

MULTIMORBIDITY ASSOCIATED ECONOMIC IMPACTS AT HOUSEHOLD LEVEL IN RURAL KOLLAM, KERALA.

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**DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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DEDICATION

I dedicate the work embodied in this dissertation to my parents, Valsala and Rajendran, and my dear sister, Arya V. R., whose unconditional support made it possible.

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Dr Anuja V R

DECLARATION

I hereby declare that the work embodied in this dissertation titled, “Multimorbidity associated economic impacts at household level in rural Kollam, Kerala.” is the bonafide record of my original field research. It has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published and unpublished work of others has been duly acknowledged in the text.

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June, 2024

CERTIFICATE

I hereby certify that the work embodied in this dissertation titled, “Multimorbidity associated economic impacts at household level in rural Kollam, Kerala.” is a bonafide record of original research work undertaken by Dr Anuja V R, in partial fulfilment of the requirements for the award of the Master of Public Health degree under my guidance and supervision.

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GLOSSARY OF ABBREVIATIONS

ADL	Activities of Daily Living
AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
ATC	Anatomical Therapeutic Chemical classification system
CCI	Charlson Comorbidity Index
CHARLS	China Health and Retirement Longitudinal Study
CHE	Catastrophic Health Expenditure
CHSI	Cost of health services in India study
CIRS-G	Cumulative Illness Rating Scale for Geriatrics
CTP	Capacity to Pay
DALYs	Disability-Adjusted Life Years
ELSI	Brazilian Longitudinal Study of Aging
ESTHER	Epidemiological Investigations of the Chances of Preventing, Recognizing Early and Optimally Treating Chronic Diseases in an Elderly Population
EUR	Euro
FE	Food Expenditure
FE	Food Expenditures
GDP	Gross Domestic Product
GHDSS	Gorakhpur Health and Demographic Surveillance Site
GP	General Practitioner
HAP	Healthcare-Associated Pneumonia
HCE	Household Consumption Expenditure
HILDA	Household, Income, and Labour Dynamics in Australia survey

HIV	Human Immunodeficiency Virus
IADL	Instrumental Activities of Daily Living
ICHA	The International Classification for Health Accounts
IFLS	Indonesian Family Life Survey
IHD	Ischemic Heart Disease
INR	Indian Rupee
INSEF	Inquérito Nacional de Saúde com Exame Físico
IP	Inpatient
IRR	Incidence Rate Ratio
JSTAR	Japanese Study of Aging and Retirement survey
KHPS	Korea Health Panel (KHP) data
KMSCL	Kerala Medical Services Corporation
LASI	The Longitudinal Ageing Study in India
LHID	National Health Insurance Database of Taiwan
LMICs	Low and Middle-Income Countries
LSMC	Late-Stage Medical Care System for the Elderly data
LTC	Long-term Care
MH	Maharashtra
NCDs	Non-Communicable Diseases
NFHS	National Family Health Survey
NHA	National Health Authority
NHI	National health insurance
NHIF	Lithuanian National Health Insurance Fund
NSSO	National Sample Survey Office
OECD	Organisation for Economic Co-operation and Development

OOP	Out of Pocket Payments
OOPE	Out-of-Pocket Expenditure
OP	Outpatient
PL	Poverty Line
PMJAY	Pradhan Mantri Jan Arogya Yojana
RJ	Rajasthan
RMB	Renminbi
Rx-MG	Rx-defined morbidity groups
SD	Standard Deviation
SDG	Sustainable Development Goals
SE	Subsistence Expenditure
SHA	State Health Authority
SHARE	Survey of Health, Aging, and Retirement in Europe
THHE	Total Household Expenditure
TILDA	The Irish Longitudinal Study on Ageing
UHC	Universal Health Coverage
UP	Uttar Pradesh
WB	West Bengal
WHO	World Health Organization
WHO SAGE	Study on Global Ageing and Adult Health
WiSE	Well-being of the Singapore Elderly
YLD	Years Lost to Disability

ABSTRACT

Background: Multimorbidity presents a substantial challenge to healthcare systems worldwide, yet its effects on healthcare costs and patient financial burden have yet to be adequately studied. Through this study, I aimed to assess the economic impacts of multimorbidity at both the individual and household levels.

Methods: A cross-sectional survey was conducted among 338 households, which consisted of 552 adult participants between 30 and 70 years of age. I assessed sociodemographic variables, medical history, healthcare-related expenditures, and household expenditures using a structured interview schedule. I used descriptive statistics to summarise the results healthcare expenditure including out of pocket expenditure for outpatient and inpatient visits, out of pocket expenditure (OOPE), out of pocket expenditure and productivity loss, total health expenditure, expenditure incurred by the health system, catastrophic health expenditure (CHE) and distress financing.

Results: The prevalence of multimorbidity was 46.2 percent (95 % CI: 42.2 – 50.4). The prevalence of multimorbidity at the household level was 63.0 percent (95 % CI: 58 – 68). Mean annual outpatient visits were 12.1(13.5) among participants without multimorbidity and 22.2 (23.6) among participants with multimorbidity. The mean in-patient admissions in individuals with and without multimorbidity were 0.39 (0.67) and 0.26 (0.65), respectively. Mean annual OOPE differed between individuals without (INR 28462.2, SD=71622.6) and with multimorbidity (INR 69864.7, SD=124599.7). However, when added productivity loss, these groups' corresponding values were ₹65072.0 (130292.6) and ₹122710.5 (207193.0). The mean annual expenditure incurred by the health system in participants without (INR 13721.4, SD=106821.6) and with multimorbidity (INR16744.0, SD=59006.7). Corresponding values for total health expenditure were 79414.4 (182588.4) and 140710.7 (241997.5) in individuals

without and with multimorbidity. The OOPE as a share of the total health expenditure was 57 percent in participants with multimorbidity compared to 39 percent in those without ($p=0.001$). Among households without multimorbidity, 12 percent experienced catastrophic health expenditure, while it was 28.6 percent ($p=0.001$) among households with multimorbidity. Similarly, distress financing was reported in 24 percent and 39.9 ($p=0.001$) percent of households without and with multimorbidity, respectively.

Conclusion: Multimorbidity was prevalent in one out of two adult individuals and six out of ten households. Participants with multimorbidity reported almost double the annual outpatient visits compared to those without multimorbidity. The OOPE was 2.5-fold higher in participants with multimorbidity than those without. When productivity loss was added, the mean annual health expenditure nearly doubled. The percentage share of OOPE in total health expenditure was 57 percent in participants with multimorbidity compared to 39 percent in those without. Among households with multimorbidity, nearly three out of ten households experienced CHE, while four out of ten experienced distress financing.

1. INTRODUCTION

In 2021, the academic community witnessed a significant shift when one of the SAGE journals, "Journal of Comorbidity," transformed into the "Journal of Multimorbidity and Comorbidity." This change may raise questions among researchers who must familiarize themselves with multimorbidity. However, clarification came through an editorial article in which authors highlighted the distinction between multimorbidity and comorbidity, emphasizing differences in research design, interventions, and healthcare delivery. (Harrison et al., 2021)

A growing body of literature on multimorbidity primarily focuses on high-income countries, where it's more of a norm than an exception, particularly among older adults. In contrast, low and middle-income countries (LMICs) grapple with a double burden of disease, characterized by both chronic and infectious ailments. (Basto-Abreu et al., 2022) The epidemiological transition exacerbates this phenomenon as degenerative diseases replace infectious and nutritional disorders (Omran, 2005), compounded by demographic and economic shifts. (Boutayeb and Boutayeb, 2005) The high burden of non-communicable diseases (NCDs) complicates the picture by leading to poor health and disability. (Smith and O'Dowd, 2007) Consequently, multimorbidity presents a unique challenge in these settings. (Dixon et al., 2023) The United Nations High-Level Meetings on NCDs in 2011, 2014, and 2018 underscored the escalating burden of multimorbidity in LMICs. (Political Declaration of the 3rd High-Level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases, 2018) This acknowledgment reflects the global recognition of the significant challenges posed by multimorbidity to both patients and healthcare systems. (Multimorbidity: A Priority for Global Health Research, 2018) As such, addressing multimorbidity has become a priority for global health research and policy initiatives. (Multimorbidity: A Priority for Global Health Research, 2018)

Multimorbidity is associated with higher healthcare utilization, out-of-pocket expenditure (OOPE), and polypharmacy, as evidenced by studies conducted in high-income and LMIC settings. (Sum et al., 2018) A systematic review by Wang et al. on the cost of illness studies of multimorbidity revealed a cost ratio ranging from 2-16 to 2-10 between multimorbidity and non-multimorbidity cases, with only two LMIC studies among the 26 included. (Wang et al., 2018) Similarly, Jaspers et al.'s systematic review of the global burden of NCDs found that OOPE as a percentage of household income varied widely across different NCDs, ranging from 2 percent to 158 percent. (Jaspers et al., 2015)

In LMICs, low levels of government expenditure for health, coupled with inadequate health insurance coverage, often lead to higher levels of OOPE and pose a significant risk of financial hardship for patients with chronic health conditions. (Sum et al., 2018) Despite comprising only 20 percent of the world's population, high-income nations allocate approximately 80 percent of global health spending. In stark contrast, LMICs accounted for just 20 percent of global health spending in 2016 despite being home to 80 percent of the world's population. (Public Spending on Health: A Closer Look at Global Trends, 2018)

Indeed, any health system should strive to achieve three intrinsic goals: improving and maintaining the health of the population, ensuring fair financing and financial risk protection to prevent households from becoming impoverished due to healthcare costs and enhancing responsiveness to meet the legitimate expectations of the population. (A WHO Framework for Health System Performance Assessment, 1999) Therefore, fairness in the method of payment for healthcare is crucial to restrict the financial burden on patients' households. (A WHO Framework for Health System Performance Assessment, 1999) However, the fragmented nature of health systems, coupled with limited resources, poses significant challenges in addressing the growing burden of multimorbidity in LMIC settings. (Basto-Abreu et al., 2022) Health system fragmentation, characterized by a lack of coordination between functions, as

defined by Thomas Bosset (Bossert et al., 2014), along with the division between public and private sectors (Miller, 1966), impedes the achievement of universal health coverage(UHC) in LMICs. Additionally, these systems often fail to meet the need for curative and supportive treatments. (Adam and de Savigny, 2012)

Healthcare systems that prioritize individual conditions, similar to those in high-income countries, inadvertently create an inefficient model of care. (Making More of Multimorbidity: An Emerging Priority, 2018) The clinical needs of individuals with multimorbidity differ significantly from those with single conditions. When healthcare systems focus on diseases rather than patients, it leads to duplication of services for multimorbid individuals, resulting in multiple visits to multiple healthcare providers. (Making More of Multimorbidity: An Emerging Priority, 2018) This imposes an economic burden on households, potentially leading to impoverishment. For example, the purchase of the lowest-priced generic diabetes medication could push 6-11 percent of the total population below the poverty line threshold of 1.25 US dollars per day in 16 low and middle-income countries. (Jaspers et al., 2015)

In 2021, India's UHC service coverage index was rated at 63 out of 100, indicating room for improvement in ensuring all access to essential healthcare services. (WHO, 2024) The National Health Policy of 2017 in India guarantees free and comprehensive primary care services, covering maternal health to preventable NCDs. (National Health Policy, 2017) However, despite these policies, OoPE constitutes over 65 percent of total health expenditure in India, according to the Health at a Glance report of 2018. (Health at a Glance: Asia/Pacific 2018, 2018) The National Health Policy of 2017 aims to allocate 2.5 percent of the Gross Domestic Product (GDP) towards healthcare spending by the Government of India. However, the current expenditure remains at 1.8 percent of GDP. The flagship healthcare program, Ayushman Bharat, primarily covers inpatient illnesses and healthcare costs. However, its effectiveness is compromised when a significant portion of the population needs more regular access to

healthcare. (Grewal et al., 2023) Consequently, millions of Indians are pushed into poverty annually due to high OOPe, with over 17 percent of households facing catastrophic levels of health expenditure. (India Health System Review, 2022) This high burden of healthcare expenditure has significant microeconomic impacts at the household level, ranging from impoverishment to the adoption of coping strategies, ultimately reducing future household consumption opportunities. (WHO Guide to Identifying the Economic Consequences of Disease and Injury, 2009)

Kerala has the lowest epidemiological transition ratio among Indian states. (C and Jeemon, 2020) So, assuming a higher multimorbidity prevalence with a higher probability of financial catastrophe is not wrong. One of the integral parts of the Kerala model of development was the availability and accessibility of government healthcare facilities. (Nair R and Varma, 2021) Still, the state managed to retain the first position in terms of private per capita expenditure in 2013-14. (Nair R and Varma, 2021) Even though there was an increase from 9 percent to 19 percent in government health expenditure, 12 percent of rural households and 9 percent of urban households were pushed below the poverty line because of the health expenditure. (Nair R and Varma, 2021) This suggests that while government healthcare facilities are available and accessible, they may not fully alleviate the financial burden of healthcare costs, particularly in the face of rising multimorbidity rates. Against these backdrops, this study aimed to assess the economic impact of multimorbidity, including its impoverishment effects at the population level in Kerala.

2. LITERATURE REVIEW

2.1 Prevalence of Multimorbidity

The term "Comorbidity" was coined by Feinstein in 1970 and defined as "any distinct additional entity that has existed or may occur during the clinical course of a patient who has the index disease under study". (Feinstein, 1970) Multimorbidity, as defined by van den Akker et al. in 1996, is "the cooccurrence of multiple chronic or acute diseases and medical conditions within one person". (van den Akker et al., 1996) Boyd and Fortin further elaborated on multimorbidity, describing it as 'the co-existence of two or more chronic conditions, where one is not necessarily more central than the others'. (Boyd and Fortin, 2010) It's important to note that there is no uniform definition of multimorbidity, and the selection of diseases varies in studies, depending on context and population

2.1.1 Global

Prevalence of multimorbidity varies widely from 12.9 percent in those aged 18 years and above to 95.1 percent in 65 years and above. (Violan et al., 2014) A multicounty study assessing the prevalence of multimorbidity in LMICs showed the mean world standardized multimorbidity prevalence for LMICs as 7.8 percent, and the prevalence significantly increased with age in all countries 3.8 percent (95 % CI, 3.0 – 4.6) for age 18–49, 12.8 percent (95 % CI, 10.5 –15.2) for 50–64; and 21.3 percent (95 % CI, 17.1 – 25.5) for 65 + years. (Afshar et al., 2015) The prevalence in China, Finland, Ghana, India, Mexico, Poland, Russia, South Africa, and Spain, respectively, was 45.07 percent, 68.25 percent, 48.30 percent, 57.92 percent, 63.89 percent, 69.39 percent, 71.93 percent, 63.44 percent, 68.77 percent.

2.1.2 India and Kerala

Studies on multimorbidity in India are limited. (Pati et al., 2014) According to a study by Pati et al., reported prevalence in adults was 28 percent (Pati et al., 2020), and it was approximately 30 percent of those aged over 60 years. (Mini and Thankappan, 2017)

Table 2.1 Literature on multimorbidity prevalence from Indian states

Authors	Setting	Population and age group	Number of conditions and measurement	Prevalence
Purty et al. (Purty et al., 2006)	Tamil Nadu-Rural	60years and above, 320	15, Count and measurement	48.1%
Pati et al. (Pati et al., 2014)	Assam, Karnataka, MH, RJ, UP, WB	18years and above, 12198	9, Count	8.9%
Banjare et al. (Banjare and Pradhan, 2014)	Bargarh, Odisha	60 years and above, 310	21, Count	56.8%
Arokiaswamy et al. (Arokiasamy et al., 2015)	Karnataka, Kerala, Punjab, Rajasthan	45years and above, 1683	7, Count	9%(Overall) 24%(Kerala)
Pati et al. (Pati et al., 2020)	Odisha (Primary care)	18 years and above, 1649	22, Structured assessment protocol	28.3%
Agrawal et al. (Agrawal et al., 2016)	Assam, Karnataka, MH, RJ, UP, WB	18years and above, 12198	9, Count	8.3% (total) 7.8% (Rural)
Mini et al. (Mini and Thankappan, 2017)	Some Indian states	60years and above, 9852	12, Count	30.7%
Himanshu et al. (Himanshu and Talukdar, 2017)	Seven states of India	60years and above, 9852	9, Count	23.6%(Total) 42.02%(Kerala)

Authors	Setting	Population and age group	Number of conditions and measurement	Prevalence
Vargese et al. (Vargese et al., 2020)	Thiruvalla, Kerala	18 years and above, 525.	7	16.2%
Rohini et al. (C and Jeemon, 2020)	Pathanamthitta, Kerala	30-69 years, 410	11, Count and measurement	45.4%
Ismail et al. (Ismail et al., 2022)	Malappuram, Kerala (Primary care)	30 years or more, 540	12, Count and measurement	39.8%
*MH-Maharashtra, RJ-Rajasthan, UP-Uttar Pradesh, WB-West Bengal				

2.2 Healthcare utilization and healthcare expenditure

Universal health coverage, the priority goal of WHO, is defined as ‘... ensuring that all people have access to needed promotive, preventive, curative, and rehabilitative health services, of sufficient quality to be effective, while also ensuring that people do not suffer financial hardship when paying for these services’. (WHO, 2023) Therefore, providing equitable access to healthcare services should be the core aim of any health policy. (Nair R and Varma, 2021)

The four dimensions of healthcare utilization are availability, accessibility, affordability, and acceptability. (O'Donnell, 2007) The population's access to healthcare services is often represented by the utilization of healthcare services. (Jacobs et al., 2012)

2.3 Out-of-Pocket Expenditure (OOPE)

The International Classification for Health Accounts (ICHA) categorizes certain household health expenditures as OOPE. These payments encompass both formal and informal expenses incurred at the time of receiving various types of care (such as promotive, curative, rehabilitative, palliative, or long-term care) from any provider, which are not covered by the third parties such as the government, health insurance, or private insurance. However, they do

not include insurance premiums or reimbursements from third parties. These expenses can be financed through income sources like remittances, savings, or borrowings. (WHO, n.d.)

According to the Organisation for Economic Co-operation and Development (OECD) library, OOPEx payments are ‘expenditures borne directly by a patient where neither public nor private insurance cover the total cost of the health good or service. They include cost-sharing and other expenditures paid directly by private households and should also ideally include estimations of informal payments to health providers. (OECD, 2019)

According to the World Bank library, the WHO defines OOPEx ‘as any spending incurred by a household when any member uses a health good or service to receive any type of care (preventive, curative, rehabilitative, long-term or palliative care); provided by any type of provider; for any type of disease, illness or health condition; in any type of setting (outpatient, inpatient, at home)’. (World Bank, 2024)

The Health System Costing Manual for India includes direct medical and non-medical costs in OOPEx. OOPEx comprises direct health expenditure, including doctor consultation fees, spending on purchasing medicine, laboratory charges, diagnostics fees, and hospital charges (e.g., bed/ward/room/procedure charges), as well as direct non-health expenditure, including expenditure on travel, boarding, and lodging while seeking healthcare. (A Handbook of Health System Costing, 2017)

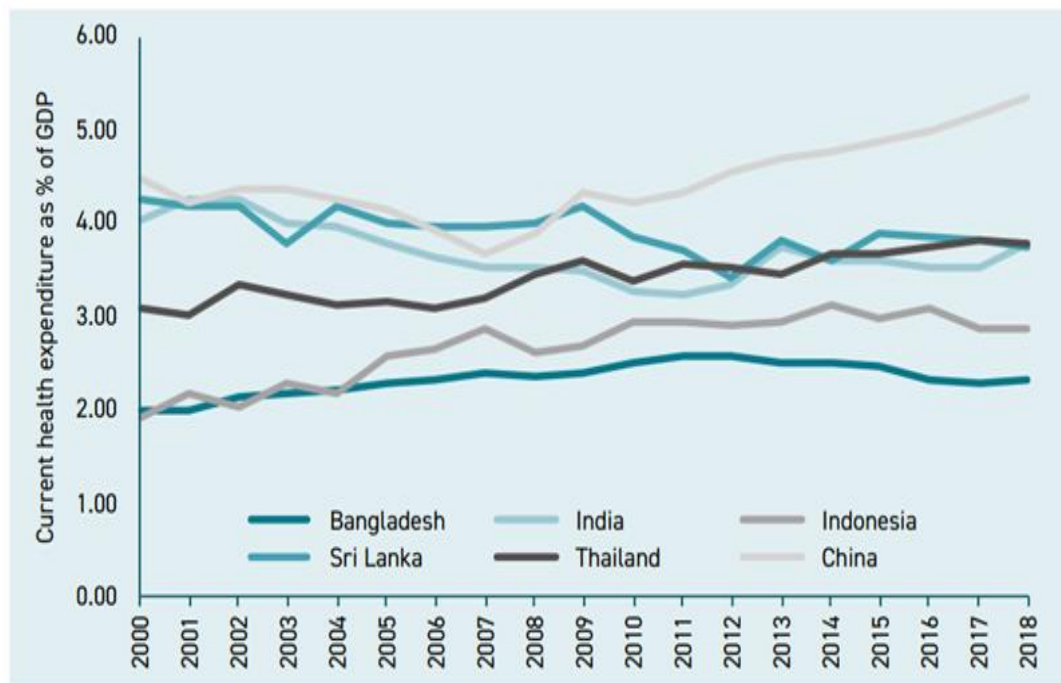
2.3.1 Health expenditures across the world

Approximately 10 percent of GDP, which approximated US\$ 7.5 trillion, was spent on health by countries worldwide in 2016. The share was higher for high-income countries, averaging about 8.2 percent, and for LMICs, it was about 6.3 percent of GDP (New perspectives on global health spending for universal health coverage, 2018).

The following graph (figure 2.1), adapted from a WHO document, depicts India's dwindling health expenditure as a share of GDP. India's overall health spending was lower than the

average of 5.2 percent of GDP in LMICs. Therefore, OOPE has become the primary financing mechanism of India's health system. (India Health System Review, 2022)

Figure 2.1 Current health expenditure as a percentage of GDP in some LMICs



Note: Current Health Expenditure excludes capital expenses

Source: Global Health Expenditure Database (WHO, 2021). India estimates are from NHA 2016–2017 (NHSRC, 2019)

2.4 Characteristics of literature on healthcare utilization and healthcare expenditure in multimorbidity

The following tables (table 2.2, table 2.3, table 2.4) show the characteristics of the articles reviewed for healthcare utilization and healthcare expenditure in the case of multimorbidity. Studies were mainly chosen if they give values stratified to multimorbidity or the number of disease conditions.

2.4.1 Global- High-income countries

Table 2.2 Characteristics of literature on healthcare utilization and healthcare expenditure in multimorbidity from high-income countries.

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency (Symbol)
Bahler et al. (Bähler et al., 2015)	Switzerland	Claims data	65 years and above, 266925 individuals	22, Count based on ATC	Healthcare utilization was assessed for 2013.	Swiss Francs (F)
Heider et al. (Heider et al., 2014)	Germany	ESTHER (2008 to 2010)	50-74 years, 3124 individuals	14, CIRS-G	The recall period for OP and inpatient admissions was three months.	Euros (€)
Picco et al. (Picco et al., 2016)	Singapore	WiSE study (August 2012 to December 2013).	60 years and above, 2565 individuals	10, Count	Three months for OP and IP	Singapore dollars (SGD)
Kuo et al. (Kuo et al., 2013)	Taiwan	LHID (2005) and NHI claims (2005 to 2010.)	No specific age group, 903 376 individuals	55, Count based on Rx-MG	Data from this period were assessed	Dollar (\$)
Larkin et al. (Larkin et al., 2022)	Ireland	TILDA (January 2016 to December 2016)	50 years and above, 5899 individuals	21, Count	12month: healthcare services. Previous month: home care services Average per month: Prescription drugs	Euros (€)
Park et al. (Park et al., 2015)	Korea	KHPS (2008 and 2009)	65 years and above, 2342 individuals	10, Count	One year.	US Dollars (\$)

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency (Symbol)
Sum et al. (Sum et al., 2020)	Australia	HILDA (2017-2018)	50 years and above, 6382 individuals	12 NCDs, Count	One year.	
Sum et al. (Sum et al., 2020)	Japan	JSTAR (2013)	50 years and above, 3503 individuals	18 NCDs, Count	One year	
Quinaz Romana et al. (Quinaz Romana et al., 2020)	Portugal,	INSEF (2015)	25-74 years, 4911 individuals	20, Count	One month is for OP, and one year is for IP.	
Mori et al. (Mori et al., 2019)	Japan	Claims data (LSMCS and LTC-2012 to 13)	75 years and above. 30,042 individuals	Based on CCI	Data from this period were assessed	Yen (¥) and US Dollar (\$)
Palladino et al. (Palladino et al., 2023)	13 European countries	SHARE (2013 and 2015)	50 and above, 65,206	17, Count	One year	Euros (€)

* ESTHER- Epidemiological investigations of the chances of preventing, recognizing early and optimally treating chronic diseases in an elderly population, WiSE- Well-being of the Singapore Elderly, LHID - National Health Insurance Database of Taiwan, TILDA- The Irish Longitudinal Study on Ageing, KHPS- Korea Health Panel (KHP) data, HILDA- Household, Income, and Labour Dynamics in Australia survey, JSTAR- Japanese Study of Aging and Retirement survey, INSEF- 'Inquérito Nacional de Saúde com Exame Físico, LSMC-Late-Stage Medical Care System for the Elderly data, SHARE- Survey of Health, Aging, and Retirement in Europe, ATC- Anatomical Therapeutic Chemical (ATC) classification system, CIRS-G- Cumulative Illness Rating Scale for Geriatrics, Rx-MG- Rx-defined morbidity groups, CCI- Charlson Comorbidity Index, NCDs-Non communicable diseases, OP – Outpatient, IP-Inpatient

2.4.2 Global- Low- and middle-income countries

Table 2.3 Characteristics of literature on healthcare utilization and healthcare expenditure in multimorbidity from low- and middle-income countries.

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency
Marthias et al. (Marthias et al., 2021)	Indonesia	IFLS (2007 and 2014)	50 years and above, 3678 individuals.	10, Count and physical examination	OP -4 weeks IP - 12 months	International dollar (Int\$)
Rivera Almaraz et al. (Rivera-Almaraz et al., 2019)	Mexico	WHO SAGE (2009 and 2014)	50 years and above 4077 individuals	6, Count and measurement	OP -12 months IP - 12 months	Mexican Pesos (\$ or Mex\$)
Lee et al. (Lee et al., 2015)	China	WHO SAGE (2007 -10)	18 years and above, 14785 individuals	9, Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Yuan (¥)
Lee et al. (Lee et al., 2015)	India	WHO SAGE (2007 -10)	18 years and above, 11043 Individuals.	9 Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Rupees (₹)
Lee et al. (Lee et al., 2015)	Ghana	WHO SAGE (2007 -10)	18 years and above, 4873 individuals	9, Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Cedi (¢)
Lee et al. (Lee et al., 2015)	Mexico	WHO SAGE (2007 -10)	18 years and above, 2595 individuals.	9, Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Mexican peso (\$ or Mex\$)

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency
Lee et al. (Lee et al., 2015)	Russia	WHO SAGE (2007-10)	18 years and above, 4268 individuals.	9, Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Ruble (₽)
Lee et al. (Lee et al., 2015)	South Africa	WHO SAGE (2007-10)	18 years and above, 3243 individuals.	9, Count	OP - 1 month IP - 1 year OOPE asked for the recent visit	Rand (R)
Zhao et al. (Zhao et al., 2020)	China	CHARLS (2011, 2013, 2015)	50 years and above, 11817 individuals	11, Count and measurement	OP -1 month IP -1 year	
Zhao et al. (Zhao, Zhang, et al., 2021)	China	CHARLS (2015 and 2018)	60 years or more, 1653 elderly with multimorbidity in 2018	11, Count and measurement	OP -1 month IP -1 year	Renminbi or RMB (¥)
Nedzinskiene et al. (Nedzinskiene et al., 2021)	Lithuania	NHIF (2012 to 2014)	18 years and older, 428430 individuals	32, Count	Data from this period were assessed	Euros (€)
Zhao et al. (Zhao, Atun, et al., 2021)	China	CHARLS (2015)	45 years and older, 10592 individuals	15, Count and measurement	OP -1 month IP -1 year	Dollars (\$)
Anindya et al. (Anindya et al., 2021)	Indonesia	IFLS (2014 to 2015)	40 years and above, 13798 individuals	14, Count and measurement	OP - 4 weeks IP - 12 months	Dollar (\$)

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency
Rasul et al. (Rasul et al., 2019)	Bangladesh	Household survey of 2500 households (2013)	15 years and above, 6958 individuals	9, Count	30 days	Bangladeshi Taka (টাকা)
Wang et al. (Wang et al., 2015)	China	CHARLS (2011)	45 years or more, 9530 households	14, Count and measurement	OP -1 month IP -1 year	Yuan RMB (¥)
Zhang et al. (Zhang et al., 2023)	China	CHARLS (2011, 2013, 2015)	45 years or more, 5548 individuals	14, Counts and measurement	OP -1 month IP -1 year	Yuan (¥)
* IFLS- Indonesian Family Life Survey, WHO SAGE- Study on Global Ageing and Adult Health, CHARLS- China Health and Retirement Longitudinal Study, NHIF- Lithuanian National Health Insurance Fund, NCDs-Non communicable Diseases, OP-Outpatient, IP-Inpatient						

2.4.3 India

Table 2.4 Characteristics of literature on healthcare utilization and healthcare expenditure in multimorbidity from India.

Authors	Setting	Data	Population and age group	Number of conditions and measurement	Recall period	Reporting currency and Symbol
Pati et al. (Pati et al., 2014)	Assam, Karnataka, MH, RJ, UP and WB	WHO SAGE (2007)	18 years and above, 10973 individuals	9, Count	OP -1 month IP -1	INR (₹)
La et al. (La et al., 2015)	Assam, Karnataka,	WHO SAGE (2015)	45 years and above,	9, Count	OP -1 month IP -1	INR (₹)

al., 2022)	MH, RJ, UP and WB		7397 individuals			
Karan et al. (Karan et al., 2022)	Whole India	NSSO (July 2017 - June 2018)	40 years and more, 113823 households	60(NCDs, Communicable diseases), Self-reported,	OP -15 days IP -1 year	INR (₹)
Sinha et al. (Sinha et al., 2022)	India	LASI (2017 to 18)	45 years and more, 9327	17, Count	OP -1 year IP -1 year	INR (₹)
Puri and Pati et al. (Puri and Pati, 2022)	Odisha	LASI (2017 to 2018)	45 years and above, 11365 individuals	16, Count	OP -1 year IP -1 year	INR (₹)
Reddy et al. (Reddy et al., 2022)	Gorakhpur-Uttar Pradesh	GHDS S (2017-2021)	≥18 years, 20,965 households-120,336 individuals	15, Count		INR (₹)
*MH-Maharashtra, RJ-Rajasthan, UP-Uttar Pradesh, WB-West Bengal, WHO SAGE - Study on Global Ageing and Adult Health, LASI- The Longitudinal Ageing Study in India, NSSO- National Sample Survey Office, GHDS- Gorakhpur Health and Demographic Surveillance Site, NCDs-Non communicable diseases, OP-Outpatient, IP-Inpatient, INR - Indian Rupee.						

2.5 Healthcare utilization in multimorbidity scenario

Most studies focusing on multimorbidity and its economic burden assessed healthcare utilization in terms of the mean number of inpatient and outpatient visits.

2.5.1 Global- High-income countries

The Anderson behavioural model of healthcare utilization was used in a study by Heider et al. to assess the association of healthcare utilization with predisposing, enabling, and need factors in older people. Illness level, i.e., the need factor, was assessed using the Cumulative Rating Scale for Geriatrics. At least one healthcare service was consumed by 98 percent of participants in a three-month recall period (Heider et al., 2014).

A study by Pico et al. assessed healthcare utilization comprehensively, including the annual mean number of contacts with community services visits, inpatient and outpatient services,

daycare centers, nursing home centers, and respite care. In the multimorbid group, the mean annual number of hospitalizations was 2.7, compared to 0.5 for one chronic condition and 0.1 for zero chronic condition. (Picco et al., 2016)

A higher mean number of outpatient visits and a mean number of hospital nights was associated with an increasing number of NCDs in Australia and Japan, as reported by Sum et al. Here, healthcare utilization was defined as the mean number of outpatient visits and mean number of nights spent in the hospital for the past year from the date of the survey. (Sum et al., 2020)

Another panel data analysis by Quinaz Romana et al. showed that, compared to patients without chronic disorders, patients with multimorbidity showed an adjusted odds ratio (AOR) for primary care consultations of 3.6 for males and 2.6 for females. When the reference group was one chronic illness, these figures were 2.4 for male patients with multimorbidity and 1.7 for female patients with multimorbidity. (Quinaz Romana et al., 2020)

Palladino et al. did a longitudinal examination of two waves of data on individuals aged 50 and above from 13 European nations. The results showed that there was a 13 percent likelihood of incurring any OOPE for medicines with each additional chronic disease. (Palladino et al., 2023)

2.5.2 Low- and Middle-Income Countries

The percentage reporting any visit increased from 15.5 percent to 55.9 percent from the zero-condition group to the three or more NCD condition group. The odds ratio of incurring any outpatient visit was 1.35, 2.43, and 4.66 for one condition, two conditions, and three or more NCD conditions (compared to individuals without any conditions), respectively. The average outpatient visit was 1.4 in those with three or more NCDs. For individuals with two NCD conditions, this was 0.78, and 0.41 for individuals with a single NCD condition.

The average inpatient visit was 0.35 in those with three or more NCDs. For individuals with two NCD conditions, this was 0.14, and 0.06 for individuals with a single NCD condition. (Marthias et al., 2021)

According to the pooled analysis of SAGE data in China, India, Ghana, Mexico, Russia, and South Africa, the mean number of outpatient visits increased from 2.66 for those without multimorbidity to 4.15 for those with multimorbidity. The mean number of hospitalization days increased from 0.15 to 0.25. (Lee et al., 2015)

Using CHARLS data, Chen and Liu assessed primary care utilization and OOPe among older people with multimorbidity in China. The primary outpatient visit rate reported by multimorbid elderly was 25.83 percent in 2018. The inpatient admission rate was 11.92 percent in 2018. It was assessed by the type of facilities chosen for the most recent visit in the recall period of one month for an outpatient visit and the most recent one in the last year for an inpatient visit. (Chen and Liu, 2022)

Using panel data, Zhai et al. conducted a comparative study between households with no chronic diseases, those with hypertension only, and those with multimorbidity in China. The study showed that the percentage of inpatient service use was 26.09 percent among those with multimorbidity, 8.38 percent among those with hypertension only, and 5.17 percent among those having no chronic diseases. The percentage of outpatient service use was 21.39 percent, 9.62 percent, and 7.86 percent, respectively. (Zhai et al., 2023)

According to a study by Wang et al. on middle-aged individuals in China, using waves of panel data, outpatient visits were reported by 17.9 percent of individuals in the multimorbidity group compared to 9.2 percent in those without multimorbidity. For inpatient visits, the percentages were 8.3 percent and 3.6 percent, respectively. (Wang et al., 2023)

Table 2.5 Literature on healthcare utilization from high-income and low- and middle-income countries.

High-Income Countries		
Authors	Outcome-healthcare utilization	Relevant details
Bahler et al. (Bähler et al., 2015)	The mean annual consultations in the multimorbid group were 15.7, compared to 4.4 in the non-multimorbid group. The mean annual number of hospitalizations was 1.5 in a multimorbid group compared to 1.2 in the non-multimorbid group.	Healthcare utilization included consultation with primary care physicians, specialists, and hospital outpatient visits.
Picco et al. (Picco et al., 2016)	In the multimorbid group, the mean annual number of primary care consultations was 3.0, and the same for private doctors/clinics was 1.9. For one condition, these figures were 2.3 and 1.8. For 0 conditions, these were 1.1 and 1.1.	In addition to direct medical care, they also assessed healthcare utilization for formal and informal care.
Quinaz Romana et al. (Quinaz Romana et al., 2020)	The mean number of primary care consultations for those with multimorbidity was 0.28 over the past four weeks of the study period, while specialist consultations over the past four weeks and the mean for hospital visits over the past year of the study period were 0.25 and 0.17, respectively. These were 0.16, 0.18, and 0.14 for those with one chronic disease. For those without any condition, these figures were 0.09 and 0.11.	Healthcare utilization is assessed as four weeks of contact with a GP, medical, or surgical specialist. : times of hospital admission in the past year.
Low- and Middle-Income Countries		
Rivera - Almaraz et al. (Rivera-Almaraz et al., 2019)	The mean number of outpatient visits in the past 12 months was 3.51 in those with multimorbidity compared to 1.94 in the non-multimorbidity group. For IP, these were 0.06 and 0.05, respectively.	Healthcare utilization assessed visits to physicians and stay in the past 12 months.
Lee et al. (Lee et al., 2015)	Results from China: Mean number of outpatient visits were 1.14 and 4.49 in those without any NCD and those with multimorbidity respectively. For those with one condition, it was 2.96. The mean number of hospitalization days were 0.07 and 0.23 for those without any NCD and those with multimorbidity respectively. For those with one condition, it was 0.17.	Assessed as OP and IP visit in the recall period.

Authors	Outcome-healthcare utilization	Relevant details
Lee et al. (Lee et al., 2015)	Results from India: Mean number of outpatient visits were 2.23 and 5.03 in those without any NCD and those with multimorbidity respectively. For those with one condition, it was 3.22. The mean number of hospitalization days were 0.06 and 0.23 for those without any NCD and those with multimorbidity respectively. For those with one condition, it was 0.14.	Assessed as OP and IP visit in the recall period.
Lee et al. (Lee et al., 2015)	Results from Ghana: Mean number of outpatient visits were 1.28 and 3.78 in those without any NCD and those with multimorbidity respectively. For those with one condition, it was 2.27. The mean number of hospitalization days were 0.18 and 0.14 for those with one NCD and those with multimorbidity respectively. For those with zero conditions, it was 0.09.	Assessed as OP and IP visit in the recall period.
Lee et al. (Lee et al., 2015)	Results from Mexico: Mean number of outpatient visits were 1.38 and 2.59 in those without any NCD and those with multimorbidity respectively. For those with one condition, it was 2.00. The mean number of hospitalization days were 0.01 and 0.2 for those without any NCD and those with multimorbidity respectively. For those with one condition, it was 0.06.	Assessed as OP and IP visit in the recall period
Lee et al. (Lee et al., 2015)	Results from Russia: Mean number of outpatient visits were 0.96 and 3.28 in those without any NCD and those with multimorbidity respectively. For those with one condition, it was 1.51. The mean number of hospitalization days were 0.08 and 0.31 for those without any NCD and those with multimorbidity respectively. For those with one condition, it was 0.17.	Assessed as OP and IP visit in the recall period
Lee et al. (Lee et al., 2015)	Results from South Africa: Mean number of outpatient visits were 0.72 and 5.74 in those without any NCD and those with	Assessed as OP and IP visit in the recall period

	multimorbidity respectively. For those with one condition, it was 2.63. The mean number of hospitalization days were 0.1 and 0.2 for those without any NCD and those with multimorbidity respectively For those with one condition, it was 0.1.	
Authors	Outcome-healthcare utilization	Relevant details
Zhao et al. (Zhao et al., 2020)	Unit increase in non-communicable disease is causing a likelihood of nearly 12 times increase in number of outpatient visits and almost 13 times increase in inpatient hospital days.	Healthcare utilization in terms of OP and IP is assessed for general hospitals, specialized hospitals, clinics, or other medical facilities.
Zhao et al. (Zhao, Zhang, et al., 2021)	Outpatient visits and inpatient care are more common in multimorbid patients than single-disease patients (IRR=1.30 & 1.52, respectively).	Healthcare utilization in terms of OP and IP is assessed for general hospitals, specialized hospitals, clinics, or other medical facilities.
Anindya et al. (Anindya et al., 2021)	The frequency of outpatient care reported was 0.21,0.35,0.68, and 1.08 for those with zero conditions, one condition, two conditions, and three or more conditions, respectively. The frequency of inpatient care also increased as the number of conditions increased.	Healthcare utilization in terms of the number of OP within a recall period of 4 weeks and the number of IP visits in a recall period of one year
Zhang et al. (Zhang et al., 2023)	The mean number of outpatient visits was 0.2 for the no multimorbidity group,0.4 for the digestive-arthritic trajectory multimorbidity group,0.3 for the cardiometabolic multimorbidity group, and 0.4 for the respiratory multimorbidity group. The mean number of inpatient visits did not differ much; the mean was almost 0.1.	Assessed the number of OP and IP visits in the recall period and unmet healthcare needs.
*NCDs-Non communicable diseases, OP-Outpatient, IP-Inpatient, INR - Indian Rupee, IRR-Incidence Rate Ratio, GP-General practitioner		

2.5.3 India

Table 2.6 Literature on Healthcare Utilization from India

India and Kerala		
Authors	Outcome-healthcare utilization	Relevant details
Pati et al. (Pati et al., 2014)	Mean number of outpatient visits were 2.24 in those with zero conditions and 6.16 those with three or more conditions. For one and two conditions, these were 3.22 and 4.46, respectively. These values were 0.066 to 0.033 for the mean number of inpatient days. For one and two conditions, these were 0.14 and 0.19, respectively.	It was assessed as the number of OP and IP visits in the recall period of one year.
Sinha et al. (Sinha et al., 2022)	Among participants who didn't have multimorbidity, 79.23 percent reported at least one OP visit in the last 12 months of the survey. This was 5.81 percent for IP visits. Among participants with multimorbidity, these figures were 81.65 and 10.94, respectively.	Assessed the number of OP and IP visits in the recall period of one year.
Puri and Pati et al. (Puri and Pati, 2022)	The percentage of participants who reported inpatient admission in the study period was 13.3 for the multimorbid group compared to 6.7 % for the non-multimorbid group. The percentage of participants who reported outpatient visits in the study period was 62 for the multimorbid group compared to 50.6 % in the non-multimorbid group.	Assessed the number of OP and IP visits in the recall period of one year.
*OP-Outpatient, IP-Inpatient		

2.6 Healthcare expenditure in multimorbidity scenario

Healthcare cost was usually calculated as the total healthcare cost, including various direct and indirect costs, and expressed as median or mean values. However, the methodology followed was inconsistent, and the measured variables varied.

2.6.1 Global -High-Income Countries

The need factor mainly drove healthcare costs, and the role of predisposing and enabling factors in explaining the variance of healthcare costs is limited. This study had a recall period of three months, and only direct medical costs were accounted for. An increase of 18 € (18 Euros) in three-month inpatient expenditures, 17 € (17 Euros) in outpatient costs, and 3 € (3 Euros) in nursing costs was linked to every additional point in the Cumulative Illness Rating Scale for Geriatrics (CIRS-G) score. (Heider et al., 2014)

In a six-year follow-up study by Kuo et al. in Taiwan, it was found that there would be an increase in total annual cost with an increase in the number of Rx-defined morbidity groups (RX-MG assignments). (Kuo and Lai, 2013)

Total social care cost for multimorbidity was S\$8,480, S\$2,032 for one condition, and S\$1,527 for zero condition. Total societal cost (sum of healthcare and social care costs) for multimorbidity was S\$15,148, S\$5,610 for one condition, and S\$2,806 for zero condition. The main contribution to societal costs came from social care costs rather than healthcare costs. Annual healthcare and social care costs increase by S\$2,265 and S\$3,177 with an increase in each additional chronic disease. These were the results of a study analyzing panel data in Singapore. (Picco et al., 2016)

A cross-sectional panel data analysis in Ireland showed a higher likelihood of OOPE in individuals with multimorbidity. Individuals with three or more conditions had 79 percent greater OOPE than those without any conditions. For individuals with two conditions, the increase was 43 percent, and for those with only one condition, it was 33 percent. (Larkin et al., 2022)

Another study conducted in Japan by Mori et al. showed that greater medical and long-term care (LTC) expenditures were associated with an increase in Charlson's comorbidity score. An increase of one unit in Charlson Comorbidity Index (CCI) scores caused medical and LTC

expenditures to rise by 2920 US Dollars. For medical and LTC expenditures separately, these were \$1780 and \$1360, respectively. Medical expenses included payments for inpatient and outpatient services and medication costs. Expenditure for dental care was not included in the medical expenditures. LTC expenditure also included LTC premiums. Both insurance reimbursements and premiums were included in the total spending. (Mori et al., 2019)

Heart failure and cardiovascular illness together accounted for the combination of multimorbidity with the highest average yearly medical cost per capita, according to a US panel data study by Schiltz et al. Triad of diabetes, rheumatoid arthritis, and cardiovascular disease were the three conditions linked to the highest median yearly expense. OOPE and those by the private health insurance were included in the medical expenditures. (Schiltz, 2022)

The incremental increase in average OOPE for medicine was reported as 26.4 euros with each additional chronic disease, as reported by Palladino et al. Here, OOPE of medicine included a lump sum of money paid for prescription medicines and non-prescription medicines over the past 12 months. (Palladino et al., 2023)

2.6.2 Global -Low- and Middle-Income Countries

When adjusted for sex, age, current labour status, marital status, years of schooling, area of residence, utilization of medical services, number of household members, health coverage, and socioeconomic level in the regression model, the probability of incurring OOPE in the presence of multimorbidity had an odds ratio of 1.28. Additionally, there was a 13 percent likelihood of an increase in the mean quarterly OOPE in the presence of multimorbidity. In this context, the total quarterly health expenditure of all household members with an older adult aged 50 years and above was considered. Then, this household was classified as having multimorbidity or not based on the multimorbidity status of the older adults. (Rivera-Almaraz et al., 2019)

OOPE for outpatient and inpatient care increased from single NCD to multimorbidity in China, India, Mexico, and Russia. However, in Ghana, both decreased. In South Africa, OOPE for

inpatient care decreased. The most significant proportion of OOPE was for medicines in China (83.5 percent), followed by India (61 percent). When comparing respondents without NCDs to those with multimorbidity, the mean outpatient care spending in China increased from 124.4 Chinese yuan to 179.2 Chinese yuan on the most recent visit. In India, individuals without NCDs spent 262.2 Indian rupees on mean outpatient care during their most recent visit, but those with multiple NCDs spent 431.0 Indian rupees. All countries except Russia (coefficient = 0.76) showed no increase in inpatient OOPE over the previous visit regarding the number of NCDs. In South Africa, however, inpatient OOPE was negatively correlated with the number of NCDs. (Lee et al., 2015)

According to a study conducted in Sri Lanka, households impacted by NCDs appeared to experience more significant economic stress and OOPE than matched control groups. The total OOPE incurred per household member for one month was about 400 rupees more in NCD-affected households than in control households. Expenses on medicines and investigations contributed to a higher portion of household health expenses. (Pallegedara, 2018)

A comparative cross-sectional study was conducted among patients over 18 with hypertension and diabetes in Ekiti state, Nigeria. The aim was to compare the differences in catastrophic health expenditure (CHE) and their contributing factors among NCD patients in private and public healthcare facilities. The study revealed that the median OOPE (in Nigerian Naira) for private facilities was ₦11,750.00, whereas, for public health facilities, it was ₦6,200.00. (Ipinnimo and Durowade, 2022)

Other studies also reported economic burden and impoverishment in households whose members faced NCD compared to those without NCDs. (Kien et al., 2016)

Table 2.7 Literature on healthcare expenditure from high-income and low- and middle-income countries.

Author s	Perspe ctive	Cost			Healthcare expenditure	Note
		Dir ect Me dic al	Direct non- medic al	Ind ire ct		
Bahler et al. (Bähle r et al., 2015)	Payer(i nsuran ce)	Ye s	No	No	*Total health care cost (Swiss Francs) for: non-multimorbidity: 1515 multimorbidity: 8301 *Outpatient OOPe for: non-multimorbidity: 983 multimorbid: 4152 *Inpatient OOPe for: non-multimorbidity: 238 multimorbid: 2038	Accounted for total cost covered by the health insurance and excluded accident-related costs.
Kuo and Lai et al. (Kuo and Lai, 2013)	Payer (public insuran ce)	Ye s	No	No	*Annual total healthcare (in Dollars) cost: In non-multimorbidity group: 2-4 Rx-MGs: 348.8, 1Rx-MG: 212.1. In the multimorbidity group: > = 9 Rx-MGs: 4023.8, 5-8 Rx-MGs: 878.8.	It comprises claims to NHI from outpatient, inpatient, and community pharmacies.
Picco et al. (Picco et al., 2016)	Health care and societa l perspe ctive.	Ye s	Yes		*Total mean health care cost (in Singapore dollars) for: Zero condition: 1,279 one condition: 3,578 multimorbidity: 6,667	Total mean healthcare cost included monetized values for ADL, IADL unpaid, and paid care. Booked informal caregiving cost under indirect cost.

Larkin et al. (Larkin et al., 2022)	Payer (OOP)	Yes	No	No	*OOPE per annum excluding public health insurance premia (in Euros) for: zero condition: 580.3 one condition: 718 two conditions: 806.8 three conditions: 885.8	Component of OOPE-GP, outpatients, specialist medical consultation, emergency department, in-patient hospital admissions, home care, prescription drugs, and 'other' health expenses.
Park et al. (Park et al., 2015)	Payer (OOP)	Yes	No	No	*OOP medical expenditure cost ratio for: zero NCDs: 1.00 one NCD: 1.63 multimorbidity: 2.61, when adjusted for age, gender, and number of major chronic diseases.	Calculated one-year cost for outpatient OOPE medication expenditure. Included copayments but not the reimbursed amount.
Low- and Middle-Income Countries						
Marthias et al. (Marthias et al., 2021)	Payer (OOP)	Yes	No	No	*Annual total OOP (in Dollars) for: zero condition: 295 one condition: 292 two conditions: 336 three or more NCDs: 968	OP and IP costs included medicine, consultation, and investigation charges.
Rivera Almaraz et al. (Rivera-Almaraz et al., 2019)	Payer (OOP)	Yes	Yes	No	*Total health expenditure in the past one year of study (in Mexican Pesos) for: without multimorbidity: 3002.71 multimorbidity: 2997.75	Total health expenditure included expenditure for OP, IP investigations, and medicines.
Lee et al (Lee et al., 2019)	Payer (OOP)	Yes	Yes	No	Results for China (in Yuan)	OOPE was calculated for

et al., 2015)					* Outpatient OOPE for: zero condition: 124.4 one condition: 131.6 multimorbidity: 179.2 * Inpatient OOPE for: zero condition: 4927.0 one condition: 4160.9 multimorbidity: 3782.5	recent care for IP and OP in the past year. Various heads included in OOPE were consultation fees, medicine costs, tests, and others.
Lee et al. (Lee et al., 2015)	Payer (OOP)	Yes	Yes	No	Results for India (in Rupees) * Outpatient OOPE for: zero condition: 262.2 one condition: 340.2 multimorbidity: 431.0 * Inpatient OOPE for: zero condition: 7653.4 one condition: 6618.7 multimorbidity: 6942.1	OOPE was calculated for recent care for IP and OP in the past year. Various heads included in OOPE were consultation fees, medicine costs, tests, and others.
Lee et al. (Lee et al., 2015)	Payer (OOP)	Yes	Yes	No	Results for Ghana (in Cedi) * Outpatient OOPE for: zero condition: 104915.4 one condition: 102665.1 multimorbidity: 80534.5 * Inpatient OOPE for: zero condition: 606336.4 one condition: 1023590.0 multimorbidity: 560583.2	OOPE was calculated for recent care for IP and OP in the past year. The heads included in OOPE were consultation fees, medicine costs, and tests.
Lee et al. (Lee et al., 2015)	Payer (OOP)	Yes	Yes	No	Results for Mexico (in Pesos) * Outpatient OOPE for: zero condition: 208.1 one condition: 183.8 multimorbidity: 468.8 * Inpatient OOPE for: zero condition: 3641.7 one condition: 7346.6 multimorbidity: 2023.1	OOPE was calculated for recent care for IP and OP in the past year. Various heads included in OOPE were consultation fees, medicine costs, tests, and others.
Lee et al.	Payer (OOP)	Yes	Yes	No	Results for Russia (in Rubble)	OOPE was calculated for

(Lee et al., 2015)					* Outpatient OOPe for: zero condition: 500.7 one condition: 356.7 multimorbidity: 331.3 * Inpatient OOPe for zero condition: 1012.4 one condition: 708.8 multimorbidity: 1558.3	recent care for IP and OP in the past year. The heads included in OOPe were consultation fees, medicine costs, and tests.
Lee et al. (Lee et al., 2015)	Payer (OOP)	Yes	Yes	No	Results for South Africa (in Rand) *Outpatient OOPe for: zero condition: 53.6 one condition: 17.2 multimorbidity: 43.7 *Inpatient OOPe for: zero condition: 770.4 one condition: 5499.0 multimorbidity: 555.6	OOPe was calculated for recent care for IP and OP in the past year. The heads included in OOPe were consultation fees, medicine costs, and tests.
Zhao et al. (Zhao, Zhang, et al., 2021)	Payer (OOP)	Yes	No	No	OOPe for outpatient and inpatient care is likely to increase by 82.99RMB and 108.43RMB in multimorbidity compared to single diseases. (RMB- Renminbi).	OOPe included OP and IP deducting reimbursement amount.
Chen and Liu et al. (Chen and Liu, 2022)	Payer (OOP)	Yes	No	No	For multimorbid elderly, *Outpatient OOPe:243 RMB in 2018, *Inpatient OOPe: 1271 RMB.	OOPe didn't include the reimbursement amount.
Nedzi nskie et al. (Nedzi nskien e et al., 2021)	Payer (Public insuran ce)	Yes	No	No	The average annual total healthcare cost (in Euros) for multimorbidity was 707.15 EUR.	Total healthcare cost was the sum of hospitalisation, reimbursed medications, OOPe for medications, primary care, and OP costs.

Zhao, Atun et al. (Zhao, Atun, et al., 2021)	Payer (OOP)	Yes	No	No	Total mean OOPe (in Dollars) where: US\$236 for those with zero condition. US\$312 for those with one condition. US\$417 for two conditions, US\$482 for three conditions, and US\$717 for those with three and above conditions.	Annual OOPe included direct payments for OP and IP deducting reimbursement.
Anindya et al. (Anindya et al., 2021)	Payer (OOP)	Yes	No	No	An average four-weekly OOPe (in dollars) was \$23.1, \$29.8, \$51.1, and \$69.3 for 0 condition, one condition, two conditions, and three or more conditions.	OOPe included expenditures for OP and IP.
Rasul et al. (Rasul et al., 2019)	Payer (OOP)	Yes	Yes	No	The mean total direct OOPe (in Bangladeshi Taka) for major NCDs is 2313.4 and 1453.3 for minor NCDs.	OOPe included expenditure for consultation, medication, tests, transportation, informal pay, and accommodation.
Wang et al. (Wang et al., 2015)	Payer (OOP)	Yes	No	No	The mean OOPe for healthcare in the past year of the study (Yuan RMB) was 3227.07 for a household with one chronic disease patient and 1652.54 for households without chronic disease patients.	OOPe included direct payments for OP and IP deducting reimbursement.
Zhang et al. (Zhang et al., 2023)	Payer (OOP)	Yes	No	No	The average OOPe for outpatient care (in yuan) was 50.6 for the no multimorbidity group, 82.8 for the digestive-arthritis trajectory multimorbidity group, 273.4 for the cardiometabolic multimorbidity group, and	OOPe included direct payments for OP and IP deducting reimbursement.

					52.1 for the respiratory multimorbidity group, respectively. The average OOPE for inpatient care (in yuan) was 150.1, 453.5, 645.2, and 152 in these groups, respectively.	
OOP – Out of pocket payments, ADL - Activities of Daily Living, IADL - Instrumental Activities of Daily Living, OOPE-Out of pocket expenditure, NHI-National health insurance, Rx-MG- Rx-defined morbidity groups, GP-General practitioner, NCDs-Non communicable diseases, OP-Outpatient, IP-Inpatient, EUR-Euro, RMB-Renminbi						

2.6.3 India

An increase in healthcare utilization and healthcare expenditure, along with a decrease in physical functioning, disability, quality of life, and psychological distress, were reported as the most common consequences of multimorbidity according to a systematic review of 13 studies from South Asia on the prevalence, patterns, and outcomes of multimorbidity. (Pati et al., 2015)

A study on the economic burden of COVID-19 hospitalization in Kerala reported a median OOPE of 19,325 INR for those with comorbidity compared to 8,990 INR for those without comorbidity. This study was conducted among 155 COVID-19-positive patients. (Thomas et al., 2021)

Table 2.8 Literature on Healthcare Expenditure from India

Author s	Perspec tive	Cost			Healthcare expenditure	Note
		Dir ect me dic al	Dire ct non- medi cal	Ind ire ct		
Pati et al. (Pati et al., 2014)	Payer (OOP)	Yes	Yes	No	The average annual OOPE (in INR) for those with zero condition, one condition, and two or more conditions was 272.07, 356.79 and 454.08, respectively. This was 7864.9, 6847.68, and	Expenditure for doctor fees, drugs, tests, and transport for the last OP visit and last IP.

					7301.33 for inpatient admission, respectively.	
La et al. (La et al., 2022)	Payer (OOP)	Yes	Yes	No	One unit increase in several long-term conditions is associated with a likelihood of a 20.9% increase in OOPE of medicines.	OOPE for medicine in the last OP visit.
Karan et al. (Karan et al., 2022)	Payer (OOP)	Yes	Yes	No	The mean per capita monthly OOPE (in INR) for those with any NCD, two or more conditions was 528, 1203 respectively.	OOPE included the cost of doctor fees, medicine, tests, bed charge, physiotherapy, appliances, blood, oxygen, and package.
Sinha et al. (Sinha et al., 2022)	Payer (OOP)	Yes	Yes	No	Total median healthcare costs (in INR) for participants without morbidity:350 one chronic condition: 500 Two chronic conditions: 600 Three chronic conditions: 650 Four or more chronic conditions: 1,080.	OOPE included the IP cost for the four visits in the last year and the OP cost for the recent visit.
Reddy et al. (Reddy et al., 2022)	Payer (OOP)				Median OOPE (in INR) for individuals with No NCD: 5000 one NCD: 8000 two NCDs: 20000	Calculated total OOPE not differentiated to direct medical, direct non-medical and indirect cost.
Puri and Pati et al (Puri and Pati, 2022)	Payer (OOP)	Yes	Yes	No	*OOPE for hospitalisation (in INR): multimorbidity:1971 single morbidity:1242 *OOPE for OP visit: multimorbidity:1535 single morbidity: 1242	OOPE only included the cost of the recent visit. Cost heads were doctor fees, medicine, tests, surgery, hospital charges, blood and oxygen, transportation, accommodation, and food.
OOPE-Out of pocket expenditure, OOP–Out of pocket payments, OP-Outpatient, IP-Inpatient, INR-Indian Rupees, NCD-Non communicable diseases.						

2.7 Catastrophic health expenditure (CHE) and Distress financing

2.7.1 Catastrophic Health Expenditure

A financial protection indicator used to track the development of universal health coverage is CHE. (Health at a glance;Asia/Pacific 2018, 2018) However, it's important to note that high healthcare costs do not always equate to CHE, as indicated by Xu et al. (Xu et al., 2003) They argue that lack of insurance coverage may lead to even a small bill for a common illness to be catastrophic for a poor household. (Xu et al., 2003) When OOPE exceeds a predefined threshold of household resources, it becomes catastrophic (Health at a glance;Asia/Pacific 2018, 2018), and this threshold is defined in different ways in various approaches to CHE estimation. However, there is no consensus among researchers regarding which approach to choose for CHE estimation. (Zhang et al., 2021)

The two main methods are

- Budget share approach/Basic approach

Here, the denominator is the household's total income or expenditure within a given period. (Wagstaff et al., 2018) When OOPE exceeds a predetermined percentage (often 10 percent or 25 percent) of a household's total income or expenses in a given timeframe, the budget share approach classifies it as CHE. (Wagstaff et al., 2018) SDG indicator 3.8.2 follows this approach. (Nguyen et al., 2023) However, this approach cannot distinguish between the rich and the poor (Zhang et al., 2021) as it does not differentiate between discretionary and non-discretionary types of household spending.

- Capacity to pay approach/ Ability to pay approach

Xu K et al. from the Department of Health Systems Financing, Health Systems and Services of the World Health Organization popularized the capacity-to-pay approach. (Designing Health Financing Systems to Reduce Catastrophic Health Expenditure, 2005) Under this approach, CHE is said to occur when OOPE surpasses the 40 percent threshold of household capacity to

pay. Unlike the former approach, this method adjusts for subsistence expenditure/basic needs. The ability-to-pay approach relies on households' allocation decisions. It can distinguish between the rich and the poor (Zhang et al., 2021), considering the variation in purchasing capacity between different income classes. (Nguyen et al., 2023) However, uncertainties exist around defining basic needs, which depend on the context and population. Additionally, this methodology requires more comprehensive. (Nguyen et al., 2023)

2.7.2 Distress financing

As per the seminal paper of Sauerborn et al. in 1996, coping strategies are defined as a set of measures that aims to take care of the costs of an event (shock) or process that threatens the welfare of some or all of the household members. (Sauerborn et al., 1996) Ultimately, coping strategies seek to sustain the household's economic viability and sustainability. Borrowing, debt, selling of properties and other valuable assets, and occasionally, help from government interventions and income from vocational activities are mentioned as major coping strategies for major health events in countries like India. (Palmer et al., 2011; Sauerborn et al., 1996) While risky financial activities like borrowing loans and selling assets are defined as distress financing. (Huffman et al., 2011; Murphy et al., 2013) As per Joe et al., it is said to occur when a household resorts to financing mechanisms like borrowing/mortgaging of assets/Land and sale of assets/land to finance the healthcare of an individual. (Joe, 2015) A panel data analysis showed that among rural households with hospitalisations, 47 percent resorted to borrowings and 7 percent to the sale of assets to finance healthcare, and this was 29 percent and 4 percent for urban households. (Joe, 2015)

2.8 Literature Catastrophic health expenditure and distress financing

2.8.1 Global

According to a systematic review by Rijal et al. on the economic impact of selected NCDs in South Asia, the most common forms of coping strategies reported were borrowing and selling assets. (Rijal et al., 2018)

Based on a cross-sectional household survey conducted in Kwara State, Nigeria, among 1500 households, 8.8 percent of individuals affected by NCDs faced CHE. In this study, CHE was calculated using the 40 percent threshold of households' capacity to pay. (Janssens et al., 2016)

Based on a population-based cross-sectional survey on health, healthcare utilization, and healthcare expenditure among residents of Urban Hanoi, Vietnam, in 2013, authors reported that 16.6 percent of households with at least one member suffering from NCDs experienced CHE, compared to 11.1 percent of households without any member having NCDs. In this study, CHE was calculated using the 40 percent threshold of household capacity to pay. (Kien et al., 2016)

In 2020, Zhao et al. reported a projected 31 percent increase in CHE when measured under a 25 percent threshold of capacity to pay for each unit increase in the number of NCDs. This analysis was based on the examination of three waves of CHARLS data. (Zhao et al., 2020)

In a study using 2018-19 CHARLS data, Li et al. reported that 31.5 percent of multimorbid individuals experienced CHE when calculated under a 40 percent threshold of capacity to pay. (Li et al., 2022)

Using the Nouna health district survey conducted from 2000 to 2001, comprising 800 households, authors reported that 6-12 percent of households experienced CHE, with chronic illness being a major determinant. This study was conducted in the Nouna district of Burkina Faso. CHE was calculated using Green's logit equation. (Su et al., 2006)

According to a cross-sectional survey conducted among chronic disease-diagnosed patients aged 60 years or older in Nepal, 14.6 percent of participants experienced CHE at a 40 percent threshold of capacity to pay. (Rai et al., 2022)

In the Zhai et al. paper, CHE was taken at a 40 percent threshold of household capacity to pay among three groups of households using CHARLS 2018 data. Among households with hypertensive patients with multimorbidity, 36.99 percent reported CHE compared to 20.27 percent in households with only hypertensive patients. For households without any chronic diseases, the percentage was 15.01 percent. (Zhai et al., 2023)

In a study examining the prevalence of multimorbidity and CHE among diabetes patients using secondary data in China, it was reported that the prevalence of CHE was 48.2 percent among diabetes patients. This study also demonstrated an increase in CHE corresponding to the number of chronic diseases: 57 percent for one chronic disease, 70.6 percent for two chronic diseases, and 74.5 percent for three or more chronic diseases. CHE was calculated under a 20 percent threshold of household capacity to pay. (Fu et al., 2022)

The prevalence of CHE was reported as 17.9 percent and 7.5 percent among individuals aged 50 years or older at threshold levels of 10 percent and 25 percent of total household income, respectively, using the ELSI dataset of 2015-2016. The odds of CHE were 2.45 (95% CI: 2.11–2.84) and 1.83 (95% CI: 1.47–2.28) among persons with multimorbidity compared to persons without multimorbidity at these two threshold levels, respectively. This study was conducted in Brazil. (Bernardes et al., 2020)

For households without multimorbidity, the cumulative number of CHE events was 1521, with an incidence rate of 6.6 per 1,000 person-months. For families with multimorbidity, the cumulative number of CHE events was 2739, with an incidence rate of 10.2 per 1,000 person-months. These results were obtained from a population-based cohort study using four waves of

CHARLS data (2011, 2013, 2015, and 2018) among individuals aged 45 years or more. CHE was calculated using a 40 percent threshold of household capacity to pay. (Wang et al., 2023)

2.8.2 India

A repeated cross-sectional analysis of the National Sample Survey from 1990 to 2014 shows that 29 million households experienced catastrophic OOPe in 2011-2012 at the threshold of 10 percent of total consumption expenditure. (Selvaraj et al., 2018)

A study discussing the impoverishment effect of hospitalization due to NCDs, using NSSO data from three rounds (2004, 2014, 2018), reported that among males, 55.9 percent experienced CHE in 2004, 47.8 percent in 2014, and 51.9 percent in 2018 at a 10 percent threshold of household total consumption expenditure. At a 30 percent threshold, the respective percentages were 26.4, 19.1, and 25.3. For females, the corresponding percentages at the 10 percent threshold were 52.8, 46.3, and 50.4, while at the 30 percent threshold, these were 29.2, 20.7, and 22.7, respectively. Among males, hardship financing was experienced by 55.6 percent in 2004, 25.5 percent in 2014, and 13 percent in 2018. For females, these percentages were 47.8, 23.2, and 11.3, respectively. In this study, borrowing with interest and selling assets were defined as hardship financing. (Yadav et al., 2021)

In the preceding year of a household survey in Orissa, 24.9 percent reported hardship financing. There was a significant relationship between having a chronically ill person in the household and facing hardship financing. Borrowing money with interest and selling assets were defined as hardship financing in this survey. (Binnendijk et al., 2012)

By analysing NSSO data in 2014, it was reported that approximately 49 percent of households faced CHE. Among these, 58 percent faced CHE due to NCD-related hospitalizations in 2014. The threshold used for CHE calculation was a 10 percent threshold of total household consumption expenditure. For NCD-related hospitalization, 33 percent of households experienced distress financing. A broad definition of distress financing was used in this study,

which included contributions from friends and relatives, borrowing money, and sales of assets. (Kastor and Mohanty, 2018)

A secondary data analysis of the NSSO 71st round by Shivendra Sangar reported a higher economic burden and CHE associated with NCDs. (Sangar et al., 2019) Another study, also using data from the 71st round of NSSO, revealed that nearly 35 percent of households experienced CHE in Kerala in 2018, compared to 15 percent in 2014. (Sriram and Albadrani, 2022) Furthermore, nearly 68.14 percent of households faced NCD-related CHE in 2014, compared to 63.61 percent in 2017-2018. CHE was calculated based on a 10 percent threshold of total household consumption expenditure, with figures for Kerala being 60.62 percent and 61.62 percent, respectively. (Verma et al., 2021)

Table 2.9 Literature on catastrophic health expenditure

Author and year	Setting and relevant details	Population and sample size	Number of conditions and method of measurement	Threshold and method	Prevalence CHE
Li et al. (Li et al., 2022)	China-LMIC CHARLS (2019)	60 years and more with multimorbidity 3511 Indi	14 Self-reported	10 % threshold of HCE	In the multimorbidity group:45.6%
				40 % threshold of CTP	In multimorbidity group:31.5%
Marthias et al. (Marthias et al., 2021)	Indonesia -LMIC IFLS (2007,2014)	50 years and more, 3678 individuals	14 Self-reported	40 % threshold of CTP	In no NCD group:1.8% In one NCD group:2.7% In two NCD group:4% In three NCD group:3.6%
Wang et al. (Wang)	Rural China CHARLS (2011)	45 years and above,	14 chronic diseases	40 % threshold of CTP	Among rural households with elderly chronic disease patients,

et al., 2015)		9530 households	Count and measurement		30.57% experienced CHE, compared to 13.54% without chronic disease
Wang et al. (Wang et al., 2015)	Rural China CHARLS (2011)	45 years and above 9530 households	14 chronic diseases Count and measurement	40 % threshold of CTP	Among urban households with elderly chronic disease patients, 22.03 % experienced CHE, compared to 8.23% without chronic disease
Zhang et al. (Zhang et al., 2023)	CHARLS (2011, 2013, and 2015)	45 years or more, 5548 individuals.	14, Self-reported and measurement	40 percent threshold of CTP	In no multimorbidity group;1.3% Multimorbidity group;4.4%
Swetha et al. (Swetha et al., 2020)	Bangalore (India)	350 households:1581 individuals	No specific conditions	10 % threshold of total household expenditure	Households with chronic illness; 41.41%
Karan et al. (Karan et al., 2022)	India-LMIC NSSO (2017-18,75 th round)	40 years and more 113823 households	60(NCDs, Communicable diseases) Self-reported, Multimorbidity-2+Chronoc conditions	10 % threshold of total household expenditure	Among households with any NCD and One NCD group:46.675 %, In the multimorbidity group:63.360%
				20 % threshold of total household expenditure	Among households with any NCD and one NCD group :27.896%, In multimorbidity group:40.872
* IFLS- Indonesian Family Life Survey, CHARLS- China Health and Retirement Longitudinal Study, NSSO-National Sample Survey Office, NCDs-Non communicable diseases, HCE-Household consumption expenditure, CTP-Capacity to pay					

2.9 Rationale

In Studies focussing on single diseases, participants are usually selected based on the presence of a disease of interest to the study, and comorbidities are recorded. Otherwise, patients with comorbidities will be excluded. (Harrison et al., 2021) For a cost-of-illness study, this is usually the scenario. Expenditure incurred for co-occurring conditions is either ignored or noted blandly. To address the variances and variety in the methodology used by various economic evaluations, the WHO suggests an algorithmic approach to assessing the microeconomic impact at the household level, such as impoverishment, coping strategies to mitigate these effects, reduced future consumption choices including a reduction in education, the substitution of labour, etc. (WHO Guide to Identifying the Economic Consequences of Disease and Injury, 2009) This approach was followed for a few studies in India, mainly for single conditions. (Daivadanam et al., 2012; Huffman et al., 2011; Rao and Bharath, 2013) The percentage of households incurring distress financing due to multimorbidity was unavailable in databases. Of the limited studies available, prevalence estimation of multimorbidity was primarily based on large-scale secondary data sources, where underestimation is an issue because of the limited scope of leveraging empirical data and cross-checking with medical documents. This can affect other outcome measures of multimorbidity, such as healthcare utilization and expenditure. Against this background, this study aimed to assess the economic impact of multimorbidity in individuals and at the household level by following a household budget approach by listing all possible household expenses. (Rao and Bharath, 2013) A comparison group of individuals or households with no multimorbidity provided a counterfactual situation to reduce the overestimation in expenditure as far as possible. (WHO Guide to Identifying the Economic Consequences of Disease and Injury, 2009) The cost incurred by the health system to treat multimorbid individuals compared to non-multimorbid will be calculated using imputing cost

data from the National costing database and Kerala Medical Services Corporation (KMSCL) website to give a holistic view of the economic impact of multimorbidity.

2.10 Objectives

- To assess healthcare utilization, healthcare expenditure, and expenditure pattern at individual and household levels stratified by multimorbidity status among adults of age group 30-70 years in rural Kollam, Kerala
- To assess catastrophic health expenditure and distress financing at the household level, stratified by multimorbidity status in rural Kollam, Kerala.

3. METHODOLOGY

3.1 Study design

A quantitative community-based cross-sectional study was conducted in rural Kollam using a structured interview schedule.

3.2 Study setting

According to the 2011 census, the Kollam district had a population of 2,635,375. Among this, 45.05 percent live in urban regions and 54.95 percent in rural regions. (Census, 2011) It is among the top 5 top-positioned districts in Kerala in terms of the prevalence of diabetes and hypertension. Among women (aged 15 years or above), 26.2 percent had high blood sugar levels or were on medication, and 32.4 percent had elevated blood pressure or were under medication. Among men, 30.2 percent had high blood sugar levels or were on medication, and 35.3 percent had elevated blood pressure or were under medication. (NFHS-Kollam, 2020)

3.3 Study population

I included participants between 30 and 70 years of age and residents of rural areas of Kollam for a minimum of one year in the study.

3.3.1 Why the 30 to 70 age group?

As per the systematic analysis of the Global burden of disease 2019, in 25-49 years, the absolute annualized rate of change in Disability-adjusted life years (DALYs) was 1.4 percent for 1990-2010, and there was no significant change for 2010-2019 in this age group. For 50-74 years, these changes were 1.3 percent and 2 percent. It shows an increased burden of diseases among this age group. The top three causes for increased DALYs among 50-74 years were ischemic heart disease (IHD), stroke, and diabetes, and in 25-49 years, this position was occupied by road traffic injuries, HIV/AIDS, and IHD, respectively. Chronic diseases occupied the top ten positions in both groups. The calculated DALYs would be higher if multiple chronic conditions in the same individual were considered. (Vos et al., 2020)

An article by McDonald et al. gives an individual-based modelling approach for calculating incidence-based DALYs for comorbidities, and they reported 545.3 as the median estimated cumulative total YLD per 1000 cases of both cancer and healthcare-associated pneumonia (HAP). (McDonald et al., 2020) Goal three of SDG focuses on reducing premature death by NCDs to 1/3rd of now by 2030. (WHO, n.d.) The WHO reports narrating an alarming statistic of premature death of 17 million per year before reaching age 70, where 86 percent are from LMICs. (WHO, 2023) The growing concern of multimorbidity accentuates this whole challenge.

The geriatric population is the target of most studies of multimorbidity. About 62.5 percent of India's population is in the age group 15-59 years. The demographic dividend of India will reach its peak by 2041, when there will be a contribution from the working age group (20-59) would be 59 percent. (Drishti IAS, 2019) Increased prevalence of risk factors, multimorbidity, and premature death on one side and contribution to the economic development of a nation, along with a high dependency ratio, makes this age group worth this study.

3.3.2 Exclusion criteria

Individuals who had not provided informed consent.

Individuals who were physically or mentally unable to respond to the questionnaire.

3.4 Sample size

Based on the literature (Karan et al., 2022; Raban et al., 2013), I assumed that 30 percent of households with multimorbidity and 53 percent of households without multimorbidity experienced CHE when calculated using the 40 percent threshold of the capacity to pay approach. For this study, households with multimorbidity were defined as those with at least one member aged 30-70 years who had multimorbidity, while households without multimorbidity were defined as those with no members aged 30-70 years having multimorbidity.

To estimate this proportion difference of 23 percent, I calculated a sample size of 101 households in each group using the software Stata version 16.1. I took the n_1/n_2 ratio as 1. Based on previous literature, it was assumed that 50 percent of households in Kerala would have at least one person with multimorbidity. The prevalence rates (p_1 and p_2) were set at 0.53 and 0.3, respectively.

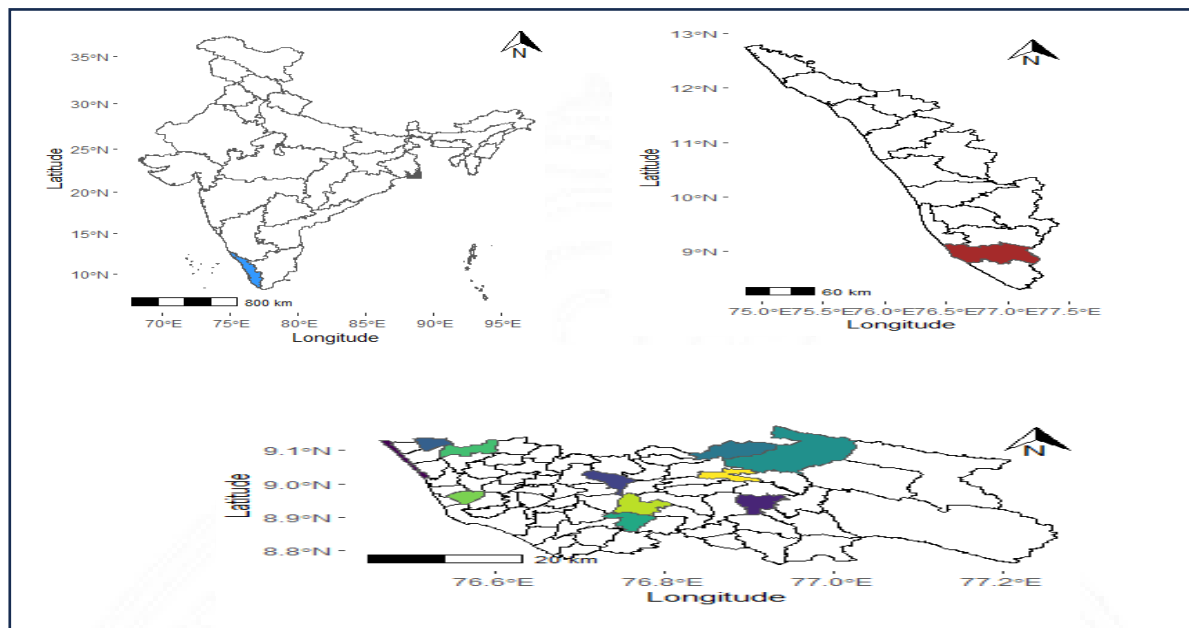
The sample size calculation was based on estimating the prevalence of CHE to achieve the maximum sample size. At 5 percent alpha, 90 percent power, design effect of 1.5, and non-response rate of 10 percent, the sample size was elevated to 168 in each group, totalling 336 households.

3.5 Sample selection

Multistage cluster sampling is used for sampling.

There were 11 community development blocks (CDB) in Kollam district. Of these 11 CDBs, five blocks were randomly selected by a simple random sampling method using computer-generated random numbers. In the second stage, three panchayats were chosen randomly from each block (15 Panchayats from five blocks). Three wards were selected randomly from each panchayat (45 wards from 15 panchayats). From each ward, eight consecutive households were visited. I assumed two adult participants from each household

Figure 3.1 Kollam district, which shows randomly selected panchayats for the study



3.6 Data collection techniques

Time frame - 11.01.2024 to 06.03.2024

I was responsible for selecting households and participants for the study. ASHA/Ward representative was informed verbally before data collection. With their help, I identified the ward's centre or main junction and then selected a random direction using a direction generator. I then proceeded along the left side of the road. Eight consecutive households were selected, starting from the first household. All the houses visited were on the left-hand side of the road. I attempted to interview all eligible participants. The next nearest household was visited if a selected household was vacant or inaccessible. If any potential participants were not present in the house during the interview, one more attempt was made at a later time.

3.7 Tool

Before initiating the data collection process, all participants provided written informed consent. I attempted to interview all eligible participants of a household.

Tools used for data collection were adapted and modified versions of tools used in economic impact studies in India. (Daivadanam et al., 2012; Harikrishnan et al., 2021; Huffman et al.,

2011) This interview schedule was prepared in English and then translated into Malayalam for data collection. It had three sections. The first section included Demographic characteristics, Participant medical history, and treatment expenditures.

The interview schedule provided a list of 14 selected morbidities to elicit multimorbidity status and asked, 'Have you ever been told by a health professional that you have any of these conditions?'. These were hypertension, dyslipidemia, diabetes, anemia, COPD or asthma, chronic kidney disease, coronary heart disease, arthritis, stroke, cancer, cataracts, dementia, depression, anxiety, and other mental conditions. In addition, the case records, if available, were verified with the participant's permission to confirm the morbidity status. This was again cross-checked by reviewing medicines taken by the participant.

Expenditure details were recorded for acute and chronic conditions and from different cost centres, including allopathy and the Indian system of medicine. These were validated with bills, if available, along with prescription medicine. The source of drugs was recorded to ascertain whether they were freely available from the health facilities to include in estimating the cost incurred by the health system. If medicine prices couldn't be obtained from the strips, they were also ascertained from the medical stores.

Household characteristics, household expenditures, and household assets were included in the second section, following 3rd section with a multimorbidity treatment burden questionnaire. Household expenditure under the second section involved a detailed exploration of the household's spending on food and non-food expenditures over the past year or month, as the case may be, to estimate catastrophic health expenses.

3.8 Data management

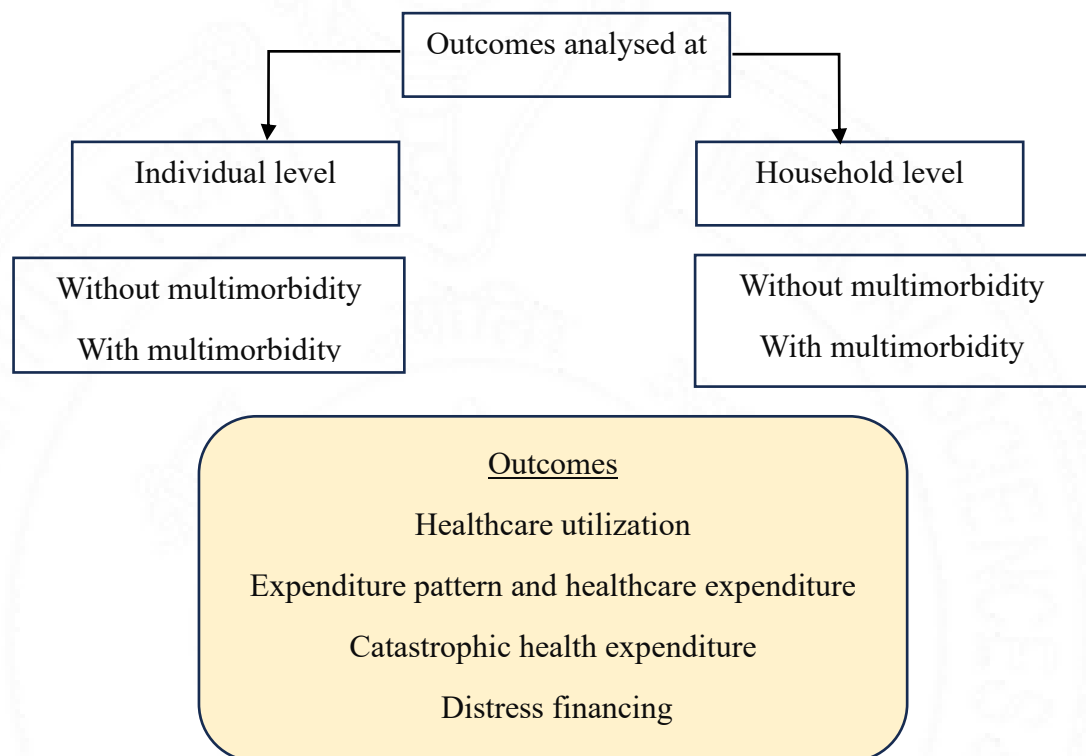
I used pen and paper to collect data and later entered it in the Open Data Kit. I securely stored the hard copies, ensuring strict confidentiality of the data. All hard copies of the questionnaire

will be deemed destroyed when no longer needed, or after one year of dissertation report submission, whichever comes first. Additionally, data sheets were kept in a password-protected folder. I used R software version 4.3.1 for cleaning and analysis of data.

3.9 Data analysis

Data analysis was done at both individual and household levels.

Figure 3.2 Flowchart for analysis

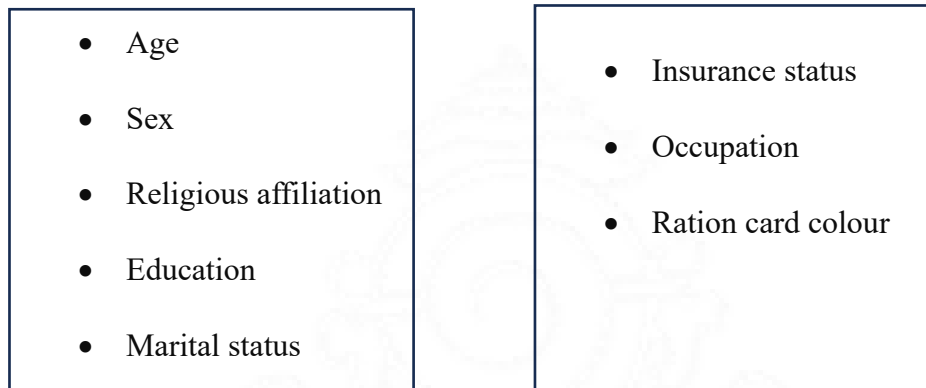


3.9.1 Categorisation of variables

Education: Initially, it was a continuous variable; later, it was converted to categories based on years of education with five categories: 0-4 years of education, 5-8 years of education, 9-12 years of education, 13 or more than 13 years of education respectively.

Current occupation: Initially, there were ten categories, which later merged into three: government employee and business, skilled and unskilled, homemaker and unemployed, and retired.

3.9.2 Variables explaining sociodemographic characteristics of the population



3.9.3 Operational definition

Multimorbidity: Co-existence of 2 or more chronic diseases in the same individual from the listing of the following 14, mainly; hypertension, dyslipidaemia, diabetes, anaemia, COPD or asthma, chronic kidney disease, coronary heart disease, arthritis, stroke, cancer, cataract, dementia, depression, anxiety, which a healthcare professional diagnosed.

Household: A group of people who live together and share a kitchen.

Households with multimorbidity: Households with at least one member aged 30-70 years who had multimorbidity.

Households without multimorbidity: Households with no members aged 30-70 years had multimorbidity.

3.9.4 Operational definition - Outcome variables

Recall period: It was set as 30 days for outpatient visits and one year for inpatient admission

- **Outcome variables at the individual level**

1) Healthcare utilization

For the study, it was defined as the mean annual outpatient visits and mean annual inpatient admission. Questions were asked about the total number of outpatient visits in the past 30 days from the date of the survey and the total number of inpatient admissions within the previous year leading from the survey date.

There were also questions about the type and grade of facilities. Type of facilities included government, private, charity, ESIS, corporate, etc. Here, charities, corporations, and others were recorded to private and ESIS to the government.

I calculated mean annual outpatient visits by multiplying monthly outpatient visits by 12 (assuming the utilization rate remains the same during the year) and following the mean calculation. This was stratified for multimorbidity status, i.e., with and without multimorbidity. In addition, stratification was done for the type of facilities, i.e., government facilities, which include primary care centers, tertiary care centers, and private facilities.

The steps for calculating mean annual inpatient admission were the same except with the multiplication by 12.

2) Expenditure pattern and healthcare expenditure

- Mean annual out-of-pocket expenditure for outpatient visit
- Mean annual out-of-pocket expenditure for inpatient admission
- Mean annual out-of-pocket expenditure
- Mean annual out-of-pocket expenditure and productivity loss
- Mean annual expenditure incurred by the health system
- Mean annual total health expenditure

a) Mean annual out-of-pocket expenditure for outpatient visit

OOPE for outpatient visits was comprised of both direct medical and direct non-medical expenditures. Direct medical expenses included doctor fees, investigations, medicine from the hospital pharmacy, medicine from outside the hospital, expenses to see a healthcare worker, if any, costs for a home nurse or paid care, and others, if any. Someone who cannot remember these heads asked for the total amount spent. Direct non-medical expenditures included travel expenses, food expenses for the caregiver, boarding, and lodging while seeking healthcare,

and others, if any. Reimbursed amounts from health insurance were asked. OOPE didn't include this amount. For each outpatient visit, these cost heads were elicited separately.

Following this, the monthly OOPE for outpatient visits was calculated by summing the expenses incurred for each visit. I calculated the mean annual out-of-pocket expenditure for outpatient visits by multiplying 12 (assuming the utilization rate remains the same during the year) with monthly OOPE and performing the mean calculation.

b) Mean annual out-of-pocket expenditure for inpatient admission

OOPE for inpatient admission comprised direct medical and direct non-medical expenditures. Direct medical expenses included hospital admission charges, emergency room or causality charges, room rent or bed charges, expenses for surgery or operation, medicines from the hospital pharmacy, medication from pharmacies outside the hospital, investigation charges, and others, if any. Direct non-medical expenditures included the cost of attendant stay (accommodation only), food expenditures of patient and caregiver, and transport cost from home to hospital and hospital to home (inclusive of caregiver also). Reimbursed amounts from health insurance were asked. OOPE for inpatient admission didn't include this amount.

For each outpatient visit, these cost heads were elicited separately. I calculated annual out-of-pocket expenditure for inpatient admission by summing these amounts and the mean annual out-of-pocket expenditure for inpatient admission by taking the mean.

c) Mean annual out-of-pocket expenditure

Details regarding currently prescribed medicines were taken during a survey, including how many tablets per day, tablets number per strip/box, and price per strip or box. From this, the OOPE incurred during one month was calculated. By multiplying 12 (assuming the utilization rate remains the same during the year) with this amount, I calculated annual out-of-pocket expenditure for medicine purchases.

Mean annual out-of-pocket expenditure was calculated as the sum of out-of-pocket yearly expenditure for inpatient admission, annual out-of-pocket spending for outpatient visits, and annual out-of-pocket expenditure for medicine purchases divided by the number of participants.

d) Mean annual out-of-pocket expenditure and productivity loss

It was calculated as the sum of yearly out-of-pocket spending and annual productivity loss divided by the number of participants.

Productivity loss: Productivity loss or indirect cost was estimated using the human capital approach in terms of loss of earnings of a patient and caregiver. Informal caregiving didn't take into account. Even though the question was included in the interview schedule, response to this question was minimal.

e) Mean annual expenditure incurred by the health system

I devoted more time to analysis in this area. The databases used for the same were the National Costing Database (PGISPH, n.d.), data from the Kerala Medical Services Corporation (KMSCL) website, Health Benefits Package version 2 (Health benefit package - 2.0, 2021), Ayushman Bharat Pradhan Mantri - Jan Arogya Yojana (PMJAY) Public Dashboard (NHA | Setu dashbaord, n.d.).

The National Costing Database for India, which PGIMER maintains, provides costs incurred by the health system for providing services at different levels of the facilities. The reported price was from a health system perspective, so it didn't involve OOPE. This comprehensive costing database was the result of two costing studies, i.e., other cost studies and cost of health services in India study (PGISPH, n.d.).

- Other costing studies

These were conducted in six states, viz Himachal Pradesh, Haryana, Punjab, Odisha, Kerala, and Tamil Nadu, to elicit costs incurred at the health system level between April and June 2013.

This study provides the facility-based total cost and unit cost at current capacity utilization, 100 percent utilization, and 80 percent utilization for district hospitals, community health centers, primary health centers, and sub-centers for 2014-2015.

Methodology in this study

I used other costing study data to get the unit cost at 100 percent utilization for per-patient outpatient consultation at primary health centers, community health centers, and district hospitals for the departments, i.e., medicine, chest, skin, and dental. This value was inflated to 2024 using the GDP price implicit deflator, with further explanation of the chosen deflator over the consumer price index provided later in this section. The inflated values were added to the Excel sheet manually. This unit cost was summed up to calculate the health system's cost in one month for each participant. This amount was multiplied by 12 to get the value for one year. Also, Unit costs at 100 percent utilization per day inpatient care for the departments, i.e., emergency, medicine, chest, and skin, were taken. The same procedure for estimating outpatient visit unit cost was followed except for multiplication by 12.

- Cost of health services in India study (CHSI)

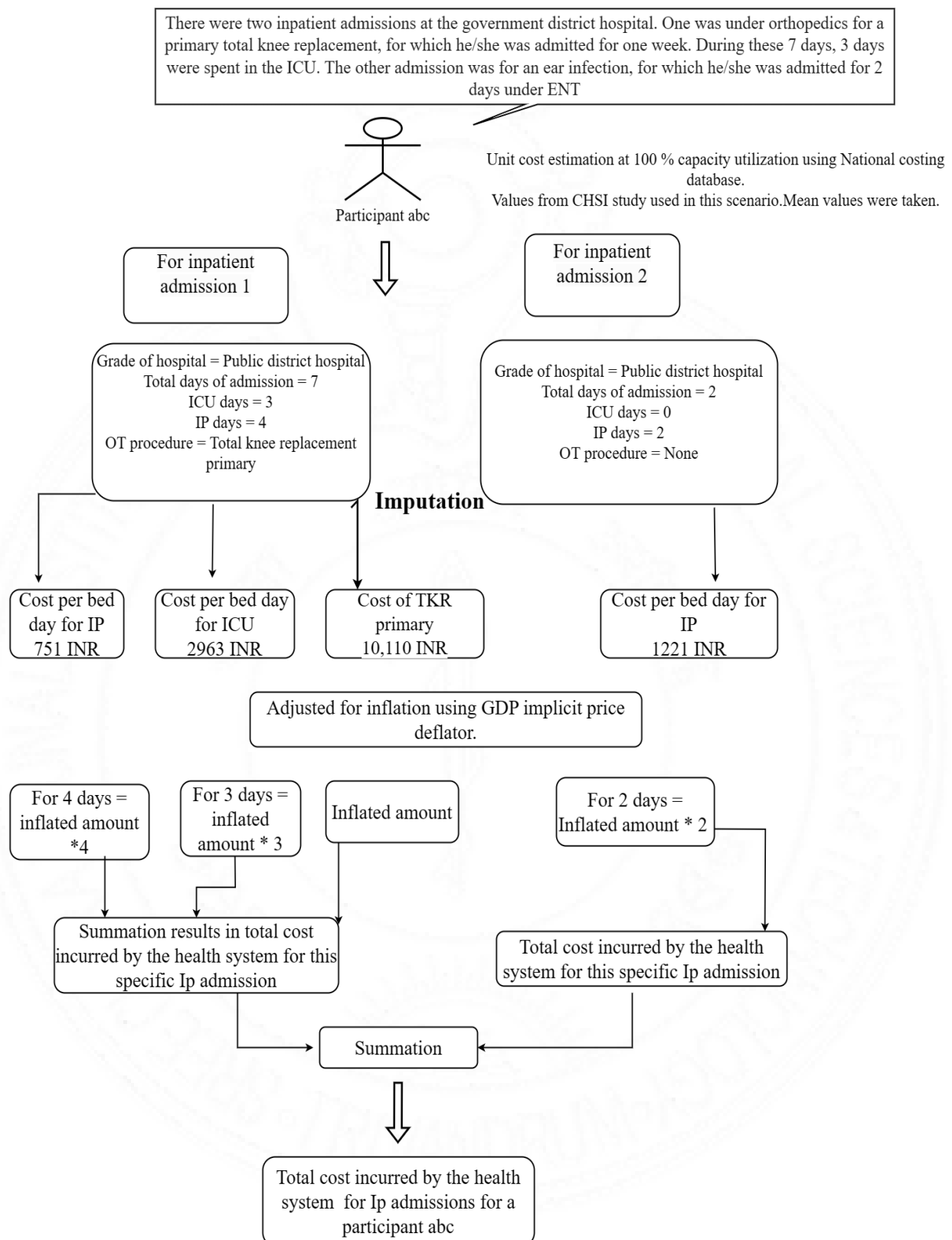
This study was conducted in 11 states, including Andhra Pradesh, Bihar, Gujarat, Maharashtra, Odisha, Rajasthan, Tamilnadu, Uttar Pradesh, West Bengal, Jammu and Kashmir, and New Delhi. Mean(range) and median (Interquartile range) unit cost values by specialty for outpatient, inpatient, intensive care unit, and operation theatre at current levels of utilization, 80 percent capacity utilization, and 100 percent capacity utilization are given. All cost estimates are for 2017-2018. Two health system levels are covered, i.e., public district hospitals and public tertiary hospitals. Unit cost data is available for public district hospitals for ophthalmology, orthopedics, general surgery, otolaryngology, obstetrics, and gynecology. Operation theatre costs of some standard procedures under this department are also provided along with the urology department. Departments covered under public tertiary

hospitals include cardiology, cardiothoracic and vascular surgery, ophthalmology, urology, orthopedics, general surgery, otolaryngology, obstetrics, and gynecology.

Methodology in this study

Imputation of unit cost data at 100 percent capacity utilization for per-patient outpatient consultation was done for the departments other than medicine, chest, skin, and dental from public district hospitals. For the public tertiary hospital, all the given departments were taken as the case may be. The procedure for estimating the cost incurred by the health system for outpatient visits for a given participant using the CHSI study was the same as for other costing studies. For inpatient admission at the public district hospital and public tertiary hospital, unit cost data at 100 percent capacity utilization was imputed from the CHSI study. All the given departments were taken as the case may be.

Figure 3.3 Illustrative example showing how the cost incurred by the health system for inpatient admission was estimated in this study.



I faced some limitations when using the National Coasting Database. For some departments, the unit cost was not available. The most suitable available departments were used as proxy departments. Cardiology was used as a proxy for neurology. Urology was proxied for nephrology. The district hospital was proxied by the Taluk headquarters hospital.

No unit cost data was available for chemotherapy, radiotherapy, and dialysis. For radiotherapy and dialysis, imputation was based on previous literature. (Chauhan et al., 2018; Kaur et al., 2018) The cheapest unit cost was imputed for radiotherapy. However, no unit cost imputation was done for chemotherapy because of the need for more data.

Calculating the cost incurred for free supply of medicine from government facilities was done using data from the KMSCL website. Question G01.1 helped to elicit this amount. The monthly cost incurred by the health system for the free supply of medicine was calculated and multiplied by 12 to get the annual cost incurred by the health system through government facilities.

The amount reimbursed through PMJAY was also added to the health system cost. Each participant's total monthly reimbursement amount was multiplied by 12 for outpatient visits. No multiplication was done for inpatient admission as the amount had already been given for one year. In this case, if the participant was a PMJAY beneficiary and also responded 'don't know' to the amount reimbursed, then the NHA public dashboard was used to get this amount by cross-checking as far as possible. Also, when these were impossible, the health benefits package version one imputed the amount based on conditions and department. The central government pays a flat premium per year for PMJAY beneficiary households. Through the discussion with the State Health Authority, I found this amount to be 631.20 INR per PMJAY household. This amount was divided by household size for PMJAY beneficiary households, which also added to the cost incurred by the health system.

I tried to attempt the possible and feasible ways in these short periods to calculate the cost incurred by the health system. In a nutshell, the mean annual cost incurred by the health system

was estimated by the summation of the yearly cost incurred by the health system for inpatient admission, outpatient visits, free supply of medicine, reimbursement through PMJAY, and an annual premium per member for PMJAY beneficiary household, following the mean calculation by dividing with the number of participants.

e) Mean annual total health expenditure

Mean annual total health expenditure was calculated as the sum of yearly out-of-pocket spending and productivity loss, the annual cost incurred by the health system, the yearly amount reimbursed by health insurance other than PMJAY, and the annual premium amount paid by the households divided by the number of participants in the household.

3)Ratio of out-of-pocket expenditure to total health expenditure

- **Outcome variables at the household level**

Each outcome variable was calculated at the household level by summing the corresponding values of participants aged 30 – 70 years. In addition, CHE and distress financing were calculated at the household level.

1)Healthcare utilization:

Mean annual inpatient admission

Mean annual outpatient visits

2)Expenditure pattern and health expenditure

- Mean annual out-of-pocket expenditure for outpatient visit
- Mean annual out-of-pocket expenditure for inpatient admission
- Mean annual out-of-pocket expenditure
- Mean annual out-of-pocket expenditure and productivity loss
- Mean annual expenditure incurred by the health system
- Mean annual total health expenditure

3)Ratio of out-of-pocket expenditure to total health expenditure

4)Catastrophic health expenditure

For this study, the calculation of CHE followed the 40 percent threshold of the capacity-to-pay approach. According to this methodology, a household was deemed to experience catastrophic health expenditure when its monthly household health expenditure (OOPE) was equal to or greater than 40 percent of the household's capacity to pay. (Xu et al., 2003)

Deducting Subsistence Expenditure (SE) from household expenditure yields Capacity to Pay (CTP).

The calculation steps were as follows. (Distribution of Health Payments and Catastrophic Expenditures Methodology, 2005; Xu et al., 2003)

Conversion of expenditure figures to monthly figures

1. Calculate the food expenditure share for each household: household's food expenditure (FE) / total expenditure (THHE)
2. Find the equivalent household size for each household. It was calculated by raising household size to the power of 0.56.
$$\text{eqSize} = (\text{Household size})^{0.56}$$
3. Find Equivalised food expenditures (eqFE)
$$\text{eqFE} = \text{FE} / \text{eqSize}$$
4. Find the 45th and 55th percentile of food expenditure share of total household expenditure across the whole sample.
5. Calculate mean food expenditure in this range, which equates to the poverty line (subsistence expenditure per (equivalent) capita or also the poverty line (PL))
6. Calculate the subsistence expenditure for each household (SE)
$$\text{SE} = \text{PL} * \text{eqSize}$$
7. Find the capacity to pay (CTP) for each household by
$$\text{CTP} = \text{THHE} - \text{SE} \text{ if } \text{SE} \leq \text{FE}$$

$$CTP = THHE - FE \text{ if } SE > FE$$

8. Lastly, a household is considered to be experiencing catastrophic health expenditure if

$$CHE = 1 \text{ if } OOPE / CTP \geq 0.4$$

$$CHE = 0 \text{ if } OOPE / CTP < 0.4$$

5) Distress financing

As per Joe et al., it is said to occur when a household resorts to financing mechanisms like borrowing/mortgaging of assets/Land and sale of assets/land to finance the healthcare of an individual. (Huffman et al., 2011; Joe, 2015)

*** GDP implicit price deflator: Adjusted cost (2023 prices) = cost (2017-2018 prices) * Ratio of GDP deflator of 2023 to 2017-18. This was suggested by the WHO-CHOICE guidebook over consumer price index. (Turner et al., 2019)

3.10 Framework for analysis

Descriptive statistics summarised the distribution of socio-demographic variables and the prevalence of multi-morbidity. Individual and household-level analysis of outcome variables stratified for multimorbidity status was also done using descriptive statistics. Chi square test and t test used to find association as necessary. All analyses were done in R software Version 4.3.1.

3.11 Ethical considerations

The study got approval from the Institutional Ethics Committee of Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCT/IEC/2162/DECEMBER/2023). Written Informed consent for participating in the study was obtained from the study participant before their enrolment. Participants were informed regarding the voluntary nature of the participation, study objectives, and potential benefits and risks. Utmost priority was given to protect the privacy and confidentiality of the participants

4. RESULTS

I collected data from 338 households, amounting to 552 participants in the age group 30-70 years. I had to visit 370 households, resulting in a non-response rate of 8.6 percent.

The background details of the study participants, distribution of disease conditions at the individual and household level, and univariate analysis of outcome variables such as healthcare utilization, healthcare expenditure and expenditure pattern, catastrophic health expenditure, and distress financing by multimorbidity status were described in this chapter. Outcomes were analysed at both individual and household levels.

4.1 Background details of the study population

4.1.1 Sociodemographic profile of the study population

The mean age of the study population was 54.2, with a SD of 11.3. About 64.1 percent were females, and 35.9 percent were males. The percentage of participants who were currently married was 79.7. Five out of ten participants had years of education of nine to twelve years. More than half of the participants, i.e., 59 percent, were BPL cardholders.

The distribution of other variables is given in the following table

Table 4.1 Sociodemographic profile of the study population

Characteristics	Females	Males	Total
	354	198	552
Age (Mean, SD)	53 (± 11.3)	56.4 (11.1)	54.2 (11.3)
Religion, n (%)			
Hindu	263 (74.3)	145 (73.2)	408 (73.9)
Christian	39 (11)	25 (12.6)	64 (11.6)
Muslims	52 (14.7)	28 (14.1)	80 (14.5)
Characteristics	Females	Males	Total
	354	198	552
Marital status, n (%)			
Currently married	254 (71.8)	186 (93.9)	440 (79.7)

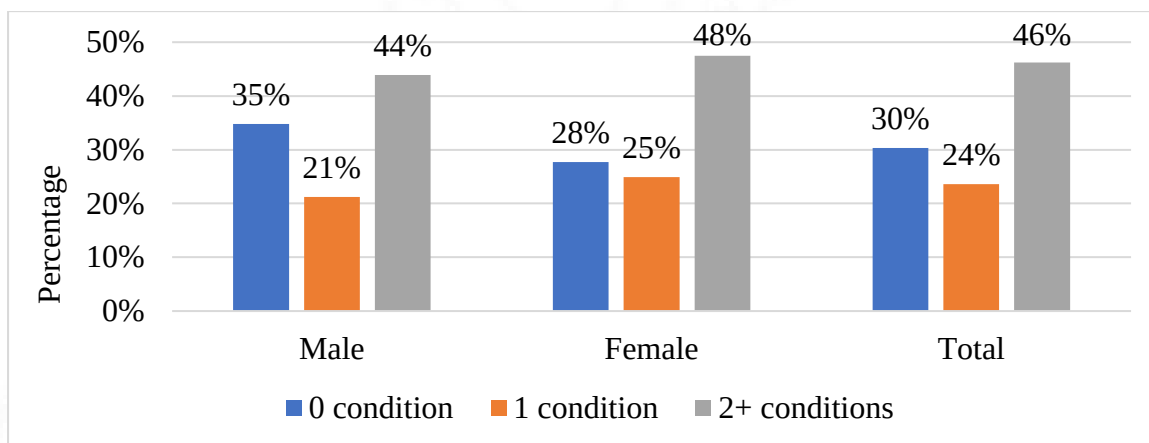
Divorced	9 (2.5)	2 (1)	11 (2)
Never married	6 (1.7)	7 (3.5)	13 (2.4)
Widow/widower	85 (24)	3 (1.5)	88 (15.9)
Education, n (%)			
0 – 4 years	41 (11.6)	25 (12.6)	66 (12)
5 – 8 years	75 (21.2)	45 (22.7)	120 (21.7)
9 – 12 years	182 (51.4)	112 (56.6)	294 (53.3)
≥ 13 years	56 (15.8)	16 (8.1)	72 (13)
Employment, n (%)			
Government employee and business	15 (4.2)	14 (7.1)	29 (5.3)
Skilled and unskilled	103 (29.1)	110 (55.6)	213 (38.6)
Homemaker and unemployed	229 (64.7)	61 (30.8)	290 (52.5)
Retired	7 (2)	13 (6.6)	20 (3.6)
Insurance, n (%)			
Don't have	98 (27.7)	65 (32.8)	163 (29.5)
Don't know which type	46 (13)	21(10.6)	67 (12.1)
PMJAY	167 (47.2)	88 (44.4)	255 (46.2)
State	12(3.4)	8 (4)	20 (3.6)
Commercial	16 (4.5)	9 (4.5)	25 (4.5)
ESI/CGHS/ECHS	14 (4)	7 (3.5)	21(3.8)
Others	1 (0.3)	0 (0)	1(0.2)
Ration card colour, n (%)			
White	68 (19.3)	42 (21.2)	110 (20)
Blue	74 (21)	42 (21.2)	116 (21.1)
Pink	181(51.3)	97 (49)	278 (50.5)
Yellow	30 (8.5)	17 (8.6)	47 (8.5)

4.2 Morbidity profile

4.2.1 Distribution of disease conditions among the study participants

Of 552 participants, 30 percent reported zero condition, 24 percent reported one condition, and 46.2 percent (95 % CI: 42.2 – 50.4). reported two or more co-existing conditions or multimorbidity.

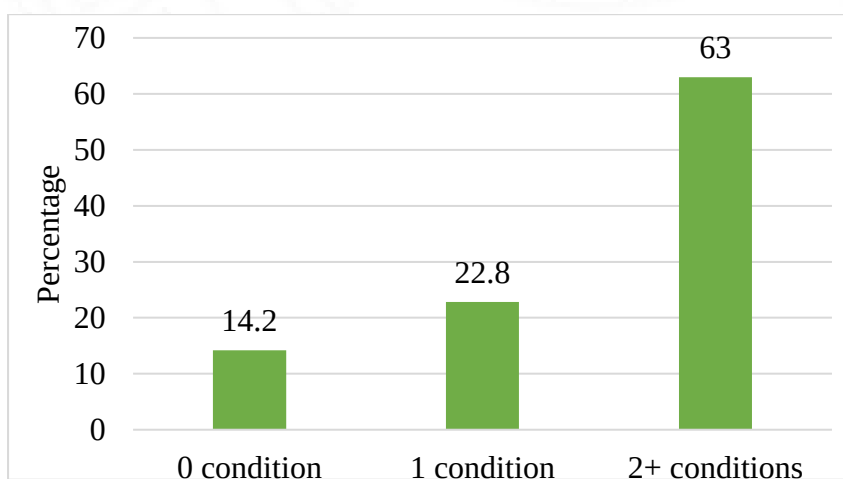
Figure 4.1 Distribution of disease conditions among the study participants.



4.2.2 Distribution of disease conditions among households

Of 338 households, 63 percent (95 % CI: 58 – 68) (n = 213) had at least one member in the age group 30-70 years who had multimorbidity. The percentage of households without multimorbidity, i.e., either no members reported a chronic condition or none did not have two or more conditions, was 37 percent (n = 125).

Figure 4.2 Distribution of disease conditions among household



4.3 Outcome analysis at the individual level

4.3.1 Healthcare utilization

Table 4.2 explains the type of health sector visited for outpatient and inpatient services in the recall period stratified for multimorbidity status. The preferences for government and private health facilities for outpatient services were nearly the same (35.3 and 34.1, respectively) among participants with multimorbidity. However, among participants without multimorbidity, three out of ten (33.3 percent) preferred private facilities, and two out of ten (19.9 percent) preferred government facilities. For inpatient services, 11.8 percent preferred government facilities, compared to 17.6 percent preferred private facilities among participants with multimorbidity. These percentages were 8.4 and 10.1, respectively, among participants without multimorbidity.

The percentage of participants who opted for both, i.e., government and private outpatient services, was only 14.1 among those with multimorbidity and 7.1 for those without multimorbidity. For inpatient services, the values were 0.8 and 0.3, respectively, in these groups.

Table 4.2 Type of health sector visited for outpatient and inpatient services by multimorbidity status

Health service use	Without multimorbidity 297	With multimorbidity 255
Outpatient services, n (%)		
None	118 (39.7)	42 (16.5)
Government	59 (19.9)	90 (35.3)
Private	99 (33.3)	87 (34.1)
Both	21 (7.1)	36 (14.1)
Inpatient services, n (%)		
None	241 (81.1)	178 (69.8)
Government	25 (8.4)	30 (11.8)
Private	30 (10.1)	45 (17.6)
Both	1 (0.3)	2 (0.8)

Table 4.3 explains healthcare utilization in terms of the mean annual number of outpatient visits and inpatient admissions stratified for multimorbidity status. The mean number of outpatient visits per year remained nearly the same at government (11.2 ± 19.2) and private facilities (11.3 ± 17.4) among participants with multimorbidity. Among participants without multimorbidity, the preference for private facilities over government facilities was slightly higher, with a mean number of outpatient services of 7.4 ($SD \pm 11.4$) and 4.9 ($SD \pm 9.9$), respectively.

However, the preferences for private facilities were seen for inpatient admission among participants with multimorbidity, with a mean number of inpatient admissions of 0.24 ($SD \pm 0.57$) and 0.15 ($SD \pm 0.42$), respectively, albeit with smaller values. Conversely, the values were nearly identical for participants without multimorbidity for private and government facilities.

Table 4.3 Healthcare utilization in terms of mean annual outpatient visits and inpatient admissions by multimorbidity status

Number of outpatient visits/inpatient admissions, mean (SD)	Without multimorbidity 297	With multimorbidity 255
Outpatient visits in government hospitals	4.9 (9.9)	11.2 (19.2)
Outpatient visits in private hospitals	7.4 (11.4)	11.3 (17.4)
Outpatient visits	12.1 (13.5)	22.2 (23.6)
Inpatient admission in government hospitals	0.11 (0.44)	0.15 (0.42)
Inpatient admission in private hospitals	0.14 (0.50)	0.24 (0.57)
Inpatient admission	0.26 (0.65)	0.39 (0.67)

4.3.2 Expenditure pattern and healthcare expenditure

Table 4.4 explains the mean values of different types of healthcare expenditure over a year, stratified for multimorbidity status. For outpatient visits, having multimorbidity resulted in a higher mean annual OOPE of INR 36519.1 (SD±78652.4) compared with INR 15303.3 (SD±53022.3) for those without multimorbidity. For inpatient services, these amounts were INR 15404.8 (SD±46971.4) and INR 7466.3 (SD±30069.4), respectively. In these two groups, the mean annual OOPE was INR 69864.7 (SD±124599.7) and INR 28462.2 (SD±71622.6). When productivity loss was added, multimorbidity resulted in a mean yearly OOPE of INR 122710.5 (SD±207193.0) compared to INR 65072.0 (SD±130292.6) in participants without multimorbidity. Even though mean annual expenditure from a health system perspective was higher for individuals with multimorbidity, the spending for individuals without multimorbidity varies more widely, as indicated by higher standard deviation. Again, the total health expenditure became nearly two times in individuals with multimorbidity with a mean annual value of INR 140710.7 (SD±241997.5) compared to INR 79414.4 (SD±182588.4) among those without multimorbidity.

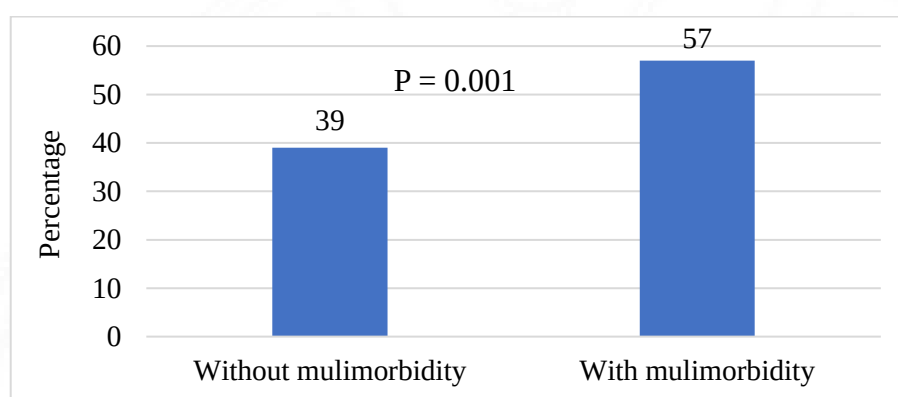
Table 4.4 Mean annual healthcare expenditure by multimorbidity status

Healthcare expenditure, mean (SD)	Without multimorbidity	With multimorbidity
Out-of-pocket expenditure for outpatient visit	₹15303.3 (53022.3)	₹36519.1 (78652.4)
Out-of-pocket expenditure for inpatient admission	₹7466.3 (30069.4)	₹15404.8 (46971.4)
Out-of-pocket expenditure	₹28462.2 (71622.6)	₹69864.7 (124599.7)
Healthcare expenditure, mean (SD)	Without multimorbidity	With multimorbidity
Out-of-pocket expenditure and productivity loss	₹65072.0 (130292.6)	₹122710.5 (207193.0)

Expenditure incurred by the health system	₹13721.4 (106821.6)	₹16744.0 (59006.7)
Total health expenditure	79414.4 (182588.4)	140710.7 (241997.5)

OOPE contributed 57 percent of the total health expenditure in participants with multimorbidity compared to 39 percent without ($P = 0.001$), as shown in the following figure. (figure 4.3)

Figure 4.3 OOPE as a percentage of total health expenditure



4.4 Outcome analysis at household level

For the study, households with multimorbidity were defined as those where any member aged between 30 and 70 years had multimorbidity. If the members in this specified age group did not have any chronic condition or only had one chronic condition, then the household was classified as a household without multimorbidity,

Household-level data were prepared by summing the corresponding values of members from the same household.

4.4.1 Healthcare utilization

Table 4.5 explains healthcare utilization in terms of the mean annual number of outpatient visits and inpatient admissions stratified for multimorbidity status at the household level.

The mean number of outpatient visits per year remained nearly the same at government (16.3 ± 22.7) and private facilities (16.8 ± 21.4) among households with multimorbidity. Among

households without multimorbidity, the preference for private facilities over government facilities was higher, with a mean number of outpatient services of 12 (SD±14.3) and 6.8 (SD±12.1), respectively.

The mean annual number for inpatient services was 0.33 (SD±0.68) and 0.23 (SD±0.52) for private and government facilities among households with multimorbidity. These values were 0.28 (SD±0.70) and 0.17 (SD±0.59) for households without multimorbidity.

Table 4.5 Healthcare utilization in terms of mean annual outpatient visits and inpatient admissions by multimorbidity status

Number of outpatient visits/inpatient admissions, mean (SD)	Households without multimorbidity 125	Households with multimorbidity 213
Outpatient visits in government hospitals	6.8 (12.1)	16.3 (22.7)
Outpatient visits in private hospitals	12.0 (14.3)	16.8 (21.4)
Outpatient visits	18.4 (17.6)	32.5 (29.6)
Inpatient admission in government hospitals	0.17 (0.59)	0.23 (0.52)
Inpatient admission in private hospitals	0.28 (0.70)	0.33 (0.68)
Inpatient admission	0.45 (0.88)	0.56 (0.78)

4.4.2 Expenditure pattern and healthcare expenditure

Table 4.6 explains the mean values of different types of healthcare expenditure over a year, stratified for multimorbidity status at the household level. For outpatient visits, having multimorbidity among any member aged 30 and 70 years in a household resulted in a higher mean annual OOPE of INR 53339.5 (SD±130909.2) compared with INR 19969.1 (SD±34100.9) for those households without multimorbidity.

For inpatient services, these amounts were INR 20052.7 (SD±52830.8) and INR 14996.1 (SD±42181.6), respectively. In these two groups, the mean annual OOPE was INR 96504.5 (SD±174078.6) and INR 45706.5 (SD±75351.0). When productivity loss of members was added, households with multimorbidity had a mean yearly OOPE of INR 176740.9 (SD±257331.9) compared to INR 103773.9 (SD±153007.5) households without multimorbidity.

The mean annual expenditure incurred by the health system for a household with multimorbidity was less than that for households without multimorbidity. Again, the total health expenditure became nearly one and half times that in households with multimorbidity with a mean annual value of INR 200288.7 (SD±289040.9) compared to INR 134446.3 (SD±245820.5) among those without multimorbidity.

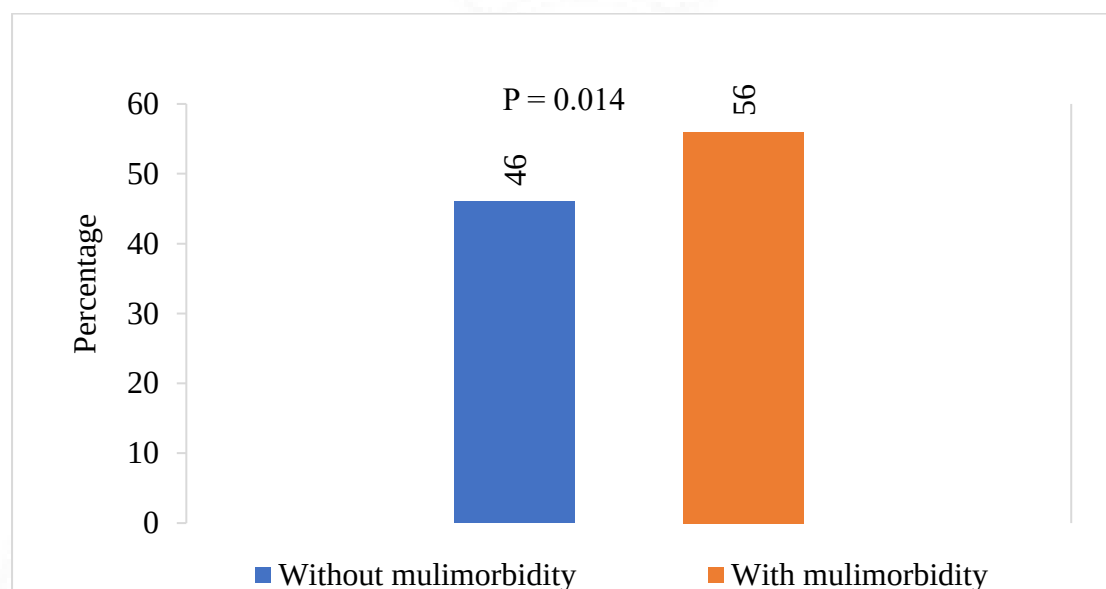
Table 4.6 Mean annual healthcare expenditure by multimorbidity status

Healthcare expenditure, mean (SD)	Households without multimorbidity 125	Households with multimorbidity 213
Out-of-pocket expenditure for outpatient visit	₹19969.1 (34100.9)	₹53339.5 (130909.2)
Out-of-pocket expenditure for inpatient admission	₹14996.1 (42181.6)	₹20052.7 (52830.8)
Out-of-pocket expenditure	₹45706.5 (75351.0)	₹96504.5 (174078.6)
Out-of-pocket expenditure and productivity loss	₹103773.9 (153007.5)	₹176740.9 (257331.9)
Expenditure incurred by the health system	₹29828.7 (163580.4)	₹21673.1 (64163.8)
Total health expenditure	₹134446.3 (245820.5)	₹200288.7 (289040.9)

The OOPE contributed to 56 percent of the total health expenditure in households with multimorbidity compared to 46 percent in households without multimorbidity ($P = 0.014$)

(Figure 4.4)

Figure 4.4 OOPE as a percentage of total health expenditure



4.4.3 Catastrophic health expenditure and Distress financing

Table 4.7 presents the percentage of households that experienced financial burden during the recall period, stratified by multimorbidity status.

Catastrophic health expenditure was calculated using the steps stated in the methodology. The prevalence of catastrophic health expenditure at the 40 percent threshold of the capacity-to-pay approach was 28.6 percent ($n=61$) among households with multimorbidity, whereas the prevalence of distress financing was 39.9 percent ($n=85$). For households without multimorbidity, catastrophic health expenditure was 12 percent ($n=15$), whereas distress financing was 24 percent ($n=30$). Financing mechanisms such as borrowing with or without interest, sale, or mortgaging of assets or land were included in the definition of distress financing. Households that didn't require any financing mechanism (4.7 percent, $n=16$) and

those reporting financing methods other than those defined as distress financing (61.2 percent, n=207) were classified as households without distress financing during the recall period.

Table 4.7 Percentage of households experienced financial burden by multimorbidity status

Financial burden, n (%)	Without multimorbidity 125	With multimorbidity 213	p value (chi square test)
Catastrophic health expenditure, n (%)			
No	88 (110)	71.4 (152)	< 0.001
Yes	12 (15)	28.6 (61)	
Distress financing, n (%)			
No	76 (95)	60.1 (128)	< 0.001
Yes	24 (30)	39.9 (85)	

5. DISCUSSION

The study aimed to assess healthcare utilization, expenditure pattern, and healthcare expenditure at individual and household levels among adults aged 30 to 70, stratified for multimorbidity status from rural areas of Kollam district, Kerala. Additionally, the study examined financial burden in terms of CHE and distress financing within households categorised by multimorbidity status.

The study found that higher healthcare utilization, healthcare expenditure, and financial burden were associated with multimorbidity.

5.1 Prevalence of multimorbidity

Multimorbidity was prevalent among 46.2 percent of 30-70-year-olds from rural Kollam district, Kerala. Direct comparisons with the other prevalence estimating studies are somewhat limited because of the varying context, population, definition of multimorbidity, and measurement method. Analysing large cross-sectional data from six states of India, data resulted in a prevalence estimate of 8.9 percent. (Pati et al., 2014) This survey was conducted in 2007, and there can also be a possible underestimation of multimorbidity. The range of the prevalence was reported as 4.5 percent to 83 percent in a systematic review of multimorbidity studies from South Asian countries. (Pati et al., 2015) One of the previous studies conducted in community-based settings of Kerala gave a prevalence of 45.4% among 30-70-year-olds (C and Jeemon, 2020), which can be comparable to the results from our study. However, it included 11 conditions to the definition of multimorbidity, while we included 14 conditions, including dyslipidaemia and cataracts. A greater prevalence of hypercholesterolemia was reported in Kerala by the INTERHEART study. (Sharma et al., 2024) A community-based cross-sectional study conducted among participants aged 40 years or above from three districts of Tamilnadu reported a prevalence of definite cataracts at 47.5% and also showed increasing

trends with age. (Nirmalan et al., 2004) Including these conditions should have resulted in a higher prevalence of multimorbidity in the stated study.

In our study, six out of ten households with members aged 30 to 70 years had multimorbidity. Household-level prevalence estimates of multimorbidity were limited. However, there are studies indicating that co-residing adults have a high degree of concordance in their chronic diseases. (Patel et al., 2017)

5.2 Discussion on outcome variables

5.2.1 Healthcare utilization

It is not surprising to expect a higher level of healthcare utilization and concomitant OOPEx associated with multimorbidity. (Wang et al., 2018) In our study, the mean annual outpatient(op) visits in the preceding 12 months were 12.1 and 22.8, respectively, among participants without multimorbidity and participants with multimorbidity, indicating a twofold increase in utilization for those with multimorbidity. The mean inpatient(ip) services were nearly the same (0.26 and 0.39) in these groups. This finding is consistent with other studies conducted in high-income and low-income settings, including India. (Glynn et al., 2011; Huntley et al., 2012; Payne et al., 2013).

The study setting, population, and the number of conditions defined for multimorbidity can indeed influence the prevalence of multimorbidity (Smith and O'Dowd, 2007; Violan et al., 2014), which in turn impacts mean values of healthcare utilization and healthcare expenditure. Six times more unplanned hospital admission were reported in persons with multimorbidity in a Scottish study. (Payne et al., 2013) A study using nationally representative data in Indonesia reported the mean four-week outpatient services among subjects with zero conditions to two conditions as 0.24 to 0.78 respectively, and it was 1.4 in those with three or more conditions. (Marthias et al., 2021) This indicates a nearly three - fold increase in mean four-week outpatient services from 0 to 2 conditions. Nearly 10 times more mean annual inpatient services reported

in those with multimorbidity compared to those without. They included all ages above 40 years, compared to our study's 30- 70-year range. They included individuals over 70 years, may be due to this they reported more fold increase than ours.

Healthcare utilization, as indicated by the mean number of outpatient visits in the preceding 12 months, varied by the number of NCDs. (Pati et al., 2014) Analysis of LASI wave 1 data from India revealed that the mean number of outpatient visits was 2.24 for respondents with 0 NCD, 3.32 for the 1 NCD group, and 6.16 for the 3+ NCD group. There was a nearly 2 times more mean annual outpatient visit in those with multimorbidity compared to those without. Notably, LASI wave one was conducted in 2007, and the reported self-reported prevalence of multimorbidity was only 8.9 percent. However, a growing body of literature indicates an increasing prevalence of multimorbidity over the years.

Furthermore, the prevalence of multimorbidity in Kerala is expected to be higher due to the advanced epidemiological transition in the state compared to other states of India. (C and Jeemon, 2020) Healthcare utilization is also higher in Kerala, attributed to both demand and supply-side factors. (Nair R and Varma, 2021) This can be due to the greater accessibility to healthcare services (Franke and Chasin, 1992) and a higher prevalence of chronic diseases and associated risk factors in Kerala. (Sarma et al., 2019)

5.2.2 Healthcare expenditure

The mean annual OOPE for outpatients were ₹15303.3 and ₹36519.1, and for inpatients, these were ₹7466.3 and ₹15404.8 among participants without multimorbidity and with multimorbidity in our study. The overall mean annual OOPE in these two groups was ₹28462.2 and ₹69864.7. There was a nearly twofold or more than twofold increase in these values between these two groups. All these values were relatively higher than those reported in previous studies. Commenting on OOPE is limited due to differences in the reporting currency and survey period.

The increase in annual OOPE for outpatient services was nearly five times from zero to three or more conditions, and the values were almost the same for those with one condition and two conditions as for those with zero conditions in the study by Marthias et al. (Marthias et al., 2021)

OOPE for outpatient services was reported as ₹272.07 for 0 condition, ₹356.79 for one condition, and ₹454.08 for multimorbidity. (Pati et al., 2014) This shows nearly a 1.5-fold more OOPE for outpatient services among those with multimorbidity to those without. The lower amounts in these respective categories could be attributed to the structure of the survey itself, as it only elicited expenditure incurred during the last visit. At the same time, in our study we calculated it for a recall period of 30 days for outpatient services and one year for inpatient services, following extrapolation to annual values by assuming the same utilization rate over the years. Additionally, the cost heads in the direct medical and direct non-medical categories varied from our study. For example, food costs were not elicited in the LASI survey. Furthermore, LASI assessed OOPE for only nine conditions, whereas our study had a broader definition of multimorbidity, including 14 conditions. For instance, cancer is one of the diseases with a higher OOPE (Kastor and Mohanty, 2018), which was excluded from this survey.

Karan et al. reported the mean OOPE for outpatient care per episode in the preceding 15 days of the survey as ₹880 for a single NCD and ₹712 for multimorbidity. Similarly, the values for inpatient services in the prior year were ₹39,662 and ₹47,943, respectively. (Karan et al., 2022) These values were lower compared to those in our study. Additionally, for outpatient services, the multimorbidity group incurred less expenditure in the recall period in the study by Karan et al. This could be due to underestimating multimorbidity in the NSSO data, as reporting is purely based on self-reported morbidities. Someone with multimorbidity could be wrongly classified as having a single disease, as seen in the case of cancer. (Karan et al., 2022)

Studies analysing productivity loss and health system costs for multimorbidity were very limited. (Picco et al., 2016) A study by Picco et al., analysing large-scale data, reported costs from a societal perspective for individuals without and with multimorbidity, stratified by the number of conditions. (Picco et al., 2016) However, this study was not directly comparable to our study due to differences in settings, chosen population, study period, and multimorbidity definition. This study was conducted among elderly dementia patients aged 60 years or above in Singapore. The reported mean annual societal costs were S\$2,806 for 0 conditions, S\$5,610 for one condition, and S\$15,148 for multimorbidity. There was an increase of nearly 5.5 times from 0 condition to multimorbidity. However, it was just above two times in our study. This difference may be because they only included dementia patients aged 60 years and above, while there is a bunch of literature showing the increasing prevalence of multimorbidity with age. They opted for a comprehensive approach to cost from a societal perspective, including activities of daily living (ADL) and instrumental activities of daily living (IADL). These should have been monetised in our study. So, there was a dilution in the included cost heads in the calculation of total health expenditure in our study compared to this stated study by Picco et al.

5.2.3 Catastrophic Health Expenditure

The percentage of households experiencing CHE was 28.6 percent among households with multimorbidity and 12.2 percent among households without multimorbidity. Studies assessing household-level multimorbidity status were already limited (C and Jeemon, 2020), so CHE estimates were also restricted.

Wang et al. compared the economic burden among rural households with chronic diseases and those without chronic diseases in China. (Wang et al., 2015) In this study, a household with chronic disease was defined as a household with at least one member aged 40 years or older with chronic disease. CHE was calculated using a 40 percent threshold of household CT. Among rural households with elderly chronic disease patients, 30.57 percent experienced CHE,

compared to 13.54 percent of households without chronic disease. However, the groups were not exclusive, as the division was not based on multimorbidity status. Therefore, there may be underestimation or overestimation compared to the findings in my study.

5.2.4 Distress financing

The percentage of households experiencing distress financing was 39.9 percent among households with multimorbidity and 12 percent among households without multimorbidity. During the literature review, I found no study specifically reporting the prevalence of distress financing among these two groups.

However, according to a study analyzing hardship financing in India using NSSO data, it was reported through multivariate logistic regression that those who had chronic diseases were more likely to face distress financing. Additionally, except for the South Zone, every other zone in India was less likely to face distress financing. (Thomas et al., 2023)

5.3 Strengths

- Primary data collection was conducted by a single investigator, limiting inter-observer bias.
- Discharge summaries, outpatient sheets, or prescribed medicines confirmed all the diagnoses. I attempted to verify hospitalization expenditures with medical bills as far as possible.
- OOPE calculations were not limited to recent care.
- This comprehensive approach accounted for every possible direct medical, direct non-medical, and indirect cost.
- We used all available data points to determine healthcare expenditure, including the National costing database, data from the KMSCL website, Health Benefit Package-2.0, and the NHA public dashboard.

- Our estimate was adjusted for inflation using the GDP implicit price deflator.
- The study included a comparison group to establish a counterfactual situation and reduce the overestimation of expenditures as much as possible. (WHO Guide to Identifying the Economic Consequences of Disease and Injury, 2009)

5.4 Limitations

- All the limitations of a cross-sectional design were also applied to this study.
- Utilization and OOPE data were based on self-report and, therefore, subject to recall bias.
- Couldn't account for the extent of financing mechanisms as the amount raised was not counted.
- Underreporting of household expenditure data and financial problems.
- A primary costing was not done to estimate the cost incurred by the health system.

5.5 Conclusions

The prevalence of multimorbidity was 46.2 percent among participants aged 30 to 70 years.

Six in ten households were with multimorbidity. Healthcare utilization and expenditure were relatively higher in participants with multimorbidity than those without. When comparing participants without multimorbidity to participants with multimorbidity, mean annual outpatient visits showed a nearly two-fold increase in those with multimorbidity. In contrast, mean yearly inpatient admissions had values of 0.26 and 0.39 in the respective groups.

OOPE showed a nearly 2.5 times increase between these groups at the individual level. When productivity loss was added, the mean annual health expenditure almost doubled. Mean annual expenditure incurred by the health system remained nearly the same between these groups, while total health expenditure increased twice. The percentage share of OOPE in total

health expenditure was 50 percent in participants with multimorbidity compared to 36 percent in those without multimorbidity.

Among households with multimorbidity, nearly three out of ten households experienced CHE, while four out of ten experienced distress financing.

5.6 Policy implications

- Need to strengthen the primary care component of Ayushman Bharat Mission, i.e., Health and wellness centers: as outpatient consultation, diagnostics, and medicines, which are supposed to be offered subsidized or free by H&W centers, account for the majority share of out-of-pocket (OOP) spending on health.
- There is a need for health protection schemes to cover outpatient services, as most out-of-pocket expenses stem from them.

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ANNEXURE 1

PARTICIPANT INFORMATION SHEET

I am Dr Anuja V R, currently pursuing Master of Public Health (MPH) at Achutha Menon Centre for Health Science Studies (AMCHSS), Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, Kerala. This study is being carried out as part of the course requirement which I am currently undertaking,

This study is being done under the supervision of Dr Jeemon P, Additional Professor at AMCHSS. If this information sheet contains any words or information that you do not understand, please feel free to clarify these. You may also ask any question related to this study.

Purpose of study

There is growing concern on the rise in chronic diseases (such as hypertension, diabetes, dyslipidemia, anemia, copd/asthma, chronic kidney disease, coronary heart disease, arthritis, stroke, cancer, cataract, thyroid disorders, depression, anxiety, dementia etc.) in our country, affecting both younger and older age groups. This has led to the emergence of multimorbidity, where individuals have multiple chronic conditions simultaneously. Even a single chronic disease can be financially challenging for many people, and having multiple chronic conditions further exacerbates this financial burden. As a result, individuals and households are experiencing the direct health and financial consequences of these illnesses. Therefore, it is crucial to monitor these expenses and their impact on households to fully grasp the significant burden that these diseases impose on our society.

A survey is being carried out to estimate the health-related expenses, and its effect on the household economy concerning the treatment and management of multiple chronic conditions.

Your household have been chosen through a random process of selection. The study involves only persons between 30 and 70 years of age in a family excluding those who are not in a physical or mental condition to answer the questions.

Procedure

The survey would take approximately 30 - 45 minutes of your valuable time. You will be asked questions in private. These will pertain to details about your socio-demographic, socio-economic profile, and medical conditions. You will be asked questions on the expenses that you incurred both for the hospitalization preceding 1 year as well as for the outpatient visit in the past 30 days, details about how you financed your treatment and effect of these expenses on your income and job. You will also be asked questions regarding your average income and general household expenses over the past one year to serve as a comparison. This collected data will be used for research purposes only. I may contact you again if the collected information was found to be incomplete.

Risks and discomforts

Participation in this study imposes no risk to your health. However, you would be asked questions which you may find personal in nature.

Benefits

There may not be any direct benefit for you from this study. The information collected from you and from other participants will help in assessing the financial burden that these diseases impose on our households.

Confidentiality

You will be interviewed in private. All information related to you will be kept confidential and at no stage will your identity be revealed. A respondent identification number will be assigned to each participant that will help in maintaining the confidentiality of the data collected. Access to this respondent identification number will be restricted to those analyzing the data only.

Voluntary participation

Your participation in this study is purely voluntary which means you can decide whether to participate in the study or not. If at any stage you wish to discontinue, you are free to do so without any adverse consequences.

Contact information

If you have any research related questions or you would like to verify my credentials, you may contact me

Dr Anuja V R
MPH2022
AMCHSS, SCTIMST
Trivandrum

Dr Srinivas G
Member Secretary
Institutional Ethics Committee
SCTIMST, TRIVANDRUM-
695011
Office: 04712524689

ANNEXURE 2

പങ്കെടുക്കുന്നയാൾക്കുള്ള വിവരപത്രിക

ഞാൻ ഡോ.അനുജ വി ആർ, ഇപ്പോൾ തിരുവനന്തപുരത്തെ ശ്രീചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ് ആൻഡ് ടെക്നോളജിയുടെ അണ്ടറിലുള്ള അച്യുതമേനോൻ സെന്റർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസിൽ മാസ്റ്റർ ഓഫ് പബ്ലിക് ഹെൽത്ത് (എംപിഎച്ച്) പഠിക്കുന്നു. ഞാൻ ഇപ്പോൾ പഠിച്ചുകൊണ്ടിരിക്കുന്ന കോഴ്സിന്റെ ഭാഗമായാണ് ഈ പഠനം നടത്തുന്നത്.

എഫ്എംസിഎച്ച്എസ്എസിലെ അഡീഷണൽ പ്രൊഫസർ ഡോ ജീമോൻ പിയുടെ മേൽനോട്ടത്തിലാണ് ഈ പഠനം നടക്കുന്നത്. ഈ വിവര ഷീറ്റിൽ നിങ്ങൾക്ക് മനസ്സിലാക്കാത്ത ഏതെങ്കിലും വാക്കുകളോ വിവരങ്ങളോ ഉണ്ടെങ്കിൽ, അവ ചോദിച്ചു വ്യക്തതവരുത്താൻ മടിക്കേണ്ടതില്ല. ഈ പഠനവുമായി ബന്ധപ്പെട്ട ഏത് ചോദ്യവും താങ്കൾക്ക് ചോദിക്കാവുന്നതാണ്.

പഠന ലക്ഷ്യം

വിട്ടുമാറാത്ത രോഗങ്ങളുടെ (രക്തസമ്മർദ്ദം, പ്രമേഹം, കൊളെസ്റ്ററോൾ, വിളർച്ച, സിഓ പിഡി/ആസ്ത്മ, വിട്ടുമാറാത്ത വൃക്കരോഗം, കൊറോണറി ഹൃദ്രോഗം, സന്ധിവാതം, പക്ഷാഘാതം, കാൻസർ, തിമിരം, തൈറോയ്ഡ് തകരാറുകൾ, വിഷാദം, ഉത്കണ്ഠ, മറവി രോഗം മുതലായവ) വർദ്ധനവ് നമ്മുടെ രാജ്യത്തു ആശങ്കപടർത്തുന്നു. ഈ രോഗങ്ങൾ ചെറുപ്പക്കാരിലും പ്രായമുള്ളവരിലും കണ്ടുവരുന്നു. ഇത് മൾട്ടിമോർബിഡിറ്റിയുടെ ആവിർഭാവത്തിലേക്ക് നയിക്കുന്നു, അതായതു ഒരു വ്യക്തിയിൽ ഒരേ സമയം ഒന്നിലധികം വിട്ടുമാറാത്ത രോഗങ്ങൾ കണ്ടുവരുന്ന അവസ്ഥ.

ഒരു രോഗാവസ്ഥപോലും നിരവധി ആളുകൾക്ക് സാമ്പത്തിക വെല്ലുവിളി ഉയർത്തുന്ന ഈ കാലത്തു ഒന്നിലധികം രോഗാവസ്ഥകൾ ഈ സാമ്പത്തിക ഭാരം കൂടുതൽ വഷളാക്കുന്നു. തൽഫലമായി, വ്യക്തികളും കുടുംബങ്ങളും ഈ രോഗങ്ങളുടെ നേരിട്ടുള്ള ആരോഗ്യവും സാമ്പത്തികവുമായ പ്രത്യാഘാതങ്ങൾ അനുഭവിക്കുന്നു. അതിനാൽ, ഈ രോഗങ്ങൾ നമ്മുടെ സമൂഹത്തിൽ അടിച്ചേൽപ്പിക്കുന്ന കാര്യമായ ഭാരം പൂർണ്ണമായി മനസ്സിലാക്കുന്നതിന് ഈ ചെലവുകളും വീടുകളിൽ അവ ചെലുത്തുന്ന സ്വാധീനവും നിരീക്ഷിക്കേണ്ടത് നിർണായകമാണ്.

ഒന്നിലധികം വിട്ടുമാറാത്ത രോഗങ്ങളുടെ ചികിത്സയ്ക്കായി വേണ്ടിവരുന്ന ചിലവുകളും അതിന്റെ ഭാഗമായി ഗാർഹിക സമ്പദ്വ്യവസ്ഥയിൽ ഉണ്ടാകുന്ന പ്രത്യാഘാതങ്ങളും പഠിക്കുവാൻ വേണ്ടിയാണു ഈ സർവ്വേ നടത്തുന്നത്.

ക്രമരഹിതമായ തിരഞ്ഞെടുപ്പ് പ്രക്രിയയിലൂടെയാണ് നിങ്ങളുടെ വീടിനെ തിരഞ്ഞെടുത്തിരിക്കുന്നത്. ചോദ്യങ്ങൾക്ക് ഉത്തരം നൽകുന്നതിന് ശാരീരികമോ മാനസികമോ ആയ ബുദ്ധിമുട്ടുള്ളവരെ ഒഴികെ ഒരു കുടുംബത്തിലെ 30 നും 70 നും ഇടയിൽ പ്രായമുള്ള വ്യക്തികളെ പഠനത്തിൽ ഉൾപ്പെടുത്തിയിട്ടുള്ളു.

നടപടിക്രമം

സർവ്വേയ്ക്ക് നിങ്ങളുടെ വിലയേറിയ സമയത്തിന്റെ ഏകദേശം 30 - 45 മിനിറ്റ് എടുക്കും. നിങ്ങളോട് സ്വകാര്യമായേ ചോദ്യങ്ങൾ ചോദിക്കുകയുള്ളൂ. നിങ്ങളുടെ സാമൂഹിക-സാമ്പത്തിക പ്രൊഫൈൽ, മെഡിക്കൽ അവസ്ഥകൾ എന്നിവയെക്കുറിച്ചുള്ള വിശദാംശങ്ങളുമായി ഇവ ബന്ധപ്പെട്ടിരിക്കും. കഴിഞ്ഞ 1 വർഷത്തിലെ ആശുപത്രിവാസത്തിനും കഴിഞ്ഞ 30 ദിവസങ്ങളിലെ ഔട്ട്പേഷ്യന്റ് സന്ദർശനത്തിനും നിങ്ങൾക്കുണ്ടായ ചെലവുകളെ കുറിച്ചും നിങ്ങളുടെ ചികിത്സയ്ക്ക് നിങ്ങൾ എങ്ങനെ പണം കണ്ടെത്തിയതിനെ കുറിച്ചും നിങ്ങളുടെ വരുമാനത്തിലും ജോലിയിലും ഈ ചിലവുകൾമൂലമുണ്ടായ പ്രഭാവത്തെ കുറിച്ചും നിങ്ങളോട് ചോദ്യങ്ങൾ ചോദിക്കും.

അപകടസാധ്യതയും അസ്വസ്ഥതകളും

ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നത് നിങ്ങളുടെ ആരോഗ്യത്തിന് ഒരു അപകടവും ഉണ്ടാക്കുന്നില്ല. എന്നിരുന്നാലും, നിങ്ങളോട് വ്യക്തിപരമായി തോന്നിയേക്കാവുന്ന ചില ചോദ്യങ്ങൾ നിങ്ങളോട് ചോദിക്കും.

നേട്ടങ്ങൾ

ഈ പഠനത്തിൽ നിന്ന് നിങ്ങൾക്ക് നേരിട്ട് പ്രയോജനമൊന്നും ഉണ്ടായേക്കില്ല. എന്നാൽ നിങ്ങളിൽ നിന്നും ശേഖരിക്കുന്ന വിവരങ്ങൾകൊണ്ട് ഈ രോഗങ്ങൾ നമ്മുടെ കുടുംബങ്ങളിൽ അടിച്ചേൽപ്പിക്കുന്ന സാമ്പത്തിക ബാധ്യതയെ കുറിച്ച് വിലയിരുത്താൻ സഹായിക്കും.

രഹസ്യാത്മകത

നിങ്ങളെ സ്വകാര്യമായി അഭിമുഖം നടത്തും. നിങ്ങളുമായി ബന്ധപ്പെട്ട എല്ലാ വിവരങ്ങളും രഹസ്യമായി സൂക്ഷിക്കും, ഒരു ഘട്ടത്തിലും നിങ്ങളുടെ ഐഡൻറിറ്റി വെളിപ്പെടുത്തില്ല. ശേഖരിക്കുന്ന ഡാറ്റയുടെ രഹസ്യസ്വഭാവം നിലനിർത്തുന്നതിനായി ഓരോ പങ്കാളിക്കും ഒരു ഒരു തിരിച്ചറിയൽ നമ്പർ നൽകും.

ഈ തിരിച്ചറിയൽ നമ്പറിലേക്കുള്ള ആക്സസ് ഡാറ്റ വിശകലനം ചെയ്യുന്നവർക്ക് മാത്രമായി പരിമിതപ്പെടുത്തും.

സ്വമേധയാ ഉള്ള പങ്കാളിത്തം

ഈ പഠനത്തിലെ നിങ്ങളുടെ പങ്കാളിത്തം പൂർണ്ണമായും സ്വമേധയാ ഉള്ളതാണ്, അതായത് പഠനത്തിൽ പങ്കെടുക്കണോ വേണ്ടയോ എന്ന് നിങ്ങൾക്ക് തീരുമാനിക്കാം. ഏതെങ്കിലും ഘട്ടത്തിൽ നിങ്ങൾ നിർത്താൻ ആഗ്രഹിക്കുന്നുവെങ്കിൽ, പ്രതികൂലമായ പ്രത്യാഘാതങ്ങളില്ലാതെ അത് ചെയ്യാൻ നിങ്ങൾക്ക് സ്വാതന്ത്ര്യമുണ്ട്.

ബന്ധപ്പെടാനുള്ള വിവരങ്ങൾ

നിങ്ങൾക്ക് ഗവേഷണവുമായി ബന്ധപ്പെട്ട എന്തെങ്കിലും ചോദ്യങ്ങൾ ഉണ്ടെങ്കിൽ അല്ലെങ്കിൽ എന്റെ ക്രെഡൻഷ്യലുകൾ പരിശോധിക്കാൻ നിങ്ങൾ ആഗ്രഹിക്കുന്നുവെങ്കിൽ, ഇനിപ്പറയുന്ന വിലാസത്തിൽ നിങ്ങൾക്ക് എന്നെയോ ഞങ്ങളുടെ ഇൻസ്റ്റിറ്റ്യൂട്ടിന്റെ എത്തിക്സ് സമിതിയുടെ മെമ്പർ സെക്രട്ടറിയെയോ ബന്ധപ്പെടാം:

ഡോ.അനൂജ വി.ആർ.

പ്രധാന അന്വേഷകൻ
എം പി എച്ച്, എ എം സി എച്ച് എസ്
എസ്,

എസ് സി റ്റി ഐ എം എസ് റ്റി

ബന്ധപ്പെടേണ്ട നമ്പർ: 7012955910

ഡോ ശ്രീനിവാസ് ജി

മെമ്പർ സെക്രട്ടറി

ഇൻസ്റ്റിറ്റ്യൂഷണൽ എത്തിക്സ് കമ്മിറ്റി
എസ് സി റ്റി ഐ എം എസ് റ്റി

തിരുവനന്തപുരം-695011

ഓഫീസ്:04712524689

ഇമെയിൽ: iec.mem.sec@sctimst.ac.in

ANNEXURE 3

Multimorbidity associated economic impacts at household level in

rural Kollam, Kerala

CONSENT FORM

I have read / been read out the information in the information sheet. The nature of the study and my involvement has been explained and all my questions have been answered satisfactorily. By signing this consent form, I indicate that I understand what will be expected from me and that I am willing to participate in this study. I know that I can withdraw at any time. I have been informed who should be contacted if the need arises.

Respondent's Name:

Respondent's Signature / Thumb Impression

Date:

Interviewer's Name

Interviewer's Signature

Date:

ANNEXURE 4

സമ്മത പത്രം

വിവര ഷീറ്റിലെ വിവരങ്ങൾ ഞാൻ വായിച്ചു/വായിച്ചിട്ടുണ്ട്. പഠനത്തിന്റെ രീതിയും എന്റെ പങ്കാളിത്തവും വിശദീകരിക്കുകയും എന്റെ എല്ലാ ചോദ്യങ്ങൾക്കും തൃപ്തികരമായ ഉത്തരം നൽകുകയും ചെയ്തിട്ടുണ്ട്. ഈ സമ്മത പത്രത്തിൽ ഒപ്പിടുന്നതിലൂടെ, എന്നിൽ നിന്ന് എന്താണ് പ്രതീക്ഷിക്കുന്നതെന്ന് ഞാൻ മനസ്സിലാക്കുന്നുവെന്നും ഈ പഠനത്തിൽ പങ്കെടുക്കാൻ ഞാൻ തയ്യാറാണെന്നും ഞാൻ സൂചിപ്പിക്കുന്നു. എപ്പോൾ വേണമെങ്കിലും പിൻവാങ്ങുമെന്നും എനിക്കറിയാം. ആവശ്യമെങ്കിൽ ആരെ ബന്ധപ്പെടണമെന്ന് എന്നെ അറിയിച്ചിട്ടുണ്ട്.

പ്രതികരിക്കുന്നയാളുടെ പേര് :

പ്രതികരിക്കുന്നയാളുടെ ഒപ്പ് / പെരുവീരലടയാളം:

തീയതി :

അന്വേഷകന്റെ പേര് :

അന്വേഷകന്റെ ഒപ്പ് :

തീയതി :

ANNEXURE 5

Achutha Menon Centre for Health Science Studies,

Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum

Multimorbidity associated economic impacts at household level in rural Kollam, Kerala

INTERVIEW SCHEDULE FOR THE SURVEY

Inclusion criteria/Exclusion Criteria			
Slno		Yes	No
1	Informed consent obtained?		
2	Age between 30 - 70 years?		
If the answer to any question is NO, then END of survey			

A.General information			
			Code
A01	Unique id of household	____ ____ ____ ____	
A02	Unique id of participant	____ ____ ____ ____	
A03	Date of interview:	Day ____ Month ____ Year ____	

Section 1

B.Individual characteristics			
			Code
B01	What is your full name?		
B02	Present address with postal code		
B03	Contact no: (Residence / Off / Cell)		
B04	What is your age? (In completed years)	____	
B05	Participant's sex	Male ☐ Female ☐ Transgender ☐ Refuse to answer ☐	1 2 3 4

B06	Religious affiliation	Hindu		1
		Christian		2
		Muslim		3
		Others		4
		Refuse to reply		5
B07	How many years of education have you completed? (Zero for illiterate)			
B08	What is your marital status?	Never married		1
		Divorce		2
		Widow/widower		3
		Currently married		4
		Living with partner		5
B09	Relationship with head of household?	Participant is household head		1
		Spouse of household head		2
		Son/daughter of household head		3
		Father/mother of household head		4
		Other		5
B09	What is your main current occupation? (If person is RETIRED then circle RETIRED, then ask and circle previous occupation)	Professional/Executive/Big business		1
		Clerical/medium business		2
		Self-employed/ skilled		3
		Unskilled/landless labourer		4
		Student		5
		Homemaker		6
		Retired		7
		Unemployed (able to work)		8
		Unemployed (unable to work)		9
		Other (_____ Specify _____)		10

C.Participants medical history and treatment expenditure					
				Confirmed by medical records	Cod e
				Yes-1 No-2	
C01	Have you ever been told by a health worker that you have	Hypertension			1
		Diabetes			2
		Dyslipidaemia			3
		Anaemia			4

D02	How many days did you stay in the hospital?	Days	Days	
D03	Type of hospital?	Government ☐ Private ☐ Charity ☐ ESIS ☐ Corporate ☐ Other ☐ (Specify) If 1, then go to D03.1 If other than 1 then go to D03.2	Government ☐ Private ☐ Charity ☐ ESIS ☐ Corporate ☐ Other ☐ (Specify)	1 2 3 4 5 6
D03.1	Grade of hospital? (If type of hospital is government)	Primary hospital PHC/FHC ☐ CHC ☐ Secondary ☐ Tertiary ☐	Primary hospital PHC/FHC ☐ CHC ☐ Secondary ☐ Tertiary ☐	1 2 3
D03.2	Grade of hospital? (If type of hospital is other than government)	Primary ☐ Secondary ☐ Tertiary ☐	Primary ☐ Secondary ☐ Tertiary ☐	1 2 3
D04	What type of treatment/procedure/surgery did you undergo? (Please tick all relevant options. In case of last two please specify the name)	Medicines ☐ Interventional ☐ (Specify) Surgical ☐ (Specify) Other procedure ☐ (Specify)	Medicines ☐ Interventional ☐ (Specify) Surgical ☐ (Specify) Other procedure ☐ (Specify)	1 2 3 4 5

Hospitalisation-direct and indirect cost

For each hospitalization episode indicated in D01 ask about the expenses incurred. Enter 0 if nothing was spent by the participant. Enter DK if participant does not know or cannot remember

		Hospitalization 01	Hospitalization 02	Cod e
E01	The total amount spent on treatment			
Can you explain each of the expenses that you/your household had spent on your hospitalisation. (if cannot remember move to question no: E02)				
a	Hospital admission charges			
b	Emergency room / Casualty charges			
c	Room rent / bed charges etc.			
d	Surgery, Operation theatre charges and related expenses			
e	Medicines from hospital pharmacy			
f	Medicines from pharmacies outside the hospital			
g	Investigation (Tests like blood tests, ECG, ECHO and other tests)			
h	Food			
i	Ambulance / Travel a) Home to hospital b) Hospital to home			
j	Home nurse/paid care giver/servant			
k	Others			
E02	Did an attendant stay with you in hospital? (If no, move to E03)	Yes ☐ No ☐	Yes ☐ No ☐	
E02.1	Number of days attendant stayed with you in hospital	Days	Days	
E02.2	Cost of attendants stay (include food, accommodation and travel)			

E03	Time taken to reach the hospital?	Hours Min	Hours Min	
E04	Distance from home to hospital?	Kms	Kms	
E05	Cost of travel from home to hospital (including ambulance cost, if any)			
E06	Have you enrolled in any health insurance schemes? (If no, move to F01)	Yes No		1 2
E06.1	What type of medical Insurance do you have?	Pradhan Mantri Jan Arogya Yojana. Health insurance schemes of states (specify the scheme) Commercial insurance ESI/CGHS/ECHS Others (Specify)	Pradhan Mantri Jan Arogya Yojana. Health insurance schemes of states (specify the scheme) Commercial insurance ESI/CGHS/ECHS Others (Specify)	1 2 3 4 5 6
E06.2	Amount reimbursed or eligible to be received from government health insurance, if any?			

Outpatient consultation				
F01	During past 30 days did you had any outpatient consultation?	Yes No If no, then go to G01		1 2
For each outpatient visit indicated in F01 ask about the expenses incurred. Enter 0 if nothing was spent by the participant. Enter DK if participant does not know or cannot remember				
		Outpatient01	Outpatient02	Code

F02A	Reason for op visit?			
F02B	Speciality name			
F03	Type of hospital?	Government ☐	Government ☐	1
		Private ☐	Private ☐	2
		Charity ☐	Charity ☐	3
		ESIS ☐	ESIS ☐	4
		Corporate ☐	Corporate ☐	5
		Other ☐	Other ☐	6
F04	Grade of hospital? (If type of hospital is government)	Primary ☐	Primary ☐	1
		PHC/FHC ☐	PHC/FHC ☐	2
		CHC ☐	CHC ☐	3
		Secondary ☐	Secondary ☐	
		Tertiary ☐	Tertiary ☐	
F05	Grade of hospital? (If type of hospital is other than government)	Primary ☐	Primary ☐	1
		Secondary ☐	Secondary ☐	2
		Tertiary ☐	Tertiary ☐	3
F06	The total amount spent including all expenses			
Can you explain each of the expenses that you have spent? (If cannot remember move to question no: F07)				
a	Doctor fees			
b	Investigation (Tests like blood tests, ECG, ECHO and other tests)			
c	Medicines from hospital			
d	Medicines from outside			
e	Expense to see health care worker			
f	Home nurse/paid care giver/servant			
g	Others (Specify)			
F07	Did anyone from your family accompanied you during this visit?	Yes No	Yes No	1 2
F08	Food expenses during follow up including the			

	food expenses of care giver			
F09	Time taken to reach the hospital?			
F10	Distance from home to hospital?			
F11	Transport cost for doctor visit (including ambulance cost) a) Home to hospital b) Hospital to home			
F12	Total amount reimbursed from health insurance, if any?			

G01	Are you under any medications currently?	Yes ☐ No ☐ If No, then go to G02			1 2
G01.1	Please indicate the medicines you are <u>currently</u> taking?	How many tablets per day	Tablets' number per strip/box	Price per strip/box	
1					
2					
3					
4					
5					
G01.2	How are you getting the medicines for your regular treatment?	Government free supply ☐ Purchasing from Medical Store (Pharmacy) ☐ If 2 is the answer, then got to G01.3			1 2
G01.3	From where do you purchase your drugs?	Local medical shop ☐ Government drug store (Karunya, Neethi, Inhouse Drug Bank) ☐ Jan aushadhi medical store			1 2 3 4 5

		☐ Medical representatives ☐ Community pharmacy outlets ☐	
G02	What do you usually do when your prescribed medications run out?	Refill from the medical shop with prescription ☐ Get medicines after visiting any health professional ☐ Stop taking medicines ☐ Others ☐ (Specify)	1 2 3 4
G03	Have you been able to take all the medicines prescribed for your treatment in the past 1 year? (If YES move to G04)	Yes, all ☐ Yes, some ☐ No ☐	1 2 3
G03.1	Reasons for not taking all prescribed medicines? (Multiple answer)	Do not want to take medicines ☐ Forgot to take medicines ☐ No one to help to buy or dispense medicine ☐ Medicine not available ☐ Medicines are too expensive ☐ Side effect ☐ Other (specify) ☐	1 2 3 4 5 6
G04	Have you been able to see a doctor or health worker (e.g.: physiotherapist) whenever necessary for	YES ☐ NO ☐	1 2

	1 year, in relation to your health?	4.Purchase of any support devices 5.Others (Specify)	
--	-------------------------------------	---	--

Productivity and Informal care			
H01	Did you cut down on time spent on work activities, since diagnosis of any of these conditions?	Yes, Cut down a lot Yes, Cut down a little No 	1 2 3
H02	Did you limit the kind of work activities you did, since diagnosis of any of these conditions?	Yes, limited a lot Yes, limited a little No 	1 2 3
H03	Did you have difficulty performing work activities since diagnosis of any of these conditions?	Yes, lot of difficulty Yes, a little difficulty No 	1 2 3
H04	Do you feel that you are able to accomplish less than you would like to as a result of any emotional problems such as depressed or anxious?	Yes No	1 2
H05	In the last 1 year, was your job affected because of these conditions? (If 1 is the answer, go to H07)	1. Not affected 2. Loss of job 3. Change of job 4. Promotion denied 5. Relocated 6. Others (specify) _____	1 2 3 4 5 6
H06	If yes, what was the loss in income for the last 1 year?		
H08	Have you resumed work after any acute event?	Yes No	1 2

H09	Total number of days lost (without wages)	Hospitalisation including medical leave in the last 1 year (Total) Episode Follow up visits 	1 2 3
H09.1	Wages lost per day		
H10	Who took care of you most of the times when you were admitted or during your outpatient visit?	Mother Father Spouse Children Other household members None 	1 2 3 4 5 6
H11	Do he/she currently employed?	Yes No If no, then go to H11.5	1 2
If primary care giver is working			
H11.1	Was his/her job affected because of your illness?	Affected Loss of job Not affected	1 2 3
H11.2	Total number of days lost (without wages)	Hospitalisation Episode 1 Episode 2 Episode 3 Follow up visits 	1 2 3 4 5

H11.3	During last week, how many hours did he/she miss from work in relation to your illness?	Hrs/week	
H11.4	Primary care givers wages lost per day		
If primary care giver is not working/ informal care giving			
H11.5	During last week, how much extra time or less time did he/she spend on household activities because of your illness?	hrs/week	
H11.6	During last week how much time did he/she spend for caring you in relation to your illness? (caring in terms of helping with personal activities, emotional support)	hrs/week	
H12	Did anyone in your family have to start a new job or work more days/hours in their existing job due to your illness? (If NO move to H13)	Yes ☐ No ☐	1 2
H12.1	Which member(s) of your family started a new job or worked more days/hours in their existing job due to your illness? (Circle all that apply)	Parents ☐ Spouse ☐ Children ☐ Other household members ☐ Nobody ☐	1 2 3 4 5
H13	Did anyone in your family stop working or worked less hours in their job because of your illness? (If NO move to H14)	Yes ☐ No ☐	1 2
H13.1	Who in your family stopped working or worked less hours because of your illness?	Parents ☐ Spouse ☐ Children ☐	1 2 3 4 5

		Other household members Nobody 	
H14	Did anyone in your family stop attending school/college/university because of your illness? (if NO move to H15)	Yes No 	1 2
H14.1	Who in your family stopped attending school/college/university because of your illness?	Spouse Children Other household members Nobody 	1 2 3 4

State of health			
H15	Would you say your current health is excellent, very good, good, fair, or poor? (Read all response options to participant)	Excellent Very good Good Fair Poor	1 2 3 4 5

Section 2

Household characteristics.

Household questionnaire to be administered to the head of the household or a person who has a good knowledge of the household

I01	How many members are there in this family within 30-70 years of age group including you	Total: No. of Males: No. of Females:	
I0A	Does your household have a ration card?	Yes No Don't know If yes, then go to I0A.1	

I0A.1	What is the type of ration card you have?	White card Yellow card Pink card Blue card	
I02	Current occupation of head of household? Circle only one. If person is RETIRED then circle RETIRED, then ask and circle previous occupation) (Skip this question if participant himself/herself is head of the household)	Professional/Executive/Big business Clerical/medium business Self-employed/ skilled Unskilled/landless labourer Student Homemaker Retired Unemployed (able to work) Unemployed (unable to work) Other Specify	1 2 3 4 5 6 7 8 9 10
I03	What is the main occupation of each earning household members? (Other than you and head) Member 1 Member 2 Member 3 Member 4 Member 5 Member 6 (fill the members number to the corresponding occupation in the column provided)	Professional/Executive/Big business Clerical/medium business Self-employed/ skilled Unskilled/landless labourer Student Homemaker Retired Unemployed (able to work) Unemployed (unable to work)	1 2 3 4 5 6 7 8 9 10

		Other Specify	
I04	How many people in your household are below 18 years of age?	Household members	
I05	How many people in your household are above 60 years of age?	Household members	
I06	How many people in your household including yourself are currently earning an income?	Household members	
I07	What is the highest educational qualification among members of your household?	Never attended school Primary school (<5) Secondary school (5-10) High school (11,12) College/University Professional degree Other (Specify) 	1 2 3 4 5 6 7
Start by asking “ I would like to ask you a few questions to assess change in household expenditure in relation to the health conditions of members aged 30-70 years in your household, including you”			
Changes in household finances			
I10	Did you come across any rearrangement in household expenditure to meet these health expenses?	Yes No If yes, then go to I10.1	1 2
I10.1	What were those rearrangements?	Reduced food expenditure Reduced investment in education Reduced expenditure on social activities 	1 2 3 4

		Reduced expenditure on smoking and drinking 	5
		Reduced medical expenses 	6
		Reduced expenditure on utilities 	7
		Reduced expenditure on daily goods 	8
		Reduced expenditure on clothes 	9
		Reduced expenditure on durable goods 	10
		Reduction in other expenses (_____Specify_____)	11

Household expenditure			
Start by asking “In the 30 days, how much was spent by your household on” Enter DK is amount not known			
J01	Food (including such things as rice, meat, fruits, vegetables, and cooking oil). → Provisions + Ration (PDS) → Vegetables + Fish, meat, eggs and milk → Baked items + Outside food → _____ Others (specify)_____	/day ___/month	
J02	Gas, electricity, water, telephone.	/day ___/month	
J03	Transport.	/day ___/month	
J04	Housing rent. If house is not rented, ask about the rental value of participant’s house.	/day ___/month	
J05	Education fees and supplies	/day ___/month	
J06	Insurance premiums or prepaid health plans	/day ___/month	

Start by asking “In the past year, how much was spent by your household on:”

J07	Goods like washing machines, cooking utensils, stove, TV, furniture, purchase of car, motorcycle, bicycle, Mobile phone.		
J08	Clothes		
J09	Reimbursement of loans.		
J10	Cooking fuel		
J11	Repair of vehicles		
J12	Property management / house maintenance		
J13	Food consumed by the household which is produced/grown in the house hold		
J14	Food Exp (special occasions) past one year: Festivals / Religious ceremonies Parties / Eating out Others (specify)_____		
J15	Other		

HOUSEHOLD ASSETS			
Start by asking “Which of the following does your household own”			
K01	Type of house	Kachha ☐ Semi pucca ☐ Pucca ☐	1 2 3
K02	Number of cars owned (enter 0 if none owned)		
K03	Number of bicycles (enter 0 if none owned)		
K04	Number of motorcycles/scooters (enter 0 if none owned)		
K05	What is the source of drinking water in your house?	Piped in house ☐ Public tap ☐ Tube well or well in house ☐ Public tube well or well ☐	1 2 3 4 5

		Other 	
K06	What type of cooking fuel is used in your house?	Gas Electricity Kerosene Wood Other Coal 	1 2 3 4 5 6
K07	What type of toilet facility does your house have?	Private flush toilet Public flush toilet Private pit toilet Public pit toilet None Other 	1 2 3 4 5 6
K08	House has electricity?	YES NO 	1 2
K09	House has washing machine for clothes?	YES NO 	1 2
K10	House has refrigerator?	YES NO 	1 2
K11	House has telephone (fixed line)?	YES NO 	1 2

K12	House has mobile phone?	YES ☐ NO ☐	1 2
K13	House has television?	YES ☐ NO ☐	1 2
K14	House has radio?	YES ☐ NO ☐	1 2
K15	House has computer?	YES ☐ NO ☐	1 2
K16	Owens livestock (sheep, goats, cows, buffalo etc)?	YES ☐ NO ☐	1 2

Section 3

MULTIMORBIDITY TREATMENT BURDEN QUESTIONNAIRE

Sl no	Please tell us how much difficulty you have with the following:	Not difficult 1	A little difficult 2	Quite difficult 3	Very difficult 4	Extremely difficult 5	Does not apply 6	Code
L1	Taking lots of medications							
L2	Remembering how and when to take medication							
L3	Collecting prescription medication							
L4	Monitoring your medical conditions (eg,							

	checking your blood pressure or blood sugar, monitoring your symptoms, etc)							
L5	Arranging appointments with health professionals							
L6	Seeing lots of different health professionals							
L7	Attending appointments with health professionals (e.g., getting time off work, arranging transport, etc)							
L8	Obtaining clear and up to date information about your condition							
L9	Making recommended lifestyle changes (eg, diet and exercise)							
L10	Having to rely on help from family and friends							

ANNEXURE 6

ഇന്റർവ്യൂ ഷെഡ്യൂൾ

ഉൾപ്പെടുത്തൽ മാനദണ്ഡം			
നമ്പർ		അതെ	അല്ല
1	സമ്മതം പത്രം		
2	പ്രായം 30-നും 70-നും ഇടയിലാണോ?		
ഏതെങ്കിലും ചോദ്യത്തിനുള്ള ഉത്തരം ഇല്ല എന്നാണെങ്കിൽ, സർവ്വേ ഇവിടെ അവസാനിപ്പിക്കുന്നു.			

A. പൊതുവായ വിവരങ്ങൾ			
			കോഡ്
A01	വീടിന്റെ യൂണിറ്റ് ഐഡി	_ _ _ _ _	
A02	പങ്കെടുക്കുന്നയാളുടെ യൂണിറ്റ് ഐഡി	_ _ _ _ _	
A03	അഭിമുഖം നടത്തുന്ന തീയതി:	ദിവസം _ _ മാസം _ _ വർഷം _ _	

Section 1

B. വ്യക്തി വിവരങ്ങൾ			
			കോഡ്
B01	പൂർണ്ണമായ പേര്		
B02	പോസ്റ്റൽ കോഡ് ഉള്ള നിലവിലെ വിലാസം		
B03	കോൺടാക്റ്റ് നമ്പർ		
B04	വയസ്സ് (പൂർത്തിയായ വർഷങ്ങൾ)	_ _ _	
B05	ലിംഗം	പുരുഷൻ ☐ സ്ത്രീ ☐ ഇതര ലിംഗം ☐ പ്രതികരിക്കുന്നില്ല ☐	1 2 3 4
B06	മതം വിഭാഗം	ഹിന്ദു ☐ ക്രിസ്ത്യൻ ☐	1 2 3 4 5

		മുസ് ലിം മറ്റുള്ളവർ പ്രതികരിക്കുന്നില്ല 	
B07	താങ്കൾക്ക് എത്ര വർഷത്തെ വിദ്യാഭ്യാസം പൂർത്തിയാക്കാൻ കഴിഞ്ഞു(പഠിച്ചിട്ടില്ലെങ്കിൽ 0 എന്ന് അടയാളപ്പെടുത്തുക)	വർഷം __	
B08	താങ്കളുടെ വൈവാഹിക നില എന്താണ്?	വിവാഹം കഴിച്ചിട്ടില്ല വേർപിരിഞ്ഞു വിധവ /വിഭാര്യൻ വിവാഹം കഴിഞ്ഞു പങ്കാളിയോടൊപ്പം ജീവിക്കുന്നു	1 2 3 4 5
B09	കുടുംബനാമനുമായുള്ള ബന്ധം	കുടുംബനാമൻ കുടുംബനാമന്റെ പങ്കാളി കുടുംബനാമന്റെ മകൻ/ മകൾ കുടുംബനാമന്റെ അച്ഛൻ/അമ്മ മറ്റുള്ളവർ 	1 2 3 4 5
B09	താങ്കളുടെ ഇപ്പോഴത്തെ പ്രധാന തൊഴിൽ എന്താണ്? (വ്യക്തി റിട്ടയേർഡ് ആണെങ്കിൽ സർക്കിൾ റിട്ടയേർഡ്, തുടർന്ന് മുൻ തൊഴിൽ ചോദിക്കുകയും സർക്കിൾ ചെയ്യുകയും ചെയ്യുക)	പ്രൊഫഷണൽ / എക്സിക്യൂട്ടീവ് / വലിയ ബിസിനസ്സ് ക്ലറിക്കൽ / മീഡിയം ബിസിനസ്സ് സ്വയം തൊഴിൽ ചെയ്യുന്ന / വൈദഗ്ധ്യമുള്ളവർ അവിദഗ്ദ്ധ / ഭൂരഹിത തൊഴിലാളി വിദ്യാർത്ഥി വീട്ടുജോലി റിട്ടയേർഡ് 	1 2 3 4 5 6 7 8 9 10

		മറ്റു മാനസിക പ്രശ്നങ്ങൾ മറ്റു വിട്ടുമാറാത്ത രോഗങ്ങൾ (_____ വ്യക്തമാക്കുക) ഒന്നുമില്ല								
C01.1	മുകളിൽ സൂചിപ്പിച്ച അവസ്ഥകൾ ഉണ്ടെങ്കിൽ, ആദ്യമായി രോഗനിർണയം നടത്തിയ സമയം?	<table><tr><td>കോഡ്</td><td>രോഗനിർണയം നടത്തിയ സമയം (മാസത്തിൽ)</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	കോഡ്	രോഗനിർണയം നടത്തിയ സമയം (മാസത്തിൽ)						
കോഡ്	രോഗനിർണയം നടത്തിയ സമയം (മാസത്തിൽ)									
C02	ഏതെങ്കിലും കാരണത്താൽ കഴിഞ്ഞ 1 വർഷത്തിനിടയിൽ ആശുപത്രിയിൽ പ്രവേശിപ്പിക്കപ്പെട്ടിട്ടുണ്ടോ?	അതെ അല്ല ഇല്ലെങ്കിൽ E06 ലേക്ക് പോകുക	1 2							

D. കിടത്തി ചികിത്സകൾ				
മുകളിൽ പ്രസ്താവിച്ച എല്ലാ കിടത്തി ചികിത്സയെയും ഉൾപ്പെടുത്തിക്കൊണ്ട് ഏറ്റവും ആദ്യത്തെ കിടത്തി ചികിത്സമുതലുള്ള കാര്യങ്ങളെക്കുറിച്ചു താഴെകൊടുത്തിരിക്കുന്ന ചോദ്യങ്ങൾ ചോദിക്കുക. കിടത്ത ചികിത്സ 3-ൽ കൂടുതലാണെങ്കിൽ, അധിക ഷീറ്റുകൾ ഉപയോഗിക്കുക.				
		1	2	
D01	എപ്പോഴാണ് കിടത്തി ചികിത്സിച്ചതു	വർഷം ____ മാസം ____ ദിവസം ____	വർഷം ____ മാസം ____ ദിവസം ____	
D01 A	കാരണം			
D01 B	സ്പെഷ്യാലിറ്റി യുടെ പേര്			
D02	എത്ര ദിവസം ആശുപത്രിയിൽ കിടക്കേണ്ടിവന്നു	ദിവസങ്ങൾ __ _	ദിവസങ്ങൾ __ _	
D03	ഏത് തരം ആശുപത്രിയാണ്	സർക്കാർ	സർക്കാർ	1
		സ്വകാര്യം	സ്വകാര്യം	2
		ചാരിറ്റി	ചാരിറ്റി	3
		ഇ എസ് ഐ എസ്	ഇ എസ് ഐ എസ്	4

		 സഹകരണം മറ്റുള്ളവ (____വ്യക്തമാക്കുക)	 സഹകരണം മറ്റുള്ളവ (____വ്യക്തമാക്കുക) Specify	5 6
D03.1	ആശുപത്രിയുടെ ഗ്രേഡ്? (ആശുപത്രി സർക്കാർ ആണെങ്കിൽ)	പ്രൈമറി പിഎച്ച് സി / എഫ് എച്ച് സി സി എച്ച് സി സെക്കണ്ടറി ടെർഷെറി	പ്രൈമറി പിഎച്ച് സി / എഫ് എച്ച് സി സി എച്ച് സി സെക്കണ്ടറി ടെർഷെറി	1 2 3
D03.2	ആശുപത്രിയുടെ ഗ്രേഡ്? (ആശുപത്രിയുടെ തരം സർക്കാർ അല്ലാത്തതാണെങ്കിൽ)	പ്രൈമറി സെക്കണ്ടറി ടെർഷെറി	പ്രൈമറി സെക്കണ്ടറി ടെർഷെറി	1 2 3
D04	ഏത് തരം ചികിത്സ / പ്രൊസിജർ / ശസ്ത്രക്രിയയാണ് നടത്തിയത്? (പ്രസക്തമായ എല്ലാ ഓപ്ഷനുകളും ടിക്ക് ചെയ്യുക. അവസാനത്തെ രണ്ടെണ്ണത്തിന്റേ കാര്യത്തിൽ ദയവായി പേര് വ്യക്തമാക്കുക)	മരുന്നുകൾ പ്രൊസിജർ (____വ്യക്തമാക്കുക) ശസ്ത്രക്രിയ (____വ്യക്തമാക്കുക) മറ്റു പ്രൊസിജർ (____വ്യക്തമാക്കുക)	മരുന്നുകൾ പ്രൊസിജർ (____വ്യക്തമാക്കുക) ശസ്ത്രക്രിയ (____വ്യക്തമാക്കുക) മറ്റു പ്രൊസിജർ (____വ്യക്തമാക്കുക)	1 2 3 4 5

കിടത്തി ചികിത്സകൾ - പ്രത്യക്ഷവും പരോക്ഷവുമായ ചെലവ്				
മുകളിൽ പ്രസ്താവിച്ച ഓരോ കിടത്തി ചികിത്സക്കും വേണ്ടിവന്ന ചിലവുകളെക്കുറിച്ചു ചോദിക്കുക. ഒന്നും ചെലവഴിച്ചിട്ടില്ലെങ്കിൽ 0 യെന്നു രേഖപ്പെടുത്തുക. അറിയില്ലെങ്കിൽ / ഓർക്കാൻ കഴിയുന്നില്ലെങ്കിൽ DK യെന്നു രേഖപ്പെടുത്തുക				
		1	2	
E01	ചികിത്സയ്ക്കായി ചെലവഴിച്ച മൊത്തം തുക			
a	ആശുപത്രി അഡ്മിഷൻ ചാർജ്ജ്			
b	എമർജൻസി റൂം / കാഷ്വാലിറ്റി ചാർജ്ജ്			
c	മുറി വാടക/ ബെഡ് ചാർജ്ജ്			
d	ശസ്ത്രക്രിയ			
e	ഹോസ്പിറ്റൽ ഫാർമസിയിൽ നിന്നുള്ള മരുന്നുകൾ			
f	ആശുപത്രിക്ക് പുറത്തുള്ള ഫാർമസികളിൽ നിന്നുള്ള മരുന്നുകൾ			
g	പരിശോധനകൾ			
h	ആഹാരം			
i	ആംബുലൻസ് / യാത്ര			
j	ഹോം നഴ്സ് / പെയ്റ്റ് കെയർ			
k	മറ്റുള്ളവ			
E02	ആശുപത്രിയിൽ കൂട്ടിരിപ്പുകാർ ഉണ്ടായിരുന്നോ? (ഇല്ലെങ്കിൽ, E03 ലേക്ക് പോകുക)	അതെ ☐ അല്ല ☐	അതെ ☐ അല്ല ☐	
E02.1	കൂട്ടിരിപ്പുകാർ എത്ര ദിവസം താങ്കളോടൊപ്പം ആശുപത്രിയിൽ താമസിച്ചു	ദിവസങ്ങൾ __	ദിവസങ്ങൾ __	
E02.2	കൂട്ടിരിപ്പുകാർക്കുണ്ടായ ചെലവ്(ഭക്ഷണം,യാത്ര, താമസം ഉൾപ്പെടെ)			
E03	ആശുപത്രിയിൽ എത്താൻ എടുക്കുന്ന സമയം	മണിക്കൂറുകൾ __ മിനിറ്റുകൾ __	മണിക്കൂറുകൾ __ മിനിറ്റുകൾ __	
E04	വീട്ടിൽ നിന്ന് ആശുപത്രിയിലേക്കുള്ള ദൂരം?	കിലോമീറ്റർ __	കിലോമീറ്റർ __	
E05	വീട്ടിൽ നിന്ന് ആശുപത്രിയിലേക്കുള്ള			

	യാത്രാ ചെലവ് (ആംബുലൻസ് ചെലവ് ഒഴികെ)			
E06	നിങ്ങൾ ഏതെങ്കിലും ആരോഗ്യ ഇൻഷുറൻസ് സ്കീമുകളിൽ ചേർന്നിട്ടുണ്ടോ? (ഇല്ലെങ്കിൽ F01 ലേക്ക് പോകുക)	അതെ ☐ അല്ല ☐		1 2
E06.1	ഏത് തരം മെഡിക്കൽ ഇൻഷുറൻസാണ് നിങ്ങൾക്കുള്ളത്?	പ്രധാന മന്ത്രി ജൻ ആരോഗ്യ യോജന. ☐ സംസ്ഥാനങ്ങളുടെ ആരോഗ്യ ഇൻഷുറൻസ് പദ്ധതികൾ ☐ (വ്യക്തമാക്കുക) കൊമേർഷ്യൽ ഇൻഷുറൻസ് ☐ ഇ സ്പെ/സി ജി എച്ച് സ്/ഇ സി എച്ച് സ് ☐ മറ്റുള്ളവ ☐ (വ്യക്തമാക്കുക)	പ്രധാന മന്ത്രി ജൻ ആരോഗ്യ യോജന. ☐ സംസ്ഥാനങ്ങളുടെ ആരോഗ്യ ഇൻഷുറൻസ് പദ്ധതികൾ ☐ (വ്യക്തമാക്കുക) കൊമേർഷ്യൽ ഇൻഷുറൻസ് ☐ ഇ സ്പെ/സി ജി എച്ച് സ്/ഇ സി എച്ച് സ് ☐ മറ്റുള്ളവ ☐ (വ്യക്തമാക്കുക)	
E06.2	സർക്കാർ ആരോഗ്യ ഇൻഷുറൻസിൽ നിന്ന് തിരികെ ലഭിച്ചതോ/സ്വീകരിക്കാൻ അർഹതയുള്ളതോ ആയതുക?			

ഔട്ട്പേഷ്യന്റ് കൺസൾട്ടേഷൻ				
F01	കഴിഞ്ഞ 30 ദിവസ വേളയിൽ നിങ്ങൾക്ക് എന്തെങ്കിലും ഔട്ട്പേഷ്യന്റ് കൺസൾട്ടേഷൻ ഉണ്ടായിരുന്നോ?	അതെ ☐ അല്ല ☐ ഇല്ലെങ്കിൽ G01 ലേക്ക് പോവുക.	1 2	

മുകളിൽ പ്രസ്താവിച്ച ഓരോ ആശുപത്രി സന്ദർശനത്തിനും വേണ്ടിവന്ന ചിലവുകളെക്കുറിച്ചു ചോദിക്കുക. ഒന്നും ചെലവഴിച്ചിട്ടില്ലെങ്കിൽ 0 യെന്നു രേഖപ്പെടുത്തുക. അറിയില്ലെങ്കിൽ / ഓർക്കാൻ കഴിയുന്നില്ലെങ്കിൽ DK യെന്നു രേഖപ്പെടുത്തുക				
		1	2	
F02A	ആശുപത്രി സന്ദർശനത്തിന്റേ കാരണം			
F02B	സ്പെഷ്യാലിറ്റി യുടെ പേര്			
F03	ഏത് തരം ആശുപത്രിയാണ്	സർക്കാർ സ്വകാര്യം ചാരിറ്റി ഇ എസ് ഐ എസ് സഹകരണം മറ്റുള്ളവ (____വ്യക്തമാക്കുക)	സർക്കാർ സ്വകാര്യം ചാരിറ്റി ഇ എസ് ഐ എസ് സഹകരണം മറ്റുള്ളവ (____വ്യക്തമാക്കുക)	
F04	ആശുപത്രിയുടെ ഗ്രേഡ്? (ആശുപത്രി സർക്കാർ ആണെങ്കിൽ)	പ്രൈമറി പിഎച്ച് സി /എഫ് എച്ച് സി സി എച്ച് സി സെക്കണ്ടറി ടെർഷ്യറി	പ്രൈമറി പിഎച്ച് സി /എഫ് എച്ച് സി സി എച്ച് സി സെക്കണ്ടറി ടെർഷ്യറി	
F05	ആശുപത്രിയുടെ ഗ്രേഡ്? (ആശുപത്രിയുടെ തരം സർക്കാർ അല്ലാത്തതാണെങ്കിൽ)	പ്രൈമറി സെക്കണ്ടറി ടെർഷ്യറി	പ്രൈമറി സെക്കണ്ടറി ടെർഷ്യറി	
F06	ചികിത്സയ്ക്കായി ചെലവഴിച്ച മൊത്തം തുക			
വിവരിക്കാൻ കഴിയുമെങ്കിൽ ഓരോന്നായി വിവരിക്കുക (ഓർമ്മിക്കാൻ കഴിയുന്നില്ലെങ്കിൽ, F07 ലേക്ക് പോകുക)				
a	കൺസൾട്ടേഷൻ ചാർജ്ജ്			
b	പരിശോധനകൾ			
c	ഹോസ്പിറ്റൽ ഫാർമസിയിൽ നിന്നുള്ള മരുന്നുകൾ			

d	ആശുപത്രിക്ക് പുറത്തുള്ള ഫാർമസികളിൽ നിന്നുള്ള മരുന്നുകൾ			
e	ഹെൽത്ത് കെയർ വർക്കറെ കാണുന്നതിനുള്ള ചെലവ്			
f	ഹോം നഴ്സ് / പെഡ് കെയർ			
g	മറ്റുള്ളവ (____ വ്യക്തമാക്കുക)			
F07	കൂടെ കുടുംബാംഗങ്ങൾ ആരെങ്കിലും വന്നിരുന്നോ?	അതെ ☐ അല്ല ☐	അതെ ☐ അല്ല ☐	
F08	കുട്ടിനു വന്ന ആളിന്റെ ഉൾപ്പടെ ആഹാരത്തിനു വേണ്ടിവന്ന ചെലവ്			
F09	ആശുപത്രിയിൽ എത്താൻ എടുക്കുന്ന സമയം			
F10	വീട്ടിൽ നിന്ന് ആശുപത്രിയിലേക്കുള്ള ദൂരം?			
F11	വീട്ടിൽ നിന്ന് ആശുപത്രിയിലേക്കുള്ള യാത്രാ ചെലവ് (അംബുലൻസ് ചെലവ് ഒഴികെ)			
F12	ആരോഗ്യ ഇൻഷുറൻസിൽ നിന്ന് തിരികെ നൽകിയ തുക, എന്തെങ്കിലും ഉണ്ടെങ്കിൽ?			

G01	നിങ്ങൾ നിലവിൽ ഏതെങ്കിലും മരുന്നുകൾ കഴിക്കുന്നുണ്ടോ	അതെ അല്ല ഇല്ലെങ്കിൽ G02 ലേക്ക് പോവുക			1 2
G01.1	നിങ്ങൾ നിലവിൽ എടുക്കുന്ന മരുന്നുകൾ സൂചിപ്പിക്കുക	പ്രതിദിനം എത്ര ഗുളികകൾ	ഒരു സ്ട്രിപ്പിൽ/ബോക്സിലുള്ള ഗുളികകളുടെ എണ്ണം	ഒരു സ്ട്രിപ്പിൽ/ബോക്സിലുള്ള ഗുളികകളുടെ വില	
1					
2					
3					
4					
5					
6					
G01.2	നിങ്ങളുടെ പതിവ് ചികിത്സയ്ക്കുള്ള മരുന്നുകൾ	സർക്കാർ സൗജന്യ വിതരണം മെഡിക്കൽ സ്റ്റോറിൽ നിന്ന് വാങ്ങുന്നു (ഫാർമസി)			1 2

	നിങ്ങൾക്ക് എങ്ങനെ ലഭിക്കുന്നു?	2 ആണ് ഉത്തരമെങ്കിൽ, G01.3 ലേക്ക് പോവുക	
G01.3	എവിടെ നിന്നാണ് നിങ്ങൾ മരുന്നുകൾ വാങ്ങുന്നത്?	പ്രാദേശിക മെഡിക്കൽ ഷോപ്പ് സർക്കാർ ഡ്രഗ് സ്റ്റോർ (കാരുണ്യ, നീതി, ഇൻഹൗസ് ഡ്രഗ് ബാങ്ക്) ജൻ ഔഷധി മെഡിക്കൽ സ്റ്റോർ മെഡിക്കൽ റെപ്രസെന്റേറ്റീവ്സ് കമ്മ്യൂണിറ്റി ഫാർമസി ഔട്ട് ലെറ്റുകൾ	1 2 3 4 5
G02	നിർദ്ദേശിച്ച മരുന്നുകൾ തീർന്നാൽ നിങ്ങൾ സാധാരണയായി എന്താണ് ചെയ്യുന്നത്?	കുറിപ്പടിയോടെ മെഡിക്കൽ ഷോപ്പിൽ നിന്ന് റീഫിൽ ചെയ്യുക ഏതെങ്കിലും ആരോഗ്യ വിദഗ്ദ്ധനെ സന്ദർശിച്ച ശേഷം മരുന്നുകൾ നേടുക മരുന്നുകൾ കഴിക്കുന്നത് നിർത്തുക മറ്റുള്ളവ വ്യക്തമാക്കുക ()	1 2 3 4
G03	കഴിഞ്ഞ 1 വർഷത്തിനിടയിൽ നിങ്ങളുടെ ചികിത്സയ്ക്കായി നിർദ്ദേശിച്ചിട്ടുള്ള എല്ലാ മരുന്നുകളും എടുക്കാൻ കഴിഞ്ഞിട്ടുണ്ടോ? (അതെ എന്നാണെങ്കിൽ G04 ലേക്ക് പോവുക)	അതെ, എല്ലാം അതെ, ചിലത് അല്ല	1 2 3
G03.1	നിർദ്ദേശിച്ച എല്ലാ മരുന്നുകളും കഴിക്കാത്തതിന്റേ കാരണങ്ങൾ? (ഒന്നിലധികം ഉത്തരം)	മരുന്നുകൾ കഴിക്കാൻ ആഗ്രഹിക്കുന്നില്ല മരുന്ന് കഴിക്കാൻ മറന്നു മരുന്ന് വാങ്ങാനോ തരാൻ സഹായത്തിനായി ആരുമില്ല മരുന്ന് ലഭ്യമല്ല മരുന്നുകൾ വളരെ ചെലവേറിയതാണ് പാർശ്വഫലം മറ്റുള്ളവ (വ്യക്തമാക്കുക)	1 2 3 4 5 6
G04	കഴിഞ്ഞ 1 വർഷത്തിനിടയിൽ നിങ്ങളുടെ ചികിത്സയ്ക്ക് ആവശ്യമുള്ളപ്പോഴെല്ലാം ഒരു ഡോക്ടറെയോ ഹെൽത്ത് വർക്കറെയോ ഉദാഹരണത്തിന്:	അതെ അല്ല (അതെ എന്നാണെങ്കിൽ G05 ലേക്ക് പോവുക)	1 2

	ഫിസിയോതെറാപ്പിസ്റ്റ് കാണാൻ നിങ്ങൾക്ക് കഴിഞ്ഞിട്ടുണ്ടോ?		
G04.1	ആവശ്യമുള്ളപ്പോൾ ഒരു ഡോക്ടറെ / ഹെൽത്ത് വർക്കറെ കാണാൻ കഴിയാത്തതിന്റെ കാരണങ്ങൾ? (ഒന്നിലധികം ഉത്തരങ്ങളുണ്ട്)	ഡോക്ടർ/ ഹെൽത്ത് വർക്കർ ലഭ്യമല്ല ഡോക്ടർ / ഹെൽത്ത് വർക്കർ വളരെ അകലെയാണ് ഡോക്ടർ / ഹെൽത്ത് വർക്കർ വളരെ ചെലവേറിയതാണ് ആരോഗ്യ സംരക്ഷണത്തിനായുള്ള പരിചരണം തേടുക എന്നത് ബുദ്ധിമുട്ടുള്ള കാര്യമാണ് മറ്റുള്ളവ (_____വ്യക്തമാക്കുക _____)	1 2 3 4 5
G05	ഒരു ചികിത്സാ ഓപ്ഷൻ ഉപദേശിച്ചുകഴിഞ്ഞാൽ, സാമ്പത്തിക പ്രശ്നങ്ങൾമൂലം നിങ്ങൾ ഇനിപ്പറയുന്നവയിൽ ഏതെങ്കിലും ചെയ്തിട്ടുണ്ടോ?	നിർദ്ദേശിച്ച ഓപ്ഷൻ നിരസിച്ചു നിർദ്ദേശിച്ച ഓപ്ഷൻ മാറ്റിവച്ചു ചെലവ് കുറഞ്ഞ ഒരു ഓപ്ഷൻ തിരഞ്ഞെടുത്തു മറ്റുള്ളവ (_____വ്യക്തമാക്കുക _____)	1 2 3 4
G06	കഴിഞ്ഞ ഒരു വർഷത്തിൽ നിങ്ങളുടെ ചികിത്സയ്ക്കായി നിങ്ങൾ എങ്ങനെയാണ് പണം കണ്ടെത്തിയത്? (ആശുപത്രിയിൽ പ്രവേശിപ്പിക്കുന്നത് ഉൾപ്പെടെ എല്ലാ ചെലവുകളും) (ഒന്നിലധികം ഉത്തരങ്ങളുണ്ട്)	സ്വന്തം സമ്പാദ്യം കുടുംബാംഗങ്ങൾ പണം നൽകി തൊഴിലുടമ നൽകി സുഹൃത്തുക്കൾ, ബന്ധുക്കൾ, തൊഴിലുടമ എന്നിവരിൽ നിന്ന് ബാങ്കിൽ നിന്ന്/ പലിശക്ക് കടമെടുത്തത് വീട്, ഭൂമി അല്ലെങ്കിൽ മറ്റ് ആസ്തികൾ വിറ്റു ആരോഗ്യ ഇൻഷുറൻസ് മറ്റുള്ളവ (_____വ്യക്തമാക്കുക _____)	1 2 3 4 5 6 7 8

കുടുംബ പുനഃക്രമീകരണവുമായി ബന്ധപ്പെട്ട ചെലവുകൾ			
		മാറ്റങ്ങൾ	ചെലവുകൾ

G07	നിങ്ങളുടെ ആരോഗ്യവുമായി ബന്ധപ്പെട്ട് കഴിഞ്ഞ 1 വർഷത്തിൽ വീട്ടിൽ നിങ്ങൾക്ക് വരുത്തേണ്ടി വന്ന മാറ്റങ്ങൾ എന്തൊക്കെയായിരുന്നു?	1. വീട്ടു ജോലി ചെയ്യാൻ ആളെ ഏർപ്പെടുത്തി 2. ഹോം നഴ്സിനെ ഏർപ്പെടുത്തി 3. ഭക്ഷണക്രമത്തിലെ മാറ്റം 4. പിന്തുണാ ഉപകരണങ്ങൾ വാങ്ങുക മറ്റുള്ളവ (വ്യക്തമാക്കുക) (_____)	
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ഉൽപാദനക്ഷമതയും അനുപചാരിക പരിചരണവും			
H01	ഈ അവസ്ഥകളിൽ ഏതെങ്കിലും നിർണ്ണയിച്ചതിനുശേഷം, ജോലി ചെയ്യുവാൻ ചെലവഴിക്കുന്ന സമയം നിങ്ങൾ കുറച്ചിട്ടുണ്ടോ?	അതെ, ഒരുപാട് കുറച്ചു അതെ, അല്പം കുറച്ചു ഇല്ല	1 2 3
H02	ഈ അവസ്ഥകളിൽ ഏതെങ്കിലും രോഗനിർണ്ണയം നടത്തിയതിനുശേഷം, നിങ്ങൾ ചെയ്ത ജോലി പ്രവർത്തനങ്ങളുടെ തരം നിങ്ങൾ പരിമിതപ്പെടുത്തിയിട്ടുണ്ടോ?	അതെ, ഒരുപാട് പരിമിതപ്പെടുത്തി അതെ, അല്പം പരിമിതപ്പെടുത്തി ഇല്ല	1 2 3
H03	ഈ അവസ്ഥകളിൽ ഏതെങ്കിലും നിർണ്ണയിച്ചതിനുശേഷം നിങ്ങൾക്ക് ജോലി ചെയ്യാൻ ബുദ്ധിമുട്ടുണ്ടായിരുന്നോ?	അതെ, ഒരുപാട് ബുദ്ധിമുട്ട് അതെ, അല്പം ബുദ്ധിമുട്ട് ഇല്ല	1 2 3
H04	വിഷാദം അല്ലെങ്കിൽ ഉത്കണ്ഠ പോലുള്ള ഏതെങ്കിലും വൈകാരിക പ്രശ്നങ്ങളുടെ ഫലമായി നിങ്ങൾ ആഗ്രഹിക്കുന്നതിനേക്കാൾ കുറവ് നേടാനേ കഴിയുമെന്ന് നിങ്ങൾക്ക് തോന്നുന്നുണ്ടോ?	അതെ ഇല്ല	1 2
H05	കഴിഞ്ഞ 1 വർഷത്തിൽ, ഈ അവസ്ഥകൾ കാരണം നിങ്ങളുടെ ജോലി ബാധിക്കപ്പെട്ടിട്ടുണ്ടോ (If 1 is the answer, go to H07)	1. ബാധിച്ചിട്ടില്ല 2. ജോലി നഷ്ടപ്പെട്ടു 3. ജോലിയിലുള്ള മാറ്റം 4. സ്ഥാനക്കയറ്റം നിഷേധിച്ചു 5. സ്ഥലം മാറ്റി 6. മറ്റുള്ളവ 	1 2 3 4 5 6

		(വ്യക്തമാക്കുക) _____	
H06	ഉണ്ടെങ്കിൽ, കഴിഞ്ഞ 1 വർഷത്തെ വരുമാന നഷ്ടം എത്രയാണ്?		
H08	ഏതെങ്കിലും ഗുരുതരമായ സംഭവത്തിന് ശേഷം നിങ്ങൾ ജോലി പുനരാരംഭിച്ചോ?	അതെ ഇല്ല	1 2
H09	നഷ്ടപ്പെട്ട മൊത്തം ദിവസങ്ങളുടെ എണ്ണം (വേതനമില്ലാതെ)	കഴിഞ്ഞ 1 വർഷത്തിൽ മെഡിക്കൽ അവധി ഉൾപ്പെടെ ആശുപത്രിയിൽ പ്രവേശിപ്പിച്ചത് (മൊത്തം) എപ്പിസോഡ് ഫോളോ-അപ്പ് സന്ദർശനങ്ങൾ	1 2 3
H09.1	പ്രതിദിനം നഷ്ടപ്പെട്ട വേതനം		
H10	നിങ്ങളെ അഡ്മിറ്റ് ചെയ്തപ്പോഴോ നിങ്ങളുടെ ഔട്ട്പേഷ്യന്റ് സന്ദർശന വേളയിലോ ആരാണ് നിങ്ങളെ കൂടുതലായും പരിപാലിച്ചത്?	അമ്മ അച്ഛൻ പങ്കാളി കുട്ടികൾ വീട്ടിലെ മറ്റ് അംഗങ്ങൾ ആരുമില്ല	1 2 3 4 5 6
H11	ടി വ്യക്തി നിലവിൽ ജോലി ചെയ്യുന്നുണ്ടോ?	അതെ ഇല്ല ഇല്ലെങ്കിൽ, H11.5 ലേക്ക് പോകുക	1 2
പ്രാഥമിക പരിചരണ ദാതാവ് ജോലി ചെയ്യുകയാണെങ്കിൽ			
H11.1	നിങ്ങളുടെ അസുഖം ടി വ്യക്തിയുടെ ജോലിയെ ബാധിച്ചിട്ടുണ്ടോ?	ബാധിക്കപ്പെട്ടു ജോലി നഷ്ടപ്പെട്ടു ബാധിച്ചിട്ടില്ല	1 2 3
H11.2	നഷ്ടപ്പെട്ട മൊത്തം ദിവസങ്ങളുടെ എണ്ണം (വേതനമില്ലാതെ)	ആശുപത്രിയിൽ പ്രവേശിപ്പിച്ചത് (മൊത്തം) എപ്പിസോഡ് 1 ഫോളോ-അപ്പ് സന്ദർശനങ്ങൾ	1 2 3 4 5
H11.3	കഴിഞ്ഞ ആഴ്ചയിൽ, നിങ്ങളുടെ രോഗവുമായി ബന്ധപ്പെട്ട് ടി വ്യക്തിക്ക് ജോലിയിൽ നിന്ന് എത്ര മണിക്കൂർ നഷ്ടമായി?	മണിക്കൂറുകൾ / ആഴ്ചകൾ	
H11.4	പ്രതിദിനം നഷ്ടപ്പെട്ട വേതനം		
പ്രാഥമിക പരിചരണ ദാതാവ് ജോലി ചെയ്യുന്നില്ലെങ്കിൽ / അനുപചാരിക പരിചരണം			
H11.5	കഴിഞ്ഞ ആഴ്ചയിൽ, നിങ്ങളുടെ അസുഖം കാരണം ഗാർഹിക	മണിക്കൂറുകൾ / ആഴ്ചകൾ	

	പ്രവർത്തനങ്ങളിൽ ടി വ്യക്തി എത്ര അധിക സമയം/ കുറവ് സമയം ചെലവഴിച്ചു?		
H11.6	കഴിഞ്ഞ ആഴ്ചയിൽ, നിങ്ങളുടെ രോഗവുമായി ബന്ധപ്പെട്ട് നിങ്ങളെ പരിചരിക്കാൻ ടി വ്യക്തി എത്ര സമയം ചെലവഴിച്ചു? (വ്യക്തിപരമായ പ്രവർത്തനങ്ങളിൽ സഹായിക്കൽ, വൈകാരിക പിന്തുണ)	മണിക്കൂറുകൾ / ആഴ്ചകൾ	
H12	നിങ്ങളുടെ അസുഖം കാരണം നിങ്ങളുടെ കുടുംബത്തിലെ ആരെങ്കിലും ഒരു പുതിയ ജോലി ആരംഭിക്കുകയോ നിലവിലുള്ള ജോലിയിൽ കൂടുതൽ ദിവസം / സമയം ചിലവഴിക്കേണ്ടതായി വന്നിട്ടുണ്ടോ? (If NO move to H13)	അതെ ഇല്ല	1 2
H12.1	നിങ്ങളുടെ അസുഖം കാരണം നിങ്ങളുടെ കുടുംബത്തിലെ ഏത് അംഗമാണ് ഒരു പുതിയ ജോലി ആരംഭിച്ചത് അല്ലെങ്കിൽ നിലവിലുള്ള ജോലിയിൽ കൂടുതൽ ദിവസം / സമയം ചിലവഴിച്ചത്? (ബാധകമായതെല്ലാം അടയാളപ്പെടുത്തുക)	മാതാപിതാക്കൾ പങ്കാളി കുട്ടികൾ വീട്ടിലെ മറ്റ് അംഗങ്ങൾ ആരുമില്ല 	1 2 3 4 5
H13	നിങ്ങളുടെ അസുഖം കാരണം നിങ്ങളുടെ കുടുംബത്തിലെ ആരെങ്കിലും ജോലി ചെയ്യുന്നത് നിർത്തുകയോ അവരുടെ ജോലിയിൽ ചിലവഴിക്കുന്ന സമയം കുറക്കേണ്ടതായി വന്നിട്ടുണ്ടോ? ഇല്ലെങ്കിൽ, H14ലേക്ക് പോകുക	അതെ ഇല്ല	1 2
H13.1	ആരാണിത് അത്?	മാതാപിതാക്കൾ പങ്കാളി കുട്ടികൾ വീട്ടിലെ മറ്റ് അംഗങ്ങൾ ആരുമില്ല 	1 2 3 4 5
H14	നിങ്ങളുടെ അസുഖം കാരണം നിങ്ങളുടെ കുടുംബത്തിലെ ആരെങ്കിലും സ്കൂൾ / കോളേജ് /	അതെ ഇല്ല	1 2

	യൂണിവേഴ്സിറ്റിയിൽ പോകുന്നത് നിർത്തിയിട്ടുണ്ടോ? ഇല്ലെങ്കിൽ, H15 ലേക്ക് പോകുക		
H14.1	ആരാണ് അത്?	പങ്കാളി കുട്ടികൾ വീട്ടിലെ മറ്റ് അംഗങ്ങൾ ആരുമില്ല 	1 2 3 4

ആരോഗ്യ സ്ഥിതി			
H15	നിങ്ങളുടെ നിലവിലെ ആരോഗ്യത്തെക്കുറിച്ചു അഭിപ്രായം എന്താണ്? (എല്ലാ പ്രതികരണ ഓപ്ഷനുകളും വായിക്കുക)	മികച്ചത് വളരെ നല്ലത് നല്ലത് കൊള്ളാം മോശം	1 2 3 4 5

Section 2

ഗാർഹിക സവിശേഷതകൾ ഗാർഹിക ചോദ്യാവലി ഗൃഹനാഥന്റേയെടുത്തു ചോദിക്കേണ്ടതാണ്			
I01	നിങ്ങൾ ഉൾപ്പെടെ 30-70 വയസ്സിനിടയിലുള്ള എത്ര അംഗങ്ങൾ ഈ കുടുംബത്തിലുണ്ട് ?	ആകെ: പുരുഷന്മാരുടെ എണ്ണം: സ്ത്രീകളുടെ എണ്ണം:	
I0A	നിങ്ങളുടെ വീടിനു റേഷൻ കാർഡ് ഉണ്ടോ?	അതെ ഇല്ല അറിയില്ല ഉണ്ടെങ്കിൽ, I0A.1 ലേക്ക് പോകുക	
I0A.1	നിങ്ങളുടെ പക്കലുള്ള റേഷൻ കാർഡ് ഏത് തരം ആണ്?	വെളുത്ത കാർഡ് മഞ്ഞ കാർഡ് പിങ്ക് കാർഡ് നീല കാർഡ്	
I02	കുടുംബനാഥന്റേ ഇപ്പോഴത്തെ തൊഴിൽ? ഏതെങ്കിലും ഒന്ന് അടയാളപ്പെടുത്തുക. (വ്യക്തി റിട്ടയേർഡ് ആണെങ്കിൽ സർക്കിൾ റിട്ടയേർഡ്, തുടർന്ന് മുൻ തൊഴിൽ ചോദിക്കുകയും സർക്കിൾ ചെയ്യുകയും ചെയ്യുക)	പ്രൊഫഷണൽ / എക്സിക്യൂട്ടീവ് / വലിയ ബിസിനസ്സ് ക്ലറിക്കൽ / മീഡിയം ബിസിനസ്സ് സ്വയം തൊഴിൽ ചെയ്യുന്ന / വൈദ്യഗുരുവർ അവിദഗ്ദ്ധ / ഭൂരഹിത തൊഴിലാളി വിദ്യാർത്ഥി	1 2 3 4 5 6 7 8 9 10

		വീട്ടുജോലി റിട്ടയേർഡ് തൊഴിൽരഹിതൻ (ജോലി ചെയ്യാൻ കഴിയും) തൊഴിൽരഹിതൻ (ജോലി ചെയ്യാൻ കഴിയുന്നില്ല) മറ്റുള്ളവർ (_____ വ്യക്തമാക്കുക _____)	
I03	സമ്പാദിക്കുന്ന ഓരോ കുടുംബാംഗത്തിന്റേയും പ്രധാന തൊഴിൽ എന്താണ്? (നിങ്ങളും കുടുംബനാഥനും ഒഴികെ) അംഗം 1 അംഗം 2 അംഗം 3 അംഗം 4 അംഗം 5 അംഗം 6 (നൽകിയിരിക്കുന്ന കോളത്തിൽ ബന്ധപ്പെട്ട തൊഴിലിലേക്ക് അംഗങ്ങളുടെ നമ്പർ പൂരിപ്പിക്കുക)	പ്രൊഫഷണൽ / എക്സിക്യൂട്ടീവ് / വലിയ ബിസിനസ്സ് ക്ലറിക്കൽ / മീഡിയം ബിസിനസ്സ് സ്വയം തൊഴിൽ ചെയ്യുന്ന / വൈദ്യഗ്യമുള്ളവർ അവിദഗ്ദ്ധ / ഭൂരഹിത തൊഴിലാളി വിദ്യാർത്ഥി വീട്ടുജോലി റിട്ടയേർഡ് തൊഴിൽരഹിതൻ (ജോലി ചെയ്യാൻ കഴിയും) തൊഴിൽരഹിതൻ (ജോലി ചെയ്യാൻ കഴിയുന്നില്ല) മറ്റുള്ളവർ (_____ വ്യക്തമാക്കുക _____)	1 2 3 4 5 6 7 8 9 10
I04	നിങ്ങളുടെ വീട്ടിൽ 18 വയസ്സിന് താഴെയുള്ള എത്ര ആളുകൾ ഉണ്ട്?	കുടുംബാംഗങ്ങൾ __	
I05	നിങ്ങളുടെ വീട്ടിൽ 60 വയസ്സിനു മുകളിലുള്ള എത്ര പേർ ഉണ്ട്?	കുടുംബാംഗങ്ങൾ __	
I06	നിങ്ങൾ ഉൾപ്പെടെ നിങ്ങളുടെ വീട്ടിൽ എത്ര പേർ നിലവിൽ സമ്പാദിക്കുന്നു?	കുടുംബാംഗങ്ങൾ __	
I07	നിങ്ങളുടെ വീട്ടിലെ അംഗങ്ങൾക്കിടയിൽ ഏറ്റവും	ഒരിക്കലും സ്കൂളിൽ പോയിട്ടില്ല പ്രൈമറി സ്കൂൾ (<5) 	1 2 3

	ഉയർന്ന വിദ്യാഭ്യാസ യോഗ്യത എന്താണ്?	 സെക്കൻഡറി സ്കൂൾ (5-10) ഹൈസ്കൂൾ(11,12) കോളേജ്/യൂണിവേഴ്സിറ്റി പ്രൊഫഷണൽ ബിരുദം മറ്റുള്ളവ (വ്യക്തമാക്കുക)	4 5 6 7
"നിങ്ങൾ ഉൾപ്പെടെ നിങ്ങളുടെ വീട്ടിലെ 30-70 വയസ്സ് പ്രായമുള്ള അംഗങ്ങളുടെ ആരോഗ്യ അവസ്ഥകളുമായി ബന്ധപ്പെട്ട് ഗാർഹിക ചെലവിലെ മാറ്റം വിലയിരുത്തുന്നതിന് കുറച്ച് ചോദ്യങ്ങൾ നിങ്ങളോട് ചോദിക്കാൻ ഞാൻ ആഗ്രഹിക്കുന്നു" എന്ന് ചോദിച്ചുകൊണ്ട് ആരംഭിക്കുക. വീടിന്റെ സാമ്പത്തിക അവസ്ഥയിൽ ഉണ്ടായ മാറ്റങ്ങൾ			
I10	ഈ ആരോഗ്യ ചെലവുകൾ നിറവേറ്റുന്നതിനായി ഗാർഹിക ചെലവുകളിൽ എന്തെങ്കിലും പുനഃക്രമീകരണം നിങ്ങൾ വരുത്തിയിട്ടുണ്ടോ?	അതെ അല്ല അതെ എന്നാണെങ്കിൽ, I10.1 ലേക്ക് പോകുക	1 2
I10.1	എന്തായിരുന്നു ആ പുനഃക്രമീകരണങ്ങളെ ?	ഭക്ഷണത്തിനുള്ള ചിലവ് കുറച്ചു വിദ്യാഭ്യാസ മേഖലയിലെ നിക്ഷേപം കുറച്ചു സാമൂഹിക ചെലവുകൾ കുറച്ചു പുകവലി, മദ്യപാനം എന്നിവയ്ക്കുള്ള ചെലവ് കുറച്ചു ചികിത്സാച്ചെലവ് കുറച്ചു യൂട്ടിലിറ്റികൾക്കുള്ള ചെലവ് കുറച്ചു (വൈദ്യുതി, വെള്ളം തുടങ്ങിയവ) ദൈനംദിന സാധനങ്ങളുടെ ചെലവ് കുറച്ചു വസ്ത്രങ്ങളുടെ ചെലവ് കുറച്ചു ഈടുനിൽക്കുന്ന വസ്തുക്കളുടെ മേലുള്ള ചെലവ് കുറച്ചു മറ്റ് ചെലവുകൾ കുറയ്ക്കുക (വ്യക്തമാക്കുക)	1 2 3 4 5 6 7 8 9 10 11

വീട്ടുചെലവ്

"കഴിഞ്ഞ 30 ദിവസത്തിൽ, താങ്കളുടെ കുടുംബം കുടുംബം താഴെ പറയുന്നവയ്ക്കായി എത്ര രൂപ ചിലവഴിച്ചു?" എന്ന് ചോദിച്ചുകൊണ്ട് ആരംഭിക്കുക, അറിയില്ലയെങ്കിൽ DK എന്ന് അടയാളപ്പെടുത്തുക			
J01	ഭക്ഷണം (അരി, മാംസം, പഴങ്ങൾ, പച്ചക്കറികൾ, പാചക എണ്ണ എന്നിവ ഉൾപ്പെടെ). → പലവ്യഞ്ജനം+ റേഷൻ (പിഡിഎസ്) → പച്ചക്കറികൾ + മത്സ്യം, മാംസം, മുട്ട, പാൽ → ബേക്കറി ഐറ്റംസ് + പുറത്തുള്ള ഭക്ഷണം → മറ്റുള്ളവ (വ്യക്തമാക്കുക)_____	_____ /ദിവസം /മാസം	
J02	ഗ്യാസ്, വൈദ്യുതി, വെള്ളം, ടെലിഫോൺ.	_____ /ദിവസം /മാസം	
J03	ഗതാഗതം.	_____ /ദിവസം /മാസം	
J04	ഭവന വാടക. വീട് വാടകയ്ക്കെടുത്തിട്ടില്ലെങ്കിൽ, വീടിന്റെ വാടക മൂല്യത്തെ കുറിച്ച് ചോദിക്കുക.	_____ /ദിവസം /മാസം	
J05	വിദ്യാഭ്യാസ ഫീസും സാധനങ്ങളും	_____ /ദിവസം /മാസം	
J06	ഇൻഷുറൻസ് പ്രീമിയങ്ങൾ അല്ലെങ്കിൽ പ്രീപെയ്ഡ് ഹെൽത്ത് പ്ലാനുകൾ	_____ /ദിവസം /മാസം	

"കഴിഞ്ഞ വർഷം, താങ്കളുടെ കുടുംബം താഴെ പറയുന്നവയ്ക്കായി എത്ര രൂപ ചിലവഴിച്ചു " എന്ന് ചോദിച്ചുകൊണ്ട് ആരംഭിക്കുക:			
J07	വാഷിംഗ് മെഷീൻ, പാചക പാത്രങ്ങൾ, സ്റ്റൗ, ടിവി, ഫർണിച്ചർ, കാർ, മോട്ടോർ സൈക്കിൾ, സൈക്കിൾ, മൊബൈൽ ഫോൺ.		
J08	വസ്ത്രങ്ങൾ		
J09	വായ്പകളുടെ തിരിച്ചടവ്.		
J10	പാചക ഇന്ധനം		
J11	ഏതെങ്കിലും ഇൻഷുറൻസ് റീഇംബേഴ്സ്മെന്റുകൾ ഒഴികെ ആരോഗ്യ പരിരക്ഷാ ചെലവുകൾ		
J12	വാഹനങ്ങളുടെ അറ്റകുറ്റപ്പണി		
J13	പ്രോപ്പർട്ടി മാനേജുമെന്റ് / വീടിന്റെ അറ്റകുറ്റപ്പണി		
J14	വീട്ടിൽ ഉത്പാദിപ്പിക്കപ്പെടുന്ന ഭക്ഷണപദാർത്ഥങ്ങൾ		
J15	വിശേഷാവസരങ്ങളിൽ ഉണ്ടായ ഭക്ഷണച്ചിലവ് :ഉത്സവങ്ങൾ / മതപരമായ ചടങ്ങുകൾ പാർട്ടികൾ / പുറത്തുനിന്നും ഭക്ഷണം കഴിക്കൽ മറ്റുള്ളവ (വ്യക്തമാക്കുക)_____		
J16	മറ്റുള്ളവ (വ്യക്തമാക്കുക)_____		

ഗാർഹിക ആസ്തികൾ			
"ഇനിപ്പറയുന്നവയിൽ ഏതാണ് നിങ്ങളുടെ കുടുംബത്തിന് സ്വന്തമായുള്ളത്" എന്ന് ചോദിച്ചുകൊണ്ട് ആരംഭിക്കുക			
K01	വീടിന്റെ തരം	കച്ചാ സെമി പക്കാ പക്കാ	1 2 3
K02	ഉടമസ്ഥതയിലുള്ള കാറുകളുടെ എണ്ണം (ആർക്കും സ്വന്തമല്ലെങ്കിൽ 0 രേഖപ്പെടുത്തുക)		
K03	സൈക്കിളുകളുടെ എണ്ണം (ആർക്കും സ്വന്തമല്ലെങ്കിൽ 0 നൽകുക)		
K04	മോട്ടോർസൈക്കിളുകളുടെ / സ്കൂട്ടറുകളുടെ എണ്ണം (ആർക്കും സ്വന്തമല്ലെങ്കിൽ 0 നൽകുക)		
K05	വീട്ടിലെ കുടിവെള്ള സ്രോതസ്സ് ഏതാണ്	പൈപ്പ് പൊതു ടാപ്പ് വീട്ടിലെ കുഴൽക്കിണർ / കിണർ പൊതു കുഴൽക്കിണർ / കിണർ മറ്റുള്ളവ	1 2 3 4 5
K06	ഏത് തരം പാചക ഇന്ധനമാണ് ഉപയോഗിക്കുന്നത്?	ഗ്യാസ് വൈദ്യുതി മണ്ണെണ്ണ വിറക് മറ്റുള്ളവ കൽക്കരി	1 2 3 4 5 6
K07	ഏത് തരം ശൗചാലയ സൗകര്യമാണ് ഉള്ളത്	സ്വകാര്യ പ്ലംബ് ടോയ്റ്റ് പബ്ലിക് പ്ലംബ് ടോയ്റ്റ് സ്വകാര്യ ശൗചാലയ കുഴി പൊതു ശൗചാലയ കുഴി ശൗചാലയം ഒന്നുമില്ല. മറ്റുള്ളവ	1 2 3 4 5 6
K08	വീട് വൈദ്യുതികരിച്ചതാണോ	അതെ അല്ല	1 2
K09	വാഷിംഗ് മെഷീൻ ഉണ്ടോ?	അതെ അല്ല	1 2

K10	റഫ്രിജറേറ്റർ ഉണ്ടോ?	അതെ അല്ല	1 2
K11	ടെലിഫോൺ (ഫിക്സ്ഡ് ലൈൻ) ഉണ്ടോ?	\ അതെ അല്ല	1 2
K12	മൊബൈൽ ഫോൺ ഉണ്ടോ?	അതെ അല്ല	1 2
K13	ടെലിവിഷൻ ഉണ്ടോ?	അതെ അല്ല	1 2
K14	റേഡിയോ ഉണ്ടോ?	അതെ അല്ല	1 2
K15	കമ്പ്യൂട്ടർ ഉണ്ടോ?	അതെ അല്ല	1 2
K16	കന്നുകാലികൾ (ആടുകൾ, പശുക്കൾ, എരുമ മുതലായവ) സ്വന്തമായുണ്ടോ?	അതെ അല്ല	1 2

Section 3:

MULTIMORBIDITY TREATMENT BURDEN QUESTIONNAIRE

പ്രയാസമില്ല 1

കുറച്ചു ബുദ്ധിമുട്ട് 2

കുറെയേറെ ബുദ്ധിമുട്ട് 3

വളരെ ബുദ്ധിമുട്ട് 4

വളരെയേറെ ബുദ്ധിമുട്ട് 5

ബാധകമല്ല 6

	ഇനിപ്പറയുന്നവയുമായി ബന്ധപ്പെട്ട് നിങ്ങൾക്ക് എത്രമാത്രം ബുദ്ധിമുട്ടുണ്ടെന്ന് ദയവായി പറയുക:	ബുദ്ധിമുട്ടു കുറഞ്ഞതിൽ നിന്നും ഉയർന്നതിലേക്കു 1 മുതൽ 6 വരെയുള്ള പ്രതികരണ സ്കെയിൽ	കോഡ്
L1	ധാരാളം മരുന്നുകൾ കഴിക്കുക		
L2	എങ്ങനെ, എപ്പോൾ മരുന്ന് കഴിക്കണമെന്ന് ഓർമ്മിക്കുക		
L3	കുറിപ്പടി മരുന്നുകൾ ശേഖരിക്കൽ		

L4	നിങ്ങളുടെ മെഡിക്കൽ അവസ്ഥകൾ നിരീക്ഷിക്കുക (ഉദാഹരണത്തിന്, നിങ്ങളുടെ രക്തസമ്മർദ്ദം അല്ലെങ്കിൽ രക്തത്തിലെ പഞ്ചസാര പരിശോധിക്കുക, നിങ്ങളുടെ രോഗലക്ഷണങ്ങൾ നിരീക്ഷിക്കുക മുതലായവ)		
L5	ആരോഗ്യ വിദഗ്ദ്ധരുമായി കൂടിക്കാഴ്ചകൾ ക്രമീകരിക്കുന്നു		
L6	വ്യത്യസ്ത ആരോഗ്യ വിദഗ്ദ്ധരെ ധാരാളം കാണുന്നു		
L7	ആരോഗ്യ വിദഗ്ദ്ധരുമായി കൂടിക്കാഴ്ചകളിൽ പങ്കെടുക്കുക (ഉദാഹരണത്തിന്, ജോലിയിൽ നിന്ന് സമയം നേടുക, ഗതാഗതം ക്രമീകരിക്കുക മുതലായവ)		
L8	നിങ്ങളുടെ അവസ്ഥയെ കുറിച്ചുള്ള വ്യക്തവും കാലികവുമായ വിവരങ്ങൾ നേടുക		
L9	ശുപാർശ ചെയ്യുന്ന ജീവിതശൈലി മാറ്റങ്ങൾ വരുത്തുക (ഉദാഹരണത്തിന്, ഭക്ഷണക്രമവും വ്യായാമവും)		
L10	കുടുംബത്തിൽ നിന്നും സുഹൃത്തുക്കളിൽ നിന്നുമുള്ള സഹായത്തെ ആശ്രയിക്കേണ്ടി വരുന്നു		

ANNEXURE 7

INSTITUTIONAL ETHICS COMMITTEE APPROVAL LETTER



श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेन्द्रम
तिरुवनन्तपुरम - ६९५०११, केरल, इंडिया
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
Thiruvananthapuram - 695 011, Kerala, India
(An Institute of National Importance under Govt. of India)

Grams : Chitramet, Phone : +91-471-2443152, Fax : +91-471-2550728 / 2446433, E-mail : sct@sctimst.ac.in, Website : www.sctimst.ac.in

Institutional Ethics Committee

CDCO Registration No: ECR/189/Inst/KL/2013/RR-21
DHR Registration No:EC/NEW/INST/2022/2775

SCT/IEC/2162/DECEMBER/2023

10.01.2024

Dr. Anuja VR
MPH Student, AMCHSS
SCTIMST, Thiruvananthapuram

Dear Dr. Anuja,

The Institutional Ethics Committee held on 30th December, 2023, reviewed and discussed your application to conduct the study titled "MULTIMORBIDITY ASSOCIATED ECONOMIC IMPACTS AT HOUSEHOLD LEVEL IN RURAL KOLLAM, KERALA" (IEC /2162) "

Principal Investigator	Dr. Anuja V R, MPH Student, AMCHSS, SCTIMST
Co-Principal Investigator(s)	Dr. Jeemon P, Additional Professor, AMCHSS, SCTIMST
Duration of the study	6 months, January 2024 to June 2024

The following members of the Ethics Committee were present at the meeting held on 30th December, 2023

SL. No.	Member Name	Highest Degree	Gender	Scientific /Non Scientific	Affiliation with Institution(s)
1.	Smt. Sathi Nair	MA (English Literature)	Female	Lay Person	No
2.	Dr. Kala Kesavan P	MBBS,MD	Female	Basic Medical Scientist	No
3.	Adv. Priya Kaimal	LLM, MBL	Female	Legal Expert	No
4.	Dr. P. Manickam	BSMS, MSc (Epid), PhD	Male	Health Science Expert/ Social Scientist	No
5.	Dr. Christina George	MD Psychiatry	Female	Clinician	No
6.	Dr. Narayanan Namboodiri. K K	MBBS,MD,DM	Male	Clinician	Yes
7.	Dr. Biju Soman	MBBS,MD, DPH, MSc, DLSHTM	Male	Basic Medical Scientist	Yes

The following documents were reviewed:

Original submission

1. Checklist Form
2. Covering letter addressed to the Chairman, IEC, SCTIMST dated 30.11.2023
3. Responses /amendments made based on the Reviewer's comments
4. IEC Application Form
5. Declaration Form
6. Research Proposal
7. Participant Information Sheet English and Malayalam
8. Consent Form in English and Malayalam
9. Interview Schedule for the Survey in English and Malayalam
10. CV of Principal Investigator and Co-PI
11. SRC Recommendation Letter

Revised submission

1. Checklist Form
2. Covering letter addressed to the Chairman, IEC, SCTIMST dated 10.01.2024
3. Responses /amendments made based on the Reviewer's comments
4. Copy of IEC Recommendation letter dated 09.01.2024
5. IEC Application Form
6. Declaration Form
7. Research Proposal
8. Participant Information Sheet English and Malayalam
9. Consent Form in English and Malayalam
10. Interview Schedule for the Survey in English and Malayalam
11. CV of Principal Investigator and Co-PI

IEC Decision

The IEC approved the conduct of the study in the present form.

Remarks:

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information/informed consent and asks to be provided a copy of the final report.

There was no member of the study team / Guide who participated in voting / decision making process. The ethics committee is organized and operated according to the requirements of Good Clinical Practice and the requirements of the Indian Council of Medical Research (ICMR).

Sincerely,



Dr. G. Srinivas
Member Secretary, IEC

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE (IEC)
SCTIMST, THIRUVANANTHAPURAM

