OPEN ACCESS

Manuscript ID:
ECO-2025-14019720

Volume: 14

Issue: 1

Month: December

Year: 2025

P-ISSN: 2319-961X

E-ISSN: 2582-0192

Received: 21.09.2025

Accepted: 17.11.2025

Published Online:01.12.2025

Citation:
Nandini Jagannarayan, et al. "Sustainable Health Financing and Resource Allocation: An Empirical Analysis of Urban Households in Mumbai (2022–2025)." *Shanlax International Journal of Economics,* vol. 14, no. 1, 2025, pp. 116–223.

DOI:
https://doi.org/10.34293/economics.v14i1.9720

Sustainable Health Financing and Resource Allocation: An Empirical Analysis of Urban Households in Mumbai (2022–2025)

Nandini Jagannarayan
Assistant Professor
Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science and Commerce (Empowered Autonomous), Ghatkopar (w), Mumbai, Maharashtra
https://orcid.org/0009-0003-5909-0274

R. Uma
Assistant Professor in Economics
Nirmala College for women, Coimbatore, Tamil Nadu, India
https://orcid.org/0009-0009-6911-005

Mala Goplani
Assistant Professor
Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science and Commerce (Empowered Autonomous), Ghatkopar (w), Mumbai, Maharashtra
https://orcid.org/0009-0005-1414-3330

Abstract
This study investigates the socio-economic factors influencing household health expenditure in Mumbai from 2022 to 2025, emphasising sustainable health financing and equitable resource distribution The regression results, which are based on 494–777 household observations per year, demonstrate that total income continues to be the most significant predictor of health expenditure, suggesting ongoing disparities in healthcare access. Education and household size also show up as important predictors in the post-pandemic era. People who have more education are more likely to know about ways to stay healthy and avoid getting sick, which means they spend more money on medical and wellness services. People in bigger families also tend to spend more of their income on health care because they have more people who depend on them and their medical needs are more varied. The study emphasizes the need for fair and sustainable health financing systems that consider income differences and family structures. It backs policies that promote preventive healthcare through community initiatives and educational programs. These efforts contribute to fair and financially stable urban health systems after the pandemic. Future studies can extend this analysis by comparing urban and rural households or multiple cities, and by incorporating factors such as health insurance use, quality of healthcare services, and access to public health infrastructure to better explain variations in health expenditure.

Keywords: Health Expenditure, Socio-Economic Determinants, Preventive Health Care, Mumbai, CMIE, CPHS

Introduction

The COVID-19 pandemic showed that not everyone has the same access to affordable healthcare. This is why Indian cities need to find ways to pay for health care that will last. Mumbai has a large and diverse population, which is driving up healthcare costs and demand. This means that we need to make health spending systems that include everyone and balance care that prevents illness with care that treats it.

This study examines the health expenditure trends of urban households in Mumbai from 2022 to 2025. It looks at things like age, income, education, job, and size of the household. The study shows that income is the most important thing that affects health spending every year. Education and job affect how aware people are of and how often they use preventive healthcare. Household size and age are becoming more important, especially for large families and older people.

The study shows that we need policies that protect people's money better, make people more aware of their health, and make sure everyone can get health care. In the time after the pandemic, these kinds of steps can help make urban health systems stronger and more inclusive.

Research is carried out with the following objectives

- To analyse the pattern and level of health expenditure among urban households in Mumbai during the post-pandemic period from 2022 to 2025.
- To identify the key socio-economic factors such as income, education, occupation, age, gender, and household size that influence household health spending.
- To examine how income differences affect access to healthcare and contribute to inequality in health expenditure.
- To assess the role of education and health awareness in encouraging preventive healthcare expenditure.
- To understand the impact of household structure and ageing on rising healthcare costs.

Research Gap Identified and Addressed

Household income always has a big impact on health spending, but there is still disagreement about how PM-JAY lowers high out-of-pocket health costs. There is not much research on how things like education, age, and family size affect preventive health spending in cities. This study uses post-pandemic CPHS data from Mumbai to connect household characteristics with city-level health financing in order to back up strong and fair health policies.

Review of Literature

Rout (MPRA) found that income is the most important factor in determining health spending in Orissa, while education has a smaller but still positive effect. Sen and Ghosh (2025) also found that Indian states had very different amounts of money spent on health care at home. They said this was because there wasn't enough money for public health. The National NSSO and hospitalisation studies from 2017 to 2018 show that the cost of staying in a hospital is going up. The cost is very different in cities and rural areas. They also show that most of these costs come from hospital stays and care at a higher level.

Ayushman Bharat/PM-JAY studies yield conflicting findings. People still spend a lot of money out of their own pockets despite an increase in insurance coverage, and preventive care has not significantly improved. The Journal of Family Medicine and Primary Care published research that shows that lack of awareness and outpatient coverage make programs less effective, especially in middle-income urban households. Research like BMC Health Services Research on caesarean deliveries shows that OOPE is high even for services that are covered.

This shows that the private sector is responsible.

Household makeup, education, and demographic factors. Studies in the Indian Journal of Medical Research and cohort studies from Maharashtra indicate that family size, age distribution, and occupation substantially influence catastrophic health expenditures. Education increases spending on both prevention and treatment by making people more aware of their health and more likely to seek care. Studies on mental health (IndiaSpend) show that families with chronic or mental illness have a lot of trouble with money, which shows how the type of illness affects spending models.

Mumbai and Sustainable Health Financing Context: Reports from Praja–TISS and the Times of India show that Maharashtra spends very little on public health and that the BMC's funding is not evenly distributed. This makes families more reliant on private providers. National surveys show that OOPE is slowly going down, but there are still gaps in financial protection. This makes it even more

important to have localised evidence in cities like Mumbai.

The above literatures have highlighted that there is a gap in terms of –

Income is still the most important factor in determining how much people spend on health care. PM-JAY's expansion of insurance improved formal coverage, but it's not clear how it affected the reduction of catastrophic spending. Demographic and educational factors affect how much people spend on prevention and treatment, but these factors are rarely looked at together with urban fiscal governance. This study fills that gap by giving household-level evidence from Mumbai for the years after the pandemic (2022–2025). It looks at how income, education, occupation, and household size affect municipal health financing using CPHS data. It also looks into how education affects spending on prevention during the recovery from COVID, which is an area that hasn't been studied much. The results will help develop long-term, fair ways to pay for health care and will help local policy work towards closing the gaps in health care access within cities and making Mumbai's health care system stronger.

Research Methodology

Data Source: Secondary data from the Centre for Monitoring Indian Economy's (CMIE) Consumer Pyramids Household Survey (CPHS).

Study Period -March 2022 to March 2025, during the pandemic and after it.

Study Area: The urban households in Mumbai that were picked to look at how health spending varies between cities.

The research design is quantitative and explanatory, and it focusses on finding out the demographic and socioeconomic factors that affect how much money people spend on health care.

Sampling: The study uses the stratified sample design of the urban household panel data from CPHS for Mumbai. Dependent variable - Monthly Total Health Expenditure (EXP_HEALTH).

Total Income (TOT_INC), Education Group (EDU_GROUP), Occupation Group (OCCUPATION_GROUP), Gender Group (GENDER_GROUP), Age Group (AGE_GROUP), and Household Size (SIZE_GROUP) are independent variables.

Analytical tools include multiple regression analysis backed by multicollinearity and model significance diagnostic tests.

Limitations of the study

The study uses self-reported data on household spending, which may be wrong because people may not remember things correctly or may have a bias when reporting. It only looks at numbers and doesn't include things like the quality of healthcare services, how easy it is to get to them, or how happy patients are with them. Also, the study only looked at households in Mumbai's cities, so the results may not be true for rural areas or other cities.

Results and Discussion

Demographic profile of households in Mumbai from 2022 to 2025, highlighting differences in age, gender, occupation, education, and household size. These indicators give us important information about the diversity of socio-economic groups and the changing structures of urban households that influence health expenditure patterns and financial behavior in metropolitan contexts.

Table1 Demographic Profile of Households in Mumbai (2022–2025)

Variable	Category	2022 (n=494)	2023 (n=734)	2024 (n=721)	2025 (n=777)
Age Group	Dominant Grown-ups	312 (63.16%)	466 (63.49%)	427 (59.22%)	479 (61.65%)
	Balanced Households	105 (21.26%)	157 (21.39%)	204 (28.29%)	208 (26.77%)
	Dominant Seniors	55 (11.13%)	82 (11.17%)	13 (1.80%)	14 (1.80%)

	Dominant Younger Members	22 (4.45%)	29 (3.95%)	77 (10.68%)	76 (9.78%)
Gender Group	Male Dominant	175 (35.43%)	252 (34.33%)	261 (36.20%)	319 (41.06%)
	Female Dominant	76 (15.38%)	134 (18.26%)	206 (28.57%)	210 (27.03%)
	Balanced	193 (39.07%)	264 (35.97%)	228 (31.62%)	226 (29.09%)
	Exclusively Male/Female	50 (10.12%)	84 (11.44%)	26 (3.61%)	22 (2.83%)
Occupation Group	White–collar Professionals & Management	256 (51.82%)	440 (59.95%)	423 (58.67%)	438 (56.37%)
	Self–employed & Entrepreneurs	91 (18.42%)	132 (17.98%)	193 (26.77%)	268 (34.49%)
	Blue–collar Workers	41 (8.30%)	41 (5.59%)	82 (11.37%)	47 (6.05%)
	Miscellaneous & Others	106 (21.46%)	121 (16.49%)	23 (3.19%)	24 (3.09%)
Education Group	Highly Educated	215 (43.52%)	271 (36.92%)	323 (44.80%)	389 (50.06%)
	Moderately Educated	237 (47.98%)	379 (51.63%)	307 (42.58%)	295 (37.97%)
	Educationally Homogeneous	42 (8.50%)	84 (11.44%)	91 (12.62%)	93 (11.97%)
Household Size	Small	315 (63.77%)	473 (64.44%)	296 (41.05%)	327 (42.08%)
	Medium	163 (33.00%)	251 (34.20%)	368 (51.04%)	387 (49.81%)
	Large	16 (3.24%)	10 (1.36%)	57 (7.91%)	63 (8.11%)

Note. Source: Author's analysis based on CPHS data (2022–2025)

Demographics

Mumbai's household demographics changed significantly between 2022 and 2025, reflecting post-pandemic socioeconomic changes. The prevalence of income-generating age groups was confirmed by the continued dominance of adult households (over 59%) (Rao et al., 2022). The percentage of households headed by women increased dramatically from 15.38% to 27.03%, highlighting the growing economic involvement and decision-making roles of women (Desai & Banerjee, 2023). White-collar workers made up more than 56% of the workforce by 2025, indicating Mumbai's continuous shift to a service-driven economy (Sengupta & Bhattacharya, 2022). Meanwhile, self-employed and entrepreneurial households almost doubled, demonstrating resilience and diversity in urban livelihoods (Kumar & Gupta, 2020).

By 2025, more than half of households had attained advanced education due to a steady increase in higher education levels (Patel et al., 2021). The cityscape was dominated by smaller nuclear families (Roy & Chatterjee, 2021). Income, education, and occupation emerged as important post-pandemic determinants in Mumbai's changing urban health financing landscape, and these structural changes directly influenced household health expenditure patterns.

Dependent Variable : Monthly Health Expenditure Hypotheses Tested

H_0: There is no significant association bet wee monthly household expenditure of the people under study in Mumbai during the said period and Total Income, Occupation Group, Household size Group, Education level, age group classification of the households and the gender group classification of the households

Table 2 Determinants of Monthly Health Expenditure of Households

Year	Significant Predictors ($p < 0.05$)	Model Fit (R^2 / Adj. R^2)	F-statistic (Sig.)	Interpretation / Result Summary
2022	Total Income (β =0.0049, p = 0.000)- Occupation Group 2 (p = 0.000)- Occupation Group 3 (p = 0.000)- Size Group 3 (p = 0.043)	R^2 = 0.148Adj. R^2 = 0.123	F = 5.959 (p = 0.000)	Income and occupation are major determinants of health expenditure. Larger households also spend significantly more. Education, age, and gender are insignificant.
2023	Total Income (β = 0.0238, p = 0.000)- Age Group 3 (p = 0.021)- Age Group 4 (p = 0.003)	R^2 = 0.162Adj. R^2 = 0.146	F = 9.925 (p = 0.000)	Income remains the strongest determinant; age groups 3 and 4 (senior-dominant households) show higher expenditure, reflecting aging-related healthcare needs.
2024	Total Income (β = 0.020, p = 0.000)- Education Group 2 (p = 0.000)- Education Group 3 (p = 0.009)	R^2 = 0.178Adj. R^2 = 0.162	F = 10.957 (p = 0.000)	Income continues to drive spending; education emerges as a strong determinant. Educated households allocate more to health, reflecting better awareness and preventive focus.
2025	Total Income(β = 0.0063, p = 0.000)- Age Group 3 (p = 0.008)- Size Group 2 (p = 0.009)- Size Group 3 (p = 0.008)- Education Group 2 (p = 0.030)	R^2 = 0.144 Adj. R^2 = 0.129	F =9.192 (p = 0.000)	Income, age, and household size significantly influence spending. Education remains relevant. Larger households and middle-aged groups face greater healthcare burdens.

Note Source: Author's Analysis based on CPHS Data (2022–2025)

Total income continuously emerged as the most significant factor influencing health spending between 2022 and 2025, demonstrating the robust relationship between financial capability and medical spending (Kumar & Gupta, 2020; Mishra & Singh, 2023). Occupation was a significant factor in 2022, with professional and managerial households being better able to pay for healthcare. However, as health care access improved through digital and community-based services, this effect eventually decreased (Sengupta &, 2022).According to Patel et al. (2021), age became a significant factor starting in 2023 due to the growing health needs of older households and the rising expense of chronic care. By 2024, education had become more prominent, indicating that literacy and awareness promote well-informed healthcare decisions. According to Desai and Banerjee (2023), household size also had an impact on spending because larger families had to pay more for medical care because of dependency and shared financial strain.In general, after the pandemic, Mumbai's health spending shifted from being mostly determined by income to reflecting broader sociodemographic and behavioural factors.
The results demonstrate Mumbai's pressing need for equitable and sustainable health funding. Adopting progressive financing models with income-based insurance support, putting in place education-driven preventive programs, and making sure that resources are allocated specifically for older and larger households are some of the main recommendations. To improve accessibility and lower costs, it is also essential to expand primary healthcare infrastructure and bolster occupational health programs.

Findings Summarised

1. The most important thing that affects health spending in urban Mumbai is household income. Health spending is still not fair, and people with more money have better access to it.
2. After COVID, education has become more important, which has led to more spending on preventive and regular healthcare.
3. Older households and larger families have higher healthcare costs because they need more medical care.
4. Occupation matters less over time, and gender does not significantly affect health expenditure.
5. Overall, the results show that we need to make urban health financing fair and long-lasting, with a focus on support based on income, preventive care, and protection for families that are at risk.

Conclusion

The study reveals that household income, education, occupation, and family size are key determinants of health expenditure in the post-pandemic urban context. Income consistently emerged as the strongest predictor, reflecting the continued dependence of health access on economic capacity. Education influenced preventive health spending, indicating the growing importance of health literacy, while occupation and household size shaped differential financial burdens.

These findings highlight the need for sustainable health financing frameworks that prioritize equity and efficiency in urban resource allocation. Policies promoting income-based subsidies, education-linked health awareness, and employer-supported healthcare can reduce disparities and strengthen system resilience.

Scope for Further Research

In order to evaluate regional differences in health spending, future research may expand this analysis by including comparisons between rural and urban areas as well as studies between cities. Household-level dynamics throughout time can be captured using longitudinal panel techniques. Analysis would be improved by including variables related to local health infrastructure, insurance utilisation, healthcare access, and quality measures. Quantitative results may be further contextualised using mixed-method approaches.

Future Research Direction

By comparing health spending trends between rural and urban areas as well as between various Indian cities, future research can expand on this study and identify regional disparities. To monitor household health spending over time and evaluate the long-term impacts of aging and income shocks, longitudinal panel analysis can be utilized. The analysis would be strengthened by including factors

like access to primary healthcare facilities, quality of healthcare services, use of public health programs like PM-JAY, and health insurance coverage. In post-pandemic urban India, behavioral factors influencing out-of-pocket expenses and preventive care can be further explained through mixed-method approaches that combine quantitative data with qualitative insights.

References

Desai, M., & Banerjee, S. (2023). Gendered patterns of urban household decision-making in India: Post-pandemic evidence. *Indian Journal of Social Development*, vol. 23, no. 2, pp. 145–158.

Deshmukh, P. R., & Garg, B. S. (2018). Socio-demographic determinants of out-of-pocket health expenditure: Evidence from Wardha District, Maharashtra. *Indian Journal of Medical Research*, vol. 148, no. 2, pp. 123–132. https://doi.org/10.4103/ijmr.IJMR_1426_17

Government of India, Ministry of Finance. (2024). Economic Survey of India 2023–24. New Delhi.

Jagannarayan, N., & Prasuna, A. (2024). Gender (Women-Led Households) as a Determinant of Consumption Expenditure on Food during March 2020 – A Case Study of Maharashtra. *South Eastern European Journal of Public Health,* pp. 269–276. https://doi.org/10.70135/seejph.vi.1636

Jagannarayan, N., & Prasuna, A. (2025). Food, Gender, and Survival: Analyzing Consumption Behavior of Women-Headed Households during the COVID-19 Lockdown in Maharashtra. *International Journal of Environmental Sciences*, vol. 11, no. 4s, pp. 466–473.

Jagannarayan, N. (2024). Post-COVID Household Expenditure in Maharashtra: Socioeconomic Influences on Food, Health, and Leisure. *Journal of Economic and Social Development Studies,* vol. 9, no. 2, pp. 55–68.

Kumar, A., & Gupta, R. (2020). Financial protection and determinants of out-of-pocket health expenditure in urban India. *Health Economics Review,* vol. 10, no. 2, pp. 1–12. https://doi.org/10.1186/s13561-020-00272-6

Mishra, P., & Singh, S. (2023). Sustainable health financing in India: Challenges and policy pathways. *Journal of Health Policy and Management*, vol. 12, no. 1, pp. 45–56.

Nair, S., & Goel, N. (2023). Health inequities in post-pandemic India: Financing and policy implications. *Economic and Political Weekly*, vol. 58, no. 4, pp. 34–41.

National Health Accounts. (2023). *National Health Accounts Estimates for India (2019–20)*. Ministry of Health and Family Welfare, Government of India.

National Health Authority (NHA). (2023). *Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY):* Policy brief on coverage and utilisation. Government of India.

National Sample Survey Office (NSSO). (2021). *Health in India: NSS 75th Round (2017–2018)*. Ministry of Statistics and Programme Implementation, Government of India.

NITI Aayog. (2022). *Evaluation study of Pradhan Mantri Jan Arogya Yojana (PM-JAY)*. Government of India.

Patel, V., Reddy, K. S., & Kumar, S. (2021). Urban health in India after COVID-19: Strengthening financing for equity and resilience. *The Lancet Global Health*, vol. 9, no. 12, pp. e1663–e1670. https://doi.org/10.1016/S2214-109X(21)00392-9

Patil, D., & Thomas, A. (2021). Out-of-pocket expenditure for maternity care in India: Evidence from cesarean deliveries. *BMC Health Services Research*, vol. 21, no. 1, pp.765–778. https://doi.org/10.1186/s12913-021-06815-5

Praja Foundation. (2022). *Urban governance and health budgeting in Mumbai: A ward-level analysis.* Mumbai: Tata Institute of Social Sciences.

Rao, M., Ghosh, S., & Bhatia, M. (2022). Urbanization, chronic disease burden, and healthcare spending in Indian metros. *Indian Journal of Public Health*, vol. 66, no. 3, pp. 210–218.

Rout, H. S. (2010). *Determinants of household health expenditure in Orissa: Some empirical evidence (MPRA Paper No. 23978).* University Library of Munich. https://mpra.ub.uni-muenchen.de/23978/

Roy, S., & Chatterjee, A. (2021). *Catastrophic health expenditure and inequality in India: Evidence from NSS data.* Social Science & Medicine, vol. 279, P. 113999. https://doi.org/10.1016/j.socscimed.2021.113999

Sen, A., & Ghosh, D. (2025). *Household health spending inequalities and the role of state-level financing in India.* Journal of Health Economics and Policy, vol. 18, no. 2, pp. 101–120.

Sengupta, A., & Bhattacharya, J. (2022). *Economic inequalities and healthcare access in Mumbai: Post-pandemic reflections*. Urban Studies, vol. 59, no. 14, pp. 2889–2907. https://doi.org/10.1177/00420980221085653

Sharma, V., & Singh, R. (2022). Assessing the impact of Ayushman Bharat on financial protection among urban households. *Journal of Family Medicine and Primary Care,* vol. 11, no. 4, pp. 1225–1233. https://doi.org/10.4103/jfmpc.jfmpc_314_22

Shinde, A., & Nair, R. (2020). Financial burden of mental health care among urban Indian households. *Asian Journal of Psychiatry*, vol. 54, P. 102243. https://doi.org/10.1016/j.ajp.2020.102243

World Health Organization. (2022). *Sustainable health financing for universal health coverage*. WHO Policy Brief.

World Health Organization. (2023). S*ustainable health financing for universal coverage: Policy strategies for equitable and efficient systems*. Geneva: WHO Press.

Xu, K., Evans, D., Carrin, G., & Aguilar-Rivera, A. (2018). *Designing health financing systems to reduce catastrophic health expenditure*. World Health Organization.

Author Details:

Nandini Jagannarayan, *Assistant Professor, Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science and Commerce (Empowered Autonomous), Ghatkopar (w), Mumbai, Maharashtra*
***Email ID**: n.jagannarayan@somaiya.edu*

R. Uma
Assistant Professor in Economics, Nirmala College for women, Coimbatore, Tamil Nadu, India
***Email ID**: umabchander@gmail.com*

Mala Goplani
Assistant Professor, Hindi Vidya Prachar Samiti's Ramniranjan Jhunjhunwala College of Arts, Science and Commerce (Empowered Autonomous), Ghatkopar (w), Mumbai, Maharashtra
***Email ID**: sheffaligoplani@gmail.com*