

Economic Burden of Accidents and Injuries in India: What Does 75th Round of National Sample Survey Imply?

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Abstract

Background: Accidents and injuries constitute a sizable share of mortality and morbidity in low- and middle-income countries. This affects the most productive age group and increases disability-adjusted life years (DALYs). It results in a substantial financial burden on the households. To explore the economic burden of accidents and Injuries on Indian households and to find how the catastrophic health expenditure (CHE) from accidents and injuries affects the population. Another objective is to explore Catastrophic out-of-pocket expenditures (OOPE) patterns and distressed financing of households in India. **Materials and Methods:** The study used data from the 75th round of nationally representative surveys, that is, the National Sample Survey (NSS). Authors have analyzed the data using descriptive binary logistic regression analysis to estimate the rate and average days of hospitalization, average OOPE, and share of the population experiencing the catastrophic impact from the health expenditure separately from the public and private healthcare institutions. **Results:** The study observed that hospitalization in the private sector imposes 72% of households incur CHE at more than 10% cut-off and 41% at more than 25% cut-off. In comparison, it is less in the public sector, with 22% of households incurring CHE at more than 10% of annual per capita household income and 9% at more than 25%. **Conclusion:** The increasing incidence of road traffic accidents (RTA) is a concern for the overstretched health system. The government should provide better healthcare facilities and universal health insurance coverage to ensure patients' speedy recovery and financial security.

Keywords: Accident, CHE, economics, OOPE, road-traffic

INTRODUCTION

Accidents and Injuries, particularly road traffic accidents (RTA), are a global problem resulting in deaths, physical injuries, psychological problems, and financial losses. There is a lack of infrastructure, coverage, and treatment proficiency in the Indian public healthcare system, which opens the door to the private sector.^[1] The involvement of public hospitals due to the high prevalence of accidents and injuries in India raises concern over healthcare expenditure. Some studies highlight the serious impacts of accidents and injuries in India.^[2-4] Such impacts are portrayed in terms of increasing mortality from injuries,^[5] high burden of health expenditure, particularly catastrophic out-of-pocket expenditure (OOPE),^[6,7] and many more. Catastrophic OOPE occurs when OOPE exceeds 10% of total household spending.

Objectives

1. To explore the economic burden of accidents and injuries on Indian households and to find how the catastrophic

health expenditure (CHE) from accidents and injuries affects the population.

2. To explore the patterns in catastrophic OOPE, and distressed financing incurred by households.

MATERIAL AND METHODS

The study used data of the 75th round of the National Sample Survey (NSS) conducted between July 2017 and June 2018, titled as "Social Consumption in India: Health". The NSS is conducted by the Ministry of Statistics and Program Implementation (MOSPI), and the NSS 75th round was the

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fourth consecutive survey since the year 1990 by the Ministry of Health. Like its predecessors, the survey data generates basic quantitative information on the health sector in India. It comprises of information related to socioeconomic and demographic characteristics of survey households, their morbidity/ailment, its causes, hospitalization, treatment, expenditure incurred for treatment, and its sources etc.,. The survey collected information from across the country, covering a total of 1,13,823 households (64,552 in rural areas and 49,271 in urban areas). A total of 5,55,115 persons were covered (3,25,883 from rural and 2,29,232 from urban areas) following a scientific survey methodology. In order to analyze the accidents and injuries, the study utilized the information on “Accidental injury, RTA and falls” coded as 52 in the list. All the 6750 spells of ailments consisting of 6354 individuals who reported hospitalization due to “accidental injury, RTA and falls” during the last 365 days as inpatients of medical institutions were taken as samples for the analysis.

Outcomes

This study aims to analyze four major aspects related with “Accidental injury, RTA, and falls” in India. **In the first part**, it captures the intensity of “Accidental injury, RTA, and falls” by estimating the rate of hospitalization, mean days of hospitalization, and probability of hospitalization across various sub-groups caused by the same. **In the second part**, the average OOPE committed by patients for the treatment and its share in the total health expenditure was estimated at the country and sub-group levels. **In the third part**, the share of households who were hospitalized due to “Accidental injury, RTA and falls” and experiencing catastrophic impact due to OOPE was measured at different sub-group levels. **In the final part**, the study estimates that a share of households use distressed financing as a major source for financing treatment for “Accidental injury, RTA and falls.” By distressed financing, the study considered the spending from sources such as borrowing, sales of assets, contributions from friends and relatives, etc., which has devastating potential for households in the near future.

Indicators of socioeconomic status (SES)

In order to analyze the impact of “Accidental injury, RTA, and falls” at the sub-group level, the study considered various socioeconomic-demographic and regional characteristics of the population. The mean OOPE is calculated by deducting the amount reimbursed from the total healthcare expenditure incurred due to accidental injury care, separately for both hospitalizations in public and private healthcare sectors.

Statistical analyses

While performing the statistical analyses, the study used descriptive statistics and binary logistic regression. We have estimated the rate and average days of hospitalization, average OOPE, and share of the population experiencing the catastrophic impact from the health expenditure separately from the public and private healthcare institutions. For measuring the CHE, 10% and 25% of annual per capita consumption of

household expenditures were taken as cut = off. On the other hand, it used the odds ratio (OR) for measuring the probability of hospitalization and the probability of CHE among the households by taking the place of residence, religion, social group, occupation, monthly per capita consumption expenditure (MPCE), insurance, and region as the predictor variables to it.

Ethical consideration: A review by the ethics board was not necessary, as the secondary data excluded any kind of personal information.

RESULTS

Table 1 shows that India’s annual hospitalization rate for accidents or injuries was 264.7 per 10000 persons. On average, the victim of accidents and injuries spent 8.77 days in the hospital for inpatient care. The binary logistic regression shows that the likelihood of seeking inpatient care for accidents, injuries, or falls increases with age (Age 60+, OR 3.9, 95% confidence interval [CI], 3.54–4.29; $P < 0.001$). The likelihood of hospitalization is significantly more for males (OR: 2.72, 95% CI, 2.57–2.88; $P < 0.001$), primary and secondary educated (OR: 1.18, 95% CI, 1.1–1.26; $P < 0.001$) and (OR: 1.10, 95% CI, 1–1.2; $P < 0.05$), those who belong to other backward castes or in the other social group category (OR: 1.11, 95% CI, 1.05–1.19; $P < 0.001$) and (OR: 1.06, 95% CI, 0.99–1.14; $P < 0.05$), high-economic strata (OR: 1.58, 95% CI, 1.43–1.74; $P < 0.001$), having insurance (OR: 1.21, 95% CI, 1.14–1.29; $P < 0.001$), and those in the Central, East, and Southern regions (OR: 1.1, 95%CI, 1.01–1.2; $P < 0.01$) (OR: 1.25, 95% CI, 1.15–1.35; $P < 0.001$) and (OR: 1.17, 95% CI, 1.08–1.26; $P < 0.001$).

Table 2 shows that the mean OOPE for accidental injury care in private healthcare was five times more than in public healthcare. The share of OOPE to the total expenditure showed that more than 90% of total healthcare expenditure was OOPE, irrespective of the type of healthcare. The mean OOPE is higher for the elderly than other age groups (Rs 9104/in the public sector), with a widened gap in private healthcare (Rs 57663/). The healthcare expenditure among males was higher (Rs 9257/in public healthcare), and the OOPE is moderately high in private hospitals in urban areas (Rs 45262/). Those with graduate education and above (Rs 16159/in public healthcare) spent more on accidental injury care than others (Rs 9331/in public healthcare). For those who sought treatment from public hospitals, the expenses were higher for those who belonged to other religious groups (Rs 13382/); among those who sought treatment from private hospitals, the healthcare expenses were higher for Muslims (Rs 51098/). The results show that other caste people (Rs 10226/) have higher OOPE than their counterparts. People from the wealthiest quintile (Rs 8866/in public healthcare) have a maximum OOPE and a minimum for those in the poorest quintile (Rs 8249/in public healthcare). The poor-rich divide in OOPE is higher for those who sought treatment from the private sector (Rs 37065/and Rs 48207/).

Table 1: Hospitalization rates, Mean days of hospitalization, and association of socioeconomic background with hospitalization caused by accidental injury, road traffic accidents, and falls in India 2017–18

| Categories | Sample size n (Proportion) | Hospitalization rate | Average days of hospitalization | Probability of hospitalization (OR) |
|---------------------------------|----------------------------|----------------------|---------------------------------|-------------------------------------|
| Age (in Years) | | | | |
| 0–14 | 836 (0.12) | 120.7 | 6.14 | 1.00(R) |
| 15–44 | 3371 (0.50) | 254.3 | 8.09 | 2.37*** [2.18–2.59] |
| 45–59 | 1568 (0.23) | 390.0 | 8.86 | 3.36*** [3.08–3.66] |
| 60+ | 975 (0.14) | 582.5 | 12.78 | 3.90*** [3.54–4.29] |
| Gender | | | | |
| Female | 1801 (0.27) | 149.2 | 8.11 | 1.00(R) |
| Male | 4949 (0.73) | 372.8 | 9.02 | 2.72*** [2.57–2.88] |
| Place of residence | | | | |
| Rural | 3962 (0.59) | 256.6 | 8.93 | 1.00(R) |
| Urban | 2788 (0.41) | 284.3 | 8.44 | 0.84*** [0.79–0.89] |
| Education | | | | |
| Noneducated | 1437 (0.22) | 244.1 | 9.78 | 1.00(R) |
| Primary | 2590 (0.39) | 238.0 | 8.43 | 1.18*** [1.1–1.26] |
| Secondary | 1087 (0.16) | 297.2 | 9.07 | 1.10* [1–1.2] |
| Higher Secondary | 789 (0.12) | 344.7 | 7.84 | 1.08 [0.98–1.2] |
| Graduation & above | 720 (0.10) | 277.0 | 8.28 | 0.87** [0.78–0.97] |
| Occupation | | | | |
| Casual Labor | 1014 (0.15) | 226.8 | 9.54 | 1.00(R) |
| Self-Employed (Agriculture) | 2703 (0.40) | 243.2 | 8.20 | 0.97 [0.89–1.05] |
| Self-Employed (Non-agriculture) | 1738 (0.26) | 281.9 | 8.82 | 1.05 [0.96–1.15] |
| Regular Wage/Salaried | 872 (0.13) | 359.1 | 9.11 | 1.05 [0.96–1.16] |
| Others | 423 (0.06) | 341.3 | 8.87 | 1.29*** [1.14–1.46] |
| Social groups | | | | |
| SC/ST | 1795 (0.26) | 230.3 | 8.39 | 1.00(R) |
| OBC | 2876 (0.42) | 262.5 | 9.20 | 1.11*** [1.05–1.19] |
| Others | 2079 (0.31) | 306.1 | 8.46 | 1.06* [0.99–1.14] |
| MPCE Quintile | | | | |
| Poorest | 1163 (0.17) | 169.9 | 9.71 | 1.00(R) |
| Poorer | 1186 (0.18) | 246.9 | 8.28 | 1.14*** [1.05–1.24] |
| Middle | 1328 (0.19) | 286.1 | 8.85 | 1.35*** [1.24–1.47] |
| Richer | 1426 (0.21) | 339.3 | 8.94 | 1.35*** [1.24–1.48] |
| Richest | 1647 (0.24) | 349.3 | 8.22 | 1.58*** [1.43–1.74] |
| Type of health facility | | | | |
| Public | 2791 (0.41) | 102.5 | 9.00 | --- |
| Private [^] | 3959 (0.59) | 166.9 | 8.87 | --- |
| Insurance | | | | |
| No | 5184 (0.78) | 237.7 | 8.85 | 1.00(R) |
| Yes | 1439 (0.22) | 383.7 | 8.55 | 1.21*** [1.14–1.29] |
| Region | | | | |
| North | 1279 (0.18) | 249.4 | 6.80 | 1.00(R) |
| Central | 1227 (0.18) | 198.5 | 10.02 | 1.10** [1.01–1.2] |
| East | 1249 (0.18) | 263.0 | 7.87 | 1.25*** [1.15–1.35] |
| Northeast | 578 (0.08) | 127.8 | 6.36 | 0.72*** [0.65–0.79] |
| West | 759 (0.11) | 253.1 | 8.49 | 0.92* [0.84–1.01] |
| South | 1649 (0.24) | 387.3 | 9.76 | 1.17*** [1.08–1.26] |
| All India | 6750 | 264.7 | 8.77 | --- |

MPCE=monthly per capita consumption expenditure, SC=Scheduled Castes, ST=Scheduled Tribes, OBC=Other Backward Class, OR=odds ratio
 Source: Authors' estimation from NSS 75th Round Data \$ Hospitalization rates among one lakh population *P<0.05, **P<0.01, ***P<0.001 [^] also included 129 sample cases which have both public and private healthcare hospitalization (OR: 1.00(R)) refers to the reference category of the variables, ORs obtained from the multiple logistic regression. The model includes an intercept term

Healthcare insurance lowering healthcare expenditure is apparent in the table, with low OOPE for those with health insurance (Rs 6059/in public healthcare). For those seeking treatment from public hospitals, the OOPE was higher in the

Table 2: Mean out-of-pocket expenditure and mean out-of-pocket expenditure as a share of total expenditure on Accidental injury, road traffic accidents, and falls in India 2017–18

| Categories | Mean Out-of-pocket Expenditure (Public) | | | Mean Out-of-pocket Expenditure (Private) | | |
|---------------------------------|-----------------------------------------|----------------|-------------------------------|------------------------------------------|----------------|-------------------------------|
| | Mean (Rs.) | (95% CI) | % of total health expenditure | Mean (Rs.) | (95% CI) | % of total health expenditure |
| Age (in Years) | | | | | | |
| 0–14 | 6640 | [5531, 7750] | 98 | 26187 | [23589, 28786] | 97 |
| 15–44 | 8652 | [7695, 9610] | 97 | 43905 | [40470, 47340] | 89 |
| 45–59 | 8067 | [6978, 9156] | 97 | 38711 | [35075, 42348] | 92 |
| 60+ | 9104 | [7242, 10967] | 98 | 57663 | [52363, 62964] | 91 |
| Gender | | | | | | |
| Female | 6165 | [5535, 6796] | 98 | 38056 | [34610, 41502] | 95 |
| Male | 9257 | [8437, 10079] | 97 | 44444 | [41894, 46996] | 90 |
| Place of residence | | | | | | |
| Rural | 8350 | [7623, 9079] | 98 | 41464 | [38824, 44104] | 93 |
| Urban | 8247 | [7061, 9433] | 95 | 45262 | [41818, 48707] | 87 |
| Education | | | | | | |
| Noneducated | 7108 | [6161, 8056] | 98 | 37706 | [34234, 41179] | 92 |
| Primary | 7718 | [6918, 8519] | 97 | 44909 | [41334, 48485] | 95 |
| Secondary | 9579 | [7381, 11778] | 98 | 44075 | [37576, 50575] | 90 |
| Higher Secondary | 9331 | [7120, 11542] | 97 | 36609 | [32025, 41195] | 89 |
| Graduation & above | 16159 | [11977, 20343] | 95 | 48529 | [41805, 55255] | 83 |
| Occupation | | | | | | |
| Casual Labor | 6961 | [5836, 8087] | 98 | 39370 | [33969, 44771] | 94 |
| Self-Employed (Agriculture) | 8739 | [7631, 9849] | 98 | 43025 | [39535, 46517] | 92 |
| Self-Employed (Non-agriculture) | 9015 | [7837, 10194] | 95 | 40263 | [36900, 43627] | 86 |
| Regular Wage/Salaried | 8641 | [6838, 10446] | 97 | 45747 | [39768, 51726] | 93 |
| Others | 9113 | [6014, 12213] | 98 | 54324 | [44534, 64116] | 93 |
| Religion | | | | | | |
| Hindus | 8099 | [7391, 8807] | 97 | 42014 | [39668, 44360] | 91 |
| Muslims | 7797 | [6500, 9094] | 98 | 51098 | [44491, 57704] | 92 |
| Others | 13382 | [10601, 16165] | 94 | 39072 | [33227, 44917] | 92 |
| Social groups | | | | | | |
| SC/ST | 6821 | [5875, 7768] | 97 | 39478 | [35075, 43882] | 87 |
| OBC | 8378 | [7500, 9258] | 97 | 43443 | [40134, 46754] | 94 |
| Others | 10226 | [8737, 11717] | 98 | 43878 | [40577, 47180] | 88 |
| MPCE Quintile | | | | | | |
| Poorest | 8249 | [6896, 9602] | 99 | 37065 | [32227, 41903] | 97 |
| Poorer | 8510 | [7125, 9896] | 98 | 43013 | [38632, 47396] | 98 |
| Middle | 7461 | [6350, 8573] | 97 | 40877 | [36372, 45382] | 89 |
| Richer | 8636 | [7257, 10015] | 98 | 42049 | [37506, 46593] | 92 |
| Richest | 8866 | [7142, 10592] | 92 | 48207 | [43594, 52821] | 85 |
| Insurance | | | | | | |
| No | 8940 | [8203, 9678] | 100 | 44969 | [42593, 47346] | 100 |
| Yes | 6059 | [4989, 7130] | 84 | 33709 | [29280, 38139] | 66 |
| Region | | | | | | |
| North | 10528 | [9083, 11973] | 96 | 41186 | [36892, 45481] | 95 |
| Central | 12262 | [10035, 14489] | 97 | 47208 | [42630, 51787] | 92 |
| East | 7342 | [6138, 8546] | 97 | 39157 | [34321, 43994] | 90 |
| Northeast | 9033 | [7165, 10902] | 93 | 52374 | [39746, 65003] | 95 |
| West | 5625 | [3783, 7467] | 98 | 40747 | [35841, 45654] | 88 |
| South | 6823 | [5817, 7829] | 98 | 43198 | [38788, 47608] | 90 |
| All India | 8325 | [7708, 8942] | 97 | 42826 | [40736, 44918] | 91 |

MPCE=monthly per capita consumption expenditure, SC=Scheduled Castes, ST=Scheduled Tribes, OBC=Other Backward Class, CI=confidence interval
Source: Authors' estimation from NSS 75th Round Data

Central region (Rs 12262/), minimum in the western region (Rs 5625/). For those who sought treatment from private hospitals, the OOPE was higher in the Northeast Region (Rs 52374/) and lower in the Eastern Region (Rs 39157/).

Table 3 presents the results of CHE incurred due to accidental injury care at 10% and 25% thresholds. The results show that 22% and 9% of households incurred CHE due to inpatient care in public hospitals at 10% and 25% thresholds, respectively. At the same time, it is alarming that 72% and 41% of the households incurred CHE due to inpatient care in private hospitals at 10% and 25% of the threshold. The odds of incurring CHE are significantly lower for urban compared with rural areas (OR: 0.71, *P*-value: <0.001, in public healthcare at the 10% threshold. The results show that moving towards the higher-economic strata, the likelihood of households incurring CHE decreases compared to the poorest households (OR: 0.33,

P-value: <0.001 in public healthcare at 10% threshold). The odds of incurring CHE for those households with the victim of accidental injury having insurance (OR: 0.62, *P*-value; <0.001 in a public hospital at 10% threshold) is significantly lower for inpatient care when compared with their counterparts. The likelihood of CHE is lower for the rest of the regions (OR: <1; *P*-value: <0.05 in public hospitals) compared with the northern region, at the 10% threshold. However, Central (OR: 0.98) and Southern regions (OR: 0.57, *P*-value: <0.01) depict higher odds of incurring CHE compared with Northern regions in public healthcare at 25% thresholds.

Figure 1 shows that more than 60% of the households used income/savings as the primary source, followed by borrowing from friends to meet the OOPE incurred due to inpatient care for accidental injuries.

Table 3: Percentage of households incurring catastrophic expenditure (>10%, >20%, and >40% of annual per capita household expenditure) on accidental injury, road traffic accidents, and falls hospitalization by demographic and socioeconomic background characteristics, India: NSS 2017–18

| Categories | Variables | Public Hospital | | Private Hospital | | Probability of catastrophic health expenditure (odds ratio) | | | |
|--------------------|--------------------------------|-----------------|--------|------------------|--------|-------------------------------------------------------------|--------------------|--------------------|--------------------|
| | | At 10% | At 25% | At 10% | At 25% | Public (10%) | Public (25%) | Private (10%) | Private (25%) |
| Place of Residence | Rural | 24 | 11 | 77 | 45 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Urban | 14 | 3 | 63 | 33 | 0.71***[0.56-0.89] | 0.54***[0.37-0.76] | 0.76***[0.64-0.90] | 0.80***[0.70-0.94] |
| Religion | Hindu | 22 | 9 | 73 | 42 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Muslim | 18 | 8 | | 43 | 0.59***[0.43-0.80] | 0.57**[0.36-0.91] | 0.94[0.74-1.20] | 0.99[0.80-1.20] |
| | Other | 24 | 11 | 57 | 30 | 1.32[0.92-1.90] | 1.49[0.86-2.56] | 0.92[0.70-1.20] | 0.85[0.70-1.10] |
| Social Groups | SC/ST | 21 | 9 | 74 | 39 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | OBC | 21 | 9 | 74 | 43 | 1.19[0.94-1.50] | 1.04[0.74-1.40] | 0.95[0.80-1.20] | 1.06[0.90-1.30] |
| | Others | 24 | 10 | 67 | 39 | 1.47***[1.10-1.90] | 1.23[0.83-1.80] | 0.93[0.80-1.10] | 1.22*[0.99-1.50] |
| Occupation | Casual Labor | 23 | 8 | 81 | 52 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Self-employed (Agriculture) | 22 | 9 | 72 | 37 | 1.04[0.80-1.40] | 1.31[0.89-1.90] | 0.83[0.63-1.10] | 0.78**[0.62-0.97] |
| | Self-employed (Nonagriculture) | 20 | 8 | 65 | 36 | 0.97[0.72-1.30] | 1.27[0.81-1.92] | 0.83[0.62-1.10] | 0.82[0.63-1.00] |
| | Regular Wage/ Salaried | 18 | 6 | 71 | 47 | 0.98[0.71-1.40] | 1.24[0.75-2.00] | 0.94[0.70-1.30] | 0.97[0.73-1.30] |
| | Others | 33 | 24 | 76 | 48 | 1.82***[1.20-2.80] | 2.85***[1.58-5.10] | 1.24[0.90-1.80] | 1.40**[1.01-1.90] |
| MPCE Quintile | Poorest | 31 | 15 | 86 | 54 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Poorer | 22 | 11 | 81 | 51 | 0.65***[0.50-0.84] | 0.65**[0.45-0.93] | 0.82[0.62-1.10] | 0.78**[0.62-0.98] |
| | Middle | 20 | 6 | 72 | 46 | 0.48***[0.36-0.60] | 0.43***[0.27-0.65] | 0.73**[0.60-0.95] | 0.67***[0.53-0.84] |
| | Richer | 19 | 6 | 70 | 37 | 0.42***[0.31-0.57] | 0.47***[0.30-0.72] | 0.63***[0.50-0.8] | 0.53***[0.40-0.70] |
| | Richest | 12 | 4 | 59 | 27 | 0.33***[0.23-0.47] | 0.35***[0.20-0.62] | 0.42***[0.32-0.6] | 0.39***[0.30-0.50] |
| Insurance | No | 23 | 10 | 75 | 43 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Yes | 15 | 5 | 62 | 35 | 0.62***[0.48-0.80] | 0.70*[0.50-1.02] | 0.54***[0.50-0.63] | 0.69***[0.60-0.82] |
| Region | North | 21 | 9 | 66 | 35 | 1.00(R) | 1.00(R) | 1.00(R) | 1.00(R) |
| | Central | 27 | 14 | 77 | 48 | 0.73*[0.52-1.03] | 0.98[0.60-1.60] | 1.39***[1.10-1.80] | 1.48***[1.20-1.90] |
| | East | 26 | 11 | 75 | 41 | 0.91[0.68-1.20] | 0.92[0.60-1.40] | 0.87[0.70-1.10] | 0.83[0.64-1.10] |
| | Northeast | 25 | 8 | 63 | 46 | 0.76[0.55-1.10] | 0.48**[0.30-0.80] | 1.00[0.70-1.50] | 1.51**[1.02-2.20] |
| | West | 15 | 4 | 70 | 38 | 0.60*[0.39-0.94] | 0.35**[0.20-0.80] | 1.19[0.92-1.50] | 1.23[0.96-1.60] |
| | South | 16 | 6 | 70 | 41 | 0.73*[0.53-1.01] | 0.57**[0.34-0.93] | 1.88***[1.50-2.30] | 1.71***[1.40-2.10] |
| All India | | 22 | 9 | 72 | 41 | | | | |

MPCE=monthly per capita consumption expenditure, SC=Scheduled Castes, ST=Scheduled Tribes, OBC=Other Backward Class
 Source: Authors' estimation from NSS 75th Round Data **P*<0.05, ***P*<0.01, ****P*<0.001 (OR: 1.00(R)) refers to the reference category of the variables, ORs obtained from the multiple logistic regression. The model includes an interception term

Table 4 shows that 13% of the households borrowed, sold assets, or received contributions from friends/relatives to meet healthcare expenditure for inpatient care at public hospitals for accidental injury care in India. For inpatient care at private hospitals, 24% of households reported distressed financing. Among households that experienced CHE for inpatient care in public and private hospitals, 27% and 35% (at the 25% threshold) reported distress financing, respectively. Overall, distressed financing is more common in rural areas than in urban areas, irrespective of the type of healthcare. The religious

differential shows that the incidence of distressed financing is less among Muslim households and other religious categories for inpatient care in public and private hospitals, respectively. Noticeably, the people from Scheduled Castes (SC)/Scheduled Tribes (ST) communities reported more incidence of distressed financing than their counterparts, irrespective of the type of healthcare facility. The economic gradient is visible, with the incidence of distressed financing being higher among the poorest households than in the better economic strata. However, in the case of households with CHE, the incidence of distressed financing is more in the wealthiest quintile, particularly for inpatient care in public hospitals. Health insurance does not make much difference in the incidence of distressed financing. Distressed financing was highest in the Southern region and lowest in the Northeast.

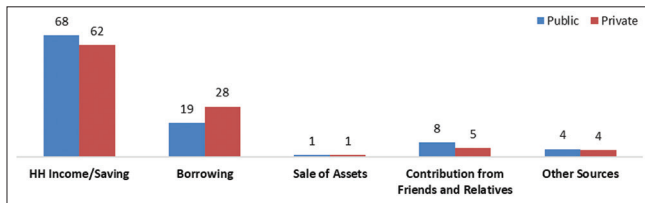


Figure 1: Percentage of financial sources contributed to CHE (>25%) for accidental injury and RTA and fall: NSS 2017–18 (Source: secondary data)

DISCUSSION

The increasing incidence of RTA is a major public health concern in India. Although a lot of studies on accidental

Table 4: Percentage of households reporting use of distressed financing as a major source by demographic and socioeconomic background characteristics, India: NSS 2017–18

| Categories | Variables | Public Sector | | | Private Sector | | |
|--------------------|---------------------------------|---------------|--------------------|------|----------------|--------------------|------|
| | | All | Catastrophic level | | All | Catastrophic level | |
| | | | >10% | >25% | | >10% | >25% |
| Place of Residence | Rural | 14 | 23 | 27 | 26 | 30 | 35 |
| | Urban | 11 | 27 | 34 | 20 | 27 | 35 |
| Religion | Hindu | 14 | 24 | 29 | 24 | 30 | 35 |
| | Muslim | 6 | 15 | 5 | 26 | 29 | 38 |
| | Other | 27 | 33 | 59 | 15 | 21 | 29 |
| Social groups | SC/ST | 17 | 33 | 35 | 27 | 31 | 38 |
| | OBC | 12 | 18 | 18 | 26 | 31 | 35 |
| | Others | 11 | 20 | 31 | 19 | 26 | 34 |
| Occupation | Casual Labor | 16 | 31 | 37 | 38 | 39 | 43 |
| | Self-employed (Agriculture) | 9 | 19 | 25 | 22 | 27 | 34 |
| | Self-employed (Non-agriculture) | 11 | 22 | 19 | 20 | 27 | 32 |
| | Regular Wage/Salaried | 15 | 17 | 17 | 20 | 25 | 32 |
| | Others | 28 | 31 | 36 | 31 | 35 | 44 |
| MPCE quintile | Poorest | 15 | 17 | 14 | 21 | 23 | 30 |
| | Poorer | 9 | 29 | 30 | 30 | 34 | 42 |
| | Middle | 11 | 17 | 25 | 30 | 34 | 41 |
| | Richer | 20 | 31 | 44 | 24 | 29 | 33 |
| | Richest | 10 | 32 | 61 | 17 | 25 | 28 |
| Insurance | No | 13 | 23 | 25 | 23 | 27 | 33 |
| | Yes | 12 | 28 | 45 | 28 | 39 | 44 |
| Region | North | 11 | 22 | 27 | 26 | 37 | 44 |
| | Central | 13 | 15 | 11 | 26 | 28 | 38 |
| | East | 10 | 25 | 31 | 24 | 28 | 33 |
| | Northeast | 4 | 5 | 9 | 6 | 8 | 8 |
| | West | 7 | 11 | 7 | 8 | 9 | 11 |
| | South | 21 | 39 | 51 | 30 | 37 | 43 |
| All India | | 13 | 24 | 27 | 24 | 29 | 35 |

MPCE = monthly per capita consumption expenditure, SC = Scheduled Castes, ST = Scheduled Tribes, OBC = Other Backward Class

Source: Authors' estimation from NSS 75th Round Data

Distressed Financing includes borrowings, sale of assets, and contributions from friends and relatives as a major source

injuries are published in India, but very few give a clear picture of its economic burden. The present study was conducted to identify the economic impact of accidental injury, RTA, and falls in terms of OOPE and the prevalence of CHE for patients hospitalized in public and private healthcare. The study observed that accidental injuries continue to be a significant challenge to public health and policy in India.

Overall, the data elucidates that the mean OOPE for hospitalization in public health facilities is Rs 8325/, while it is five times more in private health facilities (Rs 42826/). The finding is coherent with the report on Key Indicators of Social Consumption in India Health, NSS 71st round, which also reports a mean OOPE for injuries in the private sector are almost five times higher than in public sector (Rs 36,255/and Rs 6,729/respectively),^[8] and also with the study by Kumar *et al.* (2012) reveals that median medical expenditure on RTA was >4 times higher in private hospitals compared to public hospitals.^[9] This means the amount reimbursed for healthcare expenditure is less in India. These findings suggest that in order to ensure patients' speedy recovery and financial security, better healthcare facilities and universal health insurance coverage are required.

A comparison of the estimated mean OOPE in this study with earlier studies suggests that the study findings are higher than the estimates presented by Prinja *et al.* (2019) (Rs 16768/).^[10] It measured the injuries-derived OOPE in only one public sector tertiary care hospital in North India, which is an under-representation of the current sample. Pradhan *et al.* (2017) and Srinivas Goli *et al.* (2018) estimated the annual OOPE of RTA/accidental injuries in 2014 using the national statistics as Rs 26,132/and Rs 27,731/respectively.^[11,12]

The estimates of OOPE given by Kumar *et al.* (2012) were similar to the findings of the study with approximately Rs 36,000/.^[9] However, it surveyed two public hospitals and a private hospital in one of the metropolitan cities of India in 2005–06, therefore not representative of the current study. The greater mean OOPE estimated by Kumar *et al.* (2012) may be attributable to the fact that their sample was drawn from a larger metropolitan area that was used for more expensive tertiary treatment in more critical cases.

It was seen that the advanced age group (60+), males, and higher educated people are more prone to bear high mean OOPE on RTA, which is similar to the findings from other studies.^[10,13,14] The study observed a very minuscule increase in mean OOPE among the rural population and people with high wealth quintile.

This study showed the OOPE region-wise, which depicts that the Northeast region has a high burden of OOPE on accidental injury, RTA, and falls as compared to other regions of the country. This may be due to the lower number and below-par quality of healthcare facilities in that region, due to which they are compelled to travel to cities for specialized care, which increases their vulnerability to catastrophic OOPE and

results in exorbitant costs for ambulances and transportation in addition to healthcare. Unlike earlier studies, our estimates have presented a mean OOPE as a share of total health expenditure of 97% and 91% in public and private health facilities, respectively, which imposes massive economic burdens on the country's inhabitants, like some other ailments in India.

The study estimates the CHE in both private and public facilities at 10% and 25% of annual per capita household income. It states that hospitalization in the private sector imposes 72% of households incur CHE at more than 10% cut-off and 41% at more than 25% cut-off, while it is found less in the public sector with 22% of households incur CHE at more than 10% of annual per capita household income and 9% at more than 25%. The finding corroborates with the findings of the study by Prinja *et al.* (2019), estimating the prevalence of CHE as 22.2%. Prinja *et al.* (2019) also estimate the double odds of CHE when hospitalized in the private sector.^[9] Using public healthcare over private healthcare can reduce households incurring CHE by 50% at more than a 10% cut-off.

The prevalence of CHE was significantly higher in people residing in rural areas, people with lower income groups, and those with lower education levels. These findings are similar to a study conducted by Pradhan *et al.* (2017), where CHE was calculated at 5%, 10%, and 15% levels, from the data of NSSO 71st round data and also Prinja *et al.* (2019) and Kumar *et al.* (2012) in urban India.^[9,10,15] It is evident that having health insurance can reduce catastrophic payments, which is also reflected in the study by Goli *et al.* (2018).^[12]

Unlike many studies, this study finds the hospitalization rate due to accidents, RTA, and falls as 264.7 per 100000 population. The study reflected the high odds of hospitalization among old age people (60+) as they are more susceptible to fractures. Since men spend more time away from home than women do, and women often do not drive for extended periods of time, hospitalization is more common among men. The finding is consistent with the results of previous studies showing a higher incidence of accidents and hospitalization among men and higher age groups.^[16,17] People with higher education levels and higher income groups and having insurance have higher odds of hospitalization. On the contrary, study finding shows that rural people are more prone to hospitalization for accidental injuries than urban. The average days of hospitalization are 8.7 days in the study findings, which is much higher than the estimates given by previous studies by Urfi *et al.* (2016) (4–7 days) and Emamgholipour *et al.* (2021) (1.94 days).

A significant share of the population is dependent on distressed sources of finance due to their poor economic conditions. It shows that 13% and 24% of households reported the use of distressed financing as a major source in the public and private sectors, respectively. The major source of the CHE is through HH income/savings. Borrowings from various sources, selling household assets, and help from friends or relatives are the other popular distressed sources of finance. This is consistent

with the findings of other studies justifying the sources of financial distress. Alam *et al.* (2016) study to assess the household economic burden of RTA from five South-Asian countries – Bangladesh, India, Nepal, Pakistan, and Sri Lanka reported nearly 6.37% of lower socioeconomic groups and 5.67% of higher socioeconomic groups households opted for borrowing or selling assets to finance OOP health expenses on accidents.^[18] Similar results were reported by other studies in an African country.^[19]

Although, our study has major methodological strengths, such as analysis of a large-scale nationally representative survey and categorizing the CHE on a cut-off of 10% and 25% of annual per capita consumption of household expenditures, which have provided an in-depth assessment of the economic burden. We do also have certain limitations, like the data is almost 5 years old; however, the results have provided an overall burden and inference about the economic burden due to accidents and injuries in India.

Conclusion and Recommendations

The study concludes that the increasing burden of accidents and injuries is a threat to the overstretched health system. Rapid urbanization, the increasing number of vehicles, and the casual approach of citizens to not following the traffic rules may impose enormous emotional, physical, and financial burdens. Study shows that there is a huge economic burden due to RTA. In order to ensure patients' speedy recovery and financial security, the government should ensure better healthcare facilities and universal health insurance coverage. These findings may be helpful in developing measures for reducing accidental cases and the hospital expenses associated with accidental injuries.

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Conflicts of interest

There are no conflicts of interest.

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