Out of pocket health expenditure in India: An analysis of burden of healthcare costs

A Thesis Submitted
in Fulfillment of the Requirement for the
Degree of

DOCTOR OF PHILOSOPHY

in

Discipline of Management

by

MEHAK NANDA
(2K19/PHDUSME/501)

Under the Supervision of
Dr. RAJESH SHARMA
Assistant Professor, Department of Humanities and Social Sciences,
National Institute of Technology Kurukshetra-136119, Haryana,
India

Department of
University School of Management and Entrepreneurship

DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
Shahbad Daulatpur, Main Bawana Road, Delhi-110042, India

April, 2024

Delhi Technological University

(Formerly Delhi College of Engineering)
Shahbad Daulatpur, Main Bawana Road, Delhi-42

Candidate's Declaration

I, hereby certify that the thesis titled, **"Out of pocket health expenditure in India: An analysis of burden of healthcare costs"**, submitted in the fulfilment of the requirements for the award of degree of **Doctor of Philosophy** in **Discipline of Management**, is an original work carried out by me under the supervision of **Dr. Rajesh Sharma,** Assistant Professor, Department of Humanities and Social Sciences, National Institute of Technology Kurukshetra. Any material borrowed, or referred to is duly acknowledged. The research work presented and reported in the thesis has not been submitted either in part or full to any other university or institute for the award of any other degree or diploma.

Mehak Nanda

Roll No. 2K19/PHDUSME/501

University School of Management and Entrepreneurship,

Delhi Technological University

Delhi Technological University

(Formerly Delhi College of Engineering)
Shahbad Daulatpur, Main Bawana Road, Delhi-42

Supervisor's Certificate

This is to certify that the thesis titled, "**Out of pocket health expenditure in India: An analysis of burden of healthcare costs**", submitted in the fulfilment of the requirements for the award of degree of **Doctor of Philosophy** in **Discipline of Management,** is an original research work carried out by **Ms. Mehak Nanda**, under my supervision. The matter presented in the thesis has not been submitted in part or fully to any other university or institute for the award of any degree to the best of my knowledge

.

Dr. Rajesh Sharma

Assistant Professor**,**

Department of Humanities and Social Sciences,

National Institute of Technology Kurukshetra, Haryana

Acknowledgement

I would like to express my deepest gratitude to my supervisor, Dr. Rajesh Sharma, for entrusting me with the opportunity to conduct the research presented here under his expert guidance. This work stands as a testament to his extensive knowledge, unwavering support and encouragement, invaluable guidance, and affection. His expertise and analytical perspective have consistently inspired me, and his confidence in me has motivated me to move forward. Sir has been more than a guide; he has been a true inspiration, and this research owes its current shape to his continuous and substantial support. I am not just grateful but profoundly indebted to you, sir.

I owe my sincere gratitude to Prof. Amit Mookerjee, Head of Department, University School of Management and Entrepreneurship, Delhi Technological University, for his immense and constant support throughout the journey.

I would also like to extend my deepest gratitude to Dr. Naval Garg, Mr. Puneet Arora, Dr. Kusum Lata, Dr. Akanksha Kaushik, and all faculty members at University School of Management and Entrepreneurship, Delhi Technological University, for all the help and for creating a supportive and encouraging environment conducive to research discussions and interactions.

Additionally, I would also like to express my heartfelt thanks to my fellow research scholars. A very special thanks to my fellow scholar, Ms. Aashima, who has been my true companion, providing unwavering support and help throughout.

I am profoundly thankful to my parents, Mrs. Alka Nanda and Mr. Sandeep Nanda, and my sister, Mrs. Upasana Nanda, without whom achieving this milestone would not have been possible. They have consistently showered me with boundless love, blessings, encouragement, and support, standing by me through every challenge. Their unparalleled motivation and

support, which is beyond expression, have been my pillar of strength, and I owe everything to them. I want to express my heartfelt thanks to my grandparents, Mr. Satyapal Nanda and Mrs. Nirmal Nanda, for always blessing me with good wishes and providing the strength to stay focused on this journey.

I would like to express my heartfelt thanks to my friends Manan Bhatia, Amani Goel, and Aditya Sambher, who have been my support system. Their encouragement and shared laughter provided the balance needed to navigate the challenges of Ph.D. journey.

I would like to thank the Almighty for giving me the opportunity, ability, strength, and knowledge to undertake the presented research and successfully complete it. This accomplishment would not have been possible without his blessings.

Lastly, I am thankful for everyone who is directly or indirectly involved in my research work.

Mehak Nanda

Executive summary

India, which accounts for more than one-sixth of the world's population, grapples with one of the lowest public health spending (1.15% of GDP), and one of the highest out-of-pocket health expenditure (OOPE) (50.6% of health expenditure) worldwide. Dismally low health insurance coverage coupled with a dominant presence of fee-for-service private health sector forces a large proportion of Indian households to rely on OOPE as a means of financing healthcare. Heavy reliance on OOPE limits access to healthcare services, reduces the consumption of other necessities, and exposes households to impoverishment. Therefore, we have comprehensively examined the financial hardships due to OOPE using a battery of metrics, including catastrophic health expenditure (CHE), impoverishment, distressed financing, and forgone care. We examined the financial hardships at the national, state, and intra-state (rural-urban within each state) levels, across various socio-economic and demographic dimensions, and for various diseases and injuries. The presence of inequalities in the incidence of incurring CHE and distressed financing were examined. Moreover, we gauged the determinants of incurring CHE, falling below the poverty line due to OOPE, and using distressed sources. The financial burden was evaluated separately based on the type of care sought (hospitalization, outpatient care, and hospitalization and/or outpatient care), the type of healthcare facility visited (public or private), and the share of various components (such as cost of medicines, diagnostic tests, and transportation costs) in total health expenditure to identify the key drivers of financial burden. We have used the latest round of the nationally representative sample survey on health, titled, "Household Social Consumption: Health". For analysis, we have employed descriptive statistics, multivariable logistic regression, two-part model, and concentration index.

We observed high financial burden due to OOPE in poorer states/union territories (UTs) (such as Uttar Pradesh, Odisha, Jharkhand, and West Bengal) and in a few relatively well-off states/UTs (such as Kerala, Andhra Pradesh, Maharashtra, and Himachal Pradesh), irrespective

of the type of care sought. Although OOPE was higher in urban areas, the financial hardships due to OOPE were conspicuously more perturbing in rural areas, with a similar pattern observed across majority of the states/UTs. We observed prominent socio-economic and demographic disadvantages, with individuals belonging to marginalised social groups (scheduled tribes and scheduled castes), those working as casual labourers, those belonging to lower economic quintiles, and those who were not literate or lacked formal education reporting higher incidence of unmet healthcare needs. Additionally, households belonging to lower economic quintiles, residing in rural areas, belonging to scheduled castes, other backward classes and other social groups, headed by members who were not literate or lacked formal education, engaged in other work, having any elder member in household, and any member having non-communicable diseases (NCDs), were exposed to higher financial risk due to OOPE. We also observed presence of inequality in the incidence of incurring CHE and using distressed financing. Moreover, we found that households with any member suffering from cancer, genitourinary disorders, psychiatric and neurological disorders, obstetric conditions, and injuries (particularly intentional self-harm, burns or corrosions, and accidental injuries, road traffic accidents and falls) experienced colossal financial hardships. Notably, outpatient services was more burdensome than hospitalization. Furthermore, it was observed that medicines constituted the largest share of total health expenditure in India. Lastly, the brunt of OOPE was substantially higher when care was sought from private health facilities rather than public ones.

The high OOPE and the associated financial hardships underscore the pressing need to increase public health expenditure, strengthen public healthcare facilities, regulate pricing in the private health sector, and ensure availability and affordability of essential medicines and drugs, to augment financial risk protection in India. Substantial inter-, intra-state, and socio-economic disparities highlight the need to devise state-specific policies in tandem with contextual

differences and concerted efforts to bridge the rural-urban divide. Moreover, it is crucial to address the key barriers to healthcare access, including inadequate infrastructure and shortages and inefficient distribution of qualified health workers, to improve accessibility to healthcare services and reduce non-medical and transportation expenditure related to medical travel. Additionally, health insurance coverage only for hospitalisation is insufficient to safeguard against financial burden, particularly in a scenario where outpatient expenses exert higher financial burden than inpatient expenses and the rising prevalence of NCDs require frequent outpatient visits for effective disease management. Therefore, considering outpatient services under the purview of health insurance coverage is essential. Also, abysmally low health insurance enrolment in India warrants policy measures to increase awareness and uptake of health insurance. Lastly, for long term sustainability, there is a need to place a stronger impetus on health promotion and disease prevention strategies to address the evolving epidemic of NCDs and the corresponding financial burden.

Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

1.1 Background

Internationally, the "Right to Health" was first articulated in the Constitution of the World Health Organization (WHO) in 1946 (WHO, 1946). The preamble states that "*The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition*" (WHO, 1946). It was again recognised as a human right in the International Covenant on Economic, Social and Cultural Rights (1966) and in the Declaration of Alma Ata (1978) (United Nations, 1966; WHO, 1978; World Medical Association, 2023). According to WHO (2017), the right to health for all individuals implies that everyone should have access to health services, when and where they need them, without experiencing financial hardship.

Universal Health Coverage (UHC) is widely recognized to be crucial for achieving the Right to Health (World Bank, 2023). It has been as adopted as one of the target in the United Nations Sustainable Development Goals (SDGs) on Health (UNDP, 2022). UHC aims to ensure that everyone can access quality health services without facing financial hardship (WHO, 2021a). The past decade has witnessed an increasing global commitment to UHC, with many countries initiating UHC-inspired health reforms (Wagstaff and Neelsen, 2020). However, a major concern for all governments striving for UHC is how to finance the healthcare system, and this concern is more pronounced in low and middle-income countries, where public investment in health is low (Pandey et al., 2018). According to a recent report published by WHO, while government sources financed 70% of health expenditure in high income countries, low and lower-middle income countries primarily relied on out-of-pocket health expenditure (OOPE). OOPE constituted 44% and 40% of total health expenditure in low and lower-middle income countries, respectively (WHO, 2021b).

India, with a population of 1.34 billion, constitutes more than one-sixth of the world's population (Yale University, 2017). In India, ensuring affordable access to healthcare services is a crucial policy concern with 50.6% of health expenditure financed through out-of-pocket expenses by patients or their family members (WHO, 2019). OOPE in India is even higher than some other lower-middle income countries such as Vietnam (39.6%), Ghana (30.8%), Mongolia (27%), and Kenya (24.1%) (WHO, 2019).

India is experiencing a triple burden of diseases, i.e., increasing non-communicable diseases (NCDs), an unfinished agenda of infectious diseases, and a rising incidence of injuries (Bloom et al., 2014). Between 1990 and 2016, the proportion of all deaths in India due to NCDs increased from 37.9% to 61.8%, and the contribution of NCDs to total disability-adjusted life years increased from 30.5% to 55.4% (ICMR, PFHI, and IHME, 2017). Communicable diseases too, such as diarrhoea, tuberculosis, lower respiratory infections, and vector-borne diseases (for instance, dengue, malaria, and chikungunya), continue to pose substantial challenges in India (ICMR, PFHI, and IHME, 2017). In 2018, India accounted for ~11% of accident-related deaths worldwide, ranking first among the 199 countries in terms of road accident mortality (GOI, 2019a). The growing share of the elderly population, increasing middle-class population, and lifestyle changes further contribute to the escalating demand of healthcare services in India (Sarwal et al., 2021).

Nevertheless, public health spending in India is dismally low, constituting a mere 1.15% of the gross domestic product (National Health Policy, 2017). A combination of low health insurance coverage (GOI 2019b) and a dominant presence of fee-for-service private health sector (Oxfam India, 2021) forces a large proportion of Indian households to rely on OOPE as a means of financing healthcare (Shahrawat and Rao, 2012).

1.2 Financial hardship due to OOPE

According to WHO, OOPE is the most inefficient and inequitable way of financing healthcare payments (WHO and World Bank, 2021). OOPE exposes households to financial catastrophe and may push them into poverty (WHO, 2005; WHO and World Bank, 2021; Rahman et al., 2022). Globally, every year around 800 million people experience financial catastrophe and nearly 100 million people are pushed below the poverty line due to high OOPE (WHO, 2017). Healthcare payments are a major cause of poverty in India, pushing ~32–39 million individuals below the poverty line each year (Van Doorslaer et al., 2006; Bonu et al., 2007; Garg and Karan, 2009).

According to WHO, financial protection is only achieved when there are no financial hardships caused by OOPE and no financial barriers to accessing care (WHO and World Bank, 2021). The prominent parameters used to capture the undesirable effects of OOPE are catastrophic health expenditure (CHE) and impoverishment (WHO 2014; Saksena et al., 2014; Hsu et al., 2018). The occurrence of CHE implies that households forgo the consumption of other necessities due to high OOPE (Saksena et al., 2014; Hsu et al., 2018). Impoverishment highlights that households are pushed below or further below the poverty line due to OOPE (Saksena et al., 2014; Hsu et al., 2018). Households may even resort to distressed coping strategies, such as borrowing money, sale of assets, and seeking contributions from friends and relatives to finance OOPE (Joe, 2015; Sangar et al., 2019; Rahman et al., 2022). Furthermore, households might forgo necessary healthcare because of financial constraints, thereby exacerbating health problems and putting the concerned families into a downward spiral of ill-health and poverty (Rahman et al., 2022; Petrovic et al., 2021). As per a recent review (Rahman et al., 2022), comprehensive financial risk studies must measure four indicators to provide a holistic picture of the financial hardships experienced by households: i) CHE, ii)

impoverishment, iii) adoption of distressed coping strategies, and iv) forgone care due to financial reasons.

1.3 Research gaps addressed by the study

Indian healthcare system is characterized by wide rural-urban and state level variations in terms of health budget, infrastructure, manpower, and health outcomes (Niti Aayog, 2020; Jaysawal, 2015). Thus, examining the burden of OOPE at the national level will not reflect sub-national variations, which are essential for a targeted policy response. However, most of the previous studies examining the burden of OOPE provide national level estimates for rural and urban areas or are restricted to estimating the financial burden at the state level. Addressing this crucial gap in existing literature, we have estimated financial hardship due to OOPE at national, state, and intra-state levels (rural and urban areas within each state) in India. This is pertinent to identify which states and areas require a greater policy attention. Additionally, there is also a noticeable gap in studies examining the inequality in financial hardship in rural and urban areas within each state/union territory (UTs). Therefore, we extended our analysis and examined the inequality in incidence of CHE and distressed financing at national, state, and intra-state level as well.

Social, demographic, and economic factors exert substantial influence on utilization of healthcare services, OOPE, and overall financial burden. It is essential to examine the financial hardships due to OOPE and unmet healthcare needs across various socio-economic and demographic dimensions and identify the determinants of financial risk. These insights are invaluable for identifying the most affected sections and tailoring targeted policies for those who need it the most. However, previous studies have primarily focused on examining the socio-economic and demographic disparities and determinants of only one or two parameters of financial burden. Moreover, most of these studies were based on older rounds of the National Sample Survey on Consumer Expenditure (NSS CES). Our study contributes to the existing

literature by comprehensively examining the financial burden due to OOPE and unmet healthcare needs across various socio-economic and demographic dimensions. We also explored the factors associated with experiencing CHE, impoverishment, and using distressed financing due to OOPE. Furthermore, we relied on the latest round of the National Sample Survey on Health, which collects extensive data on ailments and health expenditure compared to the NSS CES, which mainly focuses on household consumption expenditure. Additionally, earlier studies based on NSS health survey did not scrutinize the disparities and determinants for all three parameters (CHE, impoverishment, and distressed financing) separately for hospitalization, outpatient care, and hospitalization and/or outpatient care. For policy implications, an in-depth analysis of all these collectively is imperative, and we have therefore undertaken this in our study.

In India, the rising burden of NCDs, injuries, and persistent challenges posed by communicable diseases underscores the necessity to analyse the economic impact of OOPE across all disease types. Although there is a growing body of studies assessing the disease-specific financial burden of OOPE, these studies have majorly focused on specific ailments such as maternal health, NCDs, cancer, diabetes, and tuberculosis, or were limited to estimating only two parameters of financial hardships. A disaggregated analysis of the OOPE burden across various diseases is crucial to highlight ailments that impose a significant financial burden on households and provide valuable insights for formulating appropriate policies. Therefore, we have comprehensively examined the financial hardships due to OOPE and unmet healthcare needs across 17 types of disease categories.

Lastly, to address the global burden of injuries, estimating the cost of injuries has been recognized as one of the priority areas. However, limited literature is available on the financial burden associated with seeking care for injuries in India. Previous studies have primarily focused on analysing the OOPE burden for specific injuries such as accidental injury, road

traffic accidents, falls, or drowning, or have considered all injuries combined. Additionally, studies were often confined to particular geographic areas, thereby limiting generalizability. Moreover, to the best of our knowledge, no study has examined the financial hardships due to OOPE across all three parameters (CHE, impoverishment, and distressed financing) for all types of injuries. Amidst the increasing burden of injuries in India, we have comprehensively examined the OOPE and corresponding financial burden for seven distinct types of injuries to provide evidence base for designing targeted financial risk protection strategies.

1.4 Objectives

Against this backdrop and to fill the gaps in the literature, we have worked on the following objectives.

1. To examine the financial hardship due to OOPE at the national, state, and intra-state levels.
2. To examine the financial hardship due to OOPE across socio-economic and demographic dimensions.
3. To examine the financial hardship due to OOPE across 17 disease categories.
4. To examine the OOPE and associated financial hardship across seven types of injuries.

1.5 Organization of the Thesis

This thesis is organized into six chapters to accommodate all the research objectives. Each chapter is organized to be fully self-contained.

Chapter 1: The first chapter provides an overview of UHC, the prevalent reliance on OOPE in low- and middle-income countries, including India, and the deleterious economic consequences associated with OOPE. Further, research gaps addressed by the study, followed by the research objectives, and an overview of the overall thesis organization.

Chapter 2: The second chapter provides a disaggregated analysis of the financial burden of OOPE and unmet healthcare needs at the national, state, and intra-state levels. This chapter used the latest 75th round of the nationally representative survey on health conducted by the National Sample Survey Organization in 2017-18. Descriptive statistics, two-part model, and concentration index were employed. In this chapter, we gauged the determinants of OOPE and determined the share of various components in total health expenditure. The financial burden of OOPE was analyzed across three parameters: the incidence and intensity of incurring CHE, the incidence and intensity of impoverishment due to OOPE, and the incidence of using distressed sources to cope with OOPE. The presence of inequalities in the incidence of incurring CHE and distressed financing were also analyzed. Furthermore, the chapter sheds light on the utilization pattern of public and private health facilities and the place where the treatment was sought (domicile or non-domicile area). All these metrics were evaluated separately based on the type of care sought i.e., hospitalization, outpatient care, and hospitalization and/or outpatient care. This holistic examination highlights the sub-national variations and identifies the areas that require greater policy attention to augment financial risk protection across states/union territories (UTs) and rural and urban areas within each state/UTs.

Chapter 3: The third chapter provides an overview of the financial hardships due to OOPE and unmet healthcare needs across various socio-economic and demographic dimensions and explores the determinants of financial risk in India. This chapter used the latest 75th round of the national sample survey on health. Multivariable logistic regression was employed to gauge the factors associated with experiencing CHE, falling below the poverty line, and using distressed financing. This assessment is crucial for highlighting the socio-economic and demographic disparities in the OOPE burden, identifying the most affected sections of society, and highlighting the determinants of financial risk that warrant policy attention.

Chapter 4: The fourth chapter provides an assessment of the OOPE and associated financial burden across 17 disease categories, disaggregated by the type of care sought (hospitalization, outpatient care, and hospitalization and/or outpatient care) and the type of healthcare facility visited (public or private). The percentage of individuals who did not seek treatment, percentage of individuals who did not seek treatment on medical advice and reasons for the same were also examined. The loss of household earning resulting from hospitalization and outpatient care for 17 categories of ailments was also estimated. The chapter used the most recent round (75^{th}) of the national sample survey on health, and employed descriptive statistics and multivariable logistic regression. The analysis is essential for providing an evidence base to formulate and tailor policies, programs, and practices that enhance financial risk protection for diseases that exert a substantial financial burden on Indian households.

Chapter 5: The fifth chapter provides an overview of the financial hardships due to OOPE for seven categories of injuries, disaggregated by the type of healthcare facility visited, either public or private. The loss of household earning resulting from hospitalization due to various injuries was also estimated. This chapter used the latest 75^{th} round of the national sample survey on health (2017-18) and employed descriptive statistics. Amidst the increasing burden of injuries in India, an evaluation of the financial ramifications of seeking inpatient care for various injuries is crucial for designing targeted strategies to augment financial risk protection.

Chapter 6: Finally, this chapter concludes the thesis by summarizing the salient findings and conclusions related to the financial hardships caused by OOPE across multiple dimensions, encompassing regional, socio-economic, and demographic levels, as well as various types of diseases and injuries. The chapter also details the policy implications, recommendations, and outlines potential areas for future research.

1.6 References

Bloom DE, Cafiero-Fonseca ET, Candeias V, et al. 2014. Economics of non-communicable diseases in India: the costs and returns on investment of interventions to promote healthy living and prevent, treat, and manage NCDs. In World economic forum, Harvard school of Public Health. 22-23. Available: https://www3.weforum.org/docs/WEF_EconomicNonCommunicableDiseasesIndia_Report_2014.pdf

Bonu S, Bhushan I, Peters D. 2007. Incidence, intensity, and correlates of catastrophic out-of-pocket health payments in India. Asian Development Bank. 32-39.

Garg CC, Karan AK. 2009. Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Health policy and planning. 24(2): 116-28.

Government of India (GOI). 2019a. Road Accidents in India 2019. Available: https://morth.nic.in/sites/default/files/RA_Uploading.pdf

Government of India. (GOI). 2019b. Key indicators of social consumption in India: Health. Ministry of Statistics & Programme Implementation, National Statistical Office. Available: https://www.mospi.gov.in/documents/213904/301563//KI_Health_75th_Final160210117871 2.pdf/1edceec8-a4af-f357-b675-837e015ae20c

Hsu J, Flores G, Evans D, Mills A, Hanson K. 2018. Measuring financial protection against catastrophic health expenditures: methodological challenges for global monitoring. Int J Equity Health 17(1):69.

ICMR, PFHI, and IHME. 2017. India: Health of the Nation's States - The India State-Level Disease Burden Initiative. Available:

https://www.healthdata.org/sites/default/files/files/policy_report/2017/India_Health_of_the_Nation%27s_States_Report_2017.pdf

Jaysawal D. 2015. Rural health system in India: A review. International Journal of Social Work and Human Services Practice,29-37.

Joe W. 2015. Distressed financing of household out-of-pocket health care payments in India: incidence and correlates. Health policy and planning, 30(6), 728-741.

National Health Policy. 2017. Ministry of Health and Family Welfare, Government of India. Available: https://www.nhp.gov.in//NHPfiles/national_health_policy_2017.pdf

Niti Aayog. 2020. Healthy States, Progressive India: Health Index Round IV 2019-20. Available: https://www.niti.gov.in/sites/default/files/2021-12/NITI-WB_Health_Index_Report_24-12-21.pdf

Oxfam India. 2021. Analysing Regulation of Private Healthcare in India. Available: https://www.oxfamindia.org/knowledgehub/workingpaper/analysing-regulationprivate-healthcare-india.

Pandey, A., Kumar, G. A., Dandona, R., & Dandona, L. (2018). Variations in catastrophic health expenditure across the states of India: 2004 to 2014. *PLoS One,13*(10),e0205510.

Petrovic D, Marcus K, Sandoval J, Cullati S, Piumatti G, Bodenmann P, et al. 2021. Health-related biological and non- biological consequences of forgoing healthcare for economic reasons. Prev Med Rep 24:101602.

Rahman T, Gasbarro D, Alam K. 2022. Financial risk protection from out-of-pocket health spending in low-and middle-income countries: a scoping review of the literature. Health Res Policy Syst 20(1):83.

Saksena P, Hsu J, Evans DB. 2014. Financial risk protection and universal health coverage: evidence and measurement challenges. PLoS Med 1111(9):e1001701.

Sangar S, Dutt V, Thakur R. 2019. Distress financing of out-of- pocket health expenditure in India. Rev Dev Econ 23(1): 314–30.

Sarwal R, Prasad U, Madangopal K, Kalal S, Kaur D, Kumar A, Regy P, Sharma J. 2021. Investment Opportunities in India's Healthcare Sector. NITI Aayog. https://www.niti.gov.in/sites/default/files/2021-03/InvestmentOpportunities_HealthcareSector_0.pdf

Shahrawat R, Rao KD. 2012. Insured yet vulnerable: out-of-pocket payments and India's poor. Health policy and planning. 27(3): 213-21.

UNDP. 2022. Goal 3: Good Health and Well-Being. United Nations Development Programme. Available: https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw9e6SBhB2EiwA5myr9uiGZfMo0bJcdr_CwHw4cE6_TIMEdupc3L_816AMWbjZEY-ElPW93BoC6YYQAvD_BwE#good-health

United Nations.1966. International Covenant on Economic, Social and Cultural Rights. https://www.ohchr.org/en/instruments-mechanisms/instruments/international-covenant-economic-social-and-cultural-rights

Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. The lancet. 368(9544): 1357-64.

Wagstaff A, Neelsen S. 2020. A comprehensive assessment of universal health coverage in 111 countries: a retrospective observational study. The Lancet Global Health ;8(1):e39-49.

WHO and World Bank. 2021. World Health Organization and the International Bank for Reconstruction and Development / The World Bank. 2021. Global monitoring report on financial protection in health 2021. Available: https://www.who.int/publications/i/item/9789240040953

WHO. 1946. Constitution of WHO. https://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf?ua=1

WHO. 1978. Alma-Ata 1978. Primary Health Care. https://www.unicef.org/media/85611/file/Alma-Ata-conference-1978-report.pdf

WHO. 2005. Distribution of health payments and catastrophic expenditures methodology.

WHO. 2017. Health is a fundamental human right. https://www.who.int/news-room/commentaries/detail/health-is-a-fundamental-human-right

WHO. 2019. Global Health Expenditure Database 2019. World Health Organisation. Available: https://apps.who.int/nha/database/country_profile/Index/en. Date Accessed: March 3, 2022

WHO. 2021a. Universal health coverage. https://www.who.int/newsroom/fact-sheets/detail/universal-health-coverage-(uhc)

WHO. 2021b. Global expenditure on health: public spending on the rise? Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO. https://files.aho.afro.who.int/afahobckpcontainer/production/files/2_Global_expenditure_on_health_Public_spending_on_the_rise.pdf

World Bank. 2023. Universal Health Coverage as a Sustainable Development Goal. https://datatopics.worldbank.org/world-development-indicators/stories/universal-health-coverage-as-a-sustainable-development-goal.html#:~:text=Beyond%20health%20and%20wellbeing%2C%20UHC,on%20health%20(target%203.8)

World Health Organization & World Bank. 2014. Monitoring progress towards universal health coverage at country and global levels: framework, measures and targets. World Health Organization. https://iris.who.int/handle/10665/112824

World Health Organization. 2017. Tracking universal health coverage: 2017 global monitoring report. Available: https://www.who.int/publications/i/item/9789241513555

World Medical Association. 2023. Right to Health. https://www.wma.net/what-we-do/human-rights/right-to-health/

Yale University. 2017. India's Population: Becoming Number One. https://archive-yaleglobal.yale.edu/content/indias-population-becoming-number-one

Chapter 2 National, state, and intra-state level examination of financial hardship due to out-of-pocket health expenditure

2.1 Introduction

The health and well-being of people at all ages lies at the heart of sustainable development. Universal Health Coverage (UHC), which aims to ensure that everyone has access to quality healthcare without facing financial hardships, has been adopted as one of the Sustainable Development Goals (UNDP, 2022), underscoring its significance as a key global health priority. However, a prominent concern for governments striving for UHC is how to finance the healthcare system, and this concern is more pronounced in low and middle-income countries, where public investments in health are limited (Pandey et al., 2018). India, which accounts for more than one-sixth of the world's population, grapples with one of the lowest public health spending (1.15% of GDP) (WHO, 2019), and one of the highest out-of-pocket health expenditure (OOPE) (50.6% of health expenditure) globally (National Health Systems Resource Centre, 2019). Abysmally low health insurance coverage (GOI, 2019) coupled with a dominant fee-for-service private health sector forces a large proportion of Indian households to rely on OOPE for financing healthcare. This heavy reliance on OOPE limits access to healthcare services, reduces the consumption of other necessities, and exposes households to impoverishment. Healthcare payments contribute significantly to poverty in India, pushing nearly 3-4% of the Indian population below the poverty line each year (Garg and Karan, 2009; Hooda, 2017a; Dhaka et al., 2018).

The Indian healthcare system is characterized by wide inter-state and rural-urban variations in terms of health infrastructure, manpower, public health spending, and service delivery (Niti Aayog, 2020; Jaysawal, 2015). For example, the Empowered Action Group (EAG) states in India often have poorer health indicators than the rest of the country, lagging behind in demographic transition and access to basic health facilities (Arokiasamy and Gautam, 2008;

Mohanty and Srivastava, 2013). Additionally, there are substantial disparities between rural and urban regions in India (Singh and Badaya, 2014; Jaysawal, 2015). Hooda (2017a) found that 50.6 million Indians were pushed below the poverty line due to OOPE, out of which, 42.7 million resided in rural areas and 7.9 million in urban areas. Thus, examining the burden of OOPE at the national level alone fails to capture sub-national differentials and the associated challenges, essential for a targeted policy response.

However, most of the studies examining the OOPE burden provide national level estimates for rural and urban areas (Selvaraj and Karan, 2009; Sangar et al., 2018; Goyanka et al., 2019) or are restricted to estimating the financial burden at the state level (Bonu et al., 2007; Ghosh, 2011; Pandey et al., 2018; Sangar et al., 2019; Mohanty and Dwivedi, 2021). Furthermore, only a few studies examined the intra-state rural-urban variations in the economic impact of OOPE, but these studies were limited to either estimating the impoverishment impact only or are based on the older datasets (Garg and Karan, 2009; Berman et al., 2010; Ladusingh and Pandey, 2013; Hooda, 2017a). Few other studies examined the OOPE burden in case of a few districts in Indian states of Haryana, Gujarat, and Uttar Pradesh (Gupta et al., 2016; Chowdhury et al., 2018). Effective efforts to reduce OOPE burden warrant both inter and intra-state analyses to inform evidence-based policy decisions towards achieving UHC goals.

Against this backdrop, this study provides a holistic assessment of the financial burden of OOPE at the national, state, and intra-state levels (rural and urban areas within each state). The analysis is bifurcated by the type of care sought, distinguishing between hospitalization and outpatient services, enabling a nuanced and detailed examination. Specifically, the current study is guided by following objectives. Firstly, we computed OOPE and determined the relative burden of each component (medicines, diagnostic tests, transportation costs, etc.) in total health expenditure. Secondly, as the financial burden varies substantially across the type of healthcare facility and place of treatment, we analysed the incidence of utilisation of public

and private health facilities, and place where the treatment was sought (i.e., domicile or non-domicile area). Thirdly, we estimated the burden of OOPE in terms of three parameters; the incidence and intensity of incurring catastrophic health expenditure (CHE), the incidence and intensity of impoverishment due to OOPE, and the incidence of using distressed sources to cope with OOPE. Fourth, we analysed the inequalities in the incidence of incurring CHE and distressed financing. Last, we examined the unmet health care needs (i.e. percentage of individuals who did not seek treatment) and percentage of individuals who did not seek treatment on medical advice and reasons for the same. This extensive and holistic assessment is expected to serve as a useful resource for policymakers to track where different states and rural-urban areas within each state are standing in terms of OOPE burden, where progress has been made, and which states and areas require a greater policy attention.

2.2 Data and Methodology

2.2.1 Overview of data source

The study employed data from the latest round of National Sample Survey (NSS) on health, titled "Household Social Consumption: Health," which was conducted during July 2017 to June 2018. This is a nationally representative survey that covered 555,115 individuals (3,25,883 in rural areas and 2,29,232 in urban areas) from 113,823 households (64,552 in rural areas and 49,271 in urban areas) across the country. The survey employed a stratified multi-stage sampling design, with village and urban blocks as the first unit and household as the second unit. The survey collected extensive information about nature of ailments, utilisation of healthcare facilities, cost of hospitalisation and outpatient care services, various sources employed to finance OOPE, and demographic and socio-economic characteristics of households and their members.

2.2.2 Outcome variables

The study assessed five main outcome variables, namely, mean OOPE, incidence and intensity of CHE, incidence and intensity of impoverishment due to OOPE, incidence of distressed financing, and unmet healthcare needs. All these measures were estimated for 30 geographical units in India, i.e., 29 states and all union territories (UTs) (combining all UTs, i.e., Delhi, Andaman and Nicobar Islands, Chandigarh, Lakshadweep, Puducherry, Dadra and Nagar Haveli and Daman and Diu), and separately for rural and urban areas within each geographical unit. To ensure comparability across geographical units, states were classified as larger and smaller states based on their population (Niti Aayog, 2020; Statistics Times, 2020). Below, we describe the methodology adopted to calculate the outcome variables.

2.2.2.1 Out-of-pocket health expenditure

The NSS health survey recorded total health expenditure separately for hospitalisation and outpatient care under three broad categories: medical, non-medical, and transportation expenditure. Medical expenditure included doctors' fees, expenses for medicines, diagnostic tests, bed charges, other medical expenses (attendant charges, physiotherapy, blood, etc.), and package component[1], and non-medical expenditure included expenses on registration, food, lodging, etc. OOPE was calculated by subtracting any reimbursement amount received from the total health expenditure incurred by a household. The recall period for hospitalisation expenditure was 365 days and for outpatient expenses, it was 15 days. OOPE for hospitalisation and outpatient care was converted into monthly figures and then aggregated to derive total OOPE for hospitalisation and/or outpatient care. Per person OOPE was defined as total OOPE incurred by a household divided by household size for each household.

[1] Package component includes expenses for various items used in surgical or non-surgical treatment, such as operation theatre (OT) charges, OT consumables, bed charges, costs of medicines, and doctors' fees. However, it does not cover expenses associated with physiotherapy, additional diagnostic tests, blood, oxygen, personal medical appliances, attendant charges, etc. The package component is commonly provided by private hospitals (GOI 2019).

2.2.2.2 Catastrophic health expenditure

2.2.2.2.1 Incidence of catastrophic health expenditure

A household is defined to incur CHE if OOPE exceeds a certain threshold of the household's total consumption expenditure (Berki, 1986; Wagstaff and Doorslaer, 2003).

$$CHE_i = \begin{cases} 1, if\ \dfrac{OOPE_i}{HCE_i} > \mathrm{Z} \\ 0, \quad otherwise \end{cases}$$

In the above equation, $OOPE_i$ is the monthly out-of-pocket health expenditure of i^{th} household, HCE_i is the monthly total consumption expenditure of i^{th} household, and Z is the threshold. In tandem with the SDG indicator 3.8.2 (WHO, 2023b), we estimated CHE at two thresholds: 10% and 25% (i.e., Z = 0.10 and Z = 0.25).

The proportion of households incurring CHE, i.e., incidence of CHE, was calculated using the following formula.

$$Incidence\ of\ CHE = \frac{1}{N}\sum_{i=1}^{N} CHE_i$$

In the above equation, N is defined as the total number of households in the sample.

2.2.2.2.2 Intensity of catastrophic health expenditure

The catastrophic overshoot, O (i.e., intensity of CHE) captures the average degree by which OOPE as a proportion of total consumption expenditure exceeds the threshold, Z (Wagstaff and Doorslaer, 2003; O'Donnell et al., 2008).

$$O = \frac{1}{N}\sum_{i=1}^{N} O_i$$

In the above equation, O_i is the overshoot of i^{th} household, i.e., $O_i = CHE_i * \left(\frac{OOPE_i}{HCE_i} - \mathrm{Z}\right)$ and N is the total number of households in the sample.

2.2.2.3 Impoverishment due to OOPE

The impoverishment impact of OOPE was measured using two indices, namely, poverty headcount ratio (as a measure of incidence of impoverishment) and normalized poverty gap (as an indicator of intensity of impoverishment) (Wagstaff and Doorslaer 2003; O'Donnell et al., 2008). We used the inflation-adjusted official state-wise poverty line for rural and urban areas separately as defined by the Tendulkar Committee (Planning commission, 2014) for measuring impoverishment due to OOPE.

2.2.2.3.1 Poverty headcount ratio

The pre-payment poverty headcount (HCR_{pre}) was calculated using the following formula.

$$HCR_{pre} = \frac{1}{M}\sum_{j=1}^{M} h_j^{pre}$$

In the above equation, $h_j^{pre} = \begin{cases} 1, & if\ HCE_j < PL \\ 0, & otherwise \end{cases}$, HCE_j is the monthly per capita consumption expenditure of j^{th} individual, PL is the poverty line, and M is the total number of individuals in the sample.

The post-payment poverty headcount (HCR_{post}) was calculated as below.

$$HCR_{post} = \frac{1}{M}\sum_{j=1}^{M} h_j^{post}$$

In the above equation, $h_j^{post} = \begin{cases} 1, & if\ (HCE_j - OOPE_j) < PL \\ 0, & otherwise \end{cases}$, $OOPE_j$ is the monthly per capita out-of-pocket health expenditure of j^{th} individual.

The proportion of individuals pushed below the poverty line due to OOPE was calculated using the following formula.

$$Poverty\ Headcount\ Ratio = HCR_{post} - HCR_{pre}$$

2.2.2.3.2 Poverty gap and Normalized poverty gap

The poverty gap measures the average amount by which individuals fall short of the poverty line.

The pre-payment poverty gap (G^{pre}) was computed as below.

$$G_{pre} = \frac{1}{M}\sum_{j=1}^{M} g_j^{pre}$$

In above equation, $g_j^{pre} = h_j^{pre} * \left(PL - HCE_j\right)$

The post-payment poverty gap (G_{post}) was calculated as below.

$$G_{post} = \frac{1}{M}\sum_{j=1}^{M} g_j^{post}$$

In above equation, $g_j^{post} = h_j^{post} * \left(PL - (HCE_j - \ OOPE_j)\right)$

The average shortfall from the poverty line due to OOPE was calculated using the following formula.

$$Poverty\ Gap = \ G_{post} - G_{pre}$$

To facilitate comparison of poverty gaps calculated for different poverty lines across states and rural and urban areas, we computed normalized poverty gap by dividing the poverty gap by the poverty line.

The pre-payment normalized poverty gap (NG_{pre}) was computed as below.

$$NG_{pre} = \frac{1}{M}\sum_{j=1}^{M} \frac{g_j^{pre}}{PL}$$

The post-payment normalized poverty gap (NG_{post}) was computed as below.

$$NG_{post} = \frac{1}{M}\sum_{j=1}^{M}\frac{g_j^{post}}{PL}$$

Normalized Poverty Gap was computed using the following formula.

$$\text{Normalized Poverty Gap} = NG_{post} - NG_{pre}$$

2.2.2.4 Incidence of using distressed sources

The NSS health survey collected information about various sources (household income/savings, borrowings, sale of physical assets, contributions from friends and relatives, and other sources) used to finance OOPE. We categorized a household as incurring distressed financing if it used any of these sources except household income or savings (Sangar et al., 2020). The proportion of households employing various sources of finance to cope with OOPE was calculated as follows.

$$I = \frac{1}{N}\sum_{i=1}^{N} n$$

In the above formula, I is the incidence of using a particular source of finance, n is the number of households using a particular source of finance, and N is the total number of households.

In case of hospitalization, NSS classified the various sources of finance as major and second major sources because households might have used more than one source in varying proportions. We have shown the percentage of households using distressed sources to finance hospitalization-related OOPE separately for major and second major sources and for both the sources combined.

2.2.3 Statistical analysis

Descriptive statistics, two-part model, and concentration index (CI) were employed in the analysis. Sample weights provided by the NSS were applied as applicable. The analysis was conducted using Stata Version 14.1.

2.2.3.1 Two-part model

A two-part model was employed to assess the socio-economic and demographic determinants of OOPE. This model is suitable when the outcome variable (i.e., OOPE) is skewed and contains a large number of zero values (Belotti et al., 2015). The first part describes the probability of a household to incur OOPE using a logit model. The second part of the model predicts the level of OOPE, conditional on non-zero value. OOPE is estimated using ordinary least square regression, and the dependent variable is the log of OOPE.

2.2.3.2 Concentration index

To measure the socio-economic inequality in occurrence of CHE and using distressed financing, we employed concentration index (CI), which is one of the most widely used methods of assessing health inequalities. The CI is defined by the following formula (O'Donnell et al., 2008).

$$CI = \frac{1}{\mu_h} 2cov(h_i, r_i)$$

In the above equation, r_i is the socio-economic rank of i^{th} household, as measured by monthly per capita consumption expenditure, h_i is the health outcome of i^{th} household, μ_h is the mean health.

CI varies between -1 and +1, where 0 represents equal distribution across socio-economic gradient, a negative value indicates concentration of health outcome among the poor, and a positive value indicates concentration of health outcome among the rich. The standard CI value breaches the range [-1, 1] in case of binary outcomes (Erreyger 2009; O'Donnell O et al., 2016); therefore, we employed the correction proposed by Erreyger for analysing binary outcomes (Erreyger 2009), as adopted by previous studies to measure the inequality in incidence of incurring CHE and using distressed sources (Barasa et al., 2017; Hernández-Vásquez et al., 2020).

2.3 Results

2.3.1 Out-of-pocket health expenditure

Supplementary Table 2.1 shows the average monthly OOPE of households by the type of care sought. In India, the average monthly OOPE was INR 235.4 for hospitalisation and INR 472.1 for outpatient care. The average monthly total OOPE was INR 707.5, varying from INR 84.2 in Meghalaya to INR 1931.2 in Kerala. Notably, in addition to high and medium income states (Kerala, Punjab, Maharashtra, Haryana, Himachal Pradesh, and Andhra Pradesh), poorer/EAG states[2] (Uttar Pradesh and West Bengal) reported OOPE higher than the national average, regardless of the type of care sought. Among the smaller states, Tripura (INR 619.0) reported the highest total OOPE, followed by Arunachal Pradesh (INR 607.6) and Goa (INR 520.5).

The average monthly OOPE was higher in urban areas than rural areas for both hospitalisation (INR 301.2 versus INR 203.4) and outpatient care (INR 580.0 versus INR 419.5), with 26/30 and 25/30 states/UTs reporting higher OOPE in urban areas than their rural counterparts, respectively (Supplementary Table 2.1). Similarly, the average monthly total OOPE was higher among urban households (INR 881.2) compared with rural households (INR 622.9), with intra-state variations as high as 3-times higher OOPE in urban households than rural households in UTs. In 27 out of 30 states/UTs, the average monthly total OOPE was higher in urban areas than rural areas.

Table 2.1 shows the results of the two-part model. The first part (logit regression) revealed that the likelihood of incurring OOPE was statistically significantly higher among households belonging to SCs, OBCs, and other social groups, having elderly member(s), following Islam, having insurance coverage, and larger family sizes in the case of both hospitalization and

[2] The government of India constituted the empowered action group (EAG) to ensure focused attention towards eight states (Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh, and Uttarakhand) with weak socio-demographic indices (GOI, 2012). These states are socio-economically backward, and lag in basic health infrastructure and health outcomes (Arokiasamy and Gautam, 2008; Mohanty and Srivastava, 2013)

outpatient care ($p < 0.05$). Additionally, in the case of outpatient care, households belonging to all economic quintiles were statistically significantly more likely to incur OOPE compared to those belonging to the poorest economic quintile ($p < 0.05$). By contrast, households primarily earning from other work and headed by members with higher educational status were less likely to incur OOPE compared with those earning from self-employment and headed by members who were not literate or lacked formal education, respectively, regardless of the type of care sought ($p < 0.05$). Households residing in rural areas were also less likely to incur OOPE compared to their urban counterparts in the case of outpatient care ($p < 0.05$). The results for the second part indicated that among the households incurring OOPE, those belonging to higher economic quintiles, other social groups, consisting of larger family size, having any elderly member in household, and headed by members having higher educational status were incurring higher OOPE, irrespective of the type of care sought ($p < 0.05$). Conversely, rural households were incurring lower OOPE compared to their urban counterparts in the case of both hospitalization and outpatient care ($p < 0.05$). Households primarily earning from casual work, following Islam, and having insurance coverage were associated with lower OOPE in the event of hospitalization ($p < 0.05$).

Table 2.1 Results of two-part model

Background characteristics	Hospitalization		Outpatient Care	
	Coefficient (Logit)	Coefficient (OLS)	Coefficient (Logit)	Coefficient (OLS)
Sector				
Urban areas ®				
Rural areas	0.01 [-0.04 - 0.06]	-0.36* [-0.42 - -0.31]	-0.16* [-0.24 - -0.07]	-0.23* [-0.31 - -0.15]
Economic quintiles				
Quintile 1 ®				
Quintile 2	-0.05 [-0.13 - 0.03]	0.15* [0.07 - 0.23]	0.14* [0.03 - 0.26]	0.10 [-0.02 - 0.23]
Quintile 3	0.03 [-0.06 - 0.11]	0.31* [0.22 - 0.40]	0.15* [0.04 - 0.27]	0.19* [0.06 - 0.31]
Quintile 4	0.03 [-0.06 - 0.11]	0.46* [0.37 - 0.54]	0.17* [0.06 - 0.29]	0.27* [0.15 - 0.39]
Quintile 5	0.05 [-0.04 - 0.14]	0.70* [0.61 - 0.79]	0.30* [0.18 - 0.43]	0.44* [0.31 - 0.57]
Major source of household income				
Self-employment ®				
Regular wage or salary	0.02 [-0.04 - 0.09]	0.02 [-0.05 - 0.08]	0.01 [-0.08 - 0.11]	0.06 [-0.04 - 0.15]
Casual labour	-0.10* [-0.16 - -0.04]	-0.20* [-0.26 - -0.13]	-0.09 [-0.18 - 0.002]	-0.06 [-0.15 - 0.04]
Others	-0.34* [-0.43 - -0.25]	0.03 [-0.08 - 0.15]	-0.19* [-0.32 - -0.06]	-0.06 [-0.20 - 0.08]
Social class				
Scheduled Tribes ®				
Scheduled Castes	0.27* [0.17 - 0.36]	0.30* [0.20 - 0.41]	0.17* [0.02 - 0.32]	0.09 [-0.08 - 0.25]
Other Backward Classes	0.19* [0.10 - 0.28]	0.47* [0.37 - 0.57]	0.18* [0.04 - 0.32]	0.13 [-0.02 - 0.29]
Others	0.18* [0.09 - 0.28]	0.61* [0.51 - 0.71]	0.19* [0.04 - 0.33]	0.19* [0.03 - 0.35]
Religion				
Hinduism ®				
Islam	0.16* [0.09 - 0.23]	-0.14* [-0.21 - -0.08]	0.16* [0.05 - 0.26]	0.003 [-0.10 - 0.11]
Others	0.09 [-0.02 - 0.21]	0.02 [-0.08 - 0.12]	0.15* [0.01 - 0.29]	0.07 [-0.08 - 0.22]

Education level of household head				
Not literate/No formal schooling ®				
Up to primary	0.06 [-0.01 - 0.13]	0.07* [0.0002 - 0.14]	0.10* [0.01 - 0.20]	0.01 [-0.10 - 0.11]
Up to secondary	0.05 [-0.01 - 0.12]	0.15* [0.08 - 0.21]	-0.01 [-0.10 - 0.09]	0.09 [-0.01 - 0.19]
Up to higher secondary	0.04 [-0.06 - 0.13]	0.24* [0.15 - 0.33]	-0.17* [-0.31 - -0.03]	0.30* [0.14 - 0.46]
Graduation and above	-0.12* [-0.22 - -0.02]	0.40* [0.30 - 0.50]	-0.17* [-0.32 - -0.03]	0.25* [0.11 - 0.39]
Presence of any elderly member in household				
No ®				
Yes	0.27* [0.21 - 0.32]	0.40* [0.34 - 0.45]	0.88* [0.80 - 0.95]	0.30* [0.22 - 0.37]
Gender of household head				
Male ®				
Female	-0.20* [-0.27 - -0.12]	-0.07 [-0.14 - 0.001]	0.03 [-0.08 - 0.14]	-0.18* [-0.29 - -0.06]
Household size				
Up to 4 members ®				
More than 4 members	0.67* [0.62 - 0.73]	0.18* [0.12 - 0.23]	0.23* [0.16 - 0.31]	0.22* [0.15 - 0.30]
Health insurance status				
Not Covered ®				
Covered	0.21* [0.14 - 0.28]	-0.21* [-0.27 - -0.15]	0.33* [0.23 - 0.43]	-0.09 [-0.19 - 0.01]

® denotes Reference category; *p < 0.05; The figures inside square brackets represent 95% confidence interval. Results are adjusted for state.

2.3.2 Share of various components in total health expenditure

Supplementary Figure 2.1 and 2.2 shows the share of various components in total health expenditure, separately for hospitalisation and outpatient care. Medicines constituted the largest share of total health expenditure in India and across majority of the states/UTs and rural-urban areas, irrespective of the type of care sought. In the event of hospitalisation in rural areas, the burden of medicines was the highest (26.4%), followed by other non-medical expenses (23.1%) and transportation expenditure (12.8%). By contrast, medicines (23.3%), other non-medical expenses (17.3%) and package component (14.2%) were the major components of total hospitalisation expenditure in urban areas. For outpatient care, medicines were the leading contributor to total health expenditure in both rural (65.1%) and urban areas (64.9%), followed by transportation expenditure in rural areas (11.9%) and doctors' fees in urban areas (13.2%). Notably, the share of transportation and non-medical expenses was higher in rural areas than urban areas, regardless of the type of care. Interestingly, among all states/UTs, Tamil Nadu reported the lowest share of expenditure on medicines in the case of both hospitalisation and outpatient care.

2.3.3 Utilisation of health facilities and place of seeking treatment

In India, 51.0% of hospitalisation episodes were reported at private health facilities compared to 49.0% in public health facilities, although significant variations were visible across Indian states/UTs (Supplementary Figure 2.3). For instance, in states such as Maharashtra, Telangana, Andhra Pradesh, Karnataka, and Punjab, more than 65% of hospitalisation episodes were recorded at private health facilities. In contrast, in Jammu and Kashmir, EAG states (Odisha, Madhya Pradesh, Chhattisgarh), Himachal Pradesh, Assam, West Bengal, and all smaller states, more than 65% of hospitalisation episodes were reported at public health facilities. Notably, outpatient care was overwhelmingly private, with nearly 70% of outpatient care sought at private health facilities. The incidence of utilisation of private health facilities was

higher in urban areas than rural areas in the case of both hospitalisation (60.9% versus 43.3%) and outpatient care (73.8% versus 67.5%). Intra-state variations ranged from a 5-fold higher utilisation of private health facilities in urban areas of Nagaland compared to their rural counterparts to a 1.4-fold higher utilisation of public health facilities in urban areas of Andhra Pradesh than their rural counterparts for outpatient care (Supplementary Figure 2.4).

Notably, individuals residing in rural areas sought hospitalisation in rural areas of their domicile district in only 26.0% of cases. In contrast, hospitalisation was sought in urban areas of their domicile district in 58.5% of cases, and in urban areas in different districts in 10.7% of cases. On the other hand, individuals residing in urban areas predominantly sought hospitalisation in urban areas of their domicile district only (85.0% of cases). Two EAG states (Jharkhand and Madhya Pradesh), Himachal Pradesh, Haryana, Arunachal Pradesh, and Punjab reported high incidence of hospitalisation sought in other states. Even in the case of outpatient care, individuals residing in rural areas sought care in urban areas of their domicile district in 37.1% of cases (Supplementary Figure 2.5 and 2.6).

2.3.4 Catastrophic health expenditure

2.3.4.1 Incidence of catastrophic health expenditure

In India, 4.9%, 11.3%, and 15.4% of households experienced CHE at 10% threshold due to OOPE for hospitalisation, outpatient care, and hospitalisation and/or outpatient care, respectively (Supplementary Table 2.2). The corresponding CHE incidence at 25% threshold was 2.0%, 5.2%, and 7.1%, respectively (Table 2.2). Substantial inter-state variations were observed; for instance, the CHE incidence (at 25% threshold) ranged from 0.7% in Meghalaya to 16.2% in Kerala in the case of hospitalisation and/or outpatient care. West Bengal and EAG states such as Uttar Pradesh, Odisha, and Jharkhand reported CHE incidence higher than the national average at both thresholds for outpatient care and hospitalisation and/or outpatient care. In addition, Kerala, Andhra Pradesh, Himachal Pradesh, and Maharashtra exhibited CHE

incidence higher than the national average at both thresholds, regardless of the type of care sought (Figure 2.1; Table 2.2; Supplementary Table 2.2).

At the national level, CHE incidence was higher in rural areas compared to urban areas at both thresholds, irrespective of the type of care sought (Table 2.2; Supplementary Table 2.2). For instance, the CHE incidence at 25% threshold was higher among rural households than urban households for hospitalization (2.1% vs. 1.8%), outpatient care (5.5% vs. 4.4%), and hospitalization and/or outpatient care (7.4% vs. 6.4%). Notably, the incidence of CHE varied substantially between rural and urban areas within states. For instance, in UTs, 3.9% of urban households experienced CHE (at 25% threshold) for hospitalisation and/or outpatient care, whereas only 1.1% of rural households incurred CHE. By contrast, the high CHE incidence in the state of Himachal Pradesh was largely attributable to high CHE among rural households (hospitalisation: 2.5%; outpatient care: 7.2%; hospitalisation and/or outpatient care: 9.7%), while urban households in the state reported one of the lowest CHE incidence (hospitalisation: 0.9%; outpatient care: 0.6%; hospitalisation and/or outpatient care: 1.8%) at 25% threshold. In 17/30, 21/30, and 18/30 states/UTs, the CHE incidence was higher in rural areas than urban areas for hospitalisation, outpatient care, and hospitalisation and/or outpatient care at 25% threshold.

Figure 2.1 Incidence of catastrophic health expenditure (%) across states/union territories at 10% threshold and by the type of care sought

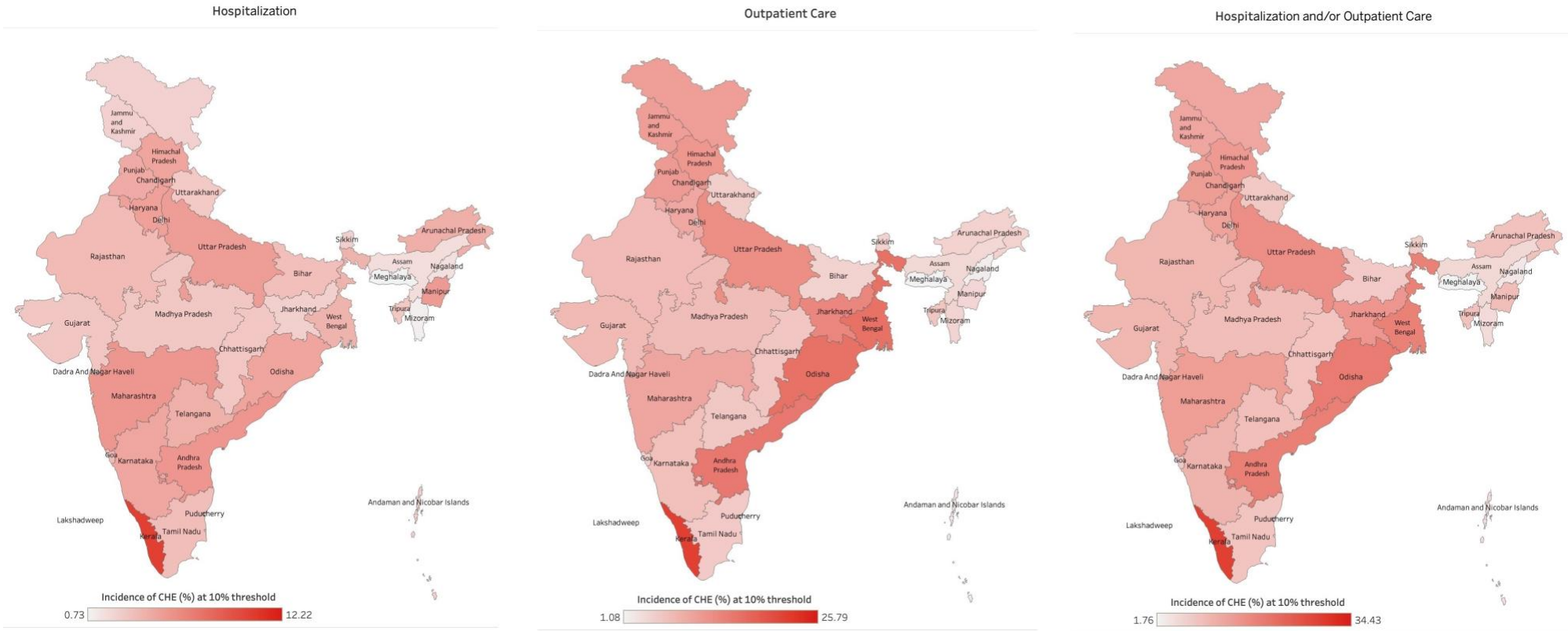


Table 2.2: Incidence of catastrophic health expenditure (%) at national, state, and intra-state level at 25% threshold

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	2.5 [2.1 - 3.0]	2.9 [2.2 - 3.6]	1.8 [1.2 - 2.5]	8.4 [7.5 - 9.2]	8.6 [7.5 - 9.7]	8.0 [6.7 - 9.4]	10.9 [10.0 - 11.9]	11.2 [9.9 - 12.4]	10.4 [8.9 - 11.9]
Assam	0.7 [0.4 - 0.9]	0.6 [0.3 - 0.9]	1.3 [0.6 - 2.0]	1.6 [1.2 - 2.0]	1.4 [1.0 - 1.9]	2.3 [1.4 - 3.2]	2.2 [1.8 - 2.7]	2.0 [1.5 - 2.6]	3.5 [2.3 - 4.6]
Bihar	1.2 [0.9 - 1.5]	1.2 [0.8 - 1.6]	1.0 [0.6 - 1.5]	2.9 [2.5 - 3.4]	3.1 [2.5 - 3.7]	1.7 [1.1 - 2.4]	4.2 [3.6 - 4.7]	4.3 [3.7 - 5.0]	2.9 [2.1 - 3.7]
Chhattisgarh	1.7 [1.2 - 2.2]	1.4 [0.8 - 1.9]	3.2 [2.1 - 4.2]	3.0 [2.4 - 3.6]	3.0 [2.2 - 3.7]	3.2 [2.2 - 4.2]	4.6 [3.8 - 5.4]	4.2 [3.2 - 5.1]	6.4 [4.9 - 7.8]
Gujarat	1.2 [0.8 - 1.5]	1.1 [0.6 - 1.6]	1.2 [0.8 - 1.6]	2.8 [2.3 - 3.3]	3.3 [2.5 - 4.1]	2.2 [1.6 - 2.8]	4.1 [3.5 - 4.7]	4.4 [3.5 - 5.3]	3.7 [2.9 - 4.4]
Haryana	1.9 [1.4 - 2.4]	1.6 [1.0 - 2.3]	2.3 [1.6 - 3.1]	3.6 [2.9 - 4.2]	3.9 [3.0 - 4.9]	2.9 [2.0 - 3.8]	5.5 [4.7 - 6.3]	5.3 [4.2 - 6.5]	5.8 [4.6 - 7.0]
Himachal Pradesh	2.3 [1.7 - 3.0]	2.5 [1.8 - 3.3]	0.9 [0.04 - 1.8]	6.3 [5.3 - 7.3]	7.2 [6.0 - 8.4]	0.6 [0.01 - 1.2]	8.7 [7.5 - 9.9]	9.7 [8.3 - 11.2]	1.8 [0.5 - 3.1]
Jammu and Kashmir	0.6 [0.4 - 0.9]	0.6 [0.2 - 0.9]	0.8 [0.3 - 1.3]	2.7 [2.2 - 3.3]	3.0 [2.3 - 3.8]	1.9 [1.1 - 2.6]	3.5 [2.9 - 4.2]	3.7 [2.8 - 4.5]	3.1 [2.1 - 4.0]
Jharkhand	1.2 [0.8 - 1.5]	1.0 [0.5 - 1.4]	1.8 [1.0 - 2.6]	7.3 [6.4 - 8.3]	8.0 [6.8 - 9.3]	4.7 [3.5 - 6.0]	8.4 [7.4 - 9.4]	9.0 [7.7 - 10.3]	6.6 [5.1 - 8.0]
Karnataka	2.0 [1.6 - 2.4]	2.2 [1.6 - 2.8]	1.6 [1.1 - 2.1]	3.3 [2.8 - 3.8]	3.8 [3.1 - 4.6]	2.6 [2.0 - 3.3]	5.3 [4.7 - 6.0]	6.2 [5.2- 7.1]	4.2 [3.4 - 5.0]
Kerala	4.9 [4.3 - 5.6]	5.3 [4.4 - 6.3]	4.4 [3.5 - 5.3]	11.1 [10.2 - 12.0]	12.2 [10.8 - 13.5]	9.8 [8.5 - 11.1]	16.2 [15.0 - 17.3]	17.5 [15.9 - 19.0]	14.6 [13.1 - 16.2]

Madhya Pradesh	1.4 [1.1 - 1.7]	1.4 [1.0 - 1.9]	1.4 [0.9 - 1.8]	4.1 [3.6 - 4.6]	4.0 [3.3 - 4.7]	4.3 [3.5 - 5.1]	5.4 [4.8 - 6.0]	5.2 [4.4 - 6.0]	6.0 [5.1 - 7.0]
Maharashtra	2.5 [2.2 - 2.8]	3.0 [2.4 - 3.5]	2.0 [1.6 - 2.4]	4.8 [4.3 - 5.2]	5.3 [4.6 - 6.0]	4.1 [3.5 - 4.6]	7.2 [6.6 - 7.7]	8.0 [7.1 - 8.8]	6.2 [5.6 - 6.9]
Odisha	2.4 [1.9 - 2.9]	2.5 [1.9 - 3.1]	1.8 [1.1 - 2.6]	9.5 [8.7 - 10.4]	10.1 [9.1 - 11.2]	6.7 [5.2 - 8.2]	11.8 [10.8 - 12.8]	12.5 [11.3 - 13.7]	8.7 [7.0 - 10.3]
Punjab	1.9 [1.4 - 2.4]	2.3 [1.6 - 3.0]	1.3 [0.8 - 1.9]	5.6 [4.8 - 6.3]	7.7 [6.4 - 8.9]	2.3 [1.6 - 3.1]	7.1 [6.2 - 7.9]	9.1 [7.8 - 10.5]	3.9 [3.0 - 4.8]
Rajasthan	1.7 [1.3 - 2.1]	1.9 [1.4 - 2.4]	1.1 [0.6 - 1.5]	4.4 [3.8 - 5.0]	4.5 [3.8 - 5.2]	4.2 [3.3 - 5.0]	5.8 [5.2 - 6.5]	6.1 [5.2 - 6.9]	5.2 [4.2 - 6.2]
Tamil Nadu	1.7 [1.4 - 2.0]	1.9 [1.4 - 2.3]	1.5 [1.1 - 1.9]	3.1 [2.7 - 3.5]	3.4 [2.8 - 4.0]	2.9 [2.3 - 3.4]	4.7 [4.2 - 5.2]	5.1 [4.3 - 5.8]	4.4 [3.7 - 5.1]
Telangana	1.8 [1.4 - 2.3]	2.1 [1.5 - 2.8]	1.4 [0.9 - 2.0]	2.7 [2.2 - 3.2]	3.9 [3.1 - 4.8]	1.3 [0.7 - 1.8]	4.4 [3.8 - 5.1]	5.4 [4.4 - 6.5]	3.3 [2.5 - 4.2]
Uttar Pradesh	2.8 [2.4 - 3.1]	2.8 [2.4 - 3.2]	2.6 [2.1 - 3.0]	6.9 [6.5 - 7.4]	7.0 [6.4 - 7.7]	6.7 [6.0 - 7.4]	9.5 [8.9 - 10.0]	9.6 [8.9 - 10.4]	9.1 [8.2 - 9.9]
Uttarakhand	1.2 [0.7 - 1.7]	1.2 [0.6 - 1.9]	1.0 [0.3 - 1.8]	2.0 [1.3 - 2.6]	1.5 [0.8 - 2.3]	3.1 [1.8 - 4.3]	3.3 [2.4 - 4.1]	2.9 [1.8 - 3.9]	4.3 [2.8 - 5.8]
West Bengal	1.9 [1.6 - 2.2]	1.9 [1.4 - 2.3]	2.0 [1.5 - 2.5]	7.7 [7.1 - 8.3]	7.2 [6.4 - 8.0]	8.9 [7.8 - 9.9]	9.8 [9.0 - 10.5]	9.2 [8.3 - 10.1]	11.0 [9.9 - 12.2]
Smaller States									
Arunachal Pradesh	1.0 [0.5 - 1.4]	1.1 [0.5 - 1.6]	0.6 [0.01 - 1.1]	3.9 [3.0 - 4.7]	3.8 [2.7 - 4.9]	4.2 [2.6 - 5.8]	4.8 [3.9 - 5.8]	4.9 [3.7 - 6.1]	4.7 [3.0 - 6.5]
Goa	1.8 [0.5 - 3.0]	0.5 [0.01 - 1.0]	2.5 [0.7 - 4.4]	1.1 [0.1 - 2.1]	1.3 [0.5 - 2.1]	1.0 [0.01 - 2.0]	3.7 [1.9 - 5.5]	2.0 [0.7 - 3.3]	4.7 [2.2 - 7.2]
Manipur	1.7 [1.2 - 2.2]	1.4 [0.8 - 2.1]	2.3 [1.4 - 3.1]	2.0 [1.5 - 2.5]	2.1 [1.3 - 2.8]	1.8 [1.1 - 2.6]	3.7 [3.0 - 4.5]	3.5 [2.6 - 4.5]	4.1 [3.0 - 5.2]
Meghalaya	0.2 [0.01 - 0.4]	0.2 [0.001 - 0.4]	0.5 [0.1 – 0.9]	0.4 [0.1 - 0.8]	0.5 [0.1 - 1.0]	0.1 [0.002 - 0.2]	0.7 [0.2 - 1.1]	0.7 [0.2 - 1.3]	0.7 [0.01 - 1.5]

Mizoram	0.2 [0.01 - 0.4]	0.3 [0.01 - 0.6]	0.1 [0.01 - 0.3]	2.4 [1.6 - 3.1]	2.7 [1.5 -3.9]	2.0 [1.0 - 3.0]	2.6 [1.8 - 3.4]	3.0 [1.7 - 4.3]	2.2 [1.2 - 3.1]
Nagaland	0.4 [0.1 - 0.8]	0.3 [0.01 - 0.6]	0.7 [0.01 - 1.4]	1.0 [0.4 - 1.5]	0.6 [0.1 - 1.1]	1.7 [0.5 - 3.0]	1.4 [0.7 - 2.0]	0.9 [0.3 - 1.6]	2.4 [0.9 - 3.9]
Sikkim	0.6 [0.1 - 1.2]	0.7 [0.1 - 1.4]	0.5 [0.01 - 1.0]	2.5 [1.4 - 3.6]	1.6 [0.6 - 2.6]	4.3 [1.4 - 7.2]	3.3 [2.1 - 4.6]	2.6 [1.4 - 3.9]	4.8 [1.8 - 7.8]
Tripura	1.0 [0.5 - 1.4]	1.0 [0.5 - 1.5]	0.8 [0.1 - 1.5]	4.0 [3.2 - 4.9]	4.5 [3.4 - 5.6]	2.5 [1.3 - 3.7]	5.0 [4.1 - 6.0]	5.5 [4.3 - 6.7]	3.5 [2.0 - 4.9]
Union Territories									
All Union Territories	1.0 [0.6 - 1.3]	0.6 [0.1 - 1.2]	1.0 [0.6 - 1.4]	2.7 [2.1 - 3.2]	0.5 [0.01 - 1.0]	2.9 [2.2 - 3.5]	3.6 [3.0 - 4.3]	1.1 [0.3 - 1.8]	3.9 [3.1 - 4.6]
India	2.0 [1.9 - 2.1]	2.1 [2.0 - 2.2]	1.8 [1.7 - 1.9]	5.2 [5.0 - 5.3]	5.5 [5.3 - 5.7]	4.4 [4.3 - 4.6]	7.1 [6.9 - 7.2]	7.4 [7.2 - 7.6]	6.4 [6.2 - 6.6]

The figures inside square brackets represent 95% confidence interval.

2.3.4.2 Inequality in the incidence of catastrophic health expenditure

Table 2.3 and Supplementary Table 2.3 shows the inequality in the incidence of CHE by type of care sought and place of residence. The statistically significant negative values of CI indicate the concentration of CHE incidence (at 25% threshold) among poor households for hospitalisation (CI: -0.003; $p<0.05$), outpatient care (-0.012; $p<0.05$), and hospitalisation and/or outpatient care (-0.015; $p<0.05$) (Table 2.3). In 6/30, 15/30, and 14/30 states/UTs, the CHE incidence was statistically significantly concentrated among the poor households for hospitalisation, outpatient care, and hospitalisation and/or outpatient care, respectively. By contrast, the CHE incidence was concentrated among the rich households in only one state/UTs (Jharkhand) for hospitalisation, in only 4 states/UTs (Gujarat, Rajasthan, Sikkim, and Nagaland) for outpatient care, and in two states/UTs (Jharkhand and Nagaland) for hospitalisation and/or outpatient care ($p<0.05$). In rural areas, the CHE incidence was concentrated among the rural-poor (rural-rich) in 4/30 (0/30), 11/30 (5/30), and 10/30 (3/30) states/UTs for hospitalisation, outpatient care, and hospitalisation and/or outpatient care, respectively ($p<0.05$). In contrast, in urban areas, the CHE incidence was concentrated among the urban-poor (urban-rich) in 6/30 (0/30), 9/30 (2/30), and 12/30 (1/30) states/UTs for hospitalisation, outpatient care, and hospitalisation and/or outpatient care, respectively. Similarly, the CHE incidence at 10% was concentrated among the poor for hospitalisation (-0.002; $p>0.05$), outpatient care (-0.008; $p<0.05$), and hospitalisation and/or outpatient care (-0.007; $p<0.05$), with 6/30 (2/30), 12/30 (3/30), and 14/30 (3/30) states/UTS reporting statistically significantly pro-poor (pro-rich) concentration of CHE, respectively (Supplementary Table 2.3).

Table 2.3: Inequality in the incidence of incurring catastrophic health expenditure (at 25% threshold) at national, state, and intra-state level

States/Union Territories	Hospitalisation			Outpatient Care			Hospitalization and/or Outpatient care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
	CI	CI	CI	CI	CI	CI	CI	CI	CI
Larger States									
Andhra Pradesh	-0.007	0.004	-0.011	-0.006	0.007	-0.016	-0.009	0.011	-0.026
Assam	0.002	0.001	-0.006	-0.007	-0.010	-0.013	-0.005	-0.008	-0.018
Bihar	-0.001	0.000	-0.005	-0.019*	-0.017*	-0.018*	-0.019*	-0.016*	-0.026*
Chhattisgarh	0.009	0.006	-0.026*	0.013	0.018*	-0.017	0.023	0.023*	-0.042*
Gujarat	0.000	0.001	-0.005	0.012*	0.038*	0.016*	0.013	0.037*	0.011
Haryana	-0.001	-0.007	-0.016	-0.034*	-0.056*	-0.001	-0.034*	-0.064*	-0.025
Himachal Pradesh	-0.012	-0.007	-0.013	-0.068*	-0.060*	0.006	-0.078*	-0.065*	-0.013
Jammu and Kashmir	-0.005	-0.007	-0.008	-0.017*	-0.007	-0.034*	-0.022*	-0.014	-0.041*
Jharkhand	0.009*	0.009	-0.011	0.021	0.049*	0.010	0.031*	0.058*	0.0001
Karnataka	-0.013*	-0.009	-0.011	-0.016*	-0.020*	-0.011	-0.030*	-0.027*	-0.026*
Kerala	-0.032*	-0.024*	-0.037*	-0.003	0.022	-0.024	-0.038*	0.004	-0.073*
Madhya Pradesh	0.001	0.004	-0.007	-0.010	-0.020*	0.013	-0.006	-0.012	0.003
Maharashtra	-0.017*	-0.016*	-0.011*	-0.028*	-0.029*	-0.015*	-0.039*	-0.037*	-0.026*
Odisha	0.007	0.012	-0.003	-0.028*	-0.019	-0.010	-0.020	-0.007	-0.012
Punjab	-0.005	-0.0004	-0.003	-0.072*	-0.063*	-0.042*	-0.071*	-0.063*	-0.044*
Rajasthan	-0.006	-0.005	-0.001	0.015*	0.032*	-0.018	0.006	0.020	-0.016
Tamil Nadu	-0.006	-0.004	-0.007	-0.021*	-0.009	-0.030*	-0.026*	-0.013	-0.036*
Telangana	-0.014*	-0.002	-0.024*	-0.017*	0.030*	-0.022*	-0.031*	0.010	-0.052*
Uttar Pradesh	0.002	0.008	-0.019*	0.002	0.013	-0.050*	0.000	0.016	-0.070*
Uttarakhand	-0.008	-0.010	-0.001	-0.005	0.006	-0.048*	-0.012	-0.005	-0.047*

West Bengal	0.002	0.004	-0.001	0.010	0.004	-0.004	0.010	0.002	-0.007
Smaller States									
Arunachal Pradesh	-0.014*	-0.014*	-0.009	0.004	0.003	0.000	-0.011	-0.011	-0.009
Goa	-0.009	0.004	-0.024	0.003	0.017	0.002	0.007	0.008	0.001
Manipur	-0.002	-0.006	-0.006	-0.019*	-0.026*	0.006	-0.022*	-0.032*	-0.004
Meghalaya	0.002	0.000	-0.003	-0.012*	-0.014*	-0.003	-0.009	-0.014*	0.000
Mizoram	0.000	0.004	-0.001	-0.035*	-0.065*	-0.005	-0.035*	-0.061*	-0.006
Nagaland	-0.002	-0.001	-0.011	0.022*	0.011	0.048*	0.021*	0.011	0.036*
Sikkim	-0.012	-0.015*	-0.010	0.033*	0.010	0.029	0.020	-0.004	0.019
Tripura	0.003	0.005	-0.001	-0.034*	-0.043*	-0.010	-0.031*	-0.038*	-0.012
Union Territories									
All Union Territories	-0.009*	-0.009	-0.009*	-0.030*	0.008	-0.035*	-0.039*	0.002	-0.045*
India	-0.003*	0.003	-0.012*	-0.012*	-0.0002	-0.026*	-0.015*	0.001	-0.038*

CI: Erreyger concentration index (CI). *$p < 0.05$

2.3.4.3 Intensity of catastrophic health expenditure

The intensity of CHE at 10% threshold was 0.9% due to hospitalisation, 2.3% due to outpatient care, and 3.2% due to hospitalization and/or outpatient care (Supplementary Table 2.4). The corresponding CHE intensity at 25% threshold was 0.4%, 1.1%, and 1.6%, respectively (Supplementary Table 2.5). Similar to the CHE incidence, the intensity of CHE was high in poorer/EAG states (West Bengal, Uttar Pradesh, Odisha, and Jharkhand) and in a few relatively well-off states (such as Kerala, Andhra Pradesh, Himachal Pradesh, and Maharashtra, and Punjab) at both thresholds, irrespective of the type of care sought. Moreover, the intensity of CHE was higher in rural areas than urban areas at both thresholds, regardless of the type of care sought, and a similar pattern was observed across many states/UTs.

2.3.5 Impoverishment due to OOPE

2.3.5.1 Poverty headcount ratio

In India, the poverty headcount ratio was 1.7% due to hospitalisation, 3.7% due to outpatient care, and 5.3% due to hospitalization and/or outpatient care (Table 2.4). Poorer/EAG states were ranked among the top seven larger states with poverty headcount ratios higher than the national average in the case of hospitalisation (Uttar Pradesh: 2.1%; Odisha: 2.0), outpatient care (West Bengal: 6.1; Uttar Pradesh: 6.0%, Odisha: 4.9%; Jharkhand: 4.4%), and hospitalization and/or outpatient care (Uttar Pradesh: 8.0%; West Bengal: 7.5%; Odisha: 6.5%; Jharkhand: 5.4%). Notably, a few relatively well-off states such as Kerala, Andhra Pradesh, and Himachal Pradesh also witnessed poverty headcount ratios higher than the national average, irrespective of the type of care sought. Among the smaller states, the poverty headcount ratio spanned from 0.7% in Mizoram to 3.4% in Arunachal Pradesh in case of hospitalization and/or outpatient care.

A higher percentage of rural population was pushed below the poverty line due to OOPE compared with urban population in the case of hospitalisation (1.9% versus 1.3%), outpatient

care (4.2% versus 2.5%), and hospitalization and/or outpatient care (5.9% versus 3.8%) (Table 2.4). The rural-urban divide was starkly visible, with the poverty headcount ratio higher in rural areas in 23/30, 24/30, and 22/30 states/UTs in case of hospitalisation, outpatient care, and hospitalization and/or outpatient care, respectively.

Table 2.4 Poverty headcount ratio (%) at national, state, and intra-state level

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	2.2 [2.0 - 2.5]	2.5 [2.2 - 2.8]	1.6 [1.3 - 1.9]	4.6 [4.3 - 4.9]	4.9 [4.5 - 5.4]	3.8 [3.4 - 4.3]	6.5 [6.1 - 6.9]	7.0 [6.5 - 7.5]	5.3 [4.8 - 5.9]
Assam	0.8 [0.7 - 1.0]	0.9 [0.7 - 1.0]	0.6 [0.4 - 0.8]	2.6 [2.3 - 2.8]	2.7 [2.4 - 2.9]	1.9 [1.5 - 2.3]	3.4 [3.1 - 3.6]	3.5 [3.2 - 3.8]	2.3 [1.9 - 2.8]
Bihar	1.6 [1.5 - 1.7]	1.7 [1.5 - 1.9]	0.8 [0.6 - 1.0]	2.5 [2.3 - 2.7]	2.6 [2.3 - 2.8]	1.7 [1.4 - 2.0]	4.0 [3.8 - 4.3]	4.2 [3.9 - 4.5]	2.5 [2.1 - 2.8]
Chhattisgarh	1.0 [0.8 - 1.1]	0.9 [0.7 - 1.1]	1.2 [0.9 - 1.5]	1.2 [1.0 - 1.4]	1.0 [0.8 - 1.2]	2.0 [1.7 - 2.4]	2.2 [1.9 - 2.4]	1.8 [1.6 - 2.1]	3.7 [3.2 - 4.2]
Gujarat	1.1 [1.0 - 1.2]	1.4 [1.1 - 1.6]	0.7 [0.5 - 0.8]	1.4 [1.3 - 1.6]	1.5 [1.3 - 1.7]	1.3 [1.1 - 1.5]	2.5 [2.3 - 2.7]	2.8 [2.5 - 3.1]	2.0 [1.7 - 2.3]
Haryana	1.9 [1.7 - 2.1]	1.2 [1.0 - 1.4]	3.2 [2.8 - 3.6]	3.3 [3.0 - 3.6]	4.0 [3.6 - 4.4]	1.8 [1.5 - 2.1]	5.1 [4.7 - 5.4]	5.0 [4.6 - 5.5]	5.1 [4.6 - 5.7]
Himachal Pradesh	1.7 [1.4 - 1.9]	1.8 [1.5 - 2.1]	0.3 [0.01 - 0.5]	3.9 [3.5 - 4.3]	4.3 [3.8 - 4.7]	0.9 [0.5 - 1.4]	5.4 [5.0 - 5.9]	5.9 [5.3 - 6.4]	1.6 [1.0 - 2.2]
Jammu and Kashmir	0.7 [0.5 - 0.8]	0.7 [0.5 - 0.8]	0.6 [0.5 - 0.8]	2.5 [2.2 - 2.7]	3.0 [2.7 - 3.3]	0.6 [0.4 - 0.8]	3.1 [2.8 - 3.3]	3.5 [3.2 - 3.9]	1.4 [1.2 - 1.7]
Jharkhand	1.0 [0.9 - 1.2]	0.9 [0.7 - 1.1]	1.8 [1.4 - 2.1]	4.4 [4.1 - 4.8]	4.7 [4.3 - 5.1]	3.3 [2.8 - 3.7]	5.4 [5.0 - 5.8]	5.5 [5.1 - 5.9]	5.0 [4.4 - 5.6]
Karnataka	1.9 [1.7 - 2.1]	2.4 [2.1 - 2.7]	1.0 [0.8 - 1.2]	1.9 [1.7 - 2.1]	2.3 [2.1 - 2.6]	1.2 [0.9 - 1.4]	3.9 [3.7 - 4.2]	5.0 [4.6 - 5.4]	2.2 [1.9 - 2.4]
Kerala	3.0 [2.8 - 3.3]	3.5 [3.1 - 3.8]	2.4 [2.1 - 2.8]	5.4 [5.1 - 5.7]	6.5 [6.0 - 6.9]	4.0 [3.6 - 4.4]	8.2 [7.8 - 8.6]	9.6 [9.1 - 10.2]	6.4 [5.9 - 6.9]
Madhya Pradesh	1.6 [1.5 - 1.8]	1.8 [1.6 - 2.0]	1.1 [0.9 - 1.3]	2.8 [2.6 - 3.0]	3.0 [2.7 - 3.2]	2.2 [1.9 - 2.4]	4.4 [4.2 - 4.6]	4.8 [4.4 - 5.1]	3.3 [3.0 - 3.7]

Maharashtra	2.2 [2.0 - 2.3]	2.6 [2.4 - 2.8]	1.6 [1.5 - 1.8]	3.2 [3.0 - 3.4]	4.1 [3.9 - 4.4]	2.0 [1.8 - 2.2]	5.2 [4.9 - 5.4]	6.3 [6.0 - 6.7]	3.6 [3.4 - 3.8]
Odisha	2.0 [1.8 - 2.2]	2.2 [1.9 - 2.4]	1.3 [1.0 - 1.7]	4.9 [4.6 - 5.2]	5.1 [4.8 - 5.5]	3.7 [3.2 - 4.2]	6.5 [6.2 - 6.9]	6.8 [6.4 - 7.2]	5.1 [4.5 - 5.7]
Punjab	1.7 [1.5 - 1.8]	2.1 [1.8 - 2.4]	0.9 [0.7 - 1.1]	3.6 [3.4 - 3.9]	5.0 [4.5 - 5.4]	1.4 [1.2 - 1.7]	4.4 [4.1 - 4.7]	5.9 [5.4 - 6.4]	2.1 [1.8 - 2.4]
Rajasthan	1.6 [1.4 - 1.7]	1.8 [1.6 - 2.0]	0.8 [0.7 - 1.0]	2.9 [2.7 - 3.1]	3.2 [3.0 - 3.5]	1.7 [1.5 - 2.0]	4.1 [3.9 - 4.4]	4.5 [4.2 - 4.9]	2.7 [2.4 - 3.1]
Tamil Nadu	1.2 [1.1 - 1.4]	1.7 [1.5 - 1.9]	0.7 [0.5 - 0.8]	2.6 [2.4 - 2.8]	3.9 [3.6 - 4.2]	1.1 [0.9 - 1.3]	3.8 [3.6 - 4.0]	5.5 [5.1 - 5.8]	1.9 [1.6 - 2.1]
Telangana	1.4 [1.2 - 1.6]	2.2 [1.8 - 2.5]	0.6 [0.4 - 0.8]	2.5 [2.3 - 2.8]	4.0 [3.5 - 4.4]	0.9 [0.7 - 1.1]	4.0 [3.7 - 4.3]	5.8 [5.3 - 6.3]	1.9 [1.5 - 2.2]
Uttar Pradesh	2.1 [2.0 - 2.2]	2.1 [2.0 - 2.3]	2.0 [1.8 - 2.1]	6.0 [5.8 - 6.2]	6.3 [6.0 - 6.5]	5.0 [4.8 - 5.3]	8.0 [7.8 - 8.2]	8.3 [8.0 - 8.6]	6.9 [6.6 - 7.2]
Uttarakhand	1.3 [1.1 - 1.6]	1.5 [1.1 - 1.8]	0.9 [0.6 - 1.3]	1.1 [0.9 - 1.3	0.6 [0.4 - 0.9]	2.4 [1.9 - 2.9]	2.4 [2.1 - 2.7]	2.0 [1.7 - 2.4]	3.4 [2.7 - 4.0]
West Bengal	1.6 [1.5 - 1.8]	1.8 [1.6 - 2.0]	1.2 [1.0 - 1.4]	6.1 [5.8 - 6.3]	6.7 [6.3 - 7.1]	4.6 [4.2 - 4.9]	7.5 [7.2 - 7.8]	8.2 [7.8 - 8.6]	5.8 [5.4 - 6.2]
Smaller States									
Arunachal Pradesh	0.9 [0.7 - 1.1]	0.8 [0.6 - 1.0]	1.9 [1.4 - 2.4]	2.5 [2.2 - 2.8]	2.4 [2.0 - 2.8]	3.0 [2.4 - 3.7]	3.4 [3.0 - 3.8]	3.1 [2.7 - 3.6]	4.9 [4.1 - 5.8]
Goa	1.9 [1.3 - 2.5]	1.3 [0.5 - 2.1]	2.3 [1.4 - 3.1]	0.5 [0.2 - 0.8]	0.7 [0.1 - 1.2]	0.4 [0.04 - 0.7]	2.2 [1.6 - 2.9]	1.8 [0.8 - 2.7]	2.5 [1.7 - 3.4]
Manipur	1.5 [1.3 - 1.7]	1.1 [0.9 - 1.4]	2.4 [2.0 - 2.7]	0.6 [0.5 - 0.8]	0.6 [0.4 - 0.8]	0.8 [0.5 - 1.0]	2.1 [1.9 - 2.4]	1.7 [1.4 - 2.0]	2.9 [2.5 - 3.4]
Meghalaya	0.3 [0.2 - 0.5]	0.4 [0.2 - 0.6]	0.1 [0.01 - 0.3]	0.4 [0.3 - 0.6]	0.5 [0.3 - 0.7]	0.1 [0.0 - 0.3]	0.8 [0.6 - 1.0]	0.9 [0.6 - 1.2]	0.2 [0.0 - 0.3]
Mizoram	0.3 [0.2 - 0.5]	0.6 [0.3 - 0.8]	0	0.4 [0.2 - 0.5]	0.1 [0.0 - 0.1]	0.8 [0.5 - 1.0]	0.7 [0.5 - 0.9]	0.6 [0.4 - 0.9]	0.8 [0.5 - 1.1]
Nagaland	0.8 [0.6 - 1.0]	1.0 [0.7 - 1.3]	0.4 [0.1 - 0.6]	0.01 [0.01 - 0.02]	0.01 [0.01 - 0.2]	0	0.8 [0.6 - 1.0]	1.0 [0.7 - 1.3]	0.4 [0.1 - 0.6]

Sikkim	1.9 [1.5 - 2.4]	2.0 [1.5 - 2.6]	1.5 [0.5 - 2.4]	1.3 [0.9 - 1.7]	1.6 [1.2 - 2.1]	0.2 [0.1 - 0.3]	3.1 [2.5 - 3.6]	3.5 [2.8 - 4.1]	1.6 [0.7 - 2.6]
Tripura	0.9 [0.7 - 1.1]	0.9 [0.7 - 1.2]	0.6 [0.3 - 0.9]	1.7 [1.4 - 2.0]	2.0 [1.7 - 2.4]	0.3 [0.1 - 0.5]	2.7 [2.3 - 3.0]	3.1 [2.7 - 3.6]	0.8 [0.5 - 1.2]
Union Territories									
All Union Territories	0.6 [0.5 - 0.7]	0.6 [0.3 - 0.8]	0.6 [0.5 - 0.8]	3.0 [2.7 - 3.2]	1.2 [0.8 - 1.5]	3.1 [2.8 - 3.4]	3.7 [3.4 - 4.0]	1.8 [1.4 - 2.2]	3.8 [3.5 - 4.2]
India	1.7 [1.7 - 1.7]	1.9 [1.8 - 1.9]	1.3 [1.2 - 1.3]	3.7 [3.6 - 3.7]	4.2 [4.1 - 4.2]	2.5 [2.5 - 2.6]	5.3 [5.2 - 5.3]	5.9 [5.8 - 5.9]	3.8 [3.7 - 3.9]

The figures inside square brackets represent 95% confidence interval.

2.3.5.2 Normalized poverty gap

In India, the normalized poverty gap was 0.8%, 1.7%, and 2.4% due to hospitalisation, outpatient care, and hospitalization and/or outpatient care, respectively (Supplementary Table 2.6). Similar to poverty headcount ratio, the normalized poverty gap was higher in poorer/EAG states (such as Odisha, Uttar Pradesh, Jharkhand, and West Bengal) and in a few relatively well-off states (such as Kerala, Andhra Pradesh, Maharashtra, and Himachal Pradesh), irrespective of the type of care sought. Among the smaller states, the intensity of impoverishment spanned from 0.2% in Meghalaya to 2.4% in Arunachal Pradesh in case of hospitalization and/or outpatient care. The normalized poverty gap was higher in rural areas compared with urban areas in the case of hospitalisation (0.9% versus 0.5%), outpatient care (2.0% versus 1.0%), and hospitalization and/or outpatient care (2.8% versus 1.6%), with a similar pattern observed in majority of the states/UTs (Supplementary Table 2.6).

2.3.6 Distressed financing

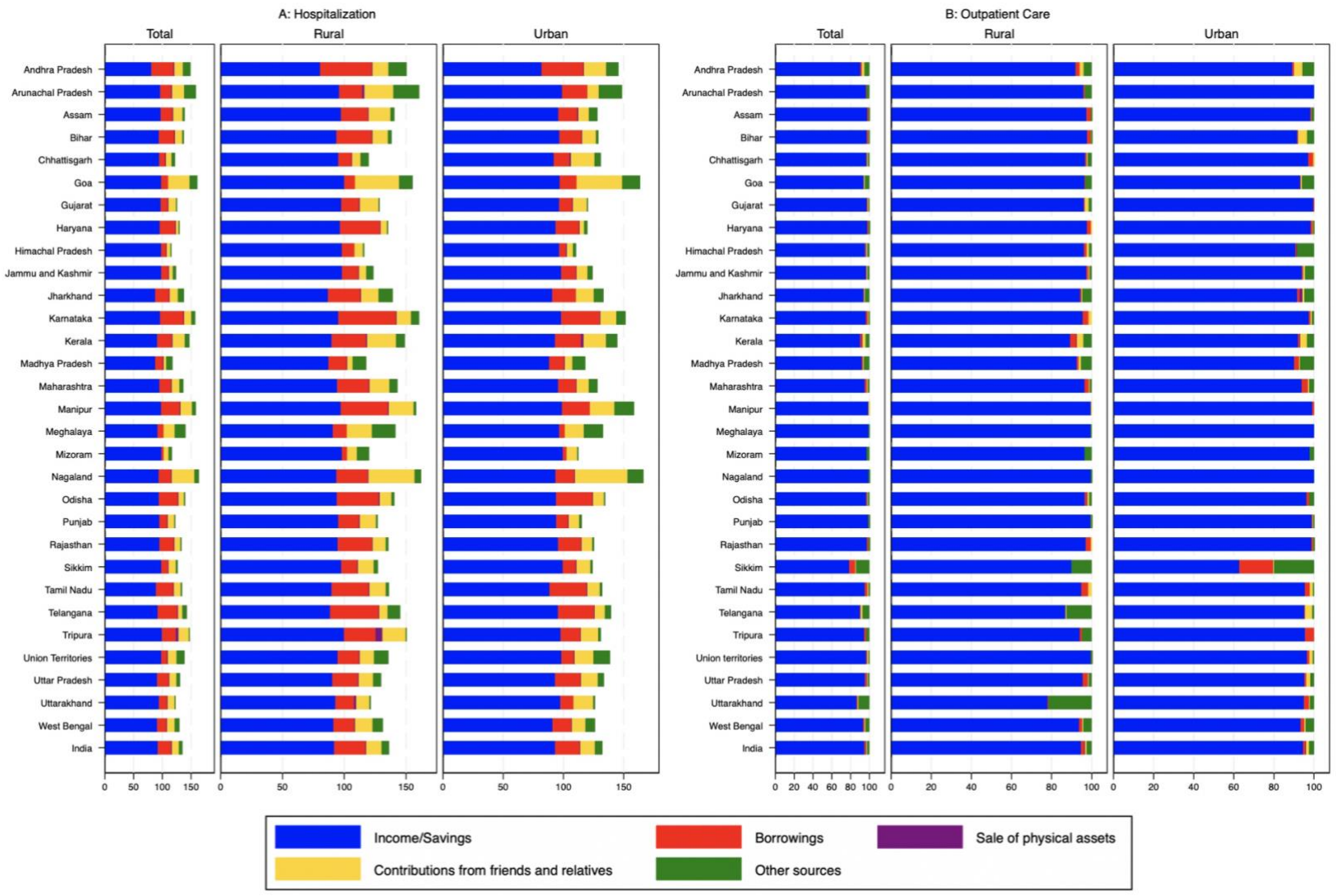
2.3.6.1 Incidence of distressed financing

In India, majority of households primarily relied on income/savings as the primary source to finance hospitalization-related OOPE (83.8%) and outpatient care (94.6%) (Supplementary Figure 2.7), and the incidence of using distressed sources as the first major source of finance was relatively low (hospitalization: 16.2% and outpatient care: 5.4%) (Supplementary Figure 2.7). However, among 26,442 households who reported using a second major source to finance hospitalization-related OOPE, 77.9% relied on distressed sources (Supplementary Figure 2.8). Overall, 40.6% of households relied on distressed financing, either as primary or secondary source, to cover OOPE for hospitalization (Supplementary Table 2.7). In states such as Andhra Pradesh and Karnataka (belonging to larger state group) and Nagaland, Arunachal Pradesh, Manipur, and Goa (belonging to smaller state group), more than 50% of households resorted to distressed sources (either as major or second major source) to cope with the cost of

hospitalisation. Borrowings (23.8%) and contributions from friends and relatives (12.3%) were the most common distressed sources for financing OOPE for hospitalization in India and across majority of the states/UTs (Figure 2.2).

The incidence of using distressed sources as a major source to finance OOPE for hospitalization was higher in rural areas (16.9%) than urban areas (14.5%) (Supplementary Figure 2.7), whereas the usage of distressed financing as a second major source was slightly higher in urban areas (78.5%) compared with their rural counterparts (77.7%) (Supplementary Figure 2.8). Overall, the incidence of distressed financing (either as major or second major source) was higher in rural areas (41.9%) than in urban areas (37.6%), with 23/30 states/UTs reporting a higher reliance on distressed financing in rural areas. (Supplementary Table 2.7). In India, 25.4%, 12.4%, 6.0%, and 0.5% of rural households relied on borrowings, contributions from friends and relatives, other sources, and sale of physical assets, respectively, to finance OOPE on hospitalisation. The corresponding incidence among urban households was 20.4%, 12.1%, 6.3%, and 0.5%, respectively. In case of outpatient care, the incidence of distressed financing was nearly 5% in both rural and urban households (Figure 2.2).

Figure 2.2 Share of various sources of finance used as coping strategies at national, state, and intra-state level



2.3.6.2 Inequality in the incidence of using distressed financing

Supplementary Table 2.8 shows the inequality in using distressed sources to finance OOPE for hospitalization. The incidence of distressed financing was concentrated among the poor households for hospitalization (CI: -0.031; $p<0.05$). This trend was observed in the majority of the states/UTs, with 19/30 states/UTs reporting statistically significantly pro-poor concentration of distressed financing. In only two states (Manipur and Chhattisgarh), the incidence of distressed financing was concentrated among the rich households ($p<0.05$). In rural areas, the incidence of distressed financing was concentrated among the poor in 11/30 states/UTs and among the rich in 5/30 states/UTs ($p<0.05$). Conversely, in urban areas, the incidence of distressed financing was concentrated among the poor in 16/30 states/UTs and among the rich in only 2/30 states/UTs ($p<0.05$).

2.3.7 Percentage of ailing individuals who did not seek treatment

Of all the individuals who reported having an ailment during the last 15 days prior to the survey date, 1.8% of ailing individuals did not seek treatment (Supplementary Figure 2.9). The incidence of not seeking treatment was higher in rural areas (2.2%) than urban areas (0.9%). Additionally, 10.8% of ailing individuals did not seek treatment on medical advice during the last 15 days, varying from 10.6% in rural areas to 11.2% in urban areas (Supplementary Figure 2.10). The primary reason for not seeking treatment on medical advice was that the ailment was not considered severe (73.5% of cases), followed by other reasons (10.8% of cases). In 2.4% of cases, individuals reported financial reasons (i.e., expensive facilities) for not seeking treatment on medical advice, ranging from 2.7% in rural areas to 1.5% in urban areas. On the other hand, in 6.7% of cases, the non-availability of medical facilities in neighbourhood was reported as a reason for not seeking treatment on medical advice. This issue was more prevalent in rural areas, where 8.7% of cases did not seek treatment on medical advice due to

unavailability of medical facilities, compared to urban areas, where only 1.1% reported this issue (Supplementary Figure 2.11).

2.4 Discussion

To the best of our knowledge, this is the first study examining all three indicators of financial hardship due to OOPE (CHE, impoverishment, and distressed financing) at national, state, and intra-state levels in India. The financial burden was evaluated separately based on the type of care sought i.e., hospitalization, outpatient care, and hospitalization and/or outpatient care. Additionally, the study analysed the inequality in terms of occurrence of CHE incidence and distressed financing across states/UTs and rural and urban areas within each state/UT. The unmet healthcare needs were also estimated. The chapter highlights marked inter and intra-state disparities, with copiously higher economic burden in poorer states and in few of the relatively well-off states, and rural areas.

In concord with previous studies (Garg and Karan, 2009; Ladusingh and Pandey, 2013; Hooda, 2017a), we found a disproportionately higher burden of CHE and impoverishment in poorer states such as states belonging to the EAG group (Uttar Pradesh, Odisha, and Jharkhand) and West Bengal. In poorer states, a larger proportion of the population is concentrated near the poverty line, and consequently, even a small OOPE pushes a higher proportion of the population into poverty (Garg and Karan, 2009). Furthermore, health insurance enrollment has remained persistently low in EAG states like Bihar, Madhya Pradesh, Jharkhand, and Uttar Pradesh from 2004 to 2018, contributing to inadequate financial risk protection (Aashima and Rajesh, 2023a). The lowest average per capita public health expenditure (National Health Profile, 2019) in the EAG states, coupled with underutilization of allocated funds, further aggravates the situation (Srivastava et al., 2022). For instance, merely 55% of allocated

National Rural Health Mission (NRHM)3 funds were utilized during 2015–2016 and 2016–2017 in Bihar, partly due to delays in the release from the state treasuries to frontline facilities (Srivastava et al., 2022). Furthermore, in line with a recent study (Arora et al., 2020), we found that Jharkhand (7.2%) and Madhya Pradesh (5.3%) reported one of the highest incidence of hospitalisation sought in other states. According to a study, over 70% of patients revealed lack of required facilities in their home state and out-of-state referral (20%) as prominent reasons for seeking cross-border care; a situation resulting in higher transportation costs as well as treatment deferral or follow-up abandonment in certain cases (Arora et al., 2020).

In line with previous studies (Berman et al., 2010; Pandey et al., 2018; Sangar et al., 2019), we also found higher OOPE and the associated financial burden (CHE and impoverishment) in a few relatively well-off states such as Kerala, Andhra Pradesh, Maharashtra, and Himachal Pradesh, regardless of the type of care sought. All these states belong to the higher-middle and highest epidemiological transition levels, characterized by a higher burden of non-communicable diseases (NCDs) and injuries than communicable, maternal, neonatal, and nutritional diseases (Dandona et al., 2017). The treatment cost of NCDs is colossal (Verma et al., 2021), given their chronic nature, which demands multiple outpatient visits, diagnostic tests, and long-term drug assistance (Selvaraj et al., 2018; Mukherjee and Chaudhuri, 2020). Moreover, much of the NCD-related care in India is delivered via the private health sector, further exacerbating the costs (Patel et al., 2011; IHME and PFHI, 2018). The high financial burden in Kerala is also attributable to the highest proportion of elderly people (16.5%) (NSO, 2021) and ailing individuals (24.5%) in the state (GOI, 2019). Consequently, there is a higher utilization of healthcare services and, correspondingly, a greater financial burden.

[3] In 2005, NRHM was initiated to bridge the rural-urban divide and provide equitable, affordable, and quality healthcare to the rural population throughout the country, with a special emphasis on 18 states (EAG states, North Eastern States, Jammu and Kashmir, and Himachal Pradesh), which have weak health indicators and/or weak infrastructure (National Health Mission, 2022a). In 2013, National Urban Health Mission was launched to cater to the healthcare needs of urban areas as well, particularly slum dwellers and other marginalised groups (National Health Mission, 2022b).

Although OOPE was higher in urban areas, the financial hardships due to OOPE were conspicuously more perturbing in rural areas, in tandem with previous studies (Garg and Karan, 2009; Ladusingh and Pandey, 2013; Hooda, 2017a; Goyanka et al., 2019). For instance, in 17/30, 23/30, and 23/30 states/UTs, the incidence of CHE (at 25% threshold), impoverishment, and distressed financing, respectively, were higher in rural areas than urban areas in the event of hospitalisation. In India, the rural healthcare system is blighted by inadequate public health facilities (for instance, 29% shortfall in primary health centres), paucity of personnel, especially specialists (for instance, shortage of 80% specialists at the community health centres) (GOI, 2021), and accessibility constraints. The situation is particularly worrisome in rural areas of EAG states (Bihar, Uttar Pradesh, and Jharkhand), and West Bengal, which report a severe deficit of public health facilities (GOI, 2021). All this translates into higher utilisation of private health facilities and concomitant financial risks, or relying on informal untrained practitioners providing poor quality of care, or even worse, treatment abstinence (IMS Institute for Healthcare Informatics, 2013; Ngangbam and Roy, 2019). After the implementation of NRHM, progress has been made; however, substantial gaps persist in both physical infrastructure and manpower, along with poor availability of drugs and equipment (Hooda, 2017b; GOI, 2021). This underscores the urgent need for policy attention and a substantial, sustained investment in the public health system to enhance the utilization of healthcare services and augment financial risk protection.

According to the two-part model, insured households showed a higher likelihood of incurring OOPE and a lower OOPE (conditional on having health spendings) compared to the uninsured in the event of hospitalization. This reflects an increase in the utilization of inpatient services as well as lower OOPE among the insured than the uninsured. In India, a majority of the insured population is enrolled under government-sponsored health insurance (GSHI) schemes, and previous studies have reported that GSHI schemes have improved the utilization of inpatient

services (Prinja et al., 2017; Reshmi et al., 2021; Aashima and Rajesh, 2023b). Furthermore, studies have shown mixed results regarding the financial protection provided by the GSHI schemes (Prinja et al., 2017; Reshmi et al., 2021). A recent study found that GSHI schemes provide marginal financial protection to insured households against hospitalization-related OOPE (Ranjan et al., 2018; Aashima and Rajesh, 2023b). In India, health insurance enrolment is abysmally low, covering a mere 14% of rural and 19% of urban population in 2018 (GOI 2019). Inadequate awareness regarding various facets of health insurance, such as eligibility criteria, where and how to enrol, details about empanelled hospitals, and how to avail oneself of benefits, result in less than the desired coverage and benefits (Devadasan et al. 2013; Hooda 2020; Prinja et al. 2017; Thakur 2016; Ahlin et al., 2016; Aashima and Rajesh, 2023a;2023b). Moreover, GSHI schemes mainly cover the poor and vulnerable population, and social health insurance schemes cover only organized sector employees, and thus, a substantial portion of the Indian population is left with the choice to either arrange private health insurance (constrained by the ability-to-pay premium) or to remain uninsured (NITI Aayog, 2021). Therefore, it is imperative to raise awareness and uptake of health insurance, and increase the affordability of health insurance products, especially for the 'missing-middle' population.

Additionally, we observed that health insurance was not associated with lower OOPE among the insured households than uninsured ones for outpatient care. This is because most of the health insurance schemes in India cover only low-volume, high-value hospitalisation costs, excluding outpatient care from the ambit of insurance coverage (Selvaraj and Karan, 2012; Hooda 2020). Outpatient services put more financial strain on households (CHE incidence at 10% threshold: 11.3%, Poverty Headcount ratio: 3.7%) in comparison to inpatient services (CHE incidence at 10% threshold: 4.9%, Poverty Headcount ratio: 1.7%). The financial burden of outpatient care can be attributed to frequent visits, relatively small but continued expenditure, and a heavy reliance on the private health sector (Berman et al., 2010; Mukherjee

and Chaudhuri, 2020). Therefore, the exclusion of outpatient care from the scope of health insurance is inadequate in preventing the financial burden. However, even the recently launched GSHI scheme, i.e., Pradhan Mantri Jan Arogya Yojana in 2018, has excluded outpatient services from its scope, which is a key contributor to financial hardships.

Although India enjoys the distinction of being the "Pharmacy of the Global South" (Selvaraj et al., 2018), medicines alone constitute the largest share of health expenditure in India (>25% in case of hospitalisation; >65% in case of outpatient care), and across majority of states/UTs and rural-urban areas. The unavailability of free or subsidized essential medicines and drugs at public health facilities forces households to buy them from open markets, resulting in higher OOPE and financial burden, or "the lower ability-to-pay" inhibits access to life-saving drugs (Maiti et al., 2015; Srivastava et al., 2022). Several lessons can be imbibed from successful state government initiatives, for instance, we found the burden of medicine was one of the lowest in Tamil Nadu, which is attributable to Tamil Nadu Medical Services Corporation ensuring availability of essential drugs in all government health facilities via an efficient and transparent procurement, storage, and distribution system (Singh et al., 2012). At the national level, providing quality generic medicines at affordable prices (50-90% cheaper than market rates) through Jan Aushadhi Kendras is a laudable initiative to curb expenditure on medicines (GOI, 2022). However, due to the dominance of private health facilities, which generally recommend branded drugs, timely revision of National Essential List of Medicines with appropriate price controls is essential to prevent illicit profiteering by pharmaceutical industry and private health sector (Hooda, 2017b).

Moreover, the non-medical and transportation expenditures often go unnoticed, but we found that they are equally burdensome, especially for rural households (>35% in hospitalisation; >20% in outpatient care). We found that in nearly 70% of hospitalisation cases and 40% of outpatient care incidence, individuals residing in rural areas sought care in urban areas of their

domicile or non-domicile districts. In India, healthcare services and manpower are highly skewed towards urban areas, for instance, 71% of India's rural population has access to mere 37% of all beds in public hospitals and 36% of all health workers (Karan et al., 2019; Srivastava et al., 2022). This forces rural households to travel long distances to seek medical care - a situation that has two negative repercussions: 1) substantial travelling and lodging expenses 2) loss of earnings due to travel. Furthermore, studies have reported poor health infrastructure and unavailability of diagnostic tests as prime reasons for medical travel (Arul and Babu, 2017; Engel et al., 2015). This underscores the importance of a robust primary healthcare system, ensuring that individuals receive comprehensive and quality care, spanning health promotion, prevention, treatment, rehabilitation, and palliative care, as closely as possible to their everyday environment (WHO, 2023a). In this regard, the government's aim to create 1,50,000 health and wellness centres by transforming existing sub-health centres and primary health centres to deliver comprehensive primary health care is a laudable step (National Health Portal, 2022).

2.5 Conclusion

The chapter highlights significant inter and intra-state disparities, with a substantial financial burden of OOPE in poorer states and in few of the relatively-well off states, in rural areas, and a pro-poor concentration of CHE and distressed financing. These disparities highlight the need to devise state-specific policies in tandem with contextual differences and concerted efforts to bridge the rural-urban divide. There is pressing need to increase public health expenditure, strengthen public healthcare facilities, and regulate pricing in the private health sector to augment financial risk protection. Effective efforts to ensure affordability of essential medicines and drugs are warranted across a majority of states/UTs in India. Moreover, it is crucial to address key barriers to healthcare access, including inadequate infrastructure and shortages and inefficient distribution of qualified health workers, to improve accessibility to healthcare services and reduce non-medical and transportation expenditure related to medical

travel. Also, health insurance coverage for hospitalisation is insufficient to safeguard against financial burden, particularly in a scenario where outpatient expenses exert higher financial strain than inpatient expenses and the rising prevalence of NCDs require frequent outpatient visits. Therefore, considering outpatient services under the purview of health insurance coverage is essential. Lastly, dismally low health insurance enrolment in India calls for policy measures to increase awareness and uptake of health insurance.

2.6 References

Aashima & Sharma R. 2023a. Inequality and disparities in health insurance enrolment in India. Journal of Medicine Surgery and Public Health 1:100009.

Aashima & Sharma R. 2023b. Is health insurance really benefitting Indian population? Evidence from a nationally representative sample survey. The International Journal of Health Planning and Management.

Ahlin T, Nichter M, Pillai G. 2016. Health insurance in India: what do we know and why is ethnographic research needed. Anthropology & medicine 23(1):102-24.

Arokiasamy, P., & Gautam, A. (2008). Neonatal mortality in the empowered action group states of India: trends and determinants. Journal of biosocial science,40(2),183-201.

Arora, A., Bhutani, P., Chhabra, S., & Smith, O. (2020). PM-JAY without borders: Analysis of Portability Services. Available: https://pmjay.gov.in/sites/default/files/2020-02/Policy%20Brief%205_Analysis%20of%20Portability%20Services.pdf

Arul, U., & Babu S. 2017. Domestic medical tourism in rural India: sociological perspective. J Res Dev (Srinagar),5(4),51-54.

Bakshi, H., Sharma, R., & Kumar, P. 2018. Ayushman bharat initiative (2018): What we stand to gain or lose!. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine,43(2),63.

Barasa EW, Maina T, Ravishankar N. 2017. Assessing the impoverishing effects, and factors associated with the incidence of catastrophic health care payments in Kenya. International journal for equity in health, 16(1):1-4.

Belotti F, Deb P, Manning WG, Norton EC. 2015. Twopm: Two-part models. The Stata Journal 15: 3–20.

Berki, S. E. 1986. A look at catastrophic medical expenses and the poor. Health affairs, 5(4), 138-145.

Berman, P., Ahuja, R., & Bhandari, L. 2010. The impoverishing effect of healthcare payments in India: new methodology and findings. Economic and Political Weekly,65-71.

Bonu, S., Bhushan, I., & Peters, D. 2007. Incidence, intensity, and correlates of catastrophic out-of-pocket health payments in India.

Bonu, S., Bhushan, I., Rani, M., & Anderson, I. 2009. Incidence and correlates of 'catastrophic'maternal health care expenditure in India. Health policy and planning,24(6),445-456.

Chowdhury, S., Gupta, I., Trivedi, M., & Prinja, S. 2018. Inequity & burden of out-of-pocket health spending: District level evidences from India. The Indian journal of medical research,148(2),180.

Dandona, L., Dandona, R., Kumar, G. A., Shukla, D. K., Paul, V. K., Balakrishnan, K., ... & Thakur, J. S. 2017. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. The Lancet,390(10111),2437-2460.

Dhaka, R., Verma, R., Agrawal, G., & Kumar, G. 2018. Ayushman Bharat Yojana: A memorable health initiative for Indians. Int J Community Med Public Health,5,3152-3.

Engel, N., Ganesh, G., Patil, M., Yellappa, V., Pant Pai, N., Vadnais, C., & Pai, M. 2015. Barriers to point-of-care testing in India: results from qualitative research across different settings, users and major diseases. PLoS One,10(8),e0135112.

Erreygers G. 2009. Correcting the concentration index. J Health Econ 28(2):504–515. https://doi.org/10.1016/j.jhealeco.2008.02.003

Garg, C. C., & Karan, A. K. 2009. Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Health policy and planning,24(2),116-128.

Ghosh, S. 2011. Catastrophic payments and impoverishment due to out-of-pocket health spending. Economic and Political Weekly,63-70.

Government of India (GOI). 2012. NRHM, Health & Population Policies. Ministry of Health and Family Welfare, Government of India. Available: https://main.mohfw.gov.in/sites/default/files/CHAPTER%202.pdf.

Government of India (GOI). 2019. Key indicators of social consumption in India: Health. Ministry of Statistics & Programme Implementation, National Statistical Office. Available: https://www.mospi.gov.in/documents/213904/301563//KI_Health_75th_Final160210117871 2.pdf/1edceec8-a4af-f357-b675-837e015ae20c.

Government of India (GOI). 2021. Rural Health Statistics 2020-2021. Government of India, Ministry of Health and Family Welfare, Statistics Division. Available: https://main.mohfw.gov.in/sites/default/files/rhs20-21_1.pdf

Government of India (GOI). 2022. Quality generic medicines at affordable prices. Pharmaceuticals & Medical Devices Bureau of India, Department of Pharmaceuticals, Government of India. Available: http://janaushadhi.gov.in/index.aspx. Accessed: July 20, 2022.

Goyanka, R., Garg, C. C., & Prasad, S. 2019. Impoverishment Due to Out-of-pocket Health Expenditures: Measurement and Comparison Across Different Surveys in India. Indian Journal of Human Development,13(2),121-134.

Gupta, I., Chowdhury, S., Prinja, S., & Trivedi, M. 2016. Out-of-pocket spending on out-patient care in India: assessment and options based on results from a district level survey. PLoS One,11(11),e0166775.

Hernández-Vásquez A, Rojas-Roque C, Vargas-Fernández R, & Rosselli D. 2020. Measuring out-of-pocket payment, catastrophic health expenditure and the related socioeconomic inequality in Peru: a comparison between 2008 and 2017. Journal of Preventive Medicine and Public Health, 53(4):266

Hooda, S. K. 2017a. Out-of-pocket payments for healthcare in India: who have affected the Most and why?. Journal of Health Management,19(1),1-15.

Hooda, S. K. 2017b. Health payments and household well-being: How effective are health policy interventions?. Economic & Political Weekly,52(16),54-65.

IMS Institute for Healthcare Informatics. 2013. Understanding Healthcare Access in India.

Institute for Health Metrics and Evaluation (IHME) and Public Health Foundation of India (PHFI). 2018. Health Service Provision in Andhra Pradesh and Telangana: Assessing Facility Capacity, Costs of Care, and Patient Perspectives. Seattle, WA: IHME and PHFI.

Jaysawal, D. 2015. Rural health system in India: A review. International Journal of Social Work and Human Services Practice,29-37.

Karan, A., Negandhi, H., Nair, R., Sharma, A., Tiwari, R., & Zodpey, S. (2019). Size, composition and distribution of human resource for health in India: new estimates using National Sample Survey and Registry data. BMJ open,9(4),e025979.

Kumar, K., Singh, A., Kumar, S., Ram, F., Singh, A., Ram, U., ... & Kowal, P. R. 2015. Socio-economic differentials in impoverishment effects of out-of-pocket health expenditure in China and India: evidence from WHO SAGE. PloS one,10(8),e0135051.

Kumar, V., & Singh, P. 2016. Access to healthcare among the Empowered Action Group (EAG) states of India: Current status and impeding factors. The National medical journal of India,29(5),267.

Ladusingh, L., & Pandey, A. 2013. Health expenditure and impoverishment in India. Journal of Health Management,15(1),57-74.

Maiti, R., Bhatia, V., Padhy, B. M., & Hota, D. 2015. Essential medicines: an Indian perspective. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine,40(4),223.

Mohanty, S. K., & Dwivedi, L. K. 2021. Addressing data and methodological limitations in estimating catastrophic health spending and impoverishment in India, 2004–18. International journal for equity in health,20(1),1-18.

Mohanty, S. K., & Kastor, A. 2017. Out-of-pocket expenditure and catastrophic health spending on maternal care in public and private health centres in India: a comparative study of pre and post national health mission period. Health Economics Review,7(1),1-15.

Mohanty, S. K., & Srivastava, A. 2013. Cost and utilisation of hospital based delivery care in empowered action group (EAG) states of India. Maternal and child health journal,17(8),1441-1451.

Mukherjee, S., & Chaudhuri, A. 2020. Outpatient care and expenses: Can they be ignored in health insurance programmes.

National Health Authority. 2022. Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana. Available: https://pmjay.qcin.org/pm-jay . Accessed: July 20, 2022.

National Health Mission. 2022a. National Rural Health Mission. Ministry of Health and Family Welfare, Government of India. Available: https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=969&lid=49

National Health Mission. 2022b. National Urban Health Mission. Ministry of Health and Family Welfare, Government of India. Available: https://nhm.gov.in/index1.php?lang=1&level=1&sublinkid=970&lid=137. Accessed: July 20, 2022.

National Health Policy. 2017. Ministry of Health and Family Welfare, Government of India. Available: https://www.nhp.gov.in//NHPfiles/national_health_policy_2017.pdf.

National Health Portal. 2022. Ayushman Bharat - Health and Wellness Centre. Ministry of Health and Family Welfare, Government of India Available: http://ab-hwc.nhp.gov.in/ . Accessed: July 20, 2022.

National Health Profile. 2019. Government of India. Available http://www.cbhidghs.nic.in/showfile.php?lid=1147.

National Health Systems Resource Centre. 2019. National Health Accounts Estimates for India (2016-17). New Delhi: Ministry of Health and Family Welfare, Government of India. Available: https://nhsrcindia.org/sites/default/files/2021-06/FINAL%20National%20Health%20Accounts%202016-17%20Nov%202019-for%20Web%20%281%29.pdf .

National Portal of India. 2022. Rashtriya Swasthya Bima Yojana. Available: https://www.india.gov.in/spotlight/rashtriya-swasthya-bima-yojana. Accessed: July 20, 2022.

Ngangbam, S., & Roy, A. K. 2019. Determinants of health-seeking behaviour in Northeast India. Journal of Health Management,21(2),234-257.

Niti Aayog. 2020. Healthy States, Progressive India: Health Index Round IV 2019-20. Available: https://www.niti.gov.in/sites/default/files/2021-12/NITI-WB_Health_Index_Report_24-12-21.pdf

NSO. 2021. Elderly in India. National Statistical Office, Ministry of Statistics & Programme Implementation, Government of India, New Delhi. Available: https://www.mospi.gov.in/documents/213904/301563/Elderly%20in%20India%202021162798514462 6.pdf/a4647f03-bca1-1ae2-6c0f-9fc459dad64c.

O'Donnell, Owen; van Doorslaer, Eddy; Wagstaff, Adam; Lindelow, Magnus. 2008. Analyzing Health Equity Using Household Survey Data : A Guide to Techniques and Their Implementation. © Washington, DC: World Bank. http://hdl.handle.net/10986/6896 License: CC BY 3.0 IGO

O'Donnell O, O'Neill S, Van Ourti T, & Walsh B. 2016. Conindex: estimation of concentration indices. The Stata Journal 16(1):112-138

Pandey, A., Kumar, G. A., Dandona, R., & Dandona, L. 2018. Variations in catastrophic health expenditure across the states of India: 2004 to 2014. PLoS One,13(10),e0205510.

Patel, V., Chatterji, S., Chisholm, D., Ebrahim, S., Gopalakrishna, G., Mathers, C., ... & Reddy, K. S. 2011. Chronic diseases and injuries in India. The Lancet,377(9763),413-428.

Planning Commission. 2014. Report of the expert group to review the methodology for measurement of poverty. Available: https://niti.gov.in/planningcommission.gov.in/docs/reports/genrep/pov_rep0707.pdf.

Rezaei, S., & Hajizadeh, M. 2019. Measuring and decomposing socioeconomic inequality in catastrophic healthcare expenditures in Iran. Journal of Preventive Medicine and Public Health,52(4),214.

Sangar, S., Dutt, V., & Thakur, R. 2018. Economic burden, impoverishment and coping mechanisms associated with out-of-pocket health expenditure: analysis of rural-urban differentials in India. Journal of Public Health,26(5),485-494.

Sangar, S., Dutt, V., & Thakur, R. 2019. Economic burden, impoverishment, and coping mechanisms associated with out-of-pocket health expenditure in India: A disaggregated analysis at the state level. The International journal of health planning and management,34(1),e301-e313.

Sangar, S., Dutt, V., & Thakur, R. 2020. Coping with out-of-pocket health expenditure in India: evidence from NSS 71st round. Global Social Welfare,7(3),275-284.

Selvaraj, S., & Karan, A. K. 2009. Deepening health insecurity in India: evidence from national sample surveys since 1980s. Economic and political weekly,55-60.

Selvaraj, S., & Karan, A. K. 2012. Why publicly-financed health insurance schemes are ineffective in providing financial risk protection. Economic and Political Weekly,60-68.

Selvaraj, S., Farooqui, H. H., & Karan, A. 2018. Quantifying the financial burden of households' out-of-pocket payments on medicines in India: a repeated cross-sectional analysis of National Sample Survey data, 1994–2014. BMJ open,8(5),e018020.

Singh, P. V., Tatambhotla, A., Kalvakuntla, R. R., & Chokshi, M. 2012. Replicating Tamil Nadu's drug procurement model. Economic and Political Weekly,47(39),26-29.

Singh, S., & Badaya, S. 2014. Health care in rural India: A lack between need and feed. South Asian journal of cancer,3(02),143-144.

Srivastava, S., Karan, A. K., Bhan, N., Mukhopadhya, I., & World Health Organization. 2022. India: health system review. Health Systems in Transition,11(1).

Statistics Times. 2020. List of Indian states by population. Available: https://statisticstimes.com/demographics/india/indian-states-population.php.

United Nations Development Programme (UNDP). 2022. Goal 3: Good Health and Well-Being. United Nations Development Programme. Available: https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw9e6SBhB2EiwA5myr9uiGZfMo0bJcdr_CwHw4cE6_TIMEdupc3L_816AMWbjZEY-ElPW93BoC6YYQAvD_BwE#good-health. Accessed: June 1, 2022.

Verma, V. R., Kumar, P., & Dash, U. 2021. Assessing the household economic burden of non-communicable diseases in India: evidence from repeated cross-sectional surveys. BMC public health,21(1),1-22.

Wagstaff, A. 2005. The bounds of the concentration index when the variable of interest is binary, with an application to immunization inequality. Health economics,14(4),429-432.

Wagstaff A and Doorslaer EV. 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. Health economics 12(11): 921-933.

WHO. 2019a. Global Health Expenditure Database 2019. https://apps.who.int/nha/database/country_profile/Index/en Accessed: 6 January, 2022.

WHO. 2023a. Primary health care. https://www.who.int/health-topics/primary-health-care#tab=tab_3 Accessed: January 5, 2023

WHO. 2023b. Catastrophic out-of-pocket health spending (SDG indicator 3.8.2 and regional indicators where available). https://www.who.int/data/gho/data/themes/topics/indicator-

groups/indicator-group-details/GHO/catastrophic-out-of-pocket-health-spending-sdg-indicator-3-8-2- Accessed: January 5, 2023

WHO. 2021. Tracking Universal Health Coverage: 2021 Global Monitoring Report. https://www.who.int/data/monitoring-universal-health-coverage Accessed: April 27, 2022.

Xu, K., Evans, D. B., Kawabata, K., Zeramdini, R., Klavus, J., & Murray, C. J. (2003). Household catastrophic health expenditure: a multicountry analysis. The lancet,362(9378),111-117.

2.7 Appendix (Supplementary Tables and Figures)

Supplementary Table 2.1 Average monthly out-of-pocket health expenditure (OOPE) across states/union territories and rural and urban areas within each state/union territory

States/ Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	247.6 [202.3 - 293.0]	227.3 [184.8 - 269.7]	289.4 [188.2 - 390.6]	618.3 [564.3 - 672.3]	522.1 [468.6 - 575.5]	815.9 [699.8 - 932.1]	865.9 [790.6 - 941.3]	749.3 [676.6 - 822.0]	1105.4 [940.4 - 1270.3]
Assam	90.3 [57.8 - 122.8]	66.6 [44.3 – 89.0]	235.1 [97.8 - 372.5]	199.6 [158.8 - 240.4]	178.2 [131.0 - 225.3]	330.8 [244.8 - 416.8]	289.9 [236.4 - 343.4]	244.8 [191.7 - 297.9]	566.0 [398.4 - 733.5]
Bihar	104.9 [87.4 - 122.5]	100.4 [81.8 - 119.0]	140.7 [87.9 - 193.6]	186.4 [157.8 - 215.1]	176.9 [147.0 - 206.9]	262.0 [173.8 - 350.3]	291.4 [256.8 - 325.9]	277.3 [240.8 - 313.9]	402.8 [299.0 - 506.6]
Chhattisgarh	200.2 [101.1 - 299.3]	196.1 [58.5 - 333.7]	217.2 [147.6 - 286.8]	178.1 [146.4 - 209.9]	142.7 [109.2 - 176.1]	326.8 [249.1 - 404.5]	378.3 [271.3 - 485.4]	338.8 [194.0 - 483.6]	544.0 [429.7 - 658.2]
Gujarat	190.8 [155.5 - 226.0]	158.7 [107.0 - 210.5]	232.7 [184.4 - 281.1]	336.1 [302.7 - 369.4]	246.5 [210.1 - 283.0]	453.5 [396.8 - 510.1]	526.8 [476.5 - 577.2]	405.3 [338.8 - 471.8]	686.2 [609.8 - 762.6]
Haryana	315.2 [262.8 - 367.6]	246.7 [190.7 - 302.7]	431.1 [332.8 - 529.3]	470.3 [404.9 - 535.6]	408.6 [338.7 - 478.5]	574.6 [452.0 - 697.1]	785.4 [696.7 - 874.2]	655.3 [557.8 - 752.8]	1005.6 [842.4 - 1168.9]
Himachal Pradesh	311.9 [225.9 - 397.9]	333.8 [233.0 - 434.6]	168.3 [49.6 - 287.1]	713.6 [557.8 - 869.5]	753.6 [571.0 - 936.2]	451.8 [234.7 - 668.9]	1025.5 [840.3 - 1210.7]	1087.4 [870.6 - 1304.2]	620.1 [358.0 - 882.3]
Jammu and Kashmir	136.2 [102.3 - 170.0]	106.4 [78.4 - 134.3]	227.9 [139.0 - 316.8]	325.5 [290.0 - 361.0]	321.4 [278.3 - 364.5]	338.2 [272.6 - 403.8]	461.7 [411.3 - 512.2]	427.8 [375.1 - 480.4]	566.1 [452.2 - 680.0]
Jharkhand	139.8 [96.0 - 183.6]	99.5 [56.6 - 142.5]	285.0 [173.3 - 396.8]	543.6 [463.6 - 623.7]	479.7 [389.5 - 570.0]	774.0 [602.2 - 945.7]	683.4 [589.3 - 777.6]	579.3 [475.6 - 683.0]	1059.0 [849.7 - 1268.3]
Karnataka	212.1 [178.0 - 246.3]	180.9 [147.3 - 214.4]	256.2 [192.3 - 320.1]	249.8 [221.4 - 278.2	221.1 [185.9 - 256.4]	290.2 [243.9 - 336.6]	461.9 [414.7 - 509.2]	402.0 [351.8 - 452.3]	546.4 [461.1 - 631.8]
Kerala	685.4 [600.7 - 770.2]	701.1 [587.8 - 814.3]	666.9 [539.4 - 794.5]	1245.8 [1136.2 - 1355.3]	1229.7 [1094.7 - 1364.7]	1264.9 [1087.3 - 1442.5]	1931.2 [1782.6 - 2079.9]	1930.7 [1735.7 - 2125.7]	1931.8 [1703.7 - 2159.8]

Madhya Pradesh	155.2 [126.3 - 184.1]	139.2 [106.4 - 171.9]	201.5 [142.7 - 260.3]	345.9 [295.4 - 396.4]	287.7 [226.2 - 349.2]	513.8 [421.3 - 606.4]	501.1 [437.9 - 564.2]	426.9 [353.4 - 500.3]	715.4 [591.5 - 839.2]
Maharashtra	319.6 [278.8 - 360.4]	262.4 [217.6 - 307.3]	388.2 [319.6 - 456.7]	496.9 [454.9 - 539.0]	384.1 [340.2 - 428.0]	632.4 [560.3 - 704.4]	816.5 [754.7 - 878.4]	646.5 [580.0 - 713.0]	1020.5 [915.9 - 1125.2]
Odisha	168.3 [133.8 - 202.9]	158.6 [120.0 - 197.2]	217.6 [137.3 - 297.8]	393.8 [359.9 - 427.6]	375.3 [336.4 - 414.2]	487.5 [417.0 - 557.9]	562.1 [510.0 - 614.2]	533.9 [474.8 - 593.0]	705.0 [591.0 - 819.1]
Punjab	353.0 [285.0 - 420.9]	362.3 [269.6 - 455.1]	338.5 [237.4 - 439.5]	679.0 [573.3 - 784.7]	719.7 [543.7 - 895.6]	616.3 [522.9 - 709.6]	1032.0 [896.9 - 1167.1]	1082.0 [867.9 - 1296.1]	954.7 [807.5 - 1102.0]
Rajasthan	215.0 [179.3 - 250.6]	212.4 [170.1 - 254.7]	222.2 [154.9 - 289.5]	437.6 [384.0 - 491.1]	433.2 [361.0 - 505.5]	449.8 [379.6 - 519.9]	652.5 [582.4 - 722.6	645.6 [555.4 - 735.9]	672.0 [562.3 - 781.6]
Tamil Nadu	205.8 [166.3 - 245.3]	173.2 [130.1 - 216.3]	238.3 [171.4 - 305.2]	296.2 [249.7 - 342.8]	328.7 [249.2 - 408.3]	263.9 [217.3 - 310.5]	502.1 [438.8 - 565.3]	501.9 [407.9 - 595.9]	502.2 [418.1 - 586.3]
Telangana	216.9 [177.6 - 256.3]	191.3 [140.4 - 242.1]	246.1 [185.1 - 307.0]	270.2 [235.1 - 305.3]	236.2 [189.1 - 283.2]	308.8 [256.2 - 361.4]	487.1 [429.0 - 545.2]	427.4 [348.5 - 506.4]	554.9 [469.2 - 640.5]
Uttar Pradesh	272.7 [241.1 - 304.3]	238.0 [205.9 - 270.2]	387.9 [313.6 - 462.1]	678.2 [594.1 - 762.4]	586.2 [505.7 - 666.6]	984.1 [776.9 - 1191.4]	950.9 [856.7 - 1045.2]	824.2 [734.2 - 914.1]	1372.0 [1139.8 - 1604.2]
Uttarakhand	160.6 [111.1 - 210.2]	141.5 [78.1 - 204.8]	208.5 [127.3 - 289.7]	194.7 [154.0 - 235.4]	99.8 [66.1 - 133.5]	431.5 [334.3 - 528.7]	355.4 [286.3 - 424.4]	241.3 [162.3 - 320.2]	640.0 [507.0 - 773.0]
West Bengal	245.3 [193.7 - 296.9]	222.6 [149.9 - 295.4]	296.1 [231.6 - 360.7]	720.4 [628.2 - 812.5]	654.7 [516.6 - 792.8]	868.0 [787.8 - 948.3]	965.6 [855.9 - 1075.3]	877.3 [716.0 - 1038.7]	1164.2 [1053.9 - 1274.5]
Smaller States									
Arunachal Pradesh	96.3 [79.4 - 113.3]	93.2 [74.5 - 111.9]	109.7 [70.4 - 149.0]	511.2 [403.8 - 618.7]	477.1 [353.5 - 600.7]	657.8 [430.8 - 884.8]	607.6 [498.0 - 717.1]	570.3 [443.7 - 696.9]	767.5 [538.9 - 996.1]
Goa	258.9 [135.1 - 382.8]	123.7 [7.1 - 240.3]	340.9 [157.5 - 524.3]	261.6 [133.9 - 389.3]	320.2 [92.6 - 547.7]	226.1 [73.3 - 378.9]	520.5 [325.9 - 715.2]	443.9 [143.1 - 744.6]	567.0 [313.3 - 820.7]
Manipur	214.6 [150.6 - 278.6]	197.4 [110.1 - 284.6]	249.6 [155.8 - 343.3]	229.4 [180.6 - 278.3]	228.8 [170.1 - 287.6]	230.6 [144.0 - 317.3]	444.1 [362.2 - 526.0]	426.2 [321.4 - 531.0]	480.2 [346.2 - 614.2]
Meghalaya	59.2 [34.4 - 83.9]	41.6 [28.9 - 54.4]	128.8 [38.5 - 219.2]	25.1 [8.1 - 42.1]	25.7 [9.5 - 41.8]	22.8 [-25.3 - 70.9]	84.2 [51.9 - 116.6]	67.3 [47.0 - 87.6]	151.6 [38.2 - 265.0]

Mizoram	80.9 [49.8 - 112.0]	68.7 [26.0 - 111.4]	95.8 [50.2 - 141.4]	248.2 [192.7 - 303.8]	185.9 [129.9 - 241.9]	323.8 [227.1 - 420.6]	329.1 [264.6 - 393.7]	254.6 [184.3 - 324.9]	419.7 [310.5 - 528.8]
Nagaland	70.3 [46.0 - 94.6]	55.7 [33.4 - 78.1]	104.1 [44.4 - 163.8]	66.0 [36.2 -95.8]	45.1 [10.2 - 79.9]	114.6 [58.1 - 171.0]	136.3 [97.4 - 175.3]	100.8 [58.2 - 143.4]	218.7 [137.5 - 299.9]
Sikkim	94.2 [61.4 - 126.9]	109.7 [68.2 - 151.1]	62.2 [13.3 - 111.1]	162.1 [110.2 - 214.0]	147.2 [88.2 - 206.3]	192.8 [84.2 - 301.4]	256.3 [193.0 - 319.5]	256.9 [181.7 - 332.0]	255.0 [135.4 - 374.7]
Tripura	166.5 [122.7 - 210.3]	152.1 [107.2 - 197.0]	214.9 [106.7 - 323.0]	452.6 [270.8 - 634.3]	368.7 [193.1 - 544.3]	734.7 [256.2 - 1213.2]	619.0 [431.8 - 806.2]	520.8 [338.6 - 703.0]	949.6 [460.6 - 1438.5]
Union Territories									
All Union Territories	228.8 [163.1 - 294.5]	104.7 [33.9 - 175.5]	239.8 [162.9 - 316.8]	423.0 [332.5 - 513.5]	104.6 [60.9 - 148.3]	451.2 [344.4 - 558.1]	651.8 [538.3 - 765.3]	209.3 [124.2 - 294.4]	691.1 [557.4 - 824.7]
India	235.4 [225.9 - 245.0]	203.4 [192.3 - 214.5]	301.2 [283.7 - 318.7]	472.1 [456.8 - 487.4]	419.5 [401.0 - 438.0]	580.0 [552.9 - 607.1]	707.5 [688.5 - 726.5]	622.9 [600.2 - 645.5]	881.2 [847.1 - 915.3]

The figures inside square brackets represent 95% confidence interval. OOPE is reported in Indian Rupee (INR).

Supplementary Table 2.2 Incidence of catastrophic health expenditure (%) at national, state, and intra-state level at 10% threshold

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	6.4 [5.6 - 7.1]	6.7 [5.7 - 7.7]	5.7 [4.6 - 6.8]	17.4 [16.2 - 18.6]	18.6 [17.1 - 20.1]	14.9 [13.2 - 16.7]	22.2 [20.9 - 23.5]	23.5 [21.8 - 25.2]	19.5 [17.5 - 21.4]
Assam	2.0 [1.5 - 2.4]	1.8 [1.3 - 2.3]	3.4 [2.3 - 4.5]	4.5 [3.9 - 5.2]	4.0 [3.3 - 4.8]	7.7 [6.1 - 9.4]	6.4 [5.6 - 7.1]	5.6 [4.8 - 6.5]	10.8 [8.9 - 12.7]
Bihar	3.8 [3.3 - 4.3]	3.9 [3.2 - 4.5]	3.4 [2.5 - 4.2]	5.1 [4.5 - 5.7]	5.3 [4.6 - 6.1]	3.7 [2.8 - 4.6]	8.7 [7.9 - 9.4]	8.9 [8.0 - 9.9]	6.9 [5.7 - 8.1]
Chhattisgarh	3.3 [2.7 - 4.0]	2.8 [2.0 - 3.6]	5.4 [4.1 - 6.7]	6.9 [6.0 - 7.8]	6.3 [5.1 - 7.4]	9.5 [7.8 - 11.2]	9.7 [8.6 - 10.8]	8.7 [7.4 - 10.0]	14.0 [11.9 - 16.0]
Gujarat	3.4	3.2	3.7	8.4	7.7	9.5	11.8	10.8	13.1

	[2.8 - 3.9]	[2.4 - 4.0]	[2.9 - 4.4]	[7.6 - 9.3]	[6.5 - 8.9]	[8.3 - 10.7]	[10.8 - 12.8]	[9.4 - 12.3]	[11.7 - 14.5]
Haryana	5.8 [4.9 - 6.6]	5.5 [4.4 - 6.7]	6.1 [4.9 - 7.4]	10.8 [9.7 - 11.9]	10.6 [9.1 - 12.2]	11.1 [9.4 - 12.7]	15.6 [14.3 - 17.0]	15.1 13.3 - 16.9]	16.6 [14.7 - 18.6]
Himachal Pradesh	5.5 [4.5 - 6.4]	5.9 [4.8 - 7.0]	2.7 [1.2 - 4.2]	13.0 [11.6 - 14.5]	13.7 [12.0 - 15.3]	9.0 [6.3 - 11.7]	17.1 [15.5 - 18.7]	18.0 [16.2 - 19.9]	11.4 [8.4 - 14.4]
Jammu and Kashmir	2.7 [2.2 - 3.3]	2.4 [1.7 - 3.1]	3.7 [2.7 - 4.7]	12.1 [11.0 - 13.2]	13.1 [11.6 - 14.5]	9.1 [7.5 - 10.6]	14.9 [13.7 - 16.1]	15.6 [14.0 - 17.2]	12.8 [11.0 - 14.6]
Jharkhand	2.8 [2.2 - 3.4]	2.5 [1.8 - 3.2]	4.0 [2.8 - 5.1]	15.5 [14.2 - 16.7]	15.3 [13.7 - 16.9]	15.9 [13.8 - 18.0]	17.9 [16.5 - 19.2]	17.5 [15.8 - 19.2]	19.2 [16.9 - 21.6]
Karnataka	5.3 [4.7 - 6.0]	5.8 [4.9 - 6.8]	4.7 [3.8 - 5.5]	7.7 [6.9 - 8.4]	8.1 [7.0 - 9.2]	7.1 [6.0 - 8.1]	12.6 [11.6 - 13.5]	13.4 [12.0 - 14.8]	11.4 [10.1 - 12.7]
Kerala	12.2 [11.2 - 13.2]	12.8 [11.5 - 14.2]	11.5 [10.1 - 12.9]	25.8 [24.5 - 27.1]	27.5 [25.7 - 29.3]	23.8 [21.9 - 25.6]	34.4 [33.0 - 35.9]	36.0 [34.1 - 38.0]	32.5 [30.5 - 34.6]
Madhya Pradesh	3.3 [2.9 - 3.8]	3.2 [2.6 - 3.8]	3.8 [3.0 - 4.5]	8.0 [7.3 - 8.8]	7.5 [6.6 - 8.5]	9.4 [8.3 - 10.6]	10.7 [9.8 - 11.5]	10.0 [8.9 - 11.0]	12.7 [11.3 - 14.0]
Maharashtra	6.3 [5.8 - 6.8]	6.8 [6.1 - 7.6]	5.7 [5.1 - 6.4]	11.1 [10.4 - 11.7]	12.2 [11.2 - 13.2]	9.7 [8.9 - 10.6]	16.4 [15.6 - 17.1]	17.6 [16.4 - 18.8]	14.9 [13.9 - 15.9]
Odisha	5.5 [4.8 - 6.2]	5.7 [4.8 - 6.5]	4.6 [3.4 - 5.8]	18.4 [17.2 - 19.6]	18.4 [17.0 - 19.8]	18.3 [16.0 - 20.5]	22.8 [21.5 - 24.1]	22.9 [21.4 - 24.5]	22.2 [19.8 - 24.7]
Punjab	5.1 [4.3 - 5.8]	5.2 [4.1 - 6.2]	4.9 [3.9 - 5.9]	12.5 [11.4 - 13.6]	14.6 [12.9 - 16.2]	9.3 [7.9 - 10.6]	16.5 [15.3 - 17.8]	18.4 [16.6 - 20.2]	13.7 [12.0 - 15.3]
Rajasthan	4.1 [3.6 - 4.7]	4.5 [3.8 - 5.2]	3.0 [2.2 - 3.7]	8.3 [7.5 - 9.0]	8.2 [7.2 - 9.2]	8.4 [7.2 - 9.6]	11.9 [11.0 - 12.8]	12.1 [10.9 - 13.2]	11.3 [9.9 - 12.7]
Tamil Nadu	3.9 [3.4 - 4.4]	4.0 [3.4 - 4.7]	3.8 [3.1 - 4.5]	6.3 [5.7 - 6.9]	7.0 [6.2 - 7.9]	5.6 [4.8 - 6.4]	9.6 [8.9 - 10.3]	10.3 [9.2 - 11.3]	8.9 [7.9 - 9.9]
Telangana	4.7 [4.0 - 5.4]	4.6 [3.6 - 5.5]	4.9 [3.9 - 6.0]	6.6 [5.8 - 7.5]	6.9 [5.8 - 8.1]	6.3 [5.2 - 7.5]	10.5 [9.5 - 11.5]	10.6 [9.2 - 12.0]	10.5 [9.0 - 12.0]
Uttar Pradesh	6.0 [5.5 - 6.4]	5.8 [5.2 - 6.4]	6.6 [5.8 - 7.3]	14.4 [13.7 - 15.1]	14.4 [13.5 - 15.3]	14.5 [13.4 - 15.5]	19.3 [18.5 - 20.0]	19.1 [18.1 - 20.0]	20.0 [18.9 - 21.2]
Uttarakhand	3.2 [2.3 - 4.0]	3.1 [2.1 - 4.2]	3.3 [2.0 - 4.6]	5.8 [4.7 - 6.8]	3.7 [2.5 - 4.8]	10.9 [8.7 - 13.2]	8.9 [7.6 - 10.3]	6.8 [5.2 - 8.3]	14.3 [11.7 - 16.8]

West Bengal	4.5 [4.0 - 5.0]	4.4 [3.7 - 5.0]	4.8 [4.1 - 5.6]	18.5 [17.5 - 19.4]	18.0 [16.9 - 19.2]	19.4 [17.9 - 20.8]	21.9 [20.9 - 22.8]	21.4 [20.1 - 22.6]	22.9 [21.4 - 24.5]
Smaller States									
Arunachal Pradesh	4.9 [3.9 - 5.8]	5.2 [3.9 - 6.4]	3.6 [2.1 - 5.1]	5.3 [4.3 - 6.3]	5.1 [3.9 - 6.3]	6.2 [4.2 - 8.1]	10.1 [8.7 - 11.4]	10.1 [8.4 - 11.8]	9.9 [7.5 - 12.3]
Goa	4.0 [2.2 - 5.8]	2.3 [0.0 - 4.7]	5.0 [2.5 - 7.6]	5.3 [3.2 - 7.4]	4.1 [1.0 - 7.2]	6.1 [3.3 - 8.9]	8.4 [5.8 - 11.0]	6.0 [2.3 - 9.8]	9.9 [6.4 - 13.4]
Manipur	6.1 [5.1 - 7.0]	5.9 [4.7 - 7.2]	6.3 [4.9 - 7.7]	4.7 [3.9 - 5.6]	4.7 [3.6 - 5.8]	4.9 [3.6 - 6.1]	10.7 [9.5 - 11.9]	10.7 [9.1 - 12.3]	10.8 [9.0 - 12.5]
Meghalaya	0.7 [0.3 - 1.2]	0.5 [0.1 - 1.0]	1.5 [0.3 - 2.6]	1.1 [0.5 - 1.6]	1.3 [0.5 - 2.0]	0.3 [-0.2 - 0.8]	1.8 [1.0 - 2.5]	1.8 [0.9 - 2.7]	1.6 [0.4 - 2.7]
Mizoram	1.0 [0.5 - 1.5]	1.1 [0.3 - 1.8]	0.9 [0.2 - 1.5]	5.0 [3.9 - 6.1]	4.5 [3.0 - 6.0]	5.6 [4.0 - 7.1]	6.0 [4.8 - 7.2]	5.7 [4.0 - 7.5]	6.4 [4.7 - 8.1]
Nagaland	1.8 [1.1 - 2.6]	1.8 [0.9 - 2.7]	1.9 [0.6 - 3.3]	1.8 [1.1 - 2.6]	1.7 [0.8 - 2.5]	2.2 [0.8 - 3.6]	3.7 [2.6 - 4.7]	3.5 [2.2 - 4.7]	4.2 [2.2 - 6.1]
Sikkim	2.8 [1.6 - 3.9]	3.3 [1.9 - 4.7]	1.7 [-0.1 - 3.5]	5.2 [3.7 - 6.7]	5.4 [3.6 - 7.1]	4.8 [1.8 - 7.9]	8.1 [6.2 - 9.9]	8.7 [6.5 - 10.9]	6.8 [3.2 - 10.3]
Tripura	3.2 [2.4 - 4.0]	3.4 [2.4 - 4.4]	2.5 [1.3 - 3.8]	7.0 [5.8 - 8.1]	7.0 [5.6 - 8.3]	7.0 [5.0 - 8.9]	10.1 [8.8 - 11.4]	10.3 [8.7 - 11.9]	9.5 [7.2 - 11.8]
Union Territories									
All Union Territories	3.1 [2.5 - 3.7]	1.2 [0.4 - 2.0]	3.2 [2.6 - 3.9]	6.2 [5.4 - 7.0]	4.4 [3.0 - 5.9]	6.4 [5.4 - 7.3]	9.1 [8.1 - 10.1]	5.6 [3.9 - 7.2]	9.4 [8.3 - 10.6]
India	4.9 [4.8 - 5.1]	5.0 [4.8 - 5.2]	4.9 [4.7 - 5.1]	11.3 [11.1 - 11.5]	11.6 [11.3 - 11.8]	10.8 [10.5 - 11.0]	15.4 [15.2 - 15.6]	15.5 [15.3 - 15.8]	15.0 [14.7 - 15.4]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 2.3 Inequality in the incidence of incurring catastrophic health expenditure (at 10% threshold) at national, state, and intra-state level

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	0.001	0.014	0.003	-0.010	0.025	-0.016	-0.007	0.043*	-0.030
Assam	0.009	0.004	0.002	0.011	-0.004	0.041*	0.016	-0.003	0.038
Bihar	0.001	0.003	-0.016	-0.028*	-0.028*	-0.018	-0.028*	-0.025*	-0.028*
Chhattisgarh	0.013	0.005	-0.027	0.043*	0.049*	-0.073*	0.054*	0.050*	-0.078*
Gujarat	-0.001	-0.001	-0.014	0.053*	0.063*	0.049*	0.049*	0.057*	0.036*
Haryana	-0.016	-0.020	-0.039*	-0.048*	-0.089*	-0.017	-0.055*	-0.106*	-0.046*
Himachal Pradesh	-0.022	-0.011	-0.028	-0.059*	-0.054*	-0.029	-0.078*	-0.067*	-0.044
Jammu and Kashmir	-0.011	-0.024*	0.002	-0.093*	-0.089*	-0.092*	-0.102*	-0.109*	-0.091*
Jharkhand	0.020*	0.019*	-0.017	-0.006	-0.011	-0.010	0.013	0.009	-0.023
Karnataka	-0.023*	-0.004	-0.036*	0.000	0.019	-0.025*	-0.023*	0.013	-0.059*
Kerala	-0.052*	-0.033*	-0.065*	-0.055*	-0.001	-0.100*	-0.092*	-0.028	-0.149*
Madhya Pradesh	0.004	0.006	-0.015	0.003	-0.016	0.024	0.006	-0.013	0.007
Maharashtra	-0.032*	-0.024*	-0.039*	-0.048*	-0.034*	-0.034*	-0.066*	-0.048*	-0.066*
Odisha	0.016	0.026*	-0.009	0.020	0.013	0.063*	0.030*	0.028	0.064*
Punjab	-0.020*	-0.012	-0.029*	-0.081*	-0.071*	-0.065*	-0.092*	-0.076*	-0.091*
Rajasthan	0.001	0.012	-0.009	0.027*	0.047*	-0.011	0.020	0.044*	-0.019
Tamil Nadu	-0.005	0.000	-0.011	-0.038*	-0.034*	-0.039*	-0.041*	-0.034*	-0.048*
Telangana	-0.008	0.003	-0.042*	0.013	0.070*	-0.051*	0.0002	0.053*	-0.086*
Uttar Pradesh	0.015*	0.022*	-0.030*	0.003	0.020*	-0.081*	0.012	0.032*	-0.104*
Uttarakhand	-0.006	-0.001	-0.020	0.010	-0.010	-0.055*	0.016	-0.007	-0.038
West Bengal	0.008	0.008	0.001	0.015	0.009	0.016	0.018	0.015	0.011
Smaller States									
Arunachal Pradesh	-0.056*	-0.062*	-0.018	-0.006	-0.007	-0.019	-0.063*	-0.071*	-0.039
Goa	0.012	0.021	0.000	0.000	0.026	-0.009	-0.022	0.029	-0.054

Manipur	-0.010	-0.010	-0.017	-0.020*	-0.047*	0.032*	-0.037*	-0.061*	0.007
Meghalaya	0.007	0.003	-0.002	-0.024*	-0.027*	0.000	-0.018*	-0.024*	-0.001
Mizoram	0.000	0.001	0.002	-0.023	-0.080*	0.011	-0.023	-0.073*	0.009
Nagaland	-0.006	-0.002	-0.013	0.000	-0.024*	0.049*	-0.006	-0.026	0.037
Sikkim	-0.031*	-0.028	-0.029	0.001	0.002	0.012	-0.025	-0.022	-0.015
Tripura	-0.006	-0.004	-0.008	-0.037*	-0.036*	-0.089*	-0.044*	-0.041*	-0.096*
Union Territories									
All Union Territories	-0.005	-0.007	-0.008	-0.054*	-0.084*	-0.054*	-0.058*	-0.092*	-0.060*
India	-0.002	0.012*	-0.023*	-0.008*	0.011*	-0.040*	-0.007*	0.017*	-0.060*

CI: Erreyger concentration index (CI). *p < 0.05.

Supplementary Table 2.4 Intensity of catastrophic health expenditure (%) at national, state, and intra-state level at 10% threshold

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	1.2 [1.0 - 1.3]	1.3 [1.0 - 1.6]	0.8 [0.6 - 1.1]	3.7 [3.3 - 4.0]	3.7 [3.2 - 4.1]	3.6 [3.0 - 4.3]	4.8 [4.4 - 5.2]	4.9 [4.4 - 5.4]	4.6 [3.9 - 5.2]
Assam	0.3 [0.2 - 0.4]	0.3 [0.2 - 0.4]	0.6 [0.3 - 0.8]	0.9 [0.7 - 1.1]	0.8 [0.6 - 1.1]	1.2 [0.8 - 1.6]	1.2 [1.0 - 1.4]	1.1 [0.8 - 1.4]	1.7 [1.2 - 2.2]
Bihar	0.6 [0.4 - 0.7]	0.6 [0.4 - 0.7]	0.5 [0.3 - 0.7]	1.3 [1.1 - 1.5]	1.3 [1.1 - 1.6]	0.7 [0.5 - 1.0]	1.8 [1.6 - 2.1]	1.9 [1.6 - 2.2]	1.3 [1.0 - 1.6]
Chhattisgarh	0.7 [0.5 - 0.9]	0.6 [0.4 - 0.8]	1.2 [0.8 - 1.6]	1.3 [1.1 - 1.6]	1.3 [1.0 - 1.6]	1.7 [1.2 - 2.1]	2.1 [1.8 - 2.4]	1.9 [1.5 - 2.3]	3.0 [2.3 - 3.6]
Gujarat	0.5 [0.4 - 0.7]	0.5 [0.3 - 0.7]	0.6 [0.4 - 0.7]	1.4 [1.2 - 1.6]	1.7 [1.3 - 2.1]	1.0 [0.8 - 1.2]	2.0 [1.7 - 2.2]	2.2 [1.8 - 2.6]	1.6 [1.4 - 1.9]
Haryana	0.9 [0.7 - 1.1]	0.7 [0.5 - 1.0]	1.1 [0.8 - 1.5]	1.7 [1.4 - 1.9]	1.9 [1.5 - 2.3]	1.4 [1.1 - 1.7]	2.6 [2.3 - 2.9]	2.5 [2.1 - 3.0]	2.7 [2.2 - 3.2]
Himachal Pradesh	1.0 [0.8 - 1.3]	1.1 [0.8 - 1.4]	0.4 [0.1 - 0.7]	2.6 [2.2 - 3.1]	2.9 [2.4 - 3.4]	0.9 [0.4 - 1.4]	3.6 [3.1 - 4.1]	4.0 [3.4 - 4.6]	1.3 [0.7 - 2.0]

Jammu and Kashmir	0.4 [0.2 - 0.5]	0.3 [0.2 - 0.5]	0.5 [0.3 - 0.6]	1.5 [1.2 - 1.7]	1.6 [1.3 - 1.9]	1.0 [0.7 - 1.3]	1.9 [1.6 - 2.1]	2.0 [1.6 - 2.3]	1.6 [1.2 - 1.9]
Jharkhand	0.5 [0.3 - 0.6]	0.4 [0.2 - 0.5]	0.8 [0.5 - 1.2]	2.9 [2.5 - 3.2]	2.9 [2.5 - 3.4]	2.6 [2.1 - 3.2]	3.3 [3.0 - 3.7]	3.3 [2.9 - 3.8]	3.5 [2.8 - 4.1]
Karnataka	0.8 [0.7 - 1.0]	0.9 [0.7 - 1.1]	0.7 [0.5 - 0.9]	1.5 [1.3 - 1.7]	1.7 [1.4 - 2.1]	1.1 [0.8 - 1.3]	2.3 [2.1 - 2.6]	2.7 [2.3 - 3.1]	1.8 [1.5 - 2.1]
Kerala	2.2 [2.0 - 2.5]	2.3 [1.9 - 2.7]	2.1 [1.7 - 2.5]	5.1 [4.7 - 5.5]	5.6 [5.0 - 6.1]	4.6 [4.1 - 5.2]	7.3 [6.8 - 7.8]	7.7 [7.0 - 8.4]	6.8 [6.2 - 7.5]
Madhya Pradesh	0.7 [0.5 - 0.8]	0.7 [0.5 - 0.9]	0.6 [0.5 - 0.8]	1.8 [1.6 - 2.1]	1.8 [1.5 - 2.1]	2.0 [1.7 - 2.4]	2.5 [2.2 - 2.7]	2.4 [2.0 - 2.7]	2.7 [2.3 - 3.2]
Maharashtra	1.2 [1.0 - 1.3]	1.3 [1.1 - 1.5]	1.0 [0.8 - 1.1]	2.2 [2.0 - 2.4]	2.6 [2.3 - 2.9]	1.8 [1.6 - 2.0]	3.3 [3.1 - 3.5]	3.7 [3.3 - 4.1]	2.9 [2.6 - 3.1]
Odisha	1.1 [0.9 - 1.3]	1.1 [0.9 - 1.4]	0.8 [0.5 - 1.1]	4.0 [3.6 - 4.3]	4.3 [3.8 - 4.7]	2.4 [2.0 - 2.9]	5.0 [4.6 - 5.4]	5.3 [4.8 - 5.8]	3.3 [2.8 - 3.9]
Punjab	0.9 [0.7 - 1.1]	1.1 [0.8 - 1.4]	0.7 [0.5 - 0.9]	2.4 [2.1 - 2.8]	3.1 [2.6 - 3.5]	1.5 [1.1 - 1.8]	3.2 [2.9 - 3.6]	3.9 [3.3 - 4.4]	2.2 [1.8 - 2.7]
Rajasthan	0.8 [0.6 - 1.0]	0.9 [0.7 - 1.1]	0.5 [0.3 - 0.7]	1.9 [1.7 - 2.1]	1.9 [1.6 - 2.2]	1.9 [1.5 - 2.3]	2.6 [2.3 - 2.9]	2.6 [2.3 - 3.0]	2.4 [2.0 - 2.9]
Tamil Nadu	0.8 [0.6 - 0.9]	0.9 [0.7 - 1.1]	0.7 [0.5 - 0.8]	1.4 [1.2 - 1.6]	1.5 [1.2 - 1.7]	1.4 [1.1 - 1.6]	2.1 [1.9 - 2.4]	2.2 [1.9 - 2.5]	2.0 [1.7 - 2.4]
Telangana	0.8 [0.6 - 1.0]	0.9 [0.6 - 1.2]	0.7 [0.5 - 1.0]	1.3 [1.1 - 1.6]	1.8 [1.4 - 2.1]	0.9 [0.6 - 1.1]	2.0 [1.7 - 2.3]	2.3 [1.9 - 2.7]	1.6 [1.3 - 2.0]
Uttar Pradesh	1.2 [1.0 - 1.3]	1.2 [1.0 - 1.4]	1.1 [0.9 - 1.3]	3.1 [2.9 - 3.3]	3.1 [2.8 - 3.4]	2.9 [2.6 - 3.2]	4.2 [4.0 - 4.5]	4.3 [3.9 - 4.6]	4.1 [3.7 - 4.5]
Uttarakhand	0.5 [0.3 - 0.7]	0.5 [0.3 - 0.8]	0.5 [0.2 - 0.8]	0.8 [0.6 - 1.0]	0.6 [0.3 - 0.8]	1.4 [1.0 - 1.8]	1.4 [1.1 - 1.7]	1.2 [0.8 - 1.6]	2.0 [1.5 - 2.5]
West Bengal	0.8 [0.7 - 1.0]	0.8 [0.6 - 1.0]	0.8 [0.6 - 1.0]	3.5 [3.2 - 3.7]	3.3 [2.9 - 3.6]	3.9 [3.5 - 4.3]	4.3 [4.0 - 4.6]	4.1 [3.7 - 4.5]	4.8 [4.3 - 5.3]
Smaller States									
Arunachal Pradesh	0.5 [0.4 - 0.7]	0.5 [0.3 - 0.8]	0.4 [0.1 - 0.6]	1.8 [1.3 - 2.2]	1.6 [1.2 - 2.1]	2.4 [1.4 - 3.4]	2.3 [1.8 - 2.7]	2.2 [1.7 - 2.7]	2.8 [1.8 - 3.8]

Goa	0.9 [0.3 - 1.5]	0.3 [0.1 - 0.5]	1.3 [0.4 - 2.1]	0.5 [0.2 - 0.8]	0.5 [0.0 - 1.1]	0.5 [0.2 - 0.9]	1.5 [0.9 - 2.2]	0.9 [0.1 - 1.7]	2.0 [1.0 - 2.9]
Manipur	0.8 [0.6 - 1.0]	0.7 [0.5 - 1.0]	1.0 [0.7 - 1.3]	0.9 [0.6 - 1.1]	0.9 [0.6 - 1.3]	0.8 [0.5 - 1.1]	1.7 [1.4 - 2.0]	1.7 [1.3 - 2.1]	1.7 [1.3 - 2.1]
Meghalaya	0.1 [0.0 - 0.2]	0.1 [0.0 - 0.1]	0.2 [0.0 - 0.4]	0.2 [0.1 - 0.3]	0.2 [0.0 - 0.3]	0.0 [-0.1 - 0.1]	0.2 [0.1 - 0.4]	0.2 [0.1 - 0.4]	0.2 [0.0 - 0.4]
Mizoram	0.1 [0.0 - 0.2]	0.2 [0.0 - 0.4]	0.1 [0.0 - 0.1]	1.1 [0.7 - 1.4]	1.3 [0.7 - 1.9]	0.8 [0.5 - 1.1]	1.2 [0.9 - 1.6]	1.5 [0.9 - 2.1]	0.9 [0.6 - 1.2]
Nagaland	0.2 [0.1 - 0.3]	0.2 [0.0 - 0.3]	0.3 [0.0 - 0.6]	0.3 [0.1 - 0.4]	0.2 [0.0 - 0.4]	0.3 [0.1 - 0.6]	0.5 [0.3 - 0.7]	0.4 [0.2 - 0.6]	0.6 [0.2 - 1.0]
Sikkim	0.3 [0.1 - 0.5]	0.4 [0.1 - 0.6]	0.2 [0.1 - 0.3]	0.8 [0.6 - 1.1]	0.7 [0.5 - 1.0]	1.0 [0.4 - 1.7]	1.2 [0.8 - 1.5]	1.1 [0.8 - 1.5]	1.2 [0.5 - 2.0]
Tripura	0.5 [0.3 - 0.6]	0.5 [0.3 - 0.7]	0.4 [0.1 - 0.6]	1.5 [1.2 - 1.9]	1.6 [1.2 - 2.0]	1.2 [0.8 - 1.7]	2.1 [1.7 - 2.4]	2.2 [1.7 - 2.7]	1.6 [1.1 - 2.1]
Union Territories									
All Union Territories	0.5 [0.4 - 0.6]	0.3 [0.0 - 0.5]	0.5 [0.4 - 0.7]	1.2 [1.0 - 1.5]	0.3 [0.1 - 0.5]	1.3 [1.0 - 1.6]	1.7 [1.5 - 2.0]	0.6 [0.3 - 0.9]	1.8 [1.5 - 2.2]
India	0.9 [0.9 - 0.9]	0.9 [0.9 - 1.0]	0.8 [0.8 - 0.9]	2.3 [2.2 - 2.4]	2.4 [2.4 - 2.5]	2.0 [2.0 - 2.1]	3.2 [3.1 - 3.2]	3.3 [3.2 - 3.4]	2.9 [2.8 - 3.0]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 2.5 Intensity of catastrophic health expenditure (%) at national, state, and intra-state level at 25% threshold

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	0.5 [0.4 - 0.7]	0.6 [0.4 - 0.8]	0.3 [0.2 - 0.5]	1.9 [1.6 - 2.1]	1.8 [1.5 - 2.1]	2.0 [1.6 - 2.4]	2.5 [2.2 - 2.8]	2.5 [2.1 - 2.9]	2.4 [2.0 - 2.9]
Assam	0.1 [0.1 - 0.2]	0.1 [0.01 - 0.2]	0.2 [0.1 - 0.4]	0.5 [0.4 - 0.7]	0.5 [0.3 - 0.7]	0.6 [0.3 - 0.9]	0.6 [0.5 - 0.8]	0.6 [0.4 - 0.8]	0.8 [0.5 - 1.2]

Bihar	0.2 [0.2 - 0.3]	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.3]	0.6 [0.5 - 0.8]	0.7 [0.5 - 0.9]	0.3 [0.2 - 0.4]	0.9 [0.7 - 1.1]	1.0 [0.8 - 1.2]	0.5 [0.3 - 0.7]
Chhattisgarh	0.4 [0.2 - 0.5]	0.3 [0.2 - 0.5]	0.6 [0.4 - 0.8]	0.7 [0.5 - 0.8]	0.6 [0.4 - 0.9]	0.8 [0.4 - 1.1]	1.1 [0.9 - 1.3]	1.0 [0.7 - 1.3]	1.5 [1.1 - 1.9]
Gujarat	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.3]	0.3 [0.1 - 0.4]	0.7 [0.5 - 0.8]	1.0 [0.7 - 1.3]	0.3 [0.2 - 0.4]	0.9 [0.8 - 1.1]	1.2 [0.9 - 1.5]	0.6 [0.4 - 0.7]
Haryana	0.4 [0.3 - 0.5]	0.3 [0.1 - 0.5]	0.6 [0.3 - 0.8]	0.7 [0.5 - 0.8]	0.8 [0.6 - 1.1]	0.4 [0.2 - 0.6]	1.1 [0.9 - 1.3]	1.1 [0.8 - 1.4]	1.1 [0.8 - 1.4]
Himachal Pradesh	0.4 [0.3 - 0.6]	0.5 [0.3 - 0.7]	0.2 [0.1 - 0.3]	1.3 [1.0 - 1.6]	1.4 [1.1 - 1.8]	0.3 [0.1 - 0.5]	1.8 [1.5 - 2.2]	2.0 [1.6 - 2.4]	0.5 [0.03 - 0.7]
Jammu and Kashmir	0.1 [0.01 - 0.2]	0.1 [0.01 - 0.2]	0.1 [0.01 - 0.2]	0.5 [0.4 - 0.7]	0.6 [0.4 - 0.8]	0.4 [0.2 - 0.6]	0.7 [0.5 - 0.8]	0.7 [0.5 - 0.9]	0.5 [0.3 - 0.8]
Jharkhand	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.2]	0.4 [0.2 - 0.7]	1.3 [1.1 - 1.5]	1.3 [1.1 - 1.6]	1.2 [0.8 - 1.6]	1.5 [1.3 - 1.8]	1.5 [1.2 - 1.8]	1.6 [1.1 - 2.1]
Karnataka	0.3 [0.2 - 04]	0.4 [0.2 - 0.5]	0.3 [0.2 - 0.4]	0.7 [0.6 - 0.9]	0.9 [0.7 - 1.1]	0.5% [0.3 - 0.6]	1.1 [0.9 - 1.3]	1.3 [1.1 - 1.6]	0.8 [0.6 - 1.0]
Kerala	1.1 [0.9 - 1.2]	1.1 [0.8 - 1.3]	1.0 [0.8 - 1.3]	2.6 [2.3 - 2.8]	2.8 [2.4 - 3.2]	2.2 [1.8 - 2.7]	3.7 [3.4 - 4.1]	4.0 [3.5 - 4.4]	3.4 [2.9 - 3.9]
Madhya Pradesh	0.4 [0.3 - 0.4]	0.4 [0.2 - 0.5]	0.3 [0.2 - 0.4]	1.0 [0.8 - 1.1]	0.9 [0.7 - 1.1]	1.1 [0.8 - 1.3]	1.3 [1.1 - 1.5]	1.3 [1.0 - 1.5]	1.4 [1.1 - 1.7]
Maharashtra	0.5 [0.4 - 0.6]	0.6 [0.5 - 0.8]	0.5 [0.3 - 0.6]	1.1 [1.0 - 1.2]	1.3 [1.1 - 1.5]	0.8 [0.7 - 1.0]	1.6 [1.5 -1.8]	1.9 [1.6 - 2.2]	1.4 [1.2 - 1.6]
Odisha	0.5 [0.4 - 0.7]	0.6 [0.4 - 0.7]	0.3 [0.1 - 0.5]	2.0 [1.7 - 2.2]	2.2 [1.9 - 2.5]	0.8 [0.6 - 1.1]	2.6 [2.3 - 2.9]	2.8 [2.5 - 3.2]	1.3 [0.9 - 1.6]
Punjab	0.5 [0.3 - 0.6]	0.6 [0.4 - 0.8]	0.3 [0.1 - 0.4]	1.1 [0.9 - 1.3]	1.4 [1.1 - 1.7]	0.6 [0.4 - 0.9]	1.5 [1.2 - 1.7]	1.8 [1.5 - 2.2]	0.9 [0.6 - 1.2]
Rajasthan	0.4 [0.3 - 0.5]	0.5 [0.3 - 0.6]	0.2 [0.1 - 0.3]	1.0 [0.8 - 1.1]	1.0 [0.8 - 1.2]	0.9 [0.6 - 1.2]	1.3 [1.1 - 1.5]	1.4 [1.1 - 1.6]	1.2 [0.9 - 1.5]
Tamil Nadu	0.4 [0.3 - 0.5]	0.4 [0.3 - 0.6]	0.3 [0.2 - 0.4]	0.7 [0.6 - 0.9]	0.7 [0.5 - 0.9]	0.8 [0.6 - 1.0]	1.1 [0.9 - 1.3]	1.1 [0.9 - 1.3]	1.1 [0.9 - 1.3]
Telangana	0.4 [0.2 - 0.5]	0.4 [0.2 - 0.6]	0.3 [0.1 - 0.4]	0.7 [0.5 - 0.8]	1.0 [0.7 - 1.3]	0.3 [0.2 - 0.5]	0.9 [0.7 - 1.1]	1.1 [0.9 - 1.4]	0.7 [0.4 - 0.9]

Uttar Pradesh	0.6 [0.5 - 0.7]	0.6 [0.5 - 0.7]	0.5 [0.4 - 0.6]	1.5 [1.4 - 1.7]	1.6 [1.4 - 1.8]	1.3 [1.1 - 1.6]	2.1 [2.0 - 2.3]	2.2 [2.0 - 2.4]	2.0 [1.7 - 2.2]
Uttarakhand	0.2 [0.1 - 0.4]	0.3 [0.1 - 0.5]	0.2 [0.0 - 0.4]	0.3 [0.2 - 0.4]	0.3 [0.1 - 0.4]	0.4 [0.2 - 0.6]	0.6 [0.4 - 0.8]	0.5 [0.3 - 0.8]	0.7 [0.4 - 1.0]
West Bengal	0.4 [0.3 - 0.5]	0.4 [0.3 - 0.5]	0.4 [0.2 - 0.5]	1.7 [1.5 - 1.8]	1.6 [1.3 - 1.8]	1.9 [1.6 - 2.2]	2.1 [1.9 - 2.3]	2.0 [1.7 - 2.2]	2.4 [2.1 - 2.7]
Smaller States									
Arunachal Pradesh	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.3]	0.1 [-0.1 - 0.3]	1.0 [0.7 - 1.3]	0.9 [0.6 - 1.2]	1.6 [0.9 - 2.4]	1.2 [0.9 - 1.5]	1.1 [0.8 - 1.4]	1.8 [1.0 - 2.5]
Goa	0.5 [0.1 - 0.9]	0.1 [0.01 - 0.2]	0.7 [0.1 - 0.3]	0.1 [0.0 - 0.3]	0.2 [0.1 - 0.3]	0.1 [0.0 - 0.2]	0.7 [0.3 - 1.1]	0.3 [-0.2 - 0.8]	1.0 [0.3 - 1.6]
Manipur	0.3 [0.2 - 0.4]	0.3 [0.1 - 0.4]	0.4 [0.2 - 0.6]	0.5 [0.3 - 0.6]	0.5 [0.3 - 0.7]	0.3 [0.1 - 0.6]	0.7 [0.5 - 0.9]	0.8 [0.5 - 1.1]	0.7 [0.4 - 1.0]
Meghalaya	0.0 [0.0 - 0.1]	0.0 [0.0 - 0.1]	0.1 [0.01 - 0.2]	0.1 [0.0 - 0.1]	0.1 [0.0 - 0.1]	0.0 [0.0 - 0.0]	0.1 [0.0 - 0.1]	0.1 [0.0 - 0.2]	0.1 [-0.1 - 0.2]
Mizoram	0.1 [0.0 - 0.1]	0.1 [0.0 - 0.2]	0.0 [0.0 - 0.0]	0.5 [0.3 - 0.7]	0.7 [0.3 - 1.2]	0.2 [0.1 - 0.4]	0.6 [0.3 - 0.8]	0.8 [0.4 - 1.3]	0.3 [0.1 - 0.4]
Nagaland	0.1 [0.0 - 0.2]	0.1 [0.0 - 0.1]	0.1 [0.01 - 0.2]	0.1 [0.0 - 0.2]	0.1 [0.0 - 0.2]	0.1 [0.0 - 0.1]	0.2 [0.1 - 0.3]	0.2 [0.0 - 0.3]	0.2 [0.0 - 0.4]
Sikkim	0.1 [0.0 - 0.2]	0.1 [0.01 - 0.2]	0.0 [0.1 - 0.1]	0.2 [0.1 - 0.3]	0.1 [0.0 - 0.2]	0.4 [0.1 - 0.6]	0.3 [0.1 - 0.5]	0.3 [0.1 - 0.4]	0.4 [0.1 - 0.7]
Tripura	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.3]	0.1 [0.0 - 0.3]	0.7 [0.5 - 0.9]	0.8 [0.5 - 1.1]	0.5 [0.2 - 0.7]	1.0 [0.7 - 1.2]	1.1 [0.7 - 1.4]	0.6 [0.3 - 0.9]
Union Territories									
All Union Territories	0.2 [0.1 - 0.3]	0.1 [0.0 - 0.3]	0.2 [0.1 - 0.3]	0.6 [0.5 - 0.8]	0.1 [0.0 - 0.2]	0.7 [0.5 - 0.9]	0.8 [0.7 - 1.0]	0.2 [0.0 - 0.4]	0.9 [0.7 - 1.1]
India	0.4 [0.4 - 0.4]	0.4 [0.4 - 0.5]	0.4 [0.3 - 0.4]	1.1 [1.1 - 1.2]	1.2 [1.2 - 1.3]	1.0 [0.9 - 1.0]	1.6 [1.5 - 1.6]	1.7 [1.6 - 1.7]	1.4 [1.3 - 1.5]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 2.6 Intensity of impoverishment (%) at national, state, and intra-state level

States/Union Territories	Hospitalization			Outpatient Care			Hospitalization and/or Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Larger States									
Andhra Pradesh	0.8 [0.8 - 0.9]	1.0 [0.9 - 1.1]	0.4 [0.3 - 0.5]	2.2 [2.0 - 2.3]	2.4 [2.2 - 2.6]	1.7 [1.4 - 1.9]	3.0 [2.8 - 3.2]	3.4 [3.1 - 3.6]	2.2 [1.9 - 2.5]
Assam	0.3 [0.3 - 0.4]	0.3 [0.3 - 0.4]	0.3 [0.2 - 0.5]	0.9 [0.8 - 1.0]	0.9 [0.8 - 1.0]	0.7 [0.5 - 0.9]	1.2 [1.1 - 1.3]	1.2 [1.1 - 1.4]	1.0 [0.8 - 1.2]
Bihar	0.7 [0.7 - 0.8]	0.7 [0.7 - 0.8]	0.5 [0.4 - 0.6]	1.6 [1.5 - 1.7]	1.7 [1.6 - 1.8]	0.4 [0.3 - 0.5]	2.3 [2.2 - 2.4]	2.4 [2.3 - 2.6]	1.0 [0.9 - 1.1]
Chhattisgarh	0.8 [0.7 - 0.9]	0.8 [0.7 - 0.9]	0.9 [0.7 - 1.0]	1.4 [1.3 - 1.5]	1.4 [1.3 - 1.5]	1.3 [1.1 - 1.5]	2.2 [2.0 - 2.3]	2.2 [2.0 - 2.3]	2.2 [2.0 - 2.5]
Gujarat	0.3 [0.3 - 0.3]	0.4 [0.3 - 0.4]	0.2 [0.2 - 0.3]	0.5 [0.5 - 0.6]	0.7 [0.6 - 0.8]	0.2 [0.2 - 0.3]	0.8 [0.7 - 0.9]	1.0 [0.9 - 1.1]	0.5 [0.4 - 0.5]
Haryana	0.6 [0.5 - 0.7]	0.7 [0.6 - 0.8]	0.4 [0.4 - 0.5]	1.2 [1.1 - 1.3]	1.6 [1.4 - 1.7]	0.4 [0.3 - 0.5]	1.8 [1.7 - 2.0]	2.2 [2.0 - 2.4]	1.0 [0.9 - 1.2]
Himachal Pradesh	0.6 [0.5 - 0.7]	0.7 [0.6 - 0.8]	0.2 [0.04 - 0.3]	1.7 [1.5 - 1.9]	1.9 [1.7 - 2.1]	0.2 [0.01 - 0.3]	2.4 [2.2 - 2.6]	2.6 [2.4 - 2.8]	0.4 [0.2 - 0.6]
Jammu and Kashmir	0.4 [0.3 - 0.4]	0.4 [0.4 - 0.5]	0.2 [0.1 - 0.3]	1.2 [1.1 - 1.3]	1.4 [1.3 - 1.5]	0.6 [0.4 - 0.7]	1.6 [1.5 - 1.7]	1.8 [1.7 - 2.0]	0.8 [0.7 - 1.0]
Jharkhand	0.5 [0.5 - 0.6]	0.5 [0.4 - 0.6]	0.7 [0.5 - 0.8]	2.7 [2.6 - 2.9]	3.0 [2.8 - 3.2]	1.6 [1.4 - 1.8]	3.2 [3.1 - 3.4]	3.4 [3.2 - 3.6]	2.3 [2.0 - 2.5]
Karnataka	0.8 [0.7 - 0.9]	1.0 [0.9 - 1.1]	0.6 [0.5 - 0.6]	1.0 [0.9 - 1.1]	1.4 [1.2 - 1.5]	0.5 [0.4 - 0.6]	1.9 [1.8 - 2.0]	2.4 [2.3 - 2.6]	1.0 [0.9 - 1.2]
Kerala	1.4 [1.3 - 1.5]	1.5 [1.4 - 1.7]	1.2 [1.0 - 1.3]	2.5 [2.4 - 2.7]	3.1 [2.8 - 3.3]	1.9 [1.7 - 2.1]	4.0 [3.8 - 4.1]	4.5 [4.2 - 4.8]	3.3 [3.0 - 3.6]
Madhya Pradesh	0.7 [0.6 - 0.8]	0.8 [0.7 - 0.8]	0.5 [0.5 - 0.6]	1.6 [1.5 - 1.6]	1.7 [1.6 - 1.9]	0.9 [0.8 - 1.0]	2.2 [2.1 - 2.3]	2.4 [2.3 - 2.6]	1.5 [1.4 - 1.7]

Maharashtra	1.1 [1.0 - 1.2]	1.4 [1.3 - 1.5]	0.7 [0.6 - 0.8]	1.8 [1.8 - 1.9]	2.5 [2.4 - 2.7]	0.9 [0.8 - 1.0]	2.8 [2.8 - 2.9]	3.8 [3.6 - 3.9]	1.6 [1.5 - 1.7]
Odisha	1.1 [1.0 - 1.2]	1.2 [1.1 - 1.3]	0.5 [0.4 - 0.6]	3.4 [3.2 - 3.5]	3.8 [3.6 - 4.0]	1.1 [0.9 - 1.2]	4.4 [4.3 - 4.6]	5.0 [4.8 - 5.2]	1.6 [1.4 - 1.8]
Punjab	0.5 [0.5 - 0.6]	0.7 [0.5 - 0.8]	0.3 [0.2 - 0.4]	1.3 [1.2 - 1.4]	1.6 [1.5 - 1.8]	0.8 [0.7 - 1.0]	1.7 [1.6 - 1.8]	2.0 [1.8 - 2.1]	1.2 [1.0 - 1.4]
Rajasthan	0.6 [0.6 - 0.7]	0.7 [0.7 - 0.8]	0.2 [0.2 - 0.3]	1.2 [1.1 - 1.3]	1.3 [1.2 - 1.4]	1.0 [0.8 - 1.1]	1.8 [1.7 - 1.9]	2.0 [1.8 - 2.1]	1.2 [1.1 - 1.4]
Tamil Nadu	0.5 [0.4 - 0.6]	0.7 [0.6 - 0.8]	0.2 [0.2 - 0.3]	0.9 [0.9 - 1.0]	1.1 [1.0 - 1.2]	0.7 [0.6 - 0.9]	1.4 [1.3 - 1.5]	1.8 [1.6 - 1.9]	1.0 [0.9 - 1.2]
Telangana	0.4 [0.3 - 0.5]	0.6 [0.5 - 0.7]	0.2 [0.2 - 0.3]	0.7 [0.6 - 0.7]	1.0 [0.9 - 1.1]	0.3 [0.2 - 0.4]	1.0 [0.9 - 1.1]	1.4 [1.3 - 1.6]	0.6 [0.4 - 0.7]
Uttar Pradesh	1.0 [1.0 - 1.1]	1.1 [1.0 - 1.2]	0.8 [0.7 - 0.9]	2.7 [2.6 - 2.7]	2.8 [2.7 - 2.9]	2.1 [2.0 - 2.2]	3.7 [3.6 - 3.8]	3.9 [3.8 - 4.0]	3.1 [2.9 - 3.2]
Uttarakhand	0.5 [0.4 - 0.6]	0.6 [0.4 - 0.7]	0.4 [0.3 - 0.5]	0.4 [0.3 - 0.4]	0.3 [0.2 - 0.4]	0.6 [0.5 - 0.8]	0.9 [0.8 - 1.0]	0.9 [0.7 - 1.0]	1.0 [0.8 - 1.2]
West Bengal	0.6 [0.5 - 0.6]	0.7 [0.6 - 0.7]	0.4 [0.4 - 0.5]	2.0 [1.9 - 2.1]	2.2 [2.0 - 2.3]	1.7 [1.6 - 1.9]	2.6 [2.5 - 2.7]	2.7 [2.6 - 2.9]	2.3 [2.1 - 2.5]
Smaller States									
Arunachal Pradesh	0.7 [0.6 - 0.7]	0.7 [0.6 - 0.8]	0.5 [0.3 - 0.6]	1.8 [1.6 - 1.9]	1.6 [1.4 - 1.8]	2.5 [2.0 - 3.1]	2.4 [2.2 - 2.6]	2.3 [2.0 - 2.5]	3.0 [2.5 - 3.6]
Goa	0.5 [0.4 - 0.7]	0.2 [0.01 - 0.4]	0.7 [0.5 - 0.9]	0.3 [0.2 - 0.4]	0.3 [0.1 - 0.5]	0.4 [0.2 - 0.5]	0.9 [0.7 - 1.1]	0.5 [0.2 - 0.8]	1.2 [0.9 - 1.5]
Manipur	0.9 [0.8 - 1.0]	1.0 [0.9 - 1.1]	0.7 [0.6 - 0.8]	0.8 [0.7 - 0.9]	1.0 [0.8 - 1.1]	0.5 [0.4 - 0.6]	1.7 [1.6 - 1.8]	2.0 [1.8 -2 .2]	1.1 [1.0 - 1.3]
Meghalaya	0.1 [0.03 - 0.1]	0.1 [0.04 - 0.1]	0.02 [0.01 - 0.04]	0.2 [0.1 - 0.2]	0.2 [0.1 - 0.3]	0.01 [0.0 - 0.01]	0.2 [0.2 - 0.3]	0.3 [0.2 - 0.3]	0.001 [0.0 - 0.1]
Mizoram	0.1 [0.1 - 0.2]	0.2 [0.2 - 0.3]	0.02 [0.01 - 0.03]	1.0 [0.8 - 1.1]	1.6 [1.3 - 1.9]	0.2 [0.1 - 0.2]	1.1 [1.0 - 1.3]	1.8 [1.5 - 2.1]	0.2 [0.1 - 0.3]

Nagaland	0.3 [0.2 - 0.4]	0.3 [0.2 - 0.4]	0.2 [0.1 - 0.4]	0.1 [0.1 - 0.2]	0.2 [0.1 - 0.3]	0.0	0.4 [0.4 - 0.5]	0.5 [0.4 - 0.6]	0.2 [0.1 - 0.4]
Sikkim	0.3 [0.2 - 0.5]	0.4 [0.2 - 0.5]	0.2 [0.1 - 0.4]	0.2 [0.1 - 0.3]	0.2 [0.1 - 0.3]	0.1 [0.01 - 0.2]	0.5 [0.4 - 0.7]	0.6 [0.4 - 0.7]	0.4 [[0.2 - 0.6]
Tripura	0.3 [0.2 - 0.4]	0.3 [0.2 - 0.4]	0.1 [0.01 - 0.2]	0.8 [0.7 - 1.0]	1.0 [0.8 - 1.1]	0.3 [0.2 - 0.5]	1.2 [1.0 - 1.3]	1.4 [1.2 - 1.6]	0.5 [0.3 - 0.6]
Union Territories									
All Union Territories	0.3 [0.2 - 0.3]	0.3 [0.1 - 0.4]	0.3 [0.2 - 0.3]	0.6 [0.5 - 0.7]	0.2 [0.2 - 0.3]	0.6 [0.5 - 0.7]	0.9 [0.8 - 1.0]	0.5 [0.4 - 0.6]	0.9 [0.8 - 1.0]
India	0.8 [0.7 - 0.8]	0.9 [0.8 - 0.9]	0.5 [0.5 - 0.5]	1.7 [1.7 - 1.7]	2.0 [2.0 - 2.0]	1.0 [1.0 - 1.1]	2.4 [2.4 - 2.5]	2.8 [2.8 - 2.8]	1.6 [1.6 - 1.6]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 2.7 Incidence of distressed financing (%) at national, state, and intra-state level

States/Union Territories	Hospitalization			Outpatient Care		
	Total	Rural	Urban	Total	Rural	Urban
Larger States						
Andhra Pradesh	63.2 [61.4 - 64.9]	64.4 [62.2 - 66.6]	60.7 [57.9 - 63.5]	9.5 [8.1 - 11.0]	8.9 [7.1 - 10.7]	10.7 [8.4 - 13.1]
Assam	41.3 [39.4 - 43.2]	42.7 [40.5 - 45.0]	31.9 [28.4 - 35.3]	2.4 [0.7 - 4.1]	2.6 [0.4 - 4.8]	1.7 [-0.7 - 4.1]
Bihar	41.0 [39.4 - 42.6]	42.1 [40.1 - 44.1]	30.6 [28.1 - 33.2]	3.0 [1.6 - 4.3]	2.3 [0.8 - 3.8]	8.2 [4.6 - 11.9]
Chhattisgarh	26.4 [24.5 - 28.3]	23.3 [21.0 - 25.6]	38.0 [34.6 - 41.4]	3.1 [1.6 - 4.6]	3.2 [1.2 -5.1]	2.9 [0.7 - 5.1]
Gujarat	26.8 [25.3 - 28.4]	29.3 [26.9 - 31.8]	23.5 [21.4 - 25.5]	2.0 [1.1 - 2.9]	3.6 [1.8 - 5.4]	0.3 [-0.2 - 0.8]
Haryana	33.6	37.8	25.9	2.2	2.4	1.7

	[31.6 - 35.6]	[35.0 - 40.7]	[23.2 - 28.7]	[1.1 - 3.2]	[0.9 - 3.9]	[0.3 - 3.0]
Himachal Pradesh	17.4 [15.5 - 19.4]	17.7 [15.6 - 19.9]	14.0 [10.0 - 17.9]	4.6 [3.0 - 6.2]	3.8 [2.2 - 5.4]	9.4 [4.7 - 14.0]
Jammu and Kashmir	24.7 [23.0 - 26.4]	24.5 [22.2 - 26.7]	25.4 [22.7 - 28.2]	3.5 [2.4 - 4.7]	2.6 [1.2 - 4.0]	6.0 [3.9 - 8.1]
Jharkhand	47.1 [44.9 - 49.3]	49.7 [46.9 - 52.5]	39.9 [36.4 - 43.4]	6.3 [4.6 - 8.0]	5.7 [3.6 - 7.9]	8.3 [5.3 - 11.4]
Karnataka	58.0 [56.4 - 59.6]	61.4 [59.2 - 63.7]	52.2 [49.8 - 54.6]	3.7 [2.5 - 5.0]	4.6 [2.6 - 6.5]	2.6 [1.0 - 4.1]
Kerala	49.7 [48.0 - 51.4]	51.7 [49.4 - 54.1]	47.0 [44.5 - 49.5]	9.8 [8.7 - 11.0]	11.4 [9.8 - 13.0]	7.9 [6.3 - 9.4]
Madhya Pradesh	29.1 [27.7 - 30.6]	29.2 [27.3 - 31.1]	28.9 [26.8 - 31.0]	8.2 [6.5 - 9.9]	7.4 [5.0 - 9.7]	9.9 [7.3 - 12.4]
Maharashtra	40.5 [39.3 - 41.7]	47.2 [45.4 - 49.0]	31.6 [30.0 - 33.1]	4.9 [4.1 - 5.7]	3.5 [2.4 - 4.7]	6.1 [5.0 - 7.3]
Odisha	43.7 [42.0 - 45.5]	44.4 [42.4 - 46.5]	39.7 [36.4 - 43.1]	3.5 [2.4 - 4.6]	3.4 [2.2 - 4.7]	3.7 [1.7 - 5.8]
Punjab	27.0 [25.2 - 28.7]	31.0 [28.4 - 33.5]	20.7 [18.4 - 23.0]	0.5 [0.1 - 0.9]	0.4 [-0.1 - 0.8]	0.9 [0.1 - 1.6]
Rajasthan	37.1 [35.6 - 38.7]	39.6 [37.6 - 41.7]	28.7 [26.3 - 31.1]	2.6 [1.6 - 3.5]	3.0 [1.7 - 4.4]	1.3 [0.3 - 2.4]
Tamil Nadu	43.0 [41.6 - 44.4]	44.2 [42.3 - 46.1]	41.6 [39.6 - 43.6]	4.9 [3.9 - 6.0]	5.2 [3.7 - 6.7]	4.6 [3.1 - 6.1]
Telangana	49.6 [47.7 - 51.5]	54.8 [52.2 - 57.4]	43.1 [40.4 - 45.9]	9.4 [7.2 - 11.6]	14.0 [10.2 - 17.8]	4.6 [2.4 - 6.8]
Uttar Pradesh	37.6 [36.5 - 38.7]	37.3 [35.9 - 38.8]	38.5 [36.8 - 40.2]	4.6 [3.9 - 5.3]	4.5 [3.6 - 5.5]	4.7 [3.6 - 5.8]
Uttarakhand	28.5 [25.9 - 31.1]	28.4 [24.9 - 32.0]	28.6 [24.7 - 32.6]	13.5 [9.4 - 17.5]	21.9 [14.4 - 29.3]	5.5 [1.9 - 9.2]
West Bengal	37.0 [35.6 - 38.3]	38.1 [36.3 - 39.8]	34.3 [32.3 - 36.4]	6.4 [5.5 - 7.3]	6.3 [5.1 - 7.5]	6.7 [5.4 - 8.0]

Smaller States						
Arunachal Pradesh	60.6 [57.4 - 63.8]	63.1 [59.2 - 67.1]	49.0 [43.5 - 54.4]	3.3 [0.7 - 6.0]	4.1 [0.6 - 7.6]	0.0
Goa	58.6 [53.1 - 64.0]	55.4 [46.2 - 64.5]	60.0 [53.2 - 66.9]	5.4 [1.8 - 8.9]	3.4 [-1.3 - 8.1]	6.7 [1.7 - 11.6]
Manipur	58.7 [56.5 - 60.9]	58.7 [55.7 - 61.8]	58.7 [55.4 - 62.0]	0.5 [-0.6 - 1.6]	0.3 [-1.0 - 1.6]	1.0 [-1.2 - 3.1]
Meghalaya	48.3 [45.0 - 51.7]	50.3 [46.2 - 54.5]	36.0 [30.5 - 41.6]	0.5 [-2.7 - 3.8]	0.5 [-3.5 - 4.6]	0.0
Mizoram	17.8 [15.6 - 20.1]	22.1 [18.4 - 25.7]	12.7 [10.1 - 15.3]	2.9 [0.5 - 5.4]	3.6 [-0.4 - 7.6]	2.2 [-0.7 - 5.0]
Nagaland	64.4 [61.1 - 67.7]	63.1 [59.0 - 67.2]	67.1 [61.5 - 72.7]	0.1 [-0.9 - 1.0]	0.1 [-1.9 - 2.2]	0.0
Sikkim	28.5 [24.9 - 32.2]	29.5 [25.4 - 33.6]	24.8 [17.3 - 32.2]	21.4 [14.1 -28.7]	10.0 [4.1 - 16.0]	37.3 [17.5 - 57.1]
Tripura	47.2 [44.6 - 49.7]	50.4 [47.3 - 53.5]	31.2 [27.0 - 35.4]	5.6 [2.1 - 9.1]	6.0 [1.7 - 10.3]	4.5 [-1.3 - 10.2]
Union Territories						
All Union Territories	39.9 [37.9 - 41.9]	37.9 [33.9 - 41.9]	40.1 [37.8 - 42.3]	3.3 [2.0 - 4.6]	0.0 [-0.3 - 0.3]	3.5 [1.9 - 5.0]
India	40.6 [40.2 - 40.9]	41.9 [41.5 - 42.4]	37.6 [37.1 - 38.1]	5.4 [5.1 - 5.6]	5.3 [5.0 - 5.7]	5.5 [5.1 - 5.9]

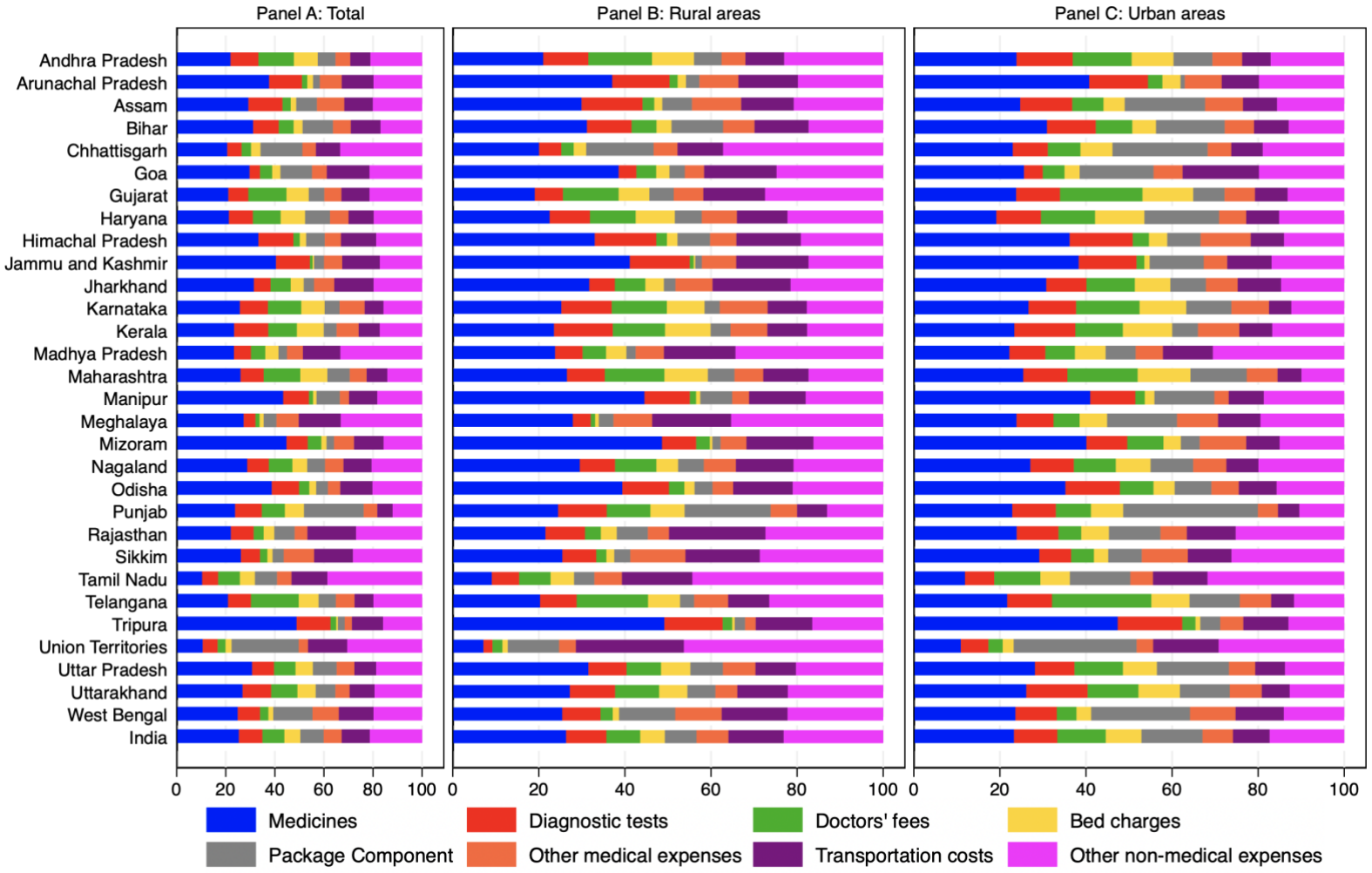
The figures inside square brackets represent 95% confidence interval.

Supplementary Table 2.8 Inequality in the incidence of using distressed financing at national, state, and intra-state level

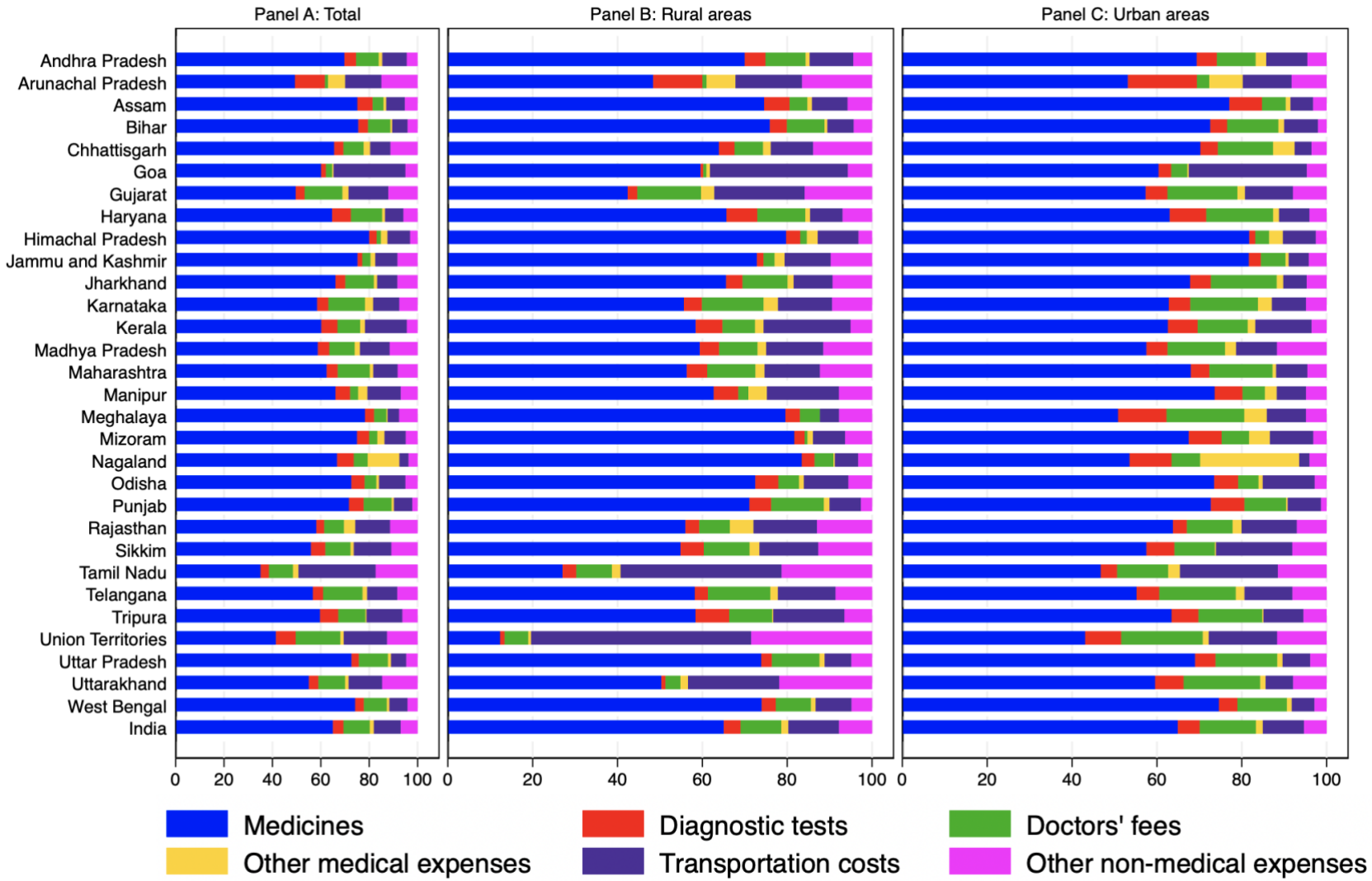
States/Union Territories	Hospitalisation		
	Total	Rural	Urban
	CI	CI	CI
Larger States			
Andhra Pradesh	-0.066*	0.003	-0.179*
Assam	-0.049*	-0.014	-0.014
Bihar	0.022	0.051*	-0.036
Chhattisgarh	0.163*	0.156*	-0.142*
Gujarat	-0.058*	0.049	-0.128*
Haryana	-0.142*	-0.076*	-0.144*
Himachal Pradesh	-0.012	-0.002	-0.128*
Jammu and Kashmir	0.034	0.028	0.016
Jharkhand	-0.058*	0.037	-0.148*
Karnataka	-0.079*	0.004	-0.043
Kerala	-0.151*	-0.112*	-0.188*
Madhya Pradesh	-0.010	-0.017	-0.030
Maharashtra	-0.184*	-0.069*	-0.156*
Odisha	-0.029	-0.009	-0.045
Punjab	-0.118*	-0.091*	-0.080*
Rajasthan	0.013	0.090*	-0.046
Tamil Nadu	-0.027	0.048*	-0.093*
Telangana	-0.178*	-0.118*	-0.116*
Uttar Pradesh	-0.011	0.022	-0.174*
Uttarakhand	-0.120*	-0.144*	-0.070
West Bengal	-0.064*	-0.040	-0.077*
Smaller States			
Arunachal Pradesh	-0.059	-0.066	0.225*
Goa	-0.375*	-0.339*	-0.387*
Manipur	0.097*	0.109*	0.078*
Meghalaya	-0.124*	-0.104*	0.045
Mizoram	-0.058*	0.065	-0.087*
Nagaland	-0.091*	-0.170*	-0.037
Sikkim	-0.193*	-0.237*	-0.053
Tripura	-0.200*	-0.161*	-0.076
Union Territories			
All Union Territories	-0.173*	-0.057	-0.180*
India	-0.031*	0.034	-0.114*

CI: Erreyger concentration index (CI). *p < 0.05.

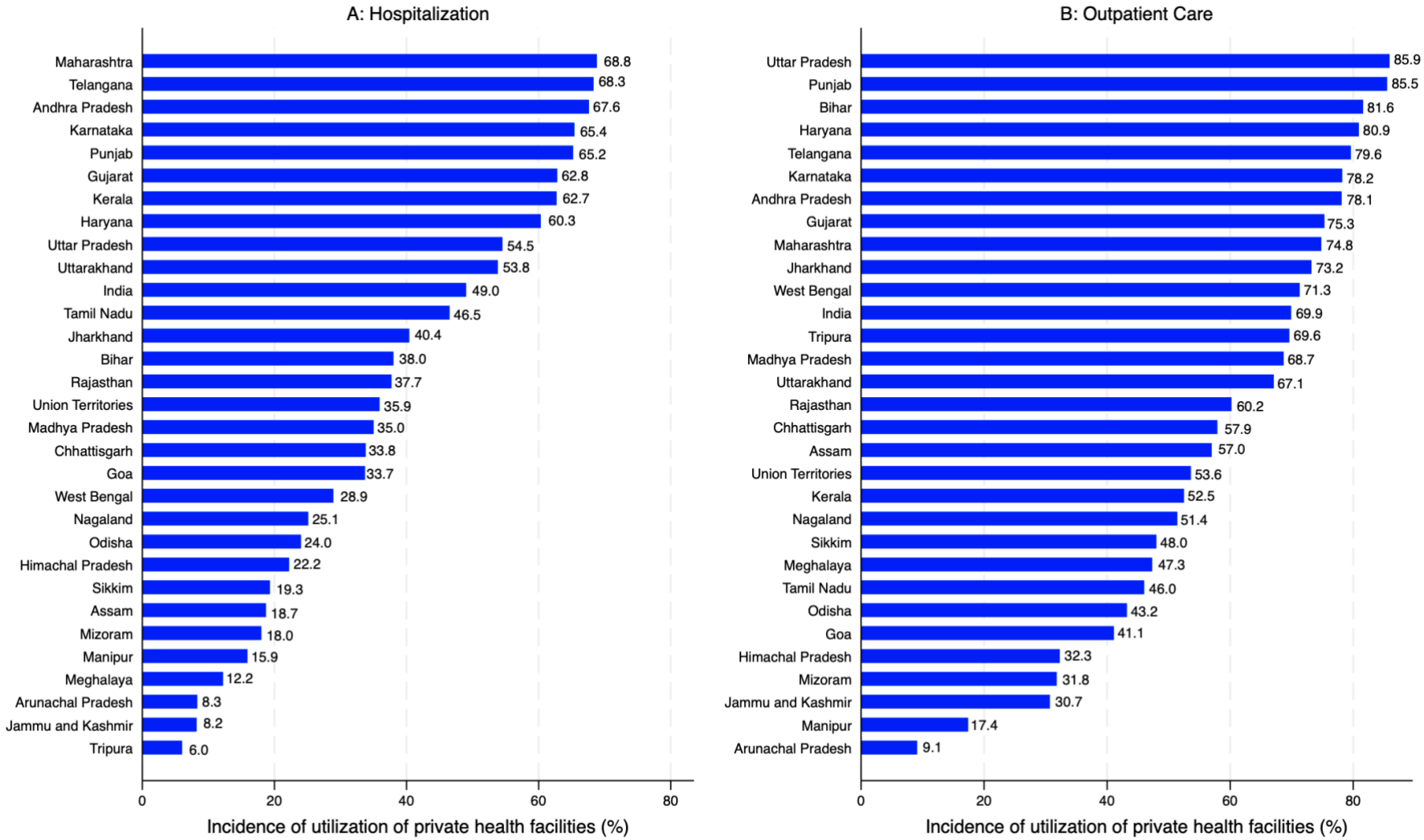
Supplementary Figure 2.1 Share of various components in total health expenditure for hospitalization



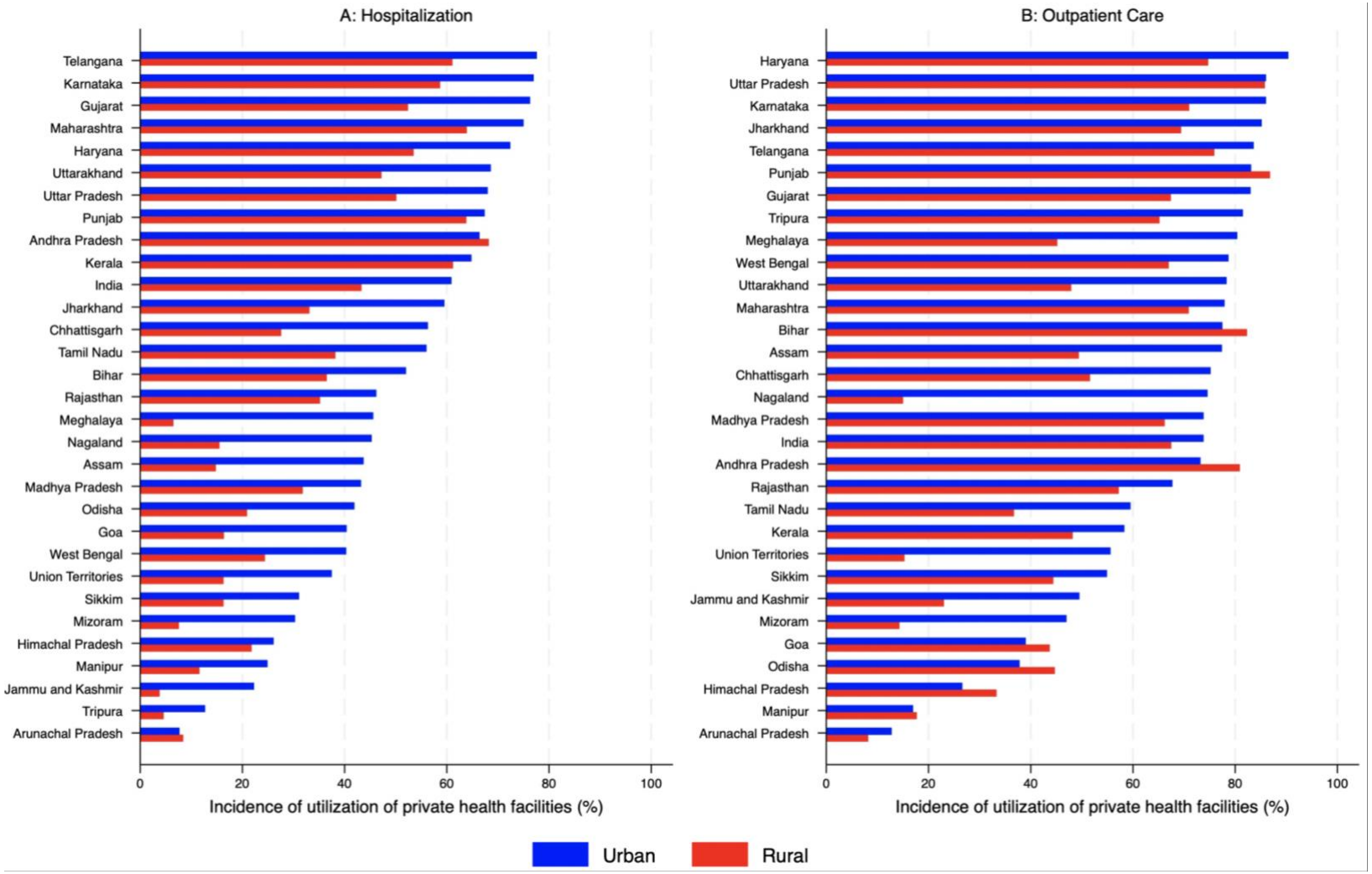
Supplementary Figure 2.2 Share of various components in total health expenditure for outpatient care



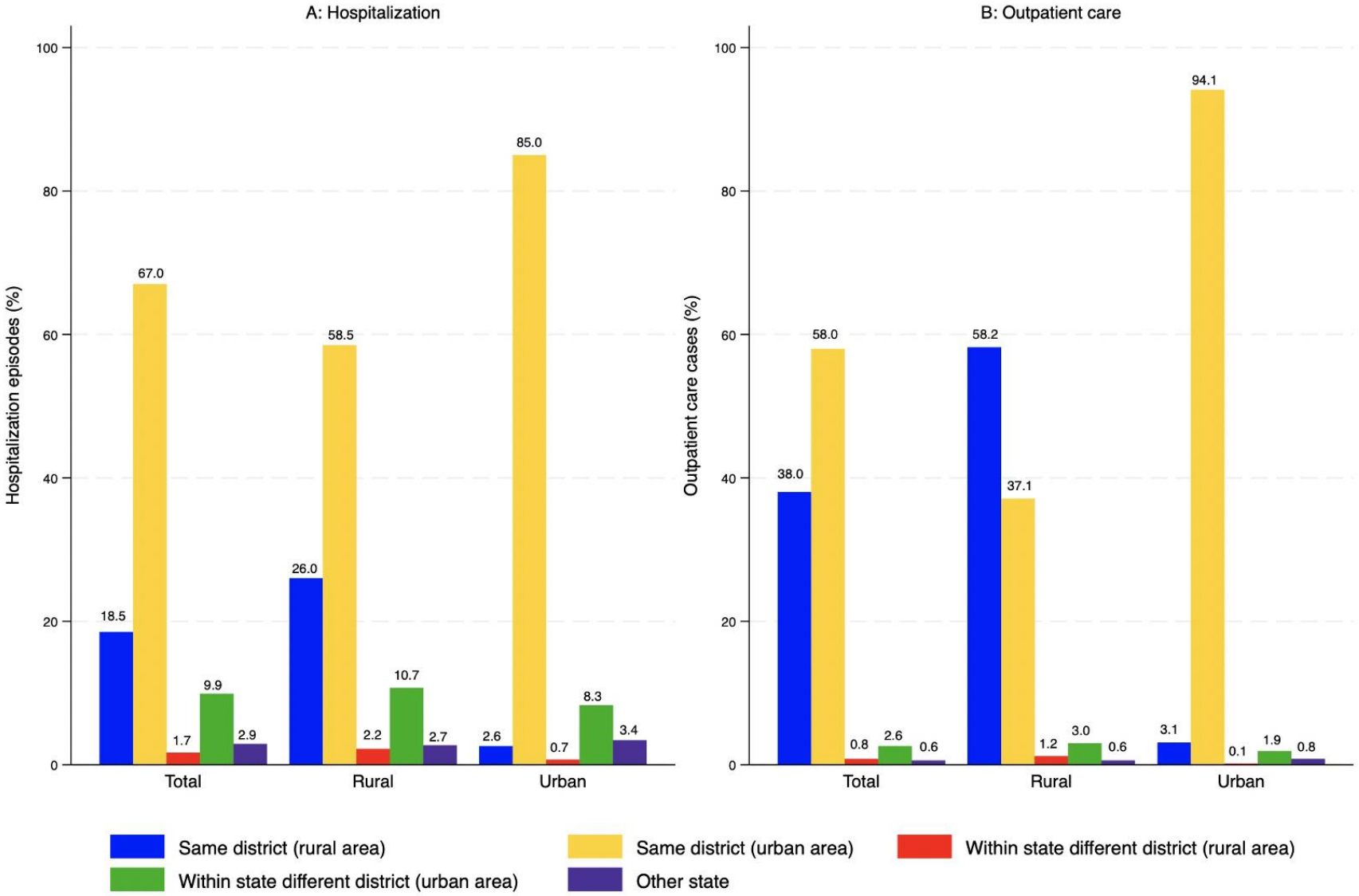
Supplementary Figure 2.3: Incidence of utilization of public and private health facilities across states/union territories



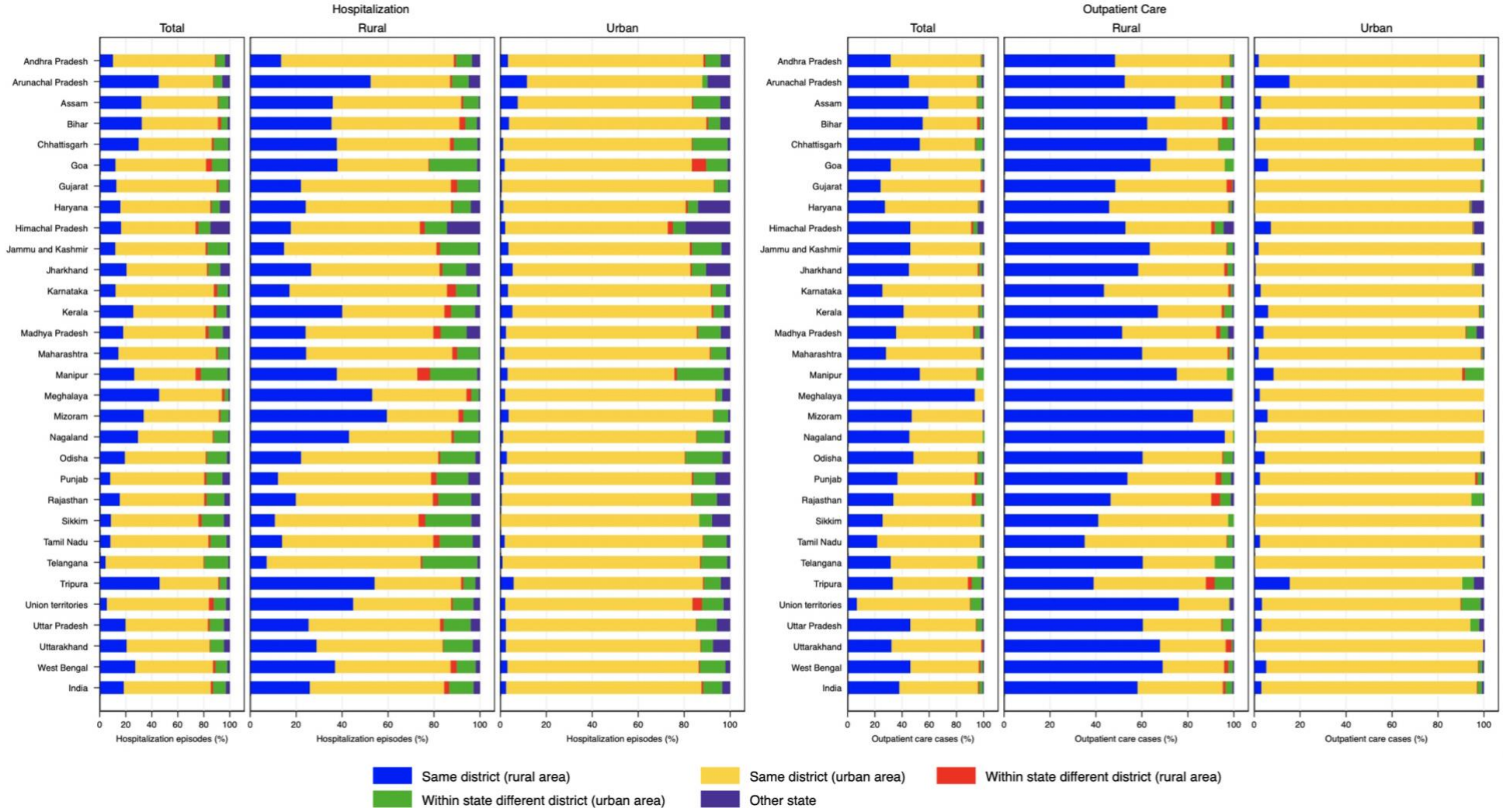
Supplementary Figure 2.4 Incidence of utilization of public and private health facilities in rural and urban areas within each state/union territory



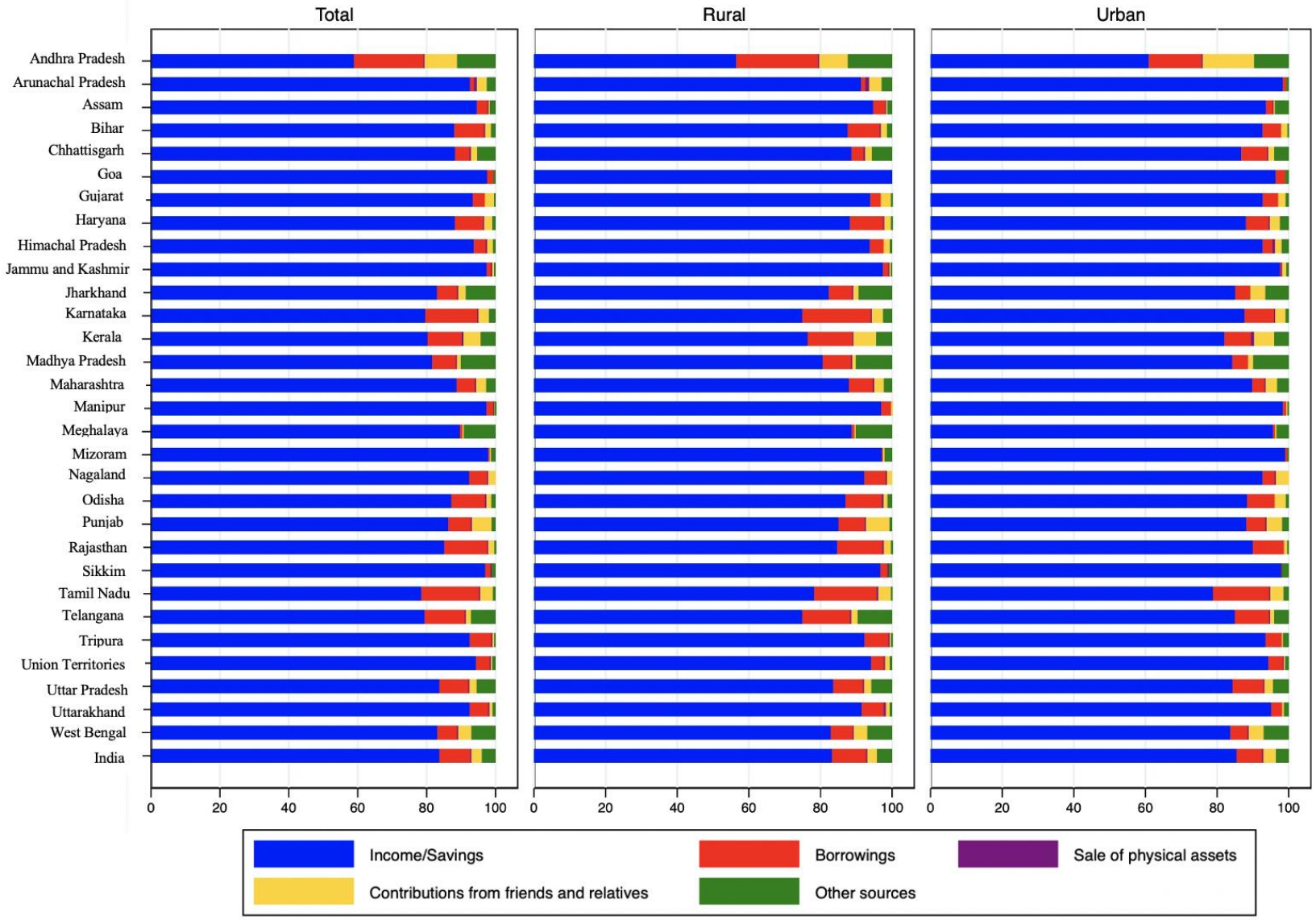
Supplementary Figure 2.5 Place of seeking treatment by the type of care sought



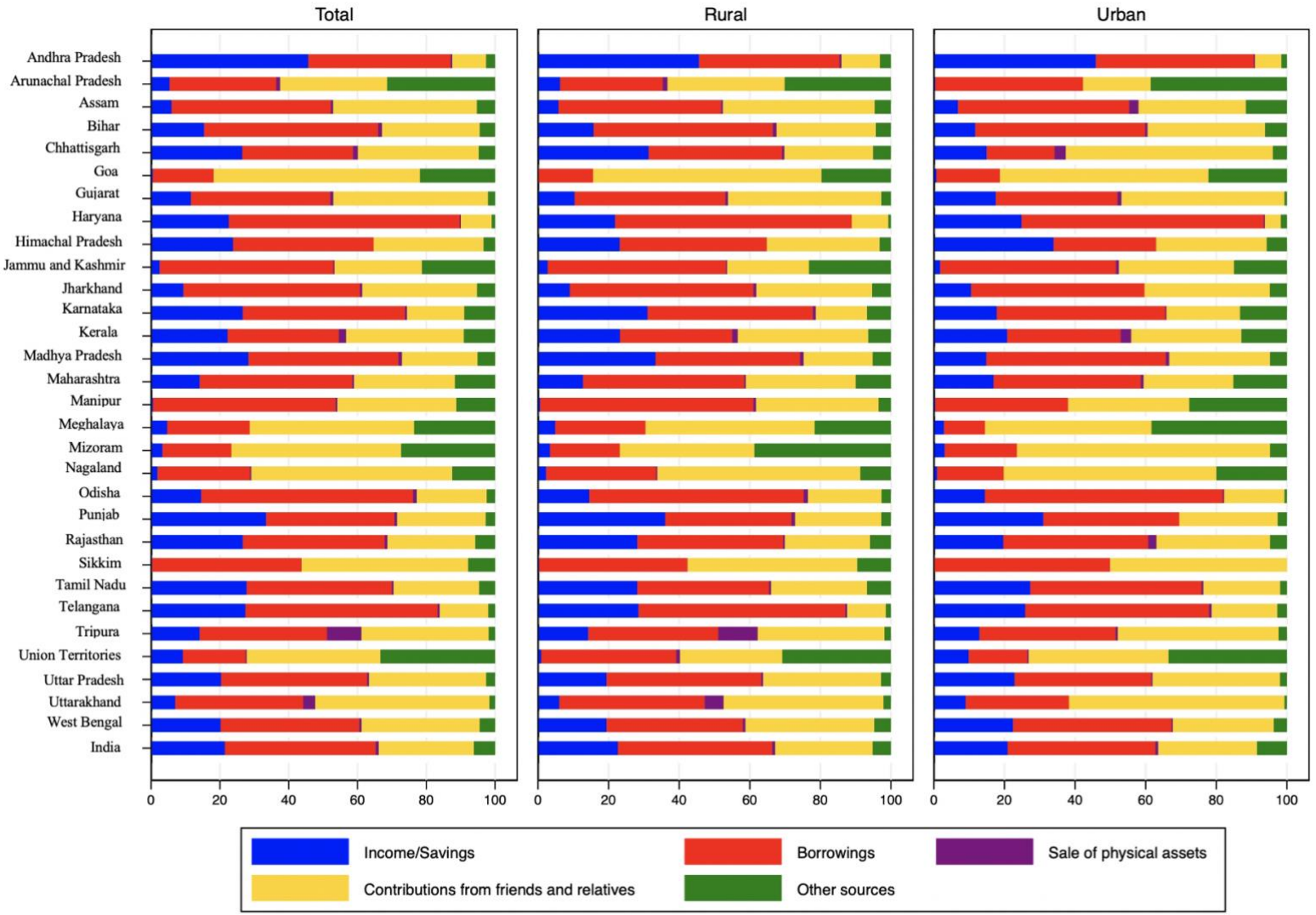
Supplementary Figure 2.6 Place of seeking treatment by the type of care sought across states/union territories and rural and urban areas within each state/union territory



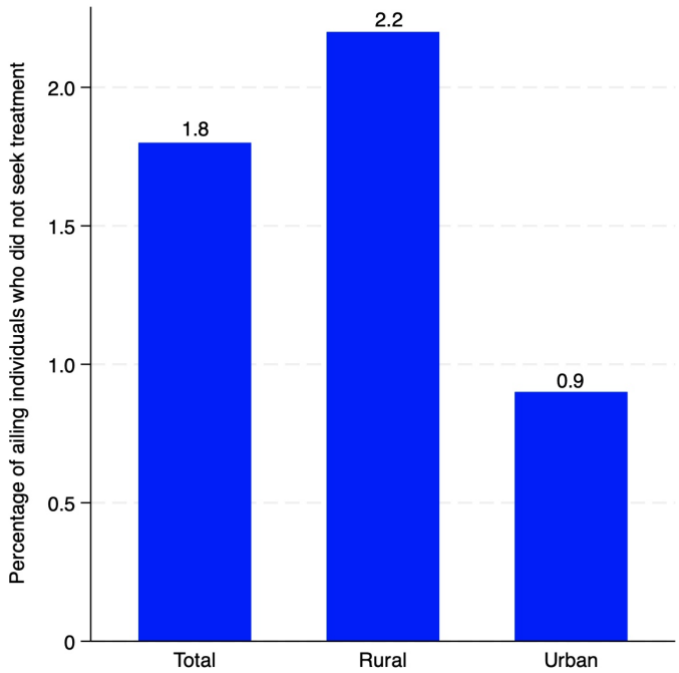
Supplementary Figure 2.7 Share of major source to finance hospitalization-related out-of-pocket health expenditure (%)



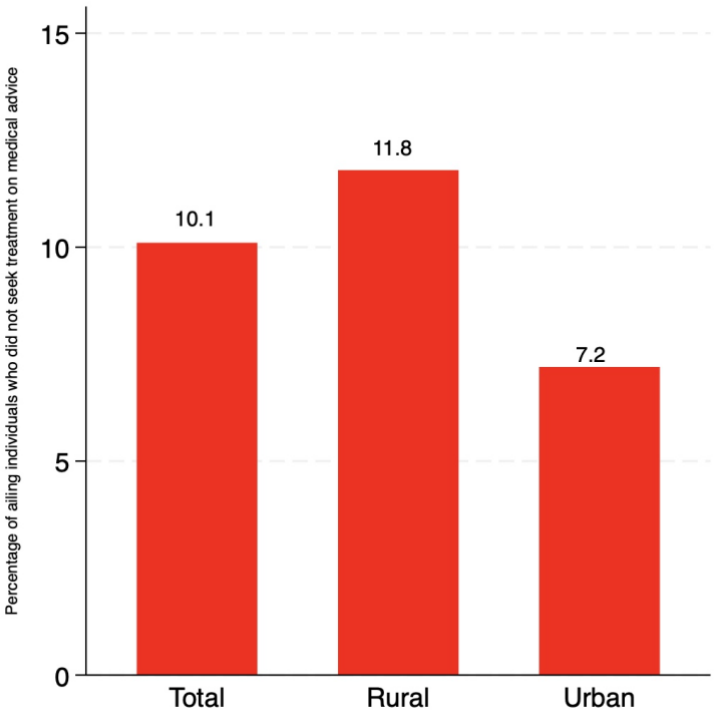
Supplementary Figure 2.8 Share of second major source to finance hospitalization-related out-of-pocket health expenditure (%)



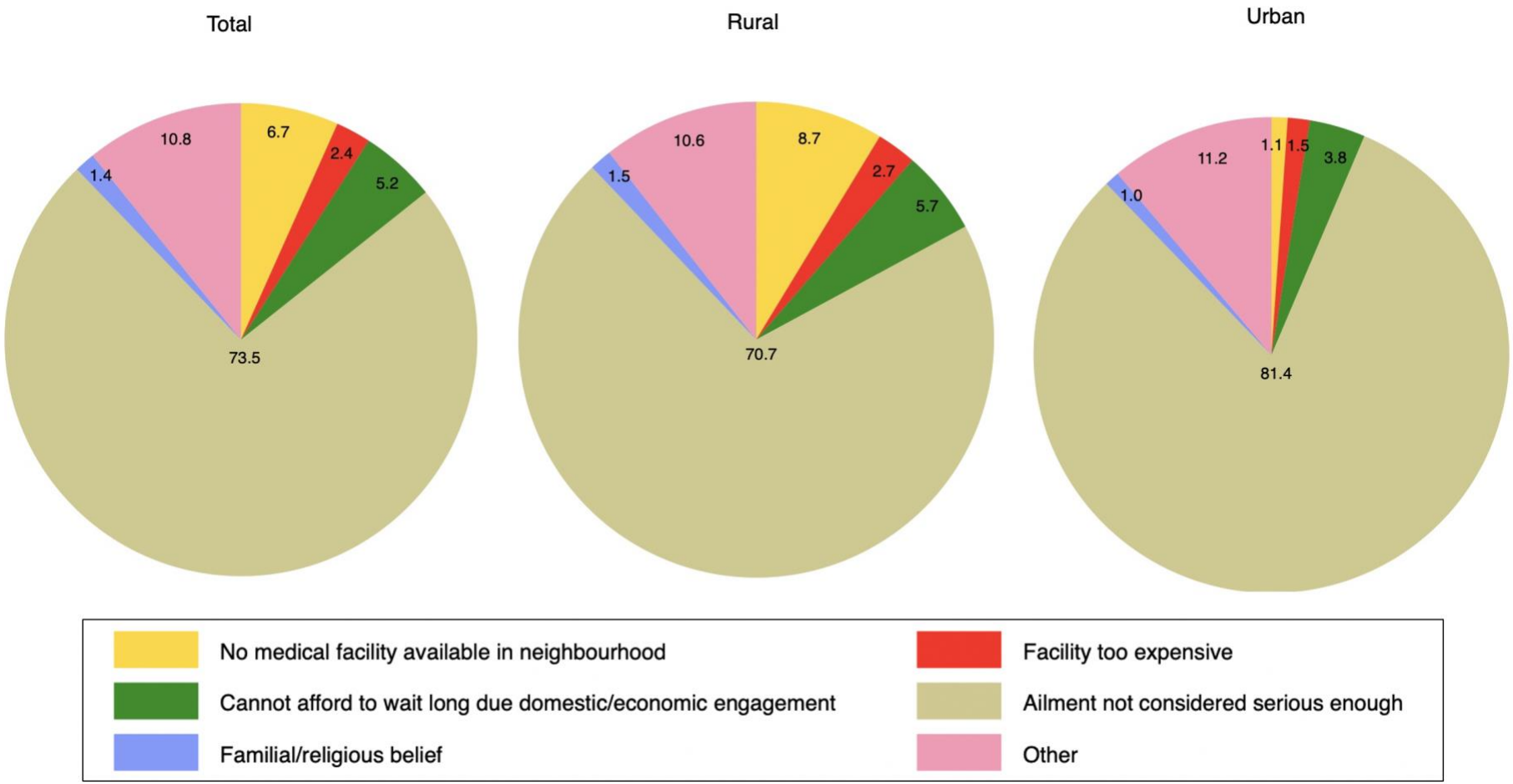
Supplementary Figure 2.9 Percentage of ailing individuals who did not seek treatment during the last 15 days



Supplementary Figure 2.10 Percentage of ailing individuals who did not seek treatment on medical advice during the last 15 days



Supplementary Figure 2.11 Reasons for not seeking treatment on medical advice



Chapter 3 Financial hardships due to out-of-pocket health expenditure and unmet healthcare needs across socio-economic and demographic dimensions

3.1 Introduction

Universal Health Coverage (UHC), the centrepiece of the United Nations' sustainable development goals on health (SDG-3), aims to ensure that everyone has access to quality healthcare services without facing financial hardships (WHO, 2023a). As a signatory to the 2030 agenda for sustainable development, India has shown its commitment towards achieving UHC and is striving hard even with one of the lowest public health expenditure (1.15% of GDP) and one of the highest out-of-pocket health expenditure (OOPE) (50.6% of health expenditure) worldwide (GOI, 2017; WHO, 2019). In India, abysmally low health insurance coverage (GOI, 2019) coupled with a dominant presence of fee-for-service private health sector forces a large proportion of Indian households to rely on OOPE as a means of financing healthcare. OOPE is the most inefficient and inequitable way of financing healthcare payments, and exposes households to financial catastrophe and impoverishment (WHO and World Bank, 2021). Nearly 3–5% of the Indian population is pushed below the poverty line each year due to high OOPE (Garg and Karan, 2009; Ghosh, 2011; Hooda, 2017;). In India, the rising burden of non-communicable diseases (NCDs) and injuries (Dandona et al., 2017) and a growing share of the elderly population (NSO, 2021) lead to an increased demand for healthcare services, which results in greater financial burden due to healthcare.

Previous literature highlights that that numerous factors including social, demographic, and economic factors exert substantial influence on utilization of healthcare services, OOPE, and overall financial burden (Pal, 2012; Joe, 2015; WHO and World Bank, 2021; Deng et al., 2022). For instance, marginalised social groups (e.g., scheduled tribes (STs) and scheduled castes (SCs), as well as vulnerable sections of society such as the elderly, experience higher risk of

impoverishment due to OOPE [Kumar et al. 2015; Sangar et al. 2022]. Therefore, the SDG indicator 3.8.2 highlights the need to assess the burden of catastrophic health expenditure (CHE) across various dimensions including economic quintiles, rural and urban areas, gender and age of the household head as the national averages mask important socio-economic and demographic disparities in financial burden (WHO, 2023a, 2023b). A disaggregated analysis at the granular level would aid in knowing *who are the most affected* and who require greater policy attention. Moreover, identifying the determinants of financial risk due to OOPE, such as incurring CHE, impoverishment, and resorting to distressed financing, is crucial for targeted policies tailored for those who require it the most.

However, previous studies have primarily focused on examining the socio-economic and demographic disparities and determinants of only one or two parameters of financial burden (Pal, 2012; Joe, 2015; Dwivedi and Pradhan, 2020; Dwivedi et al., 2021; Gaddam and Rao, 2023). Additionally, several studies were based on older rounds of the National Sample Survey on Consumer Expenditure (NSS CES) (Bonu et al., 2007; Pal, 2012; Dwivedi and Pradhan, 2020; Dwivedi et al., 2021). Our study contributes to the existing literature by comprehensively examining the financial burden due to OOPE and unmet healthcare needs across various socio-economic and demographic dimensions. We examined the adverse economic consequences of OOPE across all three parameters: i) incidence and intensity of incurring CHE; ii) incidence and intensity of impoverishment due to OOPE; iii) incidence of using distressed financing. We also explored the factors associated with experiencing CHE, impoverishment, and distressed financing due to OOPE. Moreover, we used the latest round of the NSS survey on Health, which collects extensive data on ailments and health expenditure compared to the NSS CES, which mainly focuses on household consumption expenditure. Also, unlike the NSS health survey, the NSS CES does not record reimbursements received by employers or insurance companies, and therefore health expenditures that are reimbursed are included in the total

health expenditure incurred by households (MOSPI, 2017; GOI, 2019; Goyanka et al., 2019). Moreover, earlier studies based on the NSS health survey did not scrutinize the disparities and determinants for all three parameters (CHE, impoverishment, and distressed financing) separately for hospitalization, outpatient care, and hospitalization and/or outpatient care (Sangar et al., 2020; Sriram and Albadrani, 2022a, 2022b; Sangar et al., 2022; Gaddam and Rao, 2023). For policy implications, an in-depth analysis of all these collectively is imperative, and we have therefore undertaken this in our study. This comprehensive examination is expected to serve as an informative and valuable guide for policymakers, shedding light on socio-economic and demographic disparities in OOPE burden in India and highlighting determinants of financial risk that warrant increased policy attention.

3.2 Data and Methodology

3.2.1 Overview of data source

The study employed data from the most recent round of National Sample Survey (NSS) on health, titled "Household Social Consumption: Health," which was conducted between July 2017 and June 2018. This nationally representative survey covered 555,115 individuals (3,25,883 in rural areas and 2,29,232 in urban areas) from 113,823 households (64,552 in rural areas and 49,271 in urban areas) across the country. The survey employed a stratified multi-stage sampling design, with villages and urban blocks as the first stage unit and household as the second unit. Comprehensive information was collected through the survey, covering the nature of ailments, utilization of healthcare facilities, costs of hospitalization and outpatient care services, various sources utilized to finance OOPE, and demographic and socio-economic characteristics of households and their members.

3.2.2 Outcome variables

3.2.2.1 Out-of-pocket health expenditure

The NSS survey recorded total health expenditure separately for hospitalisation and outpatient care under three broad categories: medical, non-medical, and transportation expenditure. OOPE was calculated by subtracting any reimbursement amount received from the total health expenditure incurred by a household. The recall period for hospitalisation expenditure was 365 days and for outpatient expenses, it was 15 days. OOPE for hospitalisation and outpatient care was converted into monthly figures and then aggregated to derive total OOPE for hospitalisation and/or outpatient care. Per person OOPE was defined as total OOPE incurred by a household divided by household size for each household.

3.2.2.2 Catastrophic health expenditure

3.2.2.2.1 Incidence of catastrophic health expenditure

A household is defined to incur CHE if OOPE exceeds a certain threshold of the household's total consumption expenditure (Berki, 1986; Wagstaff and Doorslaer, 2003).

$$CHE_i = \begin{cases} 1, if\ \dfrac{OOPE_i}{HCE_i} > \mathrm{Z} \\ 0, \quad otherwise \end{cases}$$

In the above equation, $OOPE_i$ is the monthly out-of-pocket health expenditure of i^{th} household, HCE_i is the monthly total consumption expenditure of i^{th} household, and Z is the threshold. In tandem with the SDG indicator 3.8.2 (WHO, 2023c), we estimated CHE at two thresholds: 10% and 25% (i.e., Z = 0.10 and Z = 0.25).

The proportion of households incurring CHE, i.e., incidence of CHE, was calculated using the following formula.

$$Incidence\ of\ CHE = \frac{1}{N}\sum_{i=1}^{N} CHE_i$$

In the above equation, N is defined as the total number of households in the sample.

3.2.2.2.2 Intensity of catastrophic health expenditure

The catastrophic overshoot, O (i.e., intensity of CHE) captures the average degree by which OOPE as a proportion of total consumption expenditure exceeds the threshold, Z (Wagstaff and Doorslaer, 2003; O'Donnell et al., 2008).

$$O = \frac{1}{N}\sum_{i=1}^{N} O_i$$

In the above equation, O_i is the overshoot of i^{th} household, i.e., $O_i = CHE_i * \left(\frac{OOPE_i}{HCE_i} - \text{Z}\right)$ and N is the total number of households in the sample.

3.2.2.3 Impoverishment due to OOPE

The impoverishment impact of OOPE was measured using two indices, namely, poverty headcount ratio (as a measure of incidence of impoverishment) and normalised poverty gap (as an indicator of intensity of impoverishment) (Wagstaff and Doorslaer 2003; O'Donnell et al., 2008). We used the inflation-adjusted official state-wise poverty line for rural and urban areas separately as defined by the Tendulkar Committee (Planning commission, 2014) for measuring impoverishment due to OOPE.

3.2.2.3.1 Poverty headcount ratio

The pre-payment poverty headcount (HCR_{pre}) was calculated using the following formula.

$$HCR_{pre} = \frac{1}{M}\sum_{j=1}^{M} h_j^{pre}$$

In the above equation, $h_j^{pre} = \begin{cases} 1, & if\ HCE_j < PL \\ 0, & otherwise \end{cases}$, HCE_j is the monthly per capita consumption expenditure of j^{th} individual, PL is the poverty line, and M is the total number of individuals in the sample.

The post-payment poverty headcount (HCR_{post}) was calculated as below.

$$HCR_{post} = \frac{1}{M}\sum_{j=1}^{M} h_j^{post}$$

In the above equation, $h_j^{post} = \begin{cases} 1, \ if \ (HCE_j - OOPE_j) < \ PL \\ 0, \ otherwise \end{cases}$, $OOPE_j$ is the monthly per capita out-of-pocket health expenditure of j^{th} individual.

The proportion of individuals pushed below the poverty line due to OOPE was calculated using the following formula.

$$Poverty\ Headcount\ Ratio = \ HCR_{post} - HCR_{pre}$$

3.2.2.3.2 Poverty gap and Normalized poverty gap

The poverty gap measures the average amount by which individuals fall short of the poverty line.

The pre-payment poverty gap (G^{pre}) was computed as below.

$$G_{pre} = \frac{1}{M}\sum_{j=1}^{M} g_j^{pre}$$

In above equation, $g_j^{pre} = h_j^{pre} * \left(PL - HCE_j\right)$

The post-payment poverty gap (G_{post}) was calculated as below.

$$G_{post} = \frac{1}{M}\sum_{j=1}^{M} g_j^{post}$$

In above equation, $g_j^{post} = h_j^{post} * \left(PL - (HCE_j - \ OOPE_j)\right)$

The average shortfall from the poverty line due to OOPE was calculated using the following formula.

$$Poverty\ Gap = \ G_{post} - G_{pre}$$

To facilitate comparison of poverty gaps calculated for different poverty lines across states and rural and urban areas, we computed normalized poverty gap by dividing the poverty gap by the poverty line.

The pre-payment normalized poverty gap (NG_{pre}) was computed as below.

$$NG_{pre} = \frac{1}{M}\sum_{j=1}^{M}\frac{g_j^{pre}}{PL}$$

The post-payment normalized poverty gap (NG_{post}) was computed as below.

$$NG_{post} = \frac{1}{M}\sum_{j=1}^{M}\frac{g_j^{post}}{PL}$$

Normalized Poverty Gap was computed using the following formula.

$$\text{Normalized Poverty Gap} = NG_{post} - NG_{pre}$$

3.2.2.4 Incidence of using distressed sources

The NSS health survey collected information about various sources (household income/savings, borrowings, sale of physical assets, contributions from friends and relatives, and other sources) used to finance OOPE. We categorized a household as incurring distressed financing if it used any of these sources except household income or savings (Sangar et al., 2020). The proportion of households employing various sources of finance to cope with OOPE was calculated as follows.

$$I = \frac{1}{N}\sum_{i=1}^{N} n$$

In the above formula, I is the incidence of using a particular source of finance, n is the number of households using a particular source of finance, and N is the total number of households.

In case of hospitalization, NSS classified the various sources of finance as major and second major sources because households might have used more than one source in varying proportions. We have shown the percentage of households using distressed sources to finance hospitalization-related OOPE separately for major and second major sources and for both the sources combined.

3.2.3 Statistical analysis

Descriptive statistics and multivariable logistic regression were employed. Sample weights provided by the NSS were applied as applicable. The analysis was conducted using Stata Version 14.1.

Multivariable logistic regression was employed to gauge the determinants of incurring CHE, falling below the poverty line due to OOPE, and using distressed financing.

$$logit\ (Y) = ln\ \frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n$$

In the above equation, $\frac{p}{1-p}$ is the odds ratio of Y (i.e., incurring CHE, falling below the poverty line, and using distressed financing). $X_1 \ldots X_n$ represent variables, including place of residence (rural, urban), economic quintile, principal source of household income (self-employment, regular wages or salaries, casual labour, other), social group[4] (STs, SCs, other backward classes (OBCs), and others), religion (Hinduism, Islam, others), household size (up to 4 members, more than 4 members), gender of household head, educational status of household head (not literate/literate without formal schooling, up to primary, up to secondary, up to higher secondary, graduation and above), presence of elderly member in household, presence of any

[4] STs and SCs are the two most socially backward and economically disadvantaged social groups in India (National Commission for Scheduled Tribes, 2023; Biswas et al., 2023). OBCs include backward classes of citizens other than SCs and STs as specified in the lists prepared by the Government of India, which are periodically updated (Ministry of Social Justice and Empowerment, 2023).

member suffering from NCD, health insurance status, type of healthcare facility visited (public, private), and state.

3.3 Results

3.3.1 Out-of-pocket health expenditure

Supplementary Table 3.1 shows the average monthly OOPE of households by the type of care sought. The average monthly total OOPE was INR 707.5 (INR 235.4 for hospitalisation and INR 472.1 for outpatient care). The OOPE was nearly 2 times higher among households belonging to the wealthiest economic quintile (hospitalization: INR 328.6, outpatient care: INR 615.0, hospitalization and/or outpatient care: INR 944.2) compared to those belonging to the poorest quintile (hospitalization: INR 152.5, outpatient care: INR 326.2, hospitalization and/or outpatient care: INR 478.7). Households belonging to other social groups reported higher OOPE compared to those belonging to marginalized social groups (STs and SCs) and OBCs, regardless of the type of care sought. Similarly, OOPE was higher among households primarily earning from regular wages or salaries, those practicing other religion, those headed by members having higher educational status, and those having any elderly member in the household, irrespective of the type of care sought.

3.3.2 Catastrophic health expenditure

The incidence and intensity of CHE were 15.4% and 3.2% at 10% threshold, respectively, and 7.1% and 1.6% at 25% threshold, respectively, for hospitalization and/or outpatient care (Supplementary Table 3.2 and Supplementary Table 3.3). Notably, the incidence and intensity of CHE at both thresholds were higher for outpatient care in comparison to hospitalization. At both thresholds, the CHE burden was higher among households belonging to the lowest economic quintile, other social groups, those primarily earning from other work, those headed by members with lower educational attainment, and those having any elderly member in

household, compared to their respective counterparts, for hospitalization and/or outpatient care. A nearly similar pattern was observed for hospitalization and outpatient care as well.

Table 3.1 shows the results of multivariable logistic regression to reveal the impact of various factors on the likelihood of incurring CHE. The odds of incurring CHE were statistically significantly higher among rural households for both inpatient (odds ratio [OR]: 2.03 [1.86–2.22]; $p < 0.05$ at 10% threshold; OR: 2.18 [1.94–2.45]; $p < 0.05$ at 25% threshold) and outpatient care (OR: 1.81 [1.56–2.11]; $p< 0.05$ at 10% threshold; OR: 1.98 [1.67–2.36]; $p < 0.05$ at 25% threshold) compared with their urban counterparts. In the case of hospitalisation, households belonging to OBCs and other social groups were more likely to experience CHE at both thresholds ($p < 0.05$). Households primarily earning from other work were more likely to incur CHE for both inpatient care (OR: 1.36 [1.16–1.59]; $p < 0.05$ at 10% threshold; OR: 1.31 [1.11–1.55]; $p < 0.05$ at 25% threshold) and outpatient care (OR: 1.55 [1.22–1.97]; $p < 0.05$ at 10% threshold; OR: 1.82 [1.40–2.36]; $p < 0.05$ at 25% threshold) compared with those earning from self-employment. Utilisation of private health facilities statistically significantly increased the likelihood of experiencing CHE at both thresholds, irrespective of the type of care sought ($p < 0.05$). Households with elderly member(s) and member(s) having NCD were more likely to experience CHE at both thresholds, irrespective of the type of care sought ($p < 0.05$). By contrast, the odds of incurring CHE were statistically significantly lower among all economic quintiles compared to the poorest quintile, irrespective of the type of care sought ($p < 0.05$). Larger households (>4 members) were less likely to incur CHE for both inpatient and outpatient care and at both thresholds ($p < 0.05$). In the case of hospitalisation, insurance coverage statistically significantly decreased the likelihood of experiencing CHE at 10% (OR: 0.62 [0.56–0.69]; $p < 0.05$) and 25% (0.71 [0.63–0.80]; $p < 0.05$) thresholds.

Table 3.1 Results of logistic regression analysis showing predictors of incurring catastrophic health expenditure

Background characteristics	Catastrophic health expenditure (at 10% threshold)		Catastrophic health expenditure (at 25% threshold)	
	Hospitalization	Outpatient Care	Hospitalization	Outpatient Care
	Odds ratio	Odds ratio	Odds ratio	Odds ratio
Sector				
Urban areas ®				
Rural areas	2.03* [1.86 - 2.22]	1.81* [1.56 - 2.11]	2.18* [1.94 - 2.45]	1.98* [1.67 - 2.36]
Economic Quintile				
Quintile I ®				
Quintile 2	0.65* [0.57 - 0.74]	0.58* [0.46 - 0.73]	0.63* [0.53 - 0.75]	0.65* [0.51 - 0.83]
Quintile 3	0.50* [0.44 - 0.57]	0.52* [0.41 - 0.65]	0.52* [0.43 - 0.63]	0.52* [0.40 - 0.68]
Quintile 4	0.40* [0.35 - 0.46]	0.44* [0.35 - 0.55]	0.37* [0.31 - 0.45]	0.45* [0.35 - 0.58]
Quintile 5	0.27* [0.23 - 0.31]	0.32* [0.25 - 0.41]	0.26* [0.22 - 0.32]	0.33* [0.24 - 0.44]
Major source of household earnings				
Self-employment ®				
Regular wage or salary	1.06 [0.96 - 1.18]	1.05 [0.88 - 1.24]	1.03 [0.90 - 1.19]	1.10 [0.89 - 1.35]
Casual labour	1.02 [0.92 - 1.13]	1.04 [0.88 - 1.24]	1.09 [0.95 - 1.25]	0.90 [0.74 - 1.10]
Other	1.36* [1.16 - 1.59]	1.55* [1.22 - 1.97]	1.31* [1.11 - 1.55]	1.82* [1.40 - 2.36]
Social Group				
Scheduled Tribes ®				
Scheduled Castes	1.12 [0.94 - 1.34]	1.13 [0.84 - 1.51]	1.04 [0.83 - 1.31]	1.18 [0.84 - 1.66]
Other Backward Classes	1.22* [1.03 - 1.43]	1.13 [0.86 - 1.49]	1.32* [1.06 - 1.63]	1.03 [0.75 - 1.42]
Others	1.28* [1.08 - 1.51]	1.17 [0.88 - 1.56]	1.30* [1.03 - 1.63]	1.01 [0.72 - 1.42]
Religion				
Hinduism ®				
Islam	0.80* [0.71 - 0.91]	0.94 [0.78 - 1.13]	0.83* [0.71 - 0.98]	0.96 [0.77 - 1.20]

Others	0.84 [0.69 - 1.02]	1.02 [0.80 - 1.29]	0.86 [0.70 - 1.07]	1.12 [0.83 - 1.50]
Educational level of Household Head				
Not literate/Literate without formal schooling ®				
Up to Primary	1.04 [0.93 - 1.17]	1.00 [0.84 - 1.20]	1.09 [0.93 - 1.27]	0.97 [0.79 - 1.20]
Up to Secondary	1.09 [0.99 - 1.21]	1.00 [0.83 - 1.20]	0.98 [0.86 - 1.11]	1.02 [0.82 - 1.26]
Up to Higher Secondary	1.12 [0.96 - 1.29]	1.07 [0.83 - 1.38]	1.03 [0.86 - 1.24]	1.19 [0.89 - 1.60]
Graduation and above	1.06 [0.90 - 1.25]	1.01 [0.78 - 1.30]	1.05 [0.84 - 1.32]	1.08 [0.79 - 1.48]
Gender of Household Head				
Male ®				
Female	1.09 [0.95 - 1.24]	1.08 [0.89 - 1.32]	1.12 [0.97 - 1.31]	0.90 [0.71 - 1.15]
Household size				
Up to 4 members ®				
>4 members	0.52* [0.48 - 0.56]	0.60* [0.52 - 0.69]	0.41* [0.36 - 0.46]	0.55* [0.47 - 0.65]
Any elderly member in household				
No ®				
Yes	1.24* [1.13 - 1.35]	1.19* [1.03 - 1.37]	1.37* [1.22 - 1.53]	1.33* [1.12 - 1.57]
Any member having NCD				
No ®				
Yes	2.31* [2.08 - 2.56]	1.33* [1.15 - 1.53]	2.52* [2.24 - 2.85]	1.24* [1.04 - 1.47]
Insurance coverage				
No ®				
Yes	0.62* [0.56 - 0.69]	0.88 [0.74 - 1.03]	0.71* [0.63 - 0.80]	0.91 [0.74 - 1.12]
Healthcare facility				
Public ®				
Private	25.93* [23.46 - 28.66]	3.15* [2.72 - 3.65]	19.03* [16.36 - 22.13]	2.80* [2.34 - 3.35]

® denotes Reference category; *$p < 0.05$; The figures inside square brackets represent 95% confidence interval. Results are adjusted for state.

3.3.3 Impoverishment due to OOPE

The poverty headcount ratio stood at 5.3% with a normalized poverty gap of 2.4% due to OOPE for hospitalization and/or outpatient care (Supplementary Table 3.4 and Supplementary Table 3.5). The impoverishment due to OOPE was more pronounced for outpatient care (poverty headcount ratio: 3.7%, normalized poverty gap: 1.7%) compared to hospitalization (poverty headcount ratio: 1.7%, normalized poverty gap: 0.8%). Notably, both incidence and intensity of impoverishment were higher among those practicing Islam, those headed by individuals with lower educational attainment, and those with an elderly member in household, compared to their respective counterparts, regardless of the type of care sought. Conversely, those belonging to the wealthiest economic quintile, primarily earning from regular wages or salaries, and headed by female members experienced lower poverty headcount ratio and normalized poverty gap, regardless of the type of care sought.

Table 3.2 illustrates the factors influencing the likelihood of falling below the poverty line due to OOPE using logistic regression. Residing in rural areas, utilising private health facilities, having any elderly member in household, and having any member suffering from NCDs statistically significantly increased the likelihood of falling below the poverty line, regardless of the type of care sought ($p < 0.05$). Compared to STs, SCs were more likely to fall below the poverty line for both inpatient (OR: 1.36 [1.06–1.75]; $p < 0.05$) and outpatient care (OR: 1.54 [1.06–2.25]; $p < 0.05$). Furthermore, belonging to OBCs (OR: 1.34 [1.07–1.67]; $p < 0.05$) and other social groups (OR: 1.33 [1.05–1.69]; $p < 0.05$) statistically significantly increased the likelihood of experiencing impoverishment due to OOPE for hospitalisation compared to STs. Compared to the poorest economic quintile, those belonging to poor and middle quintiles were more likely to experience impoverishment, irrespective of the type of care sought ($p < 0.05$). By contrast, the odds of experiencing impoverishment were lower among those belonging to the wealthiest quintile, regardless of the type of care sought ($p < 0.05$). Households headed by

members having higher educational status were less likely to fall below the poverty line than households headed by members who were not literate or lacked formal education in the event of hospitalization ($p < 0.05$). Larger household size (>4 members) decreased the odds of falling below the poverty line for both inpatient (OR: 0.65 [0.58–0.74]; $p < 0.05$) and outpatient care (OR: 0.73 [0.62–0.86]; $p < 0.05$).

Table 3.2 Results of logistic regression analysis showing predictors of falling below the poverty line due to OOPE

Background characteristic	Hospitalization	Outpatient Care
	Odds ratio	Odds ratio
Sector		
Urban areas ®		
Rural areas	3.18* [2.78 - 3.63]	3.11* [2.57 - 3.77]
Economic Quintile		
Quintile I ®		
Quintile 2	3.33* [2.67 - 4.15]	3.06* [2.33 - 4.03]
Quintile 3	2.41* [1.93 - 3.01]	2.37* [1.81 - 3.11]
Quintile 4	0.89 [0.70 - 1.12]	1.24 [0.94 - 1.63]
Quintile 5	0.30* [0.23 - 0.39]	0.43* [0.31 - 0.59]
Major source of household earnings		
Self-employment ®		
Regular wage or salary	0.94 [0.80 - 1.11]	0.96 [0.78 - 1.19]
Casual labour	0.93 [0.81 - 1.07]	0.85 [0.70 - 1.03]
Other	1.27* [1.05 - 1.55]	1.17 [0.87 - 1.59]
Social Group		
Scheduled Tribes ®		
Scheduled Castes	1.36* [1.06 - 1.75]	1.54* [1.06 - 2.25]
Other Backward Classes	1.34* [1.07 - 1.67]	1.22 [0.85 - 1.76]
Others	1.33* [1.05 - 1.69]	1.31 [0.89 - 1.92]

Religion		
Hinduism ®		
Islam	0.94 [0.80 - 1.10]	1.13 [0.91 - 1.40]
Others	0.97 [0.64 - 1.48]	1.15 [0.83 - 1.59]
Educational level of Household Head		
Not literate/Literate without formal schooling ®		
Up to Primary	1.04 [0.88 - 1.23]	0.92 [0.75 - 1.14]
Up to Secondary	0.95 [0.83 - 1.09]	0.92 [0.74 - 1.13]
Up to Higher Secondary	0.80* [0.66 - 0.97]	1.13 [0.84 - 1.53]
Graduation and above	0.73* [0.52 – 0.95]	0.89 [0.64 - 1.25]
Gender of Household Head		
Male ®		
Female	0.93 [0.79 - 1.09]	0.87 [0.68 - 1.13]
Household size		
Up to 4 members ®		
>4 members	0.65* [0.58 - 0.74]	0.73* [0.62 - 0.86]
Any elderly member in household		
No ®		
Yes	1.20* [1.05 - 1.36]	1.23* [1.04 - 1.46]
Any member having NCD		
No ®		
Yes	1.82* [1.59 - 2.08]	1.23* [1.04 - 1.46]
Insurance coverage		
No ®		
Yes	0.88 [0.76 - 1.03]	0.82 [0.67 – 1.02]
Healthcare facility		
Public ®		
Private	7.69* [6.80 - 8.70]	2.05* [1.71 - 2.47]

® denotes Reference category; *$p < 0.05$; The figures inside square brackets represent 95% confidence interval. Results are adjusted for state.

3.3.4 Distressed financing

Among all households who sought hospitalization, 16.2% relied on distressed sources as the major source to finance OOPE. Additionally, among 26,442 households that reported using a second major source to finance hospitalization-related OOPE, 77.9% relied on distressed sources (Supplementary Figure 3.1). In total, 40.6% of households resorted to distressed sources, either as the major or second major source, to cover OOPE for hospitalization (Supplementary Table 3.6). By contrast, outpatient care was predominantly financed through income or savings (94.6%) and the incidence of using distressed sources was only 5.4% (Supplementary Figure 3.2 and Supplementary Table 3.6). The incidence of distressed financing was higher among households belonging to lower economic quintiles, those primarily earning from other work, those practicing Islam, those headed by female members, those headed by members who were not literate or lacked formal education, and those with elder member in household, compared to their respective counterparts, for both hospitalization and outpatient care (Supplementary Table 3.6).

Table 3.3 shows the results of multivariable logistic regression, revealing the impact of various factors on the likelihood of using distressed sources as either the primary or secondary source. The odds of using distressed sources were statistically significantly higher among rural households (OR: 1.43 [1.33–1.54]; $p < 0.05$), households belonging to SCs (OR: 1.23 [1.06–1.42]; $p < 0.05$), households primarily earning from casual work (OR: 1.34 [1.23–1.47]; $p < 0.05$), households with any member suffering from NCDs (OR: 1.55 [1.42–1.69]; $p < 0.05$) in the case of hospitalisation. Additionally, households primarily earning from other work were more likely to use distressed financing for both inpatient (OR: 1.30 [1.14–1.50]; $p < 0.05$) and outpatient care (OR: 3.25 [2.22–4.76]; $p < 0.05$). Notably, utilisation of private health facilities statistically significantly increased the odds of using distressed financing in the case of hospitalisation and decreased the odds of using distressed financing for outpatient care ($p <$

0.05). Conversely, the odds of experiencing distressed financing were lower among all economic quintiles compared to the poorest quintile in the case of hospitalisation ($p < 0.05$). Larger households (>4 members) and households headed by members having higher education status were less likely to use distressed financing for both inpatient and outpatient care ($p < 0.05$).

Table 3.3 Results of logistic regression analysis showing predictors of using distressed financing

Background characteristic	Hospitalization	Outpatient Care
	Odds ratio	Odds ratio
Sector		
Urban areas ®		
Rural areas	1.43* [1.33 - 1.54]	0.88 [0.66 - 1.16]
Economic Quintile		
Quintile I ®		
Quintile 2	0.87* [0.78 - 0.98]	1.10 [0.70 - 1.74]
Quintile 3	0.82* [0.73 - 0.92]	0.98 [0.61 - 1.59]
Quintile 4	0.80* [0.71 - 0.91]	0.72 [0.44 - 1.18]
Quintile 5	0.65* [0.58 - 0.74]	1.31 [0.81 - 2.11]
Major source of household earnings		
Self-employment ®		
Regular wage or salary	1.00 [0.91 - 1.10]	1.11 [0.77 - 1.61]
Casual labour	1.34* [1.23 - 1.47]	1.17 [0.82 - 1.67]
Other	1.30* [1.14 - 1.50]	3.25* [2.22 - 4.76]
Social Group		
Scheduled Tribes ®		
Scheduled Castes	1.23* [1.06 - 1.42]	0.73 [0.41 - 1.30]
Other Backward Classes	1.10 [0.97 - 1.26]	0.98 [0.59 - 1.63]
Others	1.01 [0.87 - 1.16]	0.88 [0.51 - 1.53]

Religion		
Hinduism ®		
Islam	1.09 [0.98 - 1.20]	0.95 [0.65 - 1.39]
Others	0.89 [0.77 - 1.03]	0.94 [0.58 - 1.52]
Educational level of Household Head		
Not literate/Literate without formal schooling ®		
Up to Primary	0.99 [0.90 - 1.08]	0.84 [0.61 - 1.16]
Up to Secondary	0.91 [0.83 - 1.01]	0.72 [0.51 - 1.03]
Up to Higher Secondary	0.80* [0.70 - 0.92]	0.75 [0.43 - 1.31]
Graduation and above	0.65* [0.56 - 0.75]	0.39* [0.23 - 0.66]
Gender of Household Head		
Male ®		
Female	1.01 [0.91 - 1.12]	1.37 [0.98 - 1.92]
Household size		
Up to 4 members ®		
>4 members	0.86* [0.80 - 0.93]	0.61* [0.46 - 0.82]
Any elderly member in household		
No ®		
Yes	1.01 [0.93 - 1.09]	1.16 [0.85 - 1.57]
Any member having NCD		
No ®		
Yes	1.55* [1.42 - 1.69]	0.81 [0.60 - 1.10]
Insurance coverage		
No ®		
Yes	0.95 [0.87 – 1.03]	0.85 [0.61 - 1.18]
Healthcare facility		
Public ®		
Private	2.49* [2.31 - 2.69]	0.31* [0.24 - 0.41]

® denotes Reference category; *$p < 0.05$; The figures inside square brackets represent 95% confidence interval. Results are adjusted for state.

3.3.5 Percentage of ailing individuals who did not seek treatment

Among individuals who reported having an ailment during the last 15 days prior to the survey date, 1.8% did not seek treatment (Supplementary Table 3.7). The incidence of not seeking treatment was higher among those from the marginalised social groups (STs: 5.4% and SCs: 2.2%) than those from the other social group (1.1%). Individuals belonging to lower economic quintiles (Quintile 1: 1.9%, Quintile 2: 1.7%, Quintile 3: 2.0%), those primarily engaged as casual labourers (2.0%), those who were not literate or lacked formal education (2.6%), and those aged 60 years or above (2.0%) reported greater incidence of unmet healthcare needs than their respective counterparts.

Substantial socio-economic disparities were also evident in terms of incidence of not seeking treatment on medical advice, with a higher incidence observed among individuals belonging to marginalised social groups (STs: 14.8% and SCs: 11.5%), casual labourers (12.3%), lower economic quintiles (Quintile 1: 16.0%, Quintile 2: 12.3%, Quintile 3: 10.7%), and those with lower educational status (not literate or lacking formal education:11.2%, up to primary:11.5%) (Supplementary Table 3.7). While the primary reason for not seeking treatment on medical advice was that the ailment was not perceived as severe (73.5% of cases), there were socio-economic disparities, as illustrated in the Supplementary Figure 3.3. For instance, individuals who were illiterate or lacked formal education reported non-availability of medical facilities in their neighbourhood as a reason for not seeking treatment on medical advice in 5.9% of cases and financial constraints (i.e., expensive facilities) in 3.0% of cases. By contrast, individuals with a graduate degree or higher, reported unavailability of medical facilities in their neighbourhood as a reason in none of the cases and financial constraints in only 0.1% of cases.

3.4 Discussion

This chapter provides a holistic assessment of the economic impact of OOPE and unmet healthcare needs across socio-economic and demographic dimensions to convey the magnitude

of financial hardships experienced by Indian households. We also assessed the determinants of incurring CHE, falling below the poverty line, and using distressed financing. We found that OOPE is an alarming predicament in India, leading to a 15.4% incidence of CHE and poverty headcount ratio of 5.3% due to hospitalisation and outpatient care. Around 40% of households relied on distressed sources as a primary or secondary means to cover OOPE for hospitalization. Additionally, 1.8% of ailing individuals did not seek treatment. Although OOPE was reported to be higher among households belonging to the wealthiest economic quintiles, those primarily earning through regular wages or salaries, those belonging to other social groups, and those headed by members having higher educational status, the financial burden and unmet healthcare needs were more pronounced among their respective counterparts.

We observed prominent socio-economic disadvantages, with those belonging to lower economic quintiles, residing in rural areas, belonging to SCs, OBCs and other social groups, headed by members who were not literate or lacked formal education, and engaged in other work exposed to higher financial risk due to OOPE. Additionally, the incidence of unmet healthcare needs was higher among individuals belonging to marginalised social groups (STs and SCs), those working as casual labourers, those belonging to lower economic quintiles, and those who were not literate or lacked formal education. The pernicious effects of high OOPE aggravate the plight of the poor and vulnerable. For instance, the poor and vulnerable rely on coping mechanisms such as borrowings from informal moneylenders, who lend at exorbitant interest rates, driving them into debt bondage (Murphy et al., 2019). Additionally, forgoing care may exacerbate health problems and put the concerned family in a downward spiral of ill-health and poverty (Rahman et al., 2022; Petrovic et al., 2021, Wagstaff, 2002). A recent study reported that individuals belonging to lower economic quintiles, with lower educational status, belonging to SC and OBC categories, and those following the Islamic religion consistently

exhibited low health insurance enrolment compared to their counterparts in 2004, 2014, and 2018 in India (Aashima and Sharma, 2023). The combination of limited financial resources and low health insurance enrolment results in an increased financial burden and unmet healthcare needs among the most vulnerable sections of the society. This underscores the urgent need for targeted interventions to address the socio-economic and demographic disparities in financial burden and to strengthen the implementation of government-sponsored health insurance (GSHI) schemes to ensure inclusive coverage of socio-economically disadvantaged population.

We found that health insurance coverage reduces the likelihood of incurring CHE for hospitalisation at both thresholds (10% and 25%), but did not statistically significantly reduce the odds of falling below the poverty line and using distressed financing in the event of hospitalization. Previous studies have shown mixed results regarding the financial protection provided by the GSHI schemes in India (Prinja et al., 2017; Reshmi et al., 2021). Low awareness among beneficiaries regarding various facets of health insurance (such as information regarding entitled benefits, procedures, number of family members covered, details of empanelled hospitals, and ailments covered), limits their ability to fully utilize the benefits of GSHI schemes (Devadasan et al., 2013; Thakur, 2016; Ahlin et al., 2016; Prinja et al., 2017; Hooda, 2020). Additionally, supplier-induced demand and continued spending on medicines, diagnostics, and consumables, contribute to high OOPE and financial burden even among the beneficiaries enrolled under GSHI schemes (Selvaraj and Karan, 2012; Devadasan et al., 2013; Rent and Ghosh, 2015; Thakur, 2016; Ahlin et al., 2016). Concerted efforts are required to address these issues and to ensure that GSHI schemes provide adequate financial cushion to the enrolled beneficiaries.

Furthermore, we found a higher OOPE burden for outpatient care (incidence and intensity of CHE at 10% threshold: 11.3% and 2.3%, respectively; incidence and intensity of impoverishment: 3.7% and 1.7%, respectively) compared to hospitalization (incidence and intensity of CHE at 10% threshold: 4.9% and 0.9%, respectively; incidence and intensity of impoverishment: 1.7% and 0.8%, respectively). The brunt of outpatient care can be attributed to recurrent visits, small but ongoing expenses, and a heavy reliance on the private health sector (Berman et al., 2010; Mukherjee and Chaudhuri, 2020). Moreover, the lack of health insurance coverage for outpatient services exacerbates the situation (Selvaraj and Karan, 2012; Hooda, 2020). Consequently, we found that health insurance coverage did not lead to a statistically significant reduction in the likelihood of incurring CHE, experiencing impoverishment, or relying on distressed financing for the insured compared to the uninsured for outpatient care. Excluding outpatient services from the ambit of health insurance coverage is insufficient to alleviate the financial burden in India, especially during the times of the rising prevalence of NCDs, which demand frequent outpatient visits for effective disease management (Selvaraj et al., 2018; Mukherjee and Chaudhuri, 2020). The recently launched GSHI scheme, Pradhan Mantri Jan Arogya Yojana (PM-JAY), also does not cover outpatient services similar to its predecessor, Rashtriya Swasthya Bima Yojana, the central-level GSHI scheme (Bakshi et al., 2018; National Health Authority, 2022). This highlights the need to incorporate outpatient services under the purview of PM-JAY to enhance financial risk protection in India.

In tandem with previous studies (Mohanty et al, 2014; Pradhan et al., 2017; Pandey et al., 2018; Dwivedi et al., 2021), we found that households having any elderly member exhibited higher incidence and odds of incurring CHE, falling below the poverty line, and resorting to distressed sources compared to households without any elderly member. The high OOPE and economic burden among households with elderly members can be attributed to frailty, higher prevalence of chronic diseases, co-morbidities and disabilities among the older population (Husain and

Ghosh, 2017; NSO, 2021; Sahoo et al., 2021; IIPS and UNPF, 2023), leading to higher utilization of healthcare services and concomitant financial burden. Evidence from other low and middle-income countries also indicates that households with older people, especially those with chronic NCDs or disabilities, experience a higher incidence of CHE (Bloom et al., 2015; Jacobs et al., 2016; Okedo-Alex et al., 2019). In India, the financial vulnerability of the elderly is further compounded by their limited awareness of various social security schemes, lack of awareness (52.9% of cases) and affordability (21.6% of cases) of health insurance schemes (IIPS and UNPF, 2023), and their financial dependence on others (with 70% of elderly individuals being either partially or completely financially dependent on others) (Ranjan and Muraleedharan, 2020). As the proportion of the elderly population in India is projected to increase from 10.5% in 2022 to 20.8% in 2050, ensuring the physical and financial well-being of the elderly becomes a crucial policy concern (IIPS and UNPF, 2023).

Additionally, we also found that households with any member having NCDs were exposed to higher financial risk due to OOPE (Tripathy et al., 2016; Verma et al., 2021; Shukla and Arora, 2023). The treatment costs related to NCD care are substantial. Due to the chronic nature of NCDs, frequent doctor consultations, diagnostic tests, and long-term medication is required which leads to escalation of OOPE and corresponding financial hardships (Selvaraj et al., 2018; Mukherjee and Chaudhuri, 2020). Furthermore, much of the NCD-related care in India is provided by the private healthcare sector, which further amplifies the financial burden (Patel et al., 2011; IHME and PFHI, 2018). Recent research indicates that both private and public primary care facilities, as well as public secondary facilities, are currently ill-equipped to effectively address the vast and fastly-rising burden of NCDs in India (Krishnan et al., 2021). Notable gaps in the availability of essential medicines, technologies, and human resources for delivering NCD-related services have been reported (Krishnan et al., 2021; Pati et al., 2020). WHO recommends the presence of a robust primary healthcare with a focus on health

promotion and disease prevention, which can help countries avoid or delay the need for more costly services, enhance the efficiency of healthcare spending, save lives, and increase healthy life expectancy (WHO, 2019b).

We also observed that the type of healthcare facility visited is a significant determinant of financial risk due to OOPE. Utilization of private health facilities significantly increased the likelihood of incurring CHE, experiencing impoverishment, and relying on distressed financing, irrespective of the type of care sought. Only in the case of outpatient care, households seeking treatment from public healthcare facilities were more likely to rely on distressed sources compared to those treated in private facilities. This can be attributed to higher utilization of public facilities by individuals belonging to lower economic quintiles (Supplementary Figure 3.4). Such individuals have to rely on the distressed sources to finance even relatively small amounts of outpatient expenses even at subsidized public facilities (Joe, 2015). In India, private hospitals primarily focus on providing tertiary care services, incorporating advanced technologies and sub-specialties (Dehury et al., 2019). However, their lack of inadequate monitoring has emerged as a concerning issue in India (Dehury et al., 2019; Oxfam India, 2021; Selvaraj et al., 2022; Chakravarthi, 2018). Patients often face a lack transparency regarding healthcare charges imposed by private hospitals, and there have been numerous instances of overcharging, unnecessary tests and treatments, and malpractices in India (Chakravarthi, 2018; Dehury et al., 2019; Oxfam India, 2021; Selvaraj et al., 2022). An overwhelming majority of evidence highlights the need to increase public health expenditure and fortify the public healthcare system to augment financial risk protection against OOPE (National Health Policy, 2017; Muraleedharan et al., 2020; Kumar and Sarwal, 2021; Selvaraj et al., 2022). As per a report published by WHO (2019), countries with higher public health expenditure can provide greater financial protection from catastrophic and impoverishing health spending. However, the capacity and quality of healthcare services in India's public

health sector are constrained due to low government health expenditure (Kumar and Sarwal, 2021), highlighting the urgent need for significant and sustained public health investment.

3.5 Conclusion

The chapter underscores higher financial burden due to OOPE as well as unmet healthcare needs among the socio-economically and demographically disadvantaged sections in India. To address these disparities, policy measures should incorporate targeted interventions aimed at enhancing financial risk protection, especially for the poor and vulnerable sections of India. Concerted efforts are crucial to increase the uptake of health insurance and formulate comprehensive health insurance products that encompass both inpatient and outpatient services. Moreover, it is essential to address issues such as lack of awareness among beneficiaries regarding the various facets of health insurance schemes, supplier-induced demand, and continued expenditure on drugs and diagnostics even among insured individuals to augment financial risk protection (Selvaraj and Karan, 2012; Devadasan et al., 2013; Rent and Ghosh, 2015; Thakur, 2016; Ahlin et al., 2016). Furthermore, given that households with elderly members experience higher OOPE and associated financial burden, and considering the growing share of the elderly population in India, efforts to improve geriatric well-being are warranted. Lastly, for long-term sustainability, there needs to be stronger impetus on health promotion and disease prevention strategies to address the evolving epidemic of NCDs and corresponding financial brunt.

3.6 References

Aashima & Sharma R. 2023. Inequality and disparities in health insurance enrolment in India. Journal of Medicine Surgery and Public Health 1:100009.

Ahlin T, Nichter M, Pillai G. 2016. Health insurance in India: what do we know and why is ethnographic research needed. Anthropology & medicine 23(1):102-24.

Bakshi H, Sharma R, Kumar P. 2018. Ayushman bharat initiative (2018): What we stand to gain or lose!. 2018. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine 43(2):63.

Berki, SE. 1986. A look at catastrophic medical expenses and the poor. Health affairs, 5(4), 138-145.

Berman P, Ahuja R, Bhandari L. 2010. The impoverishing effect of healthcare payments in India: new methodology and findings. Economic and Political Weekly 45: 65–71.

Biswas S, Pramanik KR, Sonowal CJ. 2023. Marginalised social groups differentials in nutritional status (BMI) among reproductive-aged women in West Bengal. BMC Public Health. 23(1):842.

Bloom DE, Chatterji S, Kowal P, Lloyd-Sherlock P, McKee M, Rechel B, Rosenberg L, Smith JP. 2015. Macroeconomic implications of population ageing and selected policy responses. The Lancet 14;385(9968):649-57.

Bonu S, Bhushan I, Peters DH. 2007. Incidence, intensity, and correlates of catastrophic out-of-pocket health payments in India.

Chakravarthi I. 2018. Regulation of private health care providers in India: Current status, future directions. Indian Journal of Public Administration 64(4):587-598

Dandona L, Dandona R, Kumar GA, Shukla DK, Paul VK, Balakrishnan K, Prabhakaran D, Tandon N, Salvi S, Dash AP, Nandakumar A. 2017. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. The Lancet 390(10111):2437-60.

Dehury RK, Samal J, Coutinho S, & Dehury P. 2019. How does the largely unregulated private health sector impact the Indian mass?. Journal of Health Management. 21(3):383-393.

Deng P, Fu Y, Chen M, Si L. 2022. Factors associated with health care utilization and catastrophic health expenditure among cancer patients in China: Evidence from the China health and retirement longitudinal study. Frontiers in Public Health. 10:943271.

Devadasan N, Seshadri T, Trivedi M, & Criel B. 2013. Promoting universal financial protection: evidence from the Rashtriya Swasthya Bima Yojana (RSBY) in Gujarat, India. Health research policy and systems 11(1), 1-8.

Dwivedi R, Pradhan J, Athe R. 2021. Measuring catastrophe in paying for healthcare: A comparative methodological approach by using National Sample Survey, India. The International Journal of Health Planning and Management. 36(5):1887-915.

Dwivedi R, Pradhan J. 2020. Does affordability matter? Examining the trends and patterns in health care expenditure in India. Health Services Management Research 33(4):207-18.

Gaddam R, Rao KR. 2023. Incidence, Inequality and Determinants of Catastrophic Health Expenditure in India. Journal of Health Management 25(1):30-9.

Garg CC, Karan AK. 2009. Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Health policy and planning 24(2):116-28.

Ghosh S. 2011. Catastrophic payments and impoverishment due to out-of-pocket health spending. Economic & Political Weekly 46(47), 63–70.

GOI. 2017. National Health Policy 2017. https://www.nhp.gov.in/nhpfles/national_health_policy_2017.pdf Accessed: 6 March 2023.

GOI. 2019. Key indicators of social consumption in India: Health. Ministry of Statistics & Programme Implementation, National Statistical Office. Available: https://www.mospi.gov.in/documents/213904/301563//KI_Health_75th_Final160210117871 2.pdf/1edceec8-a4af-f357-b675-837e015ae20c

Goyanka R, Garg CC, Prasad S. 2019. Impoverishment due to out-of-pocket health expenditures: measurement and comparison across different surveys in India. Indian Journal of Human Development 13(2):121-34.

Hooda SK. 2020. Penetration and coverage of government-funded health insurance schemes in India. Clinical Epidemiology and Global Health 8: 1017–33.

Hooda, S. K., 2017. Out-of-pocket payments for healthcare in India: who have affected the Most and why?. Journal of Health Management. 19(1), 1-15.

Husain Z, Ghosh D. 2017. Analysis of perceived health status among elderly in India: Gender and positional objectivity. Cross-cultural and cross-disciplinary perspectives in social gerontology 177-202.

IIPS and UNPF. 2023. International Institute for Population Sciences & United Nations Population Fund. India Ageing Report 2023, Caring for Our Elders: Institutional Responses. United Nations Population Fund, New Delhi. https://india.unfpa.org/en/publications/caring-our-elders-institutional-responses-india-ageing-report-2023

Institute for Health Metrics and Evaluation (IHME) and Public Health Foundation of India (PHFI). 2018. Health Service Provision in Andhra Pradesh and Telangana: Assessing Facility Capacity, Costs of Care, and Patient Perspectives. Seattle, WA: IHME and PHFI.

Jacobs B, de Groot R, Fernandes Antunes A. 2016. Financial access to health care for older people in Cambodia: 10-year trends (2004-14) and determinants of catastrophic health expenses. International Journal for Equity in Health 15:1-9.

Joe W. 2015. Distressed financing of household out-of-pocket health care payments in India: incidence and correlates. Health Policy and Planning 30: 728–41.

Krishnan A, Mathur P, Kulothungan V, Salve HR, Leburu S, Amarchand R, Nongkynrih B, Chaturvedi HK, Ganeshkumar P, KS VU, Laxmaiah A. 2021. Preparedness of primary and secondary health facilities in India to address major noncommunicable diseases: results of a National Noncommunicable Disease Monitoring Survey (NNMS). BMC Health Services Research 21:1-2.

Kumar Anurag, and Sarwal Rakesh. 2021. Health Insurance for India's Missing Middle. Niti Aayog. Available: https://www.niti.gov.in/sites/default/files/2021-%2010/HealthInsurance-forIndiasMissingMiddle_28-10-2021.pdf

Kumar K, Singh A, Kumar S, Ram F, Singh A, Ram U, ... & Kowal PR. 2015. Socio-economic differentials in impoverishment effects of out-of-pocket health expenditure in China and India: evidence from WHO SAGE. PloS one, 10(8), e0135051.

Ministry of Social Justice and Empowerment, Government of India. 2023.Department of social justice and empowerment. Welfare of the other backward classes, about the division. Available from: https://socialjustice.gov.in/common/31548

Mohanty SK, Chauhan RK, Mazumdar S, Srivastava A. 2014. Out-of-pocket expenditure on health care among elderly and non-elderly households in India. Social indicators research 115:1137-57.

MOSPI. 2017. India - Household Consumer Expenditure, Type 1 : July 2011 - June 2012, NSS 68th Round. https://microdata.gov.in/nada43/index.php/catalog/1

Mukherjee S, Chaudhuri A. 2020. Outpatient care and expenses: can they be ignored in health insurance programmes. Institute of Development Studies Kolkata.

Muraleedharan VR, Vaidyanathan G, Sundararaman T, Dash U, Ranjan A, & Rajesh M. 2020. Invest more in public healthcare facilities. Econ Polit Wkly 55(37): 53-60.

Murphy A, McGowan C, McKee M, Suhrcke M, Hanson K. 2019. Coping with healthcare costs for chronic illness in low-income and middle-income countries: a systematic literature review. BMJ global health 4(4):e001475.

National Commission for Scheduled Tribes. Background. 2023 Available from: https://ncst.nic.in/content/background accessed 17 April 2023.

National Health Authority. 2022. Ayushman Bharat—Pradhan Mantri Jan Arogya Yojana. https://nha.gov.in/PM-JAY, accessed 17 April 2023.

National Health Policy 2017. Ministry of health and Family Welfare Government of India. Available: https://main.mohfw.gov.in/sites/default/files/9147562941489753121.pdf

NSO. 2021. Elderly in India, National Statistical Office, Ministry of Statistics & Programme Implementation, Government of India, New Delhi. Available: http://www.indiaenvironmentportal.org.in/files/file/Elderly%20in%20India%202021.pdf

O'Donnell, Owen; van Doorslaer, Eddy; Wagstaff, Adam; Lindelow, Magnus. 2008. Analyzing Health Equity Using Household Survey Data : A Guide to Techniques and Their Implementation. © Washington, DC: World Bank. http://hdl.handle.net/10986/6896 License: CC BY 3.0 IGO

Okedo-Alex IN, Akamike IC, Ezeanosike OB, Uneke CJ. 2019. A review of the incidence and determinants of catastrophic health expenditure in Nigeria: Implications for universal health coverage. The International journal of health planning and management. 34(4):e1387-404.

Oxfam India. 2021. Analysing Regulation of Private Healthcare in India. Available: https://www.oxfamindia.org/knowledgehub/workingpaper/analysing-regulation-private-healthcare-india

Pal R. 2012. Measuring incidence of catastrophic out-of-pocket health expenditure: with application to India. International journal of health care finance and economics. 12:63-85.

Pandey A, Ploubidis GB, Clarke L, Dandona L. 2018. Trends in catastrophic health expenditure in India: 1993 to 2014. Bulletin of the World Health Organization 96(1):18.

Patel V, Chatterji S, Chisholm D, Ebrahim S, Gopalakrishna G, Mathers C, Mohan V, Prabhakaran D, Ravindran RD, Reddy KS. 2011. Chronic diseases and injuries in India. The Lancet 377(9763):413-28.

Pati MK, Swaroop N, Kar A, Aggarwal P, Jayanna K, Van Damme W. 2020. A narrative review of gaps in the provision of integrated care for noncommunicable diseases in India. Public Health Reviews 41:1-6.

Petrovic D, Marcus K, Sandoval J et al. 2021. Health-related biological and non-biological consequences of forgoing healthcare for economic reasons. Preventive Medicine Reports 24: 101602.

Pradhan J, Dwivedi R, Banjare P. 2017. Relying on whom? correlates of out of pocket health expenditure among the rural elderly in Odisha, India. Ageing International. 42(3):306-23.

Prinja S, Chauhan AS, Karan A, Kaur G, Kumar R. 2017. Impact of publicly financed health insurance schemes on healthcare utilization and financial risk protection in India: a systematic review. PLoS One 12: e0170996.

Rahman T, Gasbarro D, Alam K. 2022. Financial risk protection from out-of-pocket health spending in low-and middle-income countries: a scoping review of the literature. Health Research Policy and Systems 20: 1–23.

Ranjan A, Muraleedharan VR. 2020. Equity and elderly health in India: reflections from 75th round National Sample Survey, 2017–18, amidst the COVID-19 pandemic. Globalization and Health 16(1):1-6.

Rent P, Ghosh S. 2015. Understanding the “cash-less” nature of government-sponsored health insurance schemes: evidence from Rajiv Gandhi Jeevandayee Aarogya Yojana in Mumbai. Sage Open 5(4):2158244015614607.

Reshmi B, Unnikrishnan B, Rajwar E et al. 2021. Impact of public-funded health insurances in India on health care utilisation and financial risk protection: a systematic review. BMJ Open 11: e050077.

Sahoo H, Govil D, James KS, Prasad RD. 2021. Health issues, health care utilization and health care expenditure among elderly in India: Thematic review of literature. Aging and Health Research. 1(2):100012.

Sangar S, Dutt V, Thakur R. 2020. Coping with out-of-pocket health expenditure in India: evidence from NSS 71st round. Global Social Welfare 7:275-84.

Sangar S, Dutt V, Thakur R. 2022. Burden of out-of-pocket health expenditure and its impoverishment impact in India: evidence from National Sample Survey. Journal of Asian Public Policy. 15(1):60-77.

Selvaraj S, Farooqui HH, Karan A. 2018. Quantifying the financial burden of households' out-of-pocket payments on medicines in India: a repeated cross-sectional analysis of National Sample Survey data, 1994–2014. BMJ Open 8: e018020.

Selvaraj S, Karan AK. 2012. Why publicly-financed health insurance schemes are ineffective in providing financial risk protection. Economic and Political Weekly 17:60-8.

Selvaraj S, Karan KA, Srivastava S et al. 2022. India: health system review. Health Systems in Transition. World Health Organization. Regional Office for South-East Asia. https://apo.who.int/publications/i/item/india-health-system-review

Shukla V, Arora R. 2023. The Economic Cost of Rising Non-communicable Diseases in India: A Systematic Literature Review of Methods and Estimates. Applied Health Economics and Health Policy 21(5):719-30.

Sriram S, Albadrani M. 2022a. A study of catastrophic health expenditures in India-evidence from Nationally Representative Survey Data: 2014-2018. F1000Research 11.

Sriram S, Albadrani M. 2022b. Impoverishing effects of out-of-pocket healthcare expenditures in India. Journal of Family Medicine and Primary Care 11(11):7120.

Thakur H. 2016. Study of awareness, enrollment, and utilization of Rashtriya Swasthya Bima Yojana (national health insurance scheme) in Maharashtra, India. Frontiers in public health, 3, 282.

Tripathy JP, Prasad BM, Shewade HD, Kumar AM, Zachariah R, Chadha S, Tonsing J, Harries AD. 2016. Cost of hospitalisation for non-communicable diseases in India: are we pro-poor?. Tropical medicine & international health 21(8):1019-28.

Verma VR, Kumar P, Dash U. 2021. Assessing the household economic burden of non-communicable diseases in India: evidence from repeated cross-sectional surveys. BMC Public Health 21: 1–22.

Wagstaff A. 2002. Poverty and health sector inequalities. Bulletin of the World Health Organization 80: 97–105.

Wagstaff A and Doorslaer EV. 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. Health economics 12(11): 921-933.

WHO and World Bank. 2021. World Health Organization and the International Bank for Reconstruction and Development / The World Bank. 2021. Global monitoring report on financial protection in health 2021. Available: https://www.who.int/publications/i/item/9789240040953

WHO. 2019a. Global Health Expenditure Database 2019. https://apps.who.int/nha/database/country_profile/Index/en Accessed: 6 March 2023.

WHO. 2019b. Primary health care on the road to universal health coverage: 2019 global monitoring report. Executive summary. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO. https://iris.who.int/bitstream/handle/10665/328913/WHO-HIS-HGF-19.1-eng.pdf?sequence=1

WHO. 2023a. Universal Health Coverage. https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc) Accessed: 5 March 2023.

WHO. 2023b. The Global Health **Observatory** https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-with-household-expenditures-on-health-greater-than-10-of-total-household-expenditure-or-income-(sdg-3-8-2)-(-) Accessed: 6 March 2023.

WHO. 2023c. Catastrophic out-of-pocket health spending (SDG indicator 3.8.2 and regional indicators where available). https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/catastrophic-out-of-pocket-health-spending-sdg-indicator-3-8-2- Accessed: 4 March 2023.

3.7 Appendix (Supplementary Tables and Figures)

Supplementary Table 3.1 Average monthly out-of-pocket health expenditure (OOPE) across socio-economic and demographic characteristics

Background characteristic	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care
Social Group			
Scheduled Tribes	105.0 [82.0 - 128.0]	259.5 [232.9 - 286.0]	364.5 [327.4 - 401.7]
Scheduled Castes	196.2 [177.4 - 215.1]	418.1 [388.1 - 448.1]	614.4 [577.2 - 651.5]
Other Backward Classes	224.8 [212.0 - 237.5]	446.5 [418.5 - 474.5]	671.3 [639.0 - 703.6]
Others	323.7 [300.6 - 346.9]	622.4 [595.6 - 649.2]	946.1 [908.8 - 983.4]
Major source of household earnings			
Self-employment	260.8 [247.3 - 274.3]	493.2 [470.3 - 516.1]	754.1 [726.1 - 782.0]
Regular wage or salary	282.1 [260.3 - 304.0]	550.8 [519.0 - 582.7]	833.0 [792.5 - 873.5]
Casual labour	148.8 [136.2 - 161.5]	357.1 [325.0 - 389.3]	506.0 [469.7 - 542.3]
Other	263.3 [205.8 - 320.7]	538.4 [488.3 - 588.4]	801.6 [720.9 - 882.4]
Economic Quintile			
Quintile I	152.5 [138.8 - 166.2]	326.2 [286.4 - 365.9]	478.7 [434.2 - 523.1]
Quintile 2	187.1 [171.1 - 203.0]	442.9 [415.2 - 470.7]	630.0 [596.7 - 663.3]
Quintile 3	232.1 [210.7 - 253.4]	471.1 [439.0 - 503.2]	702.9 [662.8 - 743.1]
Quintile 4	238.5 [217.4 - 259.5]	448.2 [416.8 - 479.7]	687.3 [648.4 - 726.3]
Quintile 5	328.6 [303.1 - 354.0]	615.0 [578.8 - 651.3]	944.2 [896.8 - 991.6]
Religion			
Hinduism	229.6 [218.6 - 240.5]	450.4 [434.1 - 466.7]	680.0 [659.4 - 700.6]
Islam	237.4 [213.3 - 261.5]	536.6 [481.9 - 591.3]	774.0 [710.5 - 837.6]
Others	329.3 [295.2 - 363.4]	672.5 [614.7 - 730.2]	1001.8 [929.7 - 1073.9]
Gender of Household Head			

Male	244.2 [233.8 - 254.6]	475.7 [459.3 - 492.2]	720.0 [699.5 - 740.4]
Female	172.1 [150.8 - 193.5]	445.9 [403.9 - 487.9]	618.1 [568.3 - 667.8]
Educational level of Household Head			
Not literate/Literate without formal schooling	173.8 [161.6 - 186.1]	403.7 [370.8 - 436.7]	577.6 [540.7 - 614.5]
Up to Primary	234.6 [215.5 - 253.6]	445.4 [421.2 - 469.6]	679.9 [647.2 - 712.7]
Up to Secondary	251.2 [231.9 - 270.5]	477.4 [448.5 - 506.4]	728.6 [692.2 - 765.1]
Up to Higher Secondary	278.4 [241.5 - 315.3]	566.0 [517.9 - 614.2]	844.4 [781.6 - 907.2]
Graduation and above	327.0 [291.6 - 362.5]	620.1 [573.5 - 666.8]	947.1 [884.7 - 1009.6]
Presence of any elderly member in household			
No	176.4 [168.0 - 184.9]	348.0 [331.0 - 364.9]	524.4 [504.6 - 544.2]
Yes	437.2 [408.7 - 465.7]	896.5 [862.5 - 930.5]	1333.7 [1286.6 - 1380.7]
Total	235.4 [225.9 - 245.0]	472.1 [456.8 - 487.4]	707.5 [688.5 - 726.5]

The figures inside square brackets represent 95% confidence interval. OOPE is reported in Indian Rupee (INR).

Supplementary Table 3.2 Incidence of catastrophic health expenditure (%) across socio-economic and demographic characteristics

Background characteristic	Incidence of catastrophic health expenditure (%) (at 10% threshold)			Incidence of catastrophic health expenditure (%) (at 25% threshold)		
	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care
Social Group						
Scheduled Tribes	2.4 [2.2 - 2.7]	8.8 [8.3 - 9.3]	11.0 [10.5 - 11.5]	0.9 [0.7 - 1.0]	4.3 [4.0 - 4.6]	5.0 [4.7 - 5.4]
Scheduled Castes	4.4 [4.1 - 4.7]	11.0 [10.5 - 11.4]	14.6 [14.1 - 15.1]	1.7 [1.5 - 1.9]	5.4 [5.0 - 5.7]	7.1 [6.7 - 7.4]
Other Backward Classes	5.2 [5.0 - 5.4]	10.9 [10.7 - 11.2]	15.2 [14.9 - 15.5]	2.2 [2.0 - 2.3]	5.0 [4.8 - 5.2]	7.1 [6.8 - 7.3]
Others	5.8 [5.5 - 6.0]	13.0 [12.6 - 13.4]	17.7 [17.2 - 18.1]	2.3 [2.1 - 2.4]	5.6 [5.3 - 5.8]	7.8 [7.5 - 8.1]
Major source of household earnings						
Self-employment	5.3 [5.2 - 5.5]	11.2 [11.0 - 11.5]	15.7 [15.4 - 16.0]	2.1 [2.0 - 2.2]	5.2 [5.0 - 5.4]	7.2 [7.0 - 7.4]
Regular wage or salary	5.3 [5.1 - 5.6]	10.6 [10.3 - 11.0]	15.2 [14.7 - 15.6]	2.0 [1.8 - 2.2]	4.6 [4.3 - 4.8]	6.7 [6.4 - 7.0]
Casual labour	4.1 [3.8 - 4.3]	10.9 [10.5 - 11.3]	14.3 [13.8 - 14.7]	1.7 [1.6 - 1.9]	4.6 [4.4 - 4.9]	6.4 [6.0 - 6.7]
Other	4.4 [4.0 - 4.9]	14.5 [13.8 - 15.3]	17.5 [16.6 - 18.3]	2.1 [1.8 - 2.4]	8.1 [7.5 - 8.7]	9.9 [9.2 - 10.5]
Economic Quintile						
Quintile I	5.0 [4.7 - 5.3]	11.8 [11.3 - 12.2]	15.9 [15.4 - 16.5]	2.3 [2.1 - 2.5]	6.0 [5.6 - 6.3]	8.1 [7.7 - 8.5]
Quintile 2	4.7	11.1	15.1	1.9	5.2	7.2

	[4.4 - 5.0]	[10.7 - 11.5]	[14.6 - 15.6]	[1.7 - 2.0]	[4.9 - 5.5]	[6.8 - 7.5]
Quintile 3	4.9 [4.6 - 5.2]	11.3 [10.9 - 11.7]	15.5 [15.0 - 16.0]	2.0 [1.9 - 2.2]	5.1 [4.8 - 5.4]	7.2 [6.9 - 7.6]
Quintile 4	5.0 [4.7 - 5.3]	11.2 [10.8 - 11.6]	15.3 [14.8 - 15.8]	1.9 [1.7 - 2.1]	4.8 [4.5 - 5.1]	6.7 [6.4 - 7.0]
Quintile 5	5.0 [4.7 - 5.2]	11.3 [10.9 - 11.6]	15.1 [14.7 - 15.5]	1.9 [1.8 - 2.1]	4.9 [4.6 - 5.1]	6.6 [6.3 - 6.9]
Religion						
Hinduism	4.8 [4.7 - 5.0]	10.9 [10.7 - 11.1]	14.9 [14.6 - 15.1]	2.0 [1.9 - 2.1]	5.0 [4.9 - 5.2]	6.9 [6.7 - 7.1]
Islam	5.3 [4.9 - 5.7]	13.3 [12.8 - 13.9]	17.7 [17.1 - 18.3]	2.1 [1.9 - 2.3]	5.5 [5.2 - 5.9]	7.7 [7.2 - 8.1]
Others	5.9 [5.5 - 6.3]	13.1 [12.5 - 13.7]	17.8 [17.1 - 18.5]	2.2 [2.0 - 2.5]	6.4 [5.9 - 6.8]	8.6 [8.1 - 9.1]
Gender of Household Head						
Male	5.0 [4.9 - 5.2]	11.1 [10.9 - 11.3]	15.3 [15.0 - 15.5]	2.0 [1.9 - 2.1]	5.1 [5.0 - 5.2]	7.0 [6.9 - 7.2]
Female	4.2 [3.8 - 4.5]	12.8 [12.2 - 13.4]	16.2 [15.6 - 16.9]	1.9 [1.6 - 2.1]	5.7 [5.2 - 6.1]	7.4 [7.0 - 7.9]
Educational level of Household Head						
Not literate/Literate without formal schooling	4.5 [4.2 - 4.7]	12.0 [11.7 - 12.4]	15.8 [15.3 - 16.2]	1.9 [1.8 - 2.1]	5.5 [5.2 - 5.8]	7.3 [7.0 - 7.7]
Up to Primary	5.0 [4.7 - 5.2]	12.4 [12.0 - 12.8]	16.3 [15.8 - 16.8]	2.1 [1.9 - 2.3]	5.5 [5.2 - 5.8]	7.6 [7.2 - 7.9]
Up to Secondary	5.2 [4.9 - 5.4]	10.8 [10.5 - 11.1]	15.1 [14.7 - 15.4]	2.0 [1.8 - 2.1]	4.9 [4.7 - 5.2]	6.9 [6.6 - 7.1]

Up to Higher Secondary	5.3 [4.9 - 5.7]	9.6 [9.1 - 10.2]	14.1 [13.5 - 14.8]	2.0 [1.8 - 2.3]	4.7 [4.3 - 5.1]	6.7 [6.2 - 7.1]
Graduation and above	5.1 [4.8 - 5.5]	10.0 [9.5 - 10.5]	14.3 [13.7 - 14.9]	2.0 [1.7 - 2.2]	4.5 [4.2 - 4.9]	6.5 [6.1 - 6.9]
Presence of any elderly member in household						
No	4.1 [4.0 - 4.3]	8.7 [8.6 - 8.9]	12.3 [12.1 - 12.6]	1.6 [1.5 - 1.7]	3.8 [3.7 - 4.0]	5.4 [5.2 - 5.6]
Yes	7.6 [7.3 - 7.9]	20.2% [19.7 -20.6]	25.9 [25.4 - 26.4]	3.3 [3.1 - 3.5]	9.7 [9.4 - 10.0]	13.0 12.6 - 13.3]
Total	4.9 [4.8 – 5.1]	11.3 [11.1 - 11.5]	15.4 [15.2 - 15.6]	2.0 [1.9 – 2.1]	5.2 [5.0 – 5.3]	7.1 [6.9 – 7.2`]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 3.3 Intensity of catastrophic health expenditure (%) across socio-economic and demographic characteristics

Background characteristic	**Intensity of Catastrophic health expenditure (%) (at 10% threshold)**			**Intensity of Catastrophic health expenditure (%) (at 25% threshold)**		
	Hospitalization	**Outpatient Care**	**Hospitalization and/or Outpatient Care**	**Hospitalization**	**Outpatient Care**	**Hospitalization and/or Outpatient Care**
Social Group						
Scheduled Tribes	0.4 [0.3 - 0.4]	1.9 [1.8 - 2.1]	2.3 [2.1 - 2.4]	0.2 [0.1 - 0.2]	1.0 [0.9 - 1.1]	1.2 [1.1 - 1.3]
Scheduled Castes	0.7 [0.7 - 0.8]	2.2 [2.1 - 2.3]	3.0 [2.8 - 3.1]	0.3 [0.3 - 0.4]	1.0 [0.9 - 1.1]	1.4 [1.3 - 1.5]
Other Backward Classes	1.0 [0.9 - 1.0]	2.2 [2.2 - 2.3]	3.2 [3.1 - 3.3]	0.5 [0.4 - 0.5]	1.1 [1.1 - 1.2]	1.6 [1.5 - 1.7]
Others	1.0 [1.0 - 1.1]	2.6 [2.5 - 2.7]	3.6 [3.4 - 3.7]	0.5 [0.4 - 0.5]	1.2 [1.2 - 1.3]	1.8 [1.7 - 1.9]

Major source of household earnings						
Self-employment	1.0 [0.9 - 1.0]	2.4 [2.3 - 2.4]	3.3 [3.2 - 3.4]	0.4 [0.4 - 0.5]	1.2 [1.1 - 1.2]	1.6 [1.6 - 1.7]
Regular wage or salary	0.9 [0.8 - 1.0]	1.9 [1.8 - 2.0]	2.9 [2.7 - 3.0]	0.4 [0.3 - 0.4]	0.9 [0.8 - 0.9]	1.3 [1.2 - 1.4]
Casual labour	0.8 [0.7 - 0.8]	2.0 [1.9 - 2.1]	2.8 [2.7 - 2.9]	0.4 [0.3 - 0.4]	0.9 [0.9 - 1.0]	1.3 [1.3 - 1.4]
Other	1.0 [0.8 - 1.1]	3.7 [3.4 - 4.0]	4.5 [4.2 - 4.8]	0.5 [0.4 - 0.6]	2.0 [1.8 - 2.2]	2.5 [2.3 - 2.7]
Economic Quintile						
Quintile I	1.0 [0.9 - 1.1]	2.6 2.5 - 2.8]	3.6 [3.4 - 3.7]	0.5 [0.4 - 0.6]	1.3 [1.2 - 1.4]	1.9 [1.7 - 2.0]
Quintile 2	0.8 [0.7 - 0.9]	2.3 [2.2 - 2.4]	3.1 [2.9 - 3.2]	0.4 [0.3 - 0.4]	1.1 [1.0 - 1.2]	1.5 [1.4 - 1.6]
Quintile 3	0.9 [0.8 - 1.0]	2.2 [2.1 - 2.4]	3.2 [3.0 - 3.3]	0.4 [0.4 - 0.5]	1.1 [1.0 - 1.2]	1.6 [1.5 - 1.7]
Quintile 4	0.9 [0.8 - 0.9]	2.2 [2.1 - 2.3]	3.1 [2.9 - 3.2]	0.4 [0.3 - 0.4]	1.1 [1.0 - 1.2]	1.5 [1.4 - 1.6]
Quintile 5	0.9 [0.8 - 1.0]	2.2 [2.1 - 2.3]	3.0 [2.9 - 3.1]	0.4 [0.4 - 0.5]	1.1 [1.0 - 1.2]	1.5 [1.4 - 1.6]
Religion						
Hinduism	0.9 [0.8 - 0.9]	2.2 [2.2 - 2.3]	3.1 [3.0 - 3.1]	0.4 [0.4 - 0.4]	1.1 [1.0 - 1.2]	1.5 [1.4 - 1.6]
Islam	0.9 [0.8 - 1.0]	2.5 [2.3 - 2.6]	3.4 [3.2 - 3.6]	0.4 [0.4 - 0.5]	1.2 [1.1 - 1.3]	1.7 [1.5 - 1.8]
Others	1.0 [0.9 - 1.2]	2.9 [2.7 - 3.1]	4.0 [3.7 - 4.2]	0.5 [0.4 - 0.6]	1.5 [1.4 - 1.6]	2.0 [1.9 - 2.2]
Gender of Household Head						
Male	0.9 [0.9 - 0.9]	2.2 [2.2 - 2.3]	3.1 [3.0 - 3.2]	0.4 [0.4 - 0.4]	1.1 [1.1 - 1.1]	1.5 [1.5 - 1.6]

Female	0.8 [0.7 - 0.9]	2.7 [2.5 - 2.9]	3.5 [3.3 - 3.7]	0.4 [0.3 - 0.5]	1.4 [1.2 - 1.5]	1.8 [1.6 - 1.9]
Educational level of Household Head						
Not literate/Literate without formal schooling	0.9 [0.8 - 0.9]	2.5 [2.4 - 2.6]	3.3 [3.2 - 3.5]	0.4 [0.4 - 0.5]	1.3 [1.2 - 1.3]	1.7 [1.6 - 1.8]
Up to Primary	1.0 [0.9 - 1.0]	2.4 [2.3 - 2.5]	3.3 [3.2 - 3.5]	0.5 [0.4 - 0.5]	1.2 [1.1 - 1.3]	1.7 [1.6 - 1.8]
Up to Secondary	0.9 [0.8 - 0.9]	2.2 [2.1 - 2.3]	3.1 [2.9 - 3.2]	0.4 [0.4 - 0.4]	1.1 [1.0 - 1.1]	1.5 [1.4 - 1.6]
Up to Higher Secondary	0.9 [0.8 - 1.0]	2.0 [1.9 - 2.2]	2.9 [2.7 - 3.1]	0.4 [0.3 - 0.4]	1.0 [0.9 - 1.1]	1.4 [1.3 - 1.6]
Graduation and above	0.9 [0.8 - 1.0]	2.0 [1.9 - 2.2]	2.9 [2.7 - 3.1]	0.4 [0.3 - 0.5]	1.0 [0.9 - 1.1]	1.4 [1.3 - 1.6]
Presence of any elderly member in household						
No	0.7 [0.7 - 0.7]	1.7 [1.7 - 1.8]	2.4 [2.4 - 2.5]	0.3 [0.3 - 0.3]	0.8 [0.8 - 0.9]	1.2 [1.1 - 1.2]
Yes	1.5 [1.4 - 1.6]	4.3 [4.1 - 4.4]	5.7 [5.5 - 5.9]	0.7 [0.7 - 0.8]	2.2 [2.1 - 2.3]	2.9 [2.8 - 3.1]
Total	0.9 [0.8 – 0.10]	2.3 [2.2 – 2.4]	3.2 [3.1 – 3.2]	0.4 [0.4 – 0.4]	1.1 [1.1 – 1.2]	1.6 [1.5 – 1.6]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 3.4 Poverty headcount ratio (%) across socio-economic and demographic characteristics

Background characteristic	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care
Social Group			
Scheduled Tribes	0.9 [0.8 – 1.0]	2.4 [2.3 – 2.5]	3.3 [3.2 – 3.4]
Scheduled Castes	1.6 [1.6 – 1.7]	4.0 [3.9 – 4.2]	5.5 [5.3 – 5.6]
Other Backward Classes	1.9 [1.8 – 1.9]	3.6 [3.5 – 3.7]	5.3 [5.2 – 5.4]
Others	1.8 [1.7 – 1.8]	4.1 [4.0 – 4.2]	5.8 [5.7 – 5.9]
Major source of household earnings			
Self-employment	1.9 [1.8 – 1.9]	4.0 [3.9 – 4.0]	5.7 [5.6 – 5.8]
Regular wage or salary	1.6 [1.5 – 1.6]	3.0 [2.9 – 3.1]	4.6 [4.5 – 4.7]
Casual labour	1.5 [1.4 – 1.6]	3.6 [3.4 – 3.7]	4.9 [4.8 – 5.0]
Other	1.6 [1.4 – 1.7]	3.9 [3.6 – 4.1]	5.3 [5.0 – 5.6]
Economic Quintile			
Quintile I	1.0 [0.9 – 1.0]	1.9 [1.8 – 2.0]	2.7% [2.6 – 2.8]
Quintile 2	2.8 [2.7 – 2.9]	6.3 [6.2 – 6.5]	9.0 [8.8 – 9.2]
Quintile 3	2.8 [2.7 – 2.9]	5.6 [5.5 – 5.7]	8.1 [7.9 – 8.3]
Quintile 4	1.3 [1.2 – 1.3]	3.0 [2.9 – 3.1]	4.4 [4.3 – 4.5]
Quintile 5	0.7 [0.6 – 0.7]	1.5 [1.4 – 1.6]	2.0 [1.9 – 2.1]
Religion			
Hinduism	1.7 [1.7 – 1.8]	3.5 [3.4 – 3.6]	5.1 [5.0 – 5.1]
Islam	1.7 [1.7 – 1.8]	4.8 [4.7 – 5.0]	6.4 [6.3 – 6.6]
Others	1.5 [1.4 – 1.6]	3.5 [3.4 – 3.7]	5.1 [4.9 – 5.2]
Gender of Household Head			
Male	1.7 [1.7 – 1.8]	3.7 [3.7 – 3.8]	5.3 [5.3 – 5.4]

Female	1.4 [1.3 – 1.5]	3.3 [3.2 – 3.5]	4.6 [4.5 – 4.8]
Educational level of Household Head			
Not literate/Literate without formal schooling	1.8 [1.7 – 1.9]	4.0 [3.9 – 4.1]	5.7 [5.6 – 5.8]
Up to Primary	1.9 [1.8 – 2.0]	4.0 [3.9 – 4.2]	5.7 [5.5 – 5.8]
Up to Secondary	1.7 [1.6 – 1.7]	3.7 [3.6 – 3.8]	5.3 [5.2 – 5.4]
Up to Higher Secondary	1.6 [1.5 – 1.7]	3.0 [2.8 – 3.1]	4.4 [4.3 – 4.6]
Graduation and above	1.1 [1.0 – 1.2]	2.3 [2.1 – 2.4]	3.4 [3.2 – 3.5]
Presence of any elderly member in household			
No	1.5 [1.4 – 1.5]	2.9 [2.9 – 3.0]	4.3 [4.2 – 4.3]
Yes	2.4 [2.3 – 2.5]	5.9 [5.8 – 6.0]	8.2 [8.0 – 8.3]
Total	1.7 [1.6 – 1.8]	3.7 [3.6 – 3.7]	5.3 [5.2 – 5.3]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 3.5 Intensity of impoverishment (%) across socio-economic and demographic characteristics

Background characteristic	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care
Social Group			
Scheduled Tribes	0.5 [0.4 – 0.5]	1.8 [1.8 – 1.9]	2.3 [2.2 – 2.3]
Scheduled Castes	0.7 [0.7 – 0.7]	1.8 [1.8 – 1.9]	2.6 [2.5 – 2.6]
Other Backward Classes	0.9 [0.8 – 0.9]	1.8 [1.7 – 1.8]	2.6 [2.5 – 2.6]
Others	0.7 [0.7 – 0.7]	1.5 [1.4 – 1.5]	2.2 [2.1 – 2.2]
Major source of household earnings			
Self-employment	0.8 [0.8 – 0.8]	1.9 [1.8 – 1.9]	2.6 [2.6 – 2.7]
Regular wage or salary	0.6 [0.6 – 0.6]	1.1 [1.0 – 1.1]	1.7 [1.6 – 1.7]
Casual labour	0.8 [0.7 – 0.8]	1.8 [1.7 – 1.8]	2.5 [2.5 – 2.6]

Other	0.7 [0.6 – 0.8]	1.9 [1.8 – 2.0]	2.6 [2.4 – 2.7]
Economic Quintile			
Quintile I	1.5 [1.4 – 1.5]	3.1 [3.1 – 3.2]	4.4 [4.4 – 4.5]
Quintile 2	1.0 [1.0 – 1.0]	2.3 [2.3 – 2.4]	3.3 [3.3 – 3.4]
Quintile 3	0.7 [0.6 – 0.7]	1.5 [1.5 – 1.6]	2.3 [2.2 – 2.3]
Quintile 4	0.3 [0.3 – 0.4]	0.9 [0.9 – 0.9]	1.3 [1.3 – 1.4]
Quintile 5	0.3 [0.2 – 0.3]	0.5 [0.5 – 0.6]	0.7 [0.7 – 0.8]
Religion			
Hinduism	0.8 [0.7 – 0.8]	1.6 [1.6 – 1.7]	2.4 [2.3 – 2.4]
Islam	0.8 [0.8 – 0.8]	2.2 [2.1 – 2.2]	3.0 [2.9 – 3.1]
Others	0.6 [0.6 – 0.6]	1.5 [1.5 – 1.6]	2.2 [2.1 – 2.3]
Gender of Household Head			
Male	0.8 [0.7 – 0.8]	1.7 [1.7 – 1.7]	2.5 [2.4 – 2.5]
Female	0.7% [0.6 – 0.7]	1.6 [1.5 – 1.6]	2.3 [2.2 – 2.3]
Educational level of Household Head			
Not literate/Literate without formal schooling	0.8 [0.8 – 0.9]	2.0 [2.0 – 2.1]	2.9 [2.8 – 2.9]
Up to Primary	0.8 [0.8 – 0.9]	1.9 [1.8 – 1.9]	2.7 [2.6 – 2.7]
Up to Secondary	0.7 [0.7 – 0.7]	1.6 [1.5 – 1.6]	2.2 [2.2 – 2.3]
Up to Higher Secondary	0.6 [0.6 – 0.7]	1.1 [1.1 – 1.2]	1.8 [1.7 – 1.9]
Graduation and above	0.5 [0.4 – 0.5]	1.1 [1.1 – 1.2]	1.6 [1.5 – 1.7]
Presence of any elderly member in household			
No	0.6 [0.6 – 0.6]	1.4 [1.3 – 1.4]	2.0 [1.9 – 2.0]
Yes	1.2 [1.1 – 1.2]	2.7 [2.7 – 2.8]	3.9 [3.8 – 3.9]
Total	0.8 [0.7 – 0.8]	1.7 [1.7 – 1.7]	2.4 [2.4 – 2.5]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 3.6 Incidence of distressed financing (%) across socio-economic and demographic characteristics

Background characteristic	Hospitalization	Outpatient Care
Social Group		
Scheduled Tribes	36.5 [35.6 - 37.4]	6.6 [5.6 - 7.7]
Scheduled Castes	42.5 [41.7 - 43.4]	4.7 [4.1 - 5.3]
Other Backward Classes	42.2 [41.7 - 42.8]	5.7 [5.3 - 6.1]
Others	37.7 [37.1 - 38.3]	5.1 [4.6 - 5.5]
Major source of household earnings		
Self-employment	38.3 [37.8 - 38.8]	3.9 [3.6 - 4.2]
Regular wage or salary	36.7 [36.0 - 37.4]	3.8 [3.3 - 4.2]
Casual labour	46.4 [45.6 - 47.1]	5.5 [4.9 - 6.1]
Other	47.8 [46.4 - 49.2]	16.1 [14.7 - 17.5]
Economic Quintile		
Quintile I	41.5 [40.6 - 42.3]	5.6 [4.9 - 6.3]
Quintile 2	40.3 [39.5 - 41.1]	5.7 [5.1 - 6.4]
Quintile 3	40.5 [39.7 - 41.3]	4.8 [4.2 - 5.3]
Quintile 4	41.1 [40.4 - 41.9]	4.0 [3.5 - 4.5]
Quintile 5	39.7 [39.1 - 40.4]	6.5 [6.0 - 7.1]
Religion		
Hinduism	40.4 [40.1 - 40.8]	5.4 [5.1 - 5.7]
Islam	41.4 [40.5 - 42.4]	6.0 [5.3 - 6.7]
Others	40.1 [39.0 - 41.1]	4.0 [3.3 - 4.8]
Gender of Household Head		
Male	40.2 [39.8 - 40.6]	4.6 [4.4 - 4.9]
Female	44.1 [43.0 - 45.2]	10.5 [9.5 - 11.5]

Educational level of Household Head		
Not literate/Literate without formal schooling	43.7 [43.0 - 44.4]	7.1 [6.5 - 7.7]
Up to Primary	42.4 [41.6 - 43.1]	5.7 [5.1 - 6.2]
Up to Secondary	39.9 [39.3 - 40.5]	4.3 [3.9 - 4.8]
Up to Higher Secondary	36.4 [35.3 - 37.5]	5.0 [4.1 - 5.9]
Graduation and above	32.3 [31.4 - 33.2]	3.0 [2.4 - 3.5]
Presence of any elderly member in household		
No	39.7 [39.3 - 40.1]	4.8 [4.4 - 5.1]
Yes	42.6 [42.0 - 43.2]	6.4 [6.0 - 6.9]
Total	40.6 [40.2 - 40.9]	5.4 [5.1 – 5.6]

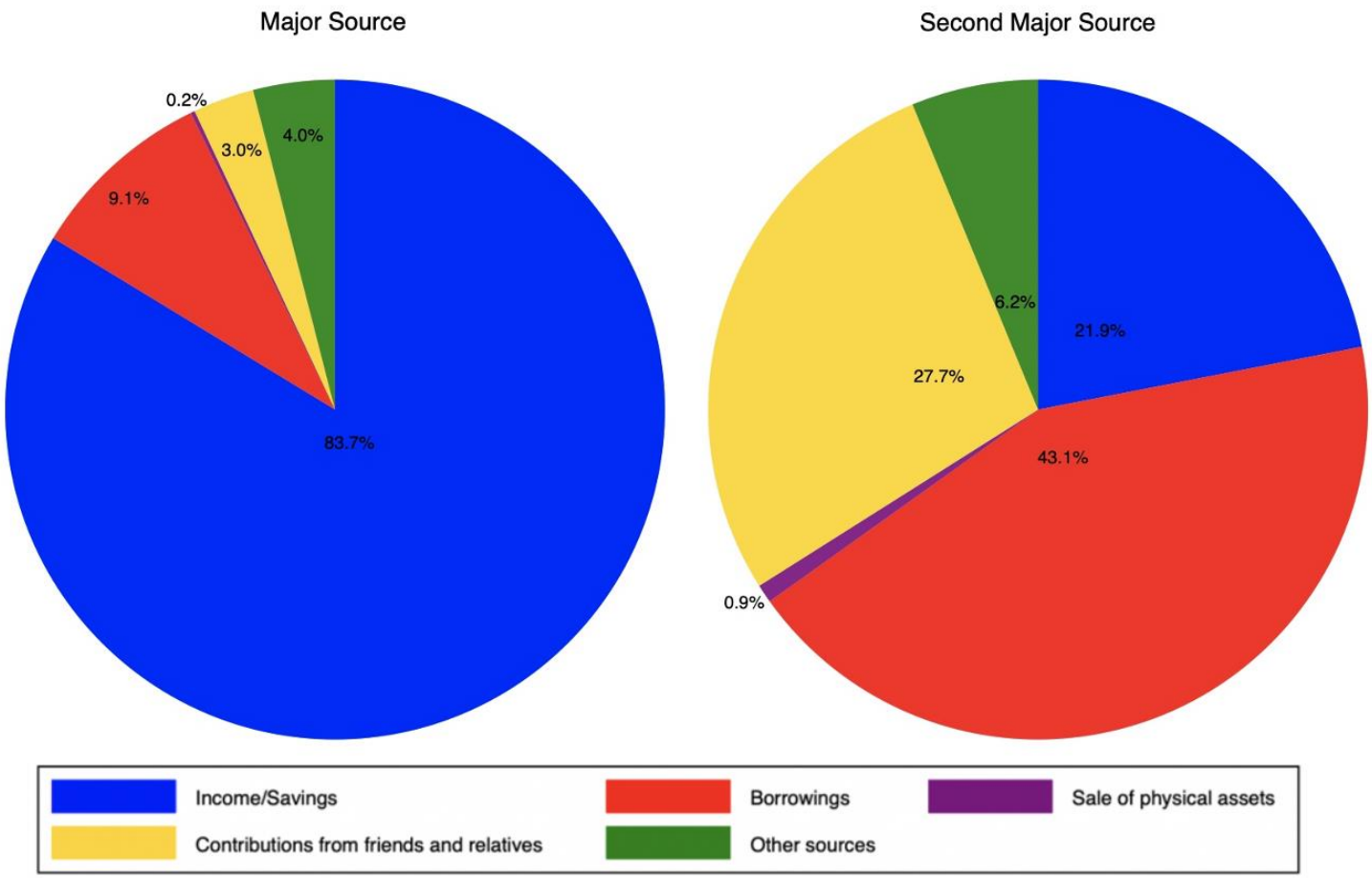
The figures inside square brackets represent 95% confidence interval.

Supplementary Table 3.7 Percentage of ailing individuals who did not seek treatment and did not seek treatment on medical advice during the last 15 days

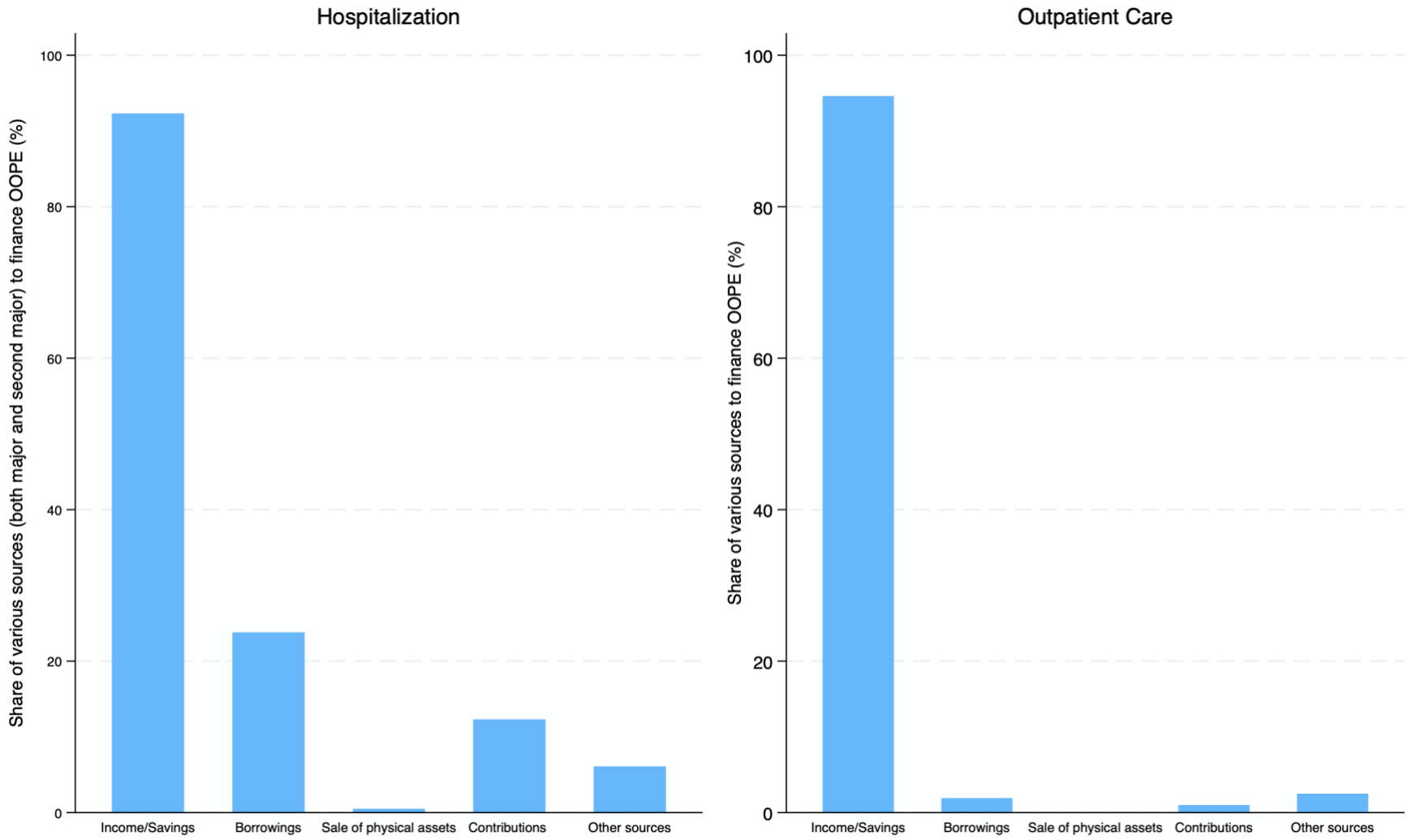
Background characteristic	Not sought treatment (%)	Not sought treatment on medical advice (%)
Social Group		
Scheduled Tribes	5.4	14.8
Scheduled Castes	2.2	11.5
Other Backward Classes	1.6	10.6
Others	1.1	8.1
Major source of household earnings		
Self-employment	1.9	11.0
Regular wage or salary	1.3	7.7
Casual labour	2.0	12.3
Other	1.7	5.9
Economic Quintile		
Quintile I	1.9	16.0
Quintile 2	1.7	12.3
Quintile 3	2.0	10.7
Quintile 4	1.6	9.4

Quintile 5	1.6	6.3
Religion		
Hinduism	1.9	10.6
Islam	0.9	9.2
Others	1.8	6.9
Gender of Household Head		
Male	1.7	10.3
Female	2.4	8.9
Educational level of Household Head		
Not literate/Literate without formal schooling	2.8	11.0
Up to Primary	1.5	11.4
Up to Secondary	1.6	9.8
Up to Higher Secondary	0.8	8.0
Graduation and above	0.7	7.7
Presence of any elderly member in household		
No	1.9	12.8
Yes	1.6	6.5
Total	1.8	10.1

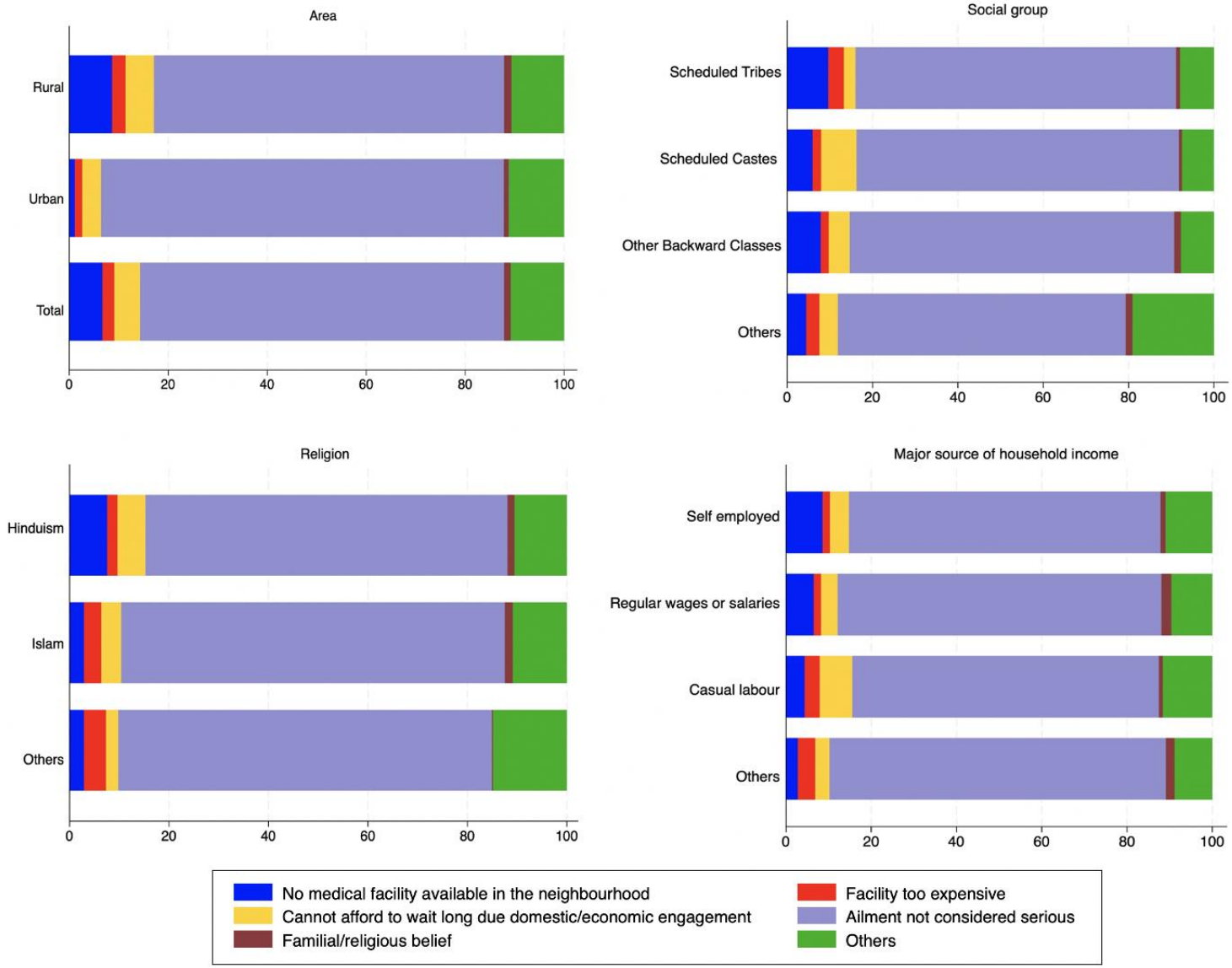
Supplementary Figure 3.1 Share of various sources used to finance out-of-pocket health expenditure for hospitalization



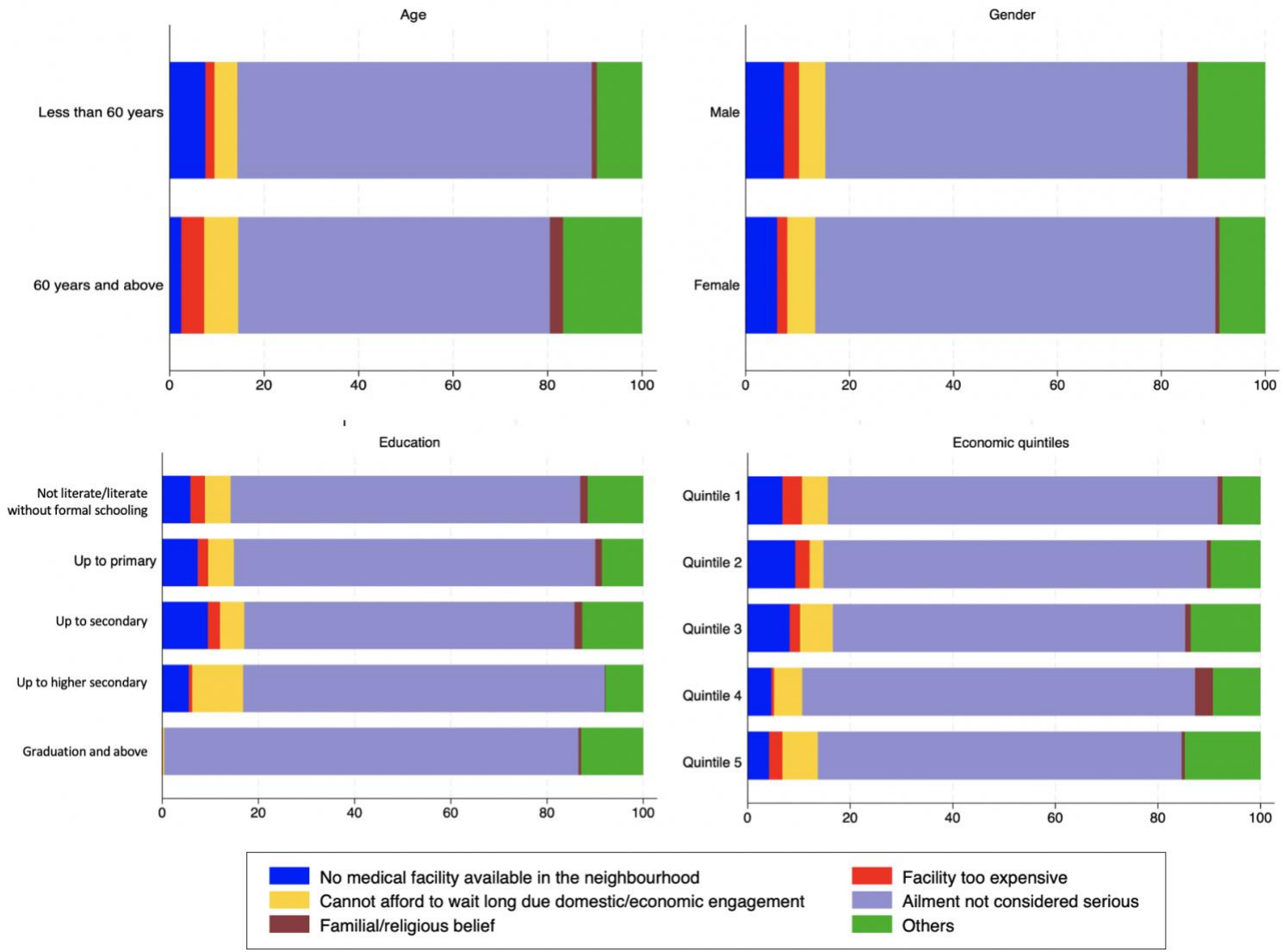
Supplementary Figure 3.2 Share of various sources of finance used as coping strategies by the type of care sought



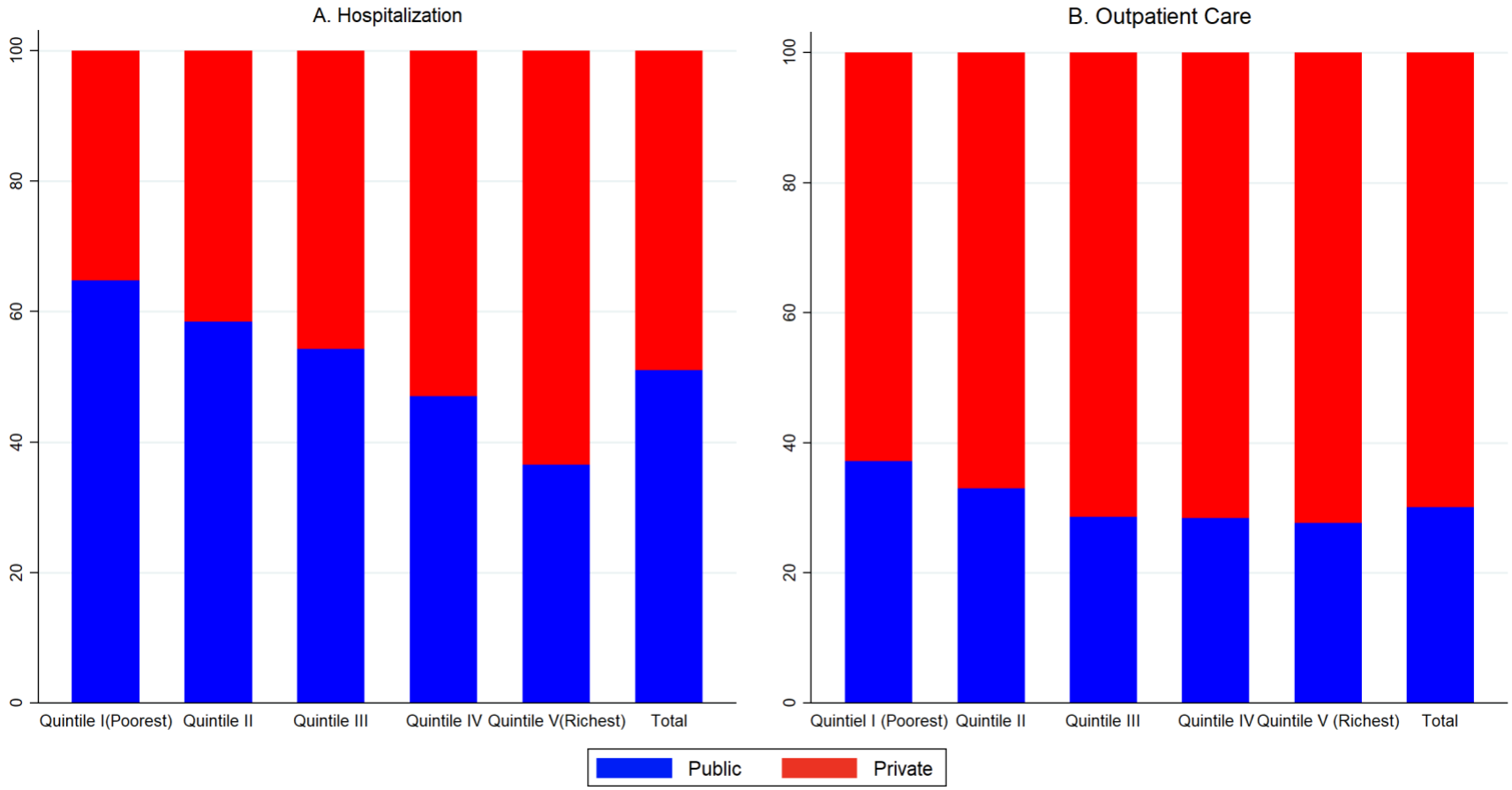
Supplementary Figure 3.3 Reasons for not seeking treatment on medical advice during the last 15 days



Supplementary Figure 3.3 Reasons for not seeking treatment on medical advice during the last 15 days



Supplementary Figure 3.4 Incidence of utilization of public and private health facilities



Chapter 4 Out-of-pocket health expenditure and associated financial hardships across 17 disease categories

4.1 Introduction

Universal Health Coverage (UHC), the centrepiece of the United Nations' sustainable development goals on health (SDG-3), aims to ensure that everyone has access to quality healthcare without facing financial hardships (WHO, 2021a). SDG-3 focuses on a broad gamut of health-related issues pertinent to the global community as well as developing countries such as India (United Nations Development Programme (UNDP), 2022). India is experiencing a triple burden of diseases, i.e. increasing non-communicable diseases (NCDs), an unfinished agenda of infectious diseases, and a rising incidence of injuries (Bloom et al., 2014). Between 1990 and 2016, the proportion of all deaths in India due to NCDs increased from 37.9% to 61.8%, and the contribution of NCDs to total disability-adjusted life years increased from 30.5% to 55.4% (Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation (ICMR, PFHI, and IHME), 2017). Communicable diseases too, such as diarrhoea, tuberculosis, lower respiratory infections, and vector-borne diseases (for instance, dengue, malaria, and chikungunya), continue to pose substantial challenges in India (Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation (ICMR, PFHI, and IHME), 2017). Furthermore, in 2018, India accounted for ~11% of accident-related deaths worldwide, ranking first among the 199 countries in terms of road accident mortality (Government of India (GOI), 2019). Studies estimate that NCDs and mental disorders will lead to ~$4.58 trillion output loss in India during 2012–30 due to savings lost and foregone productivity (Bloom et al., 2014). Despite this overwhelming scenario in India, the government health expenditure is dismally low (1.15% of gross domestic product) (Government of India (GOI), 2017a). A combination

of low health insurance coverage and a dominant presence of fee-for-service private health sector has forced Indian households to rely on out-of-pocket health expenditure (OOPE) as a means of financing healthcare (Shahrawat and Rao, 2012).

In India, OOPE accounts for 50.6% of health expenditure (WHO, 2019a), one of the highest in the world. High OOPE reduces access to healthcare services, decreases the consumption of food and basic necessities, and exposes households to financial catastrophe and impoverishment. Healthcare payments are a major cause of poverty in India, pushing ~32–39 million individuals below the poverty line each year (Van Doorslaer et al., 2006; Bonu et al., 2007; Garg and Karan, 2009). Poor people not only lack the financial resources to access healthcare, but illness also reduces labour supply and limits their financial ability (World Bank, 2014), creating a vicious circle of poverty and poor health. The rising disease burden in India, accompanied by abysmally low public health spending and insurance uptake, warrants analysis of the economic impact of OOPE across all types of diseases—communicable, non-communicable, and injuries. However, limited literature is available on the financial burden of OOPE across various ailments in India. Previous studies focussed mainly on OOPE due to hospitalization (Kastor et al., 2018) or specific ailments, such as maternal health (Bonu et al., 2009; Mohanty and Kastor, 2017), NCDs (Engelgau et al., 2012; Tripathy et al., 2016; Verma et al., 2021), cancer (Mahal et al., 2013; Rajpal et al., 2018), diabetes (Tripathy and Prasad, 2018), and tuberculosis (Yadav et al., 2021a). Other studies provided estimates for small geographic areas with non-representative data, thereby limiting the generalizability (Sneha et al., 2017; Swain et al., 2018). One study examined the economic burden of OOPE across all diseases but did not report it separately for inpatient and outpatient care and was based on data from the previous National Sample Survey (NSS) (Sangar et al., 2019a). Another study examined the OOPE burden separately for hospitalization and outpatient care across all

ailments but was limited to evaluating catastrophic health expenditure (CHE) and impoverishment impact only (Yadav et al., 2021c).

Against this backdrop, we provide a comprehensive examination of the financial burden of OOPE across 17 disease categories, disaggregated by the type of care sought (hospitalization, outpatient care, and either hospitalization or outpatient care or both) and the type of healthcare facility utilized (public or private). Specifically, our study was guided by the following objectives. First, we estimated OOPE and the corresponding financial hardships. We estimated the incidence of incurring CHE, percentage of households falling below the poverty line due to OOPE, and the incidence of using distressed sources to cope with the cost of illness. Second, we estimated the unmet needs (i.e. percentage of individuals who did not seek treatment) and percentage of individuals who did not seek treatment on medical advice and reasons for the same. Third, we gauged the loss of household earnings resulting from hospitalization and outpatient care for various ailments. This holistic assessment is expected to serve as a valuable resource for evidence-based policy decisions to improve the accessibility of healthcare services and augment financial risk protection for Indian households.

4.2 Data and Methodology

4.2.1 Overview of data source

The study used data from the latest round of the NSS on health, titled 'Household Social Consumption: Health', which was conducted from July 2017 to June 2018. This is a nationally representative survey that covered 113,823 households and 555,115 individuals across the country. The data were collected using a stratified multi-stage sampling design, with village and urban blocks as the first unit and households as the second unit. The survey collected detailed information about the nature of the ailment, utilization of health facilities, cost of inpatient and outpatient services, and demographic and socio-economic characteristics of households and their members. It collected information about the prevalence of 61 types of

diseases, which were further classified into 17 broad categories. The disease classification under the NSS health survey is provided in Supplementary Table 4.1.

4.2.2 Outcome variables

4.2.2.1 Out-of-pocket health expenditure

The NSS health survey recorded total health expenditure under three broad categories: medical, non-medical, and transportation expenditure. Medical expenditures included doctors' fees, cost of medicines, diagnostic tests, bed charges, other medical expenses (attendant charges, physiotherapy, blood, etc.), and package component, and non-medical expenditures included expenses on registration, food, lodging, etc. To determine OOPE, any reimbursement amount received was deducted from the total health expenditure. The recall period for hospitalisation expenditure was 365 days and for outpatient expenses, it was 15 days. OOPE for hospitalisation and outpatient care was converted into monthly figures and then aggregated to derive total OOPE for hospitalization and/or outpatient care.

4.2.2.2 Catastrophic health expenditure

A household is defined to incur CHE if OOPE exceeds a certain threshold of the household's total consumption expenditure (Berki, 1986).

$$CHE_i = \begin{cases} 1, if\ \dfrac{OOPE_i}{HCE_i} > \mathrm{Z} \\ 0, \quad otherwise \end{cases}$$

In the above equation, $OOPE_i$ is the monthly out-of-pocket health expenditure of i^{th} household, HCE_i is the monthly total consumption expenditure of i^{th} household, and Z is the threshold. We estimated CHE at two thresholds, 10% and 25%, as adopted by the sustainable development goal indicator 3.8.2 (WHO, 2023).

The proportion of households incurring CHE, i.e., incidence of CHE, was calculated using the following formula.

$$Incidence\ of\ CHE = \frac{1}{N}\sum_{i=1}^{N} CHE_i$$

where N is the total number of households in the sample.

4.2.2.3 Poverty headcount ratio

The poverty headcount ratio estimates the proportion of households falling below the poverty line due to OOPE (Yadav et al., 2021b).

$$Poverty\ Headcount_i = \begin{cases} 1, & if\ HCE_i \geq\ PL\ and\ (HCE_i - OOPE_i) <\ PL \\ 0, & otherwise \end{cases}$$

In the above equation, PL is the inflation-adjusted official poverty line given by the Tendulkar Committee (Planning Commission, 2014).

$$Poverty\ Headcount\ Ratio = \frac{1}{N}\sum_{i=1}^{N} Poverty\ Headcount_i$$

where *N* is the total number of households.

4.2.2.4 Distressed financing

The NSS health survey collected information about various sources of finance (household income/savings, borrowings, sale of physical assets, contributions from friends and relatives, and other sources) used as coping mechanisms. We categorized a household as incurring distressed financing if it used any of these sources except household income or savings (Sangar et al., 2020).

The proportion of households employing various sources of finance to cope with OOPE was calculated as follows.

$$I = \frac{1}{N}\sum_{i=1}^{N} n$$

In the above formula, I is the incidence of using a particular source of finance, n is the number of households using a particular source of finance, and N is the total number of households. In case of hospitalization, NSS classified the various sources of finance as major and second major sources because households might have used more than one source in varying proportions. We have shown the percentage of households using distressed sources to finance hospitalization-related OOPE separately for major and second major sources and for both sources combined.

4.2.3 Statistical analysis

Descriptive statistics and multivariable logistic regression were employed in the chapter. Sample weights provided by the NSS were applied as applicable. Statistical analysis was performed using STATA version 14.1.

Multivariable logistic regression was used to estimate the likelihood of household incurring CHE, experiencing impoverishment, and using distressed financing due to various disease conditions.

$$logit\ (Y) = ln\ \frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n$$

In the above equation, $\frac{p}{1-p}$ is the odds ratio of occurrence of binary outcome variable Y (i.e., incurring CHE, impoverishment, and distressed financing), X_1 denotes the disease category, and $X_2 \ldots X_n$ represents covariates (economic quintile, household's major source of earnings (self-employed, regular wage or salary, casual labour, and others), social group (scheduled castes (SCs), scheduled tribes (STs), other backward classes (OBCs), and others), sector (rural or urban areas), religion (Hinduism, Islam, and others), household size (up to 4 members, more than 4 members), gender of household head, educational status of household head (not literate/literate without formal schooling, up to primary, up to secondary, up to higher

secondary, graduation and above), presence of any elderly member in household, state, health insurance status, and type of healthcare facility visited (public or private)).

4.3 Results

Childbirth was the most common cause of hospitalization, causing 35.9% of households to seek inpatient care, followed by infections (20.6%), and injuries (7.7%). For outpatient care, households where any member was suffering from infections (31.7%), cardiovascular conditions (16.3%), and endocrine, metabolic, and nutritional conditions (14.9%) sought the highest outpatient care (Supplementary Table 4.2).

4.3.1 Out-of-pocket health expenditure

Supplementary Table 4.3 shows the average monthly OOPE of households by the disease type. Cancer caused the highest OOPE in the case of hospitalization (INR 6732.0)[5], followed by cardiovascular conditions (INR 3206.1), musculoskeletal conditions (INR 2797.0), and psychiatric and neurological disorders (2633.5). In the case of outpatient care, cancer (INR 6656.1), childbirth (INR 3827.5), and genitourinary disorders (INR 3725.9) were the leading ailments in terms of OOPE. Compared with public healthcare facilities, the average monthly OOPE for all diseases was invariably higher in private healthcare facilities, regardless of the type of care sought (Supplementary Table 4.4).

Supplementary Figure 4.1 shows the incidence of utilization of public and private healthcare facilities across various disease categories. Nearly 51.0% of hospitalization episodes were sought at public healthcare facilities, whereas only 30.2% of outpatient cases were sought at public facilities. The primary reasons for seeking care at private facilities instead of public ones were the non-availability of doctors or quality of public health facilities not satisfactory,

[5] USD 1= INR 68.3 using average 2018 exchange rate.

preference for a trusted doctor or hospital, and long waiting times at public health facilities in case of both hospitalization and outpatient care (Supplementary Figure 4.2).

4.3.2 Catastrophic health expenditure

Out of all the households who sought hospitalization, outpatient care, and hospitalization and/or outpatient care, 34.5%, 48.5%, and 46.4% of households, respectively, experienced CHE at 10% threshold (Figure 4.1). The incidence of CHE at 25% threshold was 15.4% for hospitalisation, 24.0% for outpatient care, and 23.5% for hospitalization and/or outpatient care. In the case of hospitalization, households with cancer-afflicted members reported the highest CHE incidence at 10% threshold (69.8%), followed by genitourinary disorders (57.9%), and psychiatric and neurological disorders (54.7%). In the case of outpatient care, obstetric conditions, cancer, genitourinary disorders, and injuries caused CHE in over 60% of the respective disease-afflicted households at 10% threshold. Notably, among all households reporting CHE, those in which any member was hospitalized for childbirth accounted for the largest share of the total CHE burden at 10% threshold (22.7%), followed by infections (14.6%) and injuries (12.0%), whereas in the case of outpatient care, infections (31.9%) and cardiovascular conditions (14.5%) constituted the largest share of the total CHE burden (Figure 4.2). A similar pattern was observed at 25% threshold as well. The incidence of CHE was higher among households who sought care in private healthcare facilities compared with those treated in public healthcare facilities, irrespective of the type of care sought. This trend persisted at both the thresholds and was consistently observed across all disease categories (Supplementary Table 4.5 and 4.6).

Figure 4.1 Percentage of households incurring catastrophic health expenditure, falling below the poverty line, and using distressed financing across various disease categories

Disease Categories	Incidence of Catastrophic Health Expenditure (%) (at 10% threshold)			Incidence of Catastrophic Health Expenditure (%) (at 25% threshold)			Poverty Headcount Ratio (%)			Incidence of Distressed Financing (%)	
	Hospitalisation	Outpatient Care	Hospitalisation and/or Outpatient Care	Hospitalisation	Outpatient Care	Hospitalisation and/or Outpatient Care	Hospitalisation	Outpatient Care	Hospitalisation and/or Outpatient Care	Hospitalisation	Outpatient Care
Infection	23.4	42.0	38.1	7.7	19.2	16.7	6.6	12.2	11.1	37.1	4.3
Cancers	69.8	68.3	74.2	49.2	42.4	50.5	31.8	21.8	32.5	63.7	7.8
Blood Diseases	42.8	52.5	48.9	16.9	33.0	26.6	11.2	19.1	16.2	47.6	4.4
Endocrine, Metabolic, Nutritional	40.1	38.5	39.4	19.1	16.2	16.9	11.2	9.9	10.3	46.3	4.8
Psychiatric & Neurological	54.7	44.9	49.1	30.3	19.8	24.9	21.0	14.3	17.0	55.1	7.5
Eye	35.3	44.9	40.6	10.3	21.3	16.0	8.4	14.7	11.4	39.9	4.4
Ear	40.4	46.0	44.0	14.4	24.3	22.5	7.2	9.0	8.7	44.0	0.7
Cardiovascular	49.6	37.2	40.1	27.6	15.9	18.6	17.1	9.5	11.3	46.9	5.3
Respiratory	34.0	34.1	34.7	12.0	14.2	14.4	7.7	10.6	10.5	45.2	4.9
Gastrointestinal	43.5	47.5	46.2	22.4	24.6	24.2	14.2	18.3	16.8	44.9	5.6
Skin	36.9	48.2	47.2	14.5	21.1	20.5	6.6	16.3	15.4	47.9	3.6
Musculoskeletal	48.8	44.4	45.2	27.7	20.9	22.3	17.9	11.6	12.5	51.3	5.6
Genito-Urinary	57.9	66.4	63.5	28.7	44.4	37.2	16.3	31.0	22.8	52.2	5.7
Obstetric	39.1	72.4	46.7	18.7	57.8	26.9	10.2	51.8	18.5	46.2	1.9
Childbirth	20.8	41.9	21.0	6.0	26.9	6.1	5.5	9.5	5.5	32.2	2.5
Injuries	51.4	60.2	54.8	27.2	35.7	30.0	17.8	17.0	18.3	52.0	7.8
Others	52.9	56.5	57.2	22.7	30.9	29.0	16.4	21.4	21.0	48.6	8.2
Total	34.5	48.5	46.4	15.4	24.0	23.5	10.7	15.0	15.0	40.4	5.3

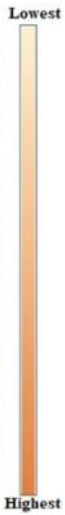


Figure 4.2 Share of each disease in total financial burden

Disease Categories	Incidence of Catastrophic Health Expenditure (at 10% threshold)		Incidence of Catastrophic Health Expenditure (at 25% threshold)		Poverty Headcount Ratio		Incidence of Distressed Financing	
	Hospitalisation	Outpatient Care	Hospitalisation	Outpatient Care	Hospitalisation	Outpatient Care	Hospitalisation	Outpatient Care
Infection	14.6	31.9	11.2	31.5	13.5	31.3	18.9	28.1
Cancers	2.0	0.6	3.3	0.8	3.0	0.7	1.5	0.6
Blood Diseases	1.6	1.1	1.5	1.5	1.4	1.3	1.4	0.8
Endocrine, Metabolic, Nutritional	2.0	13.8	2.2	12.6	1.9	11.9	1.9	14.0
Psychiatric & Neurological	5.6	4.8	7.2	4.6	7.1	5.2	4.6	6.5
Eye	2.7	1.2	1.8	1.2	2.1	1.3	2.5	1.0
Ear	0.4	0.4	0.3	0.5	0.2	0.3	0.4	0.1
Cardiovascular	8.4	14.5	10.8	13.4	9.6	12.5	6.5	16.7
Respiratory	2.5	8.2	2.0	7.4	1.8	8.6	2.7	10.0
Gastrointestinal	8.7	5.4	10.4	6.1	9.4	7.1	7.4	5.4
Skin	0.7	2.4	0.6	2.3	0.4	2.8	0.8	1.5
Musculoskeletal	4.3	9.3	5.7	9.5	5.3	8.2	3.7	9.7
Genito-Urinary	6.8	2.1	7.8	3.1	6.3	3.4	5.0	1.5
Obstetric	2.8	0.5	3.1	0.9	2.4	1.2	2.7	0.1
Childbirth	22.7	0.1	15.2	0.1	19.6	0.1	28.6	0.0
Injuries	12.0	2.0	14.7	2.5	13.7	1.9	9.9	2.1
Others	2.3	1.7	2.3	2.0	2.3	2.2	1.7	2.1
Total	100	100.0	100	100	100	100	100	100

Table 4.1 shows the results of logistic regression to reveal the impact of different ailments on the likelihood of incurring CHE. Compared with infections, the likelihood of incurring CHE (at 10% threshold) was statistically significantly higher for households in which any member sought hospitalization for cancer [odds ratio (OR): 24.34 (15.22–38.91); $p < 0.05$] and sought outpatient care for cancer [OR: 5.65 (3.01–10.60); $p < 0.05$]. In the event of hospitalization, all the diseases resulted in statistically significantly higher odds of incurring CHE compared with infections ($p < 0.05$). For outpatient care, the likelihood of incurring CHE was statistically significantly higher for households with member(s) suffering from cancer, psychiatric and neurological disorders, musculoskeletal conditions, genitourinary disorders, obstetric conditions, injuries, and other disease categories compared to infection-afflicted households ($p < 0.05$). An almost similar pattern was observed at 25% threshold as well.

Table 4.1 Odds ratio of incurring catastrophic health expenditure, falling below the poverty line, and using distressed financing for various disease categories

Disease category	Incurring CHE (at 10% threshold)		Incurring CHE (at 25% threshold)		Falling below the poverty line due to OOPE		Using distressed sources	
	Hospitalization	Outpatient Care	Hospitalization	Outpatient Care	Hospitalization	Outpatient Care	Hospitalization	Outpatient Care
	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio	Odds Ratio
Infections ®								
Cancers	24.34* [15.22 - 38.91]	5.65* [3.01 - 10.60]	24.54* [16.00 - 37.66]	6.18* [3.65 - 10.49]	10.12* [7.16 - 14.29]	4.21* [2.49 - 7.15]	3.36* [2.45 - 4.61]	1.41 [0.75 - 2.63]
Blood Diseases	3.24* [2.34 - 4.48]	1.83 [0.95 - 3.54]	2.42* [1.51 - 3.88]	2.57* [1.03 - 6.42]	1.82* [1.17 - 2.82]	2.13 [0.93 - 4.86]	1.77* [1.27 - 2.47]	0.74 [0.30 - 1.84]
Endocrine, Metabolic, Nutritional	2.39* [1.84 - 3.12]	1.16 [0.96 - 1.39]	2.89* [2.09 - 3.98]	1.16 [0.92 - 1.46]	1.78* [1.25 - 2.54]	1.32* [1.00 - 1.74]	1.37* [1.09 - 1.73]	0.73 [0.50 - 1.09]
Psychiatric & Neurological	5.60* [4.53 - 6.92]	1.44* [1.08 - 1.91]	5.63* [4.48 - 7.09]	1.38* [1.03 - 1.85]	3.90* [2.77 - 5.50]	1.75* [1.23 - 2.49]	2.10* [1.75 - 2.51]	1.52 [0.90 - 2.57]
Eye	1.68* [1.31 - 2.15]	1.28 [0.83 - 1.98]	1.12 [0.83 - 1.51]	1.17 [0.65 - 2.10]	1.08 [0.73 - 1.60]	1.36 [0.72 - 2.60]	1.07 [0.75 - 1.54]	0.84 [0.33 - 2.13]
Ear	2.70* [1.50 - 4.84]	1.32 [0.70 - 2.49]	2.07* [1.19 - 3.60]	1.59 [0.68 - 3.68]	1.24 [0.73 - 2.12]	0.88 [0.32 - 2.41]	1.35 [0.90 - 2.03]	0.14* [0.05 - 0.41]
Cardiovascular	4.42* [3.75 - 5.21]	1.04 [0.88 - 1.24]	5.43* [4.45 - 6.63]	1.08 [0.86 - 1.36]	3.58* [2.81 - 4.57]	1.17 [0.89 - 1.54]	1.54* [1.33 - 1.78]	0.83 [0.56 - 1.22]
Respiratory	2.24* [1.78 - 2.82]	0.80* [0.65 - 0.99]	1.81* [1.26 - 2.60]	0.88 [0.67 - 1.14]	1.31 [0.84 - 2.02]	1.04 [0.75 - 1.43]	1.46* [1.22 - 1.75]	1.03 [0.68 - 1.56]

Gastrointestinal	2.86* [2.47 - 3.32]	1.21 [0.92 - 1.58]	3.56* [2.90 - 4.36]	1.39* [1.02 - 1.90]	2.26* [1.74 - 2.95]	1.68* [1.17 - 2.39]	1.39* [1.21 - 1.59]	1.15 [0.63 - 2.09]
Skin	2.22* [1.42 - 3.49]	1.38 [0.92 - 2.08]	1.85* [1.19 - 2.88]	1.30 [0.84 - 2.03]	0.90 [0.56 - 1.44]	1.54 [0.92 - 2.59]	1.65* [1.17 - 2.32]	1.01 [0.52 - 1.93]
Musculoskeletal	3.45* [2.80 - 4.24]	1.34* [1.09 - 1.66]	4.57* [3.48 - 6.01]	1.35* [1.04 - 1.75]	3.13* [2.21 - 4.42]	1.15 [0.85 - 1.56]	1.70* [1.41 - 2.05]	0.91 [0.58 - 1.43]
Genito-Urinary	4.82* [3.97 - 5.86]	2.85* [1.90 - 4.28]	4.27* [3.43 - 5.32]	3.57* [2.37 - 5.37]	2.31* [1.78 - 2.99]	3.82* [2.24 - 6.53]	1.65* [1.41 - 1.94]	1.38 [0.71 - 2.69]
Obstetric	3.39* [2.52 - 4.57]	4.80* [2.41 - 9.55]	3.61* [2.31 - 5.65]	8.81* [4.26 - 18.24]	1.68* [1.13 - 2.51]	13.07* [5.40 - 31.68]	1.56* [1.22 - 1.99]	0.41 [0.14 - 1.19]
Childbirth	1.92* [1.73 - 2.14]	1.23 [0.66 - 2.29]	1.49* [1.24 - 1.78]	2.24* [1.13 - 4.42]	1.25* [1.02 - 1.53]	1.15 [0.49 - 2.71]	0.99 [0.90 - 1.08]	0.49 [0.06 - 3.95]
Injuries	4.78* [4.14 - 5.52]	2.36* [1.40 - 3.95]	5.01* [4.17 -6.02]	3.01* [1.76 - 5.16]	3.14* [2.53 - 3.89]	1.73 [0.95 - 3.15]	1.79* [1.59 - 2.02]	1.82 [0.90 - 3.70]
Others	4.94* [3.46 - 7.03]	2.08* [1.33 - 3.25]	3.60* [2.62 - 4.96]	2.37* [1.41 - 3.99]	2.55* [1.74 - 3.74]	2.63* [1.45 - 4.76]	1.48* [1.16 - 1.88]	1.74 [0.77 - 3.91]

® denotes Reference category; *P < 0.05; The figures inside square brackets represent 95% confidence interval. Results are adjusted for economic quintile, household's major source of earnings, social group, sector, religion, household size, gender of household head, educational status of household head, presence of any elderly member in household, state, health insurance status, and type of healthcare facility visited.

4.3.3 Poverty headcount ratio

Figure 4.1 shows that 10.7%, 15.0%, and 15.0% of the households who sought hospitalization, outpatient care, and hospitalization and/or outpatient care, respectively, were pushed below the poverty line as a result of OOPE. The percentage of households falling below the poverty line due to hospitalization-related OOPE was the highest for cancer (31.8%), followed by psychiatric and neurological disorders (21.0%), musculoskeletal conditions (17.9%), and injuries (17.8%). Among households where any member sought outpatient care, obstetric conditions, genitourinary disorders, and cancer were among the top three conditions that led to the highest poverty headcount ratio. Of all the households that fell below the poverty line due to OOPE, childbirth (19.6%), injuries (13.7%), and infection-afflicted households (13.5%) accounted for the largest share in the case of hospitalization, while infections (31.3%) and cardiovascular conditions (12.5%) constituted the largest share of households falling below the poverty line in the case of outpatient care (Figure 4.2). The poverty headcount ratio was higher for households that sought care at private healthcare facilities than public healthcare facilities in the case of both hospitalization (17.5% vs 3.7%) and outpatient care (17.3% vs 10.9%) (Supplementary Table 4.7).

Logistic regression showed that the likelihood of falling below the poverty line was statistically significantly higher for cancer-affected households for both hospitalization [OR: 10.12 (7.16–14.29); $p < 0.05$] and outpatient care [OR: 4.21 (2.49–7.15); $p < 0.05$] compared with households with any infection-afflicted member. In the case of hospitalization, households affected by any ailment (except for eye-, ear-, and skin-related ailments and respiratory issues) demonstrated statistically significantly higher odds of falling below the poverty line compared to infection-afflicted households ($p < 0.05$). For outpatient care, the odds of falling below the poverty line were statistically significantly higher for households with member(s) affected by cancer, endocrine, metabolic and nutritional conditions, psychiatric and neurological disorders,

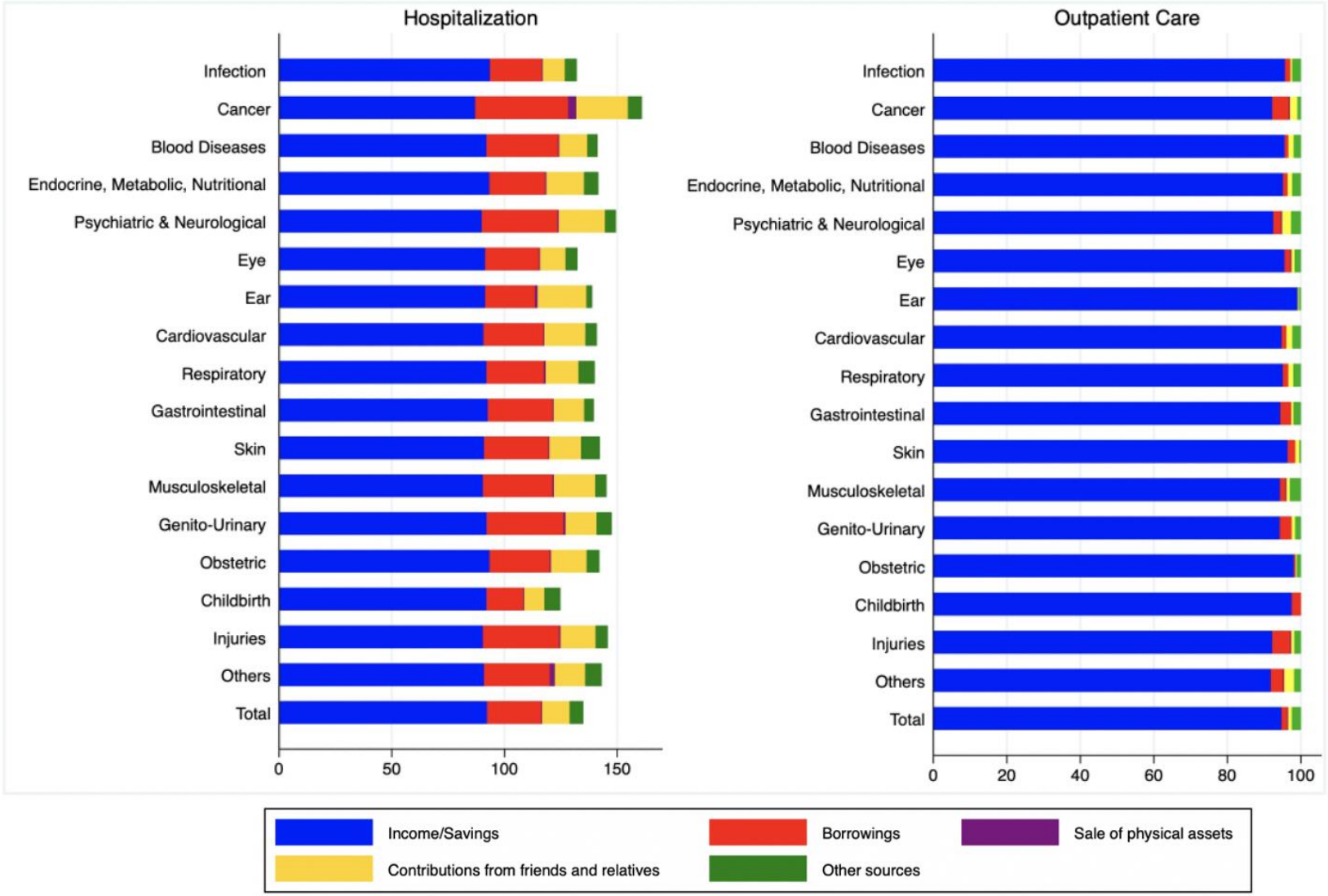
gastrointestinal conditions, genitourinary disorders, obstetric conditions, and other disease categories ($p < 0.05$) (Table 4.1).

4.3.4 Distressed financing

In India, the majority of households primarily relied on income/savings to finance hospitalization-related OOPE (83.9%) and outpatient care (94.7%) (Supplementary Figure 4.3; Figure 4.3), and the incidence of using distressed sources as the major source of finance was relatively low (hospitalization: 16.1% and outpatient care: 5.3%) (Supplementary Figure 4.3; Figure 4.3). However, among 26,442 households who reported using a second major source to finance hospitalization-related OOPE, 78.0% relied on distressed sources (Supplementary Figure 4.3). Overall, 40.6% of households relied on distressed financing, either as primary or secondary source, to cover OOPE for hospitalization. Borrowings (23.8%) and contributions from friends and relatives (12.3%) were the most commonly used distressed sources in the event of hospitalization, while sale of physical assets was the least utilized coping strategy (0.5%) (Figure 4.3). Cancer, psychiatric and neurological disorders, injuries, and genitourinary disorders were the top four disease conditions causing households to rely on distressed financing, irrespective of the type of care sought (Figure 4.1). Among all households that relied on distressed financing, infection-afflicted households accounted for the largest (28.1%) and second-largest share (18.9%) of the total burden of distressed financing for outpatient care and hospitalization, respectively (Figure 4.2). Notably, the incidence of distressed financing was higher for all disease categories (except childbirth and others category) for households where members sought outpatient care at public healthcare facilities than private ones. By contrast, in the case of hospitalization, a higher incidence of distressed financing was reported at private healthcare facilities across all disease categories compared to public healthcare facilities (Supplementary Table 4.8).

Compared with infections, the odds of using distressed financing, either as major or second source, were statistically significantly higher for households who sought hospitalization for any ailment, except eye- and ear-related ailments and childbirth ($p < 0.05$). For outpatient care, the likelihood of using distressed sources was statistically significantly lower for ear-related ailments compared with infections ($p < 0.05$) (Table 4.1).

Figure 4.3 Share of various sources used to finance out-of-pocket health expenditure for various diseases



4.3.5 Percentage of ailing individuals who did not seek treatment

Out of all the individuals who reported having an ailment during the last 15 days prior to the survey date, 1.8% of ailing individuals did not seek treatment (Supplementary Table 4.9). Individuals suffering from ear-related ailments reported the highest incidence of not seeking treatment (19.3%), followed by individuals suffering from eye-related ailments (10.7%), and psychiatric and neurological disorders (5.4%). We also determined the proportion of ailing individuals who did not seek treatment on medical advice and found that 10.1% of all the individuals suffering from an ailment during the last 15 days sought treatment not administered on medical advice (Supplementary Table 4.9). Although the primary reason for not seeking treatment on medical advice was that the ailment was not considered severe (73.5% of cases), substantial variations were observed across disease categories (Supplementary Figure 4.4). For instance, 47.0% and 20.8% of individuals suffering from blood diseases and injuries, respectively, reported the non-availability of medical facilities in their neighbourhood as one of the reasons for not seeking treatment on medical advice.

4.3.6 Loss of household income

In addition to the economic burden of financing healthcare, households also experienced indirect costs associated with the loss of earnings due to the inability of the patient or the caregiver to attend work. Supplementary Table 4.10 shows that hospitalization for cancer caused the highest loss of average household income (INR 6419.6), followed by hospitalization for psychiatric and neurological disorders (4463.2), and injuries (INR 3918.9). For outpatient care, obstetric conditions (INR 602.9), injuries (INR 549.5), and cancer (INR 515.3) resulted in the highest loss of average household earnings.

4.4 Discussion

This chapter provides a comprehensive examination of the OOPE and associated financial burden (CHE, impoverishment, and distressed financing) across 17 disease categories to assess

the magnitude of hardships experienced by Indian households incurring OOPE. The financial burden was further analyzed based on the type of care sought and the healthcare facility utilized, with the objective of identifying the primary drivers of financial hardship. Additionally, estimates of unmet healthcare needs are provided. The chapter underscores that cancer, genitourinary disorders, psychiatric and neurological disorders, obstetric conditions, and injuries pose a substantial economic burden on households.

India is experiencing a sizeable cancer burden, with 1.39 million new cancer cases registered in the country every year (Indian Council of Medical Research (ICMR), 2022), and as per the World Health Organization (WHO), one in 10 Indians is expected to develop cancer during their lifetime (World Health Organization (WHO), 2020). In tandem with previous studies (Kastor et al., 2018; Rajpal et al., 2018; Boby et al., 2021), we found that cancer led to the highest incidence of CHE, impoverishment, distressed financing, and loss of household earnings in the event of hospitalization. The deleterious effects of high cancer costs are associated with poor quality of life, non-compliance with treatment, debt accumulation and premature entry of younger family members into labour market (Boby et al., 2021), along with physical, psychological, and emotional ramifications. In India, the rural healthcare system is blighted by the paucity of personnel, especially specialists (Government of India (GOI), 2021), and cancer care facilities are largely limited to big cities, causing many patients to travel long distances to seek treatment—a situation that has two negative repercussions: (1) substantial travelling and lodging expenses, coupled with the loss of earnings due to travel, and (2) overloading and long waiting time at major cancer centres (Pramesh et al., 2014). In addition, studies have found that increased travel requirements are associated with more advanced stages of disease at diagnosis, inappropriate treatment, and poor prognosis (Ambroggi et al., 2015). Given the rising cancer burden and the grave economic consequences of cancer care, there is an urgent need for multifaceted policy measures, such as improving diagnostic and imaging

equipment, ensuring optimum surgical and radiotherapy infrastructure and palliative care facilities in all publicly funded cancer centres, and promoting cost-effective therapies (Pramesh et al., 2014; Boby et al., 2021). Furthermore, telemedicine must be scaled as it can bring quality healthcare, including specialists to a large proportion of population, decrease the burden of the healthcare system, and increase access to cost-efficient medical services (Chellaiyan et al., 2019; Aashima and Sharma, 2021; Dash et al., 2021).

In tandem with previous studies, we found that cardiovascular conditions not only pose a substantial financial burden on households (Engelgau et al., 2012; Tripathy et al., 2016; Kastor et al., 2018; Yadav et al., 2021c) but also constitute a sizeable share of total financial hardships. For the management of coronary artery disease, percutaneous coronary intervention with coronary stent placement is an important treatment modality (Heart & Stroke, 2022; Johns Hopkins Medicine, 2023). However, in India, substantial unethical price mark-ups (varying from 270% to 1000%) are applied in the stent supply chain, which makes the stent prices exorbitantly high, irrational and restrictive (Government of India (GOI), 2017b; Medical Dialogues, 2017; Pattnaik, 2019). Despite the National Pharmaceutical and Pricing Authority of India introducing a ceiling on stent prices (lowering it by up to 85%) in 2017 (National Pharmaceutical Pricing Authority (NPPA), 2018; The Times Of India, 2018; Pattnaik, 2019), several hospitals have not passed on the full benefits to the patients (The Times Of India, 2018; Pattnaik, 2019). Therefore, it is essential to cap the prices of other accessories (such as guiding catheters, balloons, and guide wires) (National Pharmaceutical Pricing Authority (NPPA), 2018), so that procedures like angioplasty can become more affordable and accessible to patients.

Injuries were among the top-5 ailments across all three parameters (i.e. CHE, impoverishment, and distressed financing) for hospitalization and accounted for one of the largest shares in the total financial hardships. Previous studies have also found that injuries lead to high incidence

of CHE and substantial productivity losses (Prinja et al., 2016; 2019; Yadav et al., 2021b). Notably, in India, road injuries are the leading cause of mortality in the economically active younger age group of 15–39 years (Dandona et al., 2020), highlighting that the burden of injuries far exceeds their immediate medical costs (Government of India (GOI), 2019). Consequently, the Indian government has recently devised a scheme to provide cashless treatment to road accident victims during the golden hour, which is the first hour after an injury when timely medical care can significantly reduce the risk of death (Government of India (GOI), 2019). There is a huge potential for cost-savings if prevention strategies such as mandatory motorcycle helmets and seat belts, speed limits and speed bump installations, and breath testing are effectively implemented in India (Pal et al., 2019; UNICEF, 2022).

In line with previous studies (Singh and Kumar, 2017; Kastor et al., 2018; Yadav et al., 2021c), we found that the brunt of OOPE was lower among households where members sought care in public facilities compared with those treated in private healthcare facilities across most disease categories. However, the lacunae in the public health system, including insufficient healthcare infrastructure, perceived low-quality care, unavailable services, and long waiting times, compel individuals to seek care from private health facilities, resulting in a significant financial burden. As per the latest report published by NITI Aayog (2021), the capacity and quality of healthcare services in India's public health sector have been constrained due to low public health expenditure, mandating the need for significant and sustained investment to strengthen the public health system. Furthermore, although private hospitals mainly cater to tertiary care services and employ advanced technologies and sub-specialities, these are inadequately monitored by the government, resulting in a plethora of cases of overpricing, unnecessary tests and treatments, and malpractices (Phadke, 2016; The Times of India, 2016; Dehury et al., 2019). Consequently, a substantial portion of financial catastrophes, impoverishment, and

indebtedness due to OOPE occurs within the private health system in India (Kastor et al., 2018; Yadav et al., 2021c; Behera and Pradhan, 2021). Conversely, we also found that the incidence of distressed financing was nearly three times higher among households who sought outpatient care in public healthcare facilities compared with those treated in private healthcare facilities. This can be attributed to the higher utilization of public facilities by households belonging to lower economic quintiles, who rely on distressed sources to finance even relatively small amounts of outpatient expenses at the subsidized public facilities (Joe, 2015). Previous studies have also found that the incidence of distressed financing is concentrated among the poor households (Joe, 2015; Sangar et al., 2019b; 2020). The overwhelming majority of evidence highlights the need to regulate private healthcare facilities as improved regulation is one of the potential drivers to reduce healthcare costs and improve the quality of care (Selvaraj et al., 2022).

Notably, we found that financial burden was more pronounced in the case of outpatient care (CHE incidence at 10% threshold: 48.5% and poverty headcount ratio: 15.0%) compared with hospitalization (CHE incidence at 10% threshold: 34.5% and poverty headcount ratio: 10.7%). Previous studies have stated that although the cost of hospitalization is higher for any given event (Chatterjee et al., 2013), the overall financial burden and impoverishment are much larger due to outpatient care (Berman et al., 2010), which involves relatively small but more frequent payments. Outpatient care demands policy attention due to a multitude of reasons. First, outpatient care in India is overwhelmingly private, with private healthcare facilities providing ~70% of outpatient care, thereby causing a substantial economic burden on households. Second, medicines and drugs alone constitute a substantial portion of OOPE (>65%) in the case of outpatient care. Unfortunately, the limited availability of free or subsidized essential medicines and drugs at public healthcare facilities forces households to buy them from private pharmacies, resulting in higher OOPE or treatment abstention (Maiti et al., 2015). Third, the

increasing prevalence of NCDs leads to an increased use of outpatient clinics because chronic illnesses require multiple consultations, regular doctor visits, diagnostic tests, and long-term medication support (Selvaraj et al., 2018; Mukherjee and Chaudhuri, 2020).

Despite all this, most of the health insurance schemes in India mainly cover hospitalization, excluding outpatient care from the ambit of insurance coverage (Selvaraj and Karan, 2012; Hooda, 2020). A study found that removing OOPE for drugs and outpatient visits had the greatest impact on poverty reduction (Shahrawat and Rao, 2012). Thus, to safeguard against financial hardships, insurance schemes covering both outpatient care and hospitalization are imperative. In India, the new flagship scheme "Pradhan Mantri Jan Arogya Yojana (PM-JAY)" was launched in 2018, with the aim to provide health insurance coverage to 100 million poor and vulnerable families, with a cover of up to USD 7,320.6 (INR 5,00,000) per family per year for secondary and tertiary care hospitalization (National Health Authority, 2022). Although PM-JAY scheme has removed two major limitations of the previous national-level health insurance scheme (Rashtriya Swasthya Bima Yojana), i.e., insurance coverage of mere USD 438.2 (INR 30,000) per annum and a cap on family size (covering five members only), still it does not cover outpatient care, which can help improve financial protection.

We also found that among all individuals who reported having an ailment during the last 15 days, 1.8% did not seek treatment and 10.1% did not seek treatment on medical advice. Nearly 47.0% of individuals suffering from blood diseases and 20.8% of individuals suffering from injuries reported the non-availability of medical facilities in their neighbourhood as one of the reasons for not seeking treatment on medical advice. Arora et al. (2020) found that >70% of surveyed Indian patients revealed a lack of required facilities in their home state and out-of-state referral (20%) as prominent reasons for seeking cross-border care, a situation resulting in higher travelling costs, loss of labour days, and treatment deferral or abandonment of follow-up care in certain cases. A recent systematic review found that the key reasons for unmet

healthcare needs were affordability (20.6%), availability (17.0%), and accessibility (12.2%) (WHO, 2021b). Forgoing care may exacerbate health problems and put the concerned families in a downward spiral of ill health and poverty (Wagstaff, 2002; Petrovic et al., 2021; Rahman et al., 2022). Moreover, even if OOPE is avoided by not seeking care, a household may still experience indirect costs such as loss of earnings if the sick individual or caregiver is unable to attend work. The loss of earnings may be limited if the patient or caregiver works in a formal sector (Alam and Mahal, 2014). However, in a country like India, where 86.8% of the workforce is employed in the informal sector (Oxfam India, 2022), suffering from an ailment can lead to a considerable loss of earnings. We found that cancer, psychiatric and neurological disorders, and injuries were the top three ailments leading to significant losses in household earnings. A study estimated that ~7% and 23% of middle-aged Indian adults had ever stopped working and had limited paid work, respectively, due to health-related issues (Akhtar et al., 2022). Furthermore, those with chronic diseases were 4% and 11% more likely to stop and limit their work, respectively (Akhtar et al., 2022).

4.5 Conclusion

The chapter highlights the colossal economic impact of OOPE and associated financial catastrophe and impoverishment faced by Indian households suffering from any type of illness. Concerted efforts such as strengthening public healthcare facilities, increasing the uptake of health insurance, designing broader insurance packages to cover outpatient care, and ensuring affordability and availability of essential medicines, are imperative to augment financial risk protection. Moreover, even though cancer causes copious financial burdens among those who have the disease and seek treatment for it, policymakers should get to the bottom of what comprises infections (given the prospect of substantial misclassification and/or misdiagnosis in this category) and address the high spending on cardiovascular diseases and injuries, which

constitute a sizeable share of the total financial hardships. Comprehensive disease-specific insurance packages (The Economic Times, 2020) should be designed for high-cost ailments such as cancer, psychiatric and neurological disorders, and genitourinary disorders. Furthermore, there is a need for improved regulation of the private health sector and to put standard treatment guidelines in place. For long-term sustainability, policymakers must prioritize health promotion and disease prevention strategies, as increasing life expectancy, ageing population, westernization, and motorization will further aggravate the burden of NCDs and injuries in India. Implementation of robust and effective evidence-based health promotion programmes holds the potential to significantly improve people's health and reduce the financial burden they face. To achieve UHC and SDG goals, the epidemic of chronic diseases and injuries should be a political priority and central to the national consciousness.

4.6 References

Aashima, Nanda M, & Sharma R. 2021. A review of patient satisfaction and experience with telemedicine: a virtual solution during and beyond COVID-19 pandemic. Telemedicine and e-Health. 27(12): 1325-1331.

Akhtar S, Mohanty SK, Singh RR, Sen S. 2022. Chronic diseases and productivity loss among middle-aged and elderly in India. BMC Public Health 22(1):2356.

Alam K, Mahal A. 2014. Economic impacts of health shocks on households in low and middle income countries: a review of the literature. Globalization and health 10(1):1-8.

Ambroggi M, Biasini C, Del Giovane C, Fornari F, & Cavanna L. 2015. Distance as a barrier to cancer diagnosis and treatment: review of the literature. The oncologist. 20(12): 1378-1385.

Arora A, Bhutani P, Chhabra S, Smith O. PM-JAY Without Borders: Analysis of Portability Services. National Health Authority; 2020 Feb p. 12. (PM-JAY Policy Briefs). Report No.: 5. Available from: https://pmjay.gov.in/sites/default/files/2020-%2002/Policy%20Brief%205_Analysis%20of%20Portability%20Service%20s.pdf

Bajpai V. 2014. The challenges confronting public hospitals in India, their origins, and possible solutions. Advances in Public Health. 898502.

Berki SE. 1986. A look at catastrophic medical expenses and the poor. Health affairs. 5(4): 138-45.

Belotti, F., Deb, P., Manning, W. G., & Norton, E. C. 2015. twopm: Two-part models. The Stata Journal, 15(1), 3-20.

Berman P, Ahuja R, Bhandari L. 2010. The impoverishing effect of healthcare payments in India: new methodology and findings. Economic and Political Weekly. 65-71.

Bloom DE, Cafiero-Fonseca ET, Candeias V, et al. 2014. Economics of non-communicable diseases in India: the costs and returns on investment of interventions to promote healthy living and prevent, treat, and manage NCDs. In World economic forum, Harvard school of Public Health. 22-23. Available: https://www3.weforum.org/docs/WEF_EconomicNonCommunicableDiseasesIndia_Report_2014.pdf.

Boby JM, Rajappa S, Mathew A. 2021. Financial toxicity in cancer care in India: a systematic review. The Lancet Oncology. 22(12): e541-9.

Bonu S, Bhushan I, Peters D. 2007. Incidence, intensity, and correlates of catastrophic out-of-pocket health payments in India. Asian Development Bank. 32-39.

Bonu S, Bhushan I, Rani M, Anderson I. 2009. Incidence and correlates of 'catastrophic' maternal health care expenditure in India. Health policy and planning. 24(6):445-56.

Chatterjee S, Levin C, Laxminarayan R. 2013. Unit cost of medical services at different hospitals in India. Plos one. 8(7): e69728.

Chellaiyan VG, Nirupama AY, & Taneja N. 2019. Telemedicine in India: Where do we stand?. Journal of family medicine and primary care. 8(6): 1872.

Dash S, Aarthy R, Mohan V. 2021. Telemedicine during COVID-19 in India—a new policy and its challenges. Journal of public health policy. 42(3): 501-509.

Dandona R, Kumar GA, Gururaj G, et al. 2020. Mortality due to road injuries in the states of India: The Global Burden of Disease Study 990–2017. Lancet Public Health. 5(2):e86–e98.

Dehury RK, Samal J, Coutinho S, Dehury P. 2019. How does the largely unregulated private health sector impact the Indian mass?. Journal of Health Management. 21(3): 383-93.

Devadasan N, Seshadri T, Trivedi M, Criel B. 2013. Promoting universal financial protection: evidence from the rashtriya Swasthya Bima Yojana (RSBY) in Gujarat, India. Health Res. Policy Syst. 11(1):1-8.

Engelgau MM, Karan A, Mahal A. 2012. The economic impact of non-communicable diseases on households in India. Globalization and health. 8(1): 1-10.

Garg CC, Karan AK. 2009. Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Health policy and planning. 24(2): 116-28.

Ghosh S, & Gupta ND. 2017. Targeting and effects of Rashtriya Swasthya Bima Yojana on access to care and financial protection. Econ Polit Wkly. 52(4): 61-70.

Government of India (GOI). 2017. Order. Available: http://www.nppaindia.nic.in/wp-content/uploads/2019/01/so412e-13-02-17-1.pdf.

Government of India (GOI). 2019. Road Accidents in India 2019. Available: https://morth.nic.in/sites/default/files/RA_Uploading.pdf.

Government of India (GOI). 2021. *Rural Health Statistics 2020-2021*. Government of India, Ministry of Health and Family Welfare, Statistics Division. Available: https://main.mohfw.gov.in/sites/default/files/rhs20-21.pdf

Gupta I, Chowdhury S, Prinja S, Trivedi M. 2016. Out-of-pocket spending on out-patient care in India: assessment and options based on results from a district level survey. PLoS One. 11(11): e0166775.

Heart & Stroke. 2022. Available: https://www.heartandstroke.ca/heart-disease/treatments/surgery-and-other-procedures/percutaneous-coronary-intervention.

Hooda SK. 2020. Penetration and coverage of government-funded health insurance schemes in India. Clinical Epidemiology and Global Health. 8(4): 1017-33.

Indian Council of Medical Research (ICMR). 2022. Cancer Statistics. Available: http://cancerindia.org.in/cancer-statistics/

Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation (ICMR, PFHI, and IHME). 2017. *India: Health of the Nation's States - The India State-Level Disease Burden Initiative*. Available: https://www.healthdata.org/sites/default/files/files/policy_report/2017/India_Health_of_the_Nation%27s_States_Report_2017.pdf

Joe W. 2015. Distressed financing of household out-of-pocket health care payments in India: incidence and correlates. Health policy and planning. 30(6): 728-41.

Kastor A, Mohanty SK. 2018. Disease-specific out-of-pocket and catastrophic health expenditure on hospitalization in India: do Indian households face distress health financing?. PloS one 13(5): e0196106.

Mahal A, Karan A, Fan VY, Engelgau M. 2013. The economic burden of cancers on Indian households. PloS one. 8(8): e71853.

Maiti R, Bhatia V, Padhy BM., & Hota D. 2015. Essential medicines: an Indian perspective. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine. 40(4), 223.

Medical Dialogues. 2017. Shockingly High Profit Margins On Cardiac Stents: NPPA Report. Available: https://business.medicaldialogues.in/shockingly-high-profit-margins-on-cardiac-stents-nppa-report?infinitescroll=1

Mohanty SK, Kastor A. 2017. Out-of-pocket expenditure and catastrophic health spending on maternal care in public and private health centres in India: a comparative study of pre and post national health mission period. Health Economics Review. 7(1): 1-5.

Mukherjee S, Chaudhuri A. 2020. Outpatient care and expenses: Can they be ignored in health insurance programmes. Institute Of Development Studies Kolkata.

National Health Authority. 2022. *Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana*. Available: https://pmjay.qcin.org/pm-jay

National Health Policy. 2017. Available: https://www.nhp.gov.in/nhpfiles/national_health_policy_2017.pdf

National Pharmaceutical Pricing Authority (NPPA). 2018. *Minutes of the NPPA meeting*. Available: http://www.nppaindia.nic.in/wp-content/uploads/2019/01/Authority_minutes.pdf

Niti Aayog. 2021. Health Insurance for India's Missing Middle. Available: https://www.niti.gov.in/sites/default/files/2021-10/HealthInsurance-forIndiasMissingMiddle_28-10-2021.pdf.

Oxfam India. 2022. A Glance at the Informal Sector in India. Available: https://www.oxfamindia.org/knowledgehub/factsheets/glance-informal-sector-india. Date Accessed: March 15, 2023.

Pal R, Ghosh A, Kumar R, et al. 2019. Public health crisis of road traffic accidents in India: Risk factor assessment and recommendations on prevention on the behalf of the Academy of Family Physicians of India. Journal of family medicine and primary care. 8(3): 775.

Patra S, Bhise MD. 2016. Gender differentials in prevalence of self-reported non-communicable diseases (NCDs) in India: evidence from recent NSSO survey. Journal of Public Health, 24:375-85.

Pattnaik A. 2019. Price ceiling of coronary stents-challenges ahead. International Journal of Telemedicine and Clinical Practices. 3(2): 165-73.

Phadke A. 2016. Regulation of doctors and private hospitals in India. Economic and Political Weekly. 46-55.

Petrovic D, Marcus K, Sandoval J, Cullati S, Piumatti G, Bodenmann P, et al. 2021. Health-related biological and non-biological consequences of forgoing healthcare for economic reasons. Prev Med Rep. 24: 101602.

Planning Commission. 2014. Report of the expert group to review the methodology for measurement of poverty. New Delhi: Planning Commission.

Pramesh CS, Badwe RA, Borthakur BB, et al. 2014. Delivery of affordable and equitable cancer care in India. The Lancet Oncology. 15(6): e223-33.

Prinja S, Chauhan AS, Karan A, Kaur G, & Kumar R. 2017. Impact of publicly financed health insurance schemes on healthcare utilization and financial risk protection in India: a systematic review. PloS one 12(2): e0170996.

Prinja S, Jagnoor J, Chauhan AS, et al. 2016. Economic burden of hospitalization due to injuries in North India: a cohort study. International journal of environmental research and public health. 13(7): 673.

Prinja S, Jagnoor J, Sharma D, et al. 2019. Out-of-pocket expenditure and catastrophic health expenditure for hospitalization due to injuries in public sector hospitals in North India. PloS one. 14(11): e0224721.

Rahman T, Gasbarro D, & Alam K. 2022b. Financial risk protection from out-of-pocket health spending in low-and middle-income countries: a scoping review of the literature. Health Research Policy and Systems 20(1): 1-23.

Ranjan A, Dixit P, Mukhopadhyay I, Thiagarajan S. 2018. Effectiveness of government strategies for financial protection against costs of hospitalization Care in India. BMC public health 18(1):1-2.

Rajpal S, Kumar A, Joe W. 2018. Economic burden of cancer in India: Evidence from cross-sectional nationally representative household survey, 2014. PloS one 13(2): e0193320.

Reshmi B, Unnikrishnan B, Rajwar E, Parsekar SS, Vijayamma R, & Venkatesh BT. 2021. Impact of public-funded health insurances in India on health care utilisation and financial risk protection: a systematic review. BMJ open 11(12): e050077.

Sangar S, Dutt V, Thakur R. 2019a. Comparative assessment of economic burden of disease in relation to out of pocket expenditure. Frontiers in Public Health.

Sangar S, Dutt V, Thakur R. 2019b. Distress financing of out-of-pocket health expenditure in India. Review of Development Economics. 23(1): 314-30.

Sangar S, Dutt V, Thakur R. 2020. Coping with out-of-pocket health expenditure in India: evidence from NSS 71st round. Global Social Welfare. 7(3): 275-84.

Sangar S, Dutt V, Thakur R. 2022. Burden of out-of-pocket health expenditure and its impoverishment impact in India: evidence from National Sample Survey. Journal of Asian Public Policy 15(1): 60-77.

Selvaraj S, Farooqui HH, Karan A. 2018. Quantifying the financial burden of households' out-of-pocket payments on medicines in India: a repeated cross-sectional analysis of National Sample Survey data, 1994–2014. BMJ open. 8(5): e018020.

Selvaraj S, & Karan AK. Why publicly-financed health insurance schemes are ineffective in providing financial risk protection. Economic and Political Weekly. 2012;60-68.

Sengupta, R., & Rooj, D. 2019. The effect of health insurance on hospitalization: Identification of adverse selection, moral hazard and the vulnerable population in the Indian healthcare market. World Development, 122, 110-129.

Shahrawat R, Rao KD. 2012. Insured yet vulnerable: out-of-pocket payments and India's poor. Health policy and planning. 27(3): 213-21.

Singh P, Kumar V. 2017. The rising burden of healthcare expenditure in India: a poverty nexus. Social Indicators Research. 133(2): 741-62.

Sneha LM, Sai J, Ashwini S, Ramaswamy S, Rajan M, Scott JX. 2017. Financial Burden Faced by Families due to Out-of-pocket Expenses during the Treatment of their Cancer Children: An Indian Perspective. Indian Journal of Medical and Paediatric Oncology. 38(01): 4-9.

Sriram S. 2019. Are the subcenters adequately equipped to deliver primary healthcare? A study of public health manpower and infrastructure in the health district in Andhra Pradesh, India. Journal of Family Medicine and Primary Care. 8(1): 102.

Steele GM, Franco-Paredes C, & Chastain DB. 2018. Noninfectious causes of fever in adults. The Nurse Practitioner. 43(4): 38-44.

Swain SP, Samal S, Sahu KS, Rout SK. 2018. Out-of-pocket expenditure and drug adherence of patients with diabetes in Odisha. Journal of family medicine and primary care. 7(6): 1229.

Thakur H. 2016. Study of awareness, enrollment, and utilization of Rashtriya Swasthya Bima Yojana (national health insurance scheme) in Maharashtra, India. Frontiers in public health. 3: 282.

The Economic Times. 2020. Need t*o have more disease-specific health insurance products: IRDAI.* Available: https://bfsi.economictimes.indiatimes.com/news/insurance/need-to-have-more-disease-specific-health-insurance-products-irdai/78678320.

The Times of India. 2016. Greed and the rise of medical malpractice in India. Available: https://timesofindia.indiatimes.com/blogs/the-irreverent-lawyer/greed-and-the-rise-of-medical-malpractice-in-india/.

The Times Of India. 2018. *Stents cheaper, but not all get benefit.* Available: https://timesofindia.indiatimes.com/india/stents-cheaper-but-not-all-get-benefit/articleshow/62687068.cms.

Tripathy JP and Prasad BM. 2018. Cost of diabetic care in India: an inequitable picture. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 12(3): 251-5.

Tripathy JP, Prasad BM, Shewade HD, et al. 2016. Cost of hospitalisation for non-communicable diseases in India: are we pro-poor?. Tropical medicine & international health. 21(8): 1019-28.

United Nations Development Programme (UNDP). 2022. Goal 3: Good Health and Well-Being. United Nations Development Programme. Available: https://www.undp.org/sustainable-development-goals?utm_source=EN&utm_medium=GSR&utm_content=US_UNDP_PaidSearch_Brand_English&utm_campaign=CENTRAL&c_src=CENTRAL&c_src2=GSR&gclid=CjwKCAjw9e6SBhB2EiwA5myr9uiGZfMo0bJcdr_CwHw4cE6_TIMEdupc3L_816AMWbjZEY-ElPW93BoC6YYQAvD_BwE#good-health. Date Accessed: March 1, 2022.

Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. The lancet. 368(9544): 1357-64.

Verma VR, Kumar P, Dash U. 2021. Assessing the household economic burden of non-communicable diseases in India: evidence from repeated cross-sectional surveys. BMC public health. 21(1): 1-22.

Wagstaff A. 2002. Poverty and health sector inequalities. Bull World Health Organ, 80:97–105.

World Bank. 2014. Poverty and Health. Available: https://www.worldbank.org/en/topic/health/brief/poverty-health

World Health Organization (WHO). 2019a. Global Health Expenditure Database 2019. World Health Organisation. Available: https://apps.who.int/nha/database/country_profile/Index/en. Date Accessed: March 3, 2022.

World Health Organization (WHO). 2019b. Primary Health Care on the Road to Universal Health Coverage: 2019 Global Monitoring Report. Available: https://www.who.int/publications/i/item/9789240029040.

World Health Organization (WHO). 2020. World Cancer Report Ca*ncer: research for cancer prevention.* Available: https://www.iccp-portal.org/system/files/resources/IARC%20World%20Cancer%20Report%202020.pdf.

WHO. 2021a. Universal health coverage. Available: https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc). Date Accessed: March 1, 2022.

WHO. 2021b. Systematic review and meta-analysis: financial barriers to accessing health services and unmet healthcare needs. Kobe: World Health Organization (WHO) Centre for Health Development; 2021. Available: https://extranet.who.int/kobe_centre/en/project-details/foregone_care.

World Health Organization (WHO). 2022. Regional Office for South-East Asia, Selvaraj S., Karan K.A., Srivastava S., Bhan N. et al. India: health system review. Health Systems in Transition, 11 (1), World Health Organization. Regional Office for South-East Asia. https://apps.who.int/iris/handle/10665/352685.

WHO. 2023. Catastrophic out-of-pocket health spending (SDG indicator 3.8.2 and regional indicators where available). https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/catastrophic-out-of-pocket-health-spending-sdg-indicator-3-8-2-

Xu K, Evans DB, Kawabata K, Zeramdini R, Klavus J, Murray CJ. 2003. Household catastrophic health expenditure: a multicountry analysis. The Lancet. 362(9378): 111-7.

Yadav J, John D, Allarakha S, Menon GR. 2021a. Rising healthcare expenditure on tuberculosis: Can India achieve the End TB goal?. Tropical Medicine & International Health. 26(10):1256-75.

Yadav J, Menon G, Agarwal A, John D. 2021c. Burden of injuries and its associated hospitalization expenditure in India. International journal of injury control and safety promotion. 28(2): 153-61.

Yadav J, Menon GR, John D. 2021b. Disease-specific out-of-pocket payments, catastrophic health expenditure and impoverishment effects in India: an analysis of national health survey Data. Applied Health Economics and Health Policy. 19(5): 769-82.

4.7 Appendix (Supplementary Tables and Figures)

Supplementary Table 4.1 Disease classification as per the NSS health survey

S.No	Disease category	Reported diagnosis and/or main symptom
1.	Infection	Fever with loss of consciousness or altered consciousness; Malaria; Fever due to Diphtheria, Whooping Cough; All other fevers (Includes typhoid, Fever with rash/ eruptive lesions and fevers of unknown origin, all specific fevers that do not have a confirmed diagnosis); Tuberculosis; Filariasis; Tetanus; HIV/AIDS; Other sexually transmitted diseases; Jaundice; Diarrhoea/ dysentery/ increased frequency of stools with or without blood and mucus in stools; Worms infestation
2.	Cancers	Cancers (known or suspected by a physician) and occurrence of any growing painless lump in the body
3.	Blood Diseases	Anaemia (any cause); Bleeding disorders
4.	Endocrine, Metabolic, Nutritional	Diabetes; Under-nutrition; Goitre and other diseases of the thyroid; Others (including obesity)
5.	Psychiatric & Neurological	Mental retardation; Mental disorders; Headache; Seizures or known epilepsy; Weakness in limb muscles and difficulty in movements; Stroke/ hemiplegia/ sudden onset weakness or loss of speech in half of body; Others including memory loss, confusion
6.	Eye	Discomfort/pain in the eye with redness or swellings/ boils; Cataract; Glaucoma; Decreased vision (chronic) NOT including where decreased vision is corrected with glasses; Others (including disorders of eye movements – strabismus, nystagmus, ptosis and adnexa)
7.	Ear	Earache with discharge/bleeding from ear/ infections; Decreased hearing or loss of hearing
8.	Cardiovascular	Hypertension; Heart disease: Chest pain, breathlessness

9.	Respiratory	Acute upper respiratory infections (cold, runny nose, sore throat with cough, allergic colds included); Cough with sputum with or without fever and NOT diagnosed as TB; Bronchial asthma/ recurrent episode of wheezing and breathlessness with or without cough over long periods or known asthma)
10.	Gastrointestinal	Diseases of mouth/teeth/gums; Pain in abdomen: Gastric and peptic ulcers/ acid reflux/ acute abdomen; Lump or fluid in abdomen or scrotum; Gastrointestinal bleeding
11.	Skin	Skin infection (boil, abscess, itching) and other skin disease
12.	Musculoskeletal	Joint or bone disease/ pain or swelling in any of the joints, or swelling or pus from the bones; Back or body aches
13.	Genito-Urinary	Any difficulty or abnormality in urination; Pain the pelvic region/reproductive tract infection/ Pain in male genital area; Change/irregularity in menstrual cycle or excessive bleeding/pain during menstruation and any other gynaecological and andrological disorders incl. male/female infertility
14.	Obstetric	Pregnancy with complications before or during labour (abortion, ectopic pregnancy, hypertension, complications during labour); Complications in mother after birth of child; Illness in the newborn/sick newborn
15.	Childbirth *(for both live birth and stillbirth)*	Normal delivery; Caesarean; other types of delivery
15.	Injuries	Accidental injury, road traffic accidents and falls; Accidental drowning and submersion; Burns and corrosions; Poisoning; Intentional self-harm; Assault; Contact with venomous/harm-causing animals and plants
16.	Others	Symptom not fitting into any of above categories; Could not even state the main symptom

Supplementary Table 4.2 Percentage distribution of households where any member sought hospitalization and outpatient care

Disease category	Hospitalization		Outpatient Care	
	Number of households (N)	Percentage (%)	Number of households (N)	Percentage (%)
Infection	18612	20.6	9213	31.7
Cancers	896	1.0	393	0.4
Blood Diseases	1024	1.2	370	0.9
Endocrine, Metabolic, Nutritional	1572	1.7	6442	14.9
Psychiatric & Neurological	3056	3.4	1918	4.5
Eye	1966	2.5	424	1.1
Ear	327	0.3	163	0.4
Cardiovascular	5044	5.6	6991	16.3
Respiratory	2195	2.4	3651	10.0
Gastrointestinal	6237	6.6	1708	4.8
Skin	577	0.6	700	2.1
Musculoskeletal	2679	2.9	2984	8.7
Genito-Urinary	3501	3.9	659	1.4
Obstetric	1617	2.4	179	0.3
Childbirth	27126	35.9	107	0.1
Injuries	7225	7.7	718	1.4
Others	1227	1.4	533	1.3
Total	84881	100	37153	100

All ‘N’ are unweighted.

Supplementary Table 4.3 Average monthly out-of-pocket health expenditure (OOPE) across all disease categories and by the type of care sought

Disease category	Hospitalization	Outpatient Care	Hospitalization and/or Outpatient Care
Infection	909.3 [875.9 - 942.6]	1350.7 [1300.9 - 1400.4]	1272.0 [1241.9 - 1302.2]
Cancers	6732.0 [5773.7 - 7690.4]	6656.1 [4907.4 - 8404.8]	8586.9 [7366.7 - 9807.0]
Blood Diseases	1398.6 [1197.3 - 1599.9]	3404.2 [2758.8 - 4049.6]	2661.2 [2360.5 - 2961.8]
Endocrine, Metabolic, Nutritional	1680.6 [1511.5 - 1849.6]	1422.2 [1363.4 - 1481.1]	1482.3 [1422.1 - 1542.5]
Psychiatric & Neurological	2633.5 [2435.2 - 2831.8]	1897.0 [1392.2 - 2401.9]	2305.5 [1979.5 - 2631.5]
Eye	1024.9 [938.5 - 1111.4]	1555.1 [1097.7 - 2012.5]	1309.2 [1159.6 - 1458.8]
Ear	1285.4 [980.6 - 1590.2]	1387.4 [1132.9 - 1641.9]	1392.5 [1196.8 - 1588.2]
Cardiovascular	3206.1 [3018.8 - 3393.4]	1443.5 [1372.5 - 1514.4]	1835.4 [1754.0 - 1916.8]
Respiratory	1337.3 [1227.9 - 1446.7]	1136.2 [1068.1 - 1204.3]	1199.9 [1136.3 - 1263.6]
Gastrointestinal	1832.8 [1734.4 - 1931.3]	2080.0 [1680.2 - 2479.8]	2072.0 [1904.8 - 2239.1]
Skin	1715.3 [1386.0 - 2044.7]	1529.4 [1389.7 - 1669.0]	1581.1 [1448.6 - 1713.5]
Musculoskeletal	2797.0 [2601.5 - 2992.4]	1698.7 [1563.4 - 1834.0]	1936.9 [1822.4 - 2051.4]
Genito-Urinary	2205.7 [2073.9 - 2337.5]	3725.9 [3154.0 - 4297.8]	3022.3 [2830.9 - 3213.7]
Obstetric	1338.8 [1202.9 - 1474.7]	3553.7 [2965.0 - 4142.3]	1822.3 [1668.8 - 1975.8]
Childbirth	742.1 [727.3 - 757.0]	3827.5 [1501.1 - 6153.9]	758.0 [740.0 - 776.1]
Injuries	2400.5 [2292.4 - 2508.5]	2873.3 [2315.9 - 3430.7]	2654.8 [2519.1 - 2790.5]
Others	2346.3 [2070.3 - 2622.4]	3020.5 [2388.3 - 3652.7]	2944.9 [2588.5 - 3301.4]
Total	1538.9 [1511.5 - 1566.2]	1895.6 [1838.1 - 1953.1]	1992.7 [1957.9 - 2027.4]

The figures inside square brackets represent 95% confidence interval. OOPE is reported in Indian Rupee (INR).

Supplementary Table 4.4 Average monthly out-of-pocket health expenditure (OOPE) across all disease categories and by the type of care sought and healthcare facility visited

Disease category	Hospitalization		Outpatient Care	
	Public health facilities	Private health facilities	Public health facilities	Private health facilities
Infections	257.4 [235.8 - 279.1]	1443.3 [1382.1 - 1504.6]	853.9 [778.9 - 928.9]	1718.5 [1645.2 - 1791.8]
Cancers	2956.1 [2413.6 - 3498.5]	8448.5 [7488.8 - 9408.3]	4856.4 [3575.1 - 6137.7]	8496.8 [5404.3 - 11589.3]
Blood Diseases	467.6 [404.5 - 530.6]	1850.9 [1656.8 - 2045.0]	669.1 [467.2 - 871.0]	4760.2 [3814.2 - 5706.3]
Endocrine, Metabolic, Nutritional	523.8 [432.6 - 614.9]	2301.6 [2035.6 - 2567.6]	728.4 [665.6 - 791.1]	1793.1 [1710.4 - 1875.7]
Psychiatric & Neurological	870.4 [697.8 - 1043.1]	3694.1 [3382.6 - 4005.7]	1505.2 [181.7 - 2828.7]	2513.4 [1952.6 - 3074.2]
Eye	321.2 [246.9 - 395.6]	1497.3 [1369.3 - 1625.3]	1012.4 [709.2 - 1315.5]	2056.4 [1313.3 - 2799.4]
Ear	718.6 [88.9 - 1348.2]	1625.8 [1392.9 - 1858.7]	1198.7 [838.6 - 1558.9]	1541.8 [1180.4 - 1903.2]
Cardiovascular	706.1 [616.2 - 796.0]	4647.0 [4352.3 - 4941.7]	927.7 [828.4 - 1027.0]	1703.3 [1606.5 - 1800.2]
Respiratory	408.8 [355.9 - 461.6]	2141.4 [1941.8 - 2341.0]	820.9 [733.0 - 908.8]	1466.7 [1361.6 - 1571.8]
Gastrointestinal	421.7 [390.8 - 452.5]	2672.3 [2512.6 - 2832.0]	1045.7 [829.6 - 1261.8]	2643.9 [2046.1 - 3241.8]
Skin	616.2 [266.2 - 966.1]	2464.6 [1935.7 - 2993.4]	1339.8 [1021.7 - 1658.0]	1762.0 [1586.9 - 1937.2]
Musculoskeletal	726.3 [582.5 - 870.1]	3885.3 [3591.1 - 4179.6]	1138.0 [980.9 - 1295.1]	2127.9 [1923.7 - 2332.2]
Genito-Urinary	575.8 [524.6 - 627.0]	2754.6 [2579.9 - 2929.2]	1829.9 [1340.7 - 2319.0]	4645.2 [3824.2 - 5466.3]
Obstetric	384.9 [333.5 - 436.4]	2429.7 [2147.1 - 2712.2]	1690.2 [1235.0 - 2145.4]	4768.6 [3918.3 - 5619.0]
Childbirth	216.7 [211.5 - 221.9]	1938.6 [1904.8 - 1972.5]	1209.4 [420.5 - 1998.3]	6340.5 [1772.7 - 10908.3]
Injuries	659.2 [610.7 - 707.7]	3465.6 [3293.2 - 3638.0]	2159.5 [1616.7 - 2702.2]	3414.8 [2633.6 - 4196.0]
Others	746.0 [569.5 - 922.6]	3233.7 [2803.5 - 3664.0]	1288.0 [931.1 - 1645.0]	3918.3 [2986.1 - 4850.5]
Total	374.4 [362.6 - 386.2]	2684.4 [2634.7 - 2734.0]	1135.5 [1043.8 - 1227.2]	2344.5 [2266.6 - 2422.3]

The figures inside square brackets represent 95% confidence interval. OOPE is reported in Indian Rupee (INR).

Supplementary Table 4.5 Incidence of catastrophic health expenditure (%) at 10% threshold across all disease categories and by the type of care sought and healthcare facility visited

Disease category	Hospitalization		Outpatient Care	
	Public health facilities	Private health facilities	Public health facilities	Private health facilities
Infections	6.1 [5.6 - 6.5]	37.2 [36.2 - 38.2]	31.1 [29.2 - 32.9]	51.6 [50.3 - 52.9]
Cancers	48.1 [42.8 - 53.4]	86.2 [83.3 - 89.2]	58.7 [51.2 - 66.3]	78.3 [72.8 - 83.8]
Blood Diseases	18.5 [15.0 - 22.1]	60.2 [56.1 - 64.3]	18.6 [11.9 - 25.3]	70.2 [64.3 - 76.2]
Endocrine, Metabolic, Nutritional	14.1 [11.4 - 16.7]	54.5 [51.2 - 57.8]	22.0 [20.2 - 23.8]	47.2 [45.7 - 48.7]
Psychiatric & Neurological	25.6% [23.2 - 28.0]	72.0 [69.8 - 74.1]	45.0 [41.1 - 49.0]	51.0 [48.1 - 54.0]
Eye	7.6 [5.7 - 9.5]	53.5 [50.7 - 56.3]	26.6 [18.8 - 34.3]	61.5 [55.6 - 67.4]
Ear	17.8 [11.3 - 24.2]	54.6 [47.4 - 61.9]	47.7 [33.8 - 61.6]	49.9 [39.7 - 60.1]
Cardiovascular	17.7 [16.1 - 19.4]	67.5 [65.8 - 69.2]	24.8 [23.1 - 26.5]	43.6 [42.1 - 45.0]
Respiratory	12.8 [10.8 - 14.7]	52.4 [49.4 - 55.5]	30.2 [27.4 - 32.9]	40.7 [38.6 - 42.8]
Gastrointestinal	12.0 [10.8 - 13.2]	62.9 [61.3 - 64.5]	38.9 [34.5 - 43.2]	54.5 [51.6 - 57.5]
Skin	9.7 [6.2 - 13.2]	55.9% [50.1 - 61.7]	41.2 [33.8 - 48.5]	55.7 [51.2 - 60.3]
Musculoskeletal	17.6 [15.4 - 19.9]	65.0 [62.7 - 67.4]	30.6 [27.5 - 33.7]	54.7 [52.4 - 57.0]
Genito-Urinary	21.4 [19.0 - 23.7]	72.0 [70.2 - 73.9]	51.7 [44.9 - 58.5]	73.7 [69.5 - 77.9]
Obstetric	13.5 [11.3 - 15.8]	68.1 [64.6 - 71.7]	56.6 [44.2 - 69.0]	83.5 [76.5 - 90.6]
Childbirth	3.6 [3.3 - 3.8]	60.2 [59.2 - 61.2]	42.7 [29.0 - 56.3]	42.2 [28.3 - 56.1]
Injuries	21.5 [20.0 - 22.9]	70.4 [69.0 - 71.8]	59.0 [52.5 - 65.6]	64.4 [59.9 - 68.8]
Others	24.7 [20.9 - 28.6]	69.3 [65.9 - 72.7]	43.5 [35.6 - 51.3]	63.4 [58.3 - 68.5]
Total	9.1 [8.8 - 9.4]	60.2 [59.7 - 60.7]	34.6 [33.7 - 35.6]	56.7 [56.0 - 57.4]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 4.6 Incidence of catastrophic health expenditure (%) at 25% threshold across all disease categories and by the type of care sought and healthcare facility visited

Disease category	Hospitalization		Outpatient Care	
	Public health facilities	Private health facilities	Public health facilities	Private health facilities
Infections	1.6 [1.4 - 1.9]	12.5 [11.8 - 13.2]	13.4 [12.1 - 14.8]	23.9 [22.7 - 25.0]
Cancers	30.6 [25.7 - 35.4]	62.5 [58.3 - 66.6]	35.7 [28.4 - 43.0]	49.4 [42.8 - 56.0]
Blood Diseases	4.0 [2.2 - 5.8]	25.4 [21.8 - 29.1]	7.1 [2.7 - 11.5]	46.2 [39.7 - 52.7]
Endocrine, Metabolic, Nutritional	5.8 [4.0 - 7.6]	26.2 [23.3 - 29.1]	7.7 [6.5 - 8.8]	20.8 [19.6 - 22.0]
Psychiatric & Neurological	10.2 [8.6 - 11.9]	41.9 [39.6 - 44.3]	17.4 [14.4 - 20.4]	25.4 [22.8 - 27.9]
Eye	1.7 [0.8 - 2.7]	16.1 [14.1 - 18.2]	11.6 [6.0 - 17.2]	29.0 [23.6 - 34.5]
Ear	3.1 [0.2 - 6.1]	21.8 [15.8 - 27.8]	21.1 [9.7 - 32.4]	28.1 [19.0 - 37.3]
Cardiovascular	6.2 [5.1 - 7.2]	39.5 [37.7 - 41.2]	11.3 [10.0 - 12.6]	18.4 [17.3 - 19.6]
Respiratory	3.0 [2.0 - 4.0]	19.6 [17.2 - 22.0]	12.6 [10.6 - 14.5]	18.6 [16.9 - 20.3]
Gastrointestinal	4.1 [3.3 - 4.8]	33.5 [31.9 - 35.0]	14.0 [10.9 - 17.1]	30.7 [27.9 - 33.4]
Skin	3.1 [1.0 - 5.1]	20.0 [15.4 - 24.7]	19.1 [13.2 - 25.0]	25.0 [21.0 - 28.9]
Musculoskeletal	7.4% [5.9 - 9.0]	38.0 [35.5 - 40.4]	14.5 [12.2 - 16.9]	25.5 [23.5 - 27.5]
Genito-Urinary	7.8 [6.2 - 9.3]	36.4 [34.4 - 38.4]	22.1 [16.5 - 27.8]	52.7 [47.9 - 57.4]
Obstetric	5.5 [4.0 - 7.0}	34.1 [30.5 - 37.7]	35.3 [23.4 - 47.3]	72.9 [64.4 - 81.3]
Childbirth	0.4 [0.3 - 0.5]	19.0 [18.2 - 19.8]	24.9 [13.0 - 36.8]	29.4 [16.6 - 42.2]
Injuries	8.5 [7.5 - 9.5]	38.4 [36.9 - 40.0]	45.2 [38.7 - 51.8]	36.4 [32.0 - 40.9]
Others	6.1 [4.0 - 8.3]	31.9 [28.5 - 35.4]	24.5 [17.6 - 31.3]	36.4 [31.3 - 41.5]
Total	2.9 [2.7 - 3.1]	27.7 [27.3 - 28.2]	15.5 [14.8 - 16.2]	28.9 [28.2 - 29.5]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 4.7 Poverty headcount ratio (%) across all disease categories and by the type of care sought and healthcare facility visited

Disease category	Hospitalization		Outpatient Care	
	Public health facilities	Private health facilities	Public health facilities	Private health facilities
Infections	2.5 [2.2 - 2.9]	9.8 [9.1 - 10.4]	8.1 [7.1 - 9.2]	15.0 [14.0 - 15.9]
Cancers	16.3 [12.4 - 20.2]	41.9 [37.6 - 46.1]	16.6 [10.9 - 22.3]	27.2 [21.3 - 33.1]
Blood Diseases	3.3 [1.6 – 4.9]	16.5 [13.4 - 19.7]	5.5 [1.5 - 9.4]	26.2 [20.4 - 31.9]
Endocrine, Metabolic, Nutritional	5.3 [3.6 - 7.0]	13.7 [11.5 - 16.0]	8.0 [6.8 - 9.1]	11.2 [10.3 - 12.2]
Psychiatric & Neurological	12.9 [11.0 - 14.7]	25.5 [23.4 - 27.5]	13.7 [11.0 - 16.5]	17.9 [15.6 – 20.1]
Eye	3.6 [2.2 - 4.9]	11.7 [9.9 - 13.5]	10.7 [5.3 - 16.1]	19.5 [14.7 - 24.3]
Ear	0.8 [0.1 - 1.5]	11.4 [6.8 - 16.0]	5.7 [2.9 - 8.5]	11.2 [4.8 - 17.6]
Cardiovascular	4.8 [3.8 - 5.7]	23.9 [22.3 - 25.4]	9.6 [8.4 - 10.7]	9.5 [8.6 - 10.3]
Respiratory	3.3 [2.3 - 4.4]	11.4 [9.4 - 13.3]	12.9 [10.9 - 14.9]	11.7 [10.3 - 13.1]
Gastrointestinal	5.6 [4.7 - 6.5]	19.3 [18.0 - 20.6]	10.5 [7.8 - 13.3]	23.0 [20.5 - 25.5]
Skin	3.0 [1.0 - 5.0]	7.3 [4.3 – 10.3]	12.0 [7.1 - 16.9]	19.2 [15.6 - 22.8]
Musculoskeletal	6.9 [5.4 - 8.4]	23.7 [21.5 - 25.8]	6.7 [5.0 - 8.4]	14.7 [13.1 - 16.3]
Genito-Urinary	5.5 [4.2 - 6.8]	20.1 [18.4 - 21.7]	14.8 [9.9 - 19.6]	35.9 [31.3 - 40.4]
Obstetric	5.0 [3.6 - 6.4]	16.0 [13.2 - 18.8]	30.0 [18.5 - 41.4]	66.3 [57.3 - 75.2]
Childbirth	2.3 [2.1 - 2.6]	12.7 [12.0 - 13.4]	6.0 [2.0 - 10.1]	12.9 [3.5 - 22.4]
Injuries	6.3 [5.5 - 7.2]	24.8 [23.5 - 26.1]	11.6 [7.4 - 15.9]	19.0 [15.3 - 22.6]
Others	5.5 [3.5 - 7.5]	22.1 [19.1 - 25.2]	19.1 [12.8 - 25.3]	24.7 [20.1 - 29.2]
Total	3.7 [3.6 - 3.9]	17.5 [17.1 - 17.8]	10.9 [10.3 - 11.5]	17.3 [16.8 - 17.9]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 4.8 Incidence of distressed financing (%) across all disease categories and by the type of care sought and healthcare facility visited

Disease category	Hospitalization		Outpatient Care	
	Public health facilities	Private health facilities	Public health facilities	Private health facilities
Infections	33.0 [32.1 - 33.9]	40.0 [38.9 - 41.0]	10.0 [8.8 - 11.3]	2.8 [2.3 - 3.2]
Cancers	54.8 [49.6 - 60.1]	68.9 [64.9 - 72.8]	7.7 [3.3 - 12.1]	7.9 [4.2 - 11.6]
Blood Diseases	46.7 [42.2 - 51.3]	47.9 [43.7 - 52.1]	6.7 [2.0 - 11.3]	3.7 [1.2 - 6.3]
Endocrine, Metabolic, Nutritional	38.8 [35.1 - 42.6]	49.6 [46.2 - 52.9]	8.6 [7.3 - 9.9]	3.4 [2.8 - 3.9]
Psychiatric & Neurological	44.9 [42.1 - 47.6]	61.0 [58.7 - 63.3]	16.9 [13.8 - 20.0]	4.4 [3.2 - 5.7]
Eye	38.0 [34.5 - 41.5]	40.9 [38.1 - 43.7]	11.0 [5.1 - 16.9]	1.8 [0.2 - 3.5]
Ear	34.9 [26.7 - 43.0]	49.4 [42.2 - 56.7]	2.6 [0.1 - 5.2]	0.2 [0.01 - 0.4]
Cardiovascular	36.4 [34.3 - 38.5]	52.3 [50.5 - 54.1]	8.4 [7.2 - 9.6]	4.4 [3.8 - 5.1]
Respiratory	35.3 [32.5 - 38.2]	53.1 [50.1 - 56.2]	10.5 [8.6 - 12.4]	3.1 [2.3 - 3.8]
Gastrointestinal	36.0 [34.2 - 37.8]	50.3 [48.6 - 51.9]	9.4 [6.7 - 12.1]	4.5 [3.3 - 5.8]
Skin	40.0 [34.2 - 45.9]	54.1 [48.3 - 59.9]	6.4 [2.5 - 10.2]	3.6 [1.9 - 5.3]
Musculoskeletal	35.4 [32.5 - 38.2]	59.9 [57.4 - 62.3]	11.9 [9.6 - 14.1]	3.2 [2.4 - 4.0]
Genito-Urinary	37.3 [34.6 - 40.1]	57.3 [55.2 - 59.3]	11.7 [7.1 - 16.3]	4.6 [2.6 - 6.7]
Obstetric	37.6 [34.5 - 40.8]	56.3 [52.5 - 60.1]	4.0 [1.0 - 7.2]	0.6 [0.1 - 1.1]
Childbirth	26.7 [26.0 - 27.3]	44.6 [43.6 - 45.6]	0	4.4 [1.3 - 7.4]
Injuries	39.0 [37.3 - 40.7]	59.8 [58.3 - 61.3]	8.8 [4.8 - 12.8]	8.8 [6.1 - 11.6]
Others	41.1 [36.7 - 45.5]	52.3 [48.6 - 56.0]	5.6 [1.7 - 9.6]	10.1 [6.9 - 13.4]
Total	31.8 [31.3 - 32.2]	49.2 [48.7 - 49.7]	10.2 [9.5 - 10.8]	3.7 [3.4 - 4.0]

The figures inside square brackets represent 95% confidence interval.

Supplementary Table 4.9 Percentage of ailing individuals who did not seek treatment and did not seek treatment on medical advice during the last 15 days

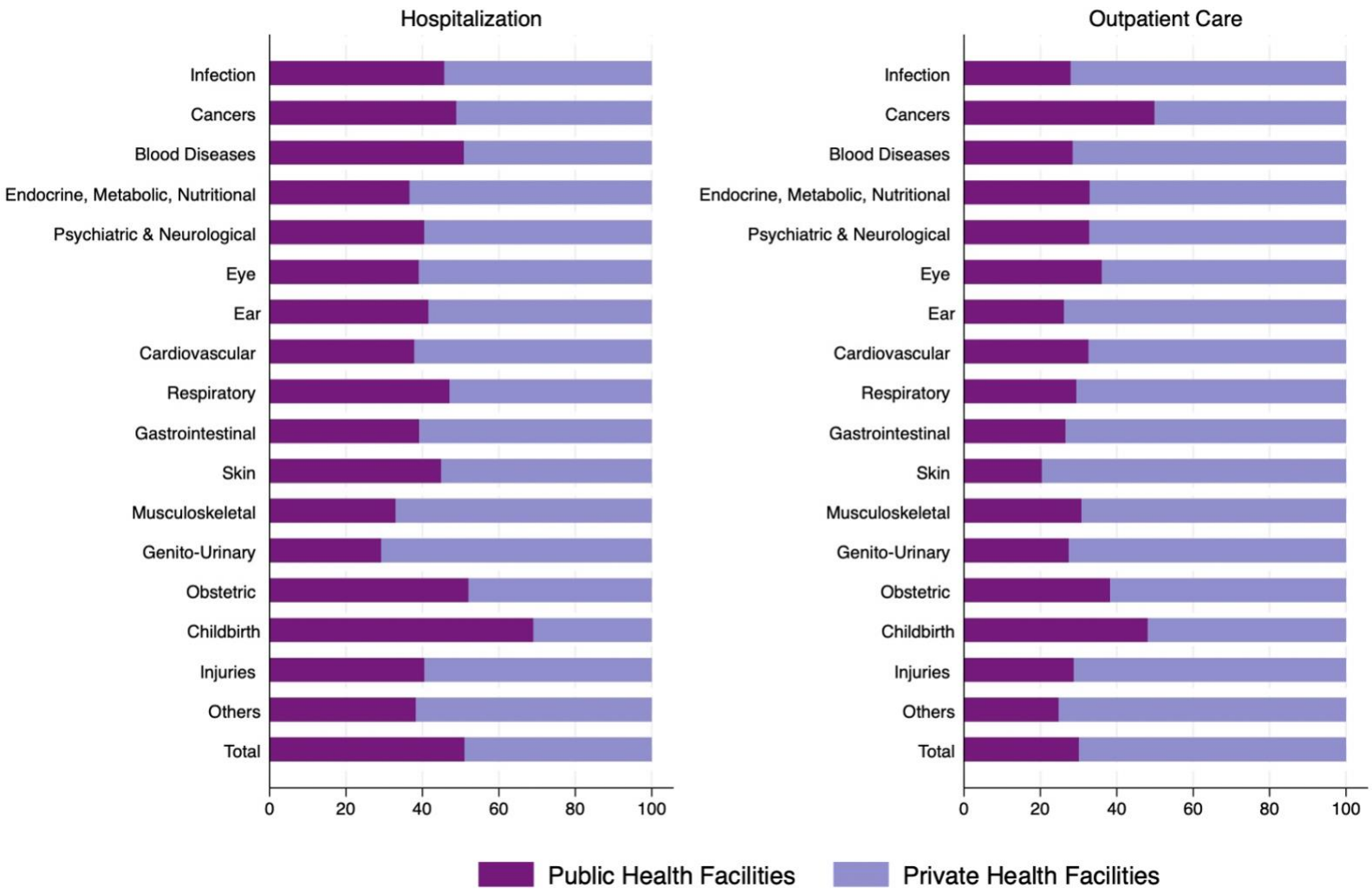
Disease category	Not sought treatment (%)	Not sought treatment on medical advice (%)
Infection	0.8	15.0
Cancers	0.2	0.4
Blood Diseases	0.9	3.8
Endocrine, Metabolic, Nutritional	0.9	2.5
Psychiatric & Neurological	5.4	15.8
Eye	10.7	11.0
Ear	19.3	7.7
Cardiovascular	0.4	2.3
Respiratory	3.0	17.3
Gastrointestinal	1.1	8.3
Skin	2.2	13.1
Musculoskeletal	4.6	12.3
Genito-Urinary	3.7	5.7
Obstetric	0.0	1.1
Childbirth	0.0	1.1
Injuries	0.2	10.7
Others	1.9	7.5
Total	1.8	10.1

Supplementary Table 4.10 Average loss of household income due to hospitalization and outpatient care for various disease categories

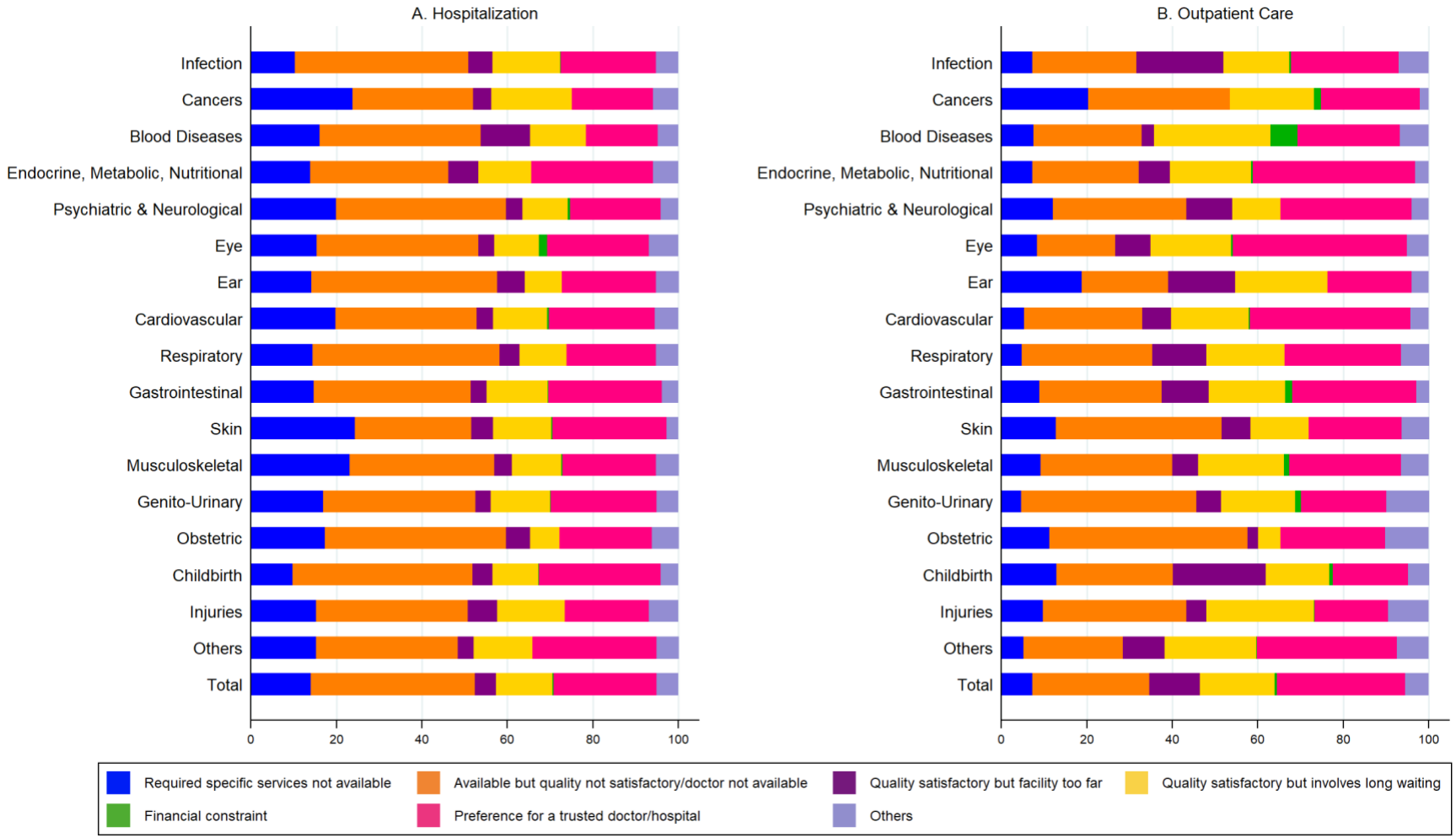
Disease category	Hospitalization	Outpatient Care
Infection	1674.7 [1625.8 - 1723.6]	311.0 [291.3 - 330.6]
Cancers	6419.6 [5277.5 - 7561.8]	515.3 [271.2 - 759.3]
Blood Diseases	2454.3 [2164.2 - 2744.4]	144.6 [73.8 - 215.4]
Endocrine, Metabolic, Nutritional	3111.2 [2711.6 - 3510.7]	84.7 [73.2 - 96.2]
Psychiatric & Neurological	4463.2 [4048.1 - 4878.2]	277.4 [228.0 - 326.9]
Eye	1486.2 [1286.4 - 1685.9]	226.1 [156.3 - 296.0]
Ear	1702.1 [1285.2 - 2119.0]	219.6 [113.0 - 326.3]
Cardiovascular	3297.1 [3048.7 - 3545.5]	106.2 [91.5 - 120.8]
Respiratory	2074.2 [1769.2 - 2379.2]	140.1 [120.7 - 159.5]
Gastrointestinal	2284.0 [2141.8 - 2426.2]	312.0 [265.1 - 359.0]
Skin	2465.0 [2075.2 - 2854.8]	202.2 [94.3 - 310.0]
Musculoskeletal	3039.4 [2738.8 - 3340.1]	173.4 [147.4 - 199.4]
Genito-Urinary	3060.1 [2852.1 - 3268.1]	283.3 [215.2 - 351.4]
Obstetric	1819.5 [1641.2 - 1997.9]	602.9 [414.8 - 791.0]
Childbirth	1109.9 [1083.2 - 1137.2]	377.7 [231.5 - 524.5]
Injuries	3918.9 [3687.5 - 4150.3]	549.5 [397.1 - 701.9]
Others	3221.8 [2652.4 - 3791.2]	356.4 [258.6 - 454.1]
Total	2070.9 [2030.6 - 2111.2]	219.9 [211.0 - 228.8]

The figures inside square brackets represent 95% confidence interval. Average loss of household income is reported in Indian Rupee (INR).

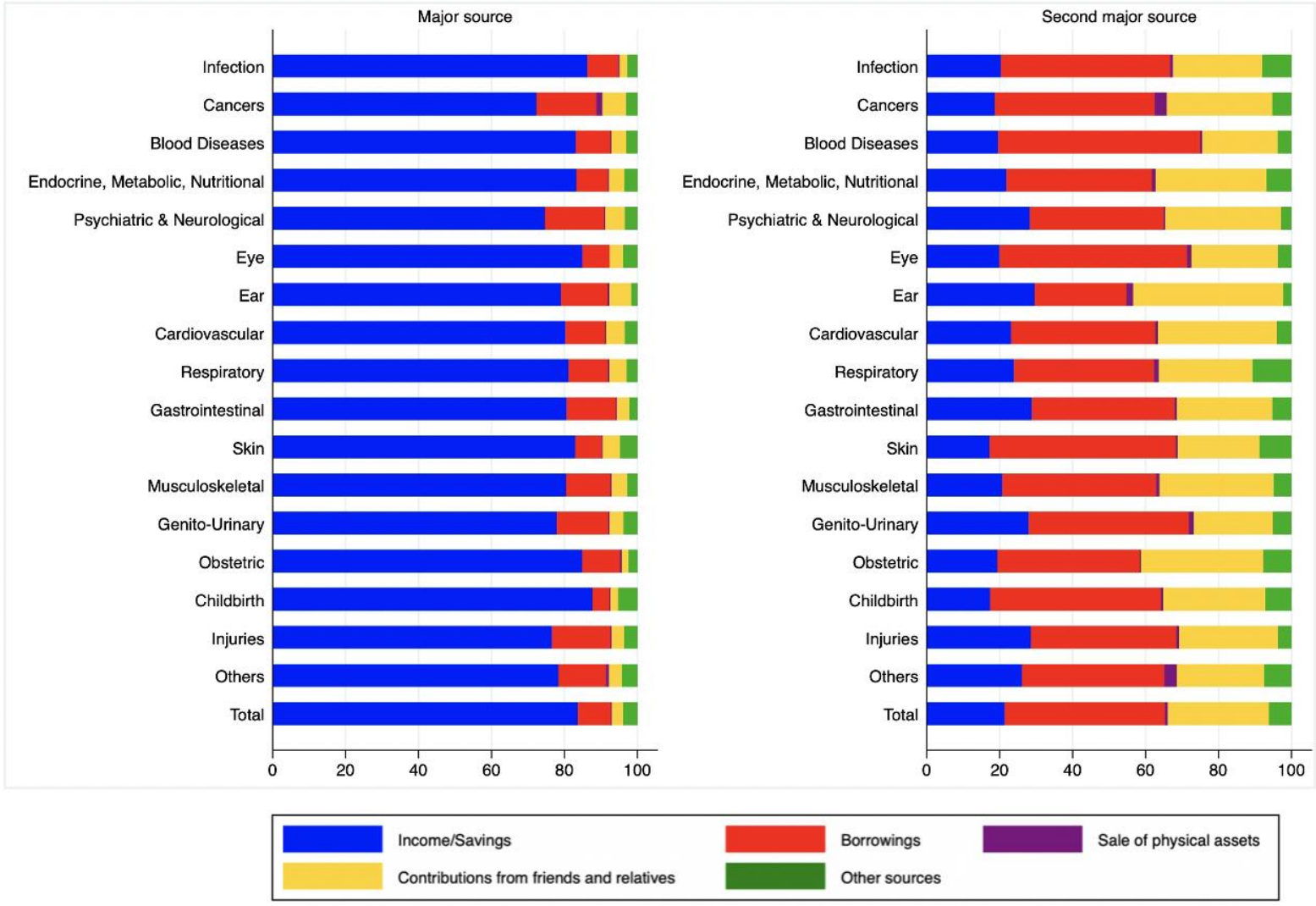
Supplementary Figure 4.1 Incidence of utilization of public and private health facilities across disease categories



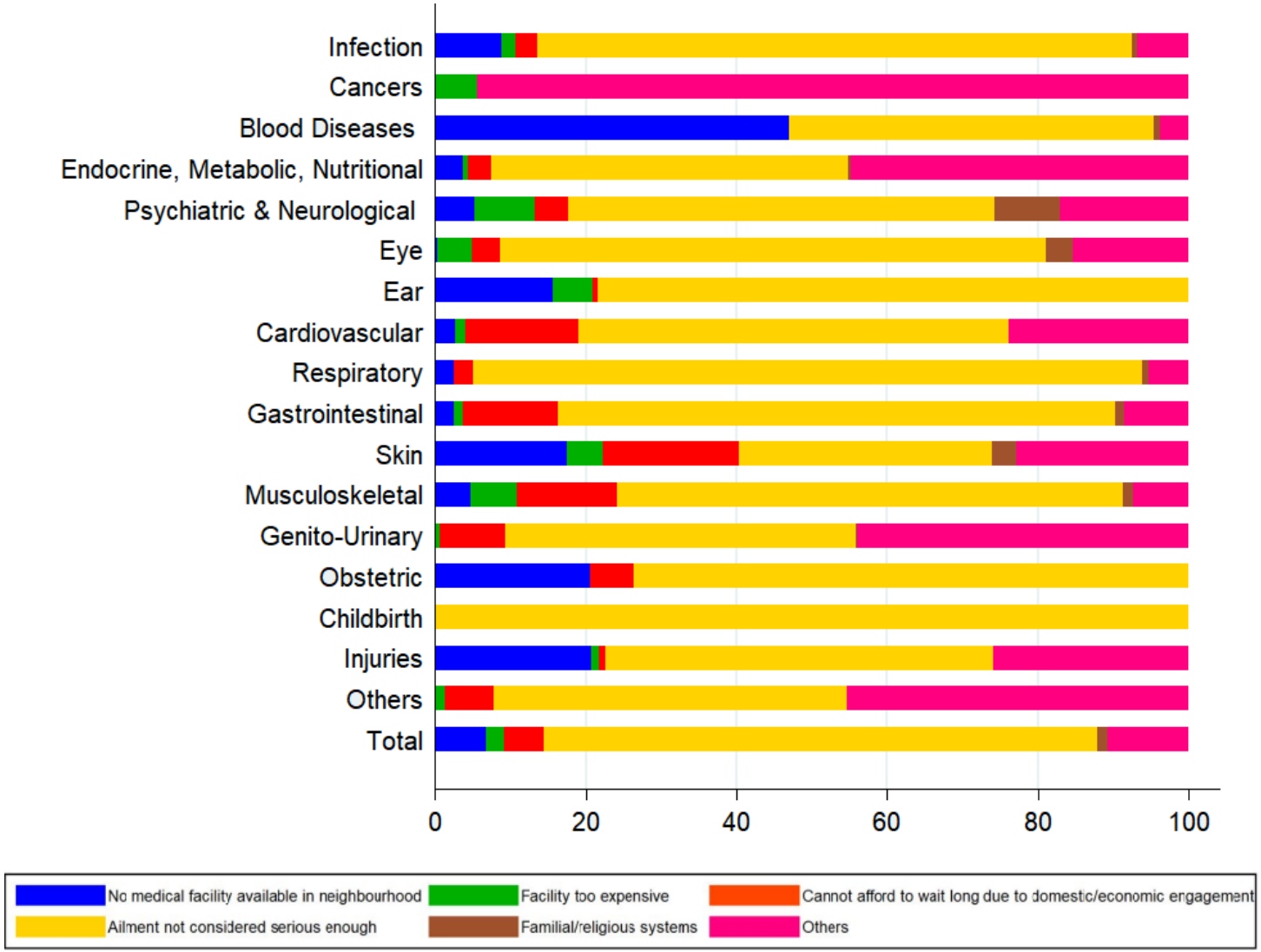
Supplementary Figure 4.2 Reasons for not choosing public health facilities



Supplementary Figure 4.3 Major and second major source used to finance out-of-pocket health expenditure for hospitalization



Supplementary Figure 4.4 Reasons for not seeking treatment on medical advice during the last 15 days



Chapter 5 The financial burden of seeking injury care in India

5.1 Introduction

Injuries are a major cause of death and disability, accounting for 8% of deaths and 10% of disability-adjusted life years worldwide (World Health Organization (WHO) 2019a). Globally, more than five million people die each year due to injuries, which is 1.7 times the number of fatalities from HIV/AIDS, tuberculosis, and malaria combined (WHO 2014). Nearly 90% of injury-related deaths occur in low and middle-income countries (WHO 2021). In 2016, India accounted for 36.6% of global suicide deaths among females and 24.3% of global suicide deaths among males (Dandona et al. 2018). Worldwide, India ranked first among 199 countries in terms of road accident mortality in 2018, accounting for nearly 11% of global accident-related deaths (Government of India (GOI) 2019a). Notably, India witnessed 54.9% increase in deaths due to unintentional injuries and 25.8% increase in suicide deaths from 1999 to 2019 (National Crime Records Bureau (NCRB) 2020). The economic consequences of any injury are dire, resulting in hefty medical and non-medical expenses, as well as productivity losses (WHO 2014). A recent study estimated that total medical costs due to road traffic accidents in India was USD 0.82–1.92 billion in 2019 (Kumaresh et al. 2021). Furthermore, India has one of the lowest public health expenditures (1.15% of gross domestic product) (National Health Policy 2017), as well as one of the highest out-of-pocket health expenditures (OOPE) (50.6% of health expenditure) worldwide (WHO 2019b). Heavy reliance on OOPE exposes households to financial catastrophe, falling into or intensification of poverty, depletion of household assets, or even worse, treatment abstinence. In India, abysmally low health insurance coverage (GOI 2019b) coupled with a dominant fee-for-service private health sector forces households to rely on OOPE. Medical payments are a major cause of poverty in India, pushing nearly 32–39 million individuals below the poverty line every year (Bonu et al. 2007; Garg and Karan 2009; Van Doorslaer et al. 2006).

Estimating the cost and economic burden of injuries has been recognized as one of the priority areas to address the global burden of injuries (Chandran et al. 2010). However, limited literature is available on the financial burden associated with seeking care for injuries in India. Previous studies have only estimated the OOPE burden for specific injuries such as accidental injury, road traffic accidents, and falls (Goli et al. 2018; Pradhan et al. 2017; Ram and Thakur 2022), or drowning (Yadav et al. 2022), or were restricted to particular geographic areas (Kumar et al. 2012; Prinja et al. 2016, 2019). One study estimated the financial burden for all injuries combined and was based on an older dataset (Tripathy et al. 2018). Another study was limited to estimating only catastrophic health expenditure (CHE) due to injury care in India (Yadav et al. 2021). Moreover, to the best of our knowledge, no study in Indian context has examined the financial hardships due to OOPE across all three parameters (CHE, impoverishment, and distressed financing) for all types of injuries.

Against this background, we provide a holistic examination of the financial burden due to hospitalization for seven categories of injuries, disaggregated by the type of healthcare facility, either public or private. Specifically, our study was guided by the following objectives. First, we estimated OOPE and determined the share of various components, such as medicines, doctors' fees, transportation costs, etc., in the total health expenditure. Second, we estimated the financial burden of OOPE using a battery of metrics, including incidence of incurring CHE, percentage of households falling into poverty due to OOPE, and incidence of using distressed financing. Third, we assessed the loss of household income resulting from hospitalization due to injuries. Amidst the increasing burden of injuries in India, analyzing the financial impact of seeking care for these injuries using nationally representative estimates of healthcare costs could aid in the development of financial risk protection strategies for Indian households.

5.2 Data and methodology

5.2.1 Overview of data source

This study used data from the latest nationally representative health survey, entitled 'Household Social Consumption: Health,' conducted by the National Sample Survey Organization. The NSS health survey was conducted between July 2017 and June 2018 and covered 555,115 individuals from 113,823 households across the country. It employed a stratified, multi-stage sampling design, with census villages in rural areas and urban blocks in urban areas as the first stage units, and households as the second stage units. The survey collected detailed information regarding diseases and injuries, utilization of healthcare facilities, healthcare expenditure, and demographic and socio-economic characteristics of households and their members.

5.2.2 Outcome variables

5.2.2.1 Out-of-pocket health expenditure

The NSS survey collected information on expenses incurred for hospitalization during the past 365 days. The total expenditure was recorded under three sub-heads: 1) medical expenditure such as doctors' fees, expenses for medicines, bed, and diagnostic tests, other medical expenses, package component[6], 2) non-medical expenditure such as registration fees, food, lodging charges, etc., and 3) transportation expenditure. To estimate the OOPE, we deducted any reimbursements received from the total expenditure.

5.2.2.2 Catastrophic health expenditure

A household is defined to incur CHE if OOPE exceeds a certain threshold of the household's total consumption expenditure (Berki, 1986). For each household i, we defined CHE as below.

[6] Package component includes expenses for various items used in surgical or non-surgical treatment, such as operation theatre (OT) charges, OT consumables, bed charges, costs of medicines, and doctors' fees. However, it does not cover expenses associated with physiotherapy, additional diagnostic tests, blood, oxygen, personal medical appliances, attendant charges, etc. The package component is commonly provided by private hospitals (NSSO 2018).

$$CHE_i = \begin{cases} 1, if\ \frac{OOPE_i}{HCE_i} > \mathrm{Z} \\ 0, \quad otherwise \end{cases}$$

In the above equation, $OOPE_i$ is the monthly out-of-pocket health expenditure of i^{th} household, HCE_i is the monthly total consumption expenditure of i^{th} household, and Z is the threshold. In tandem with the sustainable development goal indicator 3.8.2 (WHO, 2023), we estimated CHE at two thresholds: 10% and 25% (i.e. Z = 0.10 and 0.25).

The proportion of households incurring CHE, i.e., incidence of CHE, was calculated using the following formula.

$$Incidence\ of\ CHE = \frac{1}{N}\sum_{i=1}^{N} CHE_i$$

where N is the total number of households in the sample.

5.2.2.3 Poverty headcount ratio

The poverty headcount ratio estimates the proportion of households dragged below the poverty line due to OOPE (Yadav et al. 2022) and is calculated as follows:

$$Poverty\ headcount_i = \begin{cases} 1, \ if\ HCE_i \geq\ PL\ and\ (HCE_i - OOPE_i) <\ PL \\ 0, \ otherwise \end{cases}$$

PL is the inflation-adjusted, official poverty line as defined by the Tendulkar Committee (Planning Commission 2014).

$$Poverty\ headcount\ ratio = \frac{1}{N}\sum_{i=1}^{N} poverty\ headcount_i$$

where *N* is the total number of households.

5.2.2.4 Distressed financing

We categorized a household as using distressed sources if it relied on borrowing, sale of physical assets, use of contributions from friends or relatives, or other sources to finance OOPE (Sangar et al. 2020).

The proportion of households employing various sources of finance to cope with OOPE was calculated as follows:

$$I = \frac{1}{N}\sum_{i=1}^{N} k$$

In the above equation, I is the incidence of employing a particular source of finance, and k is the number of households employing a particular source of finance.

The NSS survey recorded sources of finance as major and second major sources, since households may have used more than one source to finance hospitalization-related OOPE. In this study, we combined both the first and second major sources of finance (Sangar et al. 2020). Hence, the cumulative incidence of all sources of finance may exceed 100% in some cases.

Sample weights provided by the NSS were applied as applicable. Statistical analysis was performed using STATA version 14.1.

5.3 Results

5.3.1 Out-of-pocket health expenditure and share of various components

Table 5.1 shows the average OOPE of households by injury type. Intentional self-harm caused the highest OOPE (INR 35,028.9)[7], followed by accidental injuries, road traffic accidents, and falls (INR 29,966.5), and burns and corrosions (INR 28,298.5). The average hospitalization-related OOPE was fivefold higher when care was sought from private health facilities (INR 41,503.9) compared to public health facilities (INR 7,873.4). This trend was similar across almost all types of injuries (Table 5.2). The primary reasons for choosing private, rather than public health facilities were non-availability of doctors or unsatisfactory quality of public health facilities, preference for a trusted doctor/hospital, long waiting time at public health facilities, and required services not available (Figure 5.1).

[7] USD 1= INR 68.3 using average 2018 exchange rate.

The cost of various components in total health expenditure varied considerably by the type of healthcare facility, although medicines constituted the largest share in the case of both public (30.0%) and private health facilities (23.5%) (Figure 5.2). Notably, the relative burden of other non-medical expenses and transportation expenditure was higher in public health facilities (29.4% and 16.9%, respectively) compared with private health facilities (7.2% and 3.9%, respectively). In the case of private health facilities, doctors' fees (20.0%) and package component (15.5%) were the leading contributors to total health expenditure after medicines. A similar pattern was observed across most injuries.

Table 5.1 OOPE and associated financial burden, and loss of household income due to various injuries

Injury	OOPE (INR)	Incidence of CHE (%) at 10% threshold	Incidence of CHE (%) at 25% threshold	Poverty headcount ratio (%)	Incidence of distressed financing (%)	Loss of household income (INR)
Accidental injury, road traffic accidents, and falls	29,966.5 [28,567.0–31,366.1]	53.0 [51.7 - 54.1]	28.3 [27.2 -29.4]	18.1 [17.2–19.0]	52.5 [51.3–53.8]	4,101.1 [3,845.0–4,357.3]
Accidental drowning and submersion	24,823.9 [16,262.3–33,385.4]	52.8 [45.3 - 60.7	22.3 [15.8 - 28.7]	8.5 [4.2–12.9]	52.4 [44.7–60.2]	3,592.1 [2,737.9–4,446.3]
Burns and corrosions	28,298.5 [21,141.0–35,455.9]	43.6 [36.2 - 51.0]	24.7 [18.3 - 31.1]	26.7 [20.1–33.2]	53.2 [45.8–60.6]	2,916.1 [2,356.5–3,475.8]
Poisoning	12,230.6 [8,362.7–16,098.4]	30.3 [22.9 - 37.7]	15.6 [9.8 - 21.5]	9.2 [4.6–13.9]	34.8 [27.1–42.5]	1,750.4 [1,369.9–2,130.9]
Intentional self-harm	35,028.9 [15,690.4–54,367.5]	63.5 [46.8 – 80.3]	34.3 [17.7 - 50.8]	33.7 [17.2–50.2]	67.7 [51.1–84.3]	2,777.4 [1,506.3–4,048.5]
Assault	16,585.9 [7,346.5–25,825.2]	41.7 [27.4 - 56.0]	13.6% [3.6 - 23.5]	15.9 [5.3–26.5]	50.1 [35.6–64.6]	3,102.2 [1,473.7–4,730.8]
Contact with venomous/harmful animals or plants	9,946.6 [5,218.0–14,675.2]	29.1 [21.5 - 36.7]	12.1 [6.7 - 17.6]	10.3 [5.2–15.3]	51.3 [43.0–59.7]	1,542.8 [1,147.0–1,938.6]
All injuries	28,754.5 [27,461.0–30,048.1]	51.4 [50.2 - 52.5]	27.2 [26.2 - 28.3]	17.8 [16.9–18.7]	52.1 [50.9–53.2]	3,911.5 [3,680.6–4,142.5]

The figures inside square brackets represent 95% confidence interval.

Abbreviations: OOPE: Out-of-pocket health expenditure; CHE: Catastrophic Health Expenditure

Table 5.2 OOPE and associated financial burden for seeking care for various injuries and by the type of healthcare facility

Injury	Public health facilities					Private health facilities				
	OOPE (INR)	CHE incidence (%) at 10% threshold	CHE incidence (%) at 25% threshold	Poverty headcount ratio (%)	Incidence of distressed financing (%)	OOPE (INR)	CHE incidence (%) at 10% threshold	CHE incidence (%) at 25% threshold	Poverty headcount ratio (%)	Incidence of distressed financing (%)
Accidental injury, road traffic accidents, and falls	8,267.8 [7,625.5–8,910.2]	21.4 [19.8 - 22.9]	8.7 [7.7 - 9.8]	6.1 [5.2–7.0]	38.8 [37.0–40.7]	41,945.3 [39,776.1–44,114.4]	70.9 [69.4 - 72.3]	38.8 [37.3 - 40.4]	24.7 [23.3–26.1]	60.0 [58.4–61.6]
Accidental drowning and submersion	5,825.4 [3,686.3–7,964.6]	21.7 [10.6 - 32.8]	10.4 [2.2 - 18.7]	3.6 [0.9–6.4]	40.4 [27.2–53.7]	34,899.0 [21,931.9–47,866.0]	70.5 [61.7 - 79.4]	28.1 [19.4 - 36.9]	10.8 [4.8–16.9]	58.4 [48.8–68.0]
Burns and corrosions	6,897.0 [5,068.8–8,725.3]	22.1 [13.9 - 30.3]	8.5 [3.0 - 14.1]	5.5 [1.0–10.0]	47.8 [37.9–57.7]	38,359.5 [25,741.0–50,978.0]	56.6 [44.9 - 68.3]	32.3 [21.2 - 43.4]	40.3 [28.6–51.9]	54.4 [42.6–66.1]
Poisoning	4,483.4 [3,259.5–5,707.3]	18.9 [10.7 - 27.0]	10.5 [4.1 - 16.9]	6.4 [1.3–11.5]	30.2 [20.7–39.8]	33,023.0 [22,816.7–43,229.3]	60.1 [47.0 - 73.2]	28.0 [16.0 - 40.0]	16.9 [6.8–26.9]	45.9 [32.6–59.3]
Intentional self-harm	26,855.8 [4,659.6–49,051.9]	47.6 [24.9 - 70.3]	26.0 [6.1 - 45.9]	23.2 [4.0–42.3]	58.5 [35.5–81.5]	48,303.9 [6,594.5–90,013.4]	81.2 [67.1 - 95.2]	48.3 [15.1 - 81.4]	51.0 [27.9–74.2]	84.4 [69.9–98.7]
Assault	4,342.1 [2,957.3–5,727.0]	27.8 [10.7 - 44.8]	0.0	18.5 [3.7–33.2]	42.3 [23.6–61.1]	50,233.3 [24,664.7–75,801.9]	71.9 [48.9 - 94.9]	55.1 [29.6 - 80.5]	11.2 [0.7–21.9]	63.7 [39.1–88.3]
Contact with venomous/harmful animals or plants	4,102.3 [3,031.2–5,173.4]	18.2 [10.8 - 25.5]	1.8 [0.2 - 3.4]	5.2 [1.0–9.5]	43.2 [33.7–52.6]	29,312.3 [9,716.1–48,908.5]	65.2 [47.8 - 82.7]	46.3 [28.0 - 64.6]	27.0 [10.7–43.2]	78.3 [63.2–93.4]
All injuries	7,873.4 [7,295.6–8,451.2]	21.4 [20.0 - 22.9]	8.5 [7.5 - 9.5]	6.3 [5.5–7.2]	39.1 [37.4–40.8]	41,503.9 [39,441.1–43,566.7]	70.4 [69.0 - 71.8]	38.4 [36.9 - 39.9]	24.8 [23.4–26.1]	59.9 [58.4–61.4]

The figures inside square brackets represent 95% confidence interval.

Abbreviations: OOPE: Out-of-pocket health expenditure; CHE: Catastrophic Health Expenditure

Figure 5.1 Reasons for not choosing public health facilities

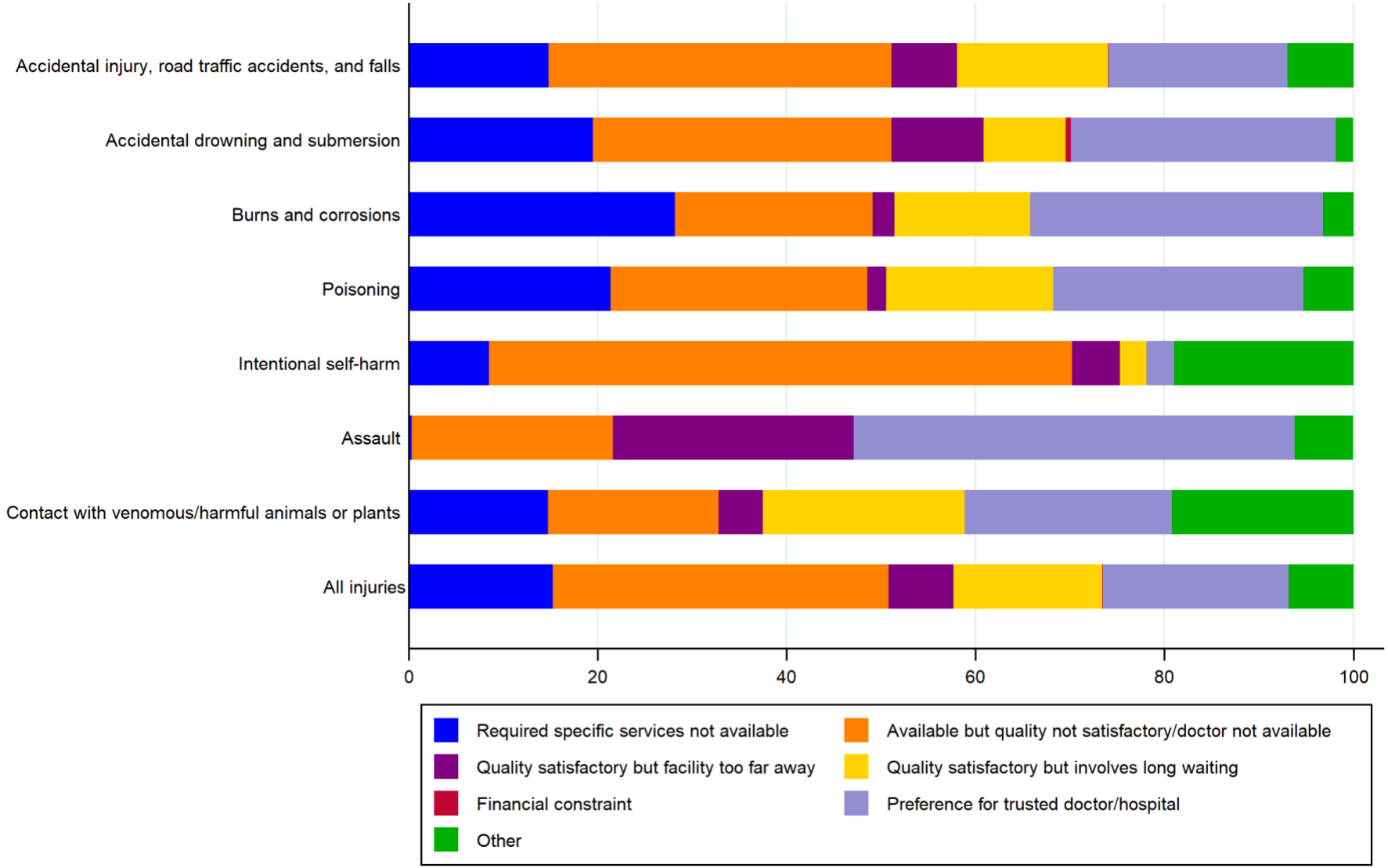
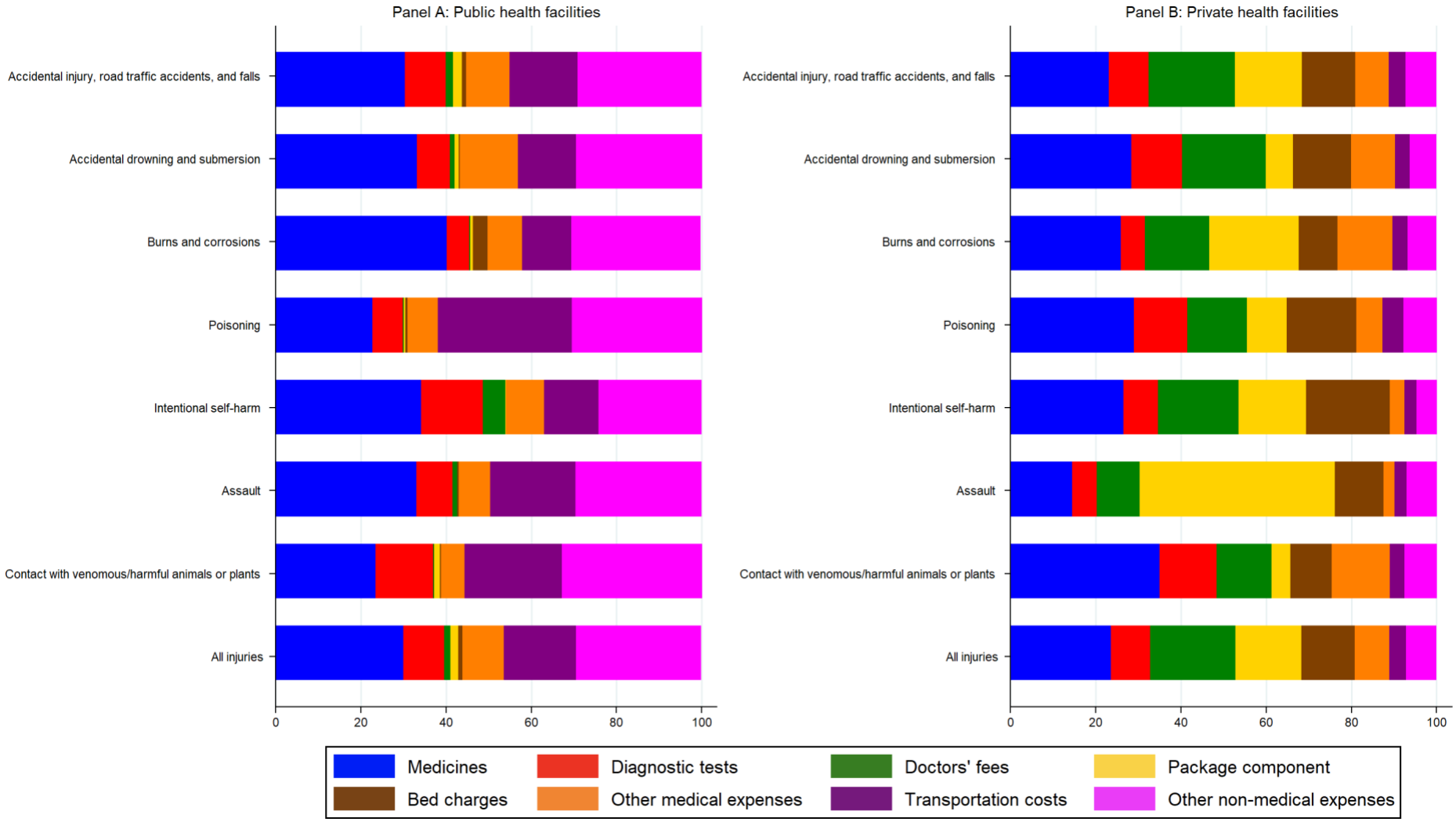


Figure 5.2 Share of various components in total health expenditure by the type of healthcare facility



5.3.2 Financial hardships

Out of all households which sought hospitalization for any injury, 51.4% of households incurred CHE at 10% threshold and 27.2% of households incurred CHE at 25% threshold (Table 5.1). Households where a member inflicted intentional self-harm reported the highest CHE incidence at both thresholds (63.5% at 10% threshold and 34.3% at 25% threshold), followed by households where a member suffered accidental injury, road traffic accidents, and falls (53.0% at 10% threshold and 28.3% at 25% threshold). At both the thresholds, the incidence of CHE was higher when care was sought from private health facilities (70.4% and 38.4% at 10% and 25% threshold, respectively) than public health facilities (21.4% and 8.5% at 10% and 25% threshold, respectively) (Table 5.2).

Table 5.1 shows that 17.8% of all injury-affected households which sought hospitalization were pushed below the poverty line due to OOPE. The percentage of households falling below the poverty line due to hospitalization-related OOPE was the highest for intentional self-harm (33.7%), burns and corrosions (26.7%), and accidental injuries, road traffic accidents, and falls (18.1%), whereas accidental drowning and submersion resulted in the lowest poverty headcount ratio (8.5%). The impoverishment impact was conspicuously higher among households which sought care in private health facilities compared to those treated in public health facilities (24.8% versus 6.3%). This trend was similar across most injuries (Table 5.2).

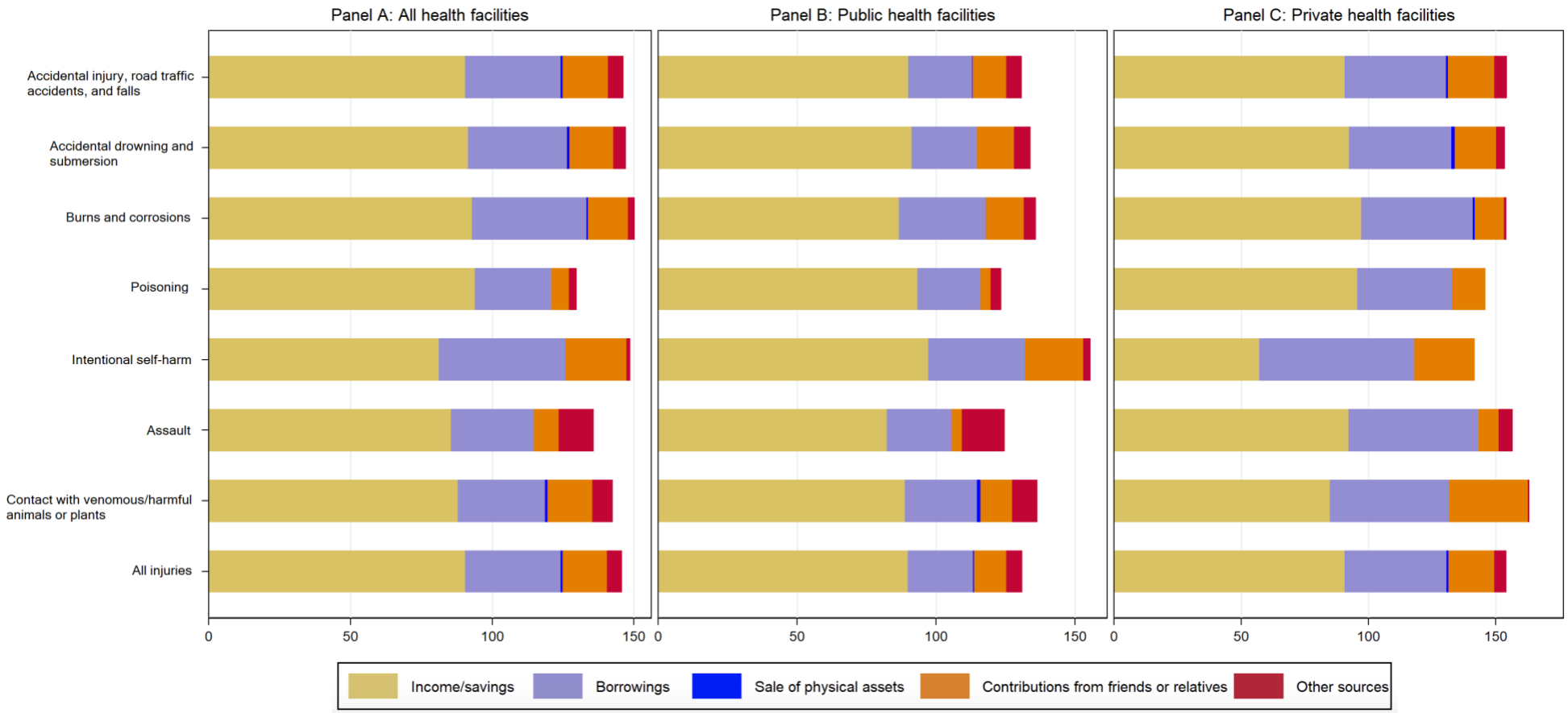
Furthermore, 52.1% of all injury-affected households relied on distressed sources (either as major or second major source) to cope with the hospitalization-related cost of injuries (Table 5.1). Notably, more than 50% of households resorted to distressed financing for all injury categories, except poisoning. Borrowing (33.8%) and contributions from friends or relatives (15.6%) were the most common sources of distressed financing, whereas sale of physical assets (0.7%) was the least preferred coping mechanism (Figure 5.3). The incidence of distressed

financing was higher for households in which any member was treated in private health facilities (59.9%) compared to public health facilities (39.1%) (Table 5.2).

5.3.3 Loss of household income

In addition to the financial burden of OOPE, households also face indirect costs such as loss of earnings due to the inability of the patient or the caregiver to work. Table 5.1 shows that the average loss of household income due to hospitalization for any injury was INR 3,911.5, varying from INR 1,542.8 in case of contact with venomous or harmful animals or plants to INR 4,101.1 in case of accidental injury, road traffic accidents, and falls. Accidental drowning and submersion (INR 3,592.1), assault (INR 3,102.2), and burns and corrosions (INR 2,916.1) also inflicted losses in the household income.

Figure 5.3 Share of various sources used to finance out-of-pocket health expenditure for various injuries and by the type of healthcare facility



5.4 Discussion

This chapter provides holistic assessment of the financial burden due to injury care in India. We found that 51.4% of injury-affected households experienced CHE (at 10% threshold), 17.8% fell into poverty, and 52.1% used distressed sources due to OOPE for hospitalization. Injuries such as intentional self-harm, burns and corrosions, and accidental injury, road traffic accidents, and falls imposed a colossal financial burden on Indian households. Moreover, the brunt of OOPE was substantially higher when care was sought from private health facilities rather than public ones. Medicines were the key drivers of total health expenditure, irrespective of the type of healthcare facility, followed by doctors' fees in private facilities, and non-medical expenses in public facilities. Households residing in rural areas, belonging to lower economic quintiles, belonging to OBC and other social groups, utilizing private health facilities, and lacking insurance coverage were more likely to experience higher financial risk when seeking care for injuries.

Notably, India reported the highest suicide rate (16.5 per 100,000) in the WHO South-East Asian region in 2016, which was even higher than the global average (10.5 per 100,000) (WHO 2019c). In agreement with a previous study (Yadav et al. 2021), we found that households in which a member inflicted intentional self-harm reported the highest OOPE (INR 35,028.9) and financial burden. This may be due to the exclusion of any act of self-harm or suicide attempts from most health insurance plans (HDFC 2022; Sarkhel 2021). A study in South India reported that the median medical cost of hospitalization due to intentional self-harm was INR 13,690, and that deliberate self-harm with pesticide consumption increased the cost of treatment by 67% compared to non-pesticide poisoning (Barnabas et al. 2021). Hanging and consuming poison are common ways of committing suicide in India (NCRB 2020). While the former is difficult to control, the latter is amenable to legislation that regulates the sale or ban of highly hazardous pesticides (Lee et al. 2021; Menon et al. 2022). For instance, Sri Lanka and

Bangladesh witnessed a significant decline in both overall and pesticide suicide rates after the ban of the most highly hazardous pesticides, without any apparent effect on agricultural output (Chowdhury et al. 2018; Knipe et al. 2017). Moreover, even though suicide was the leading cause of death in Indians aged 15–39 years in 2016 (Dandona et al. 2018), one study found that 86.4% of surveyed college students in India were unaware of any suicide support options (Cherian et al. 2022). The absence of a national suicide prevention strategy, inappropriate media reporting, such as potentially harmful reporting of practices and minimal educational and preventive information, and inadequate multisectoral engagement were reported to be major impediments to effective suicide prevention in India (Menon et al. 2021; Vijayakumar et al. 2022). In response, the Government of India recently launched the National Suicide Prevention Strategy on November 21, 2022, with the aim of reducing suicide mortality in the country by 10% by 2030 (GOI 2022). A scaffolding approach is helpful to reduce suicide rates, since interventions provided at the right time, and of the right intensity and duration, can help navigate situations in which an individual might be susceptible to and at risk of suicide (Vijayakumar et al. 2022).

Similar to previous studies (Nguyen et al. 2017), we observed that burns and corrosions imposed a copious financial burden on households and that they were the second leading cause of impoverishment and distressed financing. Burn patients often require specialized treatment in a burn centre, surgery and wound care, and long periods of hospitalization and rehabilitation, leading to high treatment costs (Yu et al. 2020). In India, nearly seven million individuals sustain burn injuries each year, of which more than 0.7 million require hospitalization (National Health Portal 2016). However, studies have recognised inadequate infrastructure and human resource as big constraints for burn care in India (Jagnoor et al. 2018a, 2018b; National Academy of Burns 2016). Appallingly, only 15.9% of the Indian population resides within two hours of a burn centre with both an intensive care unit and a skin bank (Ranganathan et al.

2020). One study highlighted the lack of communication between healthcare professionals and burn survivors, limited rehabilitation services, transportation difficulties to healthcare facilities, and high cost of burn care as the key challenges to burn care and recovery in India (Jagnoor et al. 2018a).

In tandem with previous studies (Goli et al. 2018; Pradhan et al. 2017; Ram and Thakur 2022), we found that accidental injury, road traffic accidents, and falls imposed a severe financial burden, with CHE incidence of 53.0% (at 10% thresholds), poverty headcount ratio of 18.1%, and distressed financing in case of 52.5% of households. India witnessed a 58.7% increase in mortality due to road injuries between 1990 and 2017 (Dandona et al. 2020). Importantly, road accidents mostly impact the economically-active younger age groups, with road injuries reported as the leading cause of mortality in males aged 15 to 39 years, and the second leading cause of death for both sexes combined in this age group in 2017 in India (Dandona et al. 2020). Consequently, road traffic accidents have far-reaching economic implications, such as costs of treatment, indirect expenses, and productivity losses (GOI 2019a). Goli et al. (2018) found that the share of OOPE in total healthcare expenditure was the highest for accidents and injuries, and even greater than that of cancer, cardiovascular conditions, or any other causes of hospitalization. Other studies conducted in South Asian countries such as Pakistan (Razzak et al. 2011) and Vietnam (Nguyen et al. 2013) reported OOPE in the range of USD 300–400 for road traffic injuries, highlighting the grave economic consequences of accident care. In India, the enforcement of various national road safety legislations are lagging. For instance, the WHO rated enforcement of speed and seat-belt laws in India at three on a scale of 0 to 10, with 10 representing ‘highly effective’, and drunk-driving and motorcycle helmet laws were rated at four (WHO 2018). Another study found that enhanced enforcement of traffic regulations is the most cost-effective intervention, with an average cost of USD 64 per disability adjusted life year in lower and middle-income countries (Bishai and Hyder 2006). Therefore, amidst the

rising burden of road traffic accidents and their concomitant financial impact, India must prioritize traffic law enforcement, improve road and vehicle designs, and enhance post-crash care (Dandona et al. 2020). The central government recently planned to introduce a scheme for cashless treatment of road accident victims during the 'golden hour', the period of up to an hour following an injury, when the chances of preventing death through prompt treatment are the highest (GOI 2019a).

The chapter highlights the important role of public hospitals in providing injury care, since the financial burden was invariably lower among households that sought care from public health facilities than private facilities across all injuries. However, deficiencies in the public health system, such as inadequate infrastructure, unavailable services, perceived low quality of care, and long waiting times, unfortunately forces people to use private facilities, exposing them to financial hardship. According to a recent report published by NITI Aayog[8] (2021) , the capacity and quality of healthcare services in India's public health sector is restrained due to low government health spending, necessitating the need for higher public health expenditure and strengthening the public health system to safeguard against the burgeoning OOPE. Further, previous studies have reported numerous cases of overcharging, unnecessary tests and treatments, and malpractices in the private health sector, owing to inadequate monitoring by the government (Dehury et al. 2019; Phadke 2016; Times of India 2016). In addition, a well-established system of paying commissions to doctors when they refer patients for diagnostic testing is in place in the private sector (Baru et al. 2010). Selvaraj et al (2022) suggests that improved regulation is a key driver of decreasing costs and improving quality of care.

[8] The National Institution for Transforming India (NITI Aayog) was established on January 1, 2015, as the premier policy think tank of the Government of India, providing directional and policy inputs (Press Information Bureau 2015).

We found that medicines constituted the highest proportion of health expenditure due to injury care in India. The low availability of free or subsidized essential drugs in public healthcare facilities impels individuals to either purchase them from open markets, resulting in higher OOPE, or forgo treatment (Maiti et al. 2015). Several lessons can be learned from successful procurement models in states such as Tamil Nadu, Rajasthan and Delhi, which are able to provide free and readily available medicines in public healthcare facilities (Selvaraj et al. 2022). To curtail expenditure on drugs, the government of India has launched the Pradhan Mantri Bhartiya Janaushadhi Pariyojana scheme (2008) to ensure access to quality generic medicines at affordable prices (GOI 2008). However, the dominance of private healthcare providers who mostly prescribe branded medicines, necessitates the need for timely revision of the National List of Essential Medicines along with appropriate price controls for branded drugs (Hooda 2017). Moreover, non-medical costs (29.4%) and transportation expenses (16.9%) often get overlooked, but were the leading contributors to total health expenditure when hospitalization was sought from public health facilities. India's rural healthcare system is marred by a shortage of public healthcare facilities, such as a 35% shortfall in community health centres (CHCs), and a dearth of workforce, particularly specialists. At the CHCs, for instance, there is an 80% shortage of specialists (GOI 2021). This forces individuals in rural areas to travel long distances to access treatment, resulting in two negative consequences, namely the enormous costs of travelling and lodging, and secondly, the loss of earnings due to travel. Moreover, previous studies have reported the unavailability of diagnostic tests and insufficient health infrastructure as the main reasons for medical travel (Arul and Babu 2017). This highlights the importance of a resilient healthcare system to expedite treatment, improve health outcomes, and facilitate a concomitant decline in OOPE.

5.5 Conclusion

This chapter highlights the onerous financial burden of OOPE experienced by Indian households suffering from any injury. Concerted efforts, such as increasing government health expenditure, ensuring quality provisioning of public healthcare facilities, and improving regulatory implementation for private healthcare providers, are imperative to alleviate financial hardships. There is an urgent need to ensure the availability and affordability of essential medicines and curtail non-medical costs while accessing public health facilities. For long-term sustainability, policymakers must prioritize prevention strategies and safety interventions to reduce the burden of injuries and associated economic brunt. Correct helmet use and wearing seat belts, for example, can lead to a 42% reduction in the risk of fatal injuries and a 45–50% reduction in the risk of death among drivers and front seat occupants, respectively (WHO 2022). Moreover, several lessons can be learned from the successful multisectoral efforts of the Tamil Nadu state government in reducing road traffic mortalities by 54% from 2016 to 2020. Measures included the collection of robust accident data, identification and elimination of the most crash-prone hotspots, prompt provision of emergency and medical care, road safety awareness programs, and stringent enforcement of traffic regulations (Government of Tamil Nadu 2020; Worldbank Blogs 2018).

5.6 References

Arul U, Babu S. 2017. Domestic medical tourism in rural India: sociological perspective. J Res Dev (Srinagar) 5(4):51-54.

Barnabas R, Yadav B, Jayakaran J, et al. 2021. Direct Costs of Health Care among Patients with Deliberate Self-harm: A Pilot Study from a Tertiary Care Hospital in South India. Tablet 34:31-8.

Baru R, Acharya A, Acharya S, Kumar AS, Nagaraj K. 2010. Inequities in access to health services in India: caste, class and region. Economic and political weekly 49-58.

Berki SE. 1986. A look at catastrophic medical expenses and the poor. Health affairs 5(4):138-145.

Bishai DM, Hyder AA. 2006. Modeling the cost effectiveness of injury interventions in lower and middle income countries: opportunities and challenges. Cost Effectiveness and Resource Allocation 4:1-11.

Bonu S, Bhushan I, Peters D. 2007. Incidence, intensity, and correlates of catastrophic out-of-pocket health payments in India. Asian Development Bank. https://www.adb.org/sites/default/files/publication/28364/wp102.pdf

Bonu S, Bhushan I, Rani M, Anderson I. 2009. Incidence and correlates of 'catastrophic' maternal health care expenditure in India. Health policy and planning 24(6):445-456

Chandran A, Hyder AA, Peek-Asa C. 2010. The global burden of unintentional injuries and an agenda for progress. Epidemiologic reviews 32(1):110-120.

Cherian AV, Menon V, Rathinam B, et al. 2022. Awareness and preferences about suicide crisis support service options among college students in India: A cross sectional study. Asian journal of psychiatry 74:103172.

Chowdhury FR, Dewan G, Verma VR, et al. 2018. Bans of WHO class I pesticides in Bangladesh—suicide prevention without hampering agricultural output. International journal of epidemiology 47(1):175-184.

Dandona R, Kumar GA, Dhaliwal RS, et al. 2018. Gender differentials and state variations in suicide deaths in India: the Global Burden of Disease Study 1990–2016. The Lancet Public Health 3(10):e478-e489.

Dandona R, Kumar GA, Gururaj G, et al. 2020. Mortality due to road injuries in the states of India: the Global Burden of Disease Study 1990–2017. The Lancet Public Health 5(2):e86-e98.

Dehury RK, Samal J, Coutinho S, Dehury P. 2019. How does the largely unregulated private health sector impact the Indian mass?. Journal of Health Management 21(3):383-393.

Devadasan N, Seshadri T, Trivedi M, Criel B. 2013. Promoting universal financial protection: evidence from the Rashtriya Swasthya Bima Yojana (RSBY) in Gujarat, India. Health research policy and systems 11(1):1-8.

Engelgau MM, Karan A, Mahal A. 2012. The economic impact of non-communicable diseases on households in India. Glob Health 8(1):1–10.

Garg CC, & Karan AK. 2009. Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Health policy and planning 24(2):116-128.

Goli S, Siddiqui MZ, Gouda J. 2018. Road Traffic Accidents and Injuries in India. Economic & Political Weekly 53(14):52-60.

Government of India (GOI). 2008. Pradhan Mantri Bhartiya Janaushadhi Pariyojana. http://janaushadhi.gov.in/pmjy.aspx Accessed: January 12, 2022

Government of India (GOI). 2019a. Road Accidents in India 2019. https://morth.nic.in/sites/default/files/RA_Uploading.pdf

Government of India (GOI). 2019b. Key indicators of social consumption in India: Health.https://www.mospi.gov.in/sites/default/files/publication_reports/KI_Health_75th_Final.pdf

Government of India (GOI). 2021. Rural Health Statistics 2020-2021. https://main.mohfw.gov.in/sites/default/files/rhs20-21_1.pdf

Government of India (GOI). 2022. National Suicide Prevention Strategy. https://www.mhinnovation.net/sites/default/files/downloads/resource/National%20Suicide%20Prevention%20Strategy.pdf

Government of Tamil Nadu. 2020. Road Accident Analysis in Tamil Nadu. https://tnsta.gov.in/tnsta/pdf/analysis_may2019.pdf

HDFC. 2022. 4 Common Health Insurance Exclusions. https://www.hdfcergo.com/blogs/health-insurance/4-common-health-insurance-exclusions Accessed: January 5, 2022

Hooda SK. 2017. Health payments and household well-being: How effective are health policy interventions?. Economic and Political Weekly 52(16):54-65.

Hooda SK. 2020.. Penetration and coverage of government-funded health insurance schemes in India. Clinical Epidemiology and Global Health 8(4):1017-1033.

Jagnoor J, Bekker S, Chamania S, et al. 2018a. Identifying priority policy issues and health system research questions associated with recovery outcomes for burns survivors in India: a qualitative inquiry. BMJ open 8(3):e020045.

Jagnoor J, Lukaszyk C, Christou A, et al. 2018b. Where to from here? A quality improvement project investigating burns treatment and rehabilitation practices in India. BMC research notes 11(1):1-6.

Knipe DW, Gunnell D, Eddleston M. 2017. Preventing deaths from pesticide self-poisoning—learning from Sri Lanka's success. The Lancet Global Health 5(7):e651-e652.

Kumar GA, Dilip TR, Dandona L, Dandona R. 2012. Burden of out-of-pocket expenditure for road traffic injuries in urban India. BMC health services research 12(1):1-10.

Kumaresh G, Saldanha F, Lich T, Moennich J. 2021. Estimation of Socio-Economic Loss due to Road Traffic Accidents in India. SAE International Journal of Advances and Current Practices in Mobility 4:774-784.

Lee YY, Chisholm D, Eddleston M, et al. 2021. The cost-effectiveness of banning highly hazardous pesticides to prevent suicides due to pesticide self-ingestion across 14 countries: an economic modelling study. The Lancet Global Health 9(3):e291-e300.

Maiti R, Bhatia V, Padhy BM, Hota D. 2015. Essential medicines: an Indian perspective. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine 40(4):223.

Menon V, Cherian AV, Vijayakumar L. 2022. Rising incidence and changing demographics of suicide in India: time to recalibrate prevention policies. Asian J Psychiatry 69:102983.

Menon V, Mani AM, Kurian N, et al. 2021. Newspaper reporting of suicide news in a high suicide burden state in India: Is it compliant with international reporting guidelines?. Asian journal of psychiatry 60:102647.

Ministry of Rural Development. 2020. Poverty measurement in India: A status update. https://rural.nic.in/sites/default/files/WorkingPaper_Poverty_DoRD_Sept_2020.pdf

Mohanty SK, Kastor A. 2017. Out-of-pocket expenditure and catastrophic health spending on maternal care in public and private health centres in India: a comparative study of pre and post national health mission period. Health Economics Review 7:1-15.

National Academy of Burns. 2016. Burn Units and Burn Care providers in India. http://www.thenabi.org/bcp.php Accessed: January 10, 2022

National Crime Records Bureau (NCBR). 2020. Accidental Deaths & Suicides in India 2020. https://ncrb.gov.in/sites/default/files/ADSI_2020_FULL_REPORT.pdf

National Health Policy. 2017. Available: https://www.nhp.gov.in/nhpfiles/national_health_policy_2017.pdf

National Health Portal. 2016. Burns. https://www.nhp.gov.in/disease/skin/burns Accessed: January 10, 2022

National Health Systems Resource Centre. 2019. National Health Accounts Estimates for India (2016-17). https://nhsrcindia.org/sites/default/files/2021-06/FINAL%20National%20Health%20Accounts%202016-17%20Nov%202019-for%20Web%20%281%29.pdf

Nguyen H, Ivers R, Jan S, Martiniuk A, Pham C. 2013. Catastrophic household costs due to injury in Vietnam. Injury 44(5):684-690.

Nguyen H, Ivers R, Jan S, Pham C. 2017. Analysis of out-of-pocket costs associated with hospitalised injuries in Vietnam. BMJ global health 2(1):e000082.

Niti Aayog. 2021. Health Insurance for India's Missing Middle. https://www.niti.gov.in/sites/default/files/2021-10/HealthInsurance-forIndiasMissingMiddle_28-10-2021.pdf

NSSO. 2018. India: Household Social Consumption: Health, NSS 75th Round Schedule-25.0: July 2017-June 2018. http://microdata.gov.in/nada43/index.php/catalog/152

Phadke A. 2016. Regulation of doctors and private hospitals in India. Economic and Political Weekly 46-55.

Planning Commission. 2014. Report of the expert group to review the methodology for measurement of poverty. https://forms.iimk.ac.in/libportal/reports/232858161-Planning-Commission-report-on-poverty-estimates.pdf

Pradhan J, Dwivedi R, Pati S, Rout SK. 2017. Does spending matters? Re-looking into various covariates associated with Out of Pocket Expenditure (OOPE) and catastrophic spending on accidental injury from NSSO 71st round data. Health economics review 7(1):1-16.

Press Information Bureau. 2015. NITI Aayog: Objectives and Composition. https://pib.gov.in/newsite/PrintRelease.aspx?relid=114273 Accessed: May 2, 2023

Prinja S, Chauhan AS, Karan A, Kaur G, Kumar R. 2017. Impact of publicly financed health insurance schemes on healthcare utilization and financial risk protection in India: a systematic review. PloS one 12(2):e0170996.

Prinja S, Jagnoor J, Chauhan AS, et al. 2016. Economic burden of hospitalization due to injuries in North India: a cohort study. International journal of environmental research and public health 13(7):673.

Prinja S, Jagnoor J, Sharma D, et al. 2019. Out-of-pocket expenditure and catastrophic health expenditure for hospitalization due to injuries in public sector hospitals in North India. PloS one 14(11):e0224721.

Ram B, Thakur R. 2022. Measuring the burden of accidental injuries in India: a cross-sectional analysis of the National Sample Survey (2017–18). Humanities and Social Sciences Communications 9(1):1-18.

Ranganathan K, Mouch CA, Chung M, et al. 2020. Geospatial mapping as a guide for resource allocation among burn centers in India. Journal of Burn Care & Research 41(4):853-858.

Razzak JA, Bhatti JA, Ali M, Khan UR, Jooma R. 2011. Average out-of-pocket healthcare and work-loss costs of traffic injuries in Karachi, Pakistan. International journal of injury control and safety promotion 18(3):199-204.

Sangar S, Dutt V, Thakur R. 2020. Coping with out-of-pocket health expenditure in India: evidence from NSS 71st round. Global Social Welfare 7:275-284.

Sarkhel S. 2021. Mental health insurance and attempted suicide: Need for a reappraisal. Indian Journal of Psychiatry 63(6):624-625. DOI:

Selvaraj S, Karan KA, Srivastava S, Bhan N, Mukhopadhyay I. 2022. India: health system review. New Delhi: World Health Organization, Regional Office for South-East Asia. https://apps.who.int/iris/handle/10665/352685

Thakur H. 2016. Study of awareness, enrollment, and utilization of Rashtriya Swasthya Bima Yojana (national health insurance scheme) in Maharashtra, India. Frontiers in public health 3:282.

Times of India. 2016. Greed and the rise of medical malpractice in India. https://timesofindia.indiatimes.com/blogs/the-irreverent-lawyer/greed-and-the-rise-of-medical-malpractice-in-india/ Accessed: January 15, 2022

Tripathy JP, Jagnoor J, Prasad BM, Ivers R. 2018. Cost of injury care in India: cross-sectional analysis of National Sample Survey 2014. Injury prevention 24(2):116-122.

Van Doorslaer E, O'Donnell O, Rannan-Eliya RP, et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. The lancet 368(9544):1357-1364.

Vijayakumar L, Chandra PS, Kumar MS, et al. 2022. The national suicide prevention strategy in India: context and considerations for urgent action. The Lancet Psychiatry 9(2):160-168.

World Health Organization (WHO). 2014. Injuries and Violence. The facts. https://apps.who.int/iris/bitstream/handle/10665/149798/9789241508018_eng.pdf?sequence=1&isAllowed=y Accessed: November 25, 2022

World Health Organization (WHO). 2018. Global status report on road safety 2018. https://www.who.int/publications/i/item/9789241565684

World Health Organization (WHO). 2019a. Global Health Estimates: Life expectancy and leading causes of death and disability. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates Accessed: November 25, 2022

World Health Organization (WHO). 2019b. Global Health Expenditure Database 2019. https://apps.who.int/nha/database/country_profle/Index/en Accessed: October 3, 2022.

World Health Organization (WHO). 2019c. Suicide in the world: Global Health Estimates. https://apps.who.int/iris/bitstream/handle/10665/326948/WHO-MSD-MER-19.3-eng.pdf

World Health Organization (WHO). 2021. Injuries and violence. https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence Accessed: November 25, 2022

World Health Organization (WHO). 2022. Road traffic injuries. https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries#:~:text=Road%20traffic%20injuries%20are%20the,pedestrians%2C%20cyclists%2C%20and%20motorcyclists. Accessed: January 18, 2022

World Health Organization (WHO). 2023. Catastrophic out-of-pocket health spending (SDG indicator 3.8.2 and regional indicators where available). https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/catastrophic-out-of-pocket-health-spending-sdg-indicator-3-8-2-

Worldbank Blogs. 2018. Road safety: How a state in India is leading the way to lower road crash deaths. https://blogs.worldbank.org/endpovertyinsouthasia/road-safety-how-state-india-leading-way-lower-road-crash-deaths Accessed: January 20, 2022

Xu K, Evans DB, Kawabata K, et al. 2003. Household catastrophic health expenditure: a multicountry analysis. The lancet 362(9378):111-117.

Yadav J, John D, Menon GR, et al. 2022. Nonfatal drowning-related hospitalizations and associated healthcare expenditure in India: An analysis of nationally representative survey data. Journal of safety research 82:283-292.

Yadav J, Menon G, Agarwal A, John D. 2021. Burden of injuries and its associated hospitalization expenditure in India. International journal of injury control and safety promotion 28(2):153-161.

Yu TC, Zhang X, Smiell J, et al. 2020. Healthcare resource utilization, treatment patterns, and cost of care among patients with thermal burns and inpatient autografting in two large privately insured populations in the United States. Burns 46(4):825-835.

Chapter 6 Conclusion, Policy Implications, and Future Scope of Research

6.1 Conclusion and Policy Implications

This thesis provides a comprehensive examination of the financial hardships caused by OOPE in India. The deleterious economic consequences of OOPE were assessed for all four parameters, namely, catastrophic health expenditure (CHE), impoverishment, distressed financing, and foregone care. Additionally, we disaggregated the financial burden based on the type of care sought (hospitalization and outpatient care), the healthcare facility visited (public and private), and the contribution of various components (such as cost of medicines, diagnostic tests, and transportation costs) to total health expenditure to identify the key drivers of financial burden. The analysis was carried on multiple dimensions, encompassing regional, socio-economic and demographic levels, as well as across various types of diseases and injuries, to identify the most affected regions, sections of the population, and ailments that exert substantial financial burden. This comprehensive examination will provide an evidence base for policymakers to formulate and tailor policies, programs, and practices to improve accessibility to healthcare services and augment financial risk protection for the Indian population.

In **chapter 2**, we examined the financial hardship due to OOPE at national, state, and intra-state levels, and observed substantial sub-national variations. The financial burden in terms of incidence and intensity of CHE (at all thresholds) and incidence and intensity of impoverishment was higher in poorer/empowered action group states (Uttar Pradesh, Odisha, Jharkhand, and West Bengal) and in a few relatively well-off states (such as Kerala, Andhra Pradesh, Maharashtra, and Himachal Pradesh), irrespective of the type of care sought. Although OOPE was higher in urban areas, the financial hardships due to OOPE (i.e., CHE, impoverishment, and distressed financing) were conspicuously more perturbing in rural areas, with a similar pattern observed across a majority of the states/union territories (UTs). Moreover, we found that individuals residing in rural areas sought care in urban areas in nearly

70% of hospitalization cases and 40% of outpatient care incidence. In India, the rural healthcare system is blighted by inadequate public health facilities and a paucity of personnel, especially specialists. This forces rural residents to travel long distances to seek medical care - a situation that has two negative repercussions: 1) substantial travel and lodging expenses 2) loss of earnings due to travel. Consequently, we observed that non-medical and transportation expenditures, which often go unnoticed, were higher in rural areas than urban areas. Additionally, in 8.7% of cases, individuals residing in rural areas did not seek treatment on medical advice due to the unavailability of medical facilities in their neighborhood, compared to urban areas, where only 1.1% reported this issue. Moreover, inequality was observed in financial hardship, with the incidence of CHE and distressed financing concentrated among the poor households. These disparities have pertinent policy ramifications, and accordingly, state-specific policies should be devised in tandem with contextual differences, and budgetary allocations should be revised. Concerted efforts to bridge the rural-urban divide are warranted. It is crucial to address the key barriers to healthcare access, including inadequate infrastructure and shortages and inefficient distribution of qualified health workers, to improve accessibility to healthcare services and reduce non-medical and transportation costs related to medical travel. Moreover, telemedicine must be scaled as it can bring quality healthcare, including specialists, to a large proportion of the population, decrease the burden of the healthcare system, and increase access to cost-efficient medical services.

In **chapter 3**, we assessed the economic impact of OOPE and unmet healthcare needs across socio-economic and demographic dimensions and explored the determinants of financial risk (CHE, impoverishment, and distressed financing). Prominent socio-economic and demographic disadvantages were observed, with households belonging to lower economic quintiles, residing in rural areas, belonging to scheduled castes, headed by members who were not literate or lacked formal education, and having any elderly member in the household, being

exposed to higher financial risk due to OOPE and reporting a higher incidence of foregone care. Despite the fact that government-sponsored health insurance (GSHI) schemes in India are primarily meant to cover the poor and vulnerable population, previous studies have reported persistently low enrolment among individuals belonging to lower economic quintiles, scheduled tribes and other backward classes, self-employed individuals, and those following the Islamic religion. Therefore, policy measures to increase the uptake of health insurance and strengthen the implementation of GSHI schemes to ensure inclusive coverage of socio-economically disadvantaged population are warranted. Additionally, we found that health insurance coverage reduced the likelihood of incurring CHE for hospitalization at both thresholds (10% and 25%), but did not reduce the odds of falling below the poverty line and using distressed financing in the event of hospitalization. The major roadblocks discussed in the chapter, as reported by previous studies, that contributed to the limited effectiveness of health insurance schemes were low awareness among beneficiaries regarding various facets of health insurance (such as information regarding entitled benefits, procedures, number of family members covered, details of empanelled hospitals, and ailments covered) and continued spending on medicines, diagnostics, and consumables. These issues require greater policy attention to enhance the effectiveness of health insurance in improving accessibility to care and providing financial cushion for enrolled beneficiaries.

In **chapters 2, 3, and 4**, we observed that outpatient services put more financial strain (CHE and impoverishment) on households in comparison to inpatient services. Outpatient care demands policy attention due to a multitude of reasons. First, we observed that outpatient care in India is overwhelmingly private, with private healthcare facilities providing ~70% of outpatient care, thereby causing a substantial economic burden on households. Second, we found that medicines and drugs constitute a substantial portion of OOPE (~65%) in the case of outpatient care. Unfortunately, the limited availability of free or subsidized essential

medicines and drugs at public health facilities forces individuals to buy them from open markets, resulting in higher OOPE or treatment abstention. Third, the increasing prevalence of non-communicable diseases (NCDs) leads to an increased use of outpatient clinics because chronic illnesses require multiple consultations, regular doctor visits, diagnostic tests, and long-term medication support. Despite all this, most of the health insurance schemes in India mainly cover hospitalization, excluding outpatient care from the ambit of insurance coverage. In India, the new flagship scheme "Pradhan Mantri Jan Arogya Yojana (PM-JAY)" was launched in 2018, with the aim of providing health insurance coverage to 100 million poor and vulnerable families, with a cover of up to USD 7,320.6 (INR 5,00,000) per family per year for secondary and tertiary care hospitalization. Although PM-JAY scheme has removed two major limitations of the previous national-level health insurance scheme (Rashtriya Swasthya Bima Yojana), i.e., coverage of a mere USD 438.2 (INR 30,000) per annum and a cap on family size (covering five members only), still it does not cover outpatient care, which is a key driver of financial hardships. Therefore, comprehensive health insurance products that encompass both inpatient and outpatient services are warranted to improve financial risk protection for Indian households.

In **chapters 4 and 5,** we discussed OOPE and corresponding financial hardship across various diseases and injuries. We found that households with any member suffering from cancer, genitourinary disorders, psychiatric and neurological disorders, obstetric conditions, and injuries (particularly intentional self-harm, burns or corrosions, and accidental injuries, road traffic accidents and falls) experienced a high incidence of CHE, impoverishment, and distressed financing. While it is evident that cancer causes copious financial burden among those who have the disease and seek treatment for it, policymakers should address the high spending on cardiovascular diseases and injuries, which constitute a sizeable share of the total financial hardships. Additionally, we found that the financial burden was lower among

households that sought care in public facilities in comparison to those who sought care in private facilities for most diseases and injuries. However, deficiencies in the public health system, such as inadequate infrastructure, unavailable services, perceived low quality of care, and long waiting times, were witnessed, which forced individuals to use private facilities, exposing them to financial hardship. Therefore, there is a pressing need to strengthen public health facilities and increase public health expenditure in India to augment financial risk protection against burgeoning OOPE. Moreover, cases of overcharging, unnecessary tests and treatments, and malpractices in the private health sector are well documented in the existing literature. Consequently, a substantial portion of financial catastrophes, impoverishment, and indebtedness due to OOPE occur within the private health system in India. Therefore, it is imperative to improve the regulation of private healthcare facilities, as improved regulation is one of the potential drivers to reduce healthcare costs and improve the quality of care. Lastly, for long-term sustainability, policymakers must prioritize health promotion and disease prevention strategies, as increasing life expectancy, a growing share of the elderly population, westernization, and motorization will further aggravate the burden of NCDs and injuries in India. Implementation of robust and effective evidence-based health promotion programmes holds the potential to significantly improve people's health and reduce the financial burden they face.

6.2 Limitations and Scope for future research

The NSS health data collects information on self-reported ailments, with a reported diagnosis by a qualified healthcare professional required only for specific conditions. Surveys that rely on self-reported ailments are likely to underestimate the prevalence of various health conditions and are susceptible to recall biases, as well as being influenced by respondents' knowledge and willingness to report their health status. Moreover, expenditure data collected by household surveys are subject to potential recall bias, especially for hospitalization incidence where the

recall period involves a longer time span of 365 days. Therefore, future studies can collect patient-level data from medical records of hospitals to provide a better overview of the actual OOPE incurred by patients. Additionally, qualitative studies may be undertaken to explore challenges and hardships experienced by patients and their family members due to OOPE.

Another limitation is that disregarding coping mechanisms such as borrowings and sale of physical assets to finance OOPE leads to overestimation of poverty impact. However, since the NSS health survey does not collect information on how much money is financed through distressed sources, we could not correct this. Overestimation of poverty and CHE may also be caused by our reliance on the NSS health survey, which tends to underestimate the total household consumption expenditure. Future iterations of the NSS survey should incorporate questions to quantify funds sourced from distressed means. Moreover, future studies could utilize primary surveys to gather this information, thereby providing more accurate estimates of the financial hardships caused by OOPE.

Furthermore, the magnitude of economic burden and disruption of living standards due to health expenditures should be ascertained using longitudinal data. However, in the absence of such data, cross-sectional studies like ours can provide potential estimates of the financial impact of OOPE. Future studies may undertake the assessment of the OOPE and corresponding financial hardship using longitudinal data, which will be instrumental in determining the long-term financial ramifications of OOPE.

Lastly, future research studies should explore the impact of the recently launched Pradhan Mantri Jan Arogya Yojana (PM-JAY) scheme on improving accessibility to inpatient healthcare services and enhancing financial protection against OOPE and associated financial burdens.

List of publications

Papers published

- Nanda, M., & Sharma, R. (2023). A comprehensive examination of the economic impact of out-of-pocket health expenditures in India. Health Policy and Planning, 38(8), 926-938. **Oxford (IF: 3.2, Indexation: SSCI, SCIE)**.
- Nanda, M., & Sharma, R. (2023). Financial burden of injury care in India: evidence from a nationally representative sample survey. Journal of Public Health, 1-13. **Springer (IF: 1.8, Indexation: Scopus, ESCI)**.
- Nanda, M., & Sharma, R. (2023). Financial burden of seeking diabetes mellitus care in India: Evidence from a Nationally Representative Sample Survey. Health Care Science, 2(5), 291-305. **Wiley (Indexation: Scopus)**.

Papers communicated

- Research paper titled "National, state, and intra-state level examination of financial burden of healthcare costs in India," submitted to SSCI indexed journal.
- Research paper titled "Out-of-pocket Health Expenditure in India: A Disaggregated Analysis," submitted to Scopus indexed journal.

Participation in Conferences

- Presented paper in International Conference organized by IIT Roorkee and Arizona State University, USA, November 20–22, 2022 (Received Best Paper Award).
- Presented paper at 2nd International Research Conference and Doctoral Workshop organized by IIM Lucknow, Noida Campus, December 9–11, 2022.
- Presented paper in International Conference organized by IIMS Pune, December 16–17, 2022.

- Presented paper at ICSSR sponsored 8th Annual International Commerce Conference organized by Department of Commerce, Delhi School of Economics, University of Delhi, January 11–12, 2023.
- Presented paper at 1st Management Doctoral Colloquium organized by IIT Jodhpur, February 24–25, 2023.
- Presented paper in International Conference organized by University School of Management and Entrepreneurship, Delhi Technological University, September 15–16, 2023.