-to-date and localized information. Anemia in young children can have various causes, including nutritional deficiencies (such as iron, vitamin B12, or folate deficiency), chronic infections, inherited blood disorders, and certain diseases or conditions that affect red blood cell production or lifespan. The data suggests some progress in reducing Anemia prevalence among children between NFHS 3 and NFHS 4. However, the prevalence has slightly increased in NFHS 5 compared to NFHS 4. Anemia in early childhood can have long-term health consequences, affecting cognitive development, physical growth, and overall well-being. Even the slight increase in Anemia prevalence between NFHS 4 and NFHS 5 raises concerns and highlights the need for continued efforts to address Anemia and improve the nutritional status of children.

4. Conclusion

The accomplishments of Kerala on the health front have been an outcome of deliberate policy interventions to improve the quality of life. The robust network of hospitals, a well-equipped public health infrastructure, trained health professionals, high levels of literacy, awareness about the importance of institutional deliveries, and high social mobilization have helped the state to display unparalleled success in maternal and child health. The glory hasn't been built overnight but attained as a result of focus and perseverance spanning decades. The success of vaccination campaigns, emphasis on women's empowerment, and policy action at grassroots levels aided the state in safeguarding children and pregnant ladies from potential threats. Even though the health indicators of Kerala have been performing impressively well, the alarming rise in the levels of child wasting and the occurrence of underweight among children under five unfolds the unseen cracks in the system, which needs an overhaul. Addressing underweight and malnutrition requires early identification and timely interventions to improve nutrition and health outcomes. The state should take adequate action to guarantee that everyone, including the debilitated, has access to safe, adequate, and culturally acceptable meals.

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