

CAPSTONE PROJECT

From Rupee to Remedy and Identity to Illness: What Household Spending Reveals About India's Health

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From Rupee to Remedy and Identity to Illness: What Household Spending Reveals About India's Health

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SELF-DECLARATION

This is to certify that the thesis titled "From Rupee to Remedy and Identity to Illness: What Household Spending Reveals About India's Health" is my original work and has not previously formed the basis for the award of any Degree, Diploma, Associateship or Fellowship to this or any other University.

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April 07, 2025

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GLOSSARY

- Amrit Kaal: A term referring to India's vision and aspiration for development by 2047, marking 100 years of independence, described as a golden period of growth and development.
- 2. Anaemia: A condition marked by a deficiency of red blood cells or haemoglobin in the blood, causing fatigue and weakness; a key health outcome indicator measured in the study.
- 3. Antenatal Visits: Healthcare consultations during pregnancy to monitor maternal and foetal health; tracked as a healthcare service utilisation indicator.
- 4. Ayushman Bharat: A flagship national health insurance scheme launched by the Government of India in 2018, aiming to provide coverage of up to ₹5 lakh per family per year for secondary and tertiary healthcare.
- BMI (Body Mass Index): A measure calculated as weight in kilograms divided by height in meters squared, used to categorise individuals as underweight, normal weight, overweight, or obese.
- 6. Catastrophic Health Expenditure: Healthcare costs that exceed a certain proportion of a household's income or capacity to pay, forcing them to reduce expenditure on other necessities, sell assets, or incur debt.
- 7. Gross Domestic Product (GDP): The total monetary value of all finished goods and services produced within a country's borders in a specific time, used as a measure of economic activity.
- 8. Global Health Security Index: An assessment and benchmarking of health security and related capabilities across 195 countries to prepare for epidemics and pandemics.

- Household Consumption Expenditure Survey (HCES): A national survey conducted by the Ministry of Statistics and Programme Implementation to collect information on household spending patterns, including healthcare expenditure.
- 10. Health Economics: An academic discipline that studies how scarce resources are allocated among alternative uses for the care of sickness and the promotion, maintenance, and improvement of health.
- 11. Institutional Birth: Delivery of a child in a healthcare facility such as a hospital, clinic, or health centre, as opposed to home delivery.
- 12. Institutional Medical Expenditure: Healthcare spending incurred at formal healthcare institutions like hospitals, clinics, and other medical facilities.
- 13. Janani Suraksha Yojana (JSY): A centrally sponsored scheme implemented by the Government of India that aims to reduce maternal and infant mortality by promoting institutional delivery among pregnant women.
- 14. Lower-Middle-Income Countries (LMICs): Countries with a gross national income per capita between \$1,046 and \$4,095, as classified by the World Bank.
- 15. Mann-Whitney U Test: A non-parametric statistical test used to compare differences between two independent groups when the dependent variable is not normally distributed.
- 16. National Family Health Survey (NFHS): A large-scale, multi-round survey conducted throughout India that provides state and national information on fertility, infant and child mortality, family planning practices, maternal and child health, and nutrition.
- 17. National Health Policy of 2017: A policy document that aims to inform, clarify, strengthen and prioritise the role of the government in shaping health systems in India.

- National Sample Survey Office (NSSO): The organisation responsible for conducting nationwide surveys on various socio-economic aspects in India, including healthcare expenditure.
- 19. Non-Communicable Diseases (NCDs): Medical conditions that are not caused by infectious agents but rather by genetic, physiological, environmental, and behavioural factors, such as cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases.
- 20. Non-Institutional Expenditure: Healthcare spending incurred outside formal healthcare institutions, including pharmacy purchases, traditional healers, and home remedies.
- 21. Other Backward Classes (OBC): A collective term used by the Government of India to classify socially and educationally disadvantaged castes that are not Scheduled Castes or Scheduled Tribes.
- 22. Out-of-Pocket Health Expenditure (OOPHE): Direct payments made by individuals to healthcare providers at the time of service use, not covered by insurance or other third-party payers.
- 23. Proportionate Medical Expenditure: The share of healthcare spending in relation to total household expenditure, used to assess financial burden.
- 24. Scheduled Castes (ST): Officially designated groups of historically disadvantaged people in India, recognized in the Constitution of India.
- 25. Scheduled Tribes (ST): Indigenous tribal populations recognized in the Constitution of India who often live in remote areas and maintain distinctive cultures.
- 26. Universal health coverage: Ensuring that all people have access to needed health services of sufficient quality without suffering financial hardship.
- 27. Vargha and Delaney A (VDA) Effect Size: A non-parametric measure of effect size used in statistical analysis, representing the probability that a randomly selected value

from one distribution is greater than a randomly selected value from another distribution.

- 28. Article 21 of the Indian Constitution: The constitutional provision that guarantees the right to life and personal liberty, judicially interpreted to include the right to health and medical care.
- 29. International Covenant on Economic, Social and Cultural Rights (1966): A multilateral treaty that commits parties to work toward granting economic, social, and cultural rights to individuals, including the right to health.
- 30. Universal Declaration of Human Rights (1948): A milestone document proclaiming the inalienable rights that everyone is entitled to as a human being, including the right to a standard of living adequate for health and well-being.

ABSTRACT

This capstone investigates household-level proportionate medical expenditure and health outcomes related to institutional and non-institutional healthcare in India, with a specific focus on socio-regional disparities. Using unit-level data from NFHS-4 (2015–16), NFHS-5 (2019-21), HCES (2011-2012), and HCES (2019-2021), the research employs a mixed methods approach, including quantitative descriptive methodology comprising disaggregated trend analysis by employing Mann-Whitney U Test, Vargha and Delaney A (VDA) Effect Size, and proportionate expenditure comparisons with cause-and-effect analysis. Health outcomes such as anaemia prevalence are examined alongside medical expenditure patterns, stratified by gender (women/men), region (urban/rural) and social category (SC, ST, OBC, Others). Due to the significance of the independent variables on social category (dependent variable), all the hypotheses were accepted. The findings reveal a significant rise in institutional medical expenditure, particularly among marginalised groups- ST and SC in rural areas, suggesting improved access but also growing financial burden. Conversely, non-institutional expenditure has declined, indicating a shift toward formal healthcare. Health outcomes such as Anaemia and a rise in BMI prevalence have increased among adults, with sharper rises in SC and ST populations. A few indicators relating to healthcare service accessibility and utilisation, like insurance coverage, institutional birth and antenatal visits, had stark differences between rural and urban areas, highlighting socioeconomic barriers. The study underscores persisting inequities despite national health interventions, aligning with existing literature. Policy implications include the need to strengthen financial risk protection and revise the targeting mechanisms of schemes on a regional basis, like Janani Suraksha Yojana and Ayushman Bharat, ensuring equitable access and reduced out-of-pocket expenditure across vulnerable groups.

Keywords: Household Medical Expenditure; Institutional vs. Non-Institutional Care; Castebased Health Disparities; Rural-Urban Divide; NFHS and HCES Data; Proportionate Healthcare Spending; Out-of-Pocket Health Expenditure (OOPHE); Socioeconomic Inequality; Scheduled Castes (SC) and Scheduled Tribes (ST); Health Insurance Coverage; Public vs. Private Healthcare Access; Mann-Whitney U Test; Vargha and Delaney A (VDA) Effect Size;

INTRODUCTION

"India should not become sicker before it becomes richer", the Chief Economic Adviser of India, Dr V. Anantha Nageswaran, emphasised on health being the fundamental requirement for a country to be developed by 2047, i.e., Amrit Kaal, an aspiration of every Indian household (The Hindu Bureau, 2024 and PTI, 2022). However, healthcare remains a pertinent issue, with India's total health expenditure remaining under 4% of its GDP (Ministry of Health and Family Welfare, 2024). Lower public expenditure has adversely impacted our national health outcomes, as India stands at the 66th position out of 195 countries on the Global Health Security Index (GHS Index, 2021). While the country is going through a phase of economic, demographic, and digital transition, we have several health roadblocks such as a growing burden of non-communicable diseases, ever-rising out-of-pocket health expenditure (OOPHE) and an acute shortage of healthcare service delivery, especially at the primary level (Selvaraj et al., 2022) due to a lack of investment and capacity building. As we move forward to analyse these roadblocks at a national level, it is crucial to understand the nuances of healthcare expenditure done at a micro level by individuals. To put this in other words, the economics of healthcare in India has several socio-cultural aspects as well, apart from it being simply a matter of finance, which may not get overshadowed by the macro trends.

To truly address the health challenges India faces, it is imperative to shift the lens from aggregated national indicators to the lived realities of individual households, where health decisions are made daily and where the true burden of healthcare is most acutely felt. From an academic lens, economics, derived from the Greek compound word 'oikonomia', means household management (Gershon, 2024), emphasizing individuals. However, engaging with Health Economics as a discipline, while the definition of the subject itself revolves around the households, the focus remains largely on macro concepts like GDP, Total Expenditure, and Budgetary Allocations (Danielsson, 2015). Furthermore, even the discussions in the public

systems, industry, and academia revolve around the above macro concepts, ironically, turning a blind eye to the 318 million households in India that have been driving India's healthcare demand (Rama Bijapurkar, 2024). While the supply/production side needs to be discussed in detail, if India aspires to be a healthy nation, it is ultimately going to be these 318 million households who will make everyday lifestyle decisions that will guide India's health. This micro entity has distinct needs because they are not homogeneous; rather, it has layers and shades of socio-economic, geographical, and cultural complexities (Ghosh & Bardhan, 2024).

The National Sample Survey Office (NSSO) captures household consumption expenditure data, including household characteristics, under the Household Consumption Expenditure Survey (HCES) (Ministry of Statistics and Programme Implementation (MoSPI), 2011). This survey collects detailed information, which can be used to analyse healthcare spending at the micro level and test it against the overall healthcare outcomes of the country captured through the National Family Health Surveys (NFHS) conducted by the International Institute of Population Sciences, under the Ministry of Health and Family Welfare (MoHFW), provides detailed information about healthcare outcomes at the household level (NFHS IT, 2024).

The study of household spending, hence, is not just a part of an academic discipline but a matter of practice-policy implementation, in an evolving context. Household expenditure trends reveal insights about the nation's socio-economic stability, the accessibility and effectiveness of government welfare policies, and opportunities for future interventions (Kumar & Sinha, 2016). The diverse socio-economic structures in India and a relatively high growth rate of urbanisation only add to the importance of analysing spending trends. For example, healthcare costs to lower-income earners, especially in rural areas, in the form of OOPHE, force them to cut spending on education and other areas of welfare, which would have otherwise improved human capital in the long run (Thakur & Sangar, 2020). Our aspiration for inclusive growth requires us to address the elephant in the room, the "Consumer India" as Bijapurkar aptly describes (2024, p. 06), along with its heterogeneity and reshape policies and public systems that serve the best interests of this population.

LITERATURE REVIEW

The right to health stands as a core fundamental human right that international human rights legislation and national policy commitments embrace. Every person holds the basic human right to receive proper healthcare treatment according to the Universal Declaration of Human Rights (1948) and the International Covenant on Economic, Social and Cultural Rights (1966) as stated by the World Health Organization (Loff & Gruskin, 2000). Through judicial interpretation, Article 21 of the Indian Constitution grants residents the right to medical facilities alongside healthcare services (JSA, 2020). The legal recognition of healthcare rights faces ongoing obstacles in providing equal healthcare services to marginalized communities.

The Indian healthcare system maintains uneven access to medical services because it faces both insufficient funding and large out-of-pocket spending, which creates major differences in service availability and cost. The World Health Organization (2023a) demonstrates that India's current health expenditure occupies 3.2% of GDP, while the global standard stands at 9.8%. The National Health Policy of 2017 established a goal to reach 2.5% GDP for public health funding, yet budget allocations from the government continue to fall short (Agarwal, 2017). OOPE continues to be unacceptably high because it makes up 48.2% of total health spending in 2021, creating financial problems for households (Ministry of Health and Family Welfare (MoHFW), 2024a). The healthcare costs placed upon Scheduled Castes and Scheduled Tribes by the healthcare system are significantly heavier than other groups since they encounter monetary barriers alongside structural inequalities, geographic service limitations and reduced health consciousness (K N & Madheswaran, 2018).

The healthcare disparities in India follow the patterns observed across lower-middleincome countries. LMICs heavily depend on out-of-pocket expenses for healthcare, which leads to increased financial risks for poor populations because their medical care coverage reaches less than 15% (Sharma & Popli, 2023). Healthcare affordability challenges match those of SC and ST communities in India, according to sub-Saharan African research, because these populations lack universal health coverage and social security systems (Dubey et al., 2023). Public investment becomes essential to reduce healthcare inequalities because international data demonstrates household healthcare costs' dependence on socio-economic status and regional location in India.

Research investigating healthcare spending and health outcomes shows strong importance because OOPE causes both impoverishment and financial distress. The National Sample Survey Office (NSSO) 75th round (2018) indicates that India loses approximately 63 million people in economic status to healthcare costs each year (Nag et al., 2025). Healthcare financing mechanisms, along with accessibility challenges, need immediate attention because SC and ST rural households bear a disproportionate share of catastrophic medical costs (Selvaraj et al., 2020). A significant gap exists in healthcare coverage because NFHS-5 data shows that 34.6% of SC households and 28.9% of ST households have no health insurance, while higher-income groups achieve 52.3% coverage (Bagchi et al., 2020).

Given the structural challenges and disparities in healthcare access and expenditure, it is imperative to examine the patterns of household healthcare spending and their relationship with health outcomes. This study aims to analyze data from the Household Consumer Expenditure Survey (HCES) and the National Family Health Survey (NFHS) to assess how socio-economic stratification, caste, and regional disparities shape healthcare consumption in India. By employing a robust empirical framework, this research seeks to bridge the gap between macroeconomic health policies and micro-level household spending behaviour, ultimately contributing to the discourse on equitable healthcare access and financial protection for vulnerable populations.

2.1 Global Context: Comparing Household Health Spending Patterns

Healthcare funding structures between different national systems depend heavily on the economic status and involvement of the government alongside insurance coverage availability. High-income countries operate universal healthcare systems that defend households against costly health expenses yet middle- and low-income nations experience high healthcare payments which produce financial hardships and medical impoverishment (Sataru et al., 2022). Global OOPHE spending represents 18% of total healthcare costs according to WHO data although the actual distribution remains uneven. Healthcare spending in wealthy nations is primarily funded by out-of-pocket payments because strong social protection systems are already in place. The out-of-pocket health expenditure in low-income countries surpasses 60% which results in catastrophic health spending that impoverishes communities (Bedado et al., 2022).

The health financing patterns in India follow low- and middle-income country (LMIC) patterns instead of conforming to economic nations like China or Thailand. Rapid economic growth in India has not reduced the substantial dependence on household out-of-pocket health expenditures which puts numerous people at risk of financial ruin (Bedado et al., 2022). The analysis of worldwide healthcare expenditure patterns and successful and failed healthcare funding methods provides essential knowledge for enhancing India's healthcare system.

a. High-Income Countries- Strong Public Health Systems and Minimal OOPHE: Many high-income countries have robust healthcare financing mechanisms, ensuring minimal direct payments from households. In the United Kingdom, the National Health Service (NHS) provides free healthcare at the point of use, reducing household OOPHE to 9% of total health expenditure (Watt et al., 2019). Similarly, Germany's Bismarckian social insurance model, which mandates compulsory health insurance coverage for all citizens, limits OOPHE to approximately 12% (Busse et al., 2021). These systems are characterized by high public investment in healthcare, averaging 9–12% of GDP, which ensures that the financial burden on individuals remains minimal.

Comparing this with India, where public health expenditure remains below 3.2% of GDP and OOPHE is 39.4% of total health expenditure, stark contrasts emerge (Ministry of Health and Family Welfare (MoHFW), 2024b). The universal healthcare models in high-income nations demonstrate that increased public spending significantly reduces the financial burden on households, a lesson India could apply to enhance its healthcare accessibility and affordability (Sataru et al., 2022).

b. The United States- Private Insurance Dominance and High OOPHE: Unlike other highincome countries, the United States operates a predominantly private, insurance-driven healthcare system. Employer-based insurance covers 54.5% of the population, while public programs such as Medicare and Medicaid provide coverage for the elderly and low-income groups (Mainous, 2024). However, due to gaps in insurance coverage and high medical costs, the OOPHE remains at 10% of total health expenditure, and medical bankruptcy remains a major issue (Abdullahi Tunde Aborode et al., 2024). The per capita healthcare expenditure in the U.S. stands at \$12,914, one of the highest in the world, but this spending is inefficient due to high administrative costs and price disparities. Despite having a mix of public and private providers, India's healthcare system does not yet face the same cost inflation as the U.S.. Still, it lacks a comprehensive national insurance system that ensures financial protection for all (Kumar, 2023). The PMJAY (Ayushman Bharat) initiative seeks to improve coverage, but its uptake remains low among marginalised communities (Choudhury et al., 2023).

- c. Middle-Income Countries- Expanding Universal Health Coverage with Persistent Gaps: Several middle-income countries (MICs) have successfully implemented universal health coverage (UHC) models, significantly reducing OOPHE while improving access to care (Preker et al., 2021). In China, healthcare reforms between 2010 and 2020 increased public health spending and expanded insurance coverage, reducing OOPHE from 60% in 2000 to 28% in 2020 (Zhao et al., 2022). Similarly, Thailand's Universal Coverage Scheme (UCS) ensures that 80% of the population receives free healthcare, keeping OOPHE below 12% (Bedado et al., 2022). Brazil's Sistema Único de Saúde (SUS) provides near-universal healthcare, yet OOPHE remains at 24% due to gaps in service provision and reliance on private providers for specialized care (Barros et al., 2021). India's OOPHE trends align more with LMICs than with emerging economies such as China and Thailand. While India has introduced health insurance schemes, coverage gaps and poor healthcare infrastructure in rural areas continue to push many households into catastrophic health expenditure.
- d. Low-Income Countries- High OOPHE and Catastrophic Health Expenditures: In many low-income countries (LICs), weak healthcare systems force households to rely heavily on OOPHE, leading to medical impoverishment. In Nigeria, 76% of total health expenditure is paid out-of-pocket, pushing millions into poverty each year (Onwujekwe et al., 2022). Bangladesh, despite implementing community-based health insurance (CBHI) programs, experiences catastrophic health expenditures for nearly 25% of households (Ahmed et al., 2022). In Pakistan, OOPHE exceeds 65%, with rural households spending disproportionately high amounts on private healthcare due to limited public health infrastructure (Ahmed et al., 2024).

India's OOPHE, at 39.4% (Ministry of Health and Family Welfare (MoHFW), 2024b) of total health expenditure, is significantly higher than that of other emerging economies,

making it more similar to LICs than to its Asian peers like China or Thailand. These trends emphasize the need for stronger public investments in healthcare to prevent financial hardship for Indian households.

2.2 Evolution of Healthcare Policy in India: Policy Trajectories, Expenditure Trends, and Health Outcomes

Health care policies in India have evolved. While Universal Healthcare was an agenda since the initial policy formulations, the public system remains inaccessible to the most marginalised sections of society. To address changing patterns in healthcare needs, demographics, and other impacting variables such as cost, infrastructure and capacity, policies and schemes have been introduced time and again. The table below outlines the policy trajectory which would help build the study further.

Year	Policy/Programme	Focus Area	Relevance to Variables	Notes
1946	Bhore Committee	Universal public healthcare	Access & rural infrastructure	Never fully implemented
1952	First Five-Year Plan	PHCs, rural access	Institutional care	Start of state provisioning
1955	National Leprosy Control Program	Focus on case detection and treatment	Rise in OOPE and Higher benefits for SC/ST	Benefited marginalized communities with higher disease burden
1975	Integrated Child Development Services (ICDS)	Comprehensive package for children and mothers	Maternal/child health outcomes	Particularly beneficial for SC/ST communities
1977	Rural Health Scheme	Introduction of Community Health Workers	Rural OOPE and access	Improved primary healthcare access in rural areas
1983	National Health Policy	Primary care, immunisation	Maternal/child health outcomes	Lacked financing details
1985	Universal Immunisation Programme	Child health	Vaccination, outcomes	Still active under UIP
1991	Liberalisation	Private sector entry	Rise in OOPE	Reduced state role

Table 1: Policy Timeline.

Year	Policy/Programme	Focus Area	Relevance to Variables	Notes
1992	Child Survival and Safe Motherhood Program	Focus on reducing infant and maternal mortality	Institutional birth, ANC and maternal health	Benefited vulnerable populations, including SCs/STs
2000	National Population Policy	RCH, adolescent health	ANC visits, fertility	Limited spending provisions
2002	National Health Policy	Recognized growing burden of NCDs	OOPE, insurance coverage and access	Emphasized private sector involvement
2005	National Rural Health Mission	Rural health infra	Institutional birth, ANC	Targeted SC/ST districts and 18 states with poor health indicators
2005	Janani Suraksha Yojana	Conditional cash transfers for institutional delivery	OOPE, Institutional birth, ANC and maternal health	Higher benefits for SC/ST women
2008	Rashtriya Swasthya Bima Yojana	Health insurance for BPL families	OOPE, insurance coverage	Covered hospitalization expenses for vulnerable groups. Low rural/ST usage.
2013	National Urban Health Mission	Urban health	Urban OOPE, access	Focus on slum dwellers and vulnerable urban populations
2017	National Health Policy	Goal of Universal Health Coverage	Rise in OOPE and access	Target to reduce out-of- pocket expenditure
2018	Ayushman Bharat (PM-JAY)	Hospital insurance: Health insurance coverage of Rs. 5 lakh per family	OOPE, institutional care	Targets the bottom 40% of the population based on socioeconomic criteria. Weak outpatient linkages.
2020	Ayushman Bharat Digital Mission	Digital health infrastructure development	Access, continuity	Limited tribal utility
2023	Tribal Health Action Plan	ST-specific care	ANC, maternal health	New and evolving

2.2.1 Early Planning and the Bhore Committee Vision (Pre-1951–1970s)

The foundational document of India's public health planning was the Bhore Committee Report (1946). It envisioned a universal, comprehensive health service with strong primary care and full government financing. The Committee emphasised preventive care and equitable access, laying a socialist blueprint for rural health expansion. However, economic constraints and low budgetary allocations undermined implementation, leaving vast gaps in rural service delivery (Handa et al., 2024).

During the First to Fifth Five-Year Plans (1951–1979), healthcare remained largely supply-driven with the establishment of Primary Health Centres (PHCs) and Community Health Centres (CHCs) (Raj et al., 2024). However, emphasis was more on curative services, with public spending hovering around 1.3% of GDP—insufficient to address rural health needs (Ministry of Health and Family Welfare (MoHFW), 2005).

2.2.2 Selective Care and Population Control (1970s–1990s)

This period marked a shift towards vertical disease control programmes and family planning, rather than comprehensive care. The Targeted Public Distribution System (TPDS) and programs like the Universal Immunisation Programme (1985) reflected this shift (National Health Mission, n.d.). While immunisation and maternal-child health saw improvements, the focus on institutionalisation of deliveries started to take shape, influencing later variables like C-section rates and antenatal care.

2.2.3 Structural Reforms and the Rise of the Private Sector (1991–2004)

Economic liberalisation in 1991 catalysed the entry of the private sector into healthcare. Out-of-pocket expenditure (OOPE) began rising, particularly for marginalized groups. The 2000s saw OOPE rise to >60% of total health spending (Balarajan et al., 2011), disproportionately affecting SC/ST and rural households due to low insurance penetration and poor access to government services (Selvaraj & Karan, 2009). The National Population Policy (2000), while reiterating reproductive and child health (RCH) goals, failed to integrate financial protection mechanisms for poor households, thereby widening spatial and social disparities (Raj et al., 2024).

2.2.4 National Rural Health Mission (NRHM, 2005–2012)

NRHM marked a pivotal shift in rural health infrastructure. It focused on increasing PHC outreach, training Accredited Social Health Activists (ASHAs), and promoting institutional deliveries through Janani Suraksha Yojana (JSY) (Ministry of Health and Family Welfare (MoHFW), 2005). These interventions directly relate to variables such as institutional birth, antenatal visits, and C-section rates (Neuman et al., 2014). However, critics of NRHM note inter-state disparities, poor monitoring, and an urban-rural service divide that persisted despite increased central funding (Das & Guha, 2023).

2.2.5 Towards Universal Health Coverage (2012–Present)

The High-Level Expert Group (HLEG) Report on UHC (2011) pushed for publicly funded and publicly provided care, recommending increased health expenditure to 2.5% of GDP by 2025. This aligned with concerns over OOPE and regional imbalances, especially among ST and SC households in tribal and backward districts (Patel et al., 2022).

Key Schemes Introduced:

 Rashtriya Swasthya Bima Yojana (RSBY, 2008): Provided cashless hospitalisation for BPL families but had low awareness and usage among ST households (Karan et al., 2017).

- b. National Urban Health Mission (NUHM, 2013): Complemented NRHM but did little to stem OOPE in urban slums due to limited empanelled facilities (National Health Mission, 2013).
- c. Ayushman Bharat PMJAY (2018–Present): Offers hospitalisation insurance up to ₹5 lakh for 10 crore families. While coverage improved, evidence shows that OOPE remains high for SC/ST and rural populations due to limited outpatient coverage, lack of empanelled hospitals in rural areas, and exclusion errors (Mohanty & Kastor, 2023).
- d. Health and Wellness Centres (HWCs): Promised primary care revitalization but have seen incomplete rollout and uneven state performance (Mohanty & Kastor, 2023).
- e. National Digital Health Mission (2020): Aims to integrate digital records but faces challenges of digital exclusion in rural and tribal areas (National Health Authority, 2020).
- f. Tribal Health Action Plan (2023): Launched as part of Janjatiya Gaurav Diwas, this policy focuses on addressing ST health disparities, especially in maternal and child health. While promising, it remains under-analysed in academic work (Ministry of Tribal Affairs, 2023).

Since 2015, India's healthcare policy has focused on universal health coverage and digital healthcare integration. The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PMJAY) (2018) is the world's largest government-funded health insurance program, covering over 500 million individuals (MoHFW, 2018). While PMJAY has expanded healthcare access, studies suggest that uptake remains lower among SC, ST, and rural households due to awareness gaps and administrative hurdles (Kumar et al., 2022). To enhance digital healthcare delivery, the National Digital Health Mission (NDHM) (2020) was launched, aiming to digitize health records, integrate telemedicine, and improve access to medical services (National Health Authority, 2020). Additionally, the National Health Policy (2017) set ambitious targets,

including increasing public health spending to 2.5% of GDP, enhancing primary healthcare infrastructure, and improving the availability of essential medicines (Ministry of Health and Family Welfare (MoHFW), 2017). Despite these advances, India continues to struggle with challenges such as inadequate public health expenditure, medical professional shortages, and disparities in healthcare access (Bhandari & Dutta, 2020).

Healthcare Spending and Outcome Patterns in India: India's public health expenditure remains one of the lowest globally, accounting for only 3.2% of GDP, compared to the global average of 6.6% (World Health Organization, 2023a). OOPHE remains high at 39.4%, disproportionately affecting SC, ST, and rural households (National Health Accounts, 2022). The doctor-to-population ratio stands at 1:811, significantly below the WHO recommendation of 1:1000 (Ministry of Health & Family Welfare (MoHFW), 2023).

Institutional vs. Non-Institutional Health Care Spending: Household healthcare spending in India reveals stark rural-urban and caste-based disparities. Urban households spend significantly more on institutional healthcare (hospitals, clinics, private practitioners), whereas rural households rely more on non-institutional care, including over-the-counter medicines, traditional healers, and informal healthcare providers (NSSO, 2018). In rural areas, non-institutional healthcare accounts for nearly 75% of total healthcare expenses, leading to increased vulnerability to financial shocks (Bhandari & Dutta, 2020).

Burden of Non-Communicable Diseases (NCDs): India is experiencing a rising burden of non-communicable diseases (NCDs), which now account for nearly 60% of deaths in the country (IHME, 2023). Diabetes prevalence stands at 9.8%, and hypertension affects 24% of men and 21% of women (NFHS-5, 2021). Caste and income levels significantly influence access to preventive and curative care for NCDs, with marginalized groups experiencing delayed diagnosis and inadequate treatment (Gupta et al., 2019).

2.3 Theoretical Frameworks

Healthcare-related home expenditures together with health results are formed through multiple economic and social, and institutional elements, thus demanding advanced methods to analyse spending trends and health disparities in addition to policy solutions. Multiple analytical frameworks exist that study household resource distribution toward medical care, along with the relation between socioeconomic indicators and monetary expenses and behavioural patterns influenced by spending restrictions. The analytical frameworks provide insight into why scheduled castes and tribes, together with other backward classes and other households, demonstrate dissimilar healthcare expenditures and health outcomes. Researchers use Grossman's Health Capital Model along with the Social Determinants of Health (SDH) Framework and Andersen's Behavioural Model of Health Services Use, together with Wagstaff's Catastrophic Health Expenditure Model and Sen's Capability Approach to study healthcare expenditure and health outcome disparities between Indian households.

2.3.1 Grossman's Model of Health Demand

The Health Capital Model by Michael Grossman (1972) represents the basic foundation of health economics by viewing health as a purchase and investment (Grossman, 1972). According to this model, people derive happiness through good health since it raises their work capacity and increases their earning ability and improves their lifestyle quality. The production of health by households uses both medical care and nutrition in addition to preventive behaviours, together with their financial resources and time and energy investments (Kenkel, 2020). Empirical research consistently utilizes Grossman's model to investigate how income affects the way different groups spend their health care money. Several Indian studies demonstrate how finances limit SC and ST groups, together with lower-income households, to choose subsistence requirements over healthcare expenses (Gupta & Das, 2021). The National Sample Survey Office (NSSO, 2018) shows that households that possess better education levels and higher earnings decide to spend money on institutional health care, while marginalized communities depend mostly on unregulated medical services and pay all their medical expenses out of pocket. Grossman's theory regarding financial resource barriers to healthcare accessibility is supported by Bhandari and Dutta's (2020) research, which showed that lowincome rural households in India spend less on health investments. Due to its rational decisionmaking assumption, the model ignores real-world elements such as cultural beliefs, traditional treatment methods, and the lack of adequate healthcare facilities in rural India (Kumar et al., 2022).

2.3.2 The Social Determinants of Health (SDH) Framework

The World Health Organisation (WHO, 2010) created the Social Determinants of Health (SDH) framework, which highlights how socioeconomic and structural variables outside of personal choices influence health. Education, work, caste, social class, geography, gender, and access to medical care are a few of these (Solar & Irwin, 2010). In India, research using the SDH model reveals systemic obstacles that prevent underprivileged populations from accessing healthcare. Due to systemic prejudice in healthcare institutions, difficulty of transportation, and geographic isolation, Scheduled Tribe households have less access to institutional healthcare, according to Deshpande (2022). Similarly, women from SC/ST households reported more difficulties in accessing healthcare, especially because of social norms that limit mobility, according to Mohanty & Kastor's (2023) analysis of NFHS-5 data. Further, Balarajan et al. (2011) demonstrated that SC/ST women had lower maternal healthcare utilization rates, even when financial constraints were removed, reinforcing the importance of cultural and systemic barriers. This framework is essential for this study as it helps analyse

NFHS household-level indicators, including anaemia prevalence, BMI, and access to healthcare based on social category and rural-urban residence.

2.3.3 Andersen's Behavioural Model of Health Services Use

Ronald Andersen's Behavioural Model of Health Services Use (1995) provides a structured approach to understanding healthcare utilization by categorizing factors into predisposing, enabling, and need-based determinants.

- a. Predisposing factors include demographic characteristics (age, gender, education, caste, social norms).
- b. Enabling factors refer to access-related elements such as income, insurance coverage, and healthcare infrastructure.
- c. Need-based factors include the perceived necessity of seeking medical treatment, based on illness severity or chronic conditions.

The use of Andersen's model in Indian empirical research demonstrates that SC/ST households maintain lower healthcare interactions because they lack key enabling resources including health insurance and transportation according to Mohanty and Kastor (2023). The uptake of health insurance plans under Ayushman Bharat (PMJAY) remains low for disadvantaged communities because they face limited awareness and bureaucratic hurdles as shown in NFHS-5 (2019-21) data according to Choudhury et al. (2023). The proposed framework provides essential tools to determine if household medical expenses lead to service usage and better health results.

2.3.4 Wagstaff's Catastrophic Health Expenditure Model

Wagstaff & Van Doorslaer (2003) introduced the Catastrophic Health Expenditure Model, defining healthcare spending as catastrophic when it exceeds 40% of a household's non-subsistence income (Nguyen et al., 2023). Studies show that over 17% of Indian households experience catastrophic health expenditures, with rural, SC, and ST households disproportionately affected (Raban et al., 2023). The National Health Accounts (2022) report that out-of-pocket health expenditure accounts for 62% of total health spending in rural India, worsening financial distress. This study applies the Catastrophic Health Expenditure Model to assess whether household spending patterns, especially among different social groups, indicate financial distress and whether insurance coverage mitigates this burden.

2.3.5 Sen's Capability Approach

The Capability Approach (1999) theory emphasizes that health outcomes are not only shaped by economic resources but also social structures, and personal freedoms. It critiques income-based models by arguing that financial barriers alone do not explain disparities in health outcomes. Studies applying Sen's framework show that even when financial barriers are removed, SC and ST households experience poor health outcomes due to structural discrimination and lack of healthcare access (Balarajan et al., 2011). Raban et al. (2023) found that women's healthcare access remains limited even in households with sufficient financial resources, reinforcing the role of social constraints. By integrating this model, I will evaluate whether increased household spending could lead to actual improvements in NFHS health indicators and the impact of social category and region on both expenditure and outcomes.

These theoretical frameworks provide a multidimensional understanding of India's household healthcare spending and health indicators. While economic models like Grossman's

Health Demand and Wagstaff's Catastrophic Expenditure Model focus on financial aspects, SDH, Behavioural Model of Health Services Use, and Sen's Capability Approach emphasize social and structural determinants of health inequities. Applying these frameworks will allow for a nuanced analysis of NSSO HCES and NFHS data, evaluating how caste, household size, and rural-urban divides shape healthcare spending and outcomes in India.

2.4 Existing Gaps in Literature

Despite extensive research on healthcare disparities in India, several gaps persist, limiting a comprehensive understanding of household healthcare spending and health outcomes across socio-economic groups. The existing literature predominantly focuses on caste-based inequalities but lacks an intersectional perspective that considers gender, disability, and employment status as key determinants of healthcare access. While studies confirm that Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC) face lower healthcare utilization rates than upper-caste groups (Mohanty & Kastor, 2023), few examine how intersecting disadvantages compound financial burdens. Women from SC/ST households, for instance, report lower autonomy in healthcare decision-making, contributing to delays in treatment and reduced utilization of institutional healthcare services (Mukherjee, 2022). Additionally, while research from Latin America suggests that disabled individuals incur significantly higher medical costs (Barros et al., 2021), similar data for India remains scarce.

Another major limitation in existing studies is the underestimation of informal and noninstitutional healthcare expenses. NSSO and NFHS surveys primarily capture direct medical costs, excluding expenditures on traditional medicine, over-the-counter drugs, and consultations with unregistered practitioners. This is particularly significant in rural areas, where nearly 30% of households rely on informal healthcare providers (Mazumdar et al., 2022). AYUSH treatments alone account for 18% of total rural healthcare spending yet remain largely absent from government expenditure assessments (NCAER, 2024). Moreover, indirect costs such as transportation, lost wages due to illness, and caregiving expenses are rarely factored into financial burden analyses (Murthy & Srinivasan, 2023).

Health insurance schemes like PMJAY were introduced to alleviate catastrophic health expenditures, but their impact on reducing out-of-pocket health expenditure (OOPHE) remains unclear. While PMJAY has increased insurance coverage among low-income families by 20% (Choudhury et al., 2023), its utilization remains low, with 45% of SC/ST households enrolled in the scheme never using its benefits due to a lack of empanelled hospitals nearby (Gupta & Das, 2022). In Bihar and Uttar Pradesh, more than 70% of insured households continue to seek private care despite coverage under PMJAY, suggesting persistent gaps in accessibility and service availability (National Health Authority, 2023).

Rural-urban disparities in healthcare spending remain insufficiently explored. While studies confirm that rural households spend less on institutional healthcare than their urban counterparts (Jain & Reddy, 2023), little research examines whether this reflects accessibility/affordability constraints or the unavailability of healthcare services. NSSO data indicates that 67% of rural SC/ST households forego hospital visits due to the absence of nearby facilities (NSSO, 2018). However, there is limited research on whether these households incur higher transportation costs or rely on alternative healthcare solutions. Furthermore, state-level disparities in public healthcare investment and their impact on household OOPHE have not been systematically studied. While Tamil Nadu and Kerala allocate significantly higher per capita public health spending (₹3,500 and ₹4,200, respectively), states like Bihar and Uttar Pradesh lag at ₹1,200 and ₹1,500 (Jha, 2024). However, no detailed study has assessed whether increased public health investment directly correlates with reduced OOPHE for households. A critical shortcoming in existing research is the reliance on cross-sectional data, making it difficult to track changes in healthcare expenditure over time. Most studies based on NSSO and NFHS data do not assess how policy interventions such as Ayushman Bharat have influenced household spending between NFHS-4 (2015–16) and NFHS-5 (2019–21). Additionally, limited research exists on trade-offs between healthcare and other essential expenditures. A study by Patel et al. (2022) found that in low-income households, a 10% increase in healthcare expenditure led to a 15% reduction in education spending, yet there is little research on whether rising medical costs force Indian households to adjust to other consumption priorities.

Addressing these gaps requires a more intersectional and longitudinal approach to studying healthcare spending in India. Future research should integrate quantitative household expenditure data with qualitative insights into decision-making processes and coping mechanisms for medical costs (Kumar et al., 2023). Understanding how households manage financial constraints—whether through borrowing, asset liquidation, or reducing other essential expenditures—would provide critical insights for policy interventions aimed at improving financial protection and reducing disparities in healthcare access.

While research has established links between healthcare spending and socioeconomic disparities, gaps remain in understanding intersectionality, informal expenditures, and evolving policy impacts. Further research must incorporate mixed-method approaches combining NSSO/NFHS datasets with qualitative household-level insights.
2. 5 Definition, Scope and Identifiers

To contextualize the findings and analysis of household healthcare expenditure, it is necessary to establish clear definitions and operational boundaries for key concepts and categories, which have been derived from the literature available.

2.5.1 Institutional Medical Expenses

A household's medical spending on healthcare treatment which requires admission to a healthcare facility falls under institutional medical expenses. Hospitalization expenses together with surgical costs diagnostic processes room fees and drugs provided during hospitalization and doctor fees of specialists in both public and private healthcare facilities make up institutional medical costs (Manna et al., 2023). The National Sample Survey Office (NSSO) reports that health care costs in medical institutions typically exceed other health expenses and result in catastrophic out-of-pocket payments until people acquire health insurance (Karan et al., 2017). Formal healthcare encounters lead to these expenses which healthcare system availability and patient socioeconomic status equally affect.

2.5.2 Non-Institutional Medical Expenses

Households pay medical expenses outside institutional settings as non-institutional medical expenditures. Outside institutional settings, patients seek treatments through outpatient consultations and purchase drugs as well as undergo diagnostic tests and receive minor procedures while using traditional or informal medicine services. These costs happen repeatedly and research investigators frequently overlook them in policy evaluation even though they can create extensive financial strain (Selvaraj & Karan, 2009). People make recurrent medical expenses which involve both conventional medical care and different forms of alternative treatment within their interactions with the healthcare system.

2.5.3 Region – Rural and Urban

The healthcare system in India shows substantial differences between medical services that exist in rural versus urban locations. The Census of India together with NSSO classify rural areas as territories outside statutory town boundaries that display low population density and insufficient facilities with weak infrastructure. The population density of urban areas surpasses rural areas while they possess enhanced medical facilities from public and private entities (Balarajan et al., 2011). The correct identification of these areas allows researchers to identify patterns in healthcare accessibility and the use of medical services and financial expenses. The combination of increased transport expenses subpar road infrastructure and extended distances between rural areas and health centres create barriers to prompt healthcare services (Kumar et al., 2021).

2.5.4 Social Categories

The research follows the established four-category classification system employed in Indian socio-political discourse and institutional surveys including Scheduled Tribes (ST) and Scheduled Castes (SC) with Other Backward Classes (OBC) and Others (General category). The government has established these categories through constitutional recognition because they represent historical and structural marginalization while STs and SCs encounter ongoing obstacles to obtaining healthcare services along with education training and income generation opportunities (Deshpande, 2020). Society classifies OBCs as a combined socio-economically struggling population but identifies 'Others' as socially prospering members with improved health care access and better insurance coverage. The established labels enable researchers to perform a holistic analysis of unequal health outcomes.

2.6 Assumptions

To guide the interpretation of expenditure patterns and their socio-demographic correlates, a set of grounded assumptions, supported by existing literature, was adopted to form hypotheses and standardise interpretation:

- a. For ST and SC categories, proportionate medical expenses are expected to rise. While already struggling with low-income levels, marginalized groups like STs and SCs often reside in areas with poor healthcare infrastructure, resulting in delayed treatment and higher eventual costs. They may also face a greater disease burden due to poor sanitation and undernutrition (Baru et al., 2010). Additionally, limited access to preventive care increases the risk of costly emergency interventions (Rao et al., 2020).
- b. For OBC and Others, proportionate medical expenses are expected to fall. These categories generally have better access to public and private healthcare facilities and higher insurance coverage (IIPS & ICF, 2021). Their ability to engage in preventive care, access subsidized schemes, and navigate the health system more effectively helps reduce out-of-pocket expenditures over time (Jeffery & Jeffery, 2021).
- c. Larger family size corresponds to lower proportionate medical expenditure. The assumption rests on the idea of risk pooling and economies of scale. Larger households can share transportation and consultation costs, benefit from bulk purchasing of medicines, and spread fixed costs over more members. Studies have shown that per capita health spending tends to decrease with family size due to internal pooling of resources and care responsibilities (Acharya & Ranson, 2005).
- d. The lower the access to public healthcare, the higher the household medical expenditure. Inaccessibility to public services often forces households to seek private providers, which entails higher out-of-pocket payments. This pattern is observed more

in remote rural areas or urban informal settlements where public services are sparse (Selvaraj & Karan, 2009). The cost of transport, opportunity cost of time, and unaffordability of frequent visits contribute to the overall expenditure.

- e. Remoteness increases expenditure due to logistical and cultural barriers. Households located on the periphery of rural regions or in tribal belts incur higher medical costs due to physical distance, lack of transport, and delayed treatment-seeking behaviour. Additionally, lack of formal education and literacy exacerbate difficulties in accessing timely and appropriate care (George et al., 2020).
- f. Literacy and income are inversely related to the medical expenditure burden. Urban areas generally exhibit higher literacy and income levels, translating to better awareness, preventive practices, and access to health insurance. This reduces the financial burden of medical care. NFHS-5 shows significantly higher insurance coverage and service access among urban, literate populations, especially within the 'Others' category (IIPS & ICF, 2021).
- g. Rapid urbanisation may reduce per capita service availability. With a shift toward suburbanization, urban regions may see a decline in per capita access to public health infrastructure. This can increase waiting times and stall service delivery, thereby increasing the cost burden (Gupta et al., 2022).

METHODOLOGY

3.1 Identification of the Core Issue and Proposition of the Study's Aims

This study focuses on the NSSO HCES Data and the NFHS Data to analyse underlying characteristics of household spending in India, particularly regarding medical expenditure and healthcare outcomes. As discussed earlier, the fundamental issue is the absence of micro-contextual insights into the influence of socioeconomic, cultural, and geographic contexts on spending patterns and how these patterns relate to overall healthcare outcomes and public welfare.

By addressing this gap, the study seeks to answer critical questions:

1. In the context of India, what are the impacts of socio-economic and regional disparities on household medical consumption?

This question raises concerns about how factors such as caste and place affect expenditure within households.

2. What are the new trends in healthcare expenditure over the years, and how does healthcare expenditure differ between rural and urban households, thereby influencing healthcare outcomes?

The changes in institutional and non-institutional and rural-urban medical care and their relation to health outcomes in the country will be discussed to assess the healthcare needs of the citizens. They further discuss its consequences on public health systems overall.

- 3. How do household priorities interact with consumption expenditure on medical health care, whether health insurance reduces the burden on out-of-pocket health expenditure? This question looks at the utilisation and the impact of insurance penetration on medical spending.
- 4. Has healthcare accessibility and affordability improved over the years, and has the same been reflected in the spending patterns and NFHS indicators?

This question seeks to derive policy insights concerning government welfare programs and behavioural changes.

3.2 Major Hypotheses

Through this study, I will be testing various econometric models on the NSSO HCES Unit-Level Data and NFHS Data revolving around the hypotheses below:

- H1: Households from Scheduled Caste (SC) and Scheduled Tribe (ST) groups have a significantly higher proportionate medical expenditure than Other Backward Classes (OBC) and General category households.
- 2. H2: Urban households' proportionate expenditure on healthcare is less than rural areas, indicating better infrastructure, quality, accessibility and affordability.
- 3. H3: Urban households allocate a higher proportion of expenditure to institutional health care compared to rural households, due to better healthcare infrastructure and accessibility.
- 4. H4: Higher household healthcare spending correlates with improved national health outcomes, particularly in anaemia, Body Mass Index (BMI), service delivery, access to medical healthcare, insurance coverage, etc.

While India strives to celebrate its 100 years of freedom, it is crucial to appreciate the spending behaviour of households in India to formulate and implement policies that would address the nation's socio-economic problems and developmental objectives. The findings of this study will reveal how and to what extent regional differences, inequalities in socio-economic status, service delivery, and infrastructural advancement influence household spending on healthcare and consequently its impact on healthcare outcomes. The findings will guide policy interventions in specific areas of welfare reform, including the rebalancing of welfare programs such as the Ayushman Bharat, and health and nutrition policies due to high

risks recorded among low-income earners. Therefore, the focus of this research is to align these policies with the heterogeneity of Indian households to encourage inclusive growth of the economy, reduction of inequality, and improvement of economic resilience to advance the sustainable development of the country.

3.3 Data Sources, Study Design, and Research Methodology

3.3.1 Data Sources and Study Design

This study employs two key datasets to analyse household healthcare expenditure trends over time- the Household Consumer Expenditure Survey (HCES) for the years 2011-2012 and 2023-2024, and the National Family Health Survey (NFHS) for the years 2015-2016 (NFHS-4) and 2019-2021 (NFHS-5). The HCES data derives from the National Sample Survey Office (NSSO) while the NFHS data emerges from the Ministry of Health and Family Welfare (MoHFW) of the Government of India. The selected datasets from HCES and NFHS contain extensive information about household expenditures together with demographic data and healthcare utilization patterns across the entire country of India. The datasets function well together because they use household-level survey methods that have reliable sampling practices for effective comparison purposes. The compatibility between the datasets increases because they use rigorous sampling designs which deliver national-level representative results. Moreover, their household-level design facilitates an in-depth examination of spending behaviour in conjunction with health indicators. The HCES expanded its household survey scope from 100,547 participants in 2011-12 to 2,615,953 participants in 2023-24 as the survey's coverage increased substantially. The study utilizes NFHS data for health outcomes and access-related indicators which include 601,509 respondents from NFHS-4 (2015-16) and 636,699 respondents from NFHS-5 (2019-21). The availability of HCES in .CSV format together with NFHS in .SAV format allowed structured data processing where Python analysed HCES data while SPSS examined NFHS data to ensure a methodologically rigorous analysis.

3.3.2 Limitations of the Data Sources and Study Design

Despite their robustness, the datasets pose certain limitations. One key limitation is the difference in survey timelines, as the HCES datasets cover 2011-2012 and 2023-2024, while NFHS surveys were conducted in 2015-2016 and 2019-2021. This mismatch in temporal coverage introduces challenges in direct comparisons. Additionally, the impact of the COVID-19 pandemic on the NFHS 5 (2019-2021) dataset remains an important factor, as the pandemic may have significantly altered household health indicators (Saha et al., 2022).

3.3.3 Research Methodology

This capstone used a mixed-methods approach, combining quantitative and qualitative analyses to understand the interlinkages between household health expenditures and health outcomes, particularly through the lens of caste and regional disparities. Given the nature of the dataset and the objectives of this study, statistical methods were carefully selected to ensure robustness and validity. A preliminary assessment of expenditure distribution revealed that healthcare spending variables exhibited right-skewed distributions. This skewness, indicative of expenditure inequality, necessitated the use of non-parametric tests over parametric alternatives.

Mann-Whitney U test was employed as the primary statistical test for comparing healthcare spending and health outcomes across different years. Given that both datasets consist of independent samples and exhibit right-skewed distributions, this test was selected due to its robustness in handling non-normally distributed data and unequal sample sizes. By applying this test to each category of expenditure and health outcomes, the study ensures that variations over time are statistically validated.

To further quantify the magnitude of differences observed across years, the Vargha-Delaney A (VDA) measure was used to assess effect size (Vargha & Delaney, 2000). VDA was selected due to its appropriateness in non-parametric settings, providing a standardized measure of the probability that a randomly chosen value from one distribution exceeds a randomly chosen value from another. This measure facilitates deeper insights into how healthcare expenditure patterns have evolved over time and across social categories and regions.

Significance testing and interpretation of results followed standard statistical protocols. Mann-Whitney U test results were evaluated based on the p-values, with a threshold of 0.05 for statistical significance. Effect size was computed using VDA values classified into small, medium and large categories according to Vargha and Delaney (2000). When the data in the first group was greater than in the second group, VDA was greater than 0.5, indicating a positive difference and vice versa.

Classification and Interpretation of Effect Size (VDA)								
Direction	Effect Size Range	Interpretation						
Negative Difference	0.51 - < 0.64	Small						
	0.64 - < 0.71	Medium						
	≥ 0.71	Large						
Positive Difference	> 0.34 - 0.49	Small						
	> 0.29 - 0.34	Medium						
	≤ 0.29	Large						

 Table 2: Classification and Interpretation of Effect Size (VDA)

3.3.4 Description and Treatment of Variables

The study focuses on key variables related to household healthcare expenditure, socioeconomic characteristics, and health outcomes. For ease of computation and analysis, the HCES datasets were separated into rural and urban categories. Household total consumption was calculated by adjusting the reference period of all types of consumption to 30 days, covering three broad expenditure categories: food, consumables, and durables. Similarly, medical expenses—disaggregated into institutional and non-institutional expenditures—were also adjusted to a 30-day reference period for institutional spending, while non-institutional spending did not require such adjustments. Each household was allocated a unique identifier to exclude duplicates or missing cases, facilitating consistent tracking across datasets.

To derive the proportionate healthcare expenditure, medical expenses were divided by total household consumption, ensuring separate calculations for institutional and noninstitutional expenditures across rural and urban households. A preliminary assessment of these dependent variables revealed right-skewed distributions, likely due to significant expenditure inequality. To mitigate this skewness, logarithmic transformations were applied; however, the distribution remained significantly right-skewed. Consequently, non-parametric statistical methods were chosen for analysis. The proportionate expenditure, expressed as a fraction of total expenditure rather than in absolute rupee terms, inherently accounts for some level of inflation adjustment, though further validation of this assumption is required.

Social category variables—Scheduled Tribes (ST), Scheduled Castes (SC), Other Backward Classes (OBC), and Others—were considered as independent variables. These were analysed separately for institutional and non-institutional medical expenses, with rural and urban households examined distinctly to capture nuanced socio-economic disparities. The comparison of healthcare spending across different years was conducted using the MannWhitney U test to determine statistically significant differences. Based on the significance levels obtained, the Vargha-Delaney A (VDA) effect size measure was employed to analyse the magnitude of differences in spending patterns over time.

The NFHS dataset provides critical indicators of health outcomes, enabling crossanalysis of household characteristics and health expenditure trends. Data cleaning processes involved examining missing values, with appropriate imputation or exclusion strategies applied based on the extent of missingness. Outliers were carefully assessed and addressed to avoid distortions in statistical analysis. To ensure consistency in urban-rural classification, the HV025 variable from NFHS was used to align categorisations with those in HCES.

Through this methodological approach, the study ensures that findings are both statistically sound and policy-relevant, providing critical insights into the evolving landscape of household healthcare expenditure in India.

ANALYSIS

4.1 Household Consumption Expenditure Survey Data Analysis

4.1.1 Institutional vs. Non-Institutional Expenditure: National and Regional Trends

At the aggregate level, institutional medical expenditure as a proportion of total household consumption increased marginally in rural areas (from 0.081 in 2012 to 0.085 in 2024), while it slightly declined in urban areas (from 0.082 to 0.076). This suggests a subtle rural shift toward institutional care despite persisting disparities in access and affordability.

Non-institutional medical expenditure, meanwhile, declined both in rural and urban areas. In rural regions, it decreased from 0.048 to 0.045, and in urban areas from 0.045 to 0.037, suggesting a general reduction in reliance on non-institutional or informal healthcare, possibly due to improvements in public healthcare infrastructure or insurance penetration.

Mean Mean Median Median Type Region (2012)(2024)(2012)(2024)**P-Value** VDA Institutional Rural 0.081 0.085 0.044 0.050 0.000 0.472 0.082 0.076 0.044 0.046 0.783 0.499 Institutional Urban 0.027 0.000 Non-Institutional Rural 0.048 0.045 0.028 0.511 0.045 0.022 0.000 Non-Institutional Urban 0.037 0.026 0.543

 Table 3: Overall Medical Expenditure (2012-2024)

4.1.2 Social Category-Wise Trends in Rural Areas

In rural areas, ST households showed a notable increase in institutional expenditure from a mean of 0.037 in 2012 to 0.051 in 2024, with a doubling of the median value from 0.014 to 0.024. This could reflect enhanced access via targeted schemes such as Ayushman Bharat. SC households, however, saw a decrease in institutional expenditure from 0.091 to 0.084, albeit with a median increase from 0.057 to 0.084. OBC and general (Others) groups showed marginal increases.

Category	Institutional Mean (2012 → 2024)	Institutional Median (2012 → 2024)	Non-Institutional Mean (2012 → 2024)	Non-Institutional Median (2012 → 2024)
ST	$0.037 \rightarrow 0.051$	$0.014 \rightarrow 0.024$	$0.033 \rightarrow 0.033$	$0.018 \rightarrow 0.020$
SC	$0.091 \rightarrow 0.084$	$0.057 \rightarrow 0.084$	$0.054 \rightarrow 0.048$	$0.033 \rightarrow 0.029$
OBC	$0.090 \rightarrow 0.093$	$0.052 \rightarrow 0.060$	$0.052 \rightarrow 0.046$	$0.031 \rightarrow 0.027$
Others	$0.090 \rightarrow 0.094$	$0.052 \rightarrow 0.056$	$0.048 \rightarrow 0.050$	$0.027 \rightarrow 0.029$

 Table 4: Medical Expenditure- Social Category Wise in Rural Areas

4.1.3 Social Category-Wise Trends in Urban Areas

Urban ST and SC households recorded minor declines or stagnation in institutional medical spending. ST groups remained static at a mean of 0.038, while SC declined from 0.081 to 0.075. Median values remained flat or marginally declined. OBC and Others followed similar trends, showing slight declines in mean values and steady medians.

Non-institutional medical spending fell across all urban groups, with the sharpest relative drop observed among SC households (mean from 0.046 to 0.038, median from 0.029 to 0.024). This likely reflects improved access to formal care or financial protection mechanisms.

Category	Institutional Mean (2012 → 2024)	Institutional Median (2012 → 2024)	Non-Institutional Mean (2012 → 2024)	Non-Institutional Median (2012 → 2024)
ST	$0.038 \rightarrow 0.038$	$0.013 \rightarrow 0.014$	$0.029 \rightarrow 0.028$	$0.016 \rightarrow 0.017$
SC	0.081 ightarrow 0.075	$0.048 \rightarrow 0.046$	$0.046 \rightarrow 0.038$	$0.029 \rightarrow 0.024$
OBC	$0.090 \rightarrow 0.080$	$0.050 \rightarrow 0.051$	$0.048 \rightarrow 0.037$	$0.029 \rightarrow 0.023$
Others	$0.087 \rightarrow 0.082$	$0.047 \rightarrow 0.082$	$0.045 \rightarrow 0.039$	$0.026 \rightarrow 0.023$

 Table 5: Medical Expenditure- Social Category Wise in Urban Areas

4.1.4 Overall Emerging Trends

- a. Growth in Rural Institutional Spending: Marginal increases in institutional care spending in rural areas point to improved healthcare infrastructure and targeted policy interventions.
- b. Decline in Non-Institutional Care: Reductions in non-institutional expenditure across the board reflect a gradual shift away from informal healthcare providers.
- c. Persistent Urban-Rural Gaps: Urban households consistently spend more in absolute terms, although rural households may spend a larger share of their limited incomes.
- d. Inequality Among Social Groups: ST and SC groups, despite some gains, still trail behind OBC and Others in both institutional and non-institutional expenditures, underscoring access and affordability barriers.

Type of Medical Expenditure	Region	Mean (2012)	Sample Size (2012)	Mean (2024)	Sample Size (2024)	Median (2012)	Median (2024)	P-Value	VDA
Institutional	Purel	0.081	0008	0.085	25213	0.044	0.050	0.000	0 472
Institutional	Kurai	0.081	<i>99</i> 08	0.085	23213	0.044	0.050	0.000	0.472
Institutional	Urban	0.082	6605	0.076	16084	0.044	0.046	0.783	0.499
Non-Institutional	Rural	0.048	47051	0.045	138838	0.028	0.027	0.000	0.511
Non-Institutional	Urban	0.045	31713	0.037	95877	0.026	0.022	0.000	0.543

Table 6: Medical Expenditure Overall

Category	Mean (2012)	Sample Size (2012)	Mean (2024)	Sample Size (2024)	Median (2012)	Median (2024)	P-Value	VDA
ST	0.037	1653	0.051	3907	0.014	0.024	0.000	0.384
SC	0.091	1505	0.084	5068	0.057	0.084	0.001	0.528
OBC	0.090	3905	0.093	10762	0.052	0.060	0.000	0.476
Others	0.090	2844	0.094	5428	0.052	0.056	0.000	0.475

Table 7: Institutional Medical Expenditure- Rural

Table 8: Non-Institutional Medical Expenditure- Rural

Category	Mean (2012)	Sample Size (2012)	Mean (2024)	Sample Size (2024)	Median (2012)	Median (2024)	P-Value	VDA
ST	0.033	6558	0.033	23713	0.018	0.020	0.000	0.484
SC	0.054	8310	0.048	27849	0.033	0.029	0.000	0.527
OBC	0.052	18813	0.046	57581	0.031	0.027	0.000	0.530
Others	0.048	13364	0.050	29448	0.027	0.029	0.000	0.475

Table 9: Institutional Medical Expenditure- Urban

Category	Mean (2012)	Sample Size (2012)	Mean (2024)	Sample Size (2024)	Median (2012)	Median (2024)	P-Value	VDA
ST	0.038	645	0.038	1660	0.013	0.014	0.007	0.464
SC	0.081	845	0.075	2237	0.048	0.046	0.160	0.516
OBC	0.090	2488	0.080	6507	0.050	0.051	0.939	0.499
Others	0.087	2625	0.082	5611	0.047	0.082	0.271	0.492

Table 10: Non-Institutional Medical Expenditure- Urban

Category	Mean (2012)	Sample Size (2012)	Mean (2024)	Sample Size (2024)	Median (2012)	Median (2024)	P-Value	VDA
ST	0.029	2397	0.028	8276	0.016	0.017	0.005	0.481
SC	0.046	4221	0.038	12705	0.029	0.024	0.000	0.551
OBC	0.048	11967	0.037	38357	0.029	0.023	0.000	0.561
Others	0.045	13125	0.039	35890	0.026	0.023	0.000	0.533



Figure 1: Overall Institutional Vs Non-Institutional Trends (Mean and Median)

From 2012 to 2024, institutional medical expenditure has seen a notable increase across all social categories, both in mean and median terms. This indicates a clear shift toward higher household spending on formal medical services, possibly due to increased access, reliance on hospital-based care, or inflation in institutional healthcare costs. Notably, ST and SC categories show the most pronounced increase in median values, suggesting broader improvements in access and utilization of institutional care among marginalized groups. In contrast, non-institutional medical expenditure has shown a declining trend across both metrics. The fall in both mean and median values implies that households are spending proportionately less on outpatient, home-based, or informal care. This may reflect a shift in healthcare-seeking behaviour, where individuals are moving away from traditional or non-specialized care toward more structured, facility-based interventions.



Figure 2: Rural Medical Expenditure by Social Group (Mean and Median) a.



Figure 3: Rural Medical Expenditure by Social Group (Mean and Median) b.

In rural areas, institutional medical expenditure has seen a gradual increase between 2012 and 2024. While mean values reflect a downward shift, median values reflect an upward shift, particularly for the ST and OBC categories. This suggests that rural households are increasingly allocating a higher share of their medical spending toward institutional healthcare. The rise in median expenditure indicates that this trend is not just driven by a few high spenders-but is more widespread across the population. Conversely, non-institutional rural expenditure has declined slightly, as seen in both the mean and median trends. The decline is more evident in SC and OBC categories, indicating a reduced reliance on outpatient or informal healthcare settings in rural regions.



Figure 4: Urban Medical Expenditure by Social Group (Mean and Median) a.



Figure 5: Urban Medical Expenditure by Social Group (Mean and Median) b.

In urban areas, the mean institutional expenditure has shown a decline for SCs, while it has risen slightly for STs and marginally increased for OBCs and Others. This suggests a redistribution in spending patterns, where SC households may be cutting back or facing barriers in institutional access or affordability. The median institutional expenditure, however, shows a clear and consistent rise across all social categories—most notably for SC, ST, and OBC households—indicating that a broader base of urban households is incurring more institutional medical expenses over time, even if the average (mean) remains relatively flat or declining for some. On the non-institutional side, mean expenditures have largely declined or remained stagnant, particularly for STs, while Others see a marginal rise. This suggests a tapering reliance on non-institutional care, possibly due to shifting preferences, improved institutional access, or policy nudges. The median non-institutional expenditure shows a slight increase for ST and Others, while it has declined modestly for SC and OBC households. This contraction, particularly for SCs—now converging with Others—may reflect reduced usage or affordability constraints for out-of-pocket informal care.

4.1.5 Scheduled Tribes (ST)

Scheduled Tribes (STs) represent one of the most socioeconomically disadvantaged groups in India, often situated at the bottom of the wealth and income distribution. Predominantly residing in remote and rural areas, they face persistent barriers to accessing education, healthcare, and other public services (Saxena, 2019; Ministry of Tribal Affairs, 2022). Their marginalisation is further compounded by geographical isolation, poor infrastructure, and historical neglect by policy interventions.

A comparative analysis of the Household Consumption Expenditure Survey (HCES) data from 2012 and 2023 reveals a discernible increase in proportionate medical expenditure among ST households across both rural and urban settings. While the rise in non-institutional medical expenses is marginal, reflected in a Vargha-Delaney A (VDA) value of 0.484 for rural and 0.481 for urban areas, the surge in institutional medical expenditure is notably more substantial, with rural areas showing a VDA of 0.384 and urban areas at 0.464. These findings support the assumptions made for this social category, suggesting an upward trend in medical spending despite economic disadvantage.

Several plausible factors explain this pattern:

a. Burden of Disease and Poor Health Outcomes: NFHS-5 (2019-21) data indicate that STs exhibit some of the poorest health indicators among all social categories. For instance, childhood stunting among STs is 40.6%, and anaemia prevalence in women (aged 15–49) is as high as 67.1% (IIPS & ICF, 2021). Such generational health burdens necessitate frequent medical interventions, contributing to higher institutional medical expenditure.

- b. Limited Access to Public Healthcare: The inaccessibility of public healthcare facilities in tribal areas is a well-documented issue. NFHS-5 reveals that the proportion of women in ST households who cited distance to healthcare facilities as a major barrier remains high, particularly in rural areas (IIPS & ICF, 2021). This situation is corroborated by SH74A-E and 467A-I variables of the NFHS dataset, which highlight the limited reach of services such as institutional delivery support, postnatal care, and government health insurance schemes for ST women. This lack of access often leads families to seek costlier private or informal healthcare services, pushing up out-of-pocket expenditures.
- c. Rising Healthcare Awareness and Demand: While traditional barriers such as illiteracy and distrust of allopathic medicine may persist among ST populations, the increase in institutional expenditure suggests growing awareness and demand for formal healthcare. This could be partially attributed to increased outreach by healthcare workers and improvements in transportation and mobile health units (Borah & Saikia, 2023).
- d. Demographic Factors and Economic Pressures: Though ST families often have larger household sizes—driven by lower access to contraception and the perceived economic utility of larger families (NFHS-5)—this should, in theory, reduce proportionate spending. However, the consistent economic marginalization of these communities may nullify this potential mitigating effect. As real incomes stagnate or decline, even modest healthcare use results in rising proportionate expenditure.
- e. Low Insurance Penetration: Insurance coverage remains lower among ST households compared to other social groups. According to NFHS-5, only 28.7% of ST households report any form of health insurance, significantly below the

national average of 41% (IIPS & ICF, 2021). The absence of financial protection mechanisms exposes them to high out-of-pocket payments, particularly for institutional care.

f. Comparison with NFHS Analysis: The HCES findings align with NFHS-based indicators. For example, the higher incidence of complications during delivery, as well as the lower likelihood of receiving antenatal and postnatal care among ST women, implies a reliance on institutional services under emergency or severe conditions, contributing to a spike in institutional expenditures. The discrepancy in institutional vs non-institutional trends further highlights the limited use of outpatient preventive care and higher costs associated with curative inpatient services.

4.1.6 Scheduled Caste (SC)

Scheduled Castes (SCs) form the second-lowest rung of India's socio-economic hierarchy and continue to face systemic discrimination, social exclusion, and economic marginalisation (Thorat & Dubey, 2012). Despite constitutional safeguards and targeted welfare schemes, SC households continue to exhibit limited access to quality education, employment, and healthcare services.

An analysis of HCES data from 2012 to 2023 shows mixed trends in medical expenditure for SC households. The assumption that medical spending would rise for SCs is not entirely supported. While institutional medical expenditure has declined slightly across rural (VDA = 0.528) and urban (VDA = 0.516) areas, non-institutional medical expenses have declined significantly in both rural (VDA = 0.527) and urban (VDA = 0.551) settings. This shift suggests that SC households may be increasingly relying on inpatient and/or outpatient treatment, possibly due to improved access to subsidized services or cost constraints.

- a. Insurance Coverage and Scheme Utilization: NFHS-5 findings support the view that SC households have increasingly benefited from government health schemes. About 42.5% of SC households are covered under some form of health insurance, slightly above the national average (IIPS & ICF, 2021). This coverage, driven largely by schemes like Ayushman Bharat, may have allowed these households to access institutional care at lower out-of-pocket costs, thereby reducing their proportionate institutional expenditures.
- b. Access to Healthcare Facilities: NFHS-5 data show that SC women still report notable barriers in accessing healthcare facilities, including distance and financial constraints. While such barriers persist, their severity may have reduced slightly due to better rural infrastructure, public health outreach, and increased health awareness. However, SH74A-E and 467A-I variables indicate that institutional delivery rates and antenatal care for SC women still lag behind the national average.
- c. Population Growth and Household Economics: SC households typically have higher fertility rates than general category households. This might increase the demand for healthcare, but income constraints and economic vulnerability could limit the ability to seek institutional care, thus pushing families toward noninstitutional, often less expensive alternatives. Moreover, larger household sizes may dilute medical expenditure per capita, contributing to reduced proportionate institutional spending.
- d. Health Literacy and Cultural Attitudes: While health literacy among SCs is generally lower than in other groups, NFHS-5 suggests improvement in educational attainment and health awareness over the last decade. This growing awareness might be prompting preventive or outpatient healthcare-seeking

behaviour, thereby increasing non-institutional expenditure. Simultaneously, increased utilization of subsidized public healthcare could explain the decline in institutional expenditure.

- e. Moderate Insurance Penetration and Persistent Challenges: Despite improvements, insurance coverage among SCs remains moderate. The reduced proportionate spending on institutional care may indicate that available insurance does not cover all types of care or that utilization of benefits remains suboptimal. These challenges could contribute to a reliance on non-institutional care.
- f. Comparison with NFHS Analysis: NFHS-5 confirms that SC women continue to have lower indicators for maternal and reproductive health compared to national averages. Institutional delivery among SC women is reported at 91.6%, lower than the general category (94.8%), and the unmet need for family planning remains higher. These patterns support the notion that financial constraints and access issues persist, driving reliance on informal or outpatient care reflected in the HCES data.

4.1.7 Other Backward Classes (OBC)

Other Backward Classes (OBCs) occupy an intermediate position in India's socioeconomic hierarchy. Though socioeconomically more mobile than Scheduled Castes and Scheduled Tribes, OBCs still face disparities in healthcare access and outcomes compared to the general category (Deshpande, 2020).

The HCES comparison from 2012 to 2023 shows a modest increase in institutional medical expenditure among OBC households in both rural (VDA = 0.476) and urban (VDA = 0.499) settings. Conversely, non-institutional medical expenditure has declined, particularly in

urban areas (VDA = 0.561), with a smaller yet significant fall in rural areas (VDA = 0.530). These findings align with assumptions for this group, pointing to an increasing preference or shift towards institutionalized care, possibly due to improved socio-economic status, health literacy, and accessibility.

- a. Improved Access to Public Healthcare: NFHS-5 data reveal relatively better access to institutional delivery and antenatal care for OBC women compared to SC and ST categories. SH74A-E and 467A-I variables indicate high utilisation of public health services in urban areas, likely contributing to the decline in outof-pocket spending on non-institutional care.
- b. Moderate Fertility and Economic Improvement: OBC households report lower fertility rates than SCs and STs and show moderate increases in wealth index and household income across the NFHS-5 round. This combination may allow for more focused expenditure on institutional healthcare, while also benefiting from economies of scale in larger households.
- c. Rising Literacy and Health Awareness: Educational attainment and awareness of health services have improved markedly among OBCs. NFHS-5 shows a higher awareness of family planning methods and government schemes, which can lead to preventive healthcare usage and lower dependence on informal care providers (IIPS & ICF, 2021).
- d. Insurance Penetration: OBC households report the highest health insurance coverage among the four major social categories, at 45.6% (NFHS-5). This likely contributes to increased use of institutional care while reducing the need for costlier non-institutional treatments. Government schemes such as Ayushman Bharat have further bolstered access.

e. Comparison with NFHS Analysis: While some health indicators still lag behind the general category, OBCs demonstrate improved maternal health indicators and reduced unmet need for contraception compared to SCs and STs. This convergence in indicators may support the stability of institutional health expenditure and the concurrent decline in non-institutional costs

4.1.8 Others

This category, commonly referred to as the general or unreserved category, occupies the apex of India's socio-economic hierarchy. Households in this group typically enjoy better access to quality education, employment, and healthcare, often benefitting from historically entrenched advantages and higher economic mobility (Deshpande, 2020). A comparative analysis of the Household Consumption Expenditure Survey (HCES) data from 2012 and 2023 reveals nuanced changes in medical expenditure patterns across rural and urban regions. While institutional medical expenditure shows a marginal increase in rural areas (VDA = 0.475), urban areas have remained almost stagnant (VDA = 0.496), suggesting minimal change. On the other hand, non-institutional medical expenditure demonstrates divergent trends: a decrease in urban areas (VDA = 0.523) and a slight rise in rural areas (VDA = 0.475). These findings only partially align with the original assumptions made for this category.

Several plausible explanations account for this pattern:

a. Access to Public Healthcare and Infrastructure: Households in this category often reside in regions with well-developed healthcare infrastructure, especially urban areas, allowing them to access high-quality subsidized public health services. NFHS-5 data support this assertion, showing that women from general category households report higher access to antenatal care (ANC), institutional delivery, and postnatal care (IIPS & ICF, 2021). Variables SH74A-E and 467A– I reflect higher levels of healthcare access and utilization for women in this group, particularly in terms of institutional delivery and ANC visits, thereby potentially reducing the need for costlier non-institutional services.

- b. Economic Prosperity and Stabilized Health Spending: Rising income and wealth levels among the general category households could explain the stagnation in institutional medical expenditure in urban areas. As real income grows, households may spend proportionately less on healthcare due to better overall health, improved nutrition, and timely access to preventive services. NFHS-5 confirms higher wealth index scores for this group, correlating with greater reliance on preventive and routine care, rather than emergency curative interventions.
- c. Literacy, Health Awareness, and Preventive Care: This category exhibits the highest literacy rates and health awareness levels among all social groups, leading to greater engagement with preventive healthcare practices (Deshpande, 2020; IIPS & ICF, 2021). This might explain the decline in non-institutional expenditure in urban areas, as households increasingly avoid informal care and opt for structured, public or private outpatient services that are covered under insurance or government schemes.
- d. Insurance Coverage and Utilisation: While health insurance penetration among the general category households is moderate compared to OBCs, NFHS-5 still shows considerable enrolment in schemes like Ayushman Bharat. Access to financial protection may reduce out-of-pocket payments for institutional care, contributing to stable institutional expenditure levels.

- e. Health Indicators and Service Utilization: Despite relatively favourable socioeconomic positioning, NFHS-5 data reveal that general category households do not always outperform others in health outcomes. For instance, the incidence of non-communicable diseases (NCDs) like hypertension and diabetes is higher in this group, possibly due to lifestyle factors (IIPS & ICF, 2021). However, their better access to diagnostic and follow-up services enables them to manage such conditions more cost-effectively through regular institutional engagement, maintaining stable healthcare expenditure proportions.
- f. Comparison with NFHS Analysis: The HCES findings are supported by NFHS-5 trends. General category women report the highest levels of institutional delivery (94.8%) (Pandey et al., 2023) and antenatal care usage, along with lower unmet needs for family planning. These patterns indicate that institutional health services are well-utilized and relatively affordable for this group, hence explaining the plateau in institutional spending and the decline in noninstitutional expenditure, especially in urban areas.

The HCES provides granular insights into household-level health spending. The 2011-12 round showed that ST households spent an average of INR 190 on institutional medical expenses per capita annually, significantly lower than SCs (INR 250), OBCs (INR 330), and Others (INR 420). The 2022-24 data show modest growth in institutional expenditure among STs (INR 230), indicating continued stagnation, while SC (INR 310), OBC (INR 420), and Others (INR 510) registered steeper increases (Palal et al., 2023).

Non-institutional expenditure patterns reveal that ST and SC households disproportionately rely on outpatient services and informal care providers. Rural SC and ST households in particular report higher relative spending on non-institutional care (up to 55% of

total health expenditure) compared to urban households and general category groups (around 38%). This reliance on non-institutional care has been associated with spatial and infrastructural exclusions, as argued by Baru et al. (2010) and further evidenced in NFHS data.

The data also show increasing urban-rural divergence. In 2022-24, urban OBCs and Others households spent 30-40% more on institutional care than their rural counterparts, signalling a dual system of health service access in India. This reflects the Inverse Care Law (Tudor Hart, 1971), wherein those with greater needs (rural, marginalized groups) receive less effective care.

Moreover, catastrophic health expenditure (health spending exceeding 10% of total consumption) remains highest among rural ST and SC households, which are more vulnerable to financial shocks. Kumar and Gupta (2021) note that among households facing hospitalization, 18.2% of SCs and 19.3% of STs reported borrowing or selling assets to meet medical costs, compared to 10.4% of general category households.

4.2 National Family Health Survey Data Analysis

To assess the health outcomes of the Indian households, a few indicators and variables were picked from the NFHS, and a similar methodology was used to analyse HCES data. The data was spread across two timelines- 2015 to 2016 and 2019 to 2021. Being two independent samples, a Mann-Whitney U Test was run to track the changes in the health performance during this period. The objective was to study the trends in healthcare expenditures that households make according to social category and region, and corroborate the same with trends in health outcomes, again filtered as per social category and region. While no direct relationship can be established between the two- spending and outcomes, as the datasets for both belong to different timelines, it can still build a foundation to assess the quality of expenditure and outcomes for the households based on their characteristics (Nixon & Ulmann, 2006). The

NFHS analysis is broken down into three categories: health outcomes, healthcare services penetration and utilisation, and physical accessibility of the healthcare system. This allows one to understand the overall performance of the system and the kind of differences households belonging to different social categories and regions experience (Chalasani, 2012).

Sr No.	Indicator	Variable	Theme			
1		Anaemia Levels (Women)				
2		Anaemia Levels (Pregnant Women)				
3		Anaemia Levels (Men)	~			
4	Health Outcomes-	Body Mass Index (BMI)- Women	Gender, Region and Social			
5	Aduits	Body Mass Index (BMI)- Men	Category			
6		Tobacco Consumption- Women				
7		Tobacco Consumption- Men				
8		Anaemia Levels (Children)				
9	Health Outcomes-	Stunting				
10	Children	Underweight				
11		Wasting				
12		BCG				
13	Health Outcomes-	Measles	Region and Social Category			
14	(Vaccination)	DPT				
15	(()	Vaccination) DIT Polio				
16		Iron				
17	Health Outcomes- Children (Medication)	Zinc				
18		Vitamin A				
19	Service Penetration:	Health Insurance and Scheme Coverage- Overall	Region and Social Category			
20	Insurance and Scheme	Health Insurance and Scheme Coverage- Women	Gender, Region and Social			
21	Coverage	Health Insurance and Scheme Coverage- Men	Category			
22	Service Penetration:	No. of Antenatal Visits During Pregnancy				
23	Services Accessed	Institutional Birth	Region and Social Category			
24	during Pregnancy	Caesarean Delivery				
25		Getting permission to go				
26	A • • • • • • • • •	Getting the money needed for treatment				
27	Accessibility: Problems for Women	Distance to health facility				
28	in Getting Medical	Having to take transport	Gender, Region and Social			
29	Help for Oneself and	Not wanting to go alone	Category			
30	Accessing Medical	Concerns about no female health providers				
31	Facilities	Concerns about no providers				
32		Concerns about no drugs available				
33	Accessibility Peacons	No nearby facility				
34	for Not Accessing a	Facility timing is not convenient	Region and Social Category			

Table 11: List of Variables (NFHS)

Sr No.	Indicator	Variable	Theme
35	Government Facility	Health personnel are often absent	
36	when Sick	Waiting time is too long	
37		Poor quality of care	
38		Other Reasons	

4.2.1 Health Outcomes for Adults and Children

To measure and analyse the health of the citizens using the NFHS dataset, we picked a few variables that shed light on the health outcomes of adults and children. The variables we considered were:

4.2.1.1 Anaemia Levels

The National Family Health Survey (NFHS) records anaemia levels among household members, disaggregated by gender and pregnancy status. For analytical precision, anaemia prevalence was assessed separately for women (aged 15–49 years), pregnant women, and men, using the NFHS-defined thresholds for severity—mild, moderate, and severe.

	~ .		ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
Anaemia	11 4 57	Rural	<.001	0.430	<.001	0.431	<.001	0.439	<.001	0.423
(Women) (IAPR7EI	(IAPR7EFL)	Urban	<.001	0.449	<.001	0.444	<.001	0.454	<.001	0.436
Anaemia		Rural	0.382	0.504	0.154	0.492	0.161	0.494	0.019	0.485
Levels										
(Pregnant	HA57									
Women)	(IAPR7EFL)	Urban	0.317	0.487	0.217	0.486	<.001	0.474	0.728	0.497
Anaemia		Rural	<.001	0.419	<.001	0.430	<.001	0.436	<.001	0.424
Levels (Men)	HB57	Urban	<.001	0.446	<.001	0.443	<.001	0.445	<.001	0.443

Table 12: Anaemia Levels

- a. Women: The Mann-Whitney U test revealed a statistically significant relationship between social category and anaemia prevalence among women across rural and urban regions for all four caste groups. An upward trend in anaemia was observed across the board, with rural areas witnessing a sharper increase. Notably, among the "Others" category, rural women registered a Vargha-Delaney A (VDA) effect size of 0.423, while their urban counterparts showed a VDA of 0.436, suggesting a substantial rise over time. This pattern is corroborated by the HCES analysis, which observed a decline in both institutional and non-institutional medical expenditure as a proportion of total spending among the Others category. This relative decline may suggest underutilization of healthcare services for nutritional deficiencies or a shift in spending priorities. Literature suggests that rising anaemia levels in urban areas may be linked to sedentary lifestyles and nutrient-poor diets (Tesfaye et al., 2020), while in rural areas, limited access to iron supplements and antenatal care are primary contributors (Kaur et al., 2019).
- b. Pregnant Women: Unlike the general female population, the association between anaemia levels in pregnant women and the social category was not statistically significant for most groups. Exceptions included the "Others" in rural regions (VDA = 0.485), indicative of stagnation, and urban OBCs (VDA = 0.474), showing a modest increase. This stagnancy among rural pregnant women in the Others category could reflect persistent dietary deficiencies and gaps in antenatal supplementation despite socio-economic advantages.
- c. Men: Among men, anaemia levels also showed a statistically significant rise across social categories and regions, with rural areas again exhibiting more pronounced changes. ST men in rural areas demonstrated the steepest increase (VDA = 0.419), while urban men from the Others category showed a comparable rise (VDA = 0.443).

The HCES 2012–2024 data supports this trend for STs, where non-institutional health expenditure saw only a marginal decline in rural areas (VDA = 0.493), potentially reflecting limited preventive care access. Previous studies have shown that male undernutrition and anaemia have been under-recognised in public health, with growing evidence that social inequality and occupational exposure affect men disproportionately in tribal populations (Rai et al., 2021).

The overall rise in anaemia among men compared to women also hints at gendered gaps in nutritional interventions, which have largely focused on women and children.

4.2.1.2 Body Mass Index (BMI)

BMI was computed using NFHS-recorded anthropometric data for men and women separately.

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
	HA40	Rural	<.001	0.450	<.001	0.442	<.001	0.444	<.001	0.435
BMI(Women)	(IAPR7EFL)	Urban	<.001	0.428	<.001	0.456	<.001	0.461	<.001	0.472
	HB40	Rural	<.001	0.428	<.001	0.433	<.001	0.435	<.001	0.433
BMI(Men)	(IAPR7EFL)	Urban	<.001	0.427	<.001	0.446	<.001	0.443	<.001	0.460

Table 13: Body Mass Index

a. Women: A statistically significant association was found between BMI and social category among women across rural and urban settings. Rising BMI levels were observed in both settings, more so in rural areas. The rural Others category showed the sharpest increase (VDA = 0.435), whereas urban ST women also registered a considerable rise (VDA = 0.428). The HCES analysis lends support to these findings. In rural areas, the Others category saw a decline in non-institutional expenditure, possibly reflecting a lack of engagement with preventive care even as overweight-

related risks increase. Increased BMI, especially in rural women, is often linked to nutrition transitions and increased consumption of calorie-dense foods (Popkin, 2021).

b. Men: BMI levels among men have also shown a significant rise across all social groups, with ST men demonstrating the highest increase in both rural (VDA = 0.428) and urban (VDA = 0.427) areas. This finding is supported by the HCES 2024 data, which showed limited improvement in institutional health spending among urban STs, despite the rising burden of non-communicable diseases. The observed increase in BMI may stem from shifting livelihoods, reduced physical activity, and an influx of processed foods in tribal regions (Yadav & Krishnan, 2008). Across both genders, BMI increases were more pronounced in rural regions, mirroring anaemia trends, suggesting a convergence of undernutrition and overnutrition in India's rural health landscape.

While BMI offers a general indication of nutritional status, its utility in predicting obesity-related health risks is limited in the Indian context. Experts argue for the inclusion of Body Fat Percentage or waist-to-hip ratio in national surveys for a more accurate representation of obesity-related risks (Misra & Shrivastava, 2019).

4.2.1.3 Tobacco Consumption

Tobacco use, a key risk factor for multiple non-communicable diseases (NCDs), imposes significant financial and health burdens. NFHS captures self-reported tobacco use among men and women, enabling an assessment of behavioural change over time. Public health campaigns and policy interventions such as the Cigarettes and Other Tobacco Products Act (COTPA) and anti-tobacco awareness drives have targeted this behaviour in recent years (Chengappa et al., 2024).

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
Does not use	V463Z-	Rural	<.001	0.461	<.001	0.482	<.001	0.484	<.001	0.480
tobacco? -										
Women	IAIR	Urban	<.001	0.433	<.001	0.481	<.001	0.487	<.001	0.487
Does not use	Does not use obacco? - MV463Z- Men IAMR	Rural	<.001	0.477	<.001	0.465	<.001	0.467	<.001	0.468
tobacco? -										
Men		Urban	<.001	0.453	<.001	0.460	<.001	0.461	<.001	0.466

 Table 14: Tobacco Consumption

- a. Women: While tobacco use among women declined across social groups and regions, the effect size remained small, especially in urban areas. The largest decline was observed among ST women, with a VDA of 0.461 in rural areas and 0.433 in urban areas. The decline in tobacco use among rural women is encouraging and may reflect better programmatic outreach in these areas. This is consistent with HCES findings, which show a marginal decline in non-institutional spending among STs in rural regions (VDA = 0.497), suggesting potential reductions in tobacco-related minor ailments being treated at home.
- b. Men: Tobacco consumption among men also declined, with SCs in rural areas (VDA = 0.465) and STs in urban areas (VDA = 0.453) exhibiting the sharpest reductions. The more substantial reduction in men's tobacco use compared to women's could be due to targeted campaigns and greater historical prevalence, making male consumption more responsive to public health interventions. This aligns with the HCES data, where SCs in rural areas showed a significant decrease in non-institutional health spending (VDA = 0.481), potentially reflecting fewer minor tobacco-related health issues.

Together, the NFHS and HCES findings suggest that while health behaviours like tobacco consumption are beginning to change, disparities in nutritional outcomes such as anaemia and BMI persist and are increasingly intersecting with lifestyle-related health risks.

4.2.1.4 Anaemia Levels Among Children

To enhance the robustness of our analysis, anaemia levels among children were examined separately across regions and social categories. The analysis revealed a consistent pattern with adult cohorts (women and men), indicating a marked increase in both the prevalence and severity of anaemia among children. The overall rise was more prominent in rural areas, particularly among the 'Others' category, which recorded a Vargha-Delaney A (VDA) effect size of 0.429. In contrast, urban regions exhibited a sharper increase among Scheduled Tribes (ST), with a VDA of 0.424. These findings align with the NFHS-5 results, which demonstrate a concerning rise in childhood anaemia nationally, rising from 59% in NFHS-4 to 67% in NFHS-5 (IIPS & ICF, 2021). The rural-urban disparity may stem from delayed medical attention, lack of quality healthcare access, and intergenerational effects of maternal anaemia, as documented in prior studies (Kaur et al., 2019).

Variable	Code	Туре	ST P- Value	VDA	SC P- Value	VDA	OBC P- Value	VDA	Others P-Value	VDA
Anaemia Levels		Rural	<.001	0.440	<.001	0.442	<.001	0.449	<.001	0.429
(Children)	HC57	Urban	<.001	0.424	<.001	0.448	<.001	0.468	<.001	0.434
	Derived from HC5 (<-2	Rural	<.001	0.492	<.001	0.476	<.001	0.478	<.001	0.485
Stunting	SD)- IAPR	Urban	<.001	0.485	0.01	0.491	<.001	0.484	0.077	0.495
	Derived from	Rural	<.001	0.472	<.001	0.463	<.001	0.464	<.001	0.468
Underweight	SD)- IAPR	Urban	0.232	0.495	<.001	0.468	<.001	0.466	<.001	0.477
	Derived from HC11 (<-2	Rural	<.001	0.481	<.001	0.486	<.001	0.491	<.001	0.489
Wasting	SD)- IAPR	Urban	0.245	0.496	<.001	0.485	<.001	0.488	0.032	0.495

 Table 15: Anaemia, Stunting, Underweight and Wasting (Children Specific)

4.2.1.5 Stunting

Stunting reflects chronic malnutrition and is assessed through children's height-for-age measurements using WHO thresholds (< -2 SD). The NFHS data confirmed a statistically significant relationship between stunting and social category across both rural and urban regions, excluding the 'Others' in urban areas. However, the effect size remained negligible to modest, with SCs and OBCs in rural regions registering the highest VDAs of 0.476 and 0.478, respectively. Despite a lack of a dramatic rise in stunting rates, its persistent prevalence highlights chronic undernutrition, especially in rural communities. These results are corroborated by NFHS-5, which recorded rural stunting prevalence at 37.3%, compared to 30.1% in urban areas, suggesting the need for targeted nutritional interventions (IIPS & ICF, 2021).

4.2.1.6 Underweight

Underweight, representing low BMI-for-age, was computed using the same anthropometric standards as stunting. A significant association emerged between social category and underweight status across all regions except for STs in urban areas. The largest changes were observed among SCs in rural areas (VDA = 0.463) and OBCs in urban regions (VDA = 0.466). These patterns, like stunting, were more prominent in rural areas, indicating inadequate dietary intake, suboptimal feeding practices, and limited access to health services. NFHS-5 data support these results, indicating a rural underweight prevalence of 32.3% against 25.7% in urban settings, and higher vulnerability among SC and OBC households (Deshpande, 2020; IIPS & ICF, 2021).

4.2.1.7 Wasting

Wasting, indicative of acute malnutrition, was assessed via weight-for-height ratios. Our analysis revealed a significant association between social category and wasting across
most groups, barring STs in urban areas. Nonetheless, the effect size remained minimal across all categories and regions. This finding is consistent with NFHS-5, which reports only marginal fluctuations in wasting prevalence between NFHS-4 (21%) and NFHS-5 (19.3%). The persistence of wasting at these levels, especially in rural India, underscores the need for enhanced focus on timely intervention strategies for acute undernutrition, despite the absence of worsening trends (Jeffery & Jeffery, 2021).

4.2.1.8 Vaccination

India's vaccine uptake has historically shown resilience, as demonstrated by the success of national immunisation campaigns like the Polio eradication drive. However, resistance during the COVID-19 pandemic, particularly concerning paediatric and geriatric populations, suggests emerging scepticism. NFHS-5 data provided insights into BCG, Measles, DPT, and Polio vaccination coverage. Our analysis identified significant associations between social category and vaccine uptake, except for the urban 'Others' group. Effect sizes were consistently larger in rural areas than in urban ones, likely due to plateaued coverage rates in urban populations and improved outreach in rural zones. The ST population showed the highest positive effect sizes for all vaccines across rural and urban regions, reflecting the successful penetration of immunization campaigns and increased health literacy among tribal communities (IIPS & ICF, 2021; Rai et al., 2021).

Variable	Code	Туре	ST P- Value	VDA	SC P- Value	VDA	OBC P- Value	VDA	Others P-Value	VDA
	Derived from H2\$1	Rural	<.001	0.451	<.001	0.477	<.001	0.473	<.001	0.470
BCG	to H2\$6, using varstocases- IAIR	Urban	<.001	0.468	<.001	0.483	<.001	0.482	<.001	0.484
	Derived from H9\$1	Rural	<.001	0.450	<.001	0.473	<.001	0.470	<.001	0.463
Measles	to H9\$6, using varstocases- IAIR	Urban	<.001	0.462	<.001	0.479	<.001	0.473	<.001	0.480
	Derived from H3\$1	Rural	<.001	0.462	<.001	0.489	<.001	0.486	<.001	0.482
DPT	to H3\$6, H5\$1 to 6, H7\$1 to 6, using varstocases- IAIR	Urban	<.001	0.485	0.007	0.492	<.001	0.491	0.956	0.500
	Derived from H0\$1	Rural	<.001	0.463	<.001	0.484	<.001	0.479	<.001	0.478
Polio	to H0\$6, H4\$1 to 6, H6\$1 to 6, H8\$1 to H8\$1 to H8\$1 to 6, using varstocases- IAIR	Urban	<.001	0.481	<.001	0.486	<.001	0.490	<.001	0.491

Table 16: Vaccination (Children Specific)

4.2.1.9 Medication and Supplement Intake

Micronutrient supplementation is critical for child development, often compensating for dietary deficits. NFHS-5 collected data on Iron, Zinc, and Vitamin A supplementation among children. Our findings revealed significant correlations between supplement intake and social category, except for STs in urban areas for Zinc and Vitamin A. The effect size for Zinc was the largest among the supplements, albeit still small (VDA = 0.004 rural; VDA = 0.003 urban). Iron and Vitamin A supplementation showed relatively higher uptake in rural areas, indicating better programmatic outreach through schemes like ICDS and school-based initiatives. Despite modest effect sizes, these trends align with NFHS-5 data, which reported increased micronutrient coverage among children from disadvantaged groups, though overall coverage gaps remain, especially among ST and SC households (IIPS & ICF, 2021).

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
	Derived from	Rural	<.001	0.425	<.001	0.432	<.001	0.420	<.001	0.442
T	using varstocases-	TT 1	. 001	0.440	. 001	0.445	. 001	0.405	. 001	0.450
Iron	IAIR	Urban	<.001	0.449	<.001	0.445	<.001	0.425	<.001	0.450
	Derived from	Rural	<.001	0.004	<.001	0.005	<.001	0.005	<.001	0.005
	H15E\$6, using									
Zinc	varstocases- IAIR	Urban	0.506	0.003	<.001	0.005	<.001	0.004	<.001	0.004
	Derived from	Rural	<.001	0.470	<.001	0.483	<.001	0.479	<.001	0.485
	using varstocases-									
Vitamin A	IAIR	Urban	0.407	0.494	0.051	0.489	<.001	0.479	0.018	0.487

 Table 17: Supplement Intake (Children Specific)

4.2.2 Service Penetration

To understand healthcare expenditure and outcomes at the household level, it is critical to examine access to healthcare services and government schemes, including health insurance and subsidised healthcare like Ayushman Bharat. Despite the proliferation of such schemes, the actual ground-level penetration remains uneven, impacted by socio-economic and regional disparities (Rao et al., 2020). This section examines indicators such as overall insurance coverage, gender-disaggregated insurance uptake, and maternal health service utilisation.

4.2.2.1 Insurance and Scheme Coverage

Variable	Code	Туре	ST P- Value	VDA	SC P- Value	VDA	OBC P- Value	VDA	Others P-Value	VDA
Is any usual member of this		Rural	<.001	0.423	<.001	0.409	<.001	0.404	<.001	0.423
household covered by a health scheme or	SH71 (IAPR7EF									
health insurance?	L)	Urban	<.001	0.449	<.001	0.437	<.001	0.414	<.001	0.427
Covered by a health scheme or health		Rural	<.001	0.436	<.001	0.432	<.001	0.419	<.001	0.440
insurance?- Women	V481- IAIR	Urban	<.001	0.429	<.001	0.450	<.001	0.434	<.001	0.438

 Table 18: Insurance Coverage

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
Covered by a		Rural	<.001	0.426	<.001	0.414	<.001	0.409	<.001	0.434
health scheme or										
health insurance?	MV481-									
- Men	IAMR	Urban	<.001	0.466	<.001	0.439	<.001	0.416	<.001	0.435

- a. Overall Coverage: The analysis revealed a significant relationship between social category and insurance coverage. While there was an overall increase in the proportion of individuals covered under insurance or public health schemes, the degree of improvement varied significantly across regions and social groups. The effect size was more pronounced in rural areas for OBC households (VDA = 0.404), suggesting improved access due to expanded rural outreach initiatives. In urban areas, OBCs again recorded the highest effect size (VDA = 0.414), while STs in both rural and urban areas registered the lowest effect sizes. This disparity indicates persistent exclusion of ST communities from insurance schemes, corroborated by NFHS-5 data, which show that only 27.8% of ST households had any insurance coverage compared to 41.1% for OBCs and 49.8% for Others (IIPS & ICF, 2021).
- b. Coverage Among Women: A gender-disaggregated analysis demonstrated similar patterns, with significant results from the Mann-Whitney U test. In rural areas, OBC women recorded the largest effect size (VDA = 0.419), reflecting successful targeting through schemes like Janani Suraksha Yojana (JSY) and Ayushman Bharat. Interestingly, in urban areas, ST women had the largest effect size (VDA = 0.429), implying enhanced awareness and outreach among urban tribal women. This is supported by NFHS-5 findings, which indicate improved maternal service access among urban ST women, including institutional deliveries and antenatal care (IIPS & ICF, 2021).

c. Coverage Among Men: Among male respondents, OBCs again exhibited the highest VDA in rural (0.409) and urban areas (0.416). Conversely, ST men in urban regions recorded the lowest effect size, pointing to an uneven penetration of insurance schemes across gender and caste lines. This contrasts with urban ST women, underscoring possible gender-targeted policies that benefit women more, especially in maternal and child health domains (Deshpande, 2020).

4.2.2.2 Services Accessed by Pregnant Women

Women's access to healthcare services during pregnancy is a strong indicator of the robustness of public health infrastructure. This section focuses on antenatal visits, institutional births, and caesarean deliveries.

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
No. of	Derived from	Rural	<.001	0.402	<.001	0.408	<.001	0.395	<.001	0.434
Visits	M14\$6, using									
Pregnancy	IAIR	Urban	0.002	0.481	<.001	0.455	<.001	0.446	<.001	0.469
	Derived from	Rural	<.001	0.423	<.001	0.443	<.001	0.439	<.001	0.440
	M15\$1 to M15\$6, using									
Institutional	varstocases-									
Birth	IAIR	Urban	<.001	0.477	<.001	0.458	<.001	0.459	<.001	0.475
Cassanaan	Derived from	Rural	<.001	0.483	<.001	0.467	<.001	0.462	<.001	0.458
Delivery	IAIR	Urban	<.001	0.478	<.001	0.458	<.001	0.455	<.001	0.471

Table 19: Services Accessed by Pregnant Women

a. Antenatal Visits: The Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) and JSY aim to improve antenatal care (ANC) uptake. Our analysis confirmed a significant relationship between ANC frequency and social category. In rural areas, OBC women recorded the largest effect size (VDA = 0.395), while SC women in urban areas had the highest urban effect size (VDA = 0.455). These patterns suggest greater institutional outreach among marginalised communities. However, ST women in urban regions recorded the smallest effect size (VDA = 0.481), highlighting barriers to consistent healthcare access. NFHS-5 data mirror this finding, showing that only 60.6% of urban ST women had four or more ANC visits, compared to 75.1% among Others (IIPS & ICF, 2021).

- b. Institutional Births: Despite national gains in institutional deliveries, disparities persist. The Mann-Whitney U test confirmed a significant relationship between institutional delivery rates and social category. STs in rural areas recorded the highest effect size (VDA = 0.423), followed by OBCs in urban regions (VDA = 0.458). Conversely, STs in urban areas had the lowest effect size. These results align with NFHS-5 data, which show institutional delivery coverage among STs in urban areas at 81.3%, compared to 94.6% for Others. The data underscore continued barriers in service accessibility for STs despite geographical proximity to health centres (Jeffery & Jeffery, 2021).
- c. Caesarean Deliveries: C-sections, though sometimes lifesaving, can also reflect healthcare inequalities and commercialisation. The analysis revealed that urban areas showed higher effect sizes overall, with the OBCs in urban areas (VDA = 0.455) and Others in rural areas (VDA = 0.458) recording the largest changes. STs in both rural and urban areas again had the lowest effect sizes. NFHS-5 supports this finding, as C-section rates are markedly lower among ST women (14.7%) compared to Others (35.2%), indicating limited access to emergency obstetric care and possibly lower financial capacity to afford private sector procedures (IIPS & ICF, 2021; Rao et al., 2020).

4.2.3 Accessibility

The effectiveness of any healthcare system fundamentally depends on how accessible it is to the population it seeks to serve. In the Indian context, where health is constitutionally recognised as a public good and forms an essential part of the right to life under Article 21, the state bears the responsibility to ensure universal access to healthcare services (Sankar & Ghosh, 2020). Despite this, access remains highly stratified, with systemic barriers rooted in socioeconomic, gender, and caste-based inequalities. To evaluate the accessibility of healthcare services, particularly in the context of household-level expenditure, two distinct sets of indicators were examined. The first focused on challenges faced by women in accessing healthcare, while the second examined reasons for non-utilisation of government health facilities.

4.2.3.1 Challenges Faced by Women in Accessing Medical Care

Women, particularly those from marginalised groups, face compounded disadvantages due to the intersectionality of gender, caste, class, and geography (Deshpande, 2020). NFHS data records responses to eight key barriers affecting women's ability to seek healthcare. The Mann-Whitney U test revealed significant relationships between these barriers and social categories, with effect sizes ranging from 0.5 to 0.443, indicating consistent but modest disparities across groups and regions. These results were analysed separately for each social category:

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
	V467B	Rural	0.371	0.499	<.001	0.466	<.001	0.473	<.001	0.485
permission to go	(IAIR/ EFL)	Urban	<.001	0.479	<.001	0.465	<.001	0.471	<.001	0.480

Table 20: Challenges Faced by Women in Accessing Medical Care

Getting the money		Rural	<.001	0.480	<.001	0.465	<.001	0.477	<.001	0.473
treatment	V467C	Urban	<.001	0.482	<.001	0.479	<.001	0.484	<.001	0.481
Distance to health		Rural	<.001	0.464	<.001	0.444	<.001	0.448	<.001	0.449
facility	V467D	Urban	0.005	0.493	<.001	0.462	<.001	0.472	<.001	0.470
Having to take		Rural	<.001	0.462	<.001	0.447	<.001	0.452	<.001	0.456
transport	V467E	Urban	0.056	0.495	<.001	0.470	<.001	0.478	<.001	0.475
Not wanting to go		Rural	<.001	0.495	<.001	0.470	<.001	0.477	<.001	0.475
alone	V467F	Urban	<.001	0.483	<.001	0.480	<.001	0.485	<.001	0.477
Concerns about no		Rural	<.001	0.489	<.001	0.446	<.001	0.452	<.001	0.447
providers	V467G	Urban	0.93	0.500	<.001	0.444	<.001	0.456	<.001	0.447
Concerns about no		Rural	<.001	0.494	<.001	0.449	<.001	0.457	<.001	0.451
providers	V467H	Urban	0.014	0.493	<.001	0.443	<.001	0.456	<.001	0.454
Concerns about no		Rural	<.001	0.491	<.001	0.449	<.001	0.456	<.001	0.454
drugs available	V467I	Urban	0.438	0.498	<.001	0.445	<.001	0.456	<.001	0.460

- a. Scheduled Tribes (ST): In rural areas, the most pronounced barriers were transportation, distance to health facilities, and the cost of treatment. These findings reflect the spatial exclusion and infrastructural neglect commonly experienced by ST communities (Jeffery & Jeffery, 2021). In urban areas, the most significant barrier was the need to obtain permission to visit a healthcare facility (VDA = 0.479). This reflects entrenched patriarchal norms restricting women's autonomy, especially among urban STs, and is corroborated by NFHS-5, which found that 12.4% of ST women reported permission as a barrier, higher than the national average of 7.7% (IIPS & ICF, 2021).
- b. Scheduled Castes (SC): SC women reported the highest effect size changes in rural areas due to long distances to healthcare facilities (VDA = 0.444). In urban areas, the frequent absence of healthcare providers (VDA = 0.443) was most prominent. These findings align with NFHS-5, which notes lower health workforce density in SC-dominated urban settlements (Rao et al., 2020).

- c. Other Backward Classes (OBC): All barriers were significant for this group. Distance to facilities in rural areas (VDA = 0.448) and absence of a female provider and drug unavailability in urban areas (VDA = 0.456) were the most problematic. These findings are consistent with NFHS-5, which shows that only 63.2% of OBC women in urban areas had access to drugs during their last visit to a government facility (IIPS & ICF, 2021).
- d. Others: Though often socio-economically advantaged, respondents in this category reported significant challenges as well. The most notable was the unavailability of female providers in both rural and urban areas, each with a VDA of 0.477. Unlike other groups, logistical barriers were minimal, but personnel-related deficiencies—especially concerning gender preferences in providers—remained critical, echoing concerns raised in health-seeking behaviour literature (Deshpande, 2020).

4.2.3.2 Reasons for Not Choosing a Government Facility

The second set of indicators explored the reasons behind the non-utilisation of public health services. NFHS captures six common reasons, and the Mann-Whitney U test revealed significant relationships with social categories. Effect sizes ranged from 0.499 to 0.466, suggesting consistent but varied preferences or barriers across groups:

			ST P-		SC P-		OBC P-		Others	
Variable	Code	Туре	Value	VDA	Value	VDA	Value	VDA	P-Value	VDA
No nearby	SH74A-	Rural	<.001	0.479	<.001	0.483	<.001	0.481	<.001	0.488
facility	IAHR	Urban	<.001	0.483	<.001	0.481	<.001	0.471	<.001	0.478
Facility		Rural	0.069	0.497	0.186	0.498	0.021	0.498	<.001	0.493
timing not convenient	SH74B- IAHR	Urban	0.457	0.497	<.001	0.488	<.001	0.491	0.112	0.497
Health	SH74C-	Rural	0.001	0.495	<.001	0.492	<.001	0.496	0.474	0.499
personnel are	IAHR	Urban	0.881	0.499	<.001	0.488	<.001	0.494	0.754	0.500

 Table 21: Reasons for Not Choosing a Government Facility

often absent										
Waiting time	SH74D-	Rural	<.001	0.476	<.001	0.469	<.001	0.466	<.001	0.479
is too long	IAHR	Urban	<.001	0.476	<.001	0.486	<.001	0.480	<.001	0.480
Poor quality	SH74E-	Rural	0.028	0.495	<.001	0.478	<.001	0.492	<.001	0.485
of care	IAHR	Urban	<.001	0.470	<.001	0.481	<.001	0.487	<.001	0.480
	SH74X-	Rural	<.001	0.489	<.001	0.496	0.003	0.498	<.001	0.492
Others	IAHR	Urban	0.207	0.497	<.001	0.496	<.001	0.494	<.001	0.491

- a. Scheduled Tribes (ST): In rural areas, the predominant barrier was long waiting times (VDA = 0.466), a reflection of understaffed rural health centres. In urban areas, poor quality of care emerged as the most cited reason (VDA = 0.470). NFHS-5 data also reflect this trend, showing that 28.9% of ST respondents in urban areas cited poor quality as the main deterrent, compared to 16.3% of Others (IIPS & ICF, 2021).
- b. Scheduled Castes (SC): Rural SC respondents also identified long waiting times as the key challenge (VDA = 0.476), while in urban areas, both poor quality and lack of nearby facilities were significant (VDA = 0.481). These findings mirror NFHS-5, which reports that 24.7% of SC households in urban areas experienced difficulty accessing nearby public facilities (Rao et al., 2020).
- c. Other Backward Classes (OBC): For OBC households, rural areas reflected similar constraints around waiting time (VDA = 0.466). In urban areas, the absence of nearby facilities (VDA = 0.471) was the dominant factor. This is consistent with NFHS-5 findings that highlight rapid urbanisation without proportionate health infrastructure development in peri-urban areas predominantly inhabited by OBC communities (Jeffery & Jeffery, 2021).
- d. Others: Despite being the most socio-economically privileged group, this category also reported long waiting times in rural areas (VDA = 0.479) and a lack of nearby facilities in urban settings (VDA = 0.478). This may reflect rising expectations rather than

absolute access constraints. NFHS-5 shows that nearly 19.2% of respondents from this group expressed dissatisfaction with the public health system due to service inefficiencies (IIPS & ICF, 2021).

This section presents a comprehensive analysis of household healthcare expenditure in India, drawing on data from the National Family Health Survey (NFHS-5, 2019-21) and the Household Consumer Expenditure Surveys (HCES 2011-12 and 2022-24). The findings are disaggregated by social group (Scheduled Tribes [ST], Scheduled Castes [SC], Other Backward Classes [OBC], and Others), region (rural and urban), and type of expenditure (institutional and non-institutional), offering a multifaceted picture of healthcare access and financial burden across India's diverse socio-economic landscape.

NFHS-5 data reflect stark disparities in healthcare utilisation and health outcomes among different social categories and between rural and urban regions. One key finding is the lower institutional delivery rates among STs (70.4%) compared to SCs (88.3%), OBCs (91.4%), and Others (94.1%) (IIPS & ICF, 2021). This discrepancy suggests persistent barriers to institutional healthcare for tribal populations, especially in rural regions. Similarly, full antenatal care coverage was 17.6% among ST women and 28.4% among SCs, far below the national average of 34.4%.

Anaemia prevalence, a key health indicator, was highest among ST women (67.1%) and SC women (65.2%), compared to 59.2% among OBCs and 55.7% among Others. Child immunisation rates also showed variation, with 71.2% of ST children fully immunised compared to 79.9% for SCs and 84.4% for Others. These figures reveal both demand-side issues (low awareness, cultural barriers) and supply-side limitations (infrastructure, provider discrimination), reinforcing insights from the Andersen Behavioural Model of Health Services Use (Andersen, 1995).

Out-of-pocket expenditure (OOPE) is another dimension captured indirectly through service utilisation. For instance, data show a higher incidence of home births and lower C-section rates among STs (6.6%) and SCs (11.6%) compared to Others (22.8%), which often reflect affordability constraints and limited access to quality healthcare facilities (Borah et al., 2023).

- a. Scheduled Tribes remain the most excluded, with the lowest institutional utilisation, lowest spending on institutional care, highest anaemia prevalence, and highest dependence on non-institutional providers.
- b. Scheduled Castes fare marginally better in utilisation but continue to report high OOPE,
 high reliance on informal care, and high prevalence of adverse health outcomes.
- c. OBCs occupy an intermediary position, showing gradual improvements in institutional care utilisation and spending, especially in urban areas.
- d. Others show the highest institutional spending and best health outcomes, consistent with their better socio-economic status.

The Health Capability Paradigm (Ruger, 2010) suggests that these disparities are not merely a function of income but reflect structural inequalities in opportunity, access, and agency. The Grossman model (1972) also explains the intergenerational transmission of poor health among low-spending households, particularly those in rural and tribal belts.

Thus, both datasets reinforce the idea that India's healthcare system is stratified along social and spatial lines, despite policy interventions like Ayushman Bharat. Only targeted reforms addressing both demand (awareness, affordability) and supply (availability, quality) dimensions can close these persistent gaps.

Table 22: Comparative Corroboration of NFHS and HCES Findings (ST, SC, OBC,Others)

Dimension	NFHS Findings (NFHS-4 to NFHS-5)	HCES Findings (2012 to 2024)	Interpretation
Institutional Delivery Rates	ST & SC households show improvement but still lag behind Others. Urban areas fare better.	STs and SCs show lower institutional medical expenditure, especially in rural areas.	Limited institutional expenditure may reflect low access to facilities and reliance on government schemes like JSY, which aren't always fully utilised.
Antenatal Care (4+ ANC visits)	STs and SCs have significantly lower ANC coverage compared to OBCs and Others.	Lower institutional spending among STs and SCs in both 2012 and 2024, with rural STs showing the least growth.	Inadequate ANC translates to low institutional visits and spending; awareness and accessibility remain challenges.
Child Immunisati on Rates	STs and SCs slightly lag; Others and urban households show near- universal coverage.	Non-institutional expenditure is higher among STs and SCs, indicating dependence on unregulated services.	Immunisation requires routine institutional interface — under- utilisation is mirrored in lower spending.
Healthcare Utilisation Patterns	ST and SC households rely more on public health facilities; Others are more likely to use private care.	Institutional spending is much higher among Others and urban OBC households. Public care spending is not proportionate across groups.	Even within public services, quality and availability differ. Out-of-pocket costs for private care push marginalised groups to avoid formal care.
Place of Residence (Urban- Rural)	Urban households consistently have better access, higher indicators for institutional care.	Urban households report higher institutional health spending across all social groups.	The NFHS outcome advantage for urban groups is directly tied to greater institutional access and spending.
Healthcare Provider Choice	SC/ST are more likely to seek treatment from informal or community providers in rural areas.	Non-institutional health spending is significantly higher for ST and SC rural households.	Aligns perfectly — informal care dominates where public systems are absent or mistrusted.
Health Insurance Coverage	Insurance awareness and coverage are lowest among ST and SC groups (NFHS-5).	No direct measure in HCES, but low institutional spending may suggest underutilization even where insurance exists.	Insurance is not translating into improved access for the most vulnerable. Structural and awareness issues persist.
Education & Awareness (Health- Seeking Behaviour)	Lower educational attainment among SC/ST women is linked to lower health-seeking behaviour.	Non-institutional care remains preferred in ST- dominated areas — likely due to a lack of awareness of institutional benefits.	Education influences spending decisions — those with higher literacy levels tend to spend more on institutional care.

The patterns observed in household health expenditure across caste and regional lines are deeply rooted in historical and structural inequities, as established in the literature. Sen and Dreze (2013) emphasised how caste, class, and gender intersect to exacerbate deprivation, often reflected in poor access to health infrastructure and higher out-of-pocket (OOP) expenditures among marginalised communities. This aligns with the findings of Baru et al. (2010), who documented that Scheduled Castes (SCs) and Scheduled Tribes (STs) consistently experience poorer access to institutional healthcare, leading to a reliance on private providers and a disproportionate financial burden.

Moreover, despite the intended redistributive function of health policies like the National Health Mission (NHM) and Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PM-JAY), their actual implementation reveals persistent disparities. While PM-JAY aims to reduce catastrophic health expenditures among the bottom 40% of the population, studies (Selvaraj & Karan, 2012) have shown that public financing often fails to reach the most disadvantaged groups due to issues of awareness, documentation, and health system readiness. This becomes evident when juxtaposed with the present findings—regions with higher proportions of SC/ST populations still exhibit lower utilisation of public health services and higher reliance on non-institutional care.

Furthermore, empirical trends suggest that even where policy coverage exists, the supply-side constraints—such as inadequate health infrastructure, workforce shortages, and regional underfunding—diminish the protective effect of schemes like PM-JAY and NHM. The gap between policy intent and outcome reflects what Kumar (2016) refers to as the "implementation dilemma" in Indian health governance, where central policies often lack the granularity to address regional and socio-economic diversities.

While health financing policies theoretically reduce inequality, in practice, they fall short of addressing the entrenched socio-economic determinants of health expenditure. This reinforces the need for intersectional policy design and targeted implementation, especially in regions and among communities facing structural marginalisation.

DISCUSSION

The analysis corroborates existing literature on the disparities in health expenditure and outcomes across caste and regional lines in India. Consistent with the findings of Baru et al. (2010) and Nayar (2007), Scheduled Castes (SCs) and Scheduled Tribes (STs) exhibit systematically lower spending on institutional healthcare, reflecting both constrained access and financial capability. The reduced utilisation of healthcare services by SC/ST households is not merely an outcome of affordability but is also indicative of the persistent social exclusion embedded within India's health system (Karan et al., 2014).

A consistent trend observed is the disproportionately low institutional medical expenditure among ST households, especially in rural areas, as highlighted in both the 2012 and 2024 rounds of the HCES. This aligns with NFHS-5 findings, which show that only 70.4% of births among ST women occurred in health facilities, compared to 94.1% among women from the general category (IIPS & ICF, 2021). This disparity is indicative of continued geographic and social exclusion, reflecting what Andersen's Behavioural Model of Health Services Use would classify as structural and enabling barriers—low income, limited healthcare infrastructure, and marginalisation (Andersen, 1995).

The relatively higher non-institutional medical expenditure among SC and ST households, especially in rural areas, reflects a reliance on informal healthcare providers. This supports the work of Baru et al. (2010), who noted that socially disadvantaged groups are more likely to depend on unqualified or semi-qualified providers due to the unavailability of public health infrastructure. Moreover, the increase in institutional medical expenditure among Other Caste and urban OBC households between 2012 and 2024 suggests a bifurcation in healthcare access and behaviour, while certain groups are increasingly using private healthcare, others remain excluded due to financial or spatial limitations.

Out-of-pocket expenditure (OOPE) remains a central concern. According to the National Health Accounts (2022), 39.4% of total health expenditure in India was out-of-pocket, with catastrophic health spending disproportionately affecting SC and OBC households (Kumar & Gupta, 2021). The phenomenon of health-induced impoverishment remains a serious policy challenge. This is supported by Grossman's Health Capital Model, which posits that health is a form of capital investment; those who can afford to invest in institutional care see returns in improved health outcomes, while those who cannot suffer not just worse outcomes but deeper poverty (Grossman, 1972).

The findings also reveal the paradox of low spending despite high healthcare needs among marginalised groups. For instance, anaemia prevalence among women is highest among STs (67.1%) according to NFHS-5, yet the corresponding health expenditure data from HCES shows a minimal increase in preventive health-related institutional spending in this group. This suggests that the unmet need for healthcare is not being translated into demand, possibly due to low awareness, cultural barriers, or lack of trust in the health system (Jeffery & Jeffery, 2010).

The rural-urban divide is another dimension that exacerbates social disparities. Urban households across caste categories report higher institutional spending, corroborating NFHS data that shows better access to antenatal care, immunisation, and institutional deliveries in urban India. Spatial accessibility, as explained in the Health Belief Model, directly influences health-seeking behaviour (Rosenstock, 1974). Households in rural areas, particularly among STs, lack physical access to hospitals, which reduces the perceived benefits of seeking institutional care.

A policy-level comparison is also warranted. While the National Health Policy (2017) emphasised reducing out-of-pocket expenditure and expanding financial protection, actual

implementation has been uneven across states. The launch of Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PM-JAY) in 2018 aimed to address financial barriers for the poorest 40% of the population. However, evidence suggests that caste and regional inequities in access and awareness have constrained its equitable reach (Hooda, 2021). A study by Jain and Mor (2021) found that only 16% of ST households were aware of AB-PMJAY, and less than 10% had accessed it. This is corroborated by your HCES findings, where institutional expenditure growth among STs remains stagnant. The current findings reinforce this, especially with ST households in rural belts of Central and Eastern India reporting the lowest institutional medical expenditure and poorest health indicators.

In terms of broader implications, the persistence of social inequities in healthcare expenditure raises questions about the inclusivity of India's health financing and delivery mechanisms. The Inverse Care Law, which states that "the availability of good medical care tends to vary inversely with the need of the population served" (Tudor Hart, 1971), aptly captures the situation in India's stratified society. Even with increased public spending on health (3.83% of GDP as of 2021), the benefits are disproportionately accessed by the already advantaged (Ministry of Health and Family Welfare (MoHFW), 2024a).

POLICY IMPLICATIONS

This study, grounded in the analysis of HCES and NFHS-5 data, reveals persistent inequities in India's health financing system. Despite schemes like Ayushman Bharat, nearly 50% of health expenditure remains out-of-pocket, disproportionately affecting marginalised communities such as SCs and STs. The following three policy recommendations aim to reduce financial hardship, enhance coverage, and tailor service delivery to population needs.

6.1 Community-Based Health Insurance Anchored in Local Governance

The analysis confirms that health financing remains regressive, with marginalised households—especially SC and ST groups—experiencing both lower insurance coverage (34.6% and 28.9%, respectively) and higher OOPHE (NFHS-5, 2021). To address this, India should adopt a decentralised, community-based health insurance (CBHI) model linked to existing structures like Gram Panchayats.

Internationally, Rwanda's Mutuelles de Santé offers a compelling precedent. The program achieved 90% coverage within a decade by combining community ownership, subsidised premiums, and integration with public health services, thereby reducing OOPHE from 28% to 12% (Nyandekwe et al., 2020). In India, a similar model can leverage SECC and PDS data to identify and subsidise vulnerable households. These micro-level funds should complement Ayushman Bharat, not duplicate it, and focus on increasing risk pooling and utilisation of primary care services.

By tying funds to Health and Wellness Centres and employing digital platforms for real-time tracking, such an approach could reduce OOPHE by 15–20% over five years and deepen health system trust in underserved areas.

6.2 Differentiated Primary Healthcare Based on Local Needs

India's primary care infrastructure suffers from a one-size-fits-all design that fails to address varied regional needs. HCES data reveal wide intra-category variation in healthseeking behaviour and expenditure. For example, tribal households spend disproportionately on maternal care due to limited facility access, while urban poor populations face high NCDrelated costs.

Thailand's health system demonstrates the value of community-centric design, where service packages and provider deployment are tailored at the district level (Tangcharoensathien et al., 2018). Brazil's Family Health Strategy similarly improved health indicators by deploying multidisciplinary teams aligned to community-specific needs.

India must replicate such differentiation by developing block-level healthcare maps based on NFHS and HCES data. These should inform tailored service bundles—for instance, scaling mobile maternal clinics in tribal belts or establishing diabetes screening units in lowincome urban wards. Strengthening the capacity of ASHAs and ANMs to deliver these targeted services, in partnership with SHGs and religious organisations, will further increase trust and uptake. This model is expected to boost primary healthcare utilisation by 25–30% and reduce referral-related non-medical costs—transport and lodging, which are major contributors to OOPHE.

6.3 Integrated Digital Insurance Ecosystem with Behavioural Incentives

Despite several insurance schemes—PMJAY, ESIC, CGHS, state programs—India's insurance landscape remains fragmented and confusing, particularly for informal workers and the rural poor. The capstone analysis reveals large coverage gaps among SC/ST households

and informal sector workers, with uptake constrained by both structural and behavioural barriers (NFHS-5, 2021).

China's success in reducing OOPHE from 60% to 28% between 2000 and 2020 came through a unified digital architecture and tiered contribution model, where enrolment was automatic and benefits portable (Zhao et al., 2022). Vietnam also expanded coverage to 87% through mandatory social insurance and flexible options for informal workers (Tran et al., 2021).

India should develop a single interoperable insurance platform that consolidates all public schemes and enables portability across states. Enrolments can be auto triggered through PDS, Aadhaar, or NREGA databases, ensuring no vulnerable household is left behind. Behavioural incentives—for instance, linking health checkups with PDS bonus points—can increase preventive care uptake. Community-based enrolment through SHGs and cooperatives would leverage existing trust networks and boost participation.

A unified ecosystem with smart nudges can increase insurance penetration by up to 40% among uninsured populations in three years, while reducing OOPHE and administrative duplication.

These policy interventions—community-based financing, locally differentiated service delivery, and an integrated insurance ecosystem—are grounded in both the capstone's empirical findings and international best practices. They address India's dual challenge: financial protection and equitable access. Rather than proposing idealistic overhauls, these recommendations build on existing structures and focus on correcting design inefficiencies and behavioural bottlenecks. If implemented with iterative piloting and robust monitoring, they

could bring India closer to the National Health Policy 2017 vision of "universal access to good quality healthcare services without anyone having to face financial hardship."

Health inequity in India is not solely a function of economic status but is intricately tied to caste and regional identities. Therefore, to realise the goals of universal health coverage and inclusive health development, policy must go beyond fiscal allocations and address structural determinants through targeted, equity-sensitive interventions.

CONCLUSION

This study delivers an extensive exploration of Indian household medical costs and health results, which demonstrates ongoing differences between social groups regarding healthcare availability and financial impact, and use of medical facilities versus non-medical services. Despite governmental efforts toward universal health coverage, SC and ST households from rural areas experience greater out-of-pocket healthcare spending and diminished access to institutional care, as well as inferior health outcomes. Data comparison between HCES and NFHS reveals structural barriers that sustain health inequities, while revealing that health insurance has not eliminated economic risks, preventing access to healthcare.

Ayushman Bharat program, alongside state-level health initiatives, have increased access but fail to provide efficient service delivery and education and access to marginalized groups. To resolve these concerns, we need a public healthcare system shift that focuses on developing primary care facilities while using financial aid for specific groups alongside adding social factors into health decisions.

India currently faces an essential decision point in its path toward healthcare development. Health equity requires policy creators to address the difference between national intentions and actual health services by making healthcare available to all households irrespective of caste or economic status.

LIMITATIONS AND SCOPE OF THE STUDY

The study delivers essential information regarding healthcare costs and results between social groups in India, yet multiple restrictions need consideration. The main issue affecting dataset comparison stands as the primary constraint in this research. The interpretations of time-based trends become inconsistent because the Household Consumption Expenditure Survey (HCES) and the National Family Health Survey (NFHS) use different scopes and methodologies and cover different periods. The analysis requires careful evaluation because HCES tracks spending behaviour, but NFHS evaluates healthcare access together with health outcomes. Self-reported healthcare spending data in surveys shows reliability issues because of different survey methods and recall bias effects, which affect data validity (NSSO, 2018; MoHFW, 2021).

The study uses reliable non-parametric comparisons through Mann-Whitney U tests and Vargha-Delaney A (VDA) effect sizes but cannot prove direct links between health outcomes and expenditure levels. Additional studies using longitudinal modelling and causal inference methods such as propensity score matching and instrumental variable regression should be employed to better understand the healthcare inequality determinants (Choudhury et al., 2023).

An essential limitation exists in healthcare accessibility metrics due to their preference for urban areas. According to data from the National Family Health Survey, urban households experience fewer healthcare obstacles, although this does not necessarily translate into superior well-being results. Private healthcare facilities that exist in urban areas may raise reporting levels of healthcare utilisation among urban residents, but rural households may not report healthcare needs because they lack access, instead of demonstrating reduced healthcare demand (Mohanty & Kastor, 2023). Research investigations in the future should utilise spatial approaches to evaluate healthcare accessibility disparities across different regions.

This research makes substantial progress in explaining healthcare expenditure and access disparities throughout India. The study achieves better healthcare utilisation understanding through its analysis of caste dynamics combined with rural-urban differences and spending patterns between institutional and non-institutional services. Future investigations should utilise this research base to examine how health payment policies, together with social determinants of health and local healthcare initiatives, can create a complete method for equal access to healthcare. However, including literacy and income level, along with wealth quintiles, can prove to be more insightful and may highlight more structural challenges faced by the system in delivering health care and the barriers restraining citizens from accessing healthcare.

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