

Health Expenditure in Covid-19 Times and the Need for Affordable Houses that Nurture Healthy Citizens: A Roadmap for Digital Economy of Kerala

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Abstract

Introduction: The huge and unaffordable expenditure on health for hospitalization, medicine etc. due to Covid-19 disrupted the financial stability of many households, mostly those in the lower income strata with severe infection. This study explores the Out of Pocket (OOP) expenditure and allied financial concerns of households, some of them having incurred 'Catastrophic' levels of health expenditure in Covid-19 times. So, this study seeks to reduce such expenditure and to ensure healthy and affordable living.

Methodology: Besides authentic secondary data, the study used primary data gathered from a 120-number sample (residents of Ernakulam district, Kerala) hospitalised because of Covid-19. Using a pretested interview schedule data were collected over four months' period of Covid-19. Direct hospitalization costs (medical & non-medical), and the total (monthly) costs incurred by the respective households were collected. Households which incurred direct medical expenditure in excess of 40 percent of their effective monthly income were considered as 'Catastrophic' type health expenditure.

Results: It was found that 50.83 percent of the households incurred health expenditure of 'Catastrophic' type and the rest had 'Non-Catastrophic' expenditure. In fact, 31.67 percent faced the 'Distress Financing' problem. The challenges of the households were insufficient savings, poor co-operation from the heads, poor health consciousness etc. Remedial measures, including ICT adoption in the healthcare sector, were suggested.

Conclusion: Incidence of high catastrophic health expenditure and distress financing, as disclosed from this study, shows the need to address the issues like high OOP expenses. So also, affordable houses with features that ensures good health needs to be promoted.

Keywords: *Catastrophic expenditure, Distress financing, Universal health, Housing, ICT.*

1. Introduction

It is widely recognised that health has a crucial role in human capital formation. For a nation it plays a vital part in improving the productivity gained by its citizens. From a macro view, a nation's health spending significantly influences its health capital. From a micro view, the underlying reasons for a person's health vary from individual to individual. The motives of healthcare spending are: (i) Preventive healthcare, (ii) Promotive healthcare, and (iii) Tertiary healthcare. Both the micro and macro views are vital for economic analysis of expenditure on health. From a micro economic perspective,

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health is an input to create income, and income in turn is used to purchase goods and services. Involvement of the Government in health spending and its sway on specific policy decisions is the macro view of health expenditure. The Department of Health, Government of Kerala (GOK) could take many proactive steps to ensure prompt medical attention to Covid-19 patients, including those who are unwilling to take treatment despite with Covid-19 symptoms. GOK issued strict instructions to hospital staff, health workers, other Government /Non-Government officers and also the public. Also, up-to-date information on the prevailing situation, along with the precautionary measures to be taken were disseminated. The vast ICT infrastructure in Kerala supported such initiatives and GOK could contain the spreading of virus and reduce fatality rates to globally low rates. As the excellent ICT and allied resources is prompting Kerala to attain the 'Universal health' target, there is the need to draft housing strategies that ensure good health to the households. There is a need for integrating the healthcare system with the housing infrastructure in the State as the health greatly depends on the housing conditions. Though the State of Kerala is having one of the best healthcare facilities in India, it still suffers from many epidemics even in this post-Covid-19 era. The latest is the Nipa virus that emerged again in Sept. 2023.

2. Objectives

- (i) To study the household health expenditure and its severity in Covid-19 times in Kerala;
- (ii) To study the issues like unaffordable health costs, distress financing, lack of access to medical services etc. caused by Covid-19 and the relevance of ICT-based interventions;
- (iii) To understand how affordable housing can promote better health of the households; and
- (iv) To suggest strategies to effectively use Kerala's superior healthcare and ICT resources, and also to explore housing conditions that can ensure proper health for the households.

3. Research Questions

- (i) How affordable is the household health expenditure in Covid-19 times in Kerala?
- (ii) What are the issues of the households in Covid-19 times, and if ICT can solve them?
- (iii) In what way is affordable housing related to the health of the households?
- (iv) How to effectively use the good healthcare and ICT resources for the sustained growth of Kerala and what are the housing conditions for healthy living in the post-Covid era?

4. Literature Review

Dey et al. (2013) has noted that issues of social health are primarily affecting the rural poor, as they often lack access to modern and high-tech health facilities available in urban areas; and that wide disparities in the access to health infrastructure being a reality in India. Issues like natural calamities, disasters and nutritional deficiencies cause some cumulative impact upon the vast disparities existing in the access to scarce medical infrastructure available in the country. Absence of sufficient medical infrastructure would limit the capability of the scarce facilities to ensure due healthcare to the vast majority of

the masses, mostly in rural India. The high levels of morbidity and mortality denotes India's poor public healthcare system. Saini (2020) in a study in the context of Rajasthan in India has pointed out the need for Govt. intervention in augmenting the public healthcare, especially in providing manpower.

Many national and global studies have reiterated that ICT adoption is vital for faster economic growth, by empowering the rural poor, women, farmers. Such ICT-related and other rural development and/or women empowerment studies include the following ones. Manoj (2007) "ICT industry in India: a SWOT analysis" Journal of Global Economy makes a macro study of Indian ICT industry and its key role in economic growth of India. Pickens (2009) has pointed out the vital role played by the most popular ICT-based devices viz. mobile phones in 'banking the unbanked' (financial inclusion) in the Philippines context. Manoj (2010) "Impact of technology on the efficiency and risk management of old private sector banks in India: Evidence from banks based in Kerala" has observed that ICT can improve the efficiency of banks. Robert Wood Johnson Foundation (RWJF)(2011) "Housing and Health" has noted that better housing conditions have positive association with health of the households and that three key determinants of health are housing affordability, neighbourhood conditions and 'within the home' environment. Manoj (2012) "Information and Communication Technology (ICT) for effective implementation of MGNREGA in India: An analysis" in Digital Economy of India-Security and Privacy, has observed that ICT has key relevance in executing MGNREGS projects. Nasar and Manoj (2013) "Customer satisfaction on service quality of real estate agencies: An empirical analysis with reference to Kochi Corporation Area of Kerala State in India" have suggested imparting high level education and development efforts to the real estate agents, need for better transparency in all dealings and the use of social networks. Manoj (2013) "Prospects and Challenges of Green Buildings and Green Affordable Homes: A Study with Reference to Ernakulam, Kerala" has pointed out the vast potential for green homes for employment creation sustained economic growth in India. James and Manoj (2014) "Relevance of E-Banking Services in Rural Area—An Empirical Investigation" observe immense potential in ICT-based products of banks for women empowerment and rural development, and suggested extension of ICT-based banking services in rural areas. Manoj and John (2014) "Prospects of Cattle Feed Industry in India and Strategies for Utilizing the Market Potential: A Study in Kerala with a Focus on Factors Influencing Buyer Behaviour" have suggested various strategies to use the huge market potential in India for the cattle feed industry—one that can greatly help the livelihood of the poor and the marginalised and reduce social inequality. Continuing with this paper, an additional paper on this strategic industry by Manoj (2015) "Cattle feed industry in India: a macro perspective" analyses elaborately India's cattle feed industry since this industry ensures inclusive and sustainable growth and reduce inequalities in Indian society. Lauer and Timothy (2015) have noted the favourable impact of ICT (Digital channels) to speed up financial inclusion, and the implications of ICT-based interventions.

Manoj (2015) "Socio-Economic Impact of Housing Microfinance: Findings of a Field based Study in Kerala, India" in International Research Journal of Finance and Economics points out vital role for housing microfinance to bring about sustained economic growth. Manoj (2015) "Deterrents to the Housing Microfinance: Evidence from a Study of the Bankers to 'Bhavanashree' in Kerala, India" in International Research Journal of Finance and Economics, has pointed out various roadblocks in the path of growth of housing microfinance (HMF) in Kerala, with remedies. Joju J, Vasantha S, and Manoj PK (2015) "E-CRM: A Perspective of Urban & Rural Banks in Kerala" have noted ICT-based CRM or Electronic-CRM (E-CRM) has positive impact in both urban and rural banking and have suggested separate strategies for both, based on the findings of their empirical research study. Manoj and Viswanath (2015) "Socio-Economic Conditions of Migrant Labourers - An Empirical Study in Kerala" has noted the vital need for enhancing the working and living conditions of migrants. Rajesh and Manoj (2015)

“Women Employees work life and challenges to Industrial Relations: Evidence from North Kerala” have observed vital significance in striking a balance between work and life by the women employees for healthier industrial relations. Asian Development Bank (2015) in its report as noted that the positive impact of sustainable urban development project in Kerala on the livelihood and living standards of women and girls could empower them and create more avenues for earning income too. Manoj (2016) “Employment Generation from Rural Tourism: A Field Study of the Local Community at Kumbalangi, Kerala” observes the high capacity of tourism for employment creation and suggests, inter alia, developing better ICT infrastructure (online booking etc.) for tourism development, and hence economic growth through tourism sector. Manoj (2016) “Determinants of sustainability of rural tourism: a study of tourists at Kumbalangi in Kerala, India” has identified various factors influencing sustainability of rural tourism, and improving ICT infrastructure and facilitating online reservation etc. is one among these factors recommended by the author. Manoj (2016) “Real Estate Investment Trusts (REITs) for Faster Housing Development in India: An Analysis in the Context of the New Regulatory Policies of SEBI” has noted financial innovations like REITs are crucial for the faster housing development in India and hence the rapid economic growth of India. Manoj (2016) “Bank marketing in India in the current ICT era: Strategies for effective promotion of bank products” observes crucial need for ICT-integrated bank marketing in this digital India era when ICT-adoption is the new normal. Lakshmi and Manoj (2017) “Service quality in rural banking in north Kerala: A comparative study of Kannur district co-operative bank and Kerala Gramin bank” have noted better ICT-usage in Gramin bank and thus superior service as against in Co-operative bank. Lakshmi and Manoj (2017) “Rural Customers and ICT-based Bank Products A Study with a Focus on Kannur District Co-operative Bank and Kerala Gramin Bank” have noted better acceptance for the ICT-based products and greater customer satisfaction with the products of Kerala Gramin Bank (KGB). Joju, Vasantha, and Manoj (2017) “Future of brick and mortar banking in Kerala: Relevance of branch banking in the digital era” have noted that even when ICT is imminent and so also virtual banking, there is a need for a ‘human touch’ in ‘brick and mortar’ banking.

Joju, Vasantha, and Manoj (2017) “Financial technology and service quality in banks: Some empirical evidence from the old private sector banks based in Kerala, India” have noted that financial technologies (fin-techs) can greatly improve service quality and are vital or success in modern days. Manoj (2017) “Construction costs in affordable housing in Kerala: Relative significance of the various elements of costs of affordable housing projects” wherein elements of cost are prioritised for selective and focused cost control and ICT is an effective tool for the same. Manoj (2017) “Cost management in the construction of affordable housing units in Kerala: A case study of the relevance of earned value analysis (EVA) approach” has proved EVA as an effective tool for managing construction costs. Joju, Vasantha, and Manoj (2017) “Electronic CRM & ICT-based banking services: An empirical study of the attitude of customers in Kerala, India” have pointed out vital relevance of electronic (ICT) enabled modern practice in banking viz. Electronic-CRM (e-CRM) for efficiency and competitiveness of the banks and also noted favourable customers’ opinion towards such modern ICT-enabled products in their study. A similar study on CRM adoption in the banking sector by Manoj (2018) “CRM in old private sector banks and new generation private sector banks in Kerala: A comparison” points out that new private sector banks (NPBs) rank superior to the old private sector banks (OPBs) in adopting CRM especially in high-tech platforms (like, E-CRM) and hence NPBs have a better command among the customers by giving high-tech services. Manoj (2019) “Social banking in India in the reforms era and the case of financial inclusion: Relevance of ICT-based policy options” makes suggestions on ICT-enabled policies to boost social control in banking in the ongoing ICT regime. Manoj (2019) “Dynamics of human resource management in banks in the ICT era: A study with a focus on Kerala based old private sector banks” has noted the need for ICT-based HRM policies

for the competitiveness of banks. Manoj (2019) “Competitiveness of manufacturing industry in India: need for flexible manufacturing systems” has noted the need for adopting ICT and modern manufacturing technologies like FMS (flexible manufacturing systems) for the better competitiveness for the manufacturing industry in India. Joju and Manoj (2019) “Digital Kerala: A study of the ICT Initiatives in Kerala state” have analysed Kerala-based ICT initiatives– Kerala State being the one with the highest internet penetration and universal literacy and have made suggestions to better utilise ICT in this State for its fast growth. Joju and Manoj (2019) “Banking Technology and Service Quality: Evidence from Private Sector Banks in Kerala” observe that as ICT in banks enhances quality, ICT in banks needs to be promoted. Ali and Manoj (2020) “Impact of Falling Price of Rubber-A Case Study of Kothamangalam Taluk in Ernakulam District” has noted the poor productivity due to falling prices, its impact on other industries, the need for maintaining scientific methods, and the need for governmental interventions.

A report by United Nations (UN), Digital Financial Inclusion, July 2016 has noted the significant role of ICT and digital financial services in inclusive growth, through poverty reduction and providing the benefits of financial inclusion in developing nations. Besides the IT sector, the IT/ITES applications in many sectors or industries have been noted to have positive effect on the growth of such sectors or industries. It is also noted that ICT adoption ensures more eco-friendly and hence sustainable growth than the traditional models and that ICT supports women empowerment. UN’s report, UNDESA World Social Report 2020 has noted growing inequality globally, mainly arising from four causes viz: 1) technological innovation, 2) urbanisation, 3) international migration, and 4) climate change. It has noted wage inequality as an adverse effect of technological innovation. So, like the Indian studies, the global studies too support ICT integration. So, all the studies on IT sector, including those on the implication of IT or ICT on other sectors or industries, have noted ICT’s inevitability. Harapan, et.al. (2020) “Coronavirus disease 2019 (COVID-19): A literature review” have made a systematic review of authentic studies on Covid-19.

Thongrawd (2020) “Factors managing the effective diffusion of information: a case study. Journal of Security and Sustainability Issues” has noted that information diffusion in internet marketing is influenced by (i) relevancy of information, (ii) its clarity, (iii) its dependency, (iv) its responsiveness and also that customer relations doesn’t influence information diffusion. NCHFA (2020) observes that affordable housing promotes better health. Elias (2021) “Kerala’s Innovations and Flexibility for Covid-19 Recovery: Storytelling using Systems Thinking” has discussed how Kerala could effectively fight against the Covid-19 with its ICT infrastructure. Ummer, et. al. (2021) observe that good ICT resources of Kerala’s healthcare sector, ensured the remarkable resilience of the State to threats caused by Covid-19 pandemic. It has been noted that Kerala could leverage heavily on its excellent digital (ICT) infrastructure in the health sector and could effectively fight against this global pandemic. The clear superiority of the State of Kerala in various health-related indicators vis-à-vis India as a whole has been specifically noted in this Kerala-focused study in the Covid-19 context. It may be noted that ICT-adoption is well-acknowledged strategy in the Kerala context whether it is in the realm of healthcare (say, fight against Covid-19) or faster development of other sectors of the economy, like, banking. Karat et. al. (2022) in their empirical study on disastrous impact by Corona virus-19 has analysed its impact on the volatility of the shares of the top pharma companies in India, and noted that technical analysis is worth for making prudent decisions. Das et.al. (2022) have sought to trace the origin of Covid-12 and the relevance of effectively controlling the spread of this global pandemic through vaccination drives. Likewise, Xieu et. al. (2022) have noted that risk to health, unemployment and funds shortage still restrain the tourists to travel. RBI’s Working Paper-6 Sardar, Sanyal & Das, (2023) underlines the consumers’ poor outlook in the Covid-19 times and in the period thereafter, including the future years. Recent government reports, both at the Central and

State levels, GOI (2023) and GOK (2023) indicate the ‘still persisting perils’ of Covid-19 at the national level, especially in Kerala.

Most of the studies suggest that evils of Covid-19 still persist [Ummer, et. al. (2021), Xieu et. al. (2022), RBI’s Working Paper-6 (2023) etc.]. Most studies have also pointed out that ICT-adoption is vital, not only in healthcare but in other sectors as well; particularly in a State like Kerala where there is an excellent ICT infrastructure which could be leveraged in healthcare (Ummer, 2021) as well as in other sectors like tourism, housing, banking etc. The research gaps noted are: (i) health expenditure (Covid-19 context), its impact on households and the need for ICT-integrated solutions in the specific case of Kerala, (ii) strategies for duly using Kerala’s ICT and healthcare resources for its sustained growth, and (iii) housing conditions advisable for a healthy living in the post-Covid scenario.

5. Significance of the Study

A study of the heavy impact of the health expenditure on the households, given the low GHE (Government Health Expenditure) by the governments, is the theme of the study. Financing the healthcare expenditure is a major concern for the Governments and the households. So, the prevailing disparities, which are gradually widening, in the access to healthcare services in India (Dey, et.al. 2013) are relooked in the Covid-19 context in Kerala, India. Covid-19 having given another dimension to the hardships of the masses, especially the rural poor and other marginalised groups, since they lack access to the healthcare services in the country which are mostly clustered in urban centres. In this scenario, this study attempts an economic evaluation of the impact of health expenditure on the households in Covid-19 times. It analyses the need for leveraging ICT in the healthcare sector, as ICT is a potent tool for inclusive growth and can be used in healthcare sector too, as in other sectors. Also, from a wider view, it looks into the need for encouraging housing units that duly support the health of the households and that too in an ‘affordable’ manner since ‘Affordable Housing for All’ is a national priority in India and schemes like PMAY have been striving to attain this goal.

Housing has long been recognised as a vital social determinant of health. The global pandemic Covid-19 has, in fact, made this fact more apparent across the world. The adverse implications of Covid-19 or any other epidemic being more on the poor and disadvantaged groups. So, if the barest minimum level of affordable housing facility is ensured for the masses then that will reduce their health risks arising from Covid-19 or such other epidemics.

6. Research Methodology

This is structured as an exploratory study that is descriptive-analytical also. It has drawn inputs from both sources (i) Secondary, and (ii) Primary. For secondary data, reports of the Govt., the RBI and such other authentic sources were used. Primary data were collected by way of a field survey involving 120 households with the help of a carefully drafted, pre-tested and structured Interview Schedule. The field study was done in Kalamassery Municipality region, located at Ernakulam district of the State of Kerala, India. This area was selected for the study and various health-related parameters like birth rate, maternal mortality rate, institutional delivery, immunization were collected. The criteria for choosing this area were geographical proximity, the feasibility and availability of the sample and the researcher’s familiarity with the settings. Households with agricultural jobs (rural setting) and those with industrial jobs (urban setting), were taken equally, 60 each. Findings of good studies, both national and international, in this area were corroborated to form conclusion and suggestions.

7. Corona Virus (Covid-19): A Basic Study of its Emergence and Implications

Corona Virus disease, often called Covid-19, was first called ‘2019 Novel Corona Virus’. The name of Virus was announced on 11th Feb. 2020 by World Health Organization (WHO). Covid-19 outburst arose from Wuhan in Hubei province of China during the late Dec. 2019. It spread across the globe from Wuhan within days via people with Covid-19 positive through their small droplets from nose or mouth – almost like a wild fire – from person to person and from country to country rapidly. Covid-19 spread to Thailand, Japan, U.S, South Korea, India, Spain, Italy, France, Germany, Iran, Netherland, Switzerland, United Kingdom, Singapore etc. It hit many people very hardly around the world. Many countries announced lockdown to avoid the spreading of Covid-19. Lakhs of cases were reported daily across the world, almost from 184 countries and 1.5 lakh deaths. Due to its deadly impact worldwide, WHO had declared Covid-19 to be a pandemic on 11th March 2020.

‘Stay home and Stay safe’ was a sounding mantra across the globe, including India, owing to the Covid-19 outburst. Everybody obliged to remain at home in the midst of uncertainties. Just like a coin has two sides, while one group of people enjoyed the Covid-19 situation, another group had a really vulnerable period between life and death. The former found time to play with their children, recall the golden days of their own childhood, husbands learning the cooking skills from their wives, and so on; thus really enjoying with their family members using their savings from the past. But the latter group of people really had a testing time, in between life and death, as they had no job, no money and no food. The day to day activities were badly hit by the spread of Covid-19 and the resultant lock downs. On March 28 2020, The Hindu had reported that livelihood of over 5 lakh domestic helpers in Kerala were in jeopardy. The future was uncertain for these women workers, as nobody allowed outsiders to enter their homes for fear of infection of Covid-19. Farmers were worried with the lockdown declaration at the national level. For instance, demand for milk and milk products went down.

8. Health Expenditure in Covid-19 Times in Kerala: Findings of an Empirical Study

It was noted that expenditure on health incurred by the households during the Covid-19 times was so high that it disrupted their family budgets, especially those of low income households. The poor households being of low earnings and lesser resources, they had to suffer badly when faced with high level of infection with Covid-19. Particulars regarding the treatments undergone by the households affected with Covid-19 infection are shown in Table I.

Table I: Households with Covid-19 and the Treatment Types.

Types of Treatments	Agricultural or Rural Setting	Industrial Urban Settings
Speciality	10 (16.67)	17 (28.33)
General	31 (51.67)	22 (36.67)
Speciality and General, both	19 (31.67)	21 (35.00)
Total	60 (100.00)	60 (100.00)

Source: Survey Data (Figures in brackets show percentage of the respective totals)

Treatments could be either General type or of Specialty type. It was observed more than a half of the total (51.67 percent) households with rural (agricultural) setting and over one-third (36.67 percent) of those urban setting had used the General type medical treatments. Regarding the Specialty treatments, those from rural settings formed just one-sixth of the total (16.67 percent) while more than a quarter (28.33 percent) of the urban

households used such specialised modes. Roughly one-third, i.e. 31.67 percent (rural) and 35 percent (urban), of the households has to use both the General and Specialised treatments.

Table II: Religion-wise Breakup of the Households.

Religion	Frequency	Percentage
Christians	39	32.50
Muslims (Islam)	31	25.83
Hindu	50	41.67
Total	120	100.00

Source: Survey Data

Religion-based break-up regarding the households revealed 41.67 percent to be Hindus, 32.50 percent as Christians and the rest 25.83 percent as Muslims (Islam). The households belonging to the three major religions were noted to be duly represented (Table II).

Table III: Earnings-based Breakup of the Households.

Income Status	Frequency	Percentage
Below Poverty Line (BPL)	13	10.83
Poor (Non-BPL)	39	32.50
Non-Poor and Rich	68	56.67
Total	120	100.00

Source: Survey Data

Based on survey data relating to 120 households (i.e. 60 each from rural setting and urban setting respectively) it is noted that 43.33 percent are poor, either with BPL card or otherwise. The rest 56.67 percent were not in the 'Low Income' or 'Poor' group. (Table III).

It is pointed out that a household's expenditure primarily depends on its household income. So, the head of the household and his or her occupational status is vitally significant for arriving at the health expenditure of the households. Often, earnings (income) is the key determinant of the household's consumption expenditure. Thus, a household's expenditure on health too is obviously dependent on its income levels. Naturally, the low income households, whether in an urban (industrial jobs) setting or in a rural (agricultural, informal or allied jobs) setting, can afford to spend only less towards its health expenditure. Conversely, household's expenditure on health in respect of higher income (non-poor) and rich categories would be on the higher side. It is in the above context that households from both the urban and rural settings were included in the field survey. As already noted earlier, as high as 43.33 percent were poor households and rest 56.67 percent were non-poor households. Among the poor households, more than one-tenth (10.83 percent) were strictly having BPL cards. (Table III).

It may be noted here that the global pandemic Covid-19 had had a catastrophic impact not only many individuals and households but also on many Governments the world over. The poor and the well-off might be affected due to Covid-19. Likewise, even the developed nations and their Governments could be adversely affected because of the global pandemic, though its relative impact might be lower than that of the developing nations, including India. The worst challenge of the Governments, especially those of the developing and third world countries, was that of the lack of adequate facilities, both human (manpower) and physical (infrastructure) resources, required to defend the global pandemic and to manage the ever growing number of Covid-19 cases. Patients of the high risk category, such as the old and those suffering from serious illness, are particularly vulnerable; both to the households and also the Governments. Even the advanced nations like the US have struggled a lot to cope with the huge threats caused by the global pandemic, Covid-19. More serious is the case of countries like India in the developing

world. Within India, the state of Kerala is quite different owing to its unique development model that is characterised by better education and healthcare indices, huge remittances from abroad. The remarkable ICT infrastructure of Kerala is another special feature. In fact, Kerala’s commendable ICT infrastructure and manpower could be leveraged effectively for modernising its healthcare sector, including in fighting against the Covid-19. This fact as is suggested by other empirical studies, like, that of Ummer, et.al. (2021).

Table IV: Catastrophic Household Health Expenditure.

Nature of Health Expenditure	Frequency	Percentage
Catastrophic	61	50.83
Non-Catastrophic	59	49.17
Total	120	100.00

Source: Survey Data

Among 120 households under study, it was noted that over half of them (50.83 percent) had ‘Catastrophic’ impact (direct medical expenditure that exceeds 40 percent of the effective household income) due to Covid-19. The rest households (49.17 percent) experienced only Non-Catastrophic impact due to Covid-19. It may be stated that when the Out of Pocket (OOP) expenses of households rise, they become victims of Catastrophic impact and are forced to use practices like Distress Financing. In this study it was noted that 38 households (31.67 percent) had to go for Distress Financing. (Table IV).

Table V: Healthcare Services in Covid-19 Times in Kerala

Types of Healthcare Services	Frequency	Percentage
Home visit	38	31.67
Public Health Centre (PHC) Medicine	49	40.83
Food Services (Provision of Food)	33	27.50
Total	120	100.00

Source: Survey Data

The feedback from the households about their experience with the adequacy of the healthcare services received by them in Covid-19 times from the healthcare machinery of the Govt. of Kerala (GOK) is given in Table V. It was noted that 31.67 percent of them were satisfied with home visits while 40.83 percent could experience high utility with the PHC medicines that they received. Food items supplied were noted to be of high worth by the rest 27.50 percent households. In short, the major services extended by the GOK through its Health Department may be noted to be of high use to the households in one way or the other. This in turn suggests the utmost significance of such services, because they tend to reduce the burden of direct medical expenses of the households, like, the OOP expenses on healthcare. Obviously, such services can cut OOP expenses and hence the need for ‘Distress Financing’. Thus, higher governmental spending in public healthcare is an imminent need in Kerala. Since the government has always budget constraints, models that facilitate greater healthcare investments, in partnership with the private sector, like, the public private partnership (PPP) mode may be noted to be very advisable in respect of the States like Kerala in India.

Table VI: Family Setting and Health Insurance of the Households: Cross Tabulation

Family setting	Scheme of health insurance or other types of health protection					
	Govt. funded	Arranged by households	Supported by the Employer (not Govt.)	Health Protection	Others	Total
Rural	7	23	14	15	1	60
Urban	4	19	27	8	2	60
Total	11	42	41	23	3	120

Source: Field Survey

Table VI depicts the diverse kinds of insurance or such other protection schemes availed by the households and the cross tabulation of these with the two broad types of households viz. (i) those from Rural or agricultural or allied settings, (ii) those from urban or industrial or allied settings. It is noted that less than 10 percent (11 Nos) alone were covered under various Govt.-funded schemes and over one-third of them (42 Nos) had some schemes arranged by themselves. Also, another large group representing over one-third (41 Nos) had employer (not Govt.) sponsored schemes and the majority in this group were of urban background. A small group of 23 households were covered under diverse health protection schemes while a still smaller group of 3 households alone were covered by other schemes. (Table VI). As the coverage was unavailable to non-institutional type expenses under the voluntary prepayment, such costs got added up to the health expenses of the households. The Govt.-funded health insurance schemes were noted to be less burdensome to the households, both rural and urban.

Table VII: Major Challenges Faced by the Households relating to Health Expenditure

Challenges faced	Frequency	Percentage
Insufficient savings	25	20.83
Poor co-operation from the household heads	21	17.50
Poor level of consciousness on health	16	13.33
Inadequacy of the insurance coverage	15	12.50
Lack of proper information regarding healthcare facilities	13	10.83
Inadequacy of the Governmental assistance	11	9.17
Poor infrastructure in Government-owned healthcare facilities	9	7.50
Inadequacy of the financing facilities available	7	5.83
Sub-optimal level of debt position	3	2.50
Total	120	100.00

Source: Field Survey

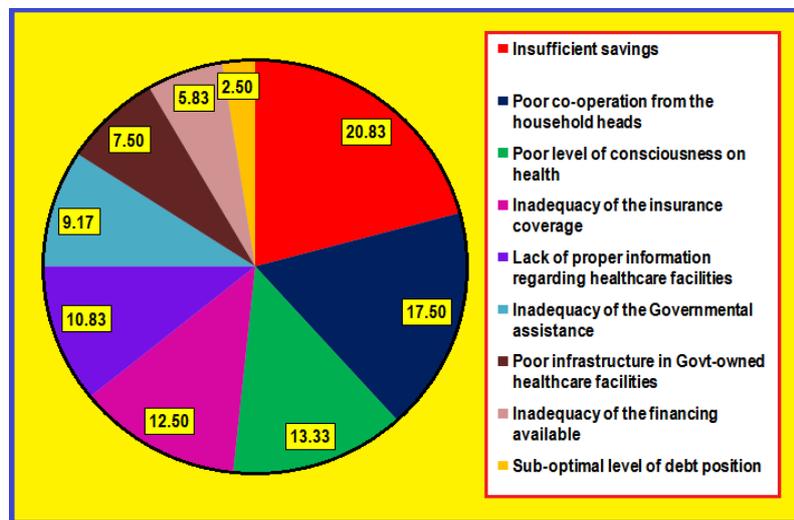


Figure I: Challenges of the Households in Covid-19 Times

Source: Field Survey Data, as in Table VII

Insufficient savings was the worst issue faced by the households savings; over one-fifth (20.83 percent) of them had this major issue. Another major issue (17.5 percent) was the poor co-operation from the heads of the households. Other issues were poor health consciousness (13.33 percent), inadequate insurance cover (12.50 percent), insufficient Governmental support (9.17 percent), poor infrastructure in Govt. hospitals (7.5 percent). Insufficient financing (5.83 percent) and sub-optimal debt position (2.5 percent). (Table VII & Figure I).

Inadequacy of savings, inadequacy of the Governmental assistance, inadequacy of the financing facilities available etc. being the major challenges faced by the households, it may be inferred that the gravity of the healthcare challenges is more on the poor and marginalised groups and they need better and more affordable healthcare facilities. This in turn suggests greater Governmental interventions that ensure affordable healthcare. Equally important is the need affordable housing facilities to all such poor and marginalised groups as there is a positive association between affordable housing and better healthcare. (NCHFA, 2020)

9. Analysis and Discussion

In view of the aforementioned discussion, it is found that Governmental interventions during the Covid-19 times in Kerala have been quite appreciable. Given the limited access to such healthcare facilities and the lack of information regarding the facilities available to more than one-tenth (10.83 percent) households, there is a need to create awareness among the households in this regard. In this context more effective use of ICT interventions and creation of awareness among households is significant. The superiority of Kerala in health indices in Covid-19 times vis-a-vis India is well documented, especially in containing the fatality rates. Kerala is globally recognised in this regard, good ICT being Kerala's main boon (Table VIII).

Table VIII: Health Indices of Kerala vis-a-vis India in Covid-19 Times

Health Indices	India	Kerala
Population	134,86,16,000	3,53,07,000
Total Confirmed Covid-19 Cases	85,07,754	4,86,109
Active Cases of Covid-19 (Percentage)	06 Percent	17 Percent
Recovery Rate of Covid-19 Cases (Percentage)	93 Percent	83 Percent
Fatality Rate of Covid-19 Cases	1.5 Percent	0.40 Percent
Tests per Million	88,331	1,45,151
Confirmed Covid-19 Cases per Million	6,383	13,839

Source: Adapted from, Ummer et. al. (2021), p.2.

Through the extensive testing of Covid-19 infected cases, meticulous treatment and containment Kerala could attain one of the least fatality rates (0.4 percent) which is one of the lowest not only in the whole of India (1.5 percent) but also elsewhere in the world, including the advanced nations like USA (2.4 percent) and emerging nations like China (5.2 percent). This globally acclaimed achievement owes a lot to a few unique features of Kerala viz. the first digital state in the whole India having the largest share of households having computers (24 percent) and internet facility (51 percent), superb mobile phone penetration (95 percent), very high digital literacy (75 percent), smart phone penetration (62 percent), and so on. All these features underscore the excellent ICT infrastructure of in Kerala. To more effectively combat Covid-19 and such other global pandemics as well as to make the healthcare facilities in Kerala more equitable, inclusive and pro-poor, there is the need to leverage the ICT infrastructure in Kerala. Problems like information asymmetry, poor access to governmental healthcare services, insurance protection, health consciousness etc. can be addressed with ICT adoption and the use of such other technologies. Besides using technology advances, equally vital is to ensure that health aspects are included for scientifically designing houses.

A recent study by JLL has revealed that social value (S) of housing (built environment) is greatly dependent on the 'Health and wellbeing' since it is one of the key levers of S. In an ESG (Environment, Social, Governance) setting of housing, health is a key aspect.(Figure II).

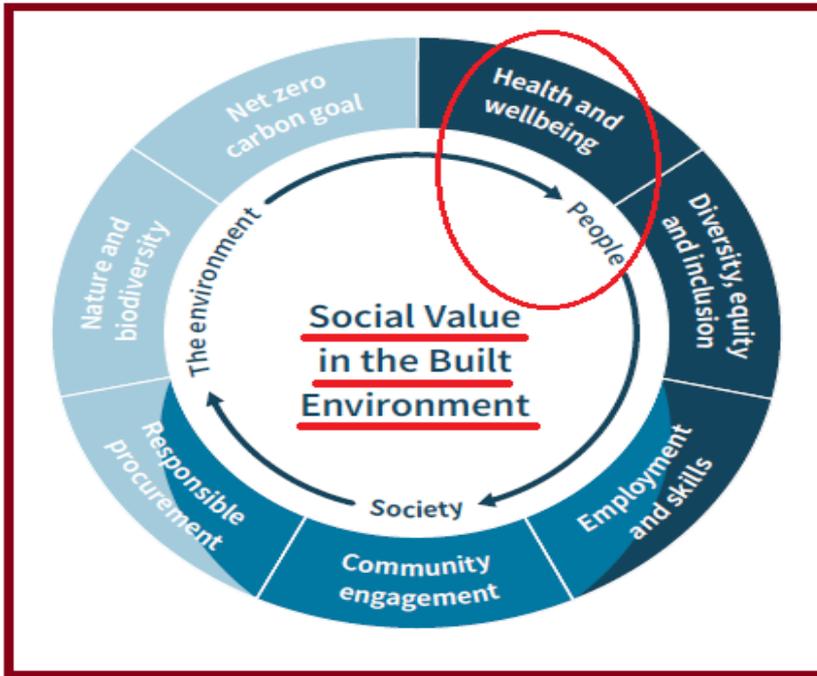


Figure II: Health-a key lever of Social value

Source: JLL (2023), Responsible Real Estate

Given the low health expenditure by the Govt. of India (GOI), the Out of Pocket (OOP) expenditure in India is high at about 50 percent. Govt. Health Expenditure (GHE) being about 40 percent, the relatively high OOP is unaffordable for the poor in India. (Figure III). This state of affairs indicates the utmost need for greater public investment by the government. Both GOI (at the national level) and individual State governments (like, GOK in respect of Kerala State) need to initiate measures to enhance their investments in the healthcare sector so that the burden of healthcare expenditure for the public at large eases. This takes the shape of lower OOPs, and also doing away with Distress Financing to the extent possible. Because of the funds constraints of the governments, both at the Central (Union) and State levels, there is high scope for encouraging alternative models like PPP (Public Private Partnership) in the context of India in general, and the State of Kerala in particular.

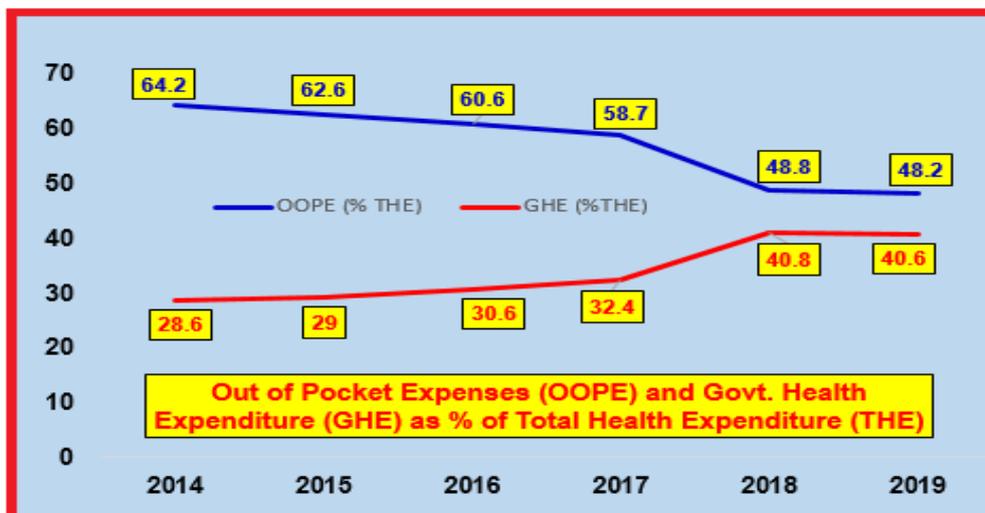


Figure III: Health Spending-OOP and GHE

Source: GoI (2023), Economic Survey.

It is noted that India’s expenditure on health as a share of GDP (2.1 percent) is very low compared with its peers in BRICS i.e. Brazil (B), Russia (R), China (C) and South Africa (S). Health expenditure of India is less than half that of Russia or China, and less than one-third that of Brazil or South Africa in GDP terms. India needs to double it at least. (Figure IV). Now, if the specific case of Kerala State in India is taken, then the share of Kerala’s GHE in the total State GDP (or, GSDP) of Kerala has been steadily growing from 1.26 percent in 2017-18 to 2.11 percent in 2021-22. Kerala’s GHE to GDP share of 2.11 percent (2021-22) matches with the GHE to GDP share of 2.1 percent for India as a whole. The GHE of Kerala as a share (percentage) of the total Governmental expenditure has also been growing over the years, and it is 7.3 percent (2021-22) as against 5.88 percent in 2017-18. (Figure V).

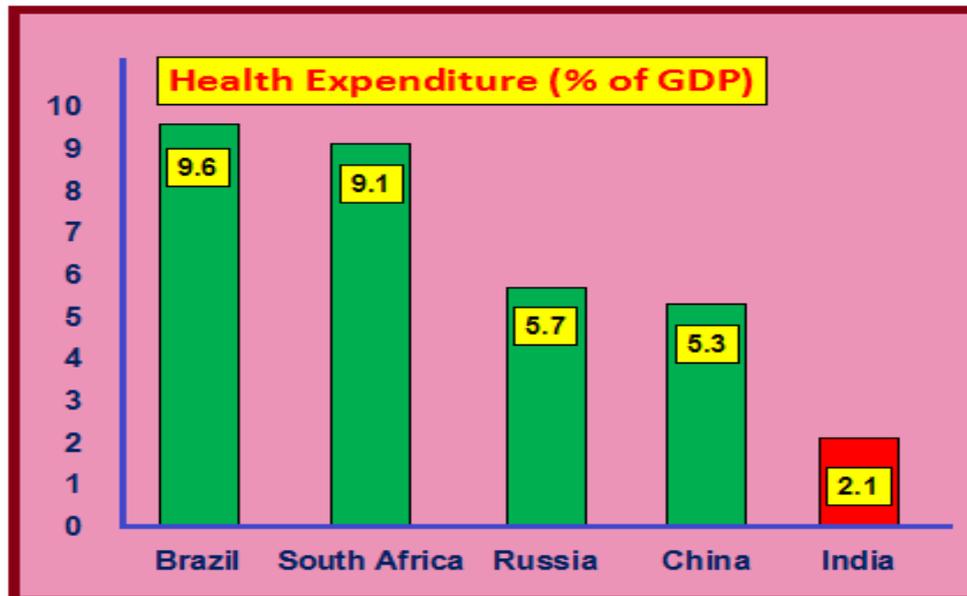


Figure IV: Health Expenditure (Percentage of GDP)

Source: GOI (2023) (www.pib.indexd.aspx)

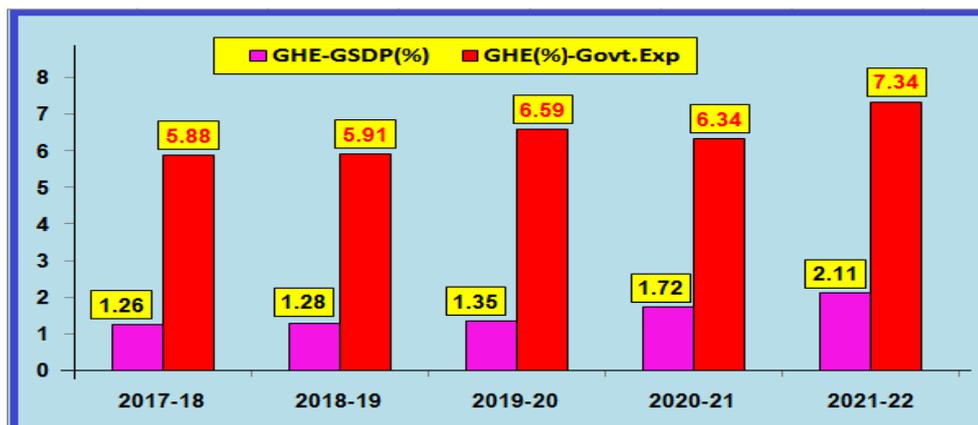


Figure V: GHE’s Share in GSDP and GHE’s Share in Total Govt. Expenditure

Source: GOK (2023), Economic Review 2022, Jan., p. 299.

From the Figures (IV) and (V), the poor GHE by the governments, both GOI and GOK, is evident. This in turn makes the OOP expenditure higher for the common man, the masses. As already noted, as per the empirical study, over a half of the Covid-19 affected households (Table IV) experienced catastrophic health expenditure and over one-fifth of them felt the challenge of inadequacy in savings (Table VII) in the Covid-19 times. Higher OOP expenses and hence unaffordability of health expenditure, coupled with

many other issues such as poor health consciousness, lack of proper information etc. (Table VII) make the living conditions of the masses miserable during the Covid-19 and such other pandemic situations. As a long term solution, higher GHEs of the State Government (GOK) and the Central Government (GOI) is vital. Equally important is the need for encouraging proper development of housing in India with due attention to the health aspect of the dwellers. Affordable healthcare and affordable housing should go hand in hand. From earlier studies, an inextricable relation between one's housing situation and his/her health status is revealed, and also the fact that a sizeable share of the household savings is spent for housing purpose. For example, a study by the US-based Robert Wood Johnson Foundation (RWJF)(2011) has noted that a significant share of the US population has spent over 50 percent of their income for housing purpose and that health depends primarily on (1) Housing affordability (2) Neighbourhood conditions, and (3) Indoor (within the house) conditions. These facts shows the key need for 'health-focused' housing policy in India and a holistic approach to healthcare and housing. (Figure VI).

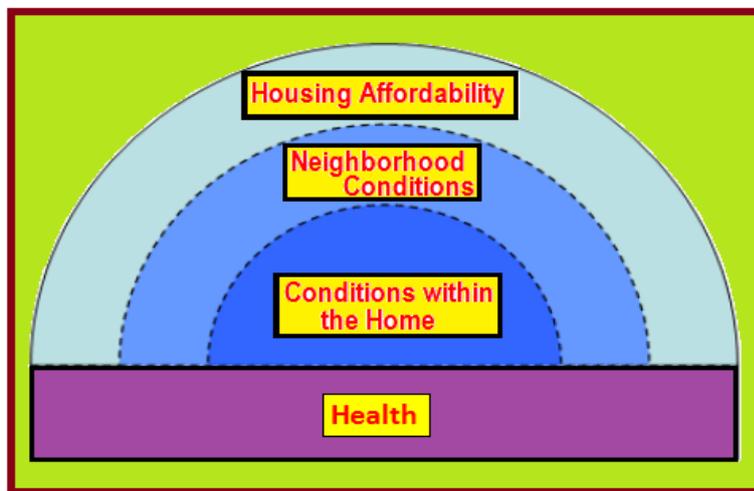


Figure VI: Relation-Health and Housing

Source: RWJF (2011), US, May. p.1.

10. Suggestions and Conclusion

From the aforesaid analysis, it is also noted that many studies in the Kerala have clearly noted the vital relevance for ICT adoption for inclusive growth. These include, studies that observed the favourable linkage of E-banking on empowering women, rural development etc. (Neeraja and Manoj, 2014), superior service quality through E-CRM (Vasantha, et. al., 2015), efficient delivery of social banking in digital era (Manoj, 2019), ICT adoption for enhanced service quality (Joju & Manoj, 2019), ICT integrated HRM for enhanced HR productivity (Manoj, 2019), and so on. It may be noted that ICT-driven and inclusive healthcare system is an imminent need in Kerala, as most of the major issues identified (Table VII) in this study can be addressed, cost-effectively and qualitatively, through digital tools or by ICT-adoption. Concurrently, requisite skills be imparted to the masses for effectively using the ICT-based services by the Government and private players. Accordingly, a more inclusive healthcare system may be put in place through meticulous ICT integration in Kerala's healthcare sector.

Needless to mention, enhanced public expenditure on the healthcare sector is vital for human capital formation since it can improve the health capital. Striking an optimal balance between public and private health expenditure is a pre-requisite for enhancing the standard of living and thus the productivity of the population in a nation, equitably and hence sustainably. GHE (Govt. Expenditure on Health) in India is very less. Household

expenditure on health is thus relatively high. This increases the OOP expenses and sometimes forces people to adopt distress financing in situations like Covid-19. Kerala's scenario is far better in comparison with other Indian States, regarding the healthcare services, trained medical professionals, and various health-related indices. In spite of this, majority of the households felt healthcare expenses to be catastrophic in the Covid-19 times, as per the empirical study in Kerala.

This study shows that even though the household health expenditure goes through a lot of stress and struggles. Household health expenditure were wholeheartedly ready to work during covid-19 outbreak. Even with coverage of medical expenses and life insurance which is provided by the central government, the risk they take when they interact with patients is immense. Health workers along with a hike in remuneration, provisions for incorporating risk allowance for their field activities during epidemics and pandemics should be done.

Expenditure on health comprises of two aspects: what the government spends on health and what is spent privately by citizens on looking after their health. The government spends on investing in and running hospitals, clinics, medical schools, and laboratories; it also spends on medical research. In many countries it pays the salaries of doctors and other health professionals directly. It may also procure drugs for free disbursement through clinics or pharmacies. Citizens in their private capacity spend money for consultations, for buying drugs, paying hospitals for treatment, for investigative procedures and such, often in less developed countries, they have to pay this out of their savings (OOP expenses). In advanced countries either the government provides most or all health benefits to everyone through a system of national health services, in which case this is financed primarily from taxes, or most of the population is covered by health insurance. In either case out-of-pocket expenditure for the citizen is minimum. Thus in poorer countries people actually have a higher burden of spending on health. Accordingly, the following are the suggestions made:

- (i) Higher GHE is imminent, both by GOI and GOK, the present level of about 2 percent being too low in comparison with other peer nations in BRICS or advanced nations. This in turn will reduce the OOP expenses involved in healthcare, and will ultimately benefit the women, low-income people, and those of other disadvantaged social groups.
- (ii) Governments, both Central and State levels, should provide better infrastructure in hospitals and healthcare units owned by it so that it helps the poor and the marginalised.
- (iii) ICT-integration in the healthcare sector can improve the access to healthcare for the poor and such other disadvantaged groups. Besides, it enhances the service quality also.
- (iv) The housing infrastructure in the country being very poor, the same needs to be scaled up through the 'Affordable Housing' initiatives. This is already a governmental priority in India. This in turn needs to be integrated with 'Affordable healthcare' also, because both these are mutually interconnected. The poor are the ultimate beneficiaries of both.
- (v) For the long-term sustainability an ESG approach in PPP (Public Private Partnership) route is preferred in infrastructure development in healthcare and social housing. A model for such an integrative perspective on housing and healthcare has been suggested based on the findings of this research for a State like Kerala in India which already has got an excellent ICT infrastructure and highly literate population with a sizeable technically skilled manpower including trained medical professionals. (Figure VII)

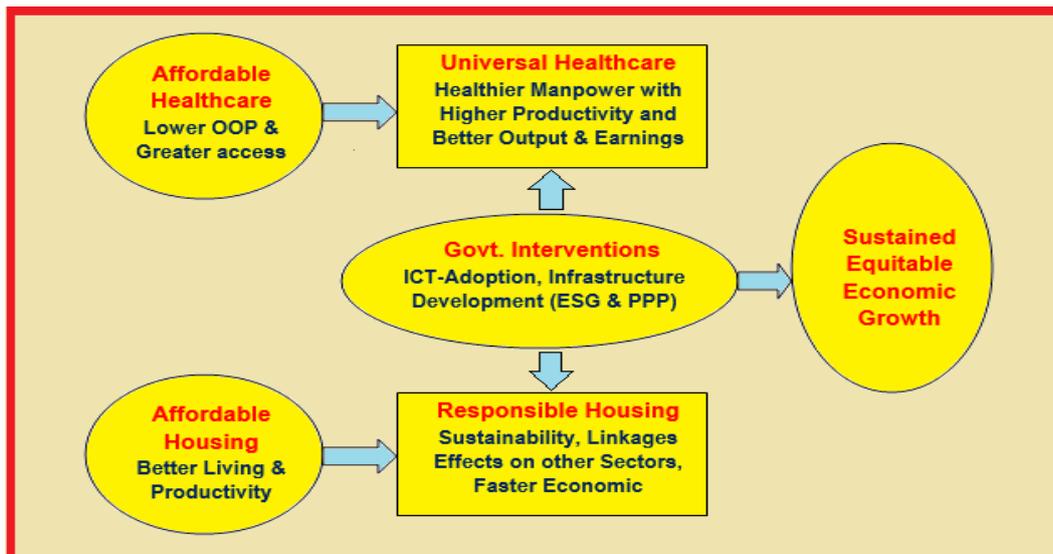


Figure VII: Affordable Healthcare and Affordable Housing – An Integrative View

Source: Author's Compilation

To sum up, all pervasive ICT-integration in healthcare is an imperative today in India. Coupled with this is the need to have a holistic approach to affordable types of healthcare and housing. Once these basic necessities are fulfilled for the masses that will automatically enhance their quality of life and productivity. This in turn would lead to rapid economic development of India in an equitable way. In fact, GOI has already embarked such schemes, like, those for affordable housing, universal healthcare etc. Integration of such schemes through ICT (say, using the Aadhaar number) is required for ensuring the holistic coverage of all citizens of India. Let us hope that the GOI will take such good initiatives in the future.

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Conflict of Interest

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References

1. Dey, B., Mitra, A., Prakash, K., Basu, A., Ray, S. and Mitra, A. (2013). Gaps in Health Infrastructure in Indian Scenario: A Review. *Indo Global Journal of Pharmaceutical Sciences*, 3(2): 156-166. (https://www.iglobaljournal.com/wp-content/uploads/2013/12/7.-Baishakhi-Dey-et-al-IGJPS-2013_Edited.pdf)
2. Saini, Tek Chand (2020). Availability of Primary Health Facilities in Rajasthan: Spatial Analysis. *International Journal of Applied Social Science*. 7 (5&6): 240-250. DOI: 10.36537/IJASS/7.5&6/240-250. (http://scientificresearchjournal.com/wp-content/uploads/2020/10/Social-Science-7_A-240-250-Full-Paper.pdf).
3. Manoj PK (2007). ICT industry in India: a SWOT analysis. *Journal of Global Economy*, 3(4): 263–282. (doi: 10.1956/jge.v3i4.143.)
4. Pickens, M (2009). Window on the unbanked: Mobile money in the Philippines. <https://www.cgap.org/sites/default/files/CGAP-Brief-Window-on-the-Unbanked-Mobile-Money-in-the-Philippines-Dec-2009.pdf>
5. P.K. Manoj (2010). Impact of Technology on the efficiency and risk management of old private sector banks in India: Evidence from banks based in Kerala. *European Journal of Social Sciences*, 14(2), 278-289.

6. Robert Wood Johnson Foundation (RWJF) (2011). Housing and Health. Issue Brief 7, May. <https://www.rwjf.org/en/insights/our-research/2011/05/housing-and-health.html>.
7. Manoj P.K. (2012), Information and Communication Technology (ICT) for Effective Implementation of MGNREGA in India: An Analysis, Digital Economy of India – Security and Privacy, Serials Publications, 4830/24, New Delhi, pp.145-150, First Ed.
8. K.K Nasar and P.K Manoj (2013).Customer satisfaction on service quality of real estate agencies: An empirical analysis with reference to Kochi Corporation Area of Kerala State in India. *International Journal of Management, IT and Engineering*. 3 (6). 213-227.
9. Manoj P.K.(2013). Prospects and Challenges of Green Buildings and Green Affordable Homes: A Study with Reference to Ernakulam, Kerala. *Global Research Analysis*. 2(12).45-49.
10. Neeraja James and Manoj, P.K. (2014), Relevance of E-Banking Services in Rural Area—An Empirical Investigation, *Journal of Management and Science*, 5, 1-14.
11. Manoj PK and John MP (2014). Prospects of Cattle Feed Industry in India and Strategies for Utilizing the Market Potential: A Study in Kerala with a Focus on Factors Influencing Buyer Behaviour. *International Journal of Business and General Management (IJBGM)*. 3(3):1-12.
12. Manoj PK (2015).Cattle feed industry in India: a macro perspective. *International Journal of Commerce and Business Management*, IV (10)(I):96-101.
13. Lauer K., and Timothy L. (2015). Digital financial inclusion: Implications for customers, regulators, supervisors, and standard-setting bodies. [https://www.documents.worldbank.org/\(https://documents1.worldbank.org/curated/en/770291468338664476/pdf/952100BRI0Box3010Inclusion0Feb02015.pdf\)](https://www.documents.worldbank.org/(https://documents1.worldbank.org/curated/en/770291468338664476/pdf/952100BRI0Box3010Inclusion0Feb02015.pdf)).
14. Manoj, P.K. (2015), Socio-Economic Impact of Housing Microfinance: Findings of a Field based Study in Kerala, India, *International Research Journal of Finance and Economics*, 137, 32-43.
15. Manoj, P.K.(2015), Deterrents to the Housing Microfinance: Evidence from a Study of the Bankers to ‘Bhavanashree’ in Kerala, India, *International Research Journal of Finance and Economics*, 138, 44-53.
16. Jacob Joju, Dr.Vasantha S, and Dr. Manoj, P. K. (2015), E-CRM: A Perspective of Urban & Rural Banks in Kerala, *International Journal of Recent Advances in Multidisciplinary Research*, 2(9), 786-791.
17. Vidya Viswanath & Manoj, P. K. (2015), Socio-Economic Conditions of Migrant Labourers - An Empirical Study in Kerala, *Indian Journal of Applied Research*, 5 (11), 88-93.
18. S Rajesh &Dr.Manoj P.K (2015). Women Employee Work-life and Challenges to Industrial Relations: Evidence from North Kerala. *IPASJ International Journal of Management (IJM)*. 3.5.2015.
19. Asian Development Bank (2015). Gender Mainstreaming Case Study India: Kerala Sustainable Urban Development Project. Asian Development Bank.
20. P.K. Manoj (2015). Employment Generation from Rural Tourism: A Field Study of the Local Community at Kumbalangi, Kerala. *International Journal of Applied Services Marketing Perspectives (IJASMP)*, 4(4),1880-1888.
21. P.K Manoj (2016). Determinants of sustainability of rural tourism: a study of tourists at Kumbalangi in Kerala, India. *International Journal of Advance Research in Computer Science and Management Studies*. 4 (4). 17-30.
22. P.K. Manoj (2016). Real Estate Investment Trusts (REITs) for Faster Housing Development in India: An Analysis in the Context of the New Regulatory Policies of SEBI. *International Journal of Advance Research in Computer Science and Management Studies*, 4(6), 152-167.
23. P.K Manoj (2016). Bank marketing in India in the current ICT era: Strategies for effective promotion of bank products. *International Journal of Advance Research in Computer Science and Management Studies*, 4 (3), 103-113.

24. Lakshmi and Manoj, P.K. (2017). Service quality in rural banking in North Kerala: A comparative study of Kannur district co-operative bank and Kerala Gramin bank. *International Journal of Applied Business and Economic Research*, 15(18), 209-220.
25. Lakshmi and Manoj, P.K. (2017). Rural customers and ICT-based bank products: A study with a focus on Kannur district co-operative bank and Kerala Gramin Bank. *International Journal of Economic Research*, 14(14), 423-434.
26. Jacob Joju, Vasantha, S. and P.K. Manoj. (2017). Future of brick and mortar banking in Kerala: Relevance of branch banking in the digital era. *International Journal of Civil Engineering and Technology*, 8(8), 780-789.
27. Jacob Joju, Vasantha, S. & Manoj, P.K. (2017). Financial technology and service quality in banks: Some empirical evidence from the old private sector banks based in Kerala, India. *International Journal of Applied Business and Economic Research*, 15(16), 447-457.
28. Manoj, P.K. (2017). Construction costs in affordable housing in Kerala: Relative significance of the various elements of costs of affordable housing projects. *International Journal of Civil Engineering and Technology*, 8(9), 1176-1186.
29. Manoj, P.K. (2017). Cost management in the construction of affordable housing units in Kerala: A case study of the relevance of earned value analysis (EVA) approach. *International Journal of Civil Engineering and Technology*, 8(10), 111-129.
30. J Joju, S Vasantha, PK Manoj (2017). Electronic CRM & ICT-based banking services: An empirical study of the attitude of customers in Kerala, India. *International Journal of Economic Research*, 14 (9), 413-423.
31. Manoj, P.K. (2018). CRM in old private sector banks and new generation private sector banks in Kerala: A comparison. *Journal of Advanced Research in Dynamical and Control Systems*, 10 (2 Special Issue), 846-853.
32. Manoj, P.K. (2019). Social banking in India in the reforms era and the case of financial inclusion: Relevance of ICT-based policy options. *Journal of Advanced Research in Dynamical and Control Systems*, 11(7 Special Issue), 1654-1666.
33. Manoj, P.K. (2019). Dynamics of human resource management in banks in the ICT era: A study with a focus on Kerala based old private sector banks. *Journal of Advanced Research in Dynamical and Control Systems*. 11(7 Special Issue), 1667-1680.
34. Manoj, P.K. (2019). Competitiveness of manufacturing industry in India: Need for flexible manufacturing systems. *International Journal of Innovative Technology and Exploring Engineering*, 8(12), 3041-3047. (DOI: 10.35940/ijitee.K2452.1081219).
35. J Joju and Manoj PK (2019). Digital Kerala: A study of the ICT: Initiatives in Kerala state. *International Journal of Research in Engineering, IT and Social Sciences*; 9: 692-703.
36. J Joju and P K Manoj (2019). Banking Technology and Service Quality: Evidence from Private Sector Banks in Kerala. *International Journal of Recent Technology*, 8 (4), 12098-12103.
37. Ali, O.P. and Manoj, P.K. (2020). Impact of falling price of rubber-a case study of Kothamangalam Taluk in Ernakulam district. *Indian Journal of Economics and Development*, 16(1), 118-124.
38. United Nations (2016). Digital Financial Inclusion. Issue Brief Series. International Telecommunication Union (ITU) 2016. (https://www.un.org/esa/ffd/wp-content/uploads/2016/01/Digital-Financial-Inclusion_ITU_IATF-Issue-Brief.pdf).
39. United Nations (2020). UNDESA World Social Report 2020. (<https://www.un.org/development/desa/dspd/world-social-report/2020-2.html>).
40. Harapan Harapana, Naoya Itoh, Amanda Yufika, Wira Winardi, Synat Keam, Haypheng Te, Dewi Megawatii, Zinatul Hayati, Abram L. Wagner, Mudatsir Mudatsir (2020), Coronavirus disease 2019 (COVID-19): A literature review, *Journal of Infection and Public Health*, 13, 667-673.

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41. Thongrawd, C.(2020).Factors managing the effective diffusion of information: a case study. *Journal of Security and Sustainability Issues*, 9(M), 275-288. [https://doi.org/10.9770/jssi.2020.9.M\(22\)](https://doi.org/10.9770/jssi.2020.9.M(22))
42. NCHFA (2020). Affordable Housing Benefits Health. North Carolina Housing Finance Agency. https://www.nchfa.com/sites/default/files/page_attachments/2020BOHAffordableHousingBenefitsHealth.pdf
43. Elias, Arun A (2021). Kerala's Innovations and Flexibility for Covid-19 Recovery: Storytelling using Systems Thinking. *Global Journal of Flexible Systems Management*, 22 (Suppl 1), June, S33-S43. (<https://doi.org/10.1007/s40171-021-00268-8>).
44. Ummer O, Scott K, Mohan D, et al. (2021), Connecting the dots: Kerala's use of digital technology during the COVID-19 response. *BMJ Global Health*; 6:e005355. DOI: 10.1136/bmjgh-2021-00535.
45. Ranjith Karat, Suraj E.S, Jacob Joju, Manoj PK and Nithin J (2022), Covid 19 and the Healthcare Sector in Digital India: A Case Study of The Top Six Nifty Pharma Companies, *International Journal of Early Childhood Special Education (INT-JECSE)*, 14 (05), Aug., 7595-7604. DOI:10.9756/INTJECSE/V14I5.960.
46. Nripendra Narayan Das, Pradeep P, Prasanth C.B., and Manoj P.K. (2022), Sars-Cov-2 Novel Corona Virus: Origin and the Vaccination Survey, *Journal of Pharmaceutical Negative Results*, 13 (1), Oct., 1032-1040. DOI: 10.47750/pnr.2022.13.S01.123.
47. Xieu, Wilson; Hur, JungYun "Christine"; and Shirsat, Abhijeet (2022) "Returning to Travel: Fear, Coping, and Resilience During the COVID-19 Pandemic," *Journal of Tourism Insights*: Vol. 12: Iss. 1, Article 2. (<https://doi.org/10.9707/2328-0824.1271>).
48. Sourajyoti Sardar, Anirban Sanyal, and Tushar B Das (2023), "Did COVID-19 Affect Households Differently? Understanding Heterogeneity in Consumer Confidence", Reserve Bank of India (RBI), WPS (DEPR): 06 / 2023, April. (www.rbi.org.in).
49. Govt. of India (GOI) (2023). Economic Survey 2022-23. Ministry of Finance. New Delhi. (<https://indiabudget.gov.in>).
50. Govt. of Kerala (GOK) (2023). Economic Review 2022. Kerala State Planning Board. Jan. (<https://spb.kerala.gov.in>) (https://spb.kerala.gov.in/sites/default/files/2023-02/ENGLISH%20FINAL%20PRESS%2004.02.2023_0.pdf).