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Inequalities in Nutritional Status of Scheduled Tribe Children in Kerala

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ABSTRACT

In India, Kerala is always applauded for the better health outcomes, this becomes possible even with a very nominal per capita income. The health outcomes of the Kerala are comparable with the Developed nations. However, in 2013 there were about 47 infant mortality death reported in Attappadi, Kerala's tribal region, further within a span of 8 years by infant mortality toll was raised to a total of 121. It created a necessity to examine the nutritional status of the ST children in Kerala and to take appropriate measures. The National Family Health Survey (NFHS) data was used to examine the nutritional status of the children both at Kerala and all Inda level. The finding clearly shows that the recent trends on child nutrition in Kerala are worrisome and there is a need to work with the marginalized communities. This paper makes an attempt to understand the nutritional outcome by social group, reasons for the inequality and disparity in the outcomes. Based on the finding the paper has suggested few policy prescriptions to address the general as well as group specific issues.

Key Words: Nutrition Status, Children Underweight, Anthropometric Measures, Inequality, Scheduled Tribe, Stunting.

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Introduction

During the launch of PM- Cares for Children's Need, our Honorable Prime Minister Shri. Narendra Modi said "Children represent the future of the country (Mint, 2021)[1]. Early child development is one of the ideal investments for a country (World Bank 2024) [2]. According to article 6 and 24 of Convention on the Rights of the Child (CRC, 1989) [3], it is the right of the new-born to have the highest attainable standard of health and health care (UN, 1989)[3]. Therefore, high quality health care should be provided to the child since its inception. The article 47 says that it is the obligation to the state and also the primary duty to raise the level of nutrition and standard of living of its people and the improvement of public health (Narayan J et. al., 2019) [4].

Since independence India has focussed on nutritional programme for children through applied nutrition Programme (ANP), Supplementary Nutrition Programme (SNP) and Integrated Child Development Service (GOI, Planning Commission, 1995)[5]. However, NSSO 38th round shows the average calorie intake in India is lesser than the set norms (Deaton & Dreze 2009).[6] The undernutrition level of India is very high it is in par with the sub-Saharan African Countries. The underweight was 57 per cent in 1992 reduced to 36.0% in 2021 (IIPS Macro-NFHS I & NFHS V)[6,7]. For a country like India which is having a specific programme on nutrition the decline in underweight should be 2 per cent per annum however, in case of India it is only 1.1 percent, which is very less (Arnold, 2004).[8]

The 3rdsustainable development goal aims to reduce infant and neonatal mortality (UNDP). Even the National Health Policy of India 2017 also states that it aims to reduce Infant Mortality to 28per 1000 live births by 2019 and MMR from current levels to 100 by 2020 (GOI, 2017) [9].

As per the Human Development Report 2020, Kerala was ranked 1st among all the Indian states, it is in par with some of the developed countries. It has very good health and education outcomes. The health statistics of Kerala shows it is having the infant mortality rate 6 as against the 30 per 1000 live birth of all India level (SRS 2020). [9] It has already achieved the National Health Policy goal and SDG target. Kerala is one of the developed states of India. It performs better in all spheres such as health,

education, per capita income. However, over the last eight years from 2013-2021, in Attappadi a tribal region of Pallakad district, Kerala recorded about 121 infant mortality death. It has observed that majority of this death are related to child undernourishment. The infant mortality in Attappadi came to limelight in 2013 when 47 infant mortality occurred in that region. It creates a serious concern and necessitates to examine the nutritional status of the ST children in Kerala and to take appropriate measures. The state and the central government took several initiatives to stop this phenomenon. The state government has spent Rs. 131 crores in this region since 2013 to address this issue (On Manorama, 2021). [10]

This paper examines the nutritional status of the children across social group using the National Family Health Survey data from 1992 to 2021; it was collected in five rounds. It provides data for the last 30 years. With help of this data an attempt has been made to understand the nutrition outcome by social group, reasons for the inequality and disparity in the outcomes across social groups. Based on the finding the papers suggest policy measures to address the general as well as group specific issues.

Research Methodology

The paper used the reports of National family health Survey (NFHS). This is a national level survey which covers all the states of India. In this survey they collect all the information related to health, including child nutrition status. Since this survey is conducted periodically it will be very helpful to analyse the trend and current situation of the nutritional status of the children, especially the tribal children. Moreover, this survey collects information on various socio-demographic characteristics, which includes caste category. This will help to do the analysis and find inequality in nutrition outcomes across the caste category. This survey was first conducted and published its first report in 1992-93 (NFHS I), the second survey NFHS II report was published in the year 1998-1999, the third survey report of NFHS III was published in the year 2005-2006, the fourth survey report NFHS IV was published in the year 2015-16 and the NFHS V report was published in the year 2019-21. This paper used the NFHS report to address the key objective of the paper, the nutrition inequality among the scheduled tribes in India and in Kerala. This paper also examines the trends and rate of change in the nutritional status of the children across different time period.

Findings and Analysis: his section will present some of the key insights and findings related to the objectives. I the first part we will discuss the health outcomes across social category at India level. The disparity between the ST and others at different time period. Level of children underweight across social category between NFHS I to NFHS V, rate of change in underweight among children and the trend analysis.

Table -1: Health outcomes across social category during NFHS 5

Indicators	Scheduled Caste	Schedule Tribe	OBC	Others	All India
IMR	32.2	32.1	25.5	21.9	35.0
Under-five mortality	39.0	35.5	29.9	26.3	42.0
Children under weight	35.1	39.5	31.2	27.0	32.0
4 ANC	55.3	57.6	57.2	64.2	59.0
Institutional Delivery	87.3	82.3	89.5	91.2	88.6
No post-natal care	17.0	16.5	15.2	16.1	16.0
Underweight women	20.2	25.5	18.8	14.5	18.7

Source: NFHS 5 Report

Table 1 shows the health outcomes across social category during NFHS V. Indicators such as infant mortality rate (IMR), under five mortality, anti-natal checkup of pregnant women, institutional delivery, not received post-natal care and under-weight women are considered for the analysis. All these indicators are related to women and children and they are related to child health and nutritional level. The result clearly shows in all the variables the scheduled tribe health outcomes of women and children are less as compared to the national average and compared to SC, OBC and others. This indicates the health conditions of the scheduled tribes are poor and they need special care and attention to improve their health status.

Table-2: Disparity between ST/Others

Indicators	2005-06 (NFHS 3)	2019-21 (NFHS 5)
IMR	1.26	1.47
Under five mortality rates	1.61	1.34
Children under weight	1.61	1.46
4 and more ANC	0.63	0.89
Institutional Delivery	0.35	0.90
Post-natal care	0.60	1.02
Underweight women	1.56	1.75

Source: NFHS 3 and NFHS 5 Report

Table 2 shows the disparity level between the ST and others during NFHS 3 and NFHS 5. The finding shows that the disparity ratio has decreased across all the variables except IMR and Women underweight. It is a positive sign but still the existing gaps need to be narrowed and more attention is required to improve the health condition of the scheduled tribes.

Table- 3: Underweight of children across social category in between NFHS I to NFHS V

Caste/tribe	Underweight Children (%)				
	1992-93 (NFHS 1)	1998-99 (NFHS 2)	2005-06 (NFHS 3)	2015-16 (NFHS 4)	2019-21 (NFHS 5)
SC	56.66	53.24	46.97	39.1	35.1
ST	57.13	56.26	52.60	45.3	39.5
OBC	NA	47.32	41.63	35.5	31.2
Others	NA	41.20	30.97	28.8	27.0
Total	52.38	47.07	40.92	35.7	32.1

Source: NFHS 1, NFHS 2, NFHS 3, NFHS 4 and NFHS 5 Report

Underweight level of the children across social category is presented in the table 3. The result shows there is improvement in the underweight in between NFHS 1 and NFHS 5 across the social category. The overall average shows from 52% children underweight during 1992-93 has got reduced to 32.0% in 2019-20. Thought it clearly shows there is a decline of 20 percentage points. But the decline happened in about 28 years, it means there is decline of 0.7 percentage point in a year. In a country like India which has a specific programme and budget to address the child underweight. It is not a appreciable rate of decline. It needs special attention at the programme implementation level and to also the other gaps should be addressed to get better outcome.

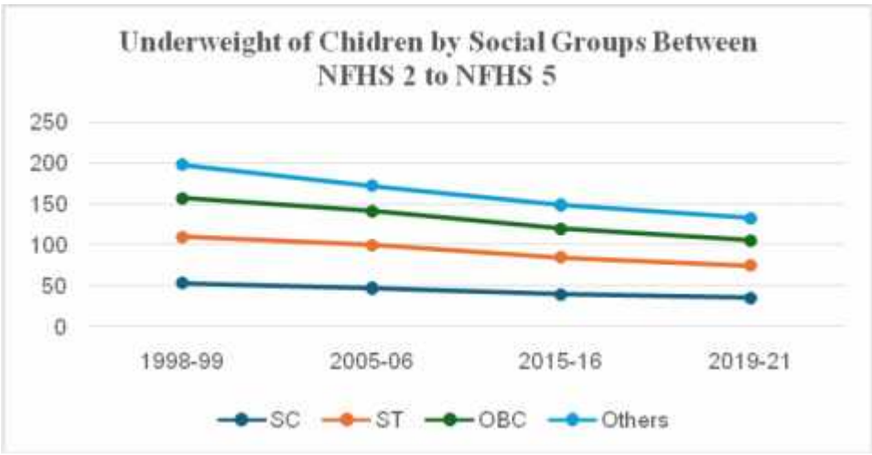
Table-4: Rate of changes in the level of underweight between NFHS 2 to NFHS 5

Caste/Tribe	1998-99 to 2005-06	2005-06 to 2015-16	2015-16 to 2019-21	1998-99 to 2019-20
SC	-1.68	-1.68	-1.71	-1.48
ST	-0.93	-1.39	-2.13	-1.30
OBC	-1.72	-1.47	-2.02	-1.48
Others	-3.55	-0.70	-1.04	-1.50
Total	-1.87	-1.28	-1.68	-1.38

Source: NFHS 2, NFHS 3, NFHS 4 and NFHS 5 Report

Rate of decline was calculated for NFHS 2 to NFHS 5. As there is no data available for OBC and Other separately for NFHS 1 it was excluded in the analysis. The table 4 shows the rate of decline at all India level the overall decline in underweight among children is 1.38 between the time periods of NFHS 2 to NFHS 5. However, it is not uniform across the time period, in-between NFHS 2 and NFHS 3 it was 1.87, which was the major decline happened. Later between NFHS 3 and NFHS 4 the decline was 1.28%, it is very less. During NFHS 4 and NFHS 5 there is a slight improvement and the rate of decline in underweight is 1.68. The social group wise data shows the rate of decline among of ST is less compare to the national average and also less compared to other social categories. There is a differential outcome on child underweight and exhibits an inequality in the outcome across social groups.

Figure-1: Trend of underweight among the children across social group



Source: NFHS 2, NFHS 3, NFHS 4 and NFHS 5 Report

The figure 1 shows the trend in decline of underweight among the children across social group in-between NFHS 2 to NFHS 5. It clearly shows the decline is slow for ST as compared to the other social groups.

Analysis of Health Outcomes of Kerala

Table -5: Anthropometric of children at Kerala in between NFHS II to NFHS V

Anthropometric Measures	NFHS-II (3 Yrs)	NFHS-III (3 Yrs)	NFHS -IV	NFHS -V
Stunting (Height for Age)	28	27	19.7	23.4
Wasting (Weight for Height)	13	16	15.7	15.8
Under Weight (Weight for Age)	22	21	16.1	19.7

Source: NFHS 2, NFHS 3, NFHS 4 and NFHS 5 Kerala State Report

Table 5 shows the anthropometric measures of children i.e., stunting, wasting and underweight for NFHS-II to NFHS-V. The result shows though there is decline in the anthropometric measures in between NFHS-II to NFHS IV but in-between NFHS-IV and NFHS-V the stunting and underweight has increased more than 4 percentage points. It clearly indicates in the recent years the anthropometric measures are very poor and there is a reverse trend. More care and attention is required to improve the children nutrition status in Kerala.

Table - 6: Stunting across social category

Social Category	NFHS- IV	NFHS -V	Rate of Decline between NFHS IV and NFHS V
SC	19.1	30.4	9.86
ST	23.9	36.9	9.07
OBC	22.0	22.4	0.30
General	15.9	22.2	6.60

Source: NFHS 4 and NFHS 5 Kerala State Report

The ST population in Kerala is very less so they did not have sufficient sample size during the survey period of NFHS I to NFHS III. Therefore, there is no data available for anthropometric measures of ST. Only during NFHS IV and latter it was taken into consideration and the data is available. Therefore, for this analysis only NFHS IV and NFHS V are considered. The data shows the stunting is increased at rate of 9.07 for ST and 9.86 for SC. It is a serious concern and the government has to take appropriate measures to address this issue.

Discussion

The preceding analysis, utilizing longitudinal data from the National Family Health Survey (NFHS), reveals a dichotomy in the state of Kerala's health achievements. While the state is globally recognized for its exemplary macro-level health indicators, these achievements fundamentally collapse when the lens is focused upon the nutritional status of its Scheduled Tribe (ST) children. This section interprets and synthesizes the data trends to articulate the critical implications of both the protracted stagnation in overall nutritional improvement and the catastrophic recent reversal in anthropometric measures specific to the marginalized communities.

[A] Interpretation of Protracted Nutritional Stagnation and Inequality

- **The Insufficiency of Long-Term Progress:** A rigorous examination of child underweight trends across India, spanning nearly three decades from NFHS I (1992-93) to NFHS V (2019-20), establishes a disturbing pattern of stagnation. Although the overall prevalence of underweight children in India decreased from 52.0% to 32.0% during this period, this 20-percentage point decline averages out to an insufficient reduction of only 0.7 percentage point per annum.

  For a nation committed to addressing child malnutrition through specific and targeted schemes like the Integrated Child Development Services (ICDS), the observed rate of decline is not appreciable. The goal for nutritional decline should approximate 2 per cent per annum (Arnold 2004).[7] The failure to achieve even half of the expected rate over such an extended timeframe suggests that generalized economic progress and standard welfare provisioning models have either reached a point of saturation or are structurally compromised in their ability to reach and sustainably uplift the most marginalized segments of the population. This pervasive, slow rate of improvement confirms that persistent undernutrition is an issue of systemic ineffectiveness, where routine welfare delivery is failing to provide the comprehensive, high-quality, and sustained nutritional dose required for vulnerable groups, thereby reinforcing inequalities.

- **The Health Disparity Paradox in Kerala's Model:** Kerala's reputation as a global developmental success story rests heavily on its extraordinary health outcomes, such as an Infant Mortality Rate (IMR) of 6 per 1000 live births, starkly contrasting with the All-India rate of 30 (SRS 2020). This performance has long made Kerala's model a subject of global study and recommendation for policy makers seeking to replicate high health outcomes despite nominal per capita income.

  However, the analysis of disaggregated data presents a paradox that fundamentally challenges the notion of universal success. During NFHS V, the prevalence of stunting—a critical anthropometric measure reflecting long-term

undernutrition and deprivation —reached 37.0% among Scheduled Tribe children, compared to only 22.0% among 'Others'. This substantial and enduring gap reveals that the benefits of Kerala's advanced social infrastructure are highly conditional and do not translate into equitable, sustained nutritional health for tribal communities.

The disparity suggests that the state's developmental model is effective primarily in achieving universal access to acute and curative healthcare (thereby reducing high IMR), but it fails in delivering preventative, socio-environmental, and nutritional support essential for determining growth indicators like stunting. The celebration of macro-indicators, therefore, masks severe internal inequality, demanding that policy attention immediately shift toward scrutinizing disaggregated outcomes and addressing the structural determinants underlying these differential health results.

[B] Analysis of the Catastrophic Anthropometric Reversal (NFHS IV to NFHS V)

- ***Magnitude of the Recent Regression*:** Perhaps the most alarming finding is the critical reversal in nutritional progress observed between NFHS IV (2015-16)[14] and NFHS V (2019-21)[17]. While anthropometric measures had generally shown a steady, albeit slow, decline up to NFHS IV, the state witnessed an overall increase in stunting and underweight rates by more than 4 percentage points in the subsequent round.

  This regression was not uniformly distributed but was acutely concentrated among marginalized populations. Specifically, the stunting rate among Scheduled Tribe children surged dramatically from 23.9% in NFHS IV to 36.9% in NFHS V. This represents an increase of 9.07% points over a short five-year period. A similarly disastrous decline was noted for Scheduled Caste (SC) children, whose stunting rate increased by 9.86% points.

  This sharp, catastrophic reversal demonstrates that tribal communities suffer from acute nutritional fragility. The disproportionate surge in chronic undernutrition within this group, compared to the general population, indicates a fundamental lack of socio-economic buffers necessary to absorb macro-level shocks (e.g., economic instability or generalized systemic pressures). The increase in stunting, which reflects cumulative nutritional deficit, places ST children in Kerala among the worst-performing groups nationally, confirming their status as being uniquely susceptible to rapid nutritional deterioration when external stability is compromised.

- **Significance of Chronic Undernutrition (Stunting):** Stunting is recognized as the most reliable measure of chronic nutritional deprivation, reflecting sustained long-term deficits in nutrient intake, inadequate hygiene, and recurrent exposure to infection (WHO, 2015).[10] The dramatic reversal in this measure, rather than wasting (acute undernutrition), confirms that the crisis is deeply rooted in persistent deprivations across fundamental determinants like dietary quality, environmental health, and poverty, factors often compounded by resource alienation. The magnitude of the increase necessitates a policy response that moves beyond compensatory mechanisms toward deep structural reform aimed at building long-term community resilience and food sovereignty.

- **The Attappadi Microcosm: Disconnect Between Fiscal Input and Nutritional Output:** The persistent health crisis observed in the Attappadi tribal region of Palakkad district serves as empirical evidence of the disconnect between significant fiscal allocation and measurable nutritional outcomes. Between 2013 and 2021, Attappadi recorded approximately 121 infant mortality deaths, with a critical peak of 47 deaths occurring in 2013 alone, with the majority directly linked to child under nourishment (On Manorama, 2021).[11]

  The immediate governmental response to the 2013 crisis was substantial, with the state government reporting the expenditure of a dedicated **Rs. 131 crores in this region since 2013** specifically to address malnutrition and infant mortality (On Manorama, 2021). [11]

  The persistence of the crisis and high rates of infant mortality despite this massive, targeted fiscal outlay indicates a critical **governance failure**. The problem is demonstrably not a lack of resources, but rather the failure of the state mechanism to ensure last-mile execution and accountability. When significant funds are allocated but fail to translate into a reduction in critical health indizecators like stunting (which surged 9.07 percentage points) or infant

mortality, it strongly suggests underlying issues of fund diversion, leakage, or operational deficiencies in scheme implementation (Mamgain & Diwakar, 2012). [1]

The Attappadi case highlights that targeted intervention, while well-intentioned, is rendered ineffective when it prioritizes administrative documentation over tangible operational outcomes, resulting in the non-delivery of the required nutritional and health dose to the vulnerable child. This structural failure in translating fiscal input into nutritional output underscores the urgent need for a complete overhaul of monitoring and accountability frameworks governing tribal welfare expenditure.

Conclusion

The persistence of severe nutritional deficits, coupled with the recent catastrophic reversal in health outcomes among Scheduled Tribe children, constitutes an irreparable indictment of the perceived universality of Kerala's celebrated developmental model. The analysis of NFHS data and localized crisis points leads to several definitive conclusions regarding the nature of nutritional inequality in the state.

First, the trajectory of nutritional improvement for marginalized groups has been characterized by chronic **stagnation**, evidenced by the insufficient national decline rate of 0.7 percentage point per annum in child underweight between NFHS I and NFHS V.[1] This stagnation, occurring despite active welfare programs, confirms that routine, macro-level efforts are structurally inadequate for overcoming deeply entrenched socio-economic barriers.

Second, the analysis confirms the existence of extreme and accelerating nutritional inequality. The NFHS V data indicates that ST children bear a disproportionate burden of chronic deprivation, with 37.0% experiencing stunting, a figure significantly higher than the 22.0% observed among 'Others'.

Third, the catastrophic reversal in stunting rates-surging from 23.9% to 36.9% among ST children (an increase of 9.07 percentage points) between NFHS IV and NFHS V[1] demonstrates a lack of structural resilience within these communities. This rapid deterioration suggests that ST populations are uniquely vulnerable to systemic shocks, highlighting that their nutritional fragility is a direct consequence of structural disadvantage.

Fourth, the sustained crisis in the Attappadi region, characterized by persistent infant mortality despite the expenditure of Rs. 131 crores, decisively confirms that resource availability is not the primary impediment. The failure resides instead in the operationalization, governance, and accountability of welfare schemes.

The evidence collectively requires a critical re-evaluation of Kerala’s health achievements. The success of the state is confirmed to be largely limited to universalizing curative and acute care access (evidenced by low IMR), while simultaneously failing to address the deeper structural determinants of malnutrition specific to its most marginalized citizens. The observed disparity confirms that high access to basic institutional care does not automatically translate into long-term nutritional health or social equity.

Consequently, the findings necessitate a policy pivot toward group-specific measures that address the root causes of vulnerability, moving beyond standardized welfare handouts (Mamgain & Diwakar 2012).[1] General economic progress and universal public health services are proven insufficient to mitigate the compounding effects of structural alienation and community-specific challenges faced by Scheduled Tribes. Sustainable improvement can only be achieved by focusing on restorative justice, resource autonomy, and rigorous, outcome-based fiscal accountability.

The recommendations proposed herein are directly derived from the evidence presented, focusing on structural empowerment, operational reform such as restoring indigenous food systems, reforms in the programme implementation, strengthening public health system, strengthening nutrition provisioning, monitoring and stringent governance.

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