

Morbidity And Out of Pocket Expenditure Among the Households of a Rural area of Kozhikode district, Kerala- A Cross-Sectional Study

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Abstract:

Introduction: Universal Health Coverage ensures access to quality healthcare without financial hardship. Even though Indian state Kerala has good achievements of health indicators, Out of Pocket expenditure remains a major concern. **Objectives:** To assess the prevalence of reported out-patient and in-patient morbidity, healthcare service utilization and to estimate the associated Out of Pocket expenditure. **Methods:** A Community based Cross Sectional study was conducted among 663 households (n=2371) of Chathamangalam Gram Panchayat, Kozhikode district. A multistage random sampling technique was used. Data on Out Patient (OP) and In Patient (IP) morbidity and expenditure, Health Insurance details were collected using a pre tested questionnaire. **Results:** Prevalence of OP and IP morbidity rate was 174 and 19 per 1000 population respectively. Private sector utilization was higher for both OP (53.4%) and IP (77%) care. OOPE for OP care at public and private care was ₹145 and 700 respectively. Highest Expenditure in public care was for medicines (₹500) and in private for investigations (₹1150). IP OOPE for public and private care was 600 and 5050 respectively. Highest Expenditure in public was for medicines (₹500) in private for investigations (₹1250). While 74.6% of households were enrolled in health insurance schemes, insured family incurred a median OOPE of ₹2625 compared to ₹4250 among the uninsured. **Conclusion:** OP and IP health care continue to impose huge financial burden on households in Kerala. Expanding financial protection to cover OP care and improving service delivery in the public sector are essential in achieving UHC.

Keywords: Health Expenditure, Health Insurance, Morbidity, Out of Pocket Expenditure, Universal Health Coverage

Introduction:

The World Health Organization (WHO) defines “Universal Health Coverage” (UHC) as access to essential, quality healthcare services along with financial risk protection, thereby promoting equity and efficiency across healthcare systems globally^[1]. It is the cornerstone of global health policy, aiming to ensure that all

individuals receive essential health services without suffering financial hardship. In line with this, “Sustainable Development Goal” (SDG) 3.8 calls for achieving UHC by ensuring financial risk protection and equitable access to quality essential healthcare services to which India is a signatory.^[2]

Quick Response Code	Access this article online	How to cite this article : Lakshmanan A, Thayyil J, Punathukandi S, Salm A. Morbidity and Out of Pocket Expenditure Among the Households of a Rural area Kozhikode district, Kerala- A Cross-Sectional Study: Healthline. 2026;17(2): 99-107
	Website : www.healthlinejournal.org	
	DOI : 10.51957/Healthline_833_2026	

Received : 22-03-2026

Accepted : 20-05-2026

Published : 23-07-2026

In India, a substantial proportion of the population continues to face financial hardship in accessing healthcare, as reflected in the high reliance on out of pocket expenditure as reported in the National Sample Survey Organisation's (NSSO) 75th round (2017–2018).^[3] The NITI Aayog has emphasized the UHC vision through various health system reforms focusing on expanding financial protection, strengthening primary healthcare, and reducing out-of-pocket expenditure.^[4] These include Public Funded Health Insurance (PFHI) schemes such as Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PMJAY) which was introduced in 2018, along with other state sponsored schemes aimed at reducing catastrophic health expenditures (CHE).^[5]

Kerala, one of the Indian states widely acclaimed for its outstanding public health achievements, continues to lead in NITI Aayog's Health Index among large states, owing to its low maternal and infant mortality, high literacy and life expectancy comparable to that of developed nations.^[4] Despite better access to healthcare services, a high proportion of households in Kerala continue to rely on out-of-pocket expenditure (OOPE) to meet healthcare needs. NSSO estimates suggest that 84% in rural areas and 80% of urban households depend on OOPE to meet hospitalisation costs.^[6] Rural households primarily depended on their household income or savings (80%) and borrowings (13%) to meet health expenditures. This finding suggests that despite strong health indicators and long-standing investments in public health, financial protection remains limited in the state. This persistent burden can be attributed to factors like cultural inflation of morbidity, the growing privatization of health services, rising drug prices, commercialization of care, and overuse of diagnostic technologies.^[6]

Despite the state's well-recognized achievements in public health and sustained investments in healthcare infrastructure, there exists a critical gap in latest household-level evidence of morbidity patterns, healthcare utilization and OOPE in Kerala following introduction of Public Funded Health Insurances (PFHI)

schemes. Such evidence is essential to identify healthcare access gaps and thus to improve financial protection mechanisms, thereby advancing UHC in both policy and practice. Therefore, the objectives of the study were to assess the prevalence of self-reported OP and IP morbidity, healthcare service utilization, estimate the associated OOPE and compare financial burden among households according to the status of any health insurance (HI) status.

Method:

A household level cross-sectional study was conducted in a rural area of Kozhikode district, Kerala, during January 2024 to December 2024. A multistage sampling technique was employed to select the study area and participants. In the first stage, one GP was selected from the 70 GPs in Kozhikode district using simple random sampling. The selection of a single Gram Panchayat was based on feasibility and the need for intensive household level data collection. The selected GP was Chathamangalam, which comprises 23 wards with a population of 46,000, and it has one Primary Health Centre (PHC) with six sub-centres and three private clinics.^[7] The availability of both public and private healthcare facilities was within accessible distance to the selected wards.

Sample size was calculated based on a morbidity prevalence of 42% from a previous study,^[8] with a 5% allowable error and 95% confidence level. A design effect of 1.95 was applied to account for clustering at the ward level. In the absence of prior local estimates of intra-cluster correlation, a value close to 2 was assumed, which is commonly used in community-based multistage sampling studies. The final sample size was rounded to 700. From the list of households obtained from the GP, 175 households were selected from each of the four selected wards using systematic sampling.

To select households, a random starting direction from the center of the ward was chosen by spinning a pen. And households along that direction were selected sequentially until the required number of houses from each ward was obtained. Permanent residents of the

households who had been residing for at least the past six months and were willing to participate were included in the study. Households unavailable even after two follow up visits, were excluded. House to house surveys were conducted by trained investigators using a pre-tested semi-structured questionnaire. After obtaining Informed consent, data were collected from the head of the household or a responsible adult including socio-demographic and enrolment in any HI, self-reported morbidity and health expenditure details of each household members.

OP Morbidity data were collected for a recall period of 15 days and IP morbidity data were collected for a recall for a period of 365 days. Morbidity was classified independent of healthcare utilization. OP morbidity included all self-reported illness episodes within the recall period, irrespective of whether care was sought, including self-medication and unmet need, while IP morbidity included episodes requiring hospital admission. Self-medication episodes were categorized as non-institutional care and were excluded from analysis of healthcare facility utilization. Multiple morbidity episodes reported by the same individual within the recall period were recorded and analyzed as separate episodes. Additional information included system of medicine utilized (Allopathy, Ayurveda, Homeopathy and Selfcare) and the type of healthcare facility used (public or private). Wherever available, data were verified by cross checking medical records, prescriptions and bills. In cases where records were not available, expenditure details were based on participant recall. Child birth related data were excluded as they represent planned healthcare utilization with distinct financing mechanisms, which could disproportionately influence OOPE estimates. Ethical clearance was obtained from the Institutional Ethics Committee and permission was secured from the local self-government authority.

Collected data were cross checked for completion and consistency to ensure reliability. and were entered in Microsoft Excel and analyzed using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY,

USA). Descriptive statistics were used to estimate prevalence of morbidity and summarize expenditure patterns. Prevalence of Morbidities were expressed per 1000 population (OP 15-day recall period, IP 1 year recall period). OOPE was calculated by summing the costs for doctor consultation, medicines, diagnostic or laboratory tests, and transportation, expressed in Indian Rupees (INR) and was summarized using the median and interquartile range (IQR). NCD related OP morbidity episodes were excluded from OOPE estimation due to their recurrent nature and potential to overestimate short term expenditure within the recall period.

Results:

A cross-sectional study was conducted among 700 households. Of these, 663 households (94.7%) comprising 2371 individuals participated in the study and were included in the final analysis. A total of 37 households were excluded, of which 12 households did not provide consent, 9 had incomplete data, and 16 were unavailable despite two follow up visits. The mean age of the study population was 32 ± 20 years (mean $\pm$ SD) with a slight female predominance (51.4%).

Out-Patient Care

Out of the total population, 413 OP morbidities were reported over 15 days recall period, corresponding to a rate of 174 per 1000 population. Multiple morbidity episodes reported by the same individual within the recall period were counted separately. Most frequently reported cause of OP morbidities were infectious diseases (76.9%) which included viral fever, respiratory tract infections (RTI), mumps, chickenpox, viral hepatitis, etc. Accidents and Injuries were constituted 7.6%. (Table 1) Of the total 413 OP morbidity episodes, 343 (83.1%) sought care from any health facilities, while 70 (16.9%) were managed through self-medication. Modern medicine was the most commonly utilized system (99.03%). Among those who sought care from a healthcare facility, 183 (53.4%) episodes were managed in private facilities, while 160 (46.6%) were managed in public facilities.

Table 1- Distribution of Self-reported Out Patient morbidities by type (15-day recall period)

Morbidities	Frequency	Proportion	Per 1000 population
Infectious Diseases*	318	76.9	134.1
Accidents & Injury	31	7.6	13.07
Others#	64	15.5	26.9
Total	413	100	174

* Also included Mumps (n=15), Chickenpox (n=7), Hepatitis A (n=26).

Skin allergies, Gastritis, Dental problems, gynaecological problems

Table 2 – Median OOPE for outpatient care in public and private facilities (in INR)

Component	Private OP (INR)		Public OP (INR)	
	Median expenditure	IQR (25 th –75 th percentile)	Median expenditure	IQR (25 th –75 th percentile)
Transportation	125	83.75-212.50	100	100-250
Consultation	200	113.75-512.50	100	150-300
Lab	1150	130-4482.50	300	200-800
Medicines	555	475-2600	500	300-2500
OOPE	700	450–1340	145	55–455

Table 3- Distribution of inpatient morbidities by type (1 year recall period)

Morbidities	Frequency	Proportion	Per 1000 population
NCDs	19	43.1	8.1
Infectious Diseases	15	34.2	6.3
Surgeries*	7	15.9	2.9
Accidents & Injury	3	6.8	1.2
Total	44	100	19

* Included Hernioplasty, Thyroidectomy, Cataract surgery

Table 4 - Median OOPE for inpatient care in public and private facilities (in INR)

Component	Private IP(INR)		Public IP(INR)	
	Median expenditure	IQR (25 th –75 th percentile)	Median expenditure	IQR (25 th –75 th percentile)
Transportation	500	400 – 5000	300	150 – 850
Consultation	300	300 – 475	200	10 – 550
Lab	1250	200 - 3250	300	500 – 1500
Medicines	1000	575 - 4000	500	300 – 2500
OOPE	5050	1510 - 13800	600	350 – 4200

Median OOPE for OP care was 145 (IQR: 55–455) in public facilities and 700 (IQR: 450–1340) in public and private facilities respectively. In public facilities, the cost of medicines (500) accounted for the highest share and in private facilities, it was for investigations (1150). (Table 2)

Inpatient Care

Over a one-year recall period, 44 IP morbidity incidents were reported with an incident rate of 19 per 1000 population. Of this, 77% were admitted in private facilities and only 23% were in public facilities. Cause of hospitalization in 43.1% were NCDs and 34.4% were infectious diseases. (Table 3)

Total OOPE for IP care was 600 (IQR 350 - 4200) and 5050 (IQR 1510- 13800) in public and private facilities respectively. In public facilities, cost of medicines (500) accounted for the highest share and in private facilities, it was for investigations (1250). (Table 4) Most of the surgeries were treated in private facilities and were not covered under any HI.

INSURANCE COVERAGE

Out of 663 households, 494 households (74.6%) were enrolled in some form of health insurance (HI) scheme, while 169 households (25.4%) had no HI coverage. The most commonly availed scheme was Pradhan Mantri Jan Arogya Yojana (PMJAY), a centrally sponsored scheme providing financial protection for secondary and tertiary inpatient care to economically vulnerable families, covering 298 households (44.9%). This was followed by Karunya Arogya Suraksha Padhathi (KASP), Kerala's state-integrated scheme extending PMJAY coverage for eligible beneficiaries, availed by 140 households (21.3%). Medical Insurance Scheme for State Employees and Pensioners (MEDISEP), a contributory insurance scheme for government employees and pensioners, covered 45 households (6.8%). Ex-Servicemen Contributory Health Scheme (ECHS), which provides healthcare services to ex-servicemen and their dependents, covered 2 households (0.3%), while Central Government Health Scheme (CGHS), meant for central government employees and pensioners, covered 1 household (0.1%). Private insurance coverage (Star Care) was reported by 8 households (1.2%). Participants who availed insurance had a median OOPE of 2625 for inpatient care compared to 4250 among uninsured households.

Discussion:

This cross-sectional study was conducted with objective to assess the prevalence of OP and IP morbidities and to estimate the associated OOPE with type of health care in a rural community

Out Patient Care

The present study reported a lower prevalence of OP morbidity compared to 245 per 1000 reported for

Kerala in the NSSO^[3]. This difference may be due to variations in study setting and sampling, including possible selection bias, as well as differences in health-seeking behaviour. It may also reflect underreporting or delayed care-seeking due to competing household priorities. In this study, 16.9% of morbidity episodes were managed through self-medication, which is higher than previously reported (<5%).^[3] Previous studies have also suggested that such practices may be influenced by economic constraints and increasing access to health information through informal sources.^[9,10]

In this study, similar to the findings reported from other Indian states, infectious diseases accounted for nearly three fourth of OP morbidities, with the most prevalent conditions being fever and RTI.^[8] In the year 2024 in which the study was conducted, there was an increased incidence of mumps in the area, reflecting a broader outbreak reported across the state, as evidenced by the Kerala State Surveillance Unit under Integrated Disease Surveillance Program (IDSP), which recorded 70,402 mumps cases state-wide in 2024.^[11] Similarly, this year also experienced a Hepatitis A outbreak in this area, similar to other districts, with 7423 reported cases at the state level.^[12] Public health experts described it as the “developmental paradox”, where the state is in the late epidemiological transition stage. This was followed by accidents and injuries, and other conditions like skin allergies, dental, and gynaecological problems (Table 1). The high prevalence of accidents is attributed to road traffic accidents with the increasing number of motor vehicles in the state 350/1000 population. The observed proportion of accidents and injuries in this study may be partly related to road traffic incidents; however, given the small number of cases and the localized study setting, these findings may not be directly comparable with state level estimates.

In the present study, more than half of OP care was sought from private facilities. This pattern is similar to the previous reported study done by Alayed A et al.^[6] In the study setting, both public and private healthcare facilities were accessible to the selected wards, allowing

individuals to choose between providers. The preference for private facilities observed in this study may reflect perceived advantages such as shorter waiting times and convenience.

Outpatient Care Expenditure

In this study, total OOPE for OP care was 422.5 with 145 in public facilities and 700 in private facilities respectively. Investigations (1150) were the major contributors to OOPE in private facilities compared to public facilities (lab: 300; medicines: 500), this could be due to over investigating for minor illness without indications. Whereas in public facilities major OOPE contribution was from medicine (500). This may be due to doctors prescribing medicines which were not available at public facilities and the limited availability of essential drugs in the public sector, leading patients to rely on other external sources^[20]

The higher out-of-pocket expenditure (OOPE) in private facilities was mainly driven by investigation costs, while in public facilities, medicines constituted the major share. This may be partly due to non-availability of certain drugs in public facilities, requiring out-of-pocket purchase. Broader factors such as drug pricing policies (DPCO 2013) and supply issues in systems like KMSCL have been reported in the literature, though not directly assessed in the study^[13]

Concerns regarding prescription practices, including inappropriate drug combinations and antibiotic use, as well as lack of standard treatment protocols and regulatory variations, have also been documented^[14–16] The OOPE estimated reflects direct medical expenditure during the 15-day recall period and does not capture the cumulative burden of recurrent morbidity.

Inpatient Care

The present study showed a hospitalisation rate of 19 per 1000 persons per year, which is lower than estimates reported by NSSO for India (29 per 1000) and Kerala (105 per 1000).^[3] The lower rate observed may also be influenced by factors such as underreporting or

limited external validity. We presume that the lower hospitalisation rate seen in the present study may not necessarily indicate a true reduction in morbidity and could be influenced by methodological and contextual factors. From an economic perspective, healthcare utilisation is known to be influenced by affordability and cost-related barriers, where individuals may delay or avoid seeking care due to financial constraints. This concept is well described in health economics literature; however, it was not directly assessed in the present study.

In our study, among the reported inpatient episodes, NCDs (43.1%) and infectious diseases (34.2%) constituted the major categories. These proportions reflect the distribution of causes among hospitalised cases in the study population and should not be interpreted as representing the overall disease burden.

Here more than three fourth of hospitalisations were in private hospitals. The higher utilisation of private IP services similar to OP may attribute to the growing trend of privatisation of health care in the state. This preference for private hospitals may be influenced by factors such as perceived accessibility, availability of services, and empanelment of private hospitals under PFHI schemes; Similar diversion of healthcare utilisation towards private facilities under existing HI schemes was reported in a study conducted by Smith KT et al.^[17] Another reason was according to their perceived aspirations people might also perceive better quality, quicker admission, and more personalised care in private settings, may influence this trend.

Inpatient Care Expenditure

The median OOPE for IP care in this study was higher in private hospitals (5050; IQR 1510–13800) compared to public facilities (600; IQR 350 – 4200), with high expenditure for laboratory investigations in private (1250; IQR 200–3250) and for medicines in public facilities (1000; IQR 575 – 4000), which was similar to OP care. These results are consistent with the NSSO data for Kerala, which reported a much higher average IP expenditure of 25,949 in private hospitals and 4,395 in public hospitals. The OOPE in public health

facilities are of concern, because government spends a huge amount for human, material resources at the expense of taxpayers.^[18] As per the National Health Accounts (NHA), the per capita public health expenditure in India is 2,590, accounting for only 24.4% of the total health expenditure; in Kerala it is 4338 which is 32.5% of total.^[19] Despite this, patients may still incur OOPE due to factors such as medicine unavailability, outsourcing of diagnostic services, and referrals to private pharmacies or laboratories, many of which function on a profit based model.

OOPE for IP care in the private sector was 5050 (1510–13800), possibly because patients were admitted for minor illnesses or discharged within a day to comply with insurance claim requirements. The maximum expenditure reported from public sector was 12,205 and from private sector was 51,500, and Variations in expenditure estimates may be influenced by differences in study setting, sample characteristics, and the number of hospitalization events captured in the present study.

In public hospitals, the major share of expenditure was on medicines (500; 300–2500), similar to the pattern observed for outpatient care, as explained in the section above. Despite the nominal availability of free care in government hospitals, hidden costs such as diagnostics and drug purchases contribute to the financial burden. These findings are similar to previous studies which indicate that even public sector services are not entirely free of cost.^[20]

Health Insurance Coverage

Present study revealed that nearly three-fourths of households were covered under some form of HI schemes, many of which primarily target economically vulnerable populations and predominantly cover inpatient services. The OOPE for IP care was 2625 among the insured, compared to 4250 among the uninsured which showed that HI schemes have some protection. Although the OOPE was relatively lower for the insured who belongs to BPL category, they still incurred substantial OOPE, indicating that they also suffer high financial burden and are not fully protected.

In the present study, households enrolled in health insurance schemes incurred relatively lower OOPE for inpatient care compared to the uninsured; however, a substantial financial burden still persisted, indicating only partial financial protection. The findings also showed that outpatient care contributed considerably to household expenditure despite high insurance enrolment, as most schemes primarily covered inpatient services.^[3,24]

As seen in our study, OP care, which constitutes a major portion of health spending, remains excluded from health insurance coverage. Without financial protection for OP services, the burden of OOPE is likely to persist, especially for low-income households.

Since OP expenditure may occur repeatedly throughout the year, the annual OP expenditure could be substantially higher than IP expenditure. If 15-day OP morbidity rate of 145 per 1000 is extrapolated over 24 recall period, the annual burden becomes 10,152 (423×24), which exceeds IP expenditure associated with a rate of 19 per 1000.

Conclusion: The present study found that the prevalence of outpatient (OP) and inpatient (IP) morbidity was 174 and 19 per 1000 population, respectively. Utilization of private healthcare facilities was higher for both OP and IP care. Out-of-pocket expenditure (OOPE) was higher in private facilities compared to public facilities for both OP and IP services. A substantial proportion of households were covered under health insurance; however, OOPE remained considerable among both insured and uninsured households.

Limitations: Since data on OP and IP care were collected retrospectively, there is a possibility of recall and information bias, particularly for minor ailments and undocumented expenditures. The study relied on self-reported morbidity and expenditure data, which may be subject to reporting bias despite efforts at verification. The use of different recall periods for OP (15 days) and IP (1 year) morbidity may also influence comparability. Exclusion of NCD related OP morbidity and childbirth-related expenditure may have led to underestimation of

overall OOPE. As the study was conducted in a single Gram Panchayat, the findings have limited generalizability and may not represent the entire district or state. Additionally, the cross-sectional design limits causal interpretation of the observed associations

Recommendation:

PFHI policies should be broadened to include OP care expenditure also. Based on the findings of this study, there is a need to explore strategies to reduce OOPE, particularly for outpatient care, including consideration of expanding financial protection mechanisms such as insurance coverage for OP services, along with strengthening service availability in public healthcare facilities.

Declaration:

Conflict of Interest: None declared

Funding: Nil

Use of AI: The authors haven't used any generative AI or AI assisted technologies in the writing process.

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