



Review on Burden of Treatment- The Kerala Scenario

Resmi.R

Research Scholar, Department of Economics, University of Kerala, Thiruvananthapuram.

Abstract

The cost of healthcare services has become a significant concern worldwide, with particular emphasis on understanding its impact on patients. This article presents a comprehensive review and analysis of the cost of treatment in Kerala based on some studies conducted in the state. Through a systematic examination of various studies, this review aims to shed light on the current state of healthcare expenses in Kerala and provide valuable insights into the factors influencing treatment costs. By collating data from diverse sources, this study offers a comprehensive perspective on the financial aspects of healthcare in Kerala. Findings from the review reveal significant variations in treatment costs across different healthcare facilities and regions within Kerala. Factors such as the type of treatment, type of disease, healthcare infrastructure, medical technology, and geographical location were found to be influential determinants of cost disparities. Furthermore, the review underscores the impact of socioeconomic factors, such as income levels, insurance coverage, and affordability, on patients' ability to access and afford necessary healthcare services. These findings emphasise the need for targeted interventions to address financial barriers and ensure equitable healthcare access in Kerala. This review analysis provides healthcare policymakers, practitioners, and researchers with valuable insights into the cost dynamics of treatment in Kerala. By understanding the factors influencing treatment costs, stakeholders can make informed decisions to enhance the affordability, efficiency, and quality of healthcare services in the state. Through this review analysis, it also aims to highlight the need for further research and policy initiatives to address the challenges associated with healthcare affordability and accessibility in the region, ultimately aiming to improve the overall well-being of the population.

Keywords: Cost of Treatment, Affordability, Well-Being

INTRODUCTION

Kerala, the southernmost state in India, has achieved unique developmental experiences that have attracted worldwide attention. In terms of social indicators and human development, Kerala holds an exceptional position. Kerala has made outstanding progress in the area of health, as evidenced by health outcomes that are on par with those of developed countries worldwide. As per the National Human Development Report, 2021, the state enjoyed a HDI score of 0.752 with a health index score of 0.834 (National Human Development Report, 2021). Kerala has gained recognition for its high-quality healthcare system for the last few decades. It can be seen in the state's performance that it is better than the rest of India in terms of life expectancy, infant mortality, maternal mortality, and other health indicators. The easy accessibility and availability of medical care services have also significantly shaped Kerala's favourable health status (Shyni, 2015).

Background of the study

Along with the achievements of healthcare statistics, the state faces some challenges, like the emergence of new infectious and communicable diseases with a high prevalence of non-communicable diseases. In Kerala, a significant proportion of adults have chronic morbidities, particularly those associated with chronic morbidities like hypertension, diabetes, and atherosclerosis, which are known to develop complications such as cardiac disorders and kidney failures (Muraleedharan and Chandak, 2021).

Table 1**Number of reported cases among the major communicable diseases in Kerala**

Disease	2013	2014	2015	2016	2017	2018	2019	2020 up to August	
Denguefever	7938	2548	4114	7218	21,993	4090	4651	2420	
Malaria	1634	1751	1549	1540	1,192	908	656	132	
Chikungunya	247	264	152	124	54	76	109	411	
Japanese Encephalitis	2	3	0	1	1	5	11	0	
Leptospirosis	814	1075	1098	1710	1,408	2079	1211	568	
Hepatitis-A	6166	2833	1980	1351	988	1369	1620	407	
Cholera	20	8	1	10	8	9	9	2	
Typhoid	2930	1955	1772	1668	3,144	109	27	15	
Diarrhea	411819	442109	467102	493973	463,368	540814	544027	194193	
Scrub typhus	68	433	1149	633	340	400	579	321	
H1N1	32	62	900	22	1411	823	853	61	
Fever	OP	2922351	2655507	2676842	2641311	3,417,968	2935627	2862375	927950
	IP	119998	85959	96189	80049	109,974	59983	60080	15898

Source: Various Economic Reviews in Kerala (2013, 2014, 2015,2016,2017,2018,2019,2020)

The number of important communicable diseases reported in Kerala from 2013 to August 2020 is shown in Table 2. It shows that the number of communicable disease cases has varied from year to year. Fever cases are another noticeable thing because they demonstrate that the state's reported case count is consistently high. The existence of communicable diseases in the state shows the importance of high-quality healthcare services there.

Table 2**Number of reported cases of important non-communicable diseases in Kerala**

Diseases	Year				
	2016-17	2017-18	2018- 19	2019- 20	2020- 21
Diabetes Mellitus	62634	53379	63130	89727	30069
Hypertension	90682	82921	97456	138507	42102
Cancer	1424	971	1862	5159	2512

Source: <https://dhs.kerala.gov.in>, <https://aogyakeralam.gov.in>

From 2016 to 2021, there was a fluctuating pattern in the data for major non-communicable diseases such as diabetes mellitus, hypertension, and cancer. All of the diseases had an increase in reported cases from 2018 to 2020, as shown in Table 3. These health issues lead to multi-morbidity, which requires intensive care for conditions like neurological and cardiac-related illnesses. The

mentioned communicable diseases also contribute to lifestyle diseases like cardiac and neuro-related problems, necessitating tertiary care facilities for their specialised care. The greater frequency of these non-communicable diseases in Kerala places a great demand on highly advanced, specialised healthcare services. Tertiary healthcare services have been offering these skilled and advanced healthcare services. In the case of common and marginalised groups of society, the affordability and accessibility of tertiary healthcare are significant concerns. Due to its easy accessibility, the low-income groups in Kerala mostly rely on the public healthcare system for their treatment. But the privatisation of healthcare institutions, especially in tertiary care, has been booming to a large extent with a profit motive. Even though there are inequalities in accessing health care services between the two choices of private and public health care services in the state, Empirical studies are rarely found on the preference of poor people towards private health care services in Kerala (Rajagopal, 2010). People visit the private hospital at a huge level because the duration of hospitalisation is shorter if treated in a private hospital than in a government hospital (Dilip, 2008). It was noted that there is a strong willingness among these categories to access private health care services due to the efficiency of the health care services provided by them (Rajagopal, 2010). If the people are rational, the choice behind a particular service cannot be questioned in the background of their socioeconomic background. At the same time, the facilitation from the public hospital is not sufficient and is highly questioned by the beneficiaries. In this context, the affordability of healthcare services in Kerala deserves importance.

Studies on healthcare cost of treatment in Kerala

Health systems provide a variety of services that can improve human health conditions; however, the use of these services may lead to catastrophic health expenditures or impoverishment for households (Xu et al., 2003). Millions of people in the world can't access the required health services due to poor performance of the health financing systems by the government and the lack of affordability of the health service charges (Yousefi et al., 2014). The expenditures or expenses related to the treatment are mostly associated with the cost of treatments, with the categorization of direct and indirect costs. The direct costs refer to those costs incurred as a result of medical management of the disease, drugs, admissions, complementary tests, and patient transportation (Pato et al., 2011). Indirect costs refer to those costs incurred not as a result of medical management of the disease but rather of other incurred losses such as lost wages, lost productivity, and costs resulting from the need for home care and child care that would otherwise not be incurred (Pato et al., 2011).

To understand and analyse the economic aspects of healthcare services, various studies have been conducted to determine the cost of treatment in Kerala. Cost of treatment studies in Kerala provide valuable insights into the financial aspects of healthcare services, and they also play a crucial role in evaluating the affordability, accessibility, and efficiency of healthcare facilities in Kerala. Cost of treatment studies aim to examine the financial implications of healthcare services provided in Kerala. These studies analysed the expenses associated with medical procedures, hospitalisations, consultations, medications, and other healthcare-related components. Measuring the costs, the economic burden on patients, the effectiveness of healthcare policies, and areas for improvement are important. So in the wake of the cost of treatment, there is a need to review the studies based on the cost of healthcare that evolved in Kerala over the years. Different academicians from public health and wellbeing in the state have contributed their sketches of opinions on the cost of healthcare in different manners. The paper tried to sort out some of the important studies related to the cost of treatment in Kerala.

The studies are mainly focused on a primary survey-based approach; researchers collected the data through surveys administered to patients or beneficiaries. These surveys inquire about treatment costs, including hospital charges, consultation fees, diagnostic tests, medication expenses, and additional out-of-pocket expenditures. The studies also used secondary medical records to extract information regarding the services provided, associated costs, and the duration of treatment. This type of approach helps in obtaining accurate and detailed cost data. The case study method was also used by the researchers to select specific medical cases and analyse the costs associated with the treatment provided to those patients. This methodology provides in-depth insights into the financial aspects of particular diseases or medical conditions.

Review analysis

This section presents a comprehensive review of relevant studies, providing an insightful analysis of the existing research landscape. It aims to identify key findings and offer valuable insights for future policy implications related to the reduction of treatment costs.

Kerala, like any other region, has its own disease burden, which refers to the overall impact of various diseases on the population. Compared to the past, the state has witnessed several types of disease burden associated with non-communicable diseases (NCDs), infectious diseases, mental health disorders, maternal and child health, and lifestyle-related diseases. The state passes through multiple morbidity situations. Thejus et al. (2008) estimated the out-of-pocket expenditure for treating acute and chronic morbidity in the population in a paper titled "Morbidity and healthcare expenditure in Kerala". It was determined that Kerala's morbidity pattern (13.9%) is in a stage of transitional health, with a shift from communicable diseases (29/1000) to non-communicable diseases (102/1000), which require lifelong care. The rate of hospitalisation was 21/1000 per year. The majority paid for their own health needs out of pocket (56.5%) or with borrowed money (39%). The cost of healthcare is rising, which is making people poorer and increasing their indebtedness. To

reduce health expenditure costs, they suggest some of the measures that strengthen the public health system and implement regulatory mechanisms to control the private sector. Professional bodies should advocate for cost-effective diagnostic algorithms, case management protocols, and referral services. Community financing mechanisms, such as social insurance and health tax collection, can help reduce economic burdens and promote health-promoting lifestyles. Finally, local self-governments should also play a significant role in reducing the economic burden of illnesses and promoting healthier lifestyles.

Social class-related inequalities can have a significant impact on household health expenditure and economic burden. It is more visible in Indian society. A study by Mukherjee et al. (2011) entitled “Social class-related inequalities in household health expenditure and economic burden: evidence from Kerala, south India” examined caste-based inequalities in households’ out-of-pocket health expenditure in Kerala and provided evidence on the consequent financial burden inflicted upon households in different caste groups through a panel survey method. To assess health expenditure burden, households incurring high health expenses and their sources of finance for meeting health expenses were analysed in this paper. The paper also exposes the results that different caste groups have unequal access to high-quality healthcare, which is reflected in caste-based inequalities in household health spending. The households most impacted by this gap are those with substantial and ongoing healthcare needs. Families in the most disadvantaged castes who have a significant need for medical care need to be protected against skyrocketing medical costs. Funding for hospitalisation must get special attention, as this expense puts households most at risk in terms of mobilising financial resources. The proportionate extent of this cost to households and how the unrecognised financial burden of outpatient and hospitalisation expenses produces negative repercussions must be better understood in order to devise protection devices.

On the background of the severe financial impact on non-communicable diseases, Daivadanam’s (2012) paper entitled “Pathways to catastrophic health expenditure for acute coronary syndrome in Kerala: ‘Good health at low cost?’” outlined the direct and indirect pathways by which patients with Acute Aorony Syndrome (ACS) and their families are trapped in a vicious cycle of debt and poverty. Based on two case studies and a thematic analysis of field notes pertaining to 210 patients and their homes in Kerala, this study examined the several pathways to catastrophic health expenditure (CHE) for patients with acute coronary syndrome (ACS). The study also contradicts the widespread belief that only low-income families are vulnerable to catastrophic health expenditure, distress financing, and their aftereffects, and it emphasises the need for a more in-depth understanding at the micro level if Kerala and India as a whole are to successfully undertake the challenging task of achieving universal health coverage to successfully tackle its increasing non-communicable disease burden.

Acute Coronary Syndrome (ACS) is a major cause of death in coronary artery disease (CAD). ACS is a medical emergency that demands prompt diagnosis and treatment to minimise damage to the heart and prevent further complications. Coronary artery disease, including ACS, is a leading cause of mortality worldwide. Immediate medical attention is crucial for improving outcomes and reducing the mortality associated with ACS. So the treatment for this issue requires huge expenses all over the world. A paper by Daivadanam et al. (2012) titled “Catastrophic health expenditure and coping strategies associated with acute coronary syndrome in Kerala, India” estimated the magnitude of CHE and studied the strategies used to cope with catastrophic health expenditure. According to the study results, catastrophic health expenditure was experienced by 84 percent of participants as a consequence of treating ACS. Participants belonging to low socio-economic status (SES) were 15 times (odds ratio), whose jobs were adversely affected were seven times, who had no health security were six times, and who underwent any intervention were three times more likely to have CHE compared to their counterparts. The coping strategies adopted by the participants were loans (41%), savings (14%), health insurance (8%), and a combination of the above (37%). They summarised the study by saying that viable financing mechanism for treating ACS is warranted to prevent CHE, particularly among low-SES respondents, those with no health security, those requiring intervention procedures, and those with adversely affected employment.

Acute Exacerbation of Chronic Obstructive Pulmonary Disease (COPD) refers to a sudden worsening of respiratory symptoms in individuals with pre-existing COPD. It is characterised by increased breathlessness, coughing, and the production of sputum. Like any other non-communicable disease, acute exacerbations can lead to significant morbidity and mortality, requiring prompt medical intervention and management strategies. Veettil et al. (2012), in “cost of acute exacerbation of COPD in patients attending government hospitals in Kerala, India,” provide an estimate of the cost of acute exacerbation of COPD in patients attending tertiary-level government hospitals in Kerala. This study is a prospective observational study aimed at identifying different costs in the treatment of acute exacerbations of COPD for seven days under non-experimental conditions using a total of 120 eligible consenting patients. In this study, the data were based on existing information on the cost of the hospital and government rates for drugs and investigations. They found that the distribution of the total costs was 93% direct cost and 7% indirect cost. It also reveals that direct medical costs contribute 80% of the total cost. Although the medicine cost contribution to the total cost was only 9.1%, the total treatment cost was highly correlated with the severity of the disease. Finally, the study argues that the costs of management of acute exacerbations of COPD are exceptionally low in government hospitals in India compared to data obtained from developed countries.

Cancer is one of the most important causes of death and disability around the world. Today, developing nations dominate two-thirds of cancer-related mortality and more than half of newly diagnosed cancer patients. The incidence of cancer in Kerala has been a topic of research and study. The cost of cancer treatment can vary widely depending on several factors, such as the type and stage of cancer, the treatment modalities used, the duration of treatment, the geographical location, the healthcare facility, and the individual patient's insurance coverage. Nair et al. (2013), "Cost of Treatment for Cancer: Experiences of Patients in Public Hospitals in India," assessed the treatment pattern and expenditure incurred by cancer patients undergoing treatment at government tertiary hospitals in India, funded by central or state governments located in major cities of five states in India, namely Kerala, Maharashtra, Rajasthan, West Bengal, and Mizoram. The study was based on a primary survey with information related to direct costs, indirect costs, opportunity costs incurred on investigations and treatment, major sources of payment, and difficulties faced by patients during their course of treatment. Their finding mainly reveals that 75% of the patients faced financial problems, and 44% of the patients complained about the physical accessibility of the treatment. On this background, in their conclusion, they highlight the importance of involving the primary health care system in cancer prevention activities.

Hypertension is not only the most common but also one of the most important, modifiable risk factors for coronary heart disease, stroke, congestive heart failure, chronic kidney disease, and peripheral vascular disease (Institute of Medicine, 2010). Lal et al. (2014), in their paper titled "Cost Effectiveness of Treating Hypertension in an Urban Area of Kerala State, India," estimated the average monthly expenditure for treating hypertension in an urban setting and compared the cost-effectiveness of combination drug therapy over monotherapy. The primary data analysis was done through a personal interview and the measurement of physical parameters. The study found that blood pressure control was significantly associated with total monthly treatment expenditure. Combination therapy was found to be as cost-effective as monotherapy for hypertension control. The study also mentioned that the only significant study on the cost of treatment of hypertension in India was from the Department of Pharmacology, Postgraduate Institute of Medical Education and Research, Chandigarh, published in 2001.

Public healthcare institutions play a crucial role in Kerala's healthcare system. The disturbing trend in Kerala is the public health care system's growing alienation from the public since the 1980s. These institutions are characterised by accessibility, affordability, strong primary healthcare services, disease surveillance and control due to innovative policies, specialist care and tertiary services at no cost, research and training in various healthcare fields, and government initiatives and programs. But private healthcare services in Kerala are typically associated with higher costs compared to public healthcare. Affordability and accessibility can be challenges for certain segments of the population. Maneesh and Alaoui (2018), in their paper entitled "Pattern of health care expenditure of private and public: a case study of hospital patients in Kannur district, Kerala, India," assessed the healthcare expenditure of government and private hospital patients in Kannur district. The study examined the relationships between significant socioeconomic variables such as monthly income, age, gender, marital status, occupation, and health care expenditure. According to their findings, hospitals in both the private and public sectors have high direct health care costs. Finally, the study reached the conclusion that a government initiative is needed to protect the needs of the poor in terms of health care while those expenses continue to rise.

In order to reduce the burden of treatment in Kerala, the government introduced the Comprehensive Health Insurance Scheme (CHIS) in 2008. It was a pioneering initiative undertaken by the Government of Kerala to provide quality healthcare services to its citizens with the aim of ensuring accessible and affordable healthcare for all residents of the state, particularly those belonging to economically weaker sections of society. In this background, Narayanan and Kodali (2018) studied the out-of-pocket health expenditure (OOPE) and catastrophic health expenditure (CHE) among the beneficiaries of the Comprehensive Health Insurance Scheme in Kerala through a primary survey focused on its beneficiaries. In "Out of Pocket Health Expenditure and Catastrophic Health Expenditure among the Beneficiaries of Comprehensive Health Insurance Scheme in Kerala," it was found that 76.6% of beneficiaries had catastrophic medical expenses, and 100% of beneficiaries had OOPE. On the basis of this result, the study concluded that although the scheme improved the volume of healthcare used, it offered little protection against increasing healthcare costs and indirect expenses. It will be further strengthened through enhanced public health systems and changes to CHIS's policies.

A cross-sectional study was conducted by Dinesh et al. (2020) with the title "Economics of Cancer Care: A Community-Based Cross-Sectional Study in Kerala, India" to estimate the economic burden of cancer in Vypin Block Panchayat at Ernakulam by analysing the average total direct and indirect cost of cancer care, socioeconomic status, and cost of cancer care between government and private hospitals. The direct cost of cancer care contributed 75% towards the cost of treatment, the remaining was found to be indirect cost, and the loss of income (44%) contributed to the largest chunk of indirect cost. The study argues that the average direct cost of cancer care was higher than the average indirect cost. It found that the average total cost of cancer care was Rs. 34,378. It was pointed out that a significant statistical variation was found between the cost of cancer care in private and government hospitals. The economic burden of cancer in this Vypin Block Panchayat was found to be Rs. 218,256,977/-, and a high proportion of the population (27%) reported having sold their assets to meet the expenditure for cancer treatment. The authors recommend that additional funding be allocated in the budget for drug and disposable support for low-income patients, for promoting the establishment of super specialty hospitals across all states by

lowering the cost of land, electricity, water, taxes, furniture, equipment, drugs, and disposables, and for ensuring the emergence of new health institutions and high-quality care at affordable costs.

The availability, price, and affordability of essential medicines are crucial factors in ensuring effective healthcare in Kerala. It is also a major concern not only in a particular region like Kerala but also in low- and middle-income countries. A study by Satheesh et al. (2020) aimed to generate data on the availability, price, and affordability of essential medicines for cardiovascular disease and diabetes in Kerala through the paper entitled “Availability, price, and affordability of essential medicines for managing cardiovascular diseases and diabetes: a statewide survey in Kerala, India”. The study adopted a different type of survey methodology that was developed by the World Health Organisation, and Health Action International (WHO and HAI) developed a standardised method in 2003 that measures the availability, prices, and affordability of essential medicines. The study found that the availability of essential medicines for cardiovascular diseases and diabetes falls short of the WHO’s 80% target in both sectors. Although availability in private retail pharmacies was near-optimal, prices appear unaffordable compared to GSDPs. Initiatives such as mandating generic prescribing, adding WHO-approved FDCs to local EM lists, improving price transparency, and streamlining medicine supply to ensure equitable access to EMs, especially in the public sector, are crucial in tackling Kerala’s ever-increasing CVD burden. The findings will contribute to evidence-based policy recommendations for improving medication access and affordability in the context of cardiovascular diseases and diabetes management in Kerala.

FINDINGS

Cost of treatment studies in Kerala have revealed significant insights into healthcare expenses, leading to a better understanding of the healthcare system. Some key findings from these studies include that they have identified considerable variations in treatment costs for the same medical condition across different healthcare facilities in Kerala. Factors such as hospital type, location, and quality of services contribute to these disparities. Another important thing is that while Kerala's healthcare services are generally considered affordable, studies have highlighted the financial burden faced by certain segments of the population. High out-of-pocket expenses and inadequate insurance coverage remain challenges in ensuring universal access to healthcare, another noticeable fact from the study.

CONCLUSION

By evaluating the costs associated with medical treatments, these studies contribute to improving healthcare affordability, accessibility, and efficiency. The findings of these studies aid policymakers, healthcare providers, and patients in making informed decisions, promoting equitable healthcare delivery in Kerala. Studies have assessed the impact of government initiatives, such as state-funded health insurance schemes, on reducing the financial burden on patients. These initiatives have played a vital role in enhancing healthcare affordability in Kerala. The studies have compared the cost-effectiveness of different treatment modalities, such as surgeries, medications, and alternative therapies. This analysis helps optimise healthcare resources and decision-making processes.

SUGGESTIONS

On the basis of the review analysis, some of the suggestions are here to improve the vulnerable cost of treatment situation in the state. Generic substitution for essential generic drugs, Price reregulation for lifesaving medicines, government health insurance reforms for highly advanced treatments, collaborations between the public and private healthcare sectors to ensure affordable access to treatments, and strengthening of health education and prevention programmes are some of the suggestions to reduce the cost of treatment and disease prevention in the state. Implementing these suggestions in a coordinated manner can contribute to reducing the cost of treatments in Kerala and improving the affordability of healthcare for individuals with cardiovascular diseases and diabetes.

REFERENCES

1. Daivadanam, M. (2012). Pathways to catastrophic health expenditure for acute coronary syndrome in Kerala: ‘Good health at low cost’?. *BMC public health*, 12(1), 1-8.
2. Daivadanam, M., Thankappan, K. R., Sarma, P. S., & Harikrishnan, S. (2012). Catastrophic health expenditure and coping strategies associated with acute coronary syndrome in Kerala, India. *Indian Journal of Medical Research*, 136(4), 585-592.
3. Dilip, T. R. (2008). Role of private hospitals in Kerala: an exploration. Working paper, Centre for Development Studies, Thiruvananthapuram. Accessed on December 14, 2017. <http://localhost:8080/xmlui/handle/123456789/158>.
4. Dinesh, T. A., Nair, P., Abhijath, V., Jha, V., & Aarthy, K. (2020). Economics of cancer care: A community-based cross-sectional study in Kerala, India. *South Asian journal of cancer*, 9(01), 07-12.

5. Government of Kerala (2014). Economic Review 2013. Kerala Stat Planning Board.
6. Government of Kerala (2014). Report of the Expert Committee on Health. State Planning Board, Thiruvananthapuram.
7. Government of Kerala (2015). Economic Review 2014. Kerala Stat Planning Board.
8. Government of Kerala (2016). Economic Review 2015. Kerala Stat Planning Board.
9. Government of Kerala (2017). Economic Review 2016. Kerala Stat Planning Board.
10. Government of Kerala (2018). Economic Review 2017. Kerala Stat Planning Board.
11. Government of Kerala (2019). Economic Review 2018. Kerala Stat Planning Board.
12. Government of Kerala (2021). Economic Review 2020. Kerala Stat Planning Board.
13. Government of Kerala. (2020). Economic Review 2019. Kerala Stat Planning Board.
14. Institute of Medicine (US) Committee on Public Health Priorities to Reduce and Control Hypertension. A Population-Based Policy and Systems Change Approach to Prevent and Control Hypertension. Washington (DC): *National Academies Press (US)*; 2010. 2, *Public Health Importance of Hypertension*.
15. Lal, A. L. A., Ali, A., KR, L. I. A., & Vijayakumar, K. (2014). Cost Effectiveness of Treating Hypertension in an Urban Area of Kerala State, India. *Kerala Medical Journal*, 7(4), 113-117.
16. Maneesh, P., & Alaoui, A. E. (2018). Pattern of healthcare expenditure of private and public: a case study of hospital patients in Kannur district, Kerala, India. *Int J Res*, 6, 431-49.
17. Mukherjee, S., Haddad, S., & Narayana, D. (2011). Social class related inequalities in household health expenditure and economic burden: evidence from Kerala, south India. *International Journal for Equity in Health*, 10, 1-13.
18. Muraleedharan, M., & Chandak, A. O. (2021). Emerging challenges in the health systems of Kerala, India: qualitative analysis of literature reviews. *Journal of Health Research*, 36(2), 242-254.
19. Nair, K. S., Raj, S., Tiwari, V. K., & Piang, L. K. (2013). Cost of treatment for cancer: experiences of patients in public hospitals in India. *Asian Pacific Journal of Cancer Prevention*, 14(9), 5049-5054.
20. Nair, M. R., & Varma, R. P. (2021) Availability, distribution and utilisation of health care services in Kerala.
21. Narayanan, N., & Kodali, P. B. (2018). Out of pocket health expenditure and catastrophic health expenditure among the beneficiaries of comprehensive health insurance scheme in Kerala. *Int J Health Sci Res*, 8(9), 207-14.
22. Pato, A. P., Pérez, E. C., Hernando, I. C., González, J. L., Constenla, I. R., & Sampedro, F. G. (2011). Analysis of direct, indirect, and intangible costs of epilepsy. *Neurología (English Edition)*, 26(1), 32-38.
23. Rajagopal, N. (2010). Transformational process of health care choice of poor in Kerala. *Journal of Health Management*, 12(2), 123-135.
24. Satheesh, G., Sharma, A., Puthean, S., Ansil TP, M., E, J., Raj Mishra, S., & Unnikrishnan, M. K. (2020). Availability, price and affordability of essential medicines for managing cardiovascular diseases and diabetes: A statewide survey in Kerala, India. *Tropical Medicine & International Health*, 25(12), 1467-1479.
25. Shyni, M. C. (2015) A Study on the Development of Healthcare Facilities in Kerala State, India. *International Journal of Management and Social Sciences Research (IJMSSR) ISSN* (2015): 2319-4421.
26. Thayyil, J., & Jayakrishnan, T. (2008). Morbidity and health Care expenditure in Kerala. In The 23rd International Conference on Health and Development Issues, Strategies and Options, Kannur University, Thalassery. *Kerala. School of Development Studies, Kannur University*.
27. Xu, K., Evans, D. B., Kawabata, K., Zeramdini, R., Klavus, J., & Murray, C. J. (2003). Household catastrophic health expenditure: a multi-country analysis. *The lancet*, 362(9378), 111-117.
28. Yousefi, M., Arani, A. A., Sahabi, B., Kazemnejad, A., & Fazaeli, S. (2014). Household health costs: Direct, indirect and intangible. *Iranian Journal of Public Health*, 43(2), 202.

Research Through Innovation