



An Economic Evaluation of Public Health Expenditure and Out-of-Pocket Expenses: Evidence from Andhra Pradesh

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Abstract

Public health expenditure plays a transformative role in driving human capital development and sustainable macroeconomic growth. In Andhra Pradesh (AP), state-sponsored universal health insurance models—most notably the Dr. YSR Aarogyasri Scheme—have significantly reshaped the healthcare landscape by systematically targeting secondary and tertiary care for low-income and vulnerable households. However, the state's health ecosystem continues to contend with a complex dual challenge: rising fiscal commitments on the state exchequer and persistent, high Out-of-Pocket Expenditure (OOPE) driven by residual gaps in primary healthcare delivery and localized systemic friction. This paper examines the contemporary trends in public healthcare financing in Andhra Pradesh, evaluates its structural impact on mitigating catastrophic household health shocks, and explores the efficiency of public versus private infrastructure across its regional districts. Utilizing a combination of institutional secondary data metrics alongside primary microeconomic data collection frameworks, the study proposes structural policy reforms targeting robust primary health networks to achieve sustainable health and fiscal equity across the state.

Keywords: Public Health Expenditure, Health Economics, Aarogyasri Scheme, Out-of-Pocket Expenditure, Andhra Pradesh, Human Capital, Fiscal Sustainability.

1. Introduction

Health economics is fundamentally distinct from classical economic market structures due to widespread information asymmetry, heavy government interventions, and the critical presence of third-party payers. In developing economies like India, public investment in health behaves as a crucial merit good that directly dictates labor productivity, poverty alleviation, and long-term macroeconomic growth. When a population faces preventable morbidity or catastrophic health expenditure, the microeconomic consequence is an immediate drop in household savings and productivity, while the macroeconomic impact manifests as suppressed human capital accumulation.

Andhra Pradesh has historically positioned itself as a highly progressive state regarding public health interventions. With a total fertility rate (TFR) below replacement levels and notable milestones in reducing maternal and infant mortality, AP's indices outshine many national averages. Yet, sub-optimal health infrastructure access at decentralized regional levels forces a heavy, continuous reliance on the private sector, resulting in high out-of-pocket spending. This study offers an updated economic

critique of the fiscal allocations made toward healthcare in Andhra Pradesh, assessing whether current public delivery frameworks systematically match the scale of the state's welfare commitments.

2. Literature Review

The intersection of fiscal policy, health infrastructure, and household economic stability has been extensively studied within Indian public finance. Lakshmi & Sahoo (2013) demonstrated a significant positive elasticity between structured health infrastructure (beds, doctors, public clinics) and regional health outcomes in undivided Andhra Pradesh using a rigorous double-log regression model. At a broader macroeconomic scale, national tracking studies emphasize that despite National Health Policy targets to increase public health spending to 2.5% of GDP, real-term public provisions often lag behind escalating medical inflation.

Scholars examining state-sponsored insurance frameworks across southern states note that while tertiary-care insurance schemes cushion families against acute, unpredictable medical shocks, they frequently neglect underlying primary care infrastructure. This structural imbalance causes supplier-induced demand within empanelled private networks. Over time, without strict regulatory boundaries and cost-containment audits, public welfare funds risk turning into a massive drain on the state exchequer without systematically upgrading public healthcare assets.

3. Key Research Objectives

- To analyze the contemporary trends and structural composition of public expenditure on health in Andhra Pradesh.
- To evaluate the operational efficiency and economic impact of the state's public health insurance models on low-income groups.
- To propose targeted economic, regulatory, and policy measures to minimize household Out-of-Pocket Expenditure (OOPE) and avoid catastrophic health shocks.

4. Methodology & Data Sources

4.1 Research Design and Sampling Framework

This study employs an empirical, mixed-method research design combining a structural macroeconomic review of secondary data with a localized microeconomic primary field survey. To capture the ground realities of Out-of-Pocket Expenditure (OOPE) and public health accessibility, a Stratified Random Sampling technique was deployed across the YSR Kadapa District of Andhra Pradesh. The district was stratified into three distinct geographical zones: North, South, and Central. From each zone, a mix of urban areas (such as Kadapa Municipal Corporation) and rural mandals were selected. The final sample size ($N = 200$ households) represents a diverse socioeconomic cross-section, focusing specifically on low- and middle-income families holding Rice Cards (eligible for the Dr. YSR Aarogyasri Scheme).

4.2 Econometric Model Specification

To identify the core socio-economic determinants driving household Out-of-Pocket Expenditure on healthcare in the state, a Multiple Linear Regression Model is specified as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + u_i$$

Where:

- Y_i = Total annual household Out-of-Pocket Expenditure (OOPE) on healthcare (in INR).
- X_{1i} = Monthly household income (in INR).

- X_{2i} = Age of the head of the household (in years).
- X_{3i} = Choice of Healthcare Provider (Dummy variable: 1 if Private Hospital, 0 if Government Hospital/PHC).
- X_{4i} = Presence of Chronic Illness in the family (Dummy variable: 1 if Yes, 0 if No).
- X_{5i} = Aarogyasri Scheme Utilization (Dummy variable: 1 if the household availed cashless surgery in the past 12 months, 0 if No).
- β_0 = Intercept term representing base costs.
- β_1 to β_5 = Regression coefficients to be empirically estimated.
- u_i = Stochastic error term capturing unobserved individual variation.

4.3 Conceptual Definitions & Data Processing

Out-of-Pocket Expenditure (OOPE) refers to direct outlays made by households, including medical costs (doctor fees, prescription medicines, diagnostic scans, bed charges) and non-medical costs (travel, food, lodging for attendants) minus any institutional reimbursement. Catastrophic Health Expenditure (CHE) occurs when a household's total medical expenses exceed 10% of their total annual budget, forcing asset liquidation or debt accumulation. Primary survey data was tabulated, coded, and analyzed using SPSS/Stata software.

5. Discussion and Data Analysis

5.1 Trend of Fiscal Allocations vs. Fiscal Health

Andhra Pradesh's fiscal commitment to welfare has intensified considerably in recent years. However, the state's overall Fiscal Health Index (FHI) has faced persistent pressures, impacting the long-term predictability and structural deployment of public healthcare funds. While nominal capital spending on health infrastructure has risen, a massive proportion of revenue expenditure goes toward meeting operational salaries and sustaining insurance payouts, limiting the fiscal room for constructing new secondary or tertiary government medical colleges and super-specialty wings.

5.2 The Economics of the Aarogyasri Insurance Scheme

The flagship public health insurance model provides cashless treatment up to ₹5 lakh per family annually across thousands of medical procedures. The dual economic nature of this framework is analyzed systematically in Table 1 below.

Economic Strength / Benefit	Economic Challenge / Shortcoming
Comprehensive Safety Net: Covers nearly 96% of the state's population, drastically eliminating the immediate threat of asset-depletion or debt cycles for BPL families during critical surgeries.	Neglect of Primary Care: The insurance model does not address basic outpatient services, diagnostics, and routine medicines, which comprise a large portion of daily health costs.
Public-Private Synergies: Seamlessly leverages the private hospital network using online workflows and pre-authorizations to deliver immediate critical care.	Exchequer Strain & Dues: Non-revised procedure tariffs alongside delayed state reimbursements to empanelled hospitals risk operational logjams and service denials.

5.3 Microeconomic Distortions: Out-of-Pocket Expenditure (OOPE)

Despite near-universal health coverage, primary datasets confirm that actual out-of-pocket expenses remain a major issue. According to National Health Statistics, public institutions conduct only about 41.6% of institutional deliveries in AP, while 58.4% take place in private facilities. This high reliance on private delivery channels, even among low-income brackets, highlights a perceived or actual quality gap in secondary public health settings. The financial leakages are primarily centered on the procurement of diagnostic tests and medicines outside the public facility pharmacies due to stockouts.

6. Main Findings and Policy Recommendations

Based on the data analysis, the study puts forward three strategic recommendations for structural health reforms:

- **Prioritize Primary Level Infrastructure:** The government should focus on strengthening the newly institutionalized grading system for Primary Health Centres (PHCs) and Village Health Clinics. Ensuring constant availability of MBBS doctors, diagnostics, and free essential drugs will curb outpatient OOPE before it escalates into tertiary illnesses.
- **Rationalize Reimbursement Workflows:** To maintain high-quality private sector participation without risking fiscal stress, a sustainable, ring-fenced health fund must be established to clear hospital dues on time and prevent informal under-the-table charges.
- **Correcting Regional Variances:** Secondary care infrastructure is unevenly distributed across Rayalaseema and coastal regions; expanding full-fledged district hospitals across all newly carved districts will relieve pressure on private channels and provide localized equity.

7. Conclusion

Andhra Pradesh presents a highly compelling case study in health economics: it features highly progressive tertiary insurance safety nets alongside a vulnerable fiscal profile and high out-of-pocket costs at the grassroots level. Moving forward, the state must pivot from an exclusively insurance-centric curative framework toward an infrastructure-centric preventive model. Balancing these fiscal and welfare priorities will not only safeguard the state's financial health but will also secure a healthier, structurally more productive labor force.

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