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TOPIC: A Retrospective Analysis of Rural and Urban Disparities in Inpatient Outcomes at NIMS Hospital Jaipur, India

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rural and urban disparities; hospital outcomes; absconding; left against medical advice; India

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ABSTRACT

Background: Health disparities between rural and urban populations persist in India, yet hospital based evidence on how place of settlement relates to inpatient outcomes is limited.
Objective: This study described the distribution of inpatients by place of settlement and age and examined the association between settlement and the outcome of management at NIMS Hospital Jaipur.
Methods: A retrospective record review was conducted on 5,514 inpatients admitted to the medical department between July and December 2015. Settlement (rural or urban) and outcome (discharged, absconded, or left against medical advice, LAMA) were extracted from hospital records and analysed with the chi square test at the 0.05 significance level. Effect size was estimated with Cramér's V.
Results: Most patients came from rural areas (79.5%), and 33.3% were aged above 50 years. Overall, 75.7% were discharged, 23.9% absconded, and 0.4% left against medical advice. Outcomes differed significantly by settlement ($\chi^2 = 1956.55$, df = 2, $p < 0.001$; Cramér's V = 0.60). Absconding was far more frequent among urban patients (72.4%) than rural patients (11.4%).
Conclusion: The hospital mainly served rural patients, and outcomes differed markedly by settlement. Hospitals should investigate the reasons for absconding and strengthen discharge counselling, financial counselling, and rural outreach. Occupation, social class, and diagnosis were not analysed, so the findings should be interpreted cautiously.

INTRODUCTION

Health inequalities between social groups and between places of residence remain a global concern, because the conditions in which people are born, live, work, and age shape the distribution of disease and death (Marmot & Bell, 2019; WHO CSDH, 2008). India illustrates this concern clearly. The country is passing through an epidemiological transition in which the burden from noncommunicable diseases and injuries overtook that from communicable, maternal, neonatal, and nutritional conditions in 2003, although the pace of change differs widely across states (Dandona et al., 2017). Noncommunicable conditions are now common: a national survey of 113,043 adults found diabetes in 11.4% and hypertension in 35.5%, and most metabolic conditions were more frequent in urban than in rural areas (ICMR-INDIAB Collaborative Study Group, 2023). An earlier survey in 15 states had already reported diabetes

in 11.2% of urban adults against 5.2% of rural adults (Anjana et al., 2017). Globally, an estimated 536.6 million adults lived with diabetes in 2021, and China (140.9 million), India (74.2 million), and the United States (32.2 million) together accounted for about 46% of them (Sun et al., 2022).

Access to health and social service. Evidence indicates that rural residents have limited access to health care (Banerjee, 2021; Karan et al., 2021). In India, the health workforce is highly skewed across states, between rural and urban areas, and between the public and private sectors; of a total stock of 5.76 million health workers only 3.12 million are active, and the combined density of doctors, nurses, and midwives remains below the WHO threshold of 44.5 per 10,000 population (Karan et al., 2021). Among older Indians, use of health care was 7 percentage points higher in urban than in rural areas, and education and economic status together explained 41% of this gap (Banerjee, 2021). Financial protection also matters. The Ayushman Bharat programme was announced to cover about 107.4 million poor and vulnerable families, or around 40% of the population, with hospitalisation cover of up to Rs 500,000 per family per year (Lahariya, 2018). Even so, out of pocket payments made up 31% of total spending per admission in public hospitals and 86% in private hospitals in one state (Garg et al., 2022), and public facilities handled only 45.3% of rural inpatient care in 2017 and 2018, up from 41.6% in 2014 (Sharma et al., 2025).

Individuals of lower socioeconomic status in India experience a wide array of health problems as a result of their economic status. They are unable to use health care as often, and when they do it is of lower quality, even though they generally tend to experience a much higher rate of health issues. Furthermore, individuals of lower socioeconomic status have less education and often perform jobs without significant health and benefits plans, whereas individuals of higher standing are more likely to have jobs that provide medical insurance. Consequently, they have higher rates of infant mortality, cancer, cardiovascular disease, and disabling physical injuries. In India, wealth and education explain a large share of the inequality in the use of basic services such as blood pressure and blood glucose testing (Sharma et al., 2022). Financial constraints, the lack of health insurance, and low family income also predict leaving the emergency department against medical advice (Kumar et al., 2025).

Social determinants of health are the economic and social conditions, and their distribution among the population, that influence individual and group differences in health status. They are risk factors found in one's living and working conditions (such as the distribution of income, wealth, influence, and power), rather than individual factors (such as behavioral risk factors or genetics) that influence the risk for a disease, injury, or vulnerability to disease or injury. According to some viewpoints, these distributions of social determinants are shaped by public policies that reflect the influence of prevailing political ideologies of those governing a jurisdiction. This definition follows the WHO framework (Marmot & Bell, 2019; WHO CSDH, 2008). Place of residence is one visible marker of these determinants. In the layered model of Dahlgren and Whitehead, individual lifestyle sits within social and community influences, which in turn sit within living and working conditions and within general socioeconomic, cultural, and environmental conditions (Dahlgren & Whitehead, 2021). Rural or urban settlement is therefore treated in this study as a marker of differences in access, cost, and social support that may shape what happens to a patient during hospital care.

Health inequality is the term used in a number of countries to refer to those instances whereby the health of two demographic groups (not necessarily ethnic or racial groups) differs despite comparative access to health care services. Such examples include higher rates of morbidity and mortality for those in lower occupational classes than those in higher occupational classes, and the increased likelihood of those from ethnic minorities being diagnosed with a mental health disorder (Marmot & Bell, 2019; WHO CSDH, 2008).

Causes of health inequalities

Economic Status: The material explanation blames poverty, poor housing conditions, lack of resources in health and educational provision as well as higher-risk occupations for the poor health of the lower social classes. Poverty is demonstrably bad for health. Life expectancy is lower in poorer countries, where communicable diseases linked to poverty and low literacy remain important, while noncommunicable diseases become more common as countries pass through epidemiological transition (Dandona et al., 2017).

Socio Cultural Factor: The cultural explanation suggests that the lower social classes prefer less healthy lifestyles, eat more fatty foods, smoke more and exercise less than the middle and upper classes. They have less money to spend on a healthy diet, although this is probably rather less important than a lack of knowledge of what is a healthy diet. This behavioural explanation should be read critically, because lifestyle choices are shaped by income, education, and the environment in which people live. In England, for example, households in the lowest income decile would need to spend more than 70% of their income to follow healthy eating guidelines (Marmot & Bell, 2019), so food choices are limited by cost and not only by knowledge.

Environmental Factor: The quality of environment people lives can affect their health in many ways, such as overcrowding, insecurity and the poor physical condition of housing, as well as people living in rural areas as compared to those in urban cities.

Previous research

Indian studies on rural and urban differences have mostly examined access and use of services rather than what happens to patients once they are admitted. Gaps between rural and urban areas have been reported in the use of health care by older adults (Banerjee, 2021), in the distribution of health workers (Karan et al., 2021), and in the choice between public and private inpatient care (Sharma et al., 2025). National surveys such as the fifth National Family Health Survey report many indicators separately for rural and urban areas, but they do not describe the outcomes of hospital care (IIPS & ICF, 2021). Research on how patients leave hospital is also scarce in India. In a private tertiary hospital in New Delhi, 5.2% of emergency patients left against medical advice (LAMA), mainly because they felt better after initial treatment (25.8%), no intensive care bed was available (20.5%), or money was short (17.3%) (Kumar et al., 2025). In a tertiary psychiatric hospital in Ranchi, 1.8 per 1,000 admissions absconded (Verma et al., 2020). Outside India, discharge against medical advice accounted for 1.5% of adult admissions in the United States and was followed by 30 day readmission in 21.0% of cases, against 11.9% after standard discharge (Tan et al., 2020). In a medical admissions unit in the United Kingdom, 3% of patients were discharged against medical advice, and 84% of them lived in the three most deprived quintiles (Alagappan et al., 2023).

Research gap, novelty, and urgency

In the literature reviewed for this study, we found few hospital based studies in India that compare the outcome of management (discharge, absconding, and LAMA) between rural and urban inpatients, and none from NIMS Hospital Jaipur. This is the gap that the present study addresses. Its novelty lies in treating place of settlement as a factor in how an inpatient episode ends, and not only in who reaches the hospital. The question is urgent because India is expanding public financing of hospital care (Lahariya, 2018) while health workers remain unevenly distributed between rural and urban areas (Karan et al., 2021), so hospitals need evidence on which patients leave before treatment is complete. NIMS Hospital Jaipur is a suitable setting because its medical department admits both rural and urban patients, which allows a direct comparison by place of settlement.

Objective Of The Study

To describe the distribution of inpatients by place of settlement (rural or urban) and by age group.

To examine the association between place of settlement and the outcome of management (discharged, absconded, or left against medical advice).

Hypotheses. The null hypothesis (H0) states that the outcome of management is independent of place of settlement. The alternative hypothesis (H1) states that the outcome of management differs between rural and urban inpatients.

Expected benefits. The findings are expected to help hospital managers identify groups of patients at risk of leaving before treatment is complete, plan discharge and financial counselling, and design outreach for rural patients. Occupational group and social class were not available for analysis and are therefore not objectives of this study.

METHOD

A retrospective record review was used. The medical records of inpatients admitted to the medical department of NIMS University Hospital during the study period were retrieved from the medical and health record department of the hospital, and the records that met the inclusion criteria were reviewed (Talari & Goyal, 2020). This paper reports on place of settlement, age, and outcome of management; specific diagnoses were not analysed.

The study population comprised inpatients admitted to the medical department of NIMS Hospital Jaipur between July and December 2015. A total of 5,514 inpatient records met the inclusion criteria and were analysed; this number forms the sample size (total enumeration, without sampling).

Flow of records. [Authors to complete from the hospital records: number of records retrieved = n; excluded as outpatient records = n; excluded for no documented medical record = n; included and analysed = 5,514.]

Inclusion Criteria:

Inpatients that spent at least 24 hours on admission

Both male and female

Exclusion Criteria:

Patients seen on outpatient basis

Patients seen at the facility without documented medical record.

Study setting and period. NIMS University Hospital is a university hospital in Jaipur, Rajasthan, India, and its medical department admits patients from the city and from surrounding rural areas. The study period was July to December 2015. These records were used as a closed baseline dataset that describes care before the Ayushman Bharat programme was announced in 2018 (Lahariya, 2018) and before the COVID-19 pandemic. The findings therefore describe a historical baseline and not current practice (see the limitations in the Discussion).

Operational definitions. Place of settlement was the rural or urban residence recorded in the hospital registration record. Outcome of management was classified as discharged (discharged by the treating team after clinical improvement), absconded (left the hospital without informing staff), or left against medical advice (LAMA; left after the patient or family refused the advised stay or treatment). Age was recorded in years and grouped as below 10, 11 to 20, 21 to 30, 31 to 40, 41 to 50, and above 50 years. Occupational group and social class were not available for analysis.

Data collection and quality control. [Authors to complete: the data abstraction form used, the number and role of data collectors, and the data quality checks performed.]

Statistical analysis. Counts and percentages described the distribution of age, settlement, and outcome. The association between place of settlement (rural or urban) and outcome of management (discharged, absconded, or LAMA) was tested with Pearson's chi square test of independence at a significance level (α) of 0.05, and effect size was expressed as Cramér's V. The test requires adequate expected counts (Kim, 2017); one of the six cells (urban LAMA, expected count 4.9) was below 5, which is within the usual limit of 20% of cells. Percentages within each settlement group (row percentages) are reported. The statistics were recomputed from the cross tabulation using Python (SciPy). [Authors to state the software used in the original analysis.]

Ethical considerations. [Authors to insert the name of the Institutional Ethics Committee of NIMS University, the approval number, and the date.] The study reviewed existing hospital records only. Waiver of informed consent for retrospective record review follows national guidelines (Behera et al., 2019; Indian Council of Medical Research, 2017), and patient identifiers were excluded from the analysis file. [Authors to confirm.]

RESULTS

Research Finding: Of the 5,514 inpatients, 4,383 (79.5%) came from rural areas and 1,131 (20.5%) from urban areas. The outcome of management differed significantly by place of settlement ($\chi^2 = 1956.55$, $df = 2$, $p < 0.001$).

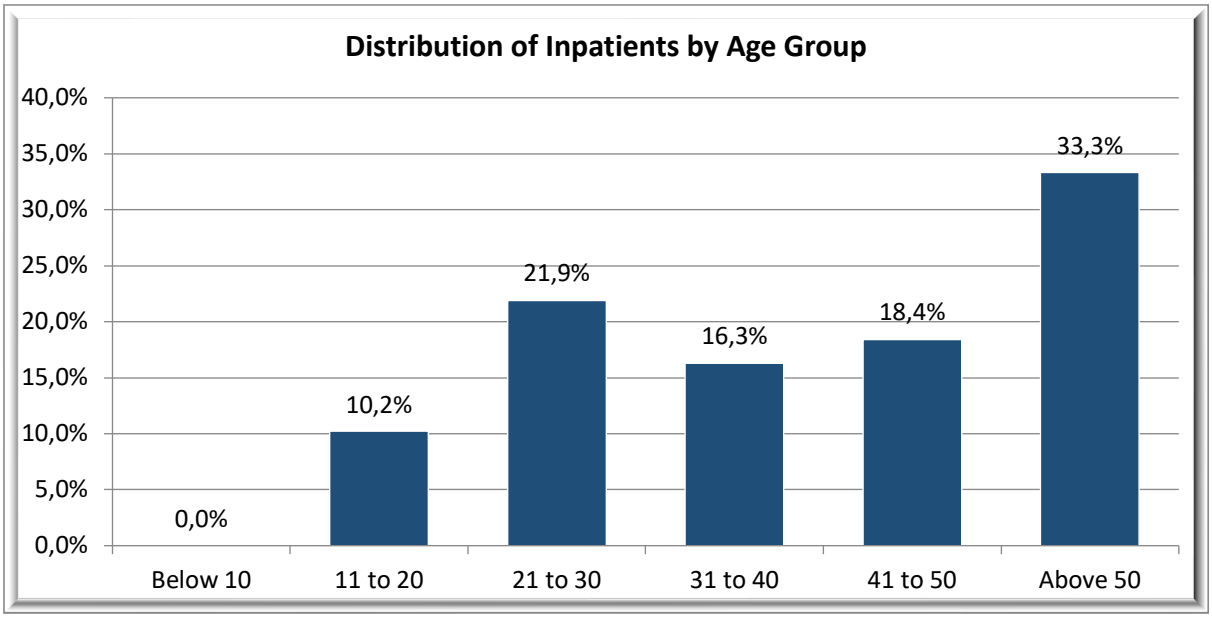


Figure 1. Distribution of inpatients by age group (%), N = 5,514.

Table 1. Distribution of inpatients by age group.

Age group (years)	n (approx.)	%
Below 10	2	0.03
11 to 20	562	10.2
21 to 30	1,208	21.9
31 to 40	899	16.3
41 to 50	1,015	18.4
Above 50	1,836	33.3
Total	**5,522**	**100.1**

Note. Counts (n) are approximate, back calculated from the reported percentages (percentage × 5,514), and sum to 5,522 because the reported percentages are rounded and sum to 100.1%. [Authors to replace with exact counts from the records.]

Figure 1 and Table 1 show the age distribution of the inpatients: below 10 years (0.03%), 11 to 20 years (10.2%), 21 to 30 years (21.9%), 31 to 40 years (16.3%), 41 to 50 years (18.4%), and above 50 years (33.3%). Patients above 50 years formed the largest group. The percentages are rounded and sum to 100.1%.

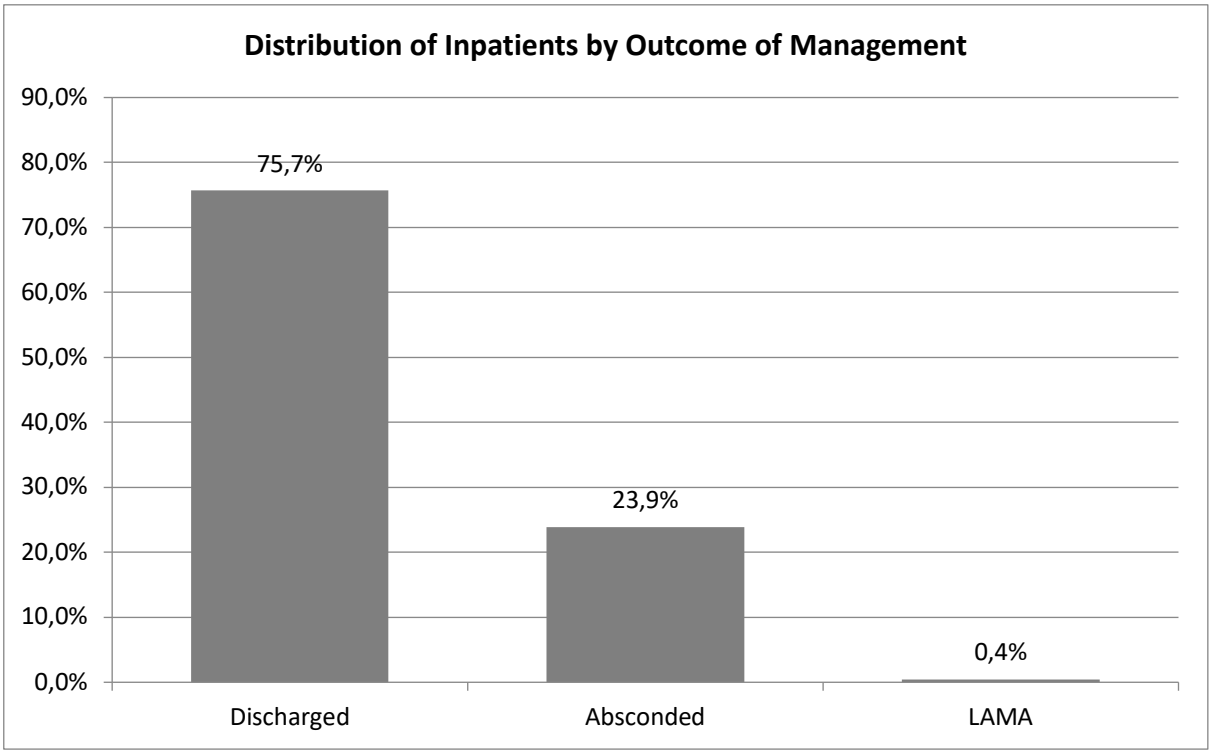


Figure 2. Distribution of inpatients by outcome of management (%), N = 5,514.

Figure 2 shows the outcome of management. Of the 5,514 inpatients, 4,172 (75.7%) were discharged, 1,318 (23.9%) absconded, and 24 (0.4%) left against medical advice (LAMA). Discharge was therefore the most common outcome.

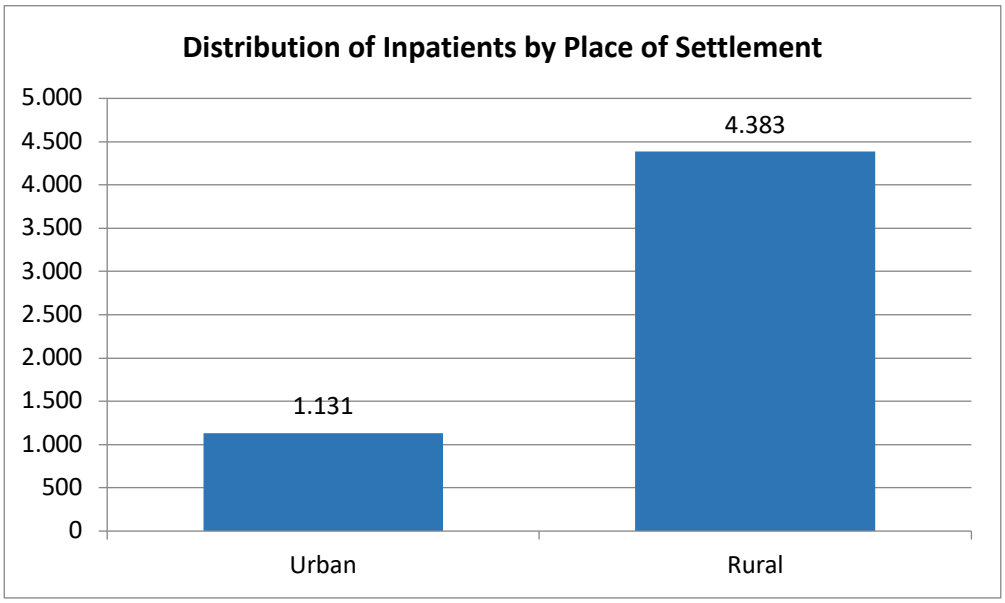


Figure 3. Distribution of inpatients by place of settlement (n), N = 5,514.

Figure 3 shows that 4,383 inpatients (79.5%) came from rural areas and 1,131 (20.5%) from urban areas.

Table 2. Association between patient settlement and outcome of management (n).

	Discharged	Absconded	LAMA		X^2	*DF*
Rural	3883	499	1	4383		
Urban	289	819	23	1131	1956.55	2
TOTAL	4172	1318	24	5514		

*Significant at the 0.05 level ($p < 0.001$); Cramér's V = 0.60.

Table 2 shows the outcome of management by place of settlement. Among the 4,383 rural patients, 3,883 were discharged, 499 absconded, and 1 left against medical advice. Among the 1,131 urban patients, 289 were discharged, 819 absconded, and 23 left against medical advice. Outcome was significantly associated with place of settlement ($\chi^2 = 1956.55$, df = 2, $p < 0.001$; Cramér's V = 0.60). Most admitted patients (79.5%) came from rural areas.

Table 3. Outcome of management by place of settlement, n (% within settlement).

Settlement	n	Discharged, n (%)	Absconded, n (%)	LAMA, n (%)
Rural	4,383	3,883 (88.6)	499 (11.4)	1 (0.02)
Urban	1,131	289 (25.6)	819 (72.4)	23 (2.0)
Total	**5,514**	**4,172 (75.7)**	**1,318 (23.9)**	**24 (0.4)**

Table 3 shows that 88.6% of rural patients were discharged, against 25.6% of urban patients, while 72.4% of urban patients absconded, against 11.4% of rural patients. LAMA was uncommon in both groups (0.02% of rural and 2.0% of urban patients).

DISCUSSION

This study found that the medical department of NIMS Hospital Jaipur served mainly rural patients (79.5%) and that the outcome of management differed strongly by place of settlement. The overall discharge rate was 75.7%, but this hid a sharp contrast: 88.6% of rural patients were discharged, against 25.6% of urban patients. This pattern is consistent with the view that where people live shapes their experience of health care through differences in access, cost, and social support (Dahlgren & Whitehead, 2021; WHO CSDH, 2008), although this study did not measure these mechanisms directly.

The predominance of rural patients is in line with the large share of hospitalisation that occurs in rural India, where public facilities handled 45.3% of inpatient care in 2017 and 2018 (Sharma et al., 2025), and with the uneven distribution of health workers between rural and urban areas (Karan et al., 2021). Because this is a single hospital study, it cannot show whether rural residents are more likely to be admitted than urban residents; it shows only that, among those admitted, rural residents were the majority. National surveys report that noncommunicable diseases are more frequent in urban populations (Anjana et al., 2017; ICMR-INDIAB Collaborative Study Group, 2023), so the rural majority here may reflect the catchment and referral pattern of the hospital rather than a higher rural disease burden.

The most striking result is the high proportion of urban patients who absconded (72.4%), against 11.4% of rural patients. This is far higher than rates reported in other Indian settings, such as 1.8 per 1,000 admissions in a psychiatric hospital (Verma et al., 2020) or the 5.2% of emergency patients who left against medical advice (Kumar et al., 2025), although these settings and definitions differ and are not directly comparable. The records cannot tell us why patients left. Financial constraints, the lack of health insurance, and the lack of intensive care beds have been reported as reasons for leaving against medical advice in India (Kumar et al., 2025), and out of pocket payments make up a large part of the cost of admission, especially in private hospitals (Garg et al., 2022). Urban patients may also have more alternatives nearby and may leave to seek care elsewhere. Because the figure is unusual, it should be verified against the source records, including how absconding was recorded for urban patients, before it is interpreted further.

LAMA was uncommon (0.4%), although it was more frequent among urban patients (2.0%) than rural patients (0.02%). Discharge against medical advice is clinically important because it has been linked to higher readmission, with 30 day readmission in 21.0% of cases after discharge against medical advice against 11.9% after standard discharge in the United States (Tan et al., 2020), and to social deprivation in the United Kingdom (Alagappan et al., 2023). Absconding and LAMA both mean that treatment was interrupted, and the hospital cannot know what happened to these patients afterwards. In this study, absconding and LAMA together affected 24.3% of patients, which is a substantial burden for hospital management.

Occupational group and social class were part of the original aims but could not be analysed, so these findings say nothing about income, wealth, or occupational status. Place of settlement is used here only as a marker of social conditions (Marmot & Bell, 2019).

Implications for hospital management. The findings suggest three practical steps. First, the hospital could review why urban inpatients leave without informing staff, for example through exit interviews, because absconding stops the care process and leaves no record of the outcome. Second, discharge and financial counselling at admission could help patients and families understand the expected cost and duration of stay, including the benefits available under public insurance schemes (Lahariya, 2018). Third, outreach and follow up arrangements for rural patients, who form most admissions, could support continuity of care after discharge.

Limitations. This study is based on one hospital, so the results cannot be generalised to other hospitals or regions. The data are from July to December 2015 and are about a decade old, so they predate the Ayushman Bharat programme and the COVID-19 pandemic. Records were created for patient care and not for research, which can lead to missing or inconsistent data and to selection bias (Talari & Goyal, 2020). Diagnosis, occupation, social class, income, and reasons for absconding were not available, so the associations could not be adjusted for these factors and no causal conclusion can be drawn.

CONCLUSION

Among 5,514 inpatients at NIMS Hospital Jaipur between July and December 2015, most came from rural areas (79.5%) and most were discharged (75.7%), but 23.9% absconded and 0.4% left against medical advice. In relation to the first objective, the largest age group was above 50 years (33.3%). In relation to the second objective, the outcome of management was

strongly associated with place of settlement ($\chi^2 = 1956.55$, df = 2, $p < 0.001$): absconding was much more frequent among urban patients (72.4%) than rural patients (11.4%). Hospitals serving similar populations should review the reasons for absconding, strengthen discharge and financial counselling, and plan outreach and follow up for rural patients. The findings come from one hospital and from 2015 records. Future studies should include diagnosis, occupation, social class, and reasons for leaving, use recent data from several hospitals, and test whether the high urban absconding rate is confirmed.

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CONFLICT OF INTEREST

The author's declared that this work was conducted in the absence of any business or money relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization: [author initials]; methodology: [author initials]; data curation: [author initials]; formal analysis: [author initials]; writing, original draft: [author initials]; writing, review and editing: [author initials]; supervision: [author initials]. [Authors to assign these roles to each author using the CRediT taxonomy.]

GENERATIVE AI STATEMENT

The authors declare that generative AI was used only to refine the clarity and grammar of the language in this manuscript.

The authors acknowledge that generative AI ([tool name and version to be stated by the authors]) was used only to improve language clarity and grammatical construction, in line with ethical guidelines on the disclosure of generative AI in scholarly research. It was not used to generate the data, the analysis, or the conclusions. The authors checked all text and take full responsibility for the integrity and final content of the manuscript.

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